

Factors Limiting the Success of NTFP Conservation Strategies:
A Case Study of Rattan in Nam Đông, Vietnam

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Sous la direction du Prof. Christian Kull



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Abstract

Non-timber forest products have recently become very attractive to international markets. Unfortunately, their often-uncontrolled use has led to extraction rates beyond their sustainable capacity. In Nam Đông, Vietnam, this is also the case, notably with rattan resources, which are in high demand nationally and internationally. Various projects have therefore been set up to establish strategies to protect these resources, while seeking to secure economic benefits for local communities. But the promises and expectations of NTFP conservation practices are not necessarily successful in every context.

This thesis seeks to highlight potential limiting factors that might hinder the achievement of NTFP conservation strategies in the context of Nam Đông, more specifically when it comes to rattan resources. To do this, the research focuses on the three assumptions often made about these approaches, the first being that NTFPs provide income to local communities and improve their livelihoods, the second that NTFP extraction will increase people's incentive to protect nature, particularly if value is added to these products, and the third that NTFP extraction will help to reduce pressure on forests, as people will turn to using NTFPs instead of other less sustainable activities such as timber.

To analyse these assumptions regionally, several interviews have been conducted with local people and institutions, in parallel with a thorough literature review. Additionally, a collaboration with WWF has enabled to carry out a survey for more information. Overall, around 50 people have responded to our questions, which have given useful data.

The results have shown that NTFP conservation strategies still face many challenges that need to be considered in future programmes aimed at enhancing local peoples' livelihoods and higher conservation results, as all three assumptions seem to be hindered by limiting factors.

Key Words: Rattan, Nam Đông, NTFP, Conservation, limiting factors

Résumé

Les produits forestiers non ligneux sont devenus très importants sur les marchés internationaux. Malheureusement, leur utilisation souvent incontrôlée a conduit à des taux d'extraction dépassant la capacité durable des ressources naturelles. À Nam Đông, au Viêt Nam, c'est également le cas, notamment pour les ressources en rotin qui font l'objet d'une forte demande au niveau national et international. Divers projets ont donc été mis en place dans la région pour établir des stratégies de protection de ces ressources, tout en cherchant à garantir des avantages économiques aux communautés locales. Mais les promesses et les attentes des pratiques de conservation des PFNL ne sont pas nécessairement couronnées de succès dans tous les contextes.

Cette thèse cherche à mettre en évidence les facteurs limitatifs potentiels qui pourraient entraver la réalisation des stratégies de conservation des PFNL dans le contexte de Nam Đông, plus spécifiquement en ce qui concerne le rotin. Pour ce faire, la recherche se concentre sur les trois hypothèses souvent formulées à propos de ces approches, la première étant que les PFNL procurent un revenu aux communautés locales et améliorent leurs moyens de subsistance, la deuxième, que l'extraction des PFNL incite davantage les gens à protéger la nature, notamment si une valeur est ajoutée à ces produits, et la troisième, que l'extraction des PFNL contribuera à réduire la pression sur les forêts, car les gens se tourneront vers l'utilisation des PFNL au lieu d'autres activités moins durables comme le bois.

Pour analyser ces hypothèses à l'échelle régionale, plusieurs entretiens ont été menés avec des personnes et des institutions locales, parallèlement à une analyse documentaire approfondie. En outre, une collaboration avec le WWF a permis de réaliser une enquête pour obtenir plus d'informations. Au total, une cinquantaine de personnes ont répondu à nos questions, ce qui a permis d'obtenir des données utiles.

Les résultats ont montré que les stratégies de conservation des PFNL sont encore confrontées à de nombreux défis qui doivent être pris en compte dans les futurs programmes visant à améliorer les moyens de subsistance des populations locales et à obtenir de meilleurs résultats en matière de conservation, car ces trois hypothèses semblent être entravées par plusieurs facteurs limitatifs.

Mots clés : Rotin, Nam Đông, PFNL, conservation, facteurs limitants

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List of Acronyms

ADB	Asian Development Bank
BCC	Biodiversity Conservation Corridor
CAL	Central Annamites Landscape
CarBi	Carbon and Biodiversity Project
CORENARM	Consultative and Research Center for Natural Resources
DEG	Germany's Entrepreneurial Development Cooperation
FLA	Forest Land Allocation
FMB	Forest Management Board
FPD	Forest Protection Department
HH	Household
MARD	Ministry of Agriculture and Rural Development
MBSF	Management Board for Special-use Forests
MPPN	Multidimensional Poverty Peer Network
NTFP	Non-timber forest product
PC	People's Committee
PFES	Payment for Forest Environmental Services
SFC	State Forest Company
SFE	State Forest Enterprise
SIDA	Swedish International Development Agency
SUF	Special-Use Forest
TTH	Thừa Thiên Huế Province
USAID	United States Agency for International Development
VND	Viet Nam Đông (currency)
WWF	World Wildlife Fund

1. Introduction

Natural forests in Vietnam have decreased over the century, notably due to the country's history of war, but also shifting cultivation, overexploitation and increasing population (Cochard et al., 2016). This has resulted in the decline of many natural resources, including rattan (Binh, 2009). Rattan is a climbing or hanging palm tree that grows mainly in Asia and Africa and of which there are about 600 species (WWF, 2010). Rattan is an important source of primary, secondary and emergency income for the people who harvest and collect it, as well as for traders, processors and sellers along the supply chain. Globally, the poorest are the most dependent on such forest resources for their livelihoods (World Bank, 2019). Unfortunately, due to insufficient control, rattan is threatened by overexploitation in many countries around the world (FAO, 2001). According to the World Wildlife Fund (WWF) (2014), "land conversion and unsustainable harvesting are leading to serious declines in rattan stocks." This is also the case in Vietnam, where many non-timber forest products (NTFPs) are still freely accessible and not sufficiently controlled, while they become more and more interesting for international markets, which increases demand. To minimise the negative effects of overexploitation on forests, several conservation strategies have been implemented to plant and protect rattan in poor forest areas, improve the livelihoods of local people, strengthen the supply chains, and increase stakeholder knowledge of sustainable practices.

In fact, NTFPs have become a common strategy to address sustainability, conservation and poverty reduction issues (Michon and Angelsen, 2005). Long-time NTFP observers such as Ros-Tonen, Sunderland, Belcher and Michon say that three main assumptions are often made about NTFPs. First, it is believed that NTFPs raise employment rates and incomes, especially in hard times. Second, increased commercial harvest of NTFPs and added value to the products are believed to increase the perceived value of forests, which increases the incentive for local people to better protect the forests (Ros-Tonen, Belcher, in FAO, 2001, Sunderland et al., 2011). And finally, NTFP exploitation is considered better than timber extraction, therefore NTFP extraction is believed to decrease human pressure on forests (Ros-Tonen, 1999). However, these assumptions being rarely tested in specific contexts, they often result in unrealistic expectations.

The aim of this study is first to provide an overview of projects and their conservation strategies in Nam Đông. This area is of interest because it is mostly covered by forestland (91% in 2010 according to GFW, n.d.) and many projects are implemented there to protect the forests through NTFP conservation activities. In a second step, this research seeks to understand to what extent these projects seem to achieve the assumptions mentioned above. To do so, several interviews were conducted with different stakeholders in Nam Đông and Hue City, and an additional survey was carried out in collaboration with WWF. The results provide answers to better identify potential limiting factors for the success of rattan conservation strategies in the specific context of Nam Đông. To answer the research question "*what are the potential limiting factors for the success of rattan conservation strategies in the district of Nam Đông, Thừa Thiên Huế?*", this thesis first summarises the important aspects of forest and rattan management in Vietnam in order to get a better overview of the current context.

2. Contextual information

2.1. Rattan resources in Vietnam

Rattan is an NTFP that refers to around 600 species that can mostly be found in tropical regions of Africa and Asia (WWF, 2010). The palm belongs to the Calamoideae subfamily of the Palmae or Arecaceae family (FAO, 2001). In recent years, its commercialisation has bloomed in the international market, rattan being used for furniture, but also smaller objects such as umbrellas, walking sticks, baskets, mattin, hats, ropes, among others (FAO, 2001). What people use most from rattan is the cane, or the stem (FAO, 2001).

“Rattan is, without question, one of the most important and widely used non-timber forest products in the world”.

(Peters and Henderson, 2014, p. 1)

However, the demand for export exceeds the supply capacity in Vietnam (WWF, 2010). The country has around 30 species of rattan, 10 of which have commercial value. Natural rattan is mainly found in the forests of the country's mountainous regions (WWF, 2010). There are almost no plants that can be considered as alternatives because rattan is exceptionally strong and flexible, which is suitable for furniture making. Some other plants such as raffia, bamboo or willow can be potentially useful, “but in the international market these products do not command prices comparable to those of rattan furniture” (FAO, 2001, p. 13). The only climbing palm that can substitute for rattan is *Desmoncus*. However, rattan remains preeminent.

Given the variety of rattan species, different collection and harvesting conditions apply, and their quality and quantity are spatially and temporally variable. In fact, not all rattans are equally useful and not all of them have the same economic value on the market. The diameters of each sort can be different, varying from 2 mm to 10 cm (Dransfield and Manokaran, 1994 in FAO, 2001).

In Vietnam, there is a great lack of information on the density and conservation status of rattan, and harvest quotas are based on demand rather than actual supply (Peters and Henderson, 2014). For instance, the Ministry of Agriculture and Rural Development (MARD) has issued a decision stipulating that a national target is to supply more than 50% of the demand for NTFP for processing and exporting (WWF, 2010).

Producers and importing countries have put in place specific policies, such as the U.S. Lacey Act, which bans the import of rattan that has been harvested or transported illegally. This law requires the knowledge of the exact scientific name of the plant in order for the NTFP to be imported. This law has a strong impact on the harvesting and trade practices given that the U.S. is “the largest single importer of rattan furniture, basketwork, and mats in the world” (Peters and Henderson, 2014, p. 205). Hence, the market conditions are continually evolving, and depend strongly on international demand. Despite such regulations, Vietnam has not yet established any clear system of policies: “Rattan and NTFPs are mentioned scattered in some legal policies, but just in one chapter, or article” (WWF, 2010). On the other hand, some

replanting strategies were mentioned, namely that NTFPs should be developed to create incomes; indications remain nevertheless very unclear.

2.1. Forests in Vietnam

As rattan grows mostly in natural forests, it is important to understand how the latter are organised and how they have evolved in the last decades. In Vietnam, the government separates land into 5 categories: agricultural land, forestry land, land for residential areas, specialised land, and unused land. Forestland can be divided into natural forests and plantation forests (Hardcastle, 2002; Nguyen, 2005). The focus of this research is on natural forests.

Since colonial times and during the wars, namely between 1945 and 1975, Vietnam saw its forests decrease significantly. Three main reasons were the massive cutting of trees for economic benefits, aerial herbicides and fires caused by war (Cochard et al., 2016). Post-war times, between the 1970's and 1980's, were then marked by a deforestation peak when all forests were nationalised and managed by more than 400 State Forest Enterprises (SFE's), responsible for timber extraction and massive overexploitation of timber resources. In the meantime, people were converting more and more land and expanding their slash and burn practices. This was mainly due to population growth in remote areas caused, amongst others, by resettlement programs to mountainous regions (Cochard et al., 2016). Furthermore, decreasing crop productivity due to forced collectivisation of agriculture in lowlands was a motivation to cultivate individual parcels in remote areas (Meyfroidt and Lambin 2008 in: Cochard et al., 2016). Finally, nationalisation of forestlands leading to insufficient local control and enforcement of regulations have also played a role in the decline of forests during this period (Cochard et al., 2016).

In the 80's, however, paradigms started shifting and forestry and land resource management became a priority as the importance of healthy forests became more and more evident (Jamieson et al. 1998, Vo and LeThac 1994, McElwee 2016 in: Cochard et al., 2016). In 1986, the National Economic Policy Reform led to new Land laws, liberalisation, and stronger property rights, in parallel with slower deforestation due to lower pressure on marginal lands. Another important change was the shift in forest ownership that was not entirely assigned to the State anymore. Indeed, provinces and districts started playing a more important role in forest management after this reform (Cochard et al., 2016). Also, SFE's have shifted roles. While they were exclusively focused on extraction in the 70's and 80's, some of them were dissolved as they were not needed anymore, and some remained and became State-owned Forest Companies (SFC's) or Forest Management Boards (FMB) responsible for the management of protection and special-use forests (SUF) (see 2.1.2) (Cochard et al., 2016).

In 1993, another big change occurred, namely a new Land Law which attributed management of some forestlands to local people through Forestland Allocation (FLA) (Cochard et al., 2016). With this law, forestland still belongs to the State, but it is allocated to different "owners" who are responsible for taking care of the given land. Initially, FLA was only provided on poor forestland or barren land with a goal to promote reforestation and economic benefits. People received technical support through tree nurseries and payments. At later stages,

however, FLA also provided natural forestland, with a focus on protection and conservation (Cochard et al., 2016).

During this period, reforestation was mainly financed by Programme 327 and Programme 661. Programme 327 was introduced by the government in 1992 as a strategy to “regreen the barren hills” (Lang, 2000). This period marks the beginning of forest expansion. However, the regreening project was aimed at making the country look green again, without giving enough thought to the protection of forests. Six years later, natural forest kept declining and fast-growing plantations did not achieve much of the expected outcomes. This was notably due to top-down approaches, FLA not involving local people and being imposed on poor households who did not necessarily protect the land. Available land for large scale tree plantations was also too rare for the programme to be successful (Lang, 2000). Therefore, in 1998, programme 661 also called the *5 Million Hectares Reforestation Programme* was implemented to protect and upgrade forests (McElwee 2009, To 2007 in: Cochard et al., 2016). This very influential programme was approved by the Prime minister for the years 1998 to 2010.

These are important aspects to consider, as communities now play an active role in the management of forests. Being responsible for allocated forestland, their practices play a key role in the management of rattan in these areas.

2.1.1. Forest ownership

Indeed, since these changes have been implemented, ownership and management arrangements of forests have evolved by including multiple stakeholders. They are shared between state property, private property, and small parts also common property. These three categories are the result of the state’s attempt to achieve national forest rehabilitation as well as rural poverty alleviation by handing forest rights to the local communities. Some parts of forestland are allocated to individual households for reforestation purposes, while others are allocated to household groups or communities. These groups and/or individuals are then entitled to legal land ownership rights (Huizinga, 2012). In fact, since 2003, communities can be recognised as legal managers of land resources. In 2004, the Law on Forest Protection and Development specified the allocation of parts of forests to local communities for them to officially participate in the protection and management of forests, however without them being owners of the lands (Nguyen, 2005). It is the People’s Committees that oversee FLA as they are the representatives of the people (Hardcastle, 2002). However, even though land allocation started a few decades ago, land and property rights are insufficiently controlled and both local and non-local actors are competing for the resources, which increases the danger of overexploitation (Nguyen, 2005).

“The shift to multilevel and multi-actor governance in the last two decades is the result of a loss of credibility of the government-centred approach in which forests are considered as public goods to be managed, regulated and controlled by state bureaucracies.”

(Wiersum et al., 2014, p.7)

Private property includes households that have been allocated land for long-term management through a land-use certificate. But there are also common property forests that are managed by collectives. These are groups of individuals that are given a land-use title for their allocated land (Nguyen, 2005). In Thừa Thiên Huế, four years after implementing this change, seven communities had already been given 4500ha of forest. State property, on the other hand, is managed by People's Committees (PC), army units and Forest Management Boards (FMB's). However, FMB's are only necessary if the forest area comprises 5000 ha or more; otherwise, it will be regulated by the PC or district department (Hardcastle, 2002). It is also possible that the owner of forestland under State property signs a contract with an organisation, one or several households, or a whole village. This means that ownership remains with the contractor, and the contractee has specific rights for the use of land. The latter receives cash remuneration for protecting the forest (Nguyen, 2005).

2.1.2. Forest functions

The state forest authorities split forestland into three categories of functions, that define how they are managed. First there is the special-use forest. This category is "intended to preserve nature and typical national forest ecosystems, protecting plant and animal gene resources, providing sites for scientific research and preserving historical and cultural heritage sites and famous landscapes" (Hardcastle, 2002, p. 12). The MARD is responsible for the special-use forests system, which is managed by a Management Board for Special-Use Forests (MBSF). If a forest belongs to the special-use category, the owner receives State budget for its management (Nguyen, 2005). Rattan cannot be extracted from these forests (CAL, n.d.).

Second, there are production forests, which can be natural or plantation forests. These forests are generally used for production and commercial activities for forest products as regulated by law. These allocated forests can be commercialised in cooperation with other organisations and individuals. They are partly managed by SFC's (Hardcastle, 2002). Rattan can usually be extracted from these natural forests (CAL, n.d.).

Finally, there is the category of protection forests, that are intended for the preservation of watersheds and soils, the prevention of soil erosion, the minimisation of natural disasters' impacts, and the contribution to environmental resilience, for instance. These are managed by a Management Board for Protection Forest (MBPF or FMB) (Hardcastle, 2002). Rattan can be extracted from these forests, provided that these practices are not threatening the ecosystems and the sustainability of forests. Timber, on the other hand, cannot be extracted from these forests. Hence, rattan remains freely accessible on most forestland. Except for SUF's, it can be collected from every other forest area. Table 1 summarises rules regarding NTFP extraction on the three forest categories.

Table 1: Laws regarding NTFP exploitation for each forest category (Kennemer, 2021).

Natural forest function	Laws about NTFPs in Vietnam
Special-Use Forests (SUF) (National forests, Nature reserves, ...)	NTFPs cannot be exploited
Protection Forests	NTFPs can be used without damaging the forest's protectability. Forest owners can decide how NTFPs are exploited (e.g. Commune People's Committee, FMB).
Production forests	Unrestricted access to NTFPs

This chapter provided important information to understand the background of current forest management structures, and to understand where rattan can be harvested and under what conditions. The following chapter will focus more specifically on the district of Nam Đông, where rattan is of high importance.

3. Area of study

Nam Đông is a rural district located in Thừa Thiên Huế Province in North Central Vietnam (fig. 1). The district is situated in a rural mountainous region and rises from relatively low-elevation valleys (around 150 meters) up to many mountain peaks such as Cha Nu, Yep or Ruy mountain (reaching around 1'100 meters) (FMB, 2017).

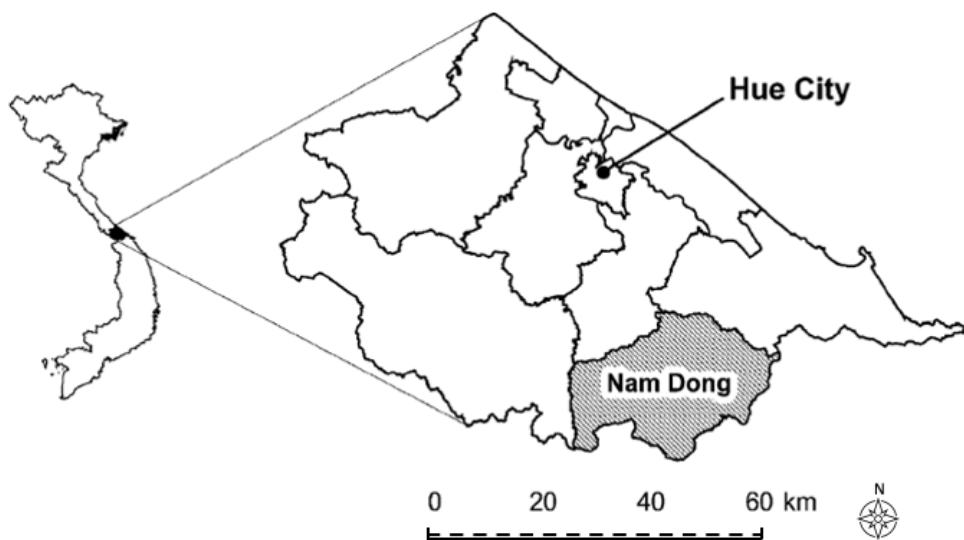


Figure 1: Nam Đông District, TTH Province, Vietnam (Webb and Kiyoshi, 2007) (modified).

The climate consists of two main seasons, the wet and dry season, typical of monsoon regions. The northeast monsoon takes place between October and March, and leads to low air temperatures, high humidity, and rain. The southwest monsoon, on the other hand, occurs from April to September. The latter is blocked by the Truong Son (Green Annamite)

mountainous area and leads to dry and warm weather, with lower air humidity (FMB, 2017). The average annual rainfall is 3'600 mm and the average amount of daylight in a year is 1'842 hours (FMB, 2017).

Nam Đông counts about 25'300 people with a population density of 39 inhabitants per km² on a total area of 647.82 km² (Thừa Thiên Huế Statistical Yearbook, 2020). The district counts 10 communes and 1 town (Thừa Thiên Huế Portal, 2020). Most people live in rural villages (Table 2).

Table 2: Communes in Nam Đông, Type of commune and number of population (CityPopulation, 2018).

Commune	Rural/town	Population
Huong Giang	Rural	1'345
Huong Hoa	Rural	2'155
Huong Huu	Rural	2'460
Huong Loc	Rural	1'960
Huong Phu	Rural	2'754
Huong Son	Rural	1'329
Khe Tre	Town	3'272
Thuong Lô	Rural	1'166
Thuong Long	Rural	2'346
Thuong Nhat	Rural	1'954
Thuong Quang	Rural	1'825

Nam Đông is located in the Central Annamites, which are one of the largest contiguous natural forest areas in Southeast Asia and are home to many rare and endemic species (WWF, n.d.). But even though the Central Annamites Landscape (CAL) has high biodiversity, it is threatened by human pressures such as large-scale land conversion, logging and poaching (WWF, n.d.). Many local and international actors, such as the Ministry of Agriculture and Rural Development, the Forest Protection Department, WWF, the International Union for Conservation of Nature (IUCN), the United States Agency for International Development (USAID), and the Asian Development Bank (ADB) are involved in the protection of this particular region. Due to its specific natural characteristics, the area is also covered by the Bach Ma National Park, and by the Sao La Nature Reserve, which are both counted as SUFs.

The following map shows how forests are organised in the province and district (fig. 2).

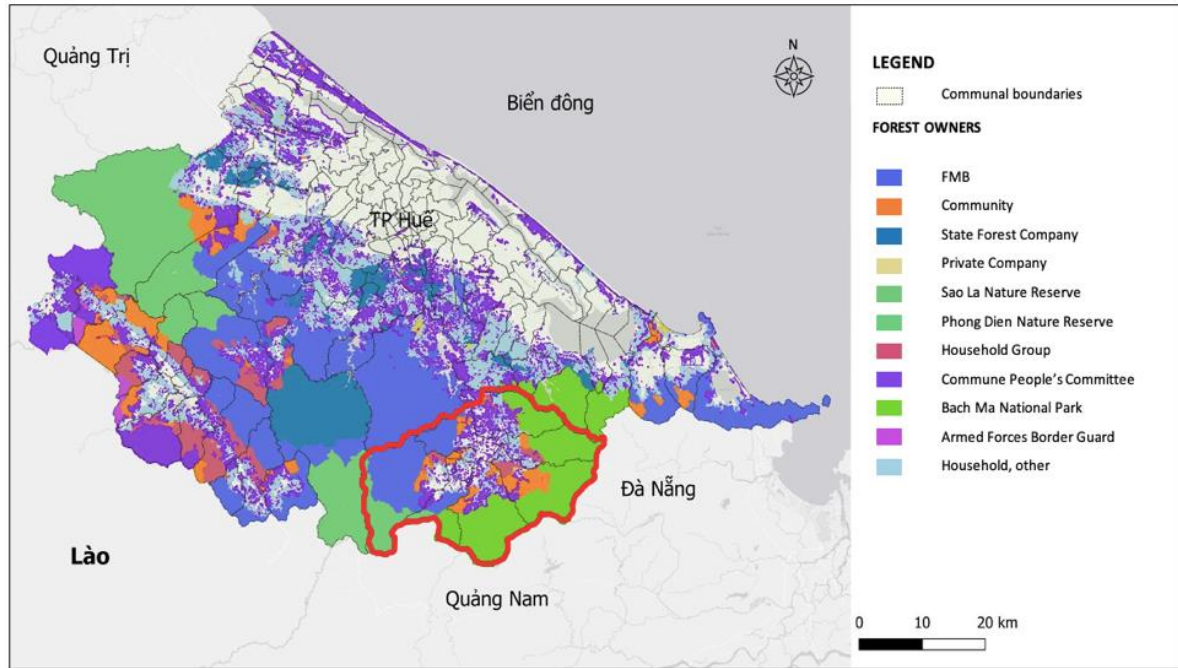


Figure 2: Map of Ownership (Provided by an employee of PFES) (modified).

The Bach Ma National Park expands in the North and East of the district, while a small area of the Sao La Nature Reserve is situated in the Southwest of Nam Đông. In the Northwest, the district is mainly managed by the FMB. In the middle and the North, near the villages, land belongs either to the communities, to households and household groups, or to the Commune People's Committee (CPC). Hence, communes and communities have been allocated forestland for management as well (Mai, 2017). Many of those communes have small wet rice areas and cropland, and large areas of forestland (Mai, 2017). But to what extent does forestland cover the district?

In 2000, 83.8 % of Nam Đông was natural forest with 54'300 ha of land, 8.5% was plantation forest, with 5'540 ha of land and finally, 7.7 % was non-forestland, with 4'960 ha of land. In 2010, Nam Đông counted about 53'700 ha of natural forest, which covered 82.8 % of the entire district area, with around 5'000 ha of plantation forest (7.8 %) and 6'000 ha of non-forestland (9.3 %). Natural forest has further decreased in 2021, with a loss of 412 ha. In fact, between 2013 and 2021, 57% of tree cover loss occurred within natural forest (GFW, n.d.).

These numbers show that forest cover has not changed significantly in Nam Đông, but that there is still a tendency for forest loss, rather than forest gain. This is also what the FMB of Nam Đông noticed, as it is responsible for the protection of around 11'302 ha of the district's forestland, 50 % of which is planned to be for production. Unfortunately, the FMB reports that illegal exploitation is still occurring, and the quality of forests is decreasing alongside its biodiversity. But what about rattan?

Thang et al. (2010) have conducted research on property rights and forest use in Nam Đông, and noticed that people have free access to NTFPs, whether it is on their allocated land or the State forest. The lack of policies leads to depletion of resources, as there are no regulations and limits to the harvesting of rattan. According to Thang et al. (2010), local people find that

boundaries are not very clear. Furthermore, they are used to open access to NTFPs in the State forest, which is why they usually still harvest rattan wherever they want. When it comes to encroachment, they usually know everyone in the community, so it is difficult for them to stop their neighbours from harvesting the resources, and since the latter are scarce anyway, they do not mind outsiders harvesting in the forest. Finally, the allocated forest boundaries do not correspond to the villagers' previous use of the forests, so they usually maintain their traditional practices (Thang et al., 2010). In consequence, even in the SUF of Bach Ma National Park, a decrease in rattan resources was observed. According to Ban *et al.* (2005) rattan quantities have considerably diminished in the last years, several species becoming rare, such as *Calamus rudentum*, *Calamus tonkinsensis*, or *Calamus scipionum*.

In the FMB forest, in 2018, of the entire natural forest area, around 54% had a high density of rattan, 44.5% a medium density of rattan, and 5.5% a low density of rattan (FMB, 2017). But due to overharvesting, rattan species become rarer and most of the remaining plants are concentrated in seedling age (not yet commercially usable) (fig. 3).

Water Rattan in the FMB Protection Forest

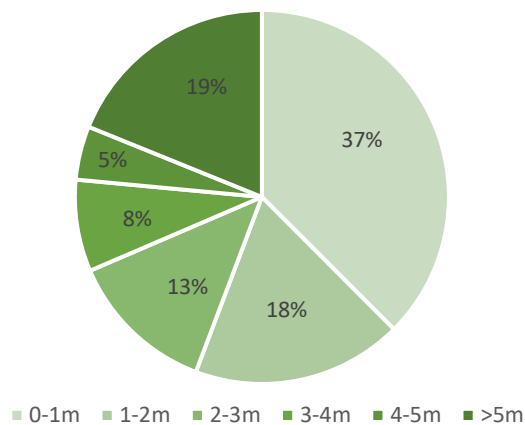


Figure 3: Water Rattan quantities present in the FMB forest by length (FMB, 2017).

In 2010, Thang et al. (2010) already observed that many forest products were decreasing, and that they were being rare compared to the past. Therefore, people already needed much time to find and harvest these products.

“There are still some limitations in the management, protection and development of forests. In some places, forests continue to be illegally exploited, forest quality and biodiversity are increasingly declining.”

(FMB, 2017, p.3)

When it comes to incomes, Mai (2017) conducted research in TTH and observed that NTFP collection only represents a small percentage of the total income of households (around 4%), but it is considered an important source of money in emergency cases such as crop failure for instance. Around 43.5% of the 313 surveyed households collected NTFPs in 2012. Interestingly, the poor depend disproportionately on NTFP collection; it is the only income source where

poor households have a higher mean income than non-poor households. All other revenues from on- and off-farm activities are higher for non-poor households (table 3) (Mai, 2017).

Table 3: Sources of income per year for poor and non-poor households (Survey, 2012 in Mai, 2017) (modified).

Income share	Poor-categories	No. of households	Mean of income source per year (Rounded to 1000 VND)
Crop income	Poor	84	4'324'000
	Non-poor	229	4'360'000
Livestock income	Poor	84	974'000
	Non-poor	229	4'572'000
Rubber income	Poor	84	4'084'000
	Non-poor	229	26'425'000
Acacia income	Poor	84	1'882'000
	Non-poor	229	3'780'000
NTFP income (honey, rattan, bamboo, leaves, ...)	Poor	84	3'116'000
	Non-poor	229	1'429'000
Timber logging income	Poor	84	1'726'000
	Non-poor	229	2'109'000
Agricultural wage labour income	Poor	84	4'393'000
	Non-poor	229	7'572'000
Salary/subsidy	Poor	84	2'324'000
	Non-poor	229	5'069'000
Small business	Poor	84	0
	Non-poor	229	1'742'000
Total income	Poor	84	22'822'000
	Non-poor	229	57'059'000

This shows how important NTFPs are for poorer households in the province. Mai (2017) also observed that in Thuong Quang, Nam Đông, poverty rates were almost 17% higher than the average rate of the district in 2010. She highlighted the importance of age and education of household heads in this matter, but also that household size and labour force can affect the demand for land for cultivation and land allocation (Mai, 2017). According to the Centre for Rural Development (CRD) (2017), local people's livelihoods are often hard to increase due to the small family size and low labour availability. The CRD hence claims that "any intervention must address these limiting factors. For instance, recommended technologies or livelihood options must not be labour-intensive" (2017, p. 1).

When it comes to economic aspects linked to rattan, the CRD (2017) claims that the rattan value-chain in TTH and Quang Nam is more or less stable since 2014. However, the raw rattan supply does not meet the market demand in both provinces, and it relies heavily on natural forests, which threatens its sustainability (CRD, 2017). Guaranteeing sustainable rattan stocks means helping its industry to be fruitful in the long term, which in return can continuously provide sources of food, material for shelter and products with export value to the people depending on it, as it is one of the most important NTFPs in the Greater Mekong region (New York Botanical Garden, 2014).

Additionally, it seems that the application of taxes for rattan exploitation is not yet sufficiently developed. The government expects rattan resource users to pay a tax of 5% for its exploitation, but in neighbouring A Roang, A Luoi, for instance, the CRD counted forty households which harvest raw rattan from the forests without paying any tax or compensation for natural forest exploitation (CRD, 2017).

This is why this area is of particular interest for this thesis, as it is highly covered in forestland, but it is declining, and rattan resources are threatened of overexploitation. But what can be done to protect rattan resources?

4. Theoretical framework: NTFP conservation strategies

NTFPs have played an essential role in rural people's livelihoods for centuries, and they are currently of special interest in the international trade, as mentioned earlier (Sills et al., 2011). In the 90's, there was great interest to develop NTFP markets and their exploitation, with the aim to protect forests while improving local welfare (Sills et al., 2011). This theory was supported by the belief that their exploitation had no important negative environmental impact, and that there was already an important international trade of NTFPs. It was also supported by the belief that these forest products were more abundant than suggested in official statistics and hence, offered a great opportunity to be brought into the formal economy, but also that new products could be developed from them. These potential opportunities therefore led to great motivation to bring NTFPs onto international markets (Sills et al., 2011).

Over time, different opinions emerged from this paradigm that promoted NTFPs as a means to alleviate poverty and preserve forests. Indeed, some people identified potential faults in this idea (Sills et al., 2011). For instance, this strategy was believed to draw attention away from real deforestation threats, and that extractivism was flawed, as there was no sufficient data on the environmental sustainability of NTFPs. Later, increased commercialisation became more evidently problematic. Even with the new focus on poverty alleviation in the early 2000's, there was still insufficient data available on NTFPs to use them efficiently and reasonably. Nevertheless, the recent scepticism about these strategies did not prevent projects from being implemented in many regions of the world, notably in central Vietnam (Sills et al., 2011).

Rattan, for instance, has an interesting commercial value and not many policies protect this resource from being overharvested, as is the case in Nam Đông. To overcome such issues, many projects have developed NTFP conservation strategies. While some of them mainly focus on planting the resource and on raising awareness among local communities, others have established objectives to bring rattan onto international markets through sustainable certification, and hence, adding value to it.

Indeed, such practices are frequently promoted to protect forests, however, they are also raising new questions as they have not always proven to be successful. Three main assumptions about them are, that they enhance conservation through increased incentives to protect the forest, provide economic advantages and higher incomes, and release human pressure on forests (Ros-Tonen, 1999; Sunderland et al., 2011; Zingerli, 2005). The FAO (2001)

highlights that these three assumptions are not necessarily true and that they are very context depended, which requires them to be tested in each situation, and must not be generalised.

When it comes to the first assumption (assumption 1), that income and employment rates rise as a result from NTFP collection, some issues have been identified in this chapter. Commercial extraction of NTFPs is often promoted as a means to increase local communities' benefits, as it leads to higher incomes. According to Ros-Tonen (1999), this assumption might be true as there is an undeniable potential to improve people's livelihoods, but it must nevertheless not be exaggerated. She explains that NTFP extraction is "basically associated with poverty", as it is mostly marginal and poorer communities that extract such products in general. NTFPs are mostly a subsistence-oriented activity that is carried out seasonally and only part-time (Van Dijk and Wiersum, in: Ros-Tonen, 1999). This means that NTFPs, such as rattan, represent a complementary activity which supplements other economic activities such as farming or timber logging, for instance, and rarely provides a livelihood (Ros-Tonen, 1999). According to the author, usually people prefer other jobs once the opportunity of an alternative employment is given to them. Rattan might be better appreciated if it is being traded on national and international markets, but generally, extraction is "looked upon as an inferior economic activity" (Dove, 1993, in: Ros-Tonen, 1999, p. 21).

The potential to increase people's livelihoods is also often constrained by poor infrastructure and high transportation costs in tropical forest areas (Ros-Tonen, 1999). To this is added the "lack of organisation among harvesters and lack of access to credit and storage facilities" (Verhey and Reinders, 1998; van Dijk, 1998, in: Ros-Tonen, 1999, p. 22).

"[...] it must be realised that support should also be given to the satisfaction of basic human needs and the improvement of the social conditions under which extractors live and work".

(Forte, 1995; Browder, 1992; Ros-Tonen et al., 1995, in : Ros-Tonen, 1999, p. 22).

Another point highlighted and observed by Ros-Tonen (1999) is that many ethnic minorities in northern Vietnam sell NTFPs to middlemen at very low prices, compared to the actual market value. This prevents them from earning much money from their activity. Peters and Henderson (2014) explain that even though demand increases for rattan, costs generated at different stages of the harvesting process keep local communities' profits low, even if the price of the raw material has increased: "one reason why local producers benefit relatively little from commercialised NTFPs, such as rattan, is that the products are locally sold for very low prices. In the international market they are highly valued NTFPs, however" (Wetterwald et al., 2004, p. 50).

The second assumption (assumption 2) made about conservation strategies is that increased value of NTFPs rises incentives to protect the forest. It is believed that by adding value to forest products, the value of the forest itself increases in the eyes of those who manage, use and live from it. Added value and market opportunities can already be influenced at the processing and harvesting level. For instance, value can be added through quality improvement, as rattan requires post-harvest treatments such as oil curing, bleaching or

protection from insects and fungi (FAO, 2001). Another strategy to increase value is sustainability certification. A certificate provides consumers as well as stakeholders with the guarantee of a third-party verification process to make sure that a company or a product meets sustainability requirements that respond to environmental, social, ethical and food safety needs (Edwards, 2018). For instance, FSC, which is one of them, is easily recognisable on products through the “tick tree” logo. This label indicates that the forest products are used in a sustainable way (fig. 3) (FSC a., n.d.).



Figure 4: Tick tree logo for FSC certified products (Unknown, 2016).

The goal of FSC is to promote an environmentally responsible, socially beneficial, and economically viable management of the world’s forests, by establishing a worldwide standard of recognized and respected Principles of Forest Stewardship (WWF, 2015). This certification, which is also planned to be introduced in Nam Đông in the near future, should increase the value as well as the demand of rattan. The process requires ten principles that cover a wide range of issues, from environmental and conservation values to community relations and worker’s rights. Each principle is then defined by several criteria, which are needed to assess whether the principle is being followed or not (FSC b., n.d.). The International Generic Indicators can then be adapted at the regional or national level, in order for them to fit the legal, social and geographical context of the target region. These adjustments are then implemented into a National Forest Stewardship Standard. Holders of the certificate can share their efforts by forming a group, which makes it easier for smallholders to become certified (FSC b., n.d.).

The resulting added value is believed to motivate forest managers to prevent illegal extraction and illegal forest use, or conversion into other land uses. For local communities, it might as well provide an occupation to protect and manage the forests sustainably (Ros-Tonen, 1999). Because if the income generated by rattan collection is threatened, it might decrease incentives to protect natural forests from abuses and bad management (WWF, 2017).

“The promotion and development of NTFPs is an assumption that increasing the commercial value of NTFPs will contribute to an increased appreciation of forests, therefore contributing both to poverty alleviation and forest conservation”.

(Neumann and Hirsch 2000; Belcher et al., 2005 in: Sunderland et al., 2011, p. 2016).

Sunderland et al. (2011) explain that this assumption is only viable if there is a strong regional or international market for the targeted NTFP. According to them, commercialisation of forest products profits mostly the richer people of a community, as they have more access

to land, and they can invest in inputs needed for harvesting and processing (Dove 1993; Marshall et al. 2003, in Sunderland et al., 2011). When a resource gains value, elites might become interested in the product and take over its extraction, processing and trade, as they usually have more capital to invest as well as larger networks (Dove, 1994).

Furthermore, international conservationists and national counterparts share intrinsic and market-driven conservation interests, which results in more politicized resources and hence, more competition because more policy actors and resource users get involved (Zingerli, 2005: 744). The value of NTFPs being influenced by demand, if it increases, it usually leads to more exploitation from the wild, which threatens the product's sustainability. Then, by losing a once commercialised product through overexploitation, the value of the standing forest will decrease, which might, in turn, lead to more destructive land-use alternatives. Hence, Sunderland et al. (2011) think that increasing the value of NTFPs may improve people's livelihoods but might not ensure the forest's conservation. This goes against common beliefs that increased commercial harvest and associated enterprise development add to the perceived value of forests and lead to higher conservation (FAO, 2001).

Indeed, according to Ros-Tonen (1999), the commercialisation-conservation link is strongly disputed. Low extraction rates are the dominant reason that NTFPs can be maintained sustainably. The ecological ability to maintain yields on the other hand, as expected from certain strategies, is much less realistic. The author claims that NTFPs cannot be expected to grow indefinitely without proper management practices to maintain these yields. Careful species selection, yield studies, monitoring and other adjustments are necessary, if not unavoidable (Ros-Tonen, 1999). In fact, when used as subsistence, NTFPs hardly affect the quality of forests. It is much more the commercial NTFP exploitation that leads to overexploitation. Therefore, sustainable harvesting methods are required, and they can only be followed if harvesters take part in their establishment and design, and if they are easy to apply (Ros-Tonen, 1999). In the end, good forest management depends mostly on the owner of the forestland, and usually better results are achieved when there is long-term trust and collaboration among stakeholders (Ros-Tonen, 1999). According to Shackleton and Ticktin (2011) a diversity of species could actually withstand fairly heavy rates of harvest if collection from the forest is controlled, and local communities apply management practices. But with poor monitoring and no enforcement of rules, sustainable practices are rarely adhered to (Terry et al., 2011). Especially with increasing pressure on forests, rattan needs to be controlled, but "sustainability can only be determined by measuring rate of extraction with rate of harvest" (Godoy and Bawa, 1993, p. 216). Without proper policies, expert inputs, and management, this will be difficult to achieve.

"Results indicated that key factors influencing the outcome of NTFP development include the nature of government involvement, distribution of property rights, the ability of local people to claim and enforce such rights, market transparency, and pressure on the resource."

(Ruiz Pérez and Byron, 1999, in: Marshall et al., 2003, p. 129)

Another important aspect raised by Sunderland et al. (2011), is that NTFPs are often part of a “forgotten” or “hidden” informal forestry sector, for which there is no policy agenda. Therefore, these products do only rarely contribute to the formal forestry sector (Sunderland et al., 2011). If NTFP value does not contribute to the formal forestry sector, benefits cannot be re-invested in forest protection and labour force for instance.

In Vietnam, one problem is that different departments target different objectives, which are not always consistent (Dung et al., 2002). This leads to misinterpretation of national policy by institutions and projects at smaller scales. For instance, the policy on circulation and marketing of NTFPs has been abolished, and their production and exportation are encouraged. As mentioned earlier, no policy on NTFPs is implemented in Vietnam until now, or they are scattered and brief. In some cases, the policies are not up-to-date and do not work in the actual economic context (Dung et al., 2002). This uncertainty about NTFP policies makes management and protection very hard. Dung et al. (2002) suggest addressing this issue by providing a general and more specific information at the policy decision-making level, and by mobilising expert input for an all-compassing NTFP development strategy at the national level (Dung et al., 2002).

Finally, the third assumption (assumption 3) is that NTFP strategies decrease people’s use of other less sustainable forest products such as timber. NTFP extraction is seen as less impactful on forests compared to other alternative land-uses, cattle, and selective timber extraction (Nepstad and Schwartzman, 1992). Belcher et al. (2005) similarly claim that NTFP exploitation is potentially more sustainable than timber extraction or non-forest utilisation. Therefore, NTFP exploitation is expected to reduce human impacts on forests as it reduces dependence on wood products. But this assumption is not necessarily a general truth as overexploitation still occurs. According to Ros-Tonen (1999), NTFPs are most often combined with less sustainable activities without reducing them, as they are more attractive than non-forest wood products, which only provide additional income.

Many extractors combine NTFP activities with other economic activities and if one of them becomes less profitable, people might compensate their losses by expanding their agricultural activities, which leads to land conversion (Ros-Tonen, 1999). This is especially the case in boom periods, where “incentives for harvesting as much as possible (immediate profit, competition with outsiders, abuse of power by external authorities towards local collectors and related fears of being evicted) are higher than incentives for sustainable management” (Michon and Angelsen, 2005, p. 42). Ros-Tonen (1999) explains that:

“Poverty and a lack of alternative income-generating options are unlikely to encourage extractors to reduce unsustainable harvesting levels. Moreover, it seems fairly impossible in practice to define commercial NTFP extraction as a separate land-use type, as it is combined with subsistence uses of NTFPs, farming and other economic activities.”

(Ros-Tonen, 1999, p. 24)

The following table summarises all three assumptions and potential limiting factors that might compromise the success of NTFP conservation strategies (table 4).

Table 4 : Three common assumptions made about NTFP conservation strategies and their potential limiting factors.

ASSUMPTION 1	ASSUMPTION 2	ASSUMPTION 3
Increased income and livelihoods	Increased value of forests leading to increased incentives to protect them	NTFP extraction decreasing dependency on other forest products, especially timber
<ul style="list-style-type: none"> • Rattan is a complementary activity, so people prefer other jobs to increase their livelihoods (Ros-Tonen, 1999) • Bad infrastructure, transport and costs decrease the opportunities to increase incomes (Ros-Tonen, 1999) • Lack of organisation between harvesters might hinder economic benefits (Ros-Tonen, 1999) • Lack of access to credit and storage might decrease peoples' opportunity to earn more from NTFPs (Ros-Tonen, 1999) • NTFPs are often sold at low prices compared to their actual value on the market (Ros-Tonen, 1999) 	<ul style="list-style-type: none"> • A strong market is needed otherwise added value might benefit mostly better-off people (Sunderland et al., 2011) • Increased value leads to more competition for the resources, and hence more pressure on forests (Zingerli, 2005; Sunderland et al. 2011; Ros-Tonen, 1999) • The forestry sector being "hidden" and "forgotten", only few unclear policies are established which leads to no contributions of NTFPs to the formal forestry sector (Sunderland et al., 2011) 	<ul style="list-style-type: none"> • Timber and other less sustainable activities might be more attractive than NTFPs (Ros-Tonen, 1999)

A framework for identifying limiting factors in the commercialisation of NTFPs has also been suggested by Marshall et al. (2003), who insist on the necessity to use an analytical framework based on several case studies. To do so, they analysed limiting factors during the process of commercialisation, such as production, collection, processing, etc. (table 5).

Table 5: Factors limiting success of NTFP commercialisation according to Marshall et al. 2003.

Factor limiting success	Factor limiting success
<p>Process: Production</p> <ul style="list-style-type: none"> Lack of technical support Lack of a favourable normative context Lack of financial instruments High opportunity cost of production Lack of adequate quality control 	<p>Process: Marketing (Identification of the market and product promotion)</p> <ul style="list-style-type: none"> High cost of product promotion High availability of substitutes Lack of access to market information Lack of contact with final consumers Lack of financial instruments Lack of technical support Lack of community organisation Lack of market valorisation of environmental goods and services Lack of adequate quality control Lack of attractive product presentation Lack of management capacity Lack of knowledge pertaining to consumer demands and needs
<p>Process: Collection</p> <ul style="list-style-type: none"> Lack of financial instruments Lack of technical support Lack of community organisation 	<p>Process: Sale</p> <ul style="list-style-type: none"> Low product price Low returns to producers Lack of market valorisation of environmental goods and services High producer dependency on market intermediaries High numbers of market intermediaries Lack of financial instruments Lack of technical support Lack of community organisation Lack of a favourable normative context Poor relationship between final product price and production cost
<p>Process: Processing</p> <ul style="list-style-type: none"> Lack of processing skills Lack of infrastructure and equipment (for processing) Lack of financial instruments Lack of technical support Lack of community organisation Lack of adequate technology Lack of adequate quality control Lack of knowledge and use of appropriate technologies Lack of access to information and exchange of experiences 	
<p>Process: Storage</p> <ul style="list-style-type: none"> Lack of financial instruments 	
<p>Process: Transport</p> <ul style="list-style-type: none"> High unit cost of transport Long distances from point of sale Lack of road and transport infrastructure Lack of financial instruments Lack of community organisation 	

Knowing that many aspects of these NTFP conservation strategies might be compromised, it is important to analyse the context in which they are conducted as to analyse their feasibility.

5. Conservation projects and strategies implemented in Nam Đông

There are five main recent rattan conservation projects and plans that have been operated in Thừa Thiên Huế, and that include several communes in Nam Đông (table 6). Most of them have very broad objectives ranging from increased local welfare, to increased infrastructure and better conservation results. Within these objectives they include more specific activities, some of them targeting rattan resources.

Table 6: Projects implemented in Nam Dong, with a focus on rattan (New York Botanical Garden, 2014; WWF, 2011; WWF, n.d.; Vietnamplus, 2021; SNV, n.d.; WWF, 2021).

Name of project	Financed by	Objective
Project for sustainable rattan part of WWF CarBi (2006 – today)	IKEA, the European Commission’s SWITCH-Asia Programme and Germany’s Entrepreneurial Development Cooperation (DEG)	Conservation of the CAL (CarBi) including a specific strategy for sustainable rattan conservation (Project for sustainable rattan)
FMB’s Sustainable Development Plan (2006 – today)	N/A but the FMB’s always receive support from the government for protecting their forestland	Collaboration with WWF for poverty alleviation and sustainable use of rattan to protect the watershed area
BCC – Biodiversity Conservation Corridor (2016 – today)	ADB with 34 mio. USD	Livelihood and infrastructure improvements, the former through strengthening of agro-forestry and afforestation for NTFPs
Green Annamite Project (2016 – today)	USAID, PFES, Kreditanstalt für Wiederaufbau (KfW), IKEA	Focus on low emissions land use, biodiversity conservation and increasing resilience for local people in the CAL
Leading the Change (2018 – 2022)	Swedish International Development Agency (SIDA)	Collaboration with the Center for Rural Development (CRD) and WWF Vietnam for the conservation of the CAL and for strengthening local communities

a. WWF

The WWF project implemented in Vietnam since 2006 was carried out by the international NGO WWF Vietnam, which is part of WWF Greater Mekong (New York Botanical Garden, 2014). It is called the Carbon and Biodiversity Project (CarBi) and it adopts several strategies that are expected to lower human impact on forest resources, increase economic benefits, and enhance people’s incentives and practices for forest protection, in Vietnam as well as in Laos (WWF Vietnam, n.d.).

[In Vietnam,] “the project will concentrate on sustainable management and logging of forests, rattan entering the FSC process, developing two craft cooperative villages in Nam

Đông and Nam Giang –which were established in phase 1- with market linkages and matching the new rural development programme of Vietnam”

(WWF, 2011).

Phase 2 was intended to happen in 2012-2014 (Viet Nam News, 2011) but only started in 2019 (WWF, n.d.) to carry on with further objectives. Indeed, since 2019, phase 2 of the Carbon and Biodiversity Project (CarBi 2) is being implemented and should last for 5 years, until 2024 (WWF, n.d.). The subproject focusing on rattan and FSC certification is called the Sustainable Rattan Project.

In Nam Đông, the pilot forest protection contract between the local community and the district's Management Board for Protection Forests (FMB) was carried out in order to better manage and benefit from rattan (WWF, 2011). It mainly aims at enhancing practices and knowledge amongst actors along the rattan supply chain. Further details about harvesting techniques (popular harvesting tools, best harvesting season, etc.) under the project are outlined in annex 3.

At a later stage, the WWF rattan project intends to achieve Forest Stewardship Council (FSC) certification, as it can also be used for NTFPs since 1998. This is hoped to guarantee a stable income for ethnic minorities and enhance economic opportunities (WWF, 2011), as forest certification is expected to create a unique connection between local forest management practices and global purchasing decisions (WWF, 2020).

While the FSC certification for rattan is already implemented in Laos, Vietnam is not yet at this stage. In fact, the project requires the assessment of legality, traceability and transparency before being able to apply FSC. Overall, since 2006, this project has supported 40 villages from Quang Nam and Nam Đông to enhance their use of rattan in a more effective and economical way. For instance, a rattan nursery garden has been created in Dong Ram Village, Quang Nam Province, with more than 100'000 seedlings distributed between 2006 and 2010 (WWF, 2011). In recent years, a lot of water rattan (*Daemonorops poilanei*), which is a commonly collected sort of rattan has been planted (WWF, 2011). Processing companies were taught about environmentally friendly production and sustainability, but also about promoting their products in international trade fairs. Mr. Le Viet Tam, who is the project manager, says in a report that this will guide the rattan industry toward sustainable development, which can then be certified by the Forest Stewardship Council (WWF, 2011).

However, only few studies have been carried out in recent years and only little information is available about the project and its results, even though thousands of ha of natural forest are being surveyed.

b. Forest Management Board

The Nam Đông-FMB manages around 11'302 ha of forest, which accounts for ca. 20% of the district's forestland. Nearly 50% of it counts as production forest. The rest is protection forest of the watershed area (table 7). As it owns a large proportion of forestland, the FMB has developed its own strategy to protect the forest and rattan resources.

Table 7: FMB Forestland repartition (adapted from Ha, 2018).

	Area size	Forest Type	Area size	Forest Function	Area Size
1. Forest Area	10'784 ha	1.1. Natural forest	10'560 ha	1.1.1. Protection	6'133 ha
				1.1.2. Production	4'363 ha
		1.2. Plantation forest	189 ha		
2. Forestland without forest	517 ha		517 ha	2.1. Protection	280 ha
				2.2. Production	263 ha

Over the years the FMB has observed more and more rattan exploitation. Therefore, it was supported by the Sustainable Rattan Project (part of CarBi) in 2013 to conduct surveys about 9 rattan species, mostly water rattan which has the highest commercial value (Ha, 2018). In 2013, the aim was to assess rattan reserves and distribution in the planned FSC area. Hence, a plan for sustainable harvesting was elaborated for the exploitation of rattan in the FSC area, including management strategies, monitoring, conservation, etc. In collaboration with WWF, the FMB had as goal to issue FSC rattan certification by the end of 2017. Unfortunately, the process was very difficult to implement in the region and, as of 2022, it has still not been achieved (FMB, 2017; Ha, 2018).

In total, 6'343 ha of FMB natural forest have been investigated and evaluated for rattan exploitation under the FSC certificate (Ha, 2018). 1'196 ha of those are in Huong Son commune and 5'146 ha in Thuong Quang (FMB, 2017). The ultimate objective is the improvement of livelihoods of people living in the area, especially the poorer households and ethnic minorities (Ha, 2018).

In order to avoid forest degradation, the FMB has also developed an annual exploitation plan. By developing a management plan specific to rattan, the FMB can exploit and develop rattan sustainably on its own, for the protection of the forest ecosystem in the long term. Furthermore, it is hoped to contribute to the implementation of guidelines and policies at the State level, that will help manage forests sustainably and alleviate poverty (Ha, 2018). The management is divided in three groups: rattan exploitation, rattan planting, and zoning and protection of rattan (FMB, 2017). But what are the specific rules stipulated in this management plan regarding harvesting?

Exploitation techniques require harvesters to follow four steps:

Step 1: Chop off the vines, branches and leaves with a machete with a stump height of 15 - 20 cm.

Step 2: Pull out the tree with a length of more than 5 meters and peel the leaves.

Step 3: Spread the tops after taking the rattan, the length of the tops is 50 - 70 cm, equivalent to 5-7 nodes or 5-7 leaves from the top. After that, the tops are cut into short pieces and piled around the rattan tree, which has the effect of both improving humus and keeping the soil moist.

Step 4: Collectors proceed by rolling the rattan into rounds or tying them into bundles to create favourable conditions for taking rattan out of the forest and transferring it to a concentrated collection place.

(FMB, 2017, p. 33)

When it comes to planting, there are certain steps to follow as well. Planting is organised in groups and there are several measures to take:

- 1) Vegetation must be cleared under the forest canopy. Those clearings must have a diameter of 2 meters. The shrubs that grow fast must be kept in shade. Rattan must not be cut down for the purpose of leaving them as a substrate.
- 2) The holes must measure 40x40x40 cm, 1 to 1.5 meters from the substrate. There must be 5x4 meters (500 holes/ha) between plants. Holes are then filled 10 to 15 days after digging.
- 3) 2 plants are planted in each hole. Then, rattan must be planted vertically, so that the root is at the same level as the hole. The soil must then be filled and compacted around the seedling until the hole is full. The seedlings must not be covered by leaves or be sunken.
- 4) After 20-30 days of planting, the plants must be checked, dead plants must be removed. The planting process must be done during rainy or shady weather.

These instructions show that the planting and harvesting procedures are not randomly carried out, and specific rules must be followed when participating in the projects. The main species planted is water rattan, but two other species are also partly used by the FMB. Between 2017 and 2025, the objective is to plant an average of 50 ha a year (FMB, 2017). This can be done by connecting local stakeholders with the sustainable rattan project from WWF, which are:

Table 8: Stakeholders involved in the management plan and their roles (based on FMB, 2017).

WWF	Propaganda and advertisement Organisation of the management Assessment of activities
Nam Đông FPD	Organisation of forest patrolling and assignment of security forces Building of forest protection stations Contracting of households, individuals, etc., for forest protection.
CPC (Commune People Committee)	Directing village communities to implement forest protection and development conventions in accordance with law and guiding the implementation of forest production (swidden cultivations and livestock). Organisation of activities and mobilisation of forces to prevent acts of deforestation.
Households, individuals, village communities, ...	Development of plans and organisation of forest protection. If their forestland is adjacent to another owner's forestland, a contract should be signed for collaboration.

In parallel, the management capacity of the staff must be consolidated through training courses and sessions, and visits to improve technical skills. The FMB gives priority to training forest farmers and forestry workers (FMB, 2017).

Hence, the FMB has established a precise plan in collaboration with the WWF, however, many of these targeted results and planned activities are yet to be implemented in 2022. This is why it is especially interesting to look more in detail into the FMB and WWF's strategy, as to identify potential success limiting factors.

c. BCC by the Asian Development Bank

The Biodiversity Conservation Corridor (BCC) project seeks to strengthen the links between the ecosystems of three provinces, Thừa Thiên Huế being one of them. 35 communes have therefore been included in the project (Vietnamplus, 2021). This area counts rich biodiversity, and the project uses a transboundary approach for maintaining important ecosystem services to protect an environment that benefits local livelihoods and downstream users as well (BCC, 2018). To do so, the project developed an ethnic minority development plan that involves local people, and tries to adapt to their priority needs, namely livelihood improvements, and infrastructure assets such as road constructions (BCC, 2018).

The Biodiversity Conservation Corridor has a specific goal regarding the planting of NTFPs on 11 plots in the two communes of Thuong Lô and Thuong Quang, Nam Đông. The project started in 2016 near the production forest planting areas managed by the communities. The purpose of the project is mainly to plant rattan for the protection and afforestation of the area (BCC, 2016).

An area of 45 ha in Thuong Quang and Thuong Long is designated for the plantation of water rattan. The project follows the regulations and techniques for planting, caring, and harvesting of seedlings from the DARD. Rattan is planted with 825 holes/ha with 2 plants 15 centimeters apart per hole. Overall, there are 1650 plants/ha on the designed area, with 4 meters between rows, and 3 meters between trees. There are several other procedures to follow regarding the treatment of rattan, standards of seedlings (healthy, straight, well-balances stems, free from any disease, with at least 4 leaves, > 20 cm tall, ...), and the planting season (September to January). Other technical measures designated by the DARD are followed as well (BCC, 2016).

Planted forests are then taken care of for 3 years, 2 times a year. The first check is done from April to June and consists of clearing bushy vines and looking for dead trees. The second check is conducted from September to December, clearing bushy vines again and cutting around rattan to let it grow. The third year works similarly. Overall, people have to regularly patrol in order to detect potential diseases, avoid cattle grazing, and human and livestock damage. In the second year, the communities must check the forest only once, between September and December, again, for cutting around rattan plants to let them grow (BCC, 2016).

The goals set by the project are to create new jobs, generate new sources of income, improve people's livelihoods and parallelly protect the environment and enhance the

watershed protection (BCC, 2016). Currently the project seeks to expand its scale, achieve better management, and maintain its ecological integrity in the CAL.

d. Green Annamite project by USAID

The Green Annamite project, also called Truong Son Khan, is another project that partly focuses on rattan, with the goal to restore the ecosystem services towards sustainability since 2016. Under the Green Annamites project, interventions are focused on biodiversity conservation and increasing resilience for vulnerable local communities, among others (SNV, n.d.) The project is targeting the Central Annamites more specifically, as these mountains are rich in biodiversity. This project is also carried out by WWF and its partners and goes in line with the CarBi 2 project (WWF Vietnam, n.d.). It is also supported by the DARD and other provincial stakeholders. It will keep supporting biodiversity conservation in TTH until 2025 in order to keep up the efforts and benefits of the project (USAID, 2020).

Activities such as planning, improved management, monitoring and law enforcement are high priorities in protected areas (e.g. Bach Ma National Park). In protection forests, they mostly put emphasis on planning and management improvement. In production forests, they plan to manage forests with the FSC certification, for sustainable value chains. Finally, in community forests, they seek to achieve capacity building, improved management, and livelihood improvement. These strategies are notably financed through payments for forest environmental services (PFES) (WWF Vietnam, n.d.).

When it comes to rattan in the district more specifically, 6'344 ha of forestland with rattan resources are under sustainable forest management. This area corresponds to the FMB forestland. The project provides technical support to the FMB of Nam Đông. Furthermore, rattan harvesters are facilitated to establish linkages to the market. Surveys on rattan species and density give a better overview for sustainable harvesting per ha. Partners of the project are IKEA, KFW, USAID and WWF (WWF Vietnam, n.d.).

e. Leading the Change by SIDA, the CRD and WWF

Finally, another project called "Leading the Change" has been launched and financed by the Swedish International Development Agency (SIDA), in collaboration with the Center for Rural Development (CRD), WWF Vietnam and TTH Forest Owners Sustainable Development Association (Hung, 2021). This project is implemented from 2018 to 2022. The focus is on the conservation of the CAL, and strengthening local communities (WWF, 2021). It is part of a larger project called "Strengthening Civil Society to Accelerate Conservation Efforts in the Central Annamites".

The project aims at "intensifying capacity and create enabling environment for people and community to effectively exercise their rights, control decisions, equitably receive benefits from natural resources and contribute to sustainable management of key ecosystems and habitats".

(WWF, 2021b)

Technical support was provided by the CRD in 2021, when 24 ha of NTFPs were cultivated under the forest canopy by communities and households, in Thuong Lo, Nam Đông.

“The cultivation of non-timber forest plants under the forest canopy aims to enrich the forest, protect biodiversity and generate incomes for forest management households”. To do so, six training courses on harvesting techniques were organised with six household groups. The project has achieved 22 ha of rattan being planted with a survival rate of 95%. In parallel, people have learned to grow ginger as well (Hung, 2021).

6. Research question

The previous chapter has summarised the general conservation strategies implemented in the district. The strategies are very similar between projects, while the specific activities are more diverse. Overall, the aim is to bring benefits to the local communities, and to increase the protection of forests.

Knowing that the situation is very complex in Nam Đông, this paper seeks to analyse what limiting factors for the success of NTFP conservation strategies can potentially be identified in the district.

When it comes to assumption 1 (the expectation to increase livelihoods and incomes), the following potential obstacles have been identified:

- Poor infrastructure and high costs decrease harvesters’ benefits (Ros-Tonen, 1999).
- Lack of organisation among harvesters hinder successful marketing and income making opportunities (Ros-Tonen, 1999).
- Lack of access to credit and storage limit NTFP collection (Ros-Tonen, 1999).
- Because of low selling prices compared to the market value, harvesters might benefit little from the NTFP resources (Ros-Tonen, 1999).
- NTFPs are mainly a complementary activity, so people prefer other jobs than NTFP extraction (Ros-Tonen, 1999).

The opportunities are nonetheless undisputable, as NTFPs represent an important income for forest dependent people, and conservation strategies can provide some support to alleviate poverty.

When it comes to assumption 2 (increased value of NTFPs, notably via certification, and thus reduced deforestation), further obstacles and opportunities have been identified that might hinder and/or increase incentives for conservation. Following observations from the literature about value increase and its potential effect on incentives can be highlighted:

- Increased value of NTFPs might motivate forest managers to prevent illegal extraction, illegal forest use and land conversion, and might provide occupations to protect and manage the forests sustainably (Ros-Tonen, 1999).
- A strong national or international market of NTFPs is required, otherwise value increase might mainly profit the richer of a community, as they have more access to land and can invest in inputs more easily (Sunderland et al., 2011).

- Value increase leads to more exploitation and more competition (Zingerli, 2005; Sunderland et al., 2011; Ros-Tonen, 1999). Therefore, added value to NTFPs requires proper management, including monitoring, yield studies and species selection (Ros-Tonen, 1999).
- With unclear policies, NTFP value might not contribute to the formal forestry sector (Sunderland et al., 2011).

About the third and last assumption that NTFP exploitation may decrease human pressure on forests by decreasing their dependence on other products such as timber, following point must be remembered:

- NTFP exploitation being an additional income source, it is mostly combined with other, sometimes less sustainable activities such as timber. In boom periods, if needed, higher economic incentives might lead to overharvesting.

In order to get a better overview of the situation in Nam Đông, these three hypotheses will be analysed in the study area to see whether or not these theories are also applicable there, and whether there are various challenges to consider that have not been mentioned above. The research question is the following: *What are the potential limiting factors for the success of rattan conservation strategies in the district of Nam Đông, Thừa Thiên Huế?*

7. Methodology

To answer this research question, my strategy was to conduct a thorough literature review in order to identify potential research gaps, before preparing relevant questionnaires for the fieldwork. Part of this strategy was to work with FT Viet project partners (see below) and with WWF, which is a major actor in the rattan sector (see section 6). With the help of the two NGOs, the questionnaires and data collection were indeed easier to carry out. After the data collection, the relevant information was collated and sorted to conduct an in-depth analysis of the current problems and constraining factors based on the literature. In this chapter, all the steps to answer the research question of this thesis are described: literature review, elaboration of questionnaires, selection of interviewees, data collection, data analysis and reflection on the research process and ethical issues.

More generally, the topic was chosen in accordance with the research field of the FT Viet project called “Assessing the ‘nature’ of a ‘forest transition’ in Vietnam: ecosystem services and social-ecological resilience in locally managed forest landscapes.” The Consultative and Research Center for Natural Resources (CORENARM), which is a partner of this programme, offered support throughout the research process by highlighting current priorities in the province, and by providing relevant documents. This local NGO which operates in the region since 2006 did also provide help for later steps, namely the fieldwork described later.

7.1. Literature review

In summary, NTFPs are intended to help alleviate poverty and reduce pressure on forests, but documented successful initiatives are relatively rare (IUCN, 2007). There are numerous research papers on NTFP conservation strategies and rattan, but many of them are out of date. In order to explore this gap in Nam Đông, the fieldwork was prepared in advance through a thorough review of the literature on forests, NTFPs and rattan resources in Vietnam, in Nam Đông and in Thừa Thiên Huế. Literature usually contains relevant information, but not necessarily enough information in the form of concrete data and analysis of the situation in Nam Đông with regard to rattan. The key terms used in the research were: Rattan, NTFP conservation and forests in Vietnam, TTH and Nam Đông.

Furthermore, when meeting different stakeholders, they agreed and offered to share some relevant documents and reports, that provided data for this research as well.

7.2. Elaboration of questionnaires

After reading various articles, reports, websites and scientific literature about this topic, it was then possible to develop questionnaires to collect relevant data on the field. Two types of questionnaires were prepared in advance.

The first set of interviews was written into semi-structured questions. These are pre-annotated questions, which may change during the interview. This means that the discussion takes shape gradually, new questions emerge, and the process is unstructured so that there is room for improvisation. This allows the interviewee to speak more freely, without being constrained by closed and rigid questions. As a result, more relevant answers can emerge, as the interview becomes a discussion in which the person can express him or herself freely (Eticha, 2019). Hence, these questionnaires can comprise a mixture of closed and open-ended questions. However, Eticha (2019) warns that these questionnaires should not be too long and repetitive, they must not be boring and should be varied, as to motivate the respondents. The semi-structured interviews were used for individual meetings, as well as for the focus groups (see below). Especially for the latter, varied questions were necessary for motivating the people to participate properly and with interest. In the course of the discussion groups, many questions evolved and or/emerged, with interesting answers leading to new interrogations.

The other data collection tool was prepared in collaboration with WWF. Indeed, the team of WWF supported this research by collaborating for the creation of relevant questions that might be useful for this thesis, as well as for the sustainable rattan project. Together with the organisation, a structured questionnaire was created. These questions were a mixture of closed and open-ended questions. Unlike the semi-structured interviews, they were transferred into a platform called *Kobo*. KoboToolbox provides a set of tools for creating forms and for facilitating the collection of interview responses in difficult field settings. This programme was created by a humanitarian non-profit organisation (<https://kobo.humanitarianresponse.info>). Hence, after working together on these questions, they were added to this platform and later used on tablets in the field. These tablets were provided by the WWF project and several people conducted the interviews adding the data

directly into the survey. Answers could be provided in form of ticks, yes/no boxes, and text. Overall, this method use enabled to collect a mixture of qualitative and quantitative data that is very useful for comparison, as all participants were asked the same questions.

7.3. Interviewees

For the semi-structured interviews, several participants were requested. In Nam Đông, people are organised in groups to harvest rattan, or to plant seedlings in remote or poor forest areas. These groups are divided by commune. For the semi-structured interviews, four communes participated, namely Thuong Nhat, Thuong Quang, Huong Son and Thuong Lô (fig. 4). The communes (harvesting and plantation groups) were selected based on their participation in a project as to have data about more than just one project. This is because each commune participates in different projects and may have other opinions and experiences to share. These meetings were organised in form of focus groups and usually counted between 4 and 6 respondents.



Figure 5: Map of the targeted communes for the fieldwork (Thừa Thiên Huế, n.d.).

In addition, other key stakeholders agreed to answer several questions or participate in a semi-structured interview to provide additional information. This was very useful, as different actors can share different expertise, but also observe the situation from different angles and perspectives.

Overall, I conducted 12 interviews by myself. 7 of them were individual interviews, while 5 of them were carried out in groups. In total, about 25 people expressed their opinions and gave answers during the discussions.

A first set of individual interviews was held. The first one was conducted with a representative of PFES. The second interview was held at the University of Agriculture and Forestry, with two representatives of the CRD who work closely with rattan-related topics. The third one was held with the FMB of the district, the fourth and fifth with the Forest Protection

Department and a middleman. And lastly, the director of a processing factory and a person who carried out several surveys on rattan in Nam Đông and works for the Center for Climate Change Research have accepted to hand in some answers online (table 9).

Table 9: Interviews carried out in Hue.

Interviewee(s)		Date
1	PFES – Payment for forest environmental services	29 April
2	CRD – Centre for rural development	
3	Forest Management Board of Nam Đông	09 May
4	Forest Protection Department (FPD)	10 May
5	Middleman	11 May
6	Processing Factory	
7	Center for Climate Change Research – Hue University of Agriculture and Forestry	26 May

A second set of interviews was carried out in Nam Đông. Thuong Lô commune gathered a few members of the plantation group for the first focus group. In Thuong Quang, a plantation group as well as a harvesting group have participated in a discussion. Another harvesting group was mobilised in Huong Son, and a plantation group in Thuong Nhat (table 10).

Table 10: Interviews carried out in Nam Đông.

Interviewee(s)		Date
1	Thuong Lô Commune - Plantation Group	09 May
2	Thuong Quang Commune - Harvesting Group	10 May
3	Thuong Quang Commune - Plantation Group	
4	Huong Son Commune - Harvesting Group	11 May
5	Thuong Nhat Commune - Plantation Group	

For the survey carried out with WWF, participants were chosen by the organisation itself. 25 people from Huong Son and Thuong Lô answered the questionnaire. Further details are given in chapter 8.2.

7.4. Data collection

Fieldwork took place between April and June 2022. All semi-structured interviews were carried out with a field assistant. Questions were asked in Vietnamese so that people could

reply in their native language. Later, the interviews were written down in Vietnamese by the assistant, and automatically translated into English via an online translation service. When certain sentences remained unclear, the interpreter provided further information orally as well.

The answers from the WWF survey on Kobo, on the other hand, were already translated in English beforehand, and results were provided automatically in Vietnamese and English on the platform. Only the answers in form of text had to be translated afterwards. All data was stored into an excel document to have a global overview of the answers. Some information had to be sorted, when answers were either not given, or the values had to be converted for instance. In rare cases, when answers were contradictory, they were not used.

7.5. Data analysis

Once collected, the data were then analysed in order to understand society-environment dynamics, with a focus on powerful actors such as governments, businesses or conservation organisations in order to analyse “what is taken for granted in leading discourses” (Benjaminsen and Svarstad, 2019). Conservation strategies are one of those processes that need to be reconsidered, or at least, critically looked at. It is important to observe different structures (economic, political, social, ...) of a specific context.

“A central premise of the field is that ecological change cannot be understood without consideration of the political and economic structures and institutions within which it is embedded”.

(Neumann, 2009, p. 228)

Looking at institutions is crucial, because regulations and rules that emerge from decision makers make up the frameworks “that govern group’s actions in natural resource usage” (InfoResources, 2008, p. 3). An institutional approach to study forest resources management is fundamental for the sustainable use of forests (Poteete and Ostrom, 2004).

Hence, with this approach in mind, I qualitatively analysed the contents of the interview transcripts and categorised statements with respect to the three assumptions identified in chapter 4. In order to have a coherent structure of analysis, the responses given during focus groups and in the survey were classified into four main categories: 1) project information, which summarises all information given about the projects, when they were joined, and what inputs they provide, 2) harvesting and planting techniques and practices, in order to understand how the participants harvest/plant rattan, how their practices evolved, if they participate in forest conservation, etc., 3) market information and financial aspects linked to their rattan activities and the projects they have joined, such as incomes, rattan selling prices, etc., 4) forest and rattan observation, to know how local communities perceive the evolution of forests, and if they have noticed any positive or negatives changes when it comes to rattan resources or forests in general.

Thanks to these categories, I acquired a better overview of the results, and limited the loss of potentially important responses.

Once sorted, the data collected from semi-structured interviews was analysed in a narrative way, as it contains mainly qualitative data in form of transcripts. The survey data was also analysed in a narrative way, especially for the answers in form of text, but also with mathematical formulas (mean values, percentages, average values, sums, ...) to illustrate quantitative data in graphics and tables (mostly from yes/no and tick answers). Those formulas were partly calculated manually, and partly also automatically via excel.

7.6. Reflexivity

Despite the relevant information that could be gathered to answer the research question, some aspects of the work must be considered with caution. Firstly, the data collected is from interviews conducted in Vietnamese. There is some information that may have been missed during the focus groups and individual interviews once they were translated. In addition, the interviewees do not come from an extremely diverse sample. Indeed, most of the people were men and in the survey, there were only Co Tu people. As the sample was rather small, the quantitative data could not be analysed using correlations or other more complex statistical approaches.

The fact that the majority of respondents were men could mean that women-specific opinions and/or problems were not taken into account. For example, they might play a special role in the family, have other priorities, or face other problems during harvesting, etc. In fact, although some women were sometimes present in the focus groups, in most cases they did not speak at all. Only in one group did a woman speak a little more openly.

All names of participants remain anonymous throughout this research, in order to protect the participants' privacy, especially because sensitive information could reveal personal interests, potential illegal practices and/or lead to conflicts among stakeholders.

Furthermore, the fieldwork lasted a little less than one month. This was due to the current pandemic that led many countries to close borders, including Vietnam. As a student, my visit was limited as the government granted visas under specific conditions due to COVID-19. Understanding the organisation of forests in Vietnam is a complex task, and in order to decipher the complexity of the topic, a longer stay in the field would have been beneficial.

Finally, data analysis requires interpretation because one has to sort out the relevant information of transcripts. By structuring the results into categories, most of the responses were considered, but the analysis may have missed some information, nevertheless.

8. Results

Below, I present the results of my data collection. First, in section 8.1. I report the results of my semi-structures interviews. In section 8.2. I report the results of the survey conducted with WWF. This chapter focuses on descriptive results, and a more detailed analysis of the three assumptions follows in the next chapter (chapter 9).

8.1. Harvesting and plantation groups

The discussions with harvesters and plantation groups have provided interesting data to analyse further. In order to have an overview of their practices and opinions, several questions were asked to them through the questionnaires prepared in advance. Four main topics were discussed and listed in the following tables.

1. Project information
2. Harvesting and planting techniques and practices
3. Market information and financial aspects
4. Forest and rattan observation

8.1.1. Project information

This first subchapter looks at whether people are involved in one or several projects, how they joined the project(s), what kind of support they received and whether they are satisfied or not.

Table 11: Project involvement: results from the interviews.

Background information	Commune	Response
Project participation	Thuong Lô	Green Annamite by USAID (2018-2019) CarBi by WWF (2016-2017) They were called by the village leader to participate in the projects.
	Thuong Quang Plantation group (P)	Green Annamite by USAID (2018-2019) BCC (2016-2017) CarBi by WWF (2016-2017) Voluntary participation
	Thuong Quang Harvesting group (H)	Green Annamite by USAID (2018-2019) BCC (2016-2017) CarBi by WWF (2016-2017) Voluntary participation: for planting, for financial benefits and future rattan resources. The commune brought and helped implementing the projects further to the communities. More than one project is needed according to the interviewees.
	Huong Son	The members do not remember the name of the projects they participated in. They joined a group voluntarily for planting in the community forest. Some people in the commune are trained for sustainable harvesting techniques, some are not. The interviewees

		themselves have never attended training courses before, but they are willing to.
	Thuong Nhat	Project by SIDA (2016) Joined voluntarily for planting in poor protection forest areas, for future rattan resources and financial support. They are not satisfied, as they receive less financial support for planting than for acacia production. They would participate again if the growing conditions were adapted to environmental conditions.
Project inputs	Thuong Lô	They receive seedlings for planting 30 cm high water rattan. The plants are provided by the agriculture and development village that collaborates with WWF They receive trainings and financial help: 2.5 mio./group/ha for a total of 28.5ha
	Thuong Quang (P)	Seedlings are provided by the project and brought to the collection site. The group will bring them to the planting site. They expect to be able to harvest rattan resources 5 years after planting it. They receive financial support for lunch and water, and trainings on how to harvest sustainably. They want more financial support for planting and protecting rattan, as it only covers for the work without adding to their livelihood. However, they would still participate in such projects as they provide protection from encroachment.
	Thuong Quang (H)	All three projects provided planting, harvesting and patrolling techniques. After that they received seedlings brought to the commune, which they transported themselves to the planting sites. The financial support and funding of the projects are not clear to them, as they just follow the instructions from the team leader. They receive 200'000 VND for every day they plant, but they are not satisfied with the projects' support. Planting is hard, and financial support is low. They want more money for taking care of rattan and for technologies to process rattan regionally.
	Huong Son	They learn about planting techniques, receive seedling provision, and financial support. 1 mio. VND/ha, which provides money for food and rest.
	Thuong Nhat	They receive trainings and financial support if they harvest stems >5m.

Overall, all groups are part of one or several projects. They mostly receive trainings, financial support and/or seedlings. The Huong Son group did not know the name of the project when being asked, and some communes are participating in 2 or more projects simultaneously. According to project documents, it turned out that the SIDA financed project is also operating in Thuong Lô, even though the interviewees of the commune did not mention it.

Interviewees mostly joined the groups voluntarily, and some even claimed to be interested to participate in other projects in the future if the offer was made to them. Many claimed to be motivated by the financial support they receive, as well as by the prospect to be able to harvest the planted rattan in the near future. The reduction of encroachment by other people

was another motivation by some interviewees. An interesting point was made by the Thuong Nhat commune; the plantation group agreed that it would participate again if the growing conditions were adapted to environmental conditions. This means that they are probably unsatisfied with the results of the planted rattan.

When it comes to the inputs, most groups shared different knowledge about the projects and did not remember very well what the training sessions were about. The projects seem to follow similar strategies and seek to achieve similar objectives by supporting harvesters and planters financially, technically and by increasing knowledge about sustainable practices. In fact, most communes mentioned similar techniques that they've learned for sustainable harvesting and planting. Planting groups receive seedlings, and they are responsible for maintaining and tending the planted rattan for a period of 5 years. However, participants from Huong Son said they never had the opportunity to follow a training course, but that they were willing to participate.

About financial help, while some receive 2.5 million VND/ha/group, some receive 200'000 VND/day and others 1 million VND/ha/group. They all claimed to be unhappy with the financial support from the projects. This can notably be explained by the economic incentive that is prevailing when joining the projects. Some explained that this money only covers daily needs when working, without increasing their livelihoods. They want more support to take care of rattan and more technologies to process rattan regionally. They all agreed that they would still join training sessions and new projects in the future, however, only if benefits are high enough. Participants from Thuong Nhat said that acacia plantations generally provided better financial support. Therefore, they still work for acacia production regardless of their rattan income, as it establishes a more stable income all year round.

Hence, projects are joined voluntarily but there seems to be a certain confusion about their inputs and their purpose. Furthermore, financial motivations seemed to be a priority. In general, the participants expect more money support from projects and find that rattan collection is hard.

8.1.2. Harvesting and planting techniques and practices

The second table (table 12) summarises all aspects linked to harvesting and planting techniques that the participants follow or have learned in theory, but also about their general practices (where, how and when they harvest and/or plant rattan).

Table 12: Harvesting and planting practices: Results from the interviews.

Background information	Commune	Response
Planting/ harvesting techniques	Thuong Lô	They harvest rattan but only for sale.
	Thuong Quang (P)	They harvest and plant rattan. To do so, they clear and dig holes, and then they plant it. After 5 years, rattan can be harvested provided that its length is > 5m and that it is 10-12mm thick.
	Thuong Quang (H)	They all plant and harvest rattan. It needs to be planted 4m apart and there must be 5m between rows.

		They harvest rattan and simultaneously they look after the community forest or the FMB forest. In practice, they harvest rattan that measures 1.5m or more, while instructions say 5m or more. They also apply selective exploitation for the ventilation of the forest.
	Huong Son	There must be 5m between rows, and rattan plants must be 4m apart. Trimming is also necessary. Harvested rattan must be at least 4-5m in length, depending on the terrain. For a favourable terrain: subtraction of shorter root part. For a difficult terrain: subtraction of longer root part. "Harvesters need to let young trees grow".
	Thuong Nhat	Rattan must be planted in a 60 cm ² hole, each plant must be 3m apart, and rows are 5m apart from each other. Size of harvested rattan: 5-10m. They "do not remember the specific techniques that they have learned".
Rattan tending/ maintenance	Thuong Lô	They hold the responsibility to protect rattan and check its quality. Furthermore, they protect, monitor, clean and check if some people destroy their forest.
	Thuong Quang (P)	They conduct periodic inspections and protect rattan for 5 years, through observation and trimming. They claim that it is necessary to raise awareness among people and buyers about harvesting techniques. For instance, middlemen sell rattan by weight, which leads to people harvesting small rattan. By buying by length again they would guarantee more sustainable practices. Hence, other stakeholders should also be informed.
	Thuong Quang (H)	They protect and take care of rattan for a period of 5 years. They conduct patrolling activities to protect the forest and combine it with rattan protection. 3 days /month, if needed they go more often.
	Huong Son	Not mentioned
	Thuong Nhat	They take care of rattan for a period of 5 years (2 first years: 3x a year and last 3 years: 1-2x a year)
Harvesting time	Thuong Lô	-
	Thuong Quang (P)	From February to May, 3-5 days/month
	Thuong Quang (H)	From April to June, 3 days/month
	Huong Son	From January to June, 4 days/month
	Thuong Nhat	From March to June, 3 days/month
Group formation	Thuong Lô	In the community they have 1 person per family participating. They harvest in groups, but benefits are individual. 7 groups manage the forest.
	Thuong Quang (P)	The village receives information from projects, and it will hold a meeting during which it assigns groups and plantation locations. From the village, 1-3 people/household plant rattan. They form groups of 10 people to plant rattan.
	Thuong Quang (H)	They harvest in groups to support each other, but benefits are individual.
	Huong Son	They form random harvesting groups of 3-4 people/group
	Thuong Nhat	There are 1-2 people/family planting rattan. They harvest in groups, but benefits are individual
Access/Tools	Thuong Lô	The forest is very far. It takes around 1 day to reach it.
	Thuong Quang (P)	The forest is around 1.5 hour by walk. That is too far for them, and it is difficult to walk such a long way.
	Thuong Quang (H)	It is a 1.5 to 2-hour walk to reach the forest. It makes it difficult to transport rattan because it is heavy. The road is difficult to travel.

		Furthermore, rattan has sharp thorns, so good tools are necessary.
	Huong Son	The forest is far, notably 2-3-hour walk away from the village. Distance is the main difficulty when harvesting rattan.
	Thuong Nhat	It is difficult to transport rattan, as the distance to the forest is far.
Location	Thuong Lô	Sometimes they harvest in the natural forest because the planted rattan is not sufficient. They planted rattan in specific areas planned for this, but they harvest elsewhere. The community forests specifically defined for planting are 1 day away. Rattan must be planted near water and not too high in the mountains. The community forest is very big, so they plant a bit everywhere.
	Thuong Quang (P)	They go to poor and flat forest areas, and plant rattan near water sources. They harvest in the community forest and in the FMB forest if they have the permission to do so.
	Thuong Quang (H)	They go to the community forest and the FMB forest.
	Huong Son	They go to the FMB and the community forest.
	Thuong Nhat	Harvest in the community forest, sometimes in the buffer zone of the natural forest.

Harvesting and planting groups both are provided with training courses for sustainable practices. While not all harvesters plant rattan, all villagers who plant rattan also harvest it. It seems, however, that between practice and theory there are differences, as practices do not concord with certain groups' knowledge about sustainability. In one interview they explained that practices are different from one person to another, notably because some people are trained for sustainable practices, and some are not. Many agreed that they harvested small rattan even though it is not sustainable. In Huong Son, none of the interviewees had ever participated in a training session. And sometimes, harvesters just "do not remember the specific techniques". However, almost all groups agreed that it is necessary to raise awareness among people and buyers about sustainable harvesting techniques.

Furthermore, the discussions revealed that rattan is recently being sold by weight and not by length to middlemen. This change of selling conditions was criticised by some interviewees, as it motivates people to harvest smaller canes. They suggested that middlemen carry the responsibility to motivate people to harvest long canes by refusing small ones and by buying them by length.

The BCC and WWF projects as well as the FMB for instance, have a very clear outline of rules to follow when planting rattan (see section 5). However, most rules were not mentioned during interviews, as many have forgotten the specific guidelines to follow. The following illustration shows the main rules that must be followed when planting rattan according to the interviewees (fig. 6). However, as shown in table 12, some rules vary depending on the commune, and not all the mentioned theory is homogenous among groups.

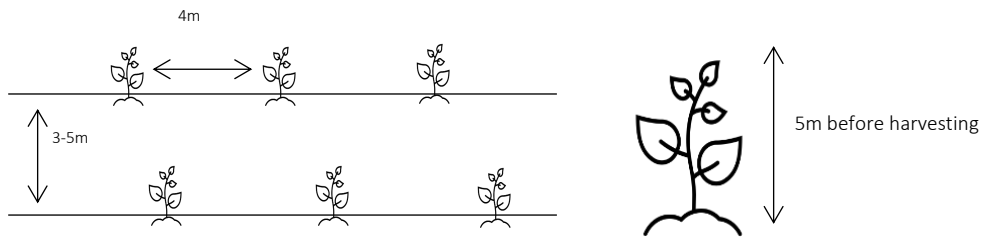


Figure 6: Rules mentioned by plantation groups with respect to spacing of planting and stem length before harvesting.

When it comes to the harvesting location, in some groups they claimed that they do not stick to the community forest due to low quantities of rattan and because the planted rattan has not grown sufficiently. Therefore, they also harvest rattan in other parts of the natural forest, notably the FMB forest.

Not only do they not have enough rattan, but they also all agree that their community forest is far and hardly accessible, which makes it difficult to transport the resources. The furthest forest area for plantation of rattan is one day away from the village, while most areas are around 1 to 2 hours by foot. They added by saying that rattan is heavy, and that the roads are difficult to travel. The plants have sharp thorns, and they need good tools to be able to work properly. Transportation was mentioned as the biggest difficulty for them.

For planting rattan, they also need to select specific areas. Water rattan being the dominant commercial species in the area, they need to plant it near water, in poor and flat forests and not too high in the mountains. However, according to the director of CORENARM, water rattan is often planted in areas where it does not grow well, as optimal areas are sometimes too far or located in separate spots, while planting rattan continuously is much easier. Indeed, plantation groups said that the forest being vast, they plant it “a bit everywhere”.

Harvesters mentioned taking care of the rattan, and protecting it several times a year. Some areas are nevertheless neglected in this regard. The local researcher from CORENARM explained that often people check rattan resources near the paths and roads they follow to move to the forest, without checking less accessible and more hidden areas. In fact, even the frequency of rattan maintenance is varying between communes. Some groups check it 2-3 times a year, while some check it about 3 times a month, usually over a period of 5 years.

When it comes to the harvesting time, participants usually harvest rattan in spring. Some already go to the forest around January and February while others start around March and April. Harvesting ends around May and June. The frequency of harvesting is quite similar for all communes.

- From February to May, 3-5 days/month
- From April to June, 3 days/month
- From January to June, 4 days/month
- From March to June, 3 days/month

From this chapter can be observed that practices as well as training courses are variable, and it is not always clear to the villagers what the training sessions have taught them, as they forgot, or never followed a course.

8.1.3. Market information and financial aspects

This sub-chapter focuses on market information that villagers hold, and on financial aspects linked to rattan.

Table 13: Market information and financial aspects: results from the interviews.

Background information	Commune	Response
Market information	Thuong Lô	-
	Thuong Quang (P)	They are slightly aware of the price of rattan in the market, mainly thanks to traders.
	Thuong Quang (H)	They do not know about the market value of rattan. They only know the prices asked by middlemen.
	Huong Son	They sell rattan to local traders and it is paid by weight, which leads to more exploitation of small rattan. They do not have any market information.
	Thuong Nhat	They “do not know about fluctuations of rattan prices on the market”, they only know the price of rattan asked by middlemen.
Rattan price fluctuation	Thuong Lô	-
	Thuong Quang (P)	The price of rattan slightly increased from 4’000 to 5’000 VND/kg. In 2020 and 2021, they did not exploit rattan because of COVID-19.
	Thuong Quang (H)	Rattan prices changed, with a small increase: in 2021 it was 4’500 VND/kg, in 2022 it was 4’700 VND/kg.
	Huong Son	Rattan prices slightly increased from 4’000 to 4’200 VND/kg.
	Thuong Nhat	The prices changed quite often: 4’500 → 5’000 → 6’000 → 6’500 → 5’500 VND/kg. Unstable prices asked by middlemen.
Source of income	Thuong Lô	-
	Thuong Quang (P)	Rattan is a secondary source of income for them. They have other jobs such as farming, wood production, conical leaves, etc.
	Thuong Quang (H)	Rattan is an additional source of income. They have many other jobs (rubber, agriculture, acacia). During COVID-19, they made no income from rattan.
	Huong Son	Rattan is an additional source of income. Agriculture and acacia bring higher economic efficiency and stability (all year round).
	Thuong Nhat	Rattan is a secondary source of income because it is only available a few months per year. They have diverse jobs (acacia, farming, grocery stores, medicinal plants, ...). They made no income from rattan during COVID-19. Rattan is more efficient: 650’000 VND/day but it is unstable because rattan is currently very limited.

Acacia only provides 300'000 VND/day.

Harvesters usually do not have market information. They only know to what price they can sell the harvested rattan to the middlemen. Furthermore, as mentioned before, rattan is bought by weight recently.

When it comes to prices, they are more or less stable, but still fluctuate from one year to another. Usually, the price changes from around 4'000 to 5'000 VND/kg.

And finally, rattan being harvestable only a few months a year, it is mainly considered as a secondary or additional income. Most of the interviewees do indeed have other jobs such as farming, acacia exploitation, conical leaves collection, and some even own small shops. However, rattan is seen as a very efficient source of revenue compared with acacia for instance. According to one group, a day of rattan collection gives twice the income of acacia labour. Overall, rattan is seen as a very interesting secondary income that brings quite a lot of money to the households, despite its seasonal availability. It is much more the financial support from projects that interviewees find too low.

8.1.4. Forest and rattan observation

At last, this table summarises people's opinion on forests, if they perceived any changes in the quality of the forests or not over time.

Table 14: Forest observation: Results from the interviews.

Background information	Commune	Response
Forest	Thuong Lô	-
	Thuong Quang (P)	They observed that the forest's quality improved.
	Thuong Quang (H)	They observed improved soil quality, better erosion prevention, and higher protection from people damaging the forest. According to them, forest quality has improved.
	Huong Son	Harvesting rattan brings many benefits to the forest. Through rattan harvesting, they increase protection from illegal harvesting. Furthermore, they promote selective harvesting which contributes to sustainable development of rattan because if the big rattan trees are cut, it will help create ventilation and facilitate the growth of rattan.
	Thuong Nhat	Projects led to more inspections and planting. The forest quality has improved.

All groups observed higher quality of forests in the last few years. However, according to the local researcher and some groups, rattan is not necessarily higher and/or more abundant than before the projects' implementation. The forests are nevertheless more controlled, as people participating in certain projects do check them more frequently. Furthermore, harvesters said that they do not necessarily collect fewer alternative resources from forests thanks to rattan. They are simply happy if they have more income sources. Hence, they would still collect other resources as usual to maximise benefits.

8.2. WWF survey

The survey carried out in collaboration with WWF has resulted in qualitative and quantitative data based on two communes participating in the IKEA financed sustainable rattan project, namely Thuong Lô and Huong Son. This survey aimed at better visualising the current opportunities and obstacles specific to this project and link the results with the data above. This project is still being carried out in several communes of Nam Đông, and it is specifically oriented towards rattan conservation, partly also on FMB forestland, where FSC is expected to be implemented in the near future. The survey was the same for all participants.

The results are, again, split into several categories similar to the previous chapter:

1. General information about participants and their households
2. Project information
3. Harvesting and planting techniques and practices
4. Market information and financial aspects
5. Forest observation

8.2.1. General information about the interviewees and their households

Overall, 25 individuals have participated in the survey. Table 15 summarises their main demographic characteristics. As mentioned in the methodology, there was quite an important imbalance between male and female participants, which could distort the results. Furthermore, all participants are part of the Co Tu ethnic minority. The Co Tu and other ethnic groups in the region are mainly subsistence farmers and are often not well integrated into the market networks, which is why their income-generating opportunities are limited (Wetterwald et al. 2004). There are around 37'000 Co Tu people living in the uplands of central Vietnam (Wetterwald et al., 2004).

Table 15: Group of interviewees for each commune.

Commune	#	Men	Women	Self-sufficient worker	State Employee	Co Tu
Huong Son	14	14	0	14 (100%)	0 (0%)	14 (100%)
Thuong Lô	11	8	3	10 (90.9%)	1 (9.1%)	11 (100%)

Most participants are part of average class households (64%), but there are still a few poor households (8%), and several near-poor households (16%) (Fig. 7). According to the Multidimensional Poverty Peer Network (MPPN) (2019), until 2015 Vietnam only measured poverty based on incomes: “the poverty line was set at the amount of money per month sufficient for a 2100 Kcal/person/day diet as well as essential non-food spending”. Since 2016, however, the government decided to use a multidimensional poverty measure, based on five basic social services: healthcare, education, housing, water and sanitation, and information access. If a household is deprived in at least three of these dimensions, it is considered as multidimensional poor (MPPN, 2019). After this first phase, the government decided to

continue to use this multidimensional approach for the period 2021-2025 (Vietnamplus, 2021b).

The answers revealed that some people might be better off than others in Nam Đông, but that most of them are not considered poor or near-poor (fig.7).

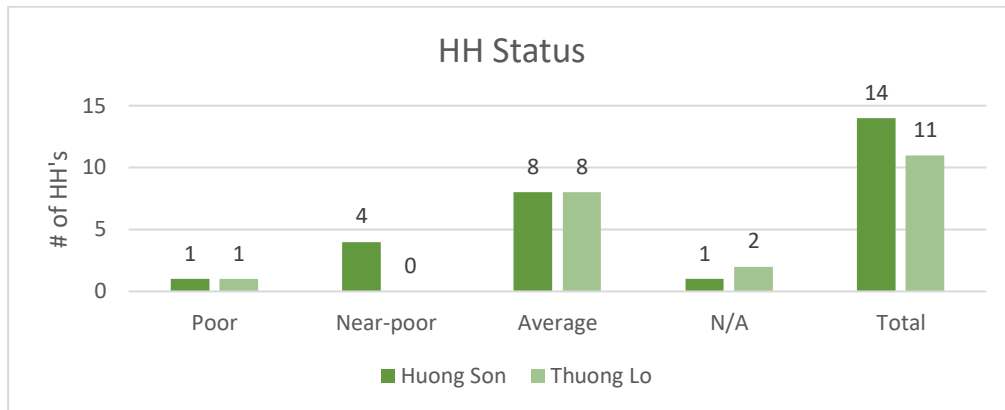


Figure 7 : Household Status of the participants.

Poor households earned between 20 and 42 million VND/year between 2020 and 2021, which corresponds to around 1.7 million VND per month, to 3.5 million VND per month. Near-poor households mentioned incomes ranging from 10 to 50 million VND/year between 2020 and 2021. Finally, average households earned between 10 and 87 million VND/year. Hence, annual incomes did not represent their household status in this case, but other dimensions of their livelihoods might influence these results. These responses might in fact also be influenced by COVID-19, as many peoples' economic opportunities were very limited. This means that even though an average household mentioned earning only 10 million VND, it might be due to the fact that 2020 and 2021 were hit by the pandemic, but their other dimensions of poverty remained the same (housing, water and sanitation, etc.)

The education level of participants was variable (fig. 8). In Huong Son, most of them reached the secondary school level. In Thuong Lô, most of them reached primary school level. Overall, only 8.4% reached high school, and 16.7% never went to school. Mai (2017) claimed that education plays a key role in poverty rates, hence, it is interesting to look at these numbers.

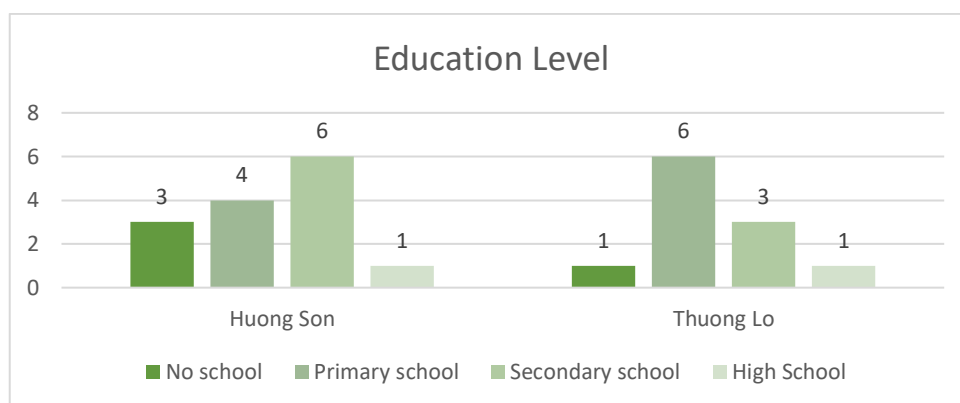


Figure 8 : Education level of participants (Total 24).

People who reached primary school level mostly corresponded to poor or near-poor households, with a few exceptions. All participants that finished secondary school belonged to average households. However, it was not necessarily average households that counted participants with the highest education level. In fact, all participants that never went to school all belonged to average households as well. This can notably be explained by the fact that these people still earn average incomes even though they never went to school, or that other household members earn an income in the family. Indeed, most households counted between 2 or 3 other labourers in the household, with a few exceptions that counted more (4 to 6) and some less (1). Households with 4 or more workers were all part of average households, while poor and near-poor households had 2 to 3 additional workers. Interestingly, a household with only 1 additional worker and the participant never having been to school was also part of an average household.

This survey having only 25 participants, it is hard to confirm or deny Mai's (2017) assumption (that education levels influence poverty rates) for these two communes, but it might be true that labour force in the families play a role in the households' average annual income (the more working family members, the better-off is potentially the household). Indeed, according to the CRD (2017), family size has an impact on land tenure and allocation opportunities, and hence, on income-generating opportunities.

When it comes to their age, 8% were younger than 30, 44% were aged between 30 and 40, 20% were aged between 40 and 50, and finally, 8% were older than 50. The two younger harvesters belonged to poor and near-poor households. One of them earned around 8 to 9 million VND per year, while the other only earned 2 to 3 million VND per year. The oldest did not harvest rattan in the last two years and did not indicate earning an income from rattan. The highest incomes were earned by a 37-year-old harvester (30 mio. VND in 2021 and 45 mio. VND in 2020), a 46-year-old (20 mio. VND in 2021 and 15 mio. VND in 2020), and a 40-year-old (12 mio. VND in 2021 and 30 mio. VND in 2020). These numbers do not establish a clear tendency, however, people older than 50 tended to stop harvesting rattan, and the youngest did not earn higher incomes from rattan than middle-aged harvesters.

Overall, all participants had different backgrounds and/or profiles, even though they come from a quite homogenous sample of Co Tu people living in Huong Son and Thuong Lô.

8.2.2. Project information

This section analyses responses linked to the project itself, how it is perceived by the participants and what inputs they benefit from. The figure below (fig. 9) shows from what activities people benefit when participating in the WWF project. They were allowed to choose several answers simultaneously.

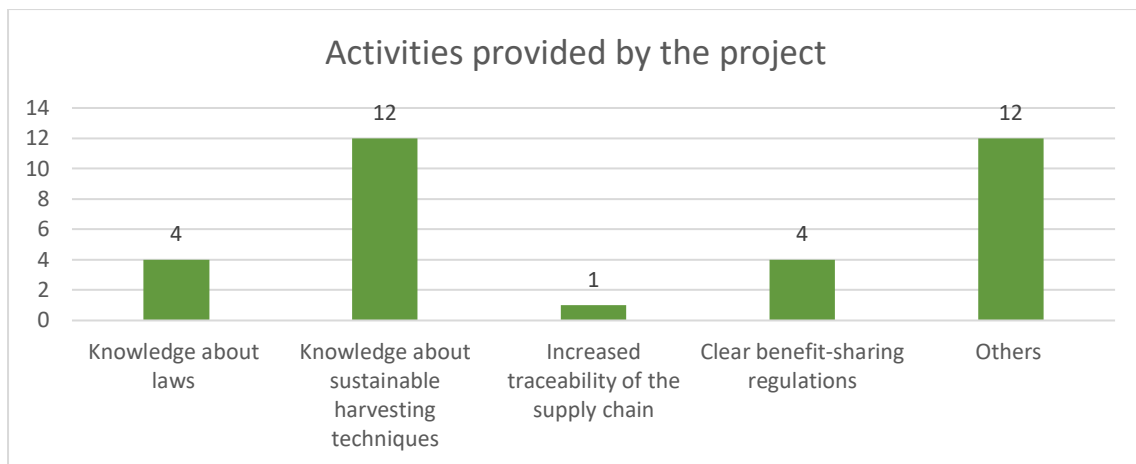


Figure 9 : Activities that the interviewees benefit from through the project.

These five categories were chosen by the WWF team, as they are the main activities of the project. 12 people confirmed that they had the opportunity to acquire “knowledge about sustainable harvesting techniques”, which only represents 48% of all participants. This shows that more trainings could be necessary to reach more people, as also suggested by the FMB interviewee (see annex 1) and participants of the focus groups (cf.8.1.). They explained that these training courses taught them about the standard harvesting length of 5 meters or more, about distinguishing between rattan species, about rattan planting techniques, safe harvesting using protective clothing, first aid skills, forest safety procedures, crew management and monitoring.

The second most selected response was "other," a response to which they could give additional information. Indeed, many other activities that were not suggested were observed by participants. This indicates that the project might have focused on specific activities, but that some of them were not obvious to the local people, or that they did not reach the expected outcomes. Some explained that the project facilitated access to the forest and to rattan for generating incomes (not only the community's forestland, but also the FMB's); some said that they learned about methods on their own, in groups, and others explained that they only recently joined the project and that they do not yet know what the benefits will be. Some also said that the project strengthened the protection of the forest, and that at the same time it helped to protect their rights and sources of income. Indeed, they explained that if they had not joined the project, the rattan would be fully exploited, which would threaten their income. Finally, some participants mentioned that they had received money to buy lunch, and support to plant rattan. One person added by saying that the project also provided financial support for taking care of rattan, as well as for the market channel. However, this answer is not supported by many others.

Overall, these additional answers are very interesting as they reveal more general benefits provided by the project (financial and technical support, forest access, ...), even though these are not necessarily “activities” as mentioned in the question.

The third most common answers were “knowledge about laws” and “clear benefit-sharing regulations”. It seems that many people are not necessarily aware of specific laws and benefit

sharing regulations (who benefits, to what extent, for how long, etc.), as was also mentioned in the focus groups conducted in different communes. It seems that a minority of stakeholders, such as team leaders and the projects themselves are aware of such information, unlike harvesters.

In addition to these activities, people were asked about what kind of support they benefitted from. 32% said that they did not benefit from any support, or they did not know yet as they just recently joined the project. 36% of all participants claimed that they benefitted from technical support, 24% from financial support and 16% from labour protection.

Respondents were also asked if they received financial support to plant and harvest rattan. 75% said that they did not. Only 25% confirmed receiving support. This means that there might be differences among participants, and that some receive more than others. In fact, in the focus groups, amounts received from the project were also variable. The same goes for technical support, which seems to only reach a few of the project members.

When asked about what type of support would be most helpful to them, many participants explained that they would "like to know more about harvesting techniques", and "have more information about the market and benefit from labour protection." This last point was mentioned 8 times. Some people mentioned that they need more financial support and technical support (tools, clothes, ...) as well as better support for the protection and maintenance of rattan.

"I want to know more about harvesting techniques; I need more than just good equipment".

"By harvesting rattan for the community, I earned a salary and followed trainings".

"I received technical and financial support".

"We acquired better technologies and earned higher salaries".

Hence, it seems that a few members of the project value technical help such as protective clothes, and increased knowledge about sustainable harvesting, as well as financial advantages. However, it would be useful for many to know more about the market, to receive more labour protection and again, to learn more about sustainable harvesting. Based on these observations, respondents were asked if they had any suggestions for improving the project. Many replied that they should receive more equipment, such as forest clothes, protective gear, hammocks, backpacks, machines and medicines. In addition, they hope to receive more funds and training courses (especially for new members), as well as support for rattan planting, to improve their livelihoods. One of them even suggested receiving support to plant other species that could be useful for his livelihoods. One participant said:

"We should have more freedom to sell our rattan. At the moment we are forced to sell the rattan at low prices because of the rules that force us to sell to fixed buyers. I would like to be able to trade more freely to get more money, or sell it to the group collectors, which is more convenient, safer and there are no fees to pass the guard posts."

The interviewee explained that he sells his rattan for 3'500VND/kg, while he knows where to sell it for 5'000-5'200 VND. One participant also could not remember which project he had been involved in, as he had joined it 5 years ago, so he had no suggestions to make.

Other suggestions were made that were not specifically focused on the rattan project, but rather on general needs from people. Someone said that he would need more time to take care of animal husbandry activities, and for self-care (diseases). Similarly, another said that he needs support for livestock development to avoid going to the forest so often. This information reveals that some people are willing to shift their practices more towards livestock or agricultural activities.

Finally, a question of interest was to know why, in the end, they were participating in the project. 10 people joined in 2022, 3 people in 2020 and 2 others in 2016 and 2017.

"I used to be self-employed and planted acacia. Now I joined the project to earn more income, and it is less hard work."

"I earn extra money, and it is safer because it is licensed. I do not have to harvest and worry at the same time".

"Because I can join training classes".

"I want to harvest on the FMB forestland".

"It is useful and informative to me."

"It helps me increase the family income".

"Because it is more profitable to harvest rattan in a group. If you are tired, someone can support you, replace you. If I go by myself, no one can help me, it is exhausting."

"I participate because the community participates in forest management".

"I followed the head of the village".

"I receive seedlings and technical support".

The reasons are therefore very different, and even though economic incentives are prevailing in many answers, participants are motivated to join such projects for various reasons. Overall, this section highlights the main perceptions of the interviewees about the project and its inputs. These answers reveal several expectations from local people, what projects could do to provide more targeted help, and to identify activities that were not sufficiently recognised.

8.2.3. Harvesting and planting techniques and practices

When being asked more specifically whether they know about sustainable practices or not, 68% answered 'yes', while 32% answered 'no'. Indeed, many of them claimed to have benefitted from increased knowledge about harvesting techniques through the project or that they taught themselves in groups.

This indicates that despite not following training classes, some participants are aware of sustainable practices. This might indeed be due to the fact that they work in groups and that knowledge can be shared among members. Furthermore, this can also be explained by general knowledge from harvesters, as forests are dominant in this area and have been used by the Co Tu for many generations. Below are listed a few answers related to this question:

"I need to be careful about the trees and bushes next to rattan to help it grow better"

"I need to take care and tend rattan".

"I know some sustainable harvesting techniques".

"I take care of rattan".

"I do not know any sustainable techniques".

"I carefully cut down old rattan plants to prevent damages to younger trees. I also do not cut young trees, but I cut vines entangled around them to let them grow."

Knowing that, it is interesting to look at more specific answers regarding these sustainable practices. When asked about the evolution of their harvesting methods, they stated that they mainly harvest tall and thick rattan canes (>5m) and that rattan should only be cut when it is old, and that young rattan should be left intact to be harvested in the future. This allows for greater exploitation in the long-term.

Almost all interviewees mentioned that the length of harvested rattan is what mainly changed. One person said that in the past, rattan was cut when it measured only 3 to 4 meters. Now, they wait for it to reach 5 to 6 meters. One person mentioned that young rattan is easily breakable, which is why they are harder to sell. Overall, there is much less rattan now than before because more people are harvesting. One reason for this is that "natural rattan is good, but planted rattan is not good for harvesting yet", as one participant explained. This goes in line with the observation of the local researcher, who noticed that there is not necessarily more rattan in the forests since the plantation projects were implemented.

Participants were then asked about the type of skills they need for more sustainable rattan harvesting, in order to understand their vision of the above-mentioned sustainable practices (see figure 10). This allows to see whether they are homogeneous among people and whether they correlate with the project trainings or not. Participants could choose several answers simultaneously.

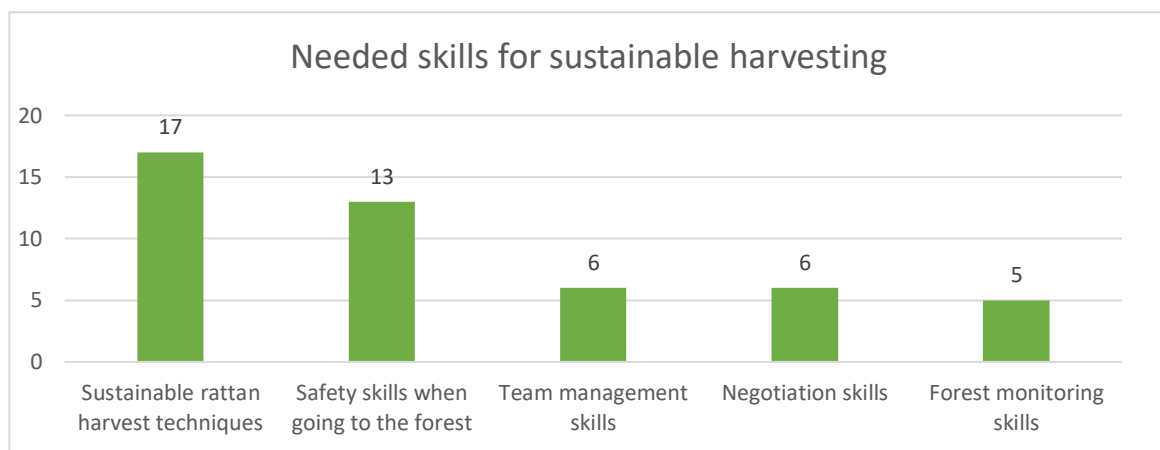


Figure 10: Needed skills for sustainable harvesting.

These variables chosen by the WWF represent 5 important skills needed for sustainable harvesting. Monitoring is necessary to observe the evolution of rattan growth, quality and density. Team management skills are also relevant, as they can help organise harvesting

methods as to have a good repartition of exploitation, better knowledge about practices, more transparency and general data. Negotiation skills are also important, as prices have an influence on harvesting quantities, as mentioned in the focus groups. Some respondents claimed that all five skills are necessary, while others only chose one or two. The results (fig. 10) show that most participants agree that harvesting techniques have the most impact on the sustainability of rattan resources in the future. Safety skills when going out in the forest came second. Team management, negotiation and forest monitoring skills appeared to be of lower priority for participants.

When being asked where they usually harvest rattan, 24 people said that they vary their harvesting location. Only one person always harvests in the same area. Furthermore, the FMB has launched a harvesting area in November 2021, specifically for rattan harvesting. The interviewees explained that they mainly changed the location for letting the rattan grow, as it takes 2 to 3 years to grow back. This is why they do not stick to one place.

"Each person goes to an area, exploits rattan that is 3 meters or more, gives it to the trader".

"Wherever there is rattan, I go."

"I only exploit in community forests."

"If you always harvest in one place, you won't have any rattan in the future."

Before, there was no community forest, so they used to go to many places, to different villages. But as mentioned earlier, it seems that now people still harvest beyond the limits of their community forests, in places they are used to go to. These answers provide interesting pieces of information. In fact, some harvesters seem to think in the long-term, while others are more focused on maximising their benefits in the present.

As the WWF project in collaboration with the FMB gives harvesters access to more forestland, when being asked whether they also follow regulations from the FMB, only three people did not. The others said that when following FMB regulations, they only cut stems over 5m, do not cut them all at the same time, and when planting, they spread them around to help rattan grow properly. One person also said it was important to leave space around rattan so that light can shine on it; he said he knew that from experience and not from the FMB. Harvesters must also plant rattan, cut rattan sustainably, not cut other species (especially wood), and supervise people entering the FMB forest area. The latter is important because rattan harvesting in the FMB forest officially requires permissions, unlike the community forest where harvesting rattan is uncontrolled and free of access. In practice, however, NTFPs are still free of access whatsoever. They added by saying that they must exploit in the right place, and not anywhere they want. "If you join a rattan harvesting group, you can only join this specific group and you cannot use anything else from the forest".

Furthermore, one person said that people share information in groups, notably because monitoring is required in the National Park area and the FMB forest. To do so, one participant explained that he had received a tablet which he uses to send data to the FMB three times a month. In general, harvesting is combined with forest protection and monitoring, but practices change depending on who the owner is, and what regulations are set beforehand. The survey

revealed that everyone knows who owns and manages the forest, except for one person. The owners are the FMB, the FPD, villagers, the commune, the communities, and finally, some household groups.

8.2.4. Market information and financial aspects

This section focuses on the financial aspects linked to the project and to rattan, but also on market information among harvesters. The aim of this section is to see whether the project and rattan harvesting/planting contributed to better livelihoods or not, whether people’s incentives and/or practices were influenced by financial support and how much they know about prices and market value of rattan along the supply chain.

Participants’ households have very different incomes, varying from less than 20 million VND per year for some, to more than 60 million VND per year for others. In Huong Son, the highest income reached 70 million VND and the lowest 20 million VND in 2021. In 2020, the highest income in the commune was 87 million VND and the lowest 10 million VND (fig. 11).

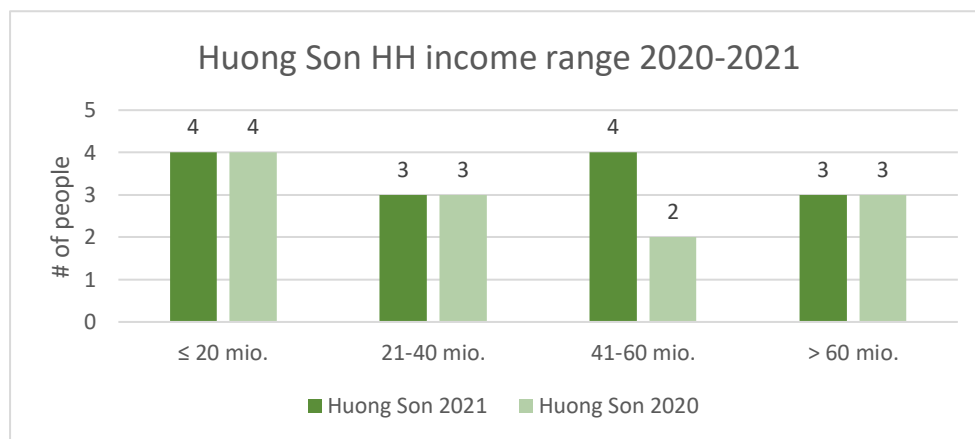


Figure 11: Income category of households in Huong Son between 2020 and 2021.

In Thuong Lô in 2021, the highest income reached 66 million VND and the lowest 10 million. In 2020, the highest income reached 66 million VND and the lowest 10 million VND (fig. 12).

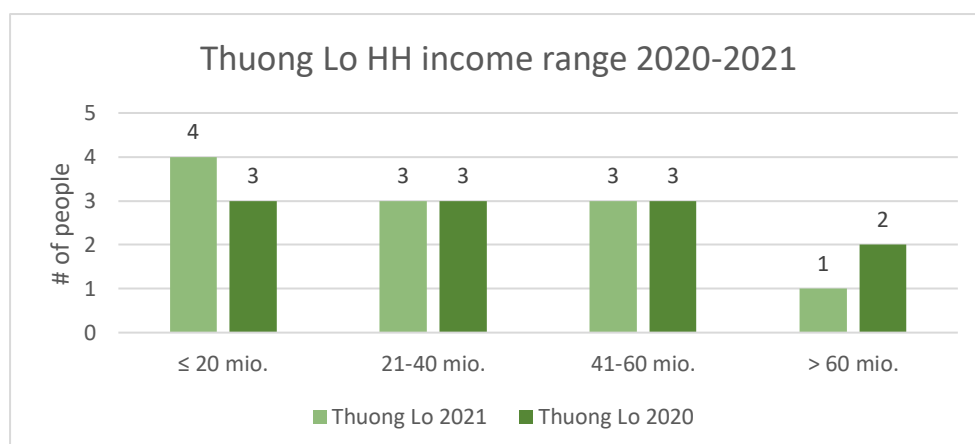


Figure 12: Income category of households in Thuong Lô between 2020 and 2021.

By looking at these numbers, it seems that salaries are variable, but there is no peak that would indicate that one category is predominant. Only in Thuong Lô fewer people reached incomes higher than 60 million VND. This might partially be influenced by the education level observed earlier, as more people reached secondary school in Huong Son.

Those with higher incomes did not necessarily have higher paying jobs than the other participants. In fact, most participants indicated that next to harvesting rattan, they also had acacia and/or rubber plantations. Income activities were therefore quite similar. Those big differences might rather be explained by the fact that other members of the household contribute to the yearly income. Furthermore, rattan mostly just represented a low percentage of that total household income. Indeed, the following chart (fig. 13) illustrates the income made from rattan by all participants between 2020 and 2021. They are classified from lowest to highest income in 2020. This shows that people earning the most were not necessarily the same in 2020 and 2021. Participant 23 remained the harvester with the highest income, but participant 22 earned less than participants 20 and 15 in 2021. Hence, rattan income is variable from one year to another, and benefits are shared quite unequally among harvesters.

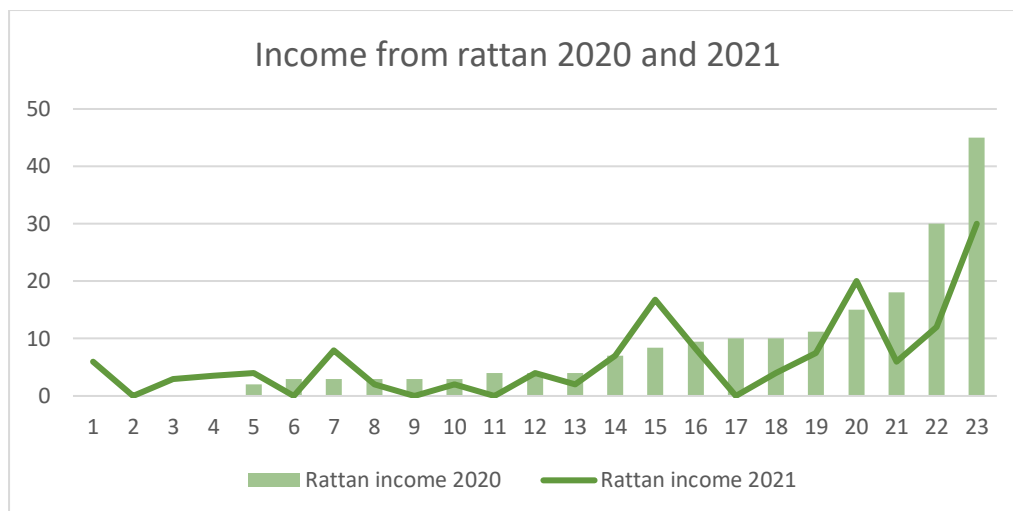


Figure 13 : Income in million VND made from rattan in 2020 and 2021 for both communes, Thuong Lô and Huong Son (23 participants).

The annual household income made from rattan ranges from 0 VND to 45 million VND. This huge gap can notably be explained by the COVID-19 pandemic. As mentioned earlier, many harvesters had no possibility to sell their rattan to middlemen, as contacts were strongly reduced. Most people still managed to earn some money from the resource, but the amounts remain low. In 2021, on average, rattan represented 16.54% of people’s incomes. The maximum value was 70% of the total income, and the minimum was 0% (fig. 14).

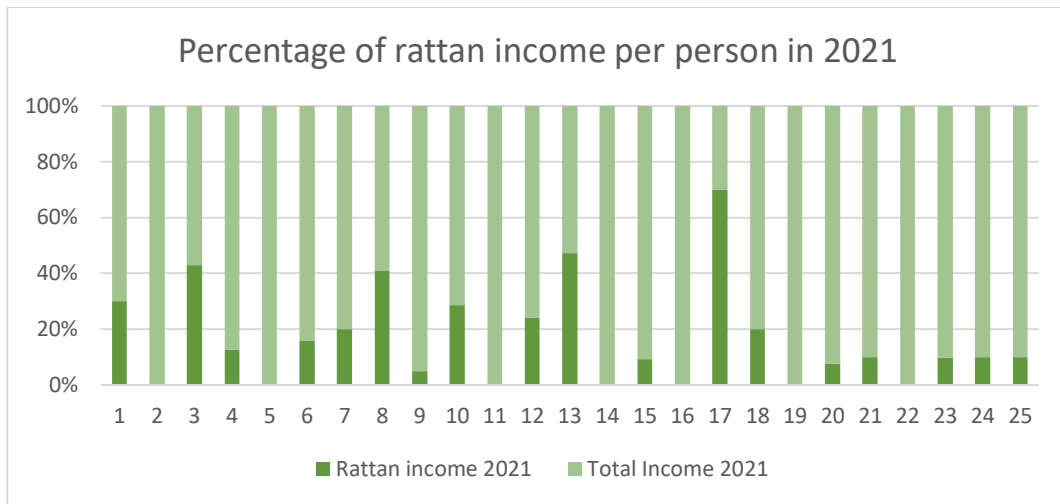


Figure 14 : Percentage of rattan income in 2021: based on the total income of each person in 2021.

The figure shows that for most participants, rattan represents an additional source of income. One frequently mentioned reason was the seasonality of rattan resources, as the plant can only be harvested in the first months of the year. This NTFP cannot often guarantee a stable income for households. The following figure shows how many people consider rattan as a main or a secondary income (fig. 15).

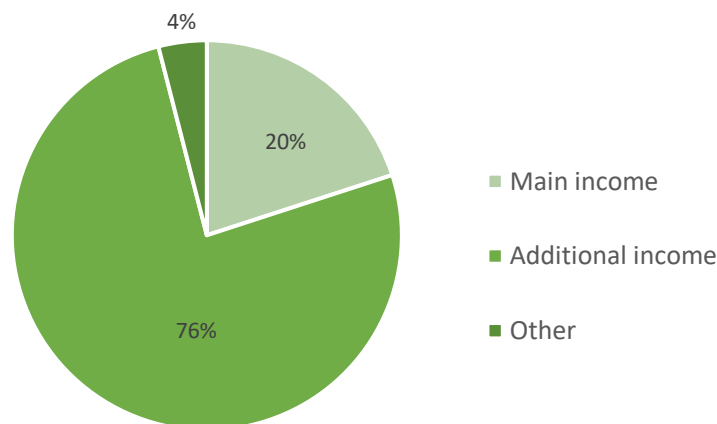


Figure 15 : Rattan Income Source of all participants.

Participants were asked what influence rattan had on their financial situation. One participant explained that “because rattan collection accounts for a large proportion of income, if you do not collect rattan, you'll have to plant acacia trees, but it's harder work.” For this participant, rattan could provide an income to avoid the hard work of wood production. Others mentioned the same reason, either because they did not find a job in acacia production, or because they prefer rattan as it is easier work. Another mainly harvested when he had free time, for increasing the family income. Others explained that children can benefit from these gains and that high incomes can be gained in a small amount of time. For instance, one harvester said that he had earned 8 million VND in only 2 months, which is a high income for the family. But why is it easier? Participants said that rattan grows faster, so they can harvest faster. Acacia requires strength, and some participants are not in good health, so rattan is more

suitable for them. Another reason is that rattan is closer. Furthermore, they are motivated to harvest rattan to protect the forest, which provides future resources, also for future generations.

Once they harvest rattan, they mainly sell it to focal points in the village (17 people) or to small traders (8 people). But do they need more market information? 19 people out of 25 (76%) said that they needed more information regarding the pricing of rattan. Some would need more information about local focal points where they can sell rattan, or even about smallholders and merchants. One participant said:

"I really want to know more about the market, but because the buyer is regulated by the management board, even if I want to know about the price and where I can sell it for a higher price, I still cannot change it, because of the FMB's regulation."

Others simply said that they want to know how to take better care of it for a better income. On the other hand, one respondent said:

"I feel that the current focal point of purchase is good, the price is reasonable, so I do not want to learn more about the market. Let [Mr. X] take responsibility, I do not really care".

When it comes to bounds with traders these answers were given:

"I am selling rattan to him [trader] for 3'900 VND".

"Due to the commitment of my trader to improve the road, it makes harvesting more convenient and saves effort. So, I sell to him".

"I have an oral commitment with my trader".

"If you do not have money, the traders will lend you money in advance. This year, 5 people advanced 3 million VND for food and for going to the forest".

"My buyer is Mr. X, he was chosen by the management board. I do not sell my rattan to outsiders, even though the price would be higher. If I sell it secretly and the management board finds out about it, I will be banned from harvesting."

"I sell it to the team leader."

"My trader lends me money, and in my village the only trader is the team leader."

"I signed a contract with the company to fix the price. The quality of rattan has to be beautiful, not muddy and not wet, it must be water rattan, and measure 2m and more. If some conditions are not fulfilled, a certain percentage is deduced".

Most people said that there is only one trader in the area, or that they have no other choice because of regulations. All participants except for one also said that they receive money advance from traders. The following chart shows the price variation that were mentioned between all participants for one ton of rattan (fig. 16).

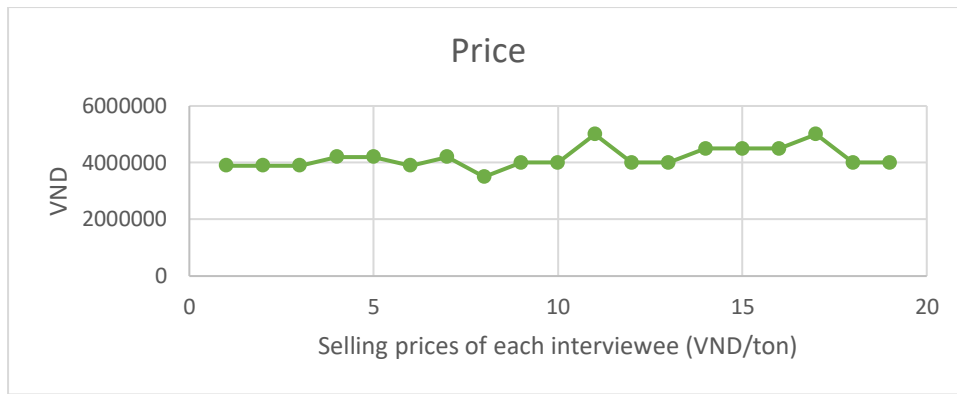


Figure 16: Price at which people can sell their rattan.

Prices seem more or less similar for most harvesters. Indeed, a dozen participants sell their rattan for a price of around 4'000 VND/kg. One interviewee is below this price and around eight people are slightly above. The maximum value is 5'000 VND/kg.

8.2.5. Forest and rattan observation

When being asked about the quality of rattan over the years, 17% said that it did not change. 83% observed an increase in rattan quality. Nobody had noticed a decrease of quality.

Most of them observed that rattan plants are now over 5 m long, unlike in the past when they used to be cut too early. They generally find longer rattan than they used to previously, thanks to the sustainable harvesting techniques. Rattan also seems to grow faster and became harder over time. One even said that now “rattan is more beautiful”. Another one said that “it’s longer, it’s bigger; the reason is good soil”. For this participant, soil was the primary reason for better quality of rattan. Furthermore, one person said it’s due to the shorter harvesting season (only a few months per year).

When it comes to its quantity, rattan evolution was evaluated less positively. Still, many observed an increase of rattan quantities (67%), but others also observed a decrease (16%), or no change at all (17%).

Opinions seem to vary, which might be linked to the locations in which they harvest, or simply due to subjective differences in evaluating the evolution of rattan quantity. In fact, for more open questions during the focus groups or even in the survey, respondents often said that resources became scarcer, and that a few of them had to harvest outside of the community forest to find proper rattan resources.

9. Analysis and discussion

This chapter reviews the data and discusses priorities to be considered when implementing NTFP conservation strategies in the specific context of Nam Đông. This will enable to potentially suggest solutions for future activities implemented by projects in the district.

Before identifying limiting factors for the success of NTFP conservation strategies, the WWF survey and the focus groups revealed some important benefits provided by the projects. Participants mentioned “protection of rights”, “protection of income sources”, “more access

to forestland”, “increased knowledge about sustainable practices” and “better protection of forests” as positive outcomes over the years. Besides, all communes participated voluntarily in different projects that took place over the last two decades, and most participants would join new projects if they were asked, but under certain conditions (better results, more financial support). In addition, they considered rattan as an 'efficient' income, as it brings in good incomes for work that is not too hard. However, theory has shown that there are factors that can undermine the success, or at least the full success of conservation and increased economic prospects.

9.1. Observations regarding assumption 1: poverty alleviation and economic benefits for increased livelihoods

When it comes to the promise of better livelihoods and incomes, even though most participants are motivated by such outcomes, they are not satisfied with the projects' results because they want more money to increase their livelihoods and to cover costs linked to extraction activities. They also suggested that they need more technical support for better working conditions, more freedom to sell rattan at better prices, and more trainings. This indicates that the projects might in fact not have considerably increased their livelihoods. But what might be hindering the success of this first expected outcome in the district? Ros-Tonen (1999) claimed that poor infrastructure, high costs, lack of access to credit and storage, lack of organisation among harvesters and low selling prices could restrain economic benefits from NTFP extraction. But is that the case in Nam Đông?

Results suggest that transport is the main constraint, as the forest is remote for all. Despite one trader offering to keep the roads in good shape, most harvesters agreed that it is hard to bring the stems to the collection point. The FMB (2017, p. 3) observed that “the technical infrastructure of forestry is still poor, the forestry production efficiency is still not commensurate with the potential and advantages of the unit”. Transport and the lack of infrastructure thus seem to be an obstacle to increasing incomes and livelihoods in the region, but this issue is rarely addressed in project activities. Only the BCC project mentions road development in its activities. It is important to note, however, that building roads can lead to bad impacts on ecosystems, as they may form barriers to the movement of animals, they may increase people's forest use and settlement, etc. (Ehrlich et al., 2013). Such strategies must therefore be considered with careful attention.

From their research in Mexico and Bolivia, Marshall et al. (2003) identified that transport constraints are mostly due to high costs, long distance from point of sale, lack of road and transport infrastructure, lack of financial instruments (loans, credits, ...) and lack of community organisation. These factors were identified as “significantly limiting” by the interviewees from their case study. In Nam Đông, harvesters are organised in groups, which facilitates transport of rattan. Indeed, most of them explained that thanks to the group formation they can go much further into the forest. But despite this successful solution, all other issues should be addressed for further development of NTFP conservation strategies in Nam Đông, as most of them were also identified during the interviews. If roads and good infrastructure are a priority need for

harvesters, they are also a necessity for other stakeholders and forest managers like the FMB to monitor and control forest use.

But it is not only good roads that are important for forest monitoring. Such activities also require good community organisation. The FMB, for instance, includes local harvesters into its strategy by giving them tablets as to collect data more frequently. This is a great step forward as it helps local communities to participate actively in monitoring the area. As they already spend a lot of time in forests, this strategy leads them to combine both harvesting and protecting the forest. However, data is still insufficient. This is also what Dung et al. (2002, p. 15) observed at the national level: “while the different departments under MARD are involved in a heroic struggle to integrate new and old approaches concerning NTFP development in its policies, these efforts appear to be seriously hampered by a lack of (access to) reliable data.” One potential reason is that relevant stakeholders are not organised as a network but rather as separate entities, which leads to unorganised practices and difficulties to monitor and survey the general state of forests. Therefore, by working together, institutions and harvesters could share more data with each other and benefit from a better overview of the forestland over time.

Further research could also be conducted to analyse whether local people are adequately consulted at the stage of implementation and design of conservation strategies, and to what extent their opinions and knowledge are incorporated into projects. This would allow their own priority needs to be taken into account, especially on issues related to roads and transport. This would also require them to have more political representation. Similar to Ros-Tonen (1999), who identified a lack of organisation among harvesters as a potentially constraining factor, Sills et al. (2011) added weak political representation as a barrier to successful economic benefits.

Unfortunately, almost no participants highlighted that team management skills are important, even though the management and organisation between stakeholders and harvesters is a prerequisite for successful income increase and better livelihoods (Ros-Tonen, 1999). The FMB (2017, p. 9) explained in a report, that “it is necessary to organize the management and supervision of people entering the forest, to register and zone the exploitation according to the plan assigned to each group of households in order to exploit and use forest resources in an integrated manner, improving economic efficiency.” To overcome this, adaptable resource management practices, transparency along the value chain, as well as organisation among producers and inclusion of women are potential solutions to overcome such challenges (Sills et al., 2011) and they need to be addressed for future projects.

According to Peters and Henderson (2014, p. 204) there is also a need to...

“increase capacity at the community-level about the value chain in which it participates, and to put in place better mechanisms of enforcement to deal with over-harvesting and inequities and/or misunderstandings between buyers and sellers. By banding together to consolidate their rattan resources, communities could enhance their market position and strengthen their ability to negotiate a price with buyers.”

In the literature, interesting observations were made in Thuong Long commune, Nam Đông. Wetterwald et al. (2004) observed that Kinh people, which are one majority ethnic group of Vietnam, are more wealthy and more involved in the market network than the minority ethnic group of Co Tu. They are generally less dependent on NTFPs than the Co Tu for additional sources of income. This results in a social differentiation along the market chain, where Co Tu are mainly the harvesters with little market information and influence, and the Kinh are the traders who set the prices (Wetterwald et al., 2004). This is another lead for research in Nam Đông.

Indeed, the interviews and the survey revealed that almost none of the harvesters had proper access to market information (notably the survey participants who were all Co Tu), and they did not know how benefits were shared. One respondent said that it was the team leader that managed such matters and that harvesters simply follow instructions. During the focus groups, it was often mentioned that harvesting groups usually sell rattan to the same middleman. Some participants who harvest in the FMB forest are unhappy with the prices, but they are not allowed to sell their rattan to other traders. Hence, low selling prices compared to the real value on the market might be a reality in Nam Đông. This was indeed another potential constraint mentioned by Ros-Tonen (1999).

This might notably be due to the fact that most support programmes only focus on increasing production, while ignoring business relationships. They might in fact promote yield maximization through knowledge and new varieties, but economic growth is not really achieved because there are too many challenges along the value chain of rattan, that go beyond the need of 'modern' inputs (CRD, 2017). In Nam Đông, communities could enhance their market position by cooperating and collaborating in order to consolidate their rattan resources. But many sell their products to middlemen as raw materials, to which they did often not know how to add value (CRD, 2017).

Hence, a lack of organisation among harvesters (as also identified by Marshall et al. 2003), but also more generally among stakeholders, decrease marketing opportunities, and NTFPs are often sold at low prices. One participant explained that he would be interested in knowing how to keep rattan "more beautiful" for selling it at higher prices. Another one explained that he would be happy to process the rattan in the region, so that the value of rattan increases regionally, and not outside of Nam Đông.

When it comes to costs, none of the interviewees mentioned paying for harvesting, except for one participant who claimed that selling to the team leader would avoid him to pay fees to the guard posts. The FMB, however, mentioned taking a certain percentage of the total harvested rattan on its forestland. Others explained that they would be happy to receive at least enough money from the projects to cover costs generated for harvesting and planting activities. Hence, even though the question was not raised further during interviews and focus groups, responses indicated that there are certain costs that the harvesters would like to avoid and cover with the help of projects. Sills et al. (2011) call these costs a "poverty trap". If forest products with low prices do not compensate for the generated exploitation costs, decreasing prices will result in the need to increase harvesting to maintain a certain income level, which

leads to this so-called poverty trap. This potential obstacle must therefore be considered by projects, as to not neglect potential costs that might increase harvesting, and hence, threaten resources of overexploitation (especially because rattan value has indeed decreased in certain communes).

When it comes to access to money, the WWF survey has revealed that all participants receive money advance from traders for harvesting rattan. However, they did not mention any amounts of interest they need to pay. These advances provide help for communities to be able to harvest rattan and invest in inputs. It would be interesting to look further into this matter, as high interests could create a dependency towards traders for instance. Marshall et al. (2003) identified lack of financial instruments (loans, credit) as a main limiting factor. But with traders providing money advances to harvesters, this issue might be less problematic in Nam Đông. Further interest should still be given to this question nevertheless, especially because they seem to struggle for paying certain costs.

But what about storage facilities? Lack of storage was not mentioned at all, but as described earlier, the CRD (2017) observed that due to harvesters being small in production, a lack of sufficient supply volume makes storage more difficult. This issue should therefore not be neglected either.

Finally, the last criteria that Ros-Tonen (1999) identified as a constraint to improve livelihoods from NTFPs, is that non-timber products are usually less attractive than other jobs, such as timber. People therefore usually prefer joining other income activities if the opportunity is given to them. This is notably due to the seasonality of rattan resources, as they do not provide a sufficient income all year round. Two harvesters explained that they would rather receive support to take more care of animal husbandry activities and livestock development and go less to the forest. Another one claimed that it would be useful to receive support to plant other species in the forest to increase his livelihood. These answers indicate that these people would indeed prefer other jobs. However, those working in acacia plantations all agreed that rattan is easier to harvest and requires less strength and brings higher incomes in less time. Hence, this NTFP remains an attractive source of income for many harvesters, even though the resource is only available a few months a year, and increasing livelihoods is more limited than with full-time activities. Wetterwald et al. (2004, p.50) explain that “the improvement of economic situations of local people is not guaranteed because NTFPs are highly unpredictable due to resource characteristics and their history of exploitation. Their seasonal occurrences impede a continuous contribution to local people’s well-being”.

Thang et al. (2010) conducted research with Kinh people in Nam Đông and observed that they increased their animal husbandry activities and their agriculture production, and hence, decreased their dependency on forests. They also increased their productivity with the help of home gardens. Since forest allocation, “the income structure shifts the dependence from forest to other sources or income from forest, is compensated by the income increase from agriculture and livestock production.” (p.317). These alternatives might be more attractive as they are also more viable, but rattan seems to play an important role for increasing peoples’ incomes, nevertheless. Table 16 summarises key findings for assumption 1.

Table 16: Limiting factors regarding assumption 1.

Limiting factors	Limit identified? Yes/No/Unclear	Observation
Transport & Poor infrastructure	Yes	The distance to the forest is the main constraint for many harvesters. Difficult road conditions and poor infrastructure make it more difficult to harvest rattan and increase incomes.
Costs	Unclear, but potentially yes	It is not clear to what extent harvesters face high costs when harvesting rattan. Results indicate, however, that there are costs they would like the projects to cover in order to increase their livelihoods. This would avoid them to face the “poverty trap”.
Lack of access to credit and storage	Unclear	Almost all harvesters receive money advance from traders. Here, it would be interesting to analyse further if they face high interests, if there are inequalities between Co Tu and Kinh and if all harvesters have the same opportunities.
Lack of organisation hindering successful marketing	Yes	Organisation of stakeholders or even just of harvesters seems quite scattered. This leads to constraints at different levels, such as monitoring, benefit-sharing, market information, income-making, etc. This matter should be targeted more seriously when introducing NTFP strategies as to see whether the current situation permits a project to work properly or not.
Low selling prices	Yes	Lack of market information and lack of organisation among harvesters, as well as low representation hinder harvesters to benefit more from rattan. Furthermore, middlemen are either fixed, or they are the only ones in the commune. This leads to harvesters nor having much saying about the price, nor having a choice about whom to sell.
People prefer other jobs than NTFP collection	Unclear	It seems to depend on how they diversified their incomes in the first place. If they work in acacia plantations, they seem to rely a lot on rattan, as it is easier and more attractive. However, in comparison with agricultural and livestock activities, people seem to favour these activities to rattan harvesting. Seasonality of rattan is nevertheless a hindrance when it comes to stable livelihoods.

To summarise, many obstacles seem to restrain the success of NTFP conservation strategies in increasing livelihoods in Nam Đông. Wetterwald et al. (2004, p.51) even say that they “find that NTFPs as a strategy to develop rural livelihoods is unlikely to create viable economic opportunities for low-income forest users.” For instance, the lack of organisation among stakeholders seems to prevent many aspects of NTFP strategies to become successful.

Maybe the projects in Nam Đông should focus more on every step of the rattan supply chain. For instance, in Laos, WWF collaborated with villagers for viable livelihoods and for

setting up handicraft groups and cooperatives (FSC a., n.d.). In Thaveng Village, thirty-one families are involved in weaving rattan products, which has more than tripled the families' collective income. The project provided them with funding, training on harvesting and production, but also capacity building. Some of these trainings include management of inventory and harvesting, splitting and weaving, etc. (WWF, n.d.).

9.2. Observations regarding assumption 2: added value to NTFPs for increased incentives to protect the forest

Assumption 2 asserts that added value to NTFPs increases people's incentives to protect forests in Nam Đông. This assumption is based on the belief that forest owners and users will be motivated to protect their forestland, notably against illegal activities, abuses, bad management, and land conversion. Also, rattan harvesting can simultaneously provide jobs to protect and manage forests in a sustainable way, which can notably prevent harvesters' incomes from being threatened.

The assumption has two parts. First, regarding adding value to NTFPs, and second, regarding the impact on forest conservation incentives. I address each in turn in order to have a better overview of both aspects.

First, how can value be added to rattan? The most common approach to adding value to rattan is via certification programmes. As mentioned before, in Nam Đông the FMB and the WWF project are working together for the implementation of FSC certification for increasing the value of rattan, certifying its sustainable use, and therefore also decreasing threats on forests. The success of a certification process strongly depends on its scheme, the identification of relevant stakeholders and their commitment along the process. The FAO (n.d.) summarises advantages and challenges linked to NTFP certification (table 17):

Table 17: Positive and negative aspects of NTFP certification (FAO, n.d.).

Positive aspects of NTFP certification	Negative aspects of NTFP certification
Creation of management plans for NTFP production	Intensification of production to satisfy consumerism
Diversification of income sources for rural people	Creation of a real or perceived impediment to NTFP access by rural poor
Direct linkage of green consumers to local producers	Disruption of traditional, social, and economic structures in subsistence communities
Acquisition of legal titles of local producers	Failure to address sustainability issues for many locally consumed NTFPs, for which no certification will be undertaken
Promotion of multi-management of forest resources	
Enhancement of existing legislation	
Promotion of awareness of forest issues	

Hence, there are already challenges emerging at this stage of the process. But value cannot be added through certification alone, it can also be added at several stages in the value chain, by processing locally, by guaranteeing good quality of canes by limiting damages during harvest and transportation, etc. Ramón and Oddone (2016) call this “economic upgrading”. It refers to the transformation of the chain towards better products and services, but also better production processes or activities that add value to a product. Economic upgrading goes hand in hand with “social upgrading”, namely the raise of communities’ living standards through increased working standards, social protection, a safe working environment, etc. in a context of environmental sustainability. According to the authors, strengthened value chains lead to more equality, higher incomes and a more balanced share of value added.

Adding value is not an easy task whatsoever. Before analysing whether incentives may be increased through added value of rattan in the region, it is important to look at the already-existing potential risks during the process of adding value to a product. According to Arquiza (2008, in: Sills et al., 2011, p.40) “effective marketing of forest goods and sustainable livelihood development is a long and tedious process, requiring a step-by-step approach”.

First, when it comes to strengthening the value chain, Ramón and Oddone (2016) explain that “public policies assume a central role” in processes like income increase, equality and so on. It is also important to consider the cost effectiveness of the project and the capacity of a group or a member to meet the required standards and monitoring needs (WWF, 2015). Several interviewees thought that FSC was not suitable in the area (annex 1), especially because of a lack of monitoring and bad management. The CRD (2017) observed that labour intensive solutions must be avoided in this region, due to insufficient labour force. The FMB (2017, p.23) similarly claims that “the area of natural forest is large while the managing human resources of the unit are too low, which leads to many difficulties in forest management and protection”.

Second, by implementing FSC, value might not increase considerably. FSC not being carried out yet, prices of rattan mentioned by participants reached average levels of around 4’000 to 5’000 VND/kg, sometimes a little less. If FSC was to be implemented in the near future, State employees and the director of the local processing factory explained that the value would not increase much (around 2’000 VND/kg) (annex 1). On the other hand, demand would nevertheless increase as consumer interest in buying sustainable products would grow.

This brings me to the second half of the assumption: whether increased value leads to conservation incentives. There are two reactions that communities can have when the demand increases, which are harvesting more or negotiating a higher price with the buyer, the first option being dominant (Peters and Henderson, 2014). Hence, do added value and higher demand for rattan lead to an increase in people’s incentives to protect the forest?

According to Sunderland et al. (2011), for conservation incentives to increase, a strong market is needed (e.g. stable prices and demand, transparent supply chain), otherwise there is a risk that the added value might mainly benefit the richer members of a community, as they have more access to land and money to invest in exploitation. Furthermore, if the value of forest products increases, clear policies and proper management are needed to ensure that

benefits flow to the formal forestry sector (eg. taxes, laws, ...), that uncontrolled overexploitation is avoided, and that resources can be monitored. This is notably necessary because there is a risk that the increased value leads to more competition for the resources, and hence, more exploitation.

Many harvesters said that they needed support to cover their costs, at least for planting and harvesting, and that they could benefit from more information about the market. These high costs, as mentioned earlier, lead to a “poverty trap” which potentially increases harvesting (Sills et al., 2011). Market information could help harvesters to better identify their opportunities and offer prices adapted to demand, and hence, reduce their dependency on forest products. Indeed, Poschen et al. (2014) found that collectors are poorly positioned in many timber and NTFP value chains because they have poor access to markets and market information, for which they rely heavily on intermediaries.

In fact, middlemen play a crucial role in this matter. They are important intermediaries that bring the necessary information, as well as contacts that make up the local network (Poschen et al., 2014). Not only middlemen, but also large companies strongly influence supply chains. In fact, IKEA for instance, helps its suppliers to diversify their marketing channels to make them more independent. For this to work properly, Poschen et al. (2014) emphasise the importance of understanding the supply chain in its entirety in order to know the individual actors and develop measures to enable a more equitable distribution of benefits.

“Markets for both rattan and bamboo are monopolised by traders and companies who often take advantage of farmers’ lack of market information and bargaining position. Ethnic minorities, the main rattan and bamboo producers, are particularly disadvantaged by not having large-scale production capacity or adequate processing and storage facilities. They also have few opportunities to expand their economic benefits from producing rattan and bamboo.”

(Oxfam, n.d.)

The WWF project in collaboration with IKEA addresses this issue by establishing a stable network for harvesters to sell their rattan to. The director of the local rattan processing factory explained that he always buys rattan from the same middlemen. These middlemen, in turn, only buy rattan from people who participate in the project. This helps to create a more transparent supply chain, benefitting harvesters as they have a guarantee to find buyers at all times. The local processing factory also seeks to create more jobs in the district in the future, by increasing the production of furniture made from rattan in Nam Đông (annex 1). Marshall et al. (2003) observed that at the processing stage, specific skills, infrastructure and equipment are required, if this is not the case, successful NTFP production might be hindered. Other factors such as adequate technology, access to information and exchange of experiences are fundamental as well (Marshall et al., 2003). These factors need to be considered when strengthening the markets. If it succeeds, this can help to move processing activities to the region and increase income and employment opportunities.

However, even though the supply chain is more transparent and more regulated under the WWF project, harvesters still seem to have no say in the price of rattan. During interviews they

claimed that middlemen fix the prices, and if they harvest in the FMB forest, traders cannot be chosen as they are predetermined. Hence, even though the projects work on better and more stable value chains, “NTFP users often depend fully on the interventions outlined by non-local users, development agencies and national governments” (Wetterwald, 2004, p.51).

Additionally, benefits of added value might only reach better-off households. Dove (1994) explained that when a resource gains value, elites might become interested in the product and take over its extraction, processing and trade, as they usually have more capital to invest as well as larger networks. This might again be the fact with the Kinh and Co Tu ethnic groups, and further research should be carried out on this topic, as to prevent potential inequalities in the future.

But does rattan extraction provide additional jobs to protect and manage the forests sustainably? This assumption was often confirmed in Nam Đông, as rattan harvesting is combined with protection activities. The FMB (2017) has involved local communities in forest protection and thereby created jobs. The projects expect participants to monitor rattan resources several times a year, and the funding received from PFES also brings communities to protect the forest (annex 1). Many harvesters are satisfied with the fact that the projects lead to better protection of forests from encroachment and unsustainable practices. FSC certification would also increase monitoring of forests, and thereby increase the protection of forestland as outlined in table 17.

Nevertheless, the communities’ motivation to protect the forest still seemed to be strongly driven by economic incentives, as illegal practices reduce the profits of those who use the forest. One informal interview with a local researcher who observed and worked closely with harvesters revealed that despite the generally positive opinions about forest protection, local communities often do not properly tend rattan in their allocated forest. In consequence, rattan is not harvestable after 5 years (which was however promised by several projects). The researcher explained that people often walk along the paths, check the quality of trees around them, without going deeper into the forest to tend rattan and check for locations that might require care. Also, very often harvesters admitted cutting canes shorter than 5m, even though it does not follow what they know about sustainable practices. This might notably be due to a lack of training courses and awareness-raising. The FMB employee suggested that more trainings should be available, especially for new members (annex 1).

The local researcher highlighted the need to present to local harvesters their allocated land as a long-term asset that needs to be protected rather than a short-term benefit. In his opinion, this is not yet the case, and the value of the forest is rarely recognised for its potential long-term benefits. Emerton (1999) points out the importance of recognising that local economies depend on the availability of forest resources. In parallel, local economic concerns play a central role in forest resource management. If a project and conservation efforts are economically desirable for local people, they will want to protect the forest (Emerton, 1999). Seeing their allocated forestland as economically beneficial would therefore potentially increase their incentives.

“Economic incentives are concerned with making it more worthwhile in financial and livelihood terms for communities to maintain, rather than to degrade, natural resources in the course of their economic activity. [...] Economic incentives present a valuable tool for both nature conservation and sustainable livelihood development”.

(Emerton, 1999, p.3)

Emerton (1999) explains that community economic activities are usually adapted to the prices and the markets, as they influence the products' profitability and desirability. She says: “Price distortions and market inefficiencies can send the wrong signals to communities about the value of biodiversity-based goods and services” (p.11). This in turn leads communities to overharvest and degrade nature.

One influential factor mentioned by the author is precisely the monopoly of middlemen in local markets. Hence, middlemen and other stakeholders must not be neglected. For instance, in Nam Đông, one reason that strongly influences harvesters' practices is that rattan is sold by weight and not by length, as mentioned in the results. In the past it used to be the opposite, but with these new selling conditions harvesters can sell long and short rattan as it does not matter to the buyer. As a result, some harvesters allow themselves to harvest short canes to maximise their benefits, thereby endangering the available resources.

Could better policies help to achieve better protection and set clearer rules about the commercialisation of forest products? The FMB explained in a report that secondary forest products do have great potential, but they are difficult to manage because they are freely accessible in production and protection forests. Indeed, difficult conditions prevailed in recent years due to limited investment funds from the state and uncoordinated policies (FMB, 2017). Furthermore, taxes are not paid for rattan harvesting. People therefore freely exploit resources, which leads to depletion. The FMB (2017, p.3) says: “The arrangement of production organisation as well as forest management and protection are still not reasonable.” Indeed, open access regimes lead to decline of rattan (Wetterwald et al., 2004). In Thuong Long for example, representatives of rattan furniture factories visit the area and clear the stocks of good commercial rattan species for three to four years. These resources then need about 15 years of growth before collection is possible again. In general, the forests in Thuong Long are accessed by both local and non-local actors, as property rights are neither developed, nor controlled. This leads to higher pressure on rattan, as forest users become more competitive (Wetterwald et al. 2004). Also, as land tenure is often unclear and influences the households' decisions in relation to their practices, they need to “be addressed to stimulate local people's interest, cooperation and support with any effort to conserve the natural resources” (CRD, 2017, p. 2). Therefore, Wetterwald et al. (2004, p.51) suggest that the current open access regimes must be closed down to be replaced by “property right regimes entitling local people to maintain access to their resources and to exclude others”. Local communities' access rights should be preserved through collaborative management agreements for instance, or communal land titles, but still by restricting access to non-local users (Den Boog et al., 2018), at least on their allocated land.

In the Philippines and Indonesia, for instance, forest policies often negatively perceive smallholder farmers (Michon and Angelsen, 2005). This results in “policies, regulations and development plans for forestlands that give preference to contracted firms” in order to convert practices into more modern approaches and, “as a consequence, local systems of forest management [...] are not supported, and often not even accepted” (Michon and Angelsen, 2005, p. 16). This is an interesting point to consider. Indeed, Osborne (2017) claims that a key flaw in structures such as the WWF project is that local authorities play a main role in decision making, which creates a top-down approach neglecting some stakeholders.

Hence, local people could benefit more from forests if policies and land tenure were better defined and gave more advantages to them. This would notably reduce pressure and competition on NTFPs, which is what Zingerli (2005), Ros-Tonen (1999) and Sunderland et al. (2011) identified as a potential threat to NTFPs. Participants explained that they have to go to forest areas where they should not, because there are less resources where they used to harvest, notably because there are more people exploiting rattan. Furthermore, the rattan they planted under projects did not grow properly, so they cannot harvest in planted areas. But certification might even strengthen the competition for rattan in the area. In fact, commercialisation of NTFPs does not necessarily alleviate poverty or guarantee sustainability, because sale of NTFPs only little benefits local communities and does not provide any socioeconomic change. This is due to the fact that incomes are often very low and the dependency on income from sale of NTFPs may perpetuate poverty rather than alleviate it (Marshall et al., 2003). Indeed, NTFPs are mainly used out of necessity due to poverty and market failure, rather than by choice. Cavendish (2000, in: Sills et al., 2011, p.34) observed that “the current prevalence of NTFP use” by local communities is due to low incomes and not the attractiveness of NTFPs themselves. The following table (table 18) summarises key findings regarding assumption 2.

Table 18: Limiting factors regarding assumption 2.

Limiting factors	Limit identified? Yes/no/unclear	Observation
Weak national or international market, and lack of market information which lead to mostly richer people benefitting from NTFPs	Rather yes	The market is not necessarily weak in that sense, as demand is quite high, and rattan is an interesting resource on international markets. The supply chain is simply not well organised, not very transparent and FSC certification cannot be introduced yet, which reflects the lack of monitoring, labour force and management resources available. Market information being insufficient among harvesters, it is unclear at this point how much more money they could make from rattan, if they had the ability to discuss prices (maybe around 5'000 VND from results of the WWF survey). It would be interesting to analyse this question with Kinh and Co Tu people, to see if there is a big gap, and if one ethnic group or the other has much more opportunities.

		<p>Literature suggests that this issue is frequent and must not be neglected.</p> <p>It is also important to consider other stakeholders such as middlemen, that might influence people's practices as well as market information.</p>
Increased competition for resources	Yes	<p>Many harvesters confirmed that rattan resources being scarce, they must move to other parts of the forests, whether they are allowed to or not.</p> <p>For instance, one said: "Wherever there is rattan I go."</p> <p>Another one stated that there are always more people harvesting. Literature even suggests that non-local users add pressure to the resources.</p> <p>Middlemen buying by weight influence harvesting practices as well.</p> <p>Hence, adding value to rattan could even strengthen this problem.</p> <p>Monitoring was mentioned several times as a big challenge in the area. Labour intensive strategies are hard to implement in Nam Đông. Furthermore, management is scattered and knowledge about sustainable practices is lacking among harvesters.</p>
The forestry sector being "hidden" and "forgotten", only few unclear policies lead to no contributions of NTFPs to the formal forestry sector	Yes	<p>NTFPs lack clear regulations, they are still freely accessible and influence people's practices to harvest unsustainably. Furthermore, taxes are not paid, and it seems that institutions do not benefit much from the rattan sector, especially because processing is mainly organised outside the district.</p>

Many stakeholders and forest owners put great efforts into protecting rattan, especially when it comes to organising harvesting, increasing knowledge about sustainable practices, and planting new rattan for the future, whether its value is high or not. The problem seems rather to be linked to a lack of policies, bad management and monitoring, and overharvesting among harvesters due to high competition. Indeed, as seen in chapter 4, adding value to a forest product is only a good idea if scientific knowledge is collected about the resources, that enough labour force is available to protect and maintain the forests in the long term, and if harvesting rates can be monitored properly, as it is the very commercialisation of NTFPs that threaten resources, and not their exploitation for subsistence needs. Overall, harvesters also need to be trained to see the forests like long-term assets by recognising their value in the future.

9.3. Observations regarding assumption 3: decreasing pressure on forests thanks to NTFP exploitation

The third assumption is that NTFP exploitation will decrease human pressure on forests, as people reduce their less sustainable activities such as timber extraction. The aim of this section is to discuss whether people in Nam Đông have generally combined rattan activities with other

jobs, and whether they would rather collect rattan or shift towards these other occupations, that might be less sustainable.

In the district, there are many activities from which harvesters make an income, such as rubber, acacia, agriculture, livestock, etc. In fact, almost all interviewees also worked in acacia plantations (on owned land or hired). Mai (2017) who conducted research in Thuong Nhat, Thuong Quang and Phu Vinh commune (A Luoi district), observed that in all three communes, acacia represented the economic activity involving most households. However, she observed that in 2012, acacia only represented 7% of people's income. Rubber on the other hand, represented 43% of people's incomes, and agricultural wage labour around 14%. Despite low incomes from acacia, stable incomes and financial support motivate many to keep working in those plantations, which are not necessarily leading to sustainable forests as explained by the local researcher. When it comes to rattan, the percentage is often low as well. It is only a part-time activity and does not provide an income all year round, but it provides higher incomes for less work, which makes it an attractive additional income source, nevertheless.

Overall, when asked if harvesters changed their livelihood strategies since harvesting rattan, most of them explained that their income-generating activities did not evolve since harvesting rattan and that they still spend the same amount of time doing all of their other jobs. Indeed, they explained that rattan is mostly an additional income that they seek regardless of their other activities. Many agreed by explaining that this extra money is beneficial for their children, their family, etc. The local researcher explained that a lot of people collect rattan because they have no other choice.

Overall, the results have shown that having other jobs does not create an incentive to harvest less rattan and harvesting rattan does not create an incentive to reduce other activities in the region. This can be explained by the low incomes that the different forest activities provide. According to Michon and Angelsen (2005), if certain activities (such as acacia) do not provide sufficient income sources, people might turn to NTFP extraction in an unsustainable way, in order to maximise their benefits to cover for their subsistence needs. It seems that this is exactly the case in the district. In fact, despite harvesting rattan, people do even expand their other activities. For instance, Nguyen and Kull (2022) observed that forest activities such as acacia boomed in recent years. These forest activities empowered smallholder households who expanded forest where they found value in forest products to invest work and plant trees. This is also what Cochard et al. (2016) explain. In the central highlands, agricultural fields expanded and ethnic minorities became more and more engaged in acacia and rubber forestry. However, this limits natural forest increase on allocated lands.

Over the years, Thang et al. (2020) observed that people in Nam Đông have diminished their forest dependency and turned to other income-generating activities like agriculture. As mentioned before, two harvesters explained that they would rather receive support to take more care of animal husbandry activities and livestock development and go less to the forest. This indicates a shift from forest dependent livelihoods to more production-based systems in agriculture and animal husbandry activities (Thang et al., 2020). Tendencies could be a

decrease of reliance on forests, but this is only beneficial for forests if other activities are not overstepping on forestland and hence, leading to land conversion.

Nerfa et al. 2020 suggest quantifying forest dependence for informing approaches to poverty reduction and forest conservation. Dependence on forest goods should not simply be calculated in monetary terms, since in certain contexts households primarily consume rather than sell forest products. Other variables such as time use should also be included, for example (Nerfa et al, 2020). The authors observed a correlation between poverty and dependence on forests. In fact, absence of livelihood alternatives and poverty are often the result of high forest dependence. In Nam Đông, people rely on many different incomes, but most of them have no access to non-farm activities, such as working in factories and companies or for government bodies. Mai (2017) explains that these activities require specific conditions, such as education and recruitment criteria, social relationships, etc. Hence, such alternatives are limited to certain more advantaged people. The WWF survey has shown that only one person was a state employee (see table 15). This person is also one of the two only participants that finished high school: “It can be said that non-farm activities are not yet good opportunities or alternatives for many households in the uplands and remote areas” (Mai, 2017, P.76). This is why poverty alleviation can be better understood and achieved if projects and institutions know which households depend more heavily on forest goods, and which ones also have less livelihood opportunities (Nerfa et al., 2020). As seen previously, in the study area people might indeed have different and unequal opportunities, notably because of their education level or their ethnicity.

Additionally, one interesting observation in Nam Đông, is that the FMB prohibits the use of timber and other resources from the forest while harvesting rattan. By doing so, people could in fact put less pressure on forests by still earning money from rattan. If such rules were to go hand-in-hand with a harvesting quota, the alternative income from rattan would be very beneficial, without threatening the forests. Indeed, it seems that the high competition on resources caused by a lack of policies and land tenure arrangements is problematic, as the increasing commercialisation of NTFPs puts pressure on local harvesters and their surrounding ecosystems (Den Boog et al., 2018). If people rely on these NTFP’s for subsistence needs and extra incomes, they will not necessarily reduce their harvesting practices, but rather turn to illegal locations and unsustainable practices for income maximisation, or in other cases to other, less sustainable activities. The assumption that NTFPs reduce pressure of human practices on forests is not necessarily true in the study area. Indeed, it seems that rattan does not necessarily reduce considerably people’s use of timber for their livelihoods. But rattan was often mentioned as an easier job that requires less strength. This NTFP might probably rather lead to released pressure on people and less hard work, which might keep them healthier over time, than to the provision of an incentive to reduce pressure on forests.

9.4. Potential ways forward

Overall, the results have shown that many “prerequisites” highlighted by Ros-Tonen (1999) and other authors for successful NTFP conservation strategies are still not entirely fulfilled.

Some require more attention than others, as Nam Đông seems to face multiple challenges for the future. What seems to be redundant is the need to better organise monitoring, conservation as well as benefit-sharing from rattan extraction among all actors involved in the rattan supply chain. There still seems to be a lack of involvement of local communities in the conceptual planning, but also in the steps of implementation for conservation practices (Zingerli, 2005). In fact, peoples' concerns for the environment and resources are often neglected.

In Mbeililing, Indonesia, which is a very biodiverse region, nature is increasingly threatened by deforested land, land conversion, poaching, illegal wildlife trade, etc. To protect this area of dense tropical forest, an organisation has helped local communities to "set up Village Resource Management Agreements". As a result, local communities have been able to work with conservationists to identify priority threats and think together about solutions (Law, 2022). In this case, the agreements are "recognised by government policy makers and are overseen by a committee of local people who ensure they are properly carried out." These agreements have helped the organisation reach out to more stakeholders and "engage them in advocacy, training, conservation and economic development" (Law, 2022). As a result, local people have acquired a much better understanding of ecosystem services and the importance of protecting them for water filtration, climate regulation, etc. (Law, 2022).

This strategy would allow local communities to have a say in the design phase of projects. In result, they can feel better included and their own priorities might be better considered and identified as well. In addition, they could become more aware of the intrinsic value of forests, and not just their economic value. Indeed, by increasing their general knowledge about environmental issues, it could increase their motivation for long-term prospects, eventually leading to better practices. In fact, most participants agree that harvesting techniques and sustainable practices is what has the most impact on the sustainability of rattan. They seemed interested in learning more and acquiring more knowledge. However, team management, negotiation and forest monitoring skills appear to be of lower priority for participants. Theory has shown that these very factors might in fact compromise the success of conservation strategies. Harvesters need to learn more about all these aspects as well. For instance, projects could provide more training courses, that increase communities' knowledge about monitoring, rattan tending, team management, market information, and so on, including many aspects of conservation.

In Laos for instance, for implementing FSC, trainings were very varied, including group policy, rattan inventory, biodiversity monitoring, post-harvesting monitoring, etc. This was also combined with a separate feasibility study, which includes collecting preliminary data about legal and political feasibility, financial and resource feasibility, etc. (tenure rights, management rights, available time of community, cost analysis,) (WWF, 2015). Such multidimensional trainings could avoid conservation strategies to miss out on important factors. For example, if monitoring, patrolling, and taking care of rattan is neglected, rattan resources will as well not grow properly. Hence, planted rattan cannot be commercialised and the projects' efforts might get lost over time. Projects could mobilise more expert knowledge as to look at different

variables in order to identify further limiting factors or take into account potential limits and try to avoid them. For instance, a table to identify the potential factors limiting the sustainable use of NTFPs has been suggested (see annex 2), as to analyse beforehand whether an NTFP conservation strategy can be potentially successful or not.

Furthermore, Sills et al. (2011) highlight the necessity for projects to establish realistic, long-term time frames, as well as guarantee a continuity of commitment, hard-work and mutual respect. In Nam Đông, most projects were implemented for around 5 years, sometimes a little longer, without further continuous efforts and results. Some rattan plantation projects were even “forgotten” by some groups that planted rattan in the past. Participants said that there were no satisfying results regarding plantations, as the stems remained small, which was also confirmed by the FMB (2017). Hence, if conservation strategies are not established and designed for the long-term, they might not benefit local communities, and hence, not increase their incomes and livelihoods over the years.

For better results, the FMB (2017) suggests implementing silvicultural measures (nurturing and enriching the forest) with various tree species and NTFPs. This would enable to increase the value of forest, as well as its quality, and in result, increase local communities’ income. To do so, a combination of fast-growing and long-term trees is required, in combination with multipurpose trees and NTFPs (FMB, 2017).

For management plans, for instance, multipurpose and participatory management systems including timber and non-timber use by local communities are important, notably in forms of enriched forests and human-modified vegetation types as a source of NTFPs. These deserve to be focused on more seriously as a way of decreasing human pressure on natural forests (Ros-Tonen, 1999).

In fact, farming or cultivation of NTFPs increase production as well as access. Growing NTFPs such as rattan in home gardens or agroforestry systems or enrichment plantings is very promising for sustainability. “For example, agroforestry systems that involve low intensity management and retain the canopy cover of native trees can conserve a high diversity of plants, mammals, birds, and insects” (Bhagwat et al. 2008, in: Shackleton et al., 2011, p.165).

Some of these strategies are already implemented in Nam Đông, but mostly only for rattan. Indeed, other species are not included in most strategies and the enrichment planting, as mentioned in the analysis and results, are not sufficiently taken care of. Hence, organising better solutions together with harvesters would be beneficial, but how well is the collaboration between institutions? How do local actors work with higher level institutions such as the MARD?

When asked about collaboration, an interviewee of the FPD claimed to be satisfied with the current situation, as they work with different institutions and projects. Two CRD employees, on the other hand, claimed that at the district-level there is no collaboration, and that communes and projects do not collaborate: “Everything is scattered, there is no research organism that works together”. In fact, most institutions (the FMB, communities, and other parts of the administration) are not very well organised as everything functions separately. This might lead to a new line of potential research. Maybe it is essential to involve experts and

scientific knowledge into the policy making steps, as well as into the project implementation, the understanding of ecosystems, etc. and work hand in hand with the district and the province.

“There is a need for longer-term studies that focus on multiple ecological levels (ranging from genes to ecosystems), that assess the mechanisms underlying impacts and that validate current models. Researchers and forest managers need to work with local harvesters in designing and evaluating management practices that can mitigate the negative effects of harvest”.

(Ticktin, 2004, p.11)

10. Conclusion

This thesis does not so much try to identify new faults in NTFP conservation strategies, nor does it seek to belittle the work that has been done in the region so far. The research aims much more to summarise the current situation in Nam Đông, and to establish an overview of the potential limiting factors that might complicate the work of many projects and other stakeholders involved in increasing the quality and quantity of forests, as well as local livelihoods. Hopefully, this overview will provide an interesting background of potential ideas for facilitating the current strategies, and maybe bring to light some elements that were not considered so far.

Overall, assumption 1 is facing many challenges, mostly due to bad infrastructure and difficult transportation, lack of organisation between harvesters and other stakeholders, and low selling prices. Costs and a lack of access to credit and storage facilities might also hinder the increase of their livelihoods, but these limiting factors were less evident in the region. Finally, it was unclear whether people prefer other jobs to rattan harvesting (even though literature highlights that forest dependency decreases), but it seems that this NTFP is an easily accessible source of income, that requires less hard work than other activities, and is therefore attractive.

Assumption 2 also faces many obstacles for it to be successful in Nam Đông. Indeed, it seems that economic incentives are dominant among harvesters, and that participants do not necessarily comply with sustainable harvesting practices and laws. While the market of rattan is blooming internationally, supply does not satisfy demand and its value is quite high compared to other forest products. But harvesters often do not have proper market information and benefits do not necessarily reach them. Furthermore, pressure on forest products seems to have increased, with more and more people harvesting rattan from the forests. Finally, unclear policies hinder benefits from reaching the formal forestry sector, which is not given enough attention by governments and institutions. This leads to depletion and illegal practices, as well as a lack of control over forestland.

Assumption 3 seems not successful in the district. In fact, it seems that timber extraction is carried out regardless of rattan collection, because most of the other income generating activities do not provide sufficient incomes for households. Hence, people need to diversify their jobs, rattan being one of several strategies. As it is only available seasonally, most harvesters need to rely on other activities such as acacia to earn enough money all year round.

To conclude, for higher benefits, there is a need to include communities at the design stage of projects to better identify priorities, such as reducing costs when harvesting, facilitate access to forests via better technical and transport conditions, and have more transparent supply chains for better market information to guarantee a better share of benefits. Indeed, it seems that harvesters often do not have enough say in the implementation of project activities, but chapter 9 stresses the importance of working with local communities. Also, adding value to NTFPs and increasing their commercialisation does not necessarily benefit everyone equally, as local communities might be poorly positioned and missing important market information, which is the case in the study area. For instance, in the district Co Tu and Kinh might have unequal opportunities along the supply chain, and it would be relevant to consider such aspects in the future. But also middlemen and organisations are often designing and fixing their strategies that local people have to follow without having a say (price of rattan, traders, etc.).

Furthermore, harvesters should not only be given technical support, but also more trainings about ecosystems and their benefits, which could lead to greater compliance due to a greater awareness of the value of natural resources. Indeed, “it is clear that local management practices play a fundamental role in determining harvest sustainability” (Shackleton and Ticktin, 2011, p. 166). For identifying and promoting sustainable NTFP exploitation, Shackleton and Ticktin (2011) suggest adopting participatory research which reveals local knowledge and practices of local communities, their ecological impact, and promoting adaptive management strategies. Furthermore, when designing participatory management systems, they should include timber and non-timber use by local communities (Ros-Tonen, 1999).

By strengthening local communities’ political representation, and by developing stronger resource management with more transparent supply chains, forests could evolve towards sustainability. This would also facilitate the certification process, which is not necessarily applicable as of today, as there are low human resources, a lack of data, and bad management and monitoring structures.

Furthermore, there is a need to reconsider the current open access of NTFPs that does not provide any protection or quotas about harvesting levels. The lack of policies does even increase competition between local and non-local users, which leads to more depletion. Several authors suggest reinforcing land tenure rights in order to decrease competition for forest resources. If people have more exclusive rights on their land, they might find more interest in protecting these areas, as well as reduce their pressure on resources as they won’t have to compete with non-local users.

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Annex

Annex 1: individual interviews

Next to the focus groups, several interviews have been conducted with different institutions and stakeholders in order to collect additional information, notably general information about forest management in Nam Đông. Hence, they were asked about general aspects of rattan conservation, forest management and the current situation in Nam Đông and/or TTH.

PFES

One institution that is important to consider is the Payment for Forest Environmental Services (PFES), which plays an important role in the sustainable management of forests. It is a non-profit fund in collaboration with the forest Protection and Development Fund. The collected funds are distributed among important stakeholders to protect the forest.

“Viet Nam launched Asia’s first Payments for Forest Environmental Services (PFES) policy in 2008, implementing it nationwide in 2010. More than 90% of PFES revenue is generated through fees added to electricity and water bills; these funds are then paid to environmental service providers that protect forests, with the aim of ensuring a more stable water supply for electricity production and clean water for the public”.

(Thuy et al. 2021)

For instance, based on a study, commercial hydropower production brings in 20 VND per kilowatt-hour for the Fund. Local communities and households who manage allocated forestland are priority beneficiaries from the PFES. This policy is the first of its kind to be implemented in whole southeast Asia (Winrock International, 2011).

The interviewee, an employee at PFES, explained that this fund has been established in 2011, but until 2014 it was still in a conceptualisation phase for doing surveys on the watershed area, the forest and for collecting relevant information about the context. After 2014, funds have finally been collected and in 2015 first payments allocated to forest owners could be distributed. The interviewee explained that in Thừa Thiên Huế this fund is used to protect a watershed area of around 160'000 ha, which covers around 50% of all the forest and watershed area of the province. At first, around 1.5 million dollars had been shared among owners, while the fund now reaches around 2.5 million dollars. The rest is expected to be covered by a REDD+ project in the future. Hence, PFES also plays an important role in Nam Đông, as the fund provides additional financial support to communities and village groups. In return, owners have to protect and check the state of the forest. There are 4 criteria (forest quality, origin of forest, function of forest, level of difficulty to protect the forest) that determine how much owners will receive per 100ha.

According to the interviewee, people have both economic and conservation incentives. This is because they do not receive enough money, as payments from the fund are not attractive enough (about 10-20% of their income). He explained that people are aware of climate change and policies in this regard, and that they are therefore protecting the forests as well, not only for money. Additionally, the money provided during COVID-19 was extremely relevant and meaningful, as people struggled to find jobs and sources of income. Local people receive this payment independently from what the projects pay for rattan protection and planting. The money received was, therefore, not influenced by the pandemic and provided a useful source of financial help.

Center for Rural Development (CRD)

Another interview was conducted with two employees from the Center for Rural Development (CRD). The CRD works closely with certain projects to protect rural areas. They notably supported the project funded by SIDA with the help of WWF for protecting rattan resources. The interviewees observed several challenges regarding forests and rattan resources. They noticed that some land allocated to communities overlaps protection forest areas and are not only distributed on production forests. They think it might be a mistake or because these areas are adjacent to protection forests and divided into blocs.

Furthermore, they explained that only a few people harvest rattan as it is not profitable, but that the natural forest is nevertheless overused. They suggested planting rattan in gardens for limiting exploitation in forests.

When it comes to forest management, they claimed that at the district-level there is no collaboration, also communes and projects do not collaborate: "Everything is scattered, there is no research organism that works together". In fact, most institutions (the FMB, communities, and other parts of the administration) are not very well organised as everything functions separately. Even under the projects with rattan planting activities in the region (BCC, WWF, ...), they observed that after 5 years of planting rattan remains small and cannot be harvested, which makes these activities ineffective. In fact, the CRD observed that most rattan measures around 2m instead of the 10-15m that were promised by the projects. They said: "People call it *sitting* rattan instead of climbing rattan, because it's too small". The CRD tries to motivate people to check the planted rattan and to tend it. In fact, as the communities are not paid for tending rattan, they do not do it: "if there is no benefit, there is no motivation".

One main problem highlighted is that projects, once implemented, leave most responsibilities to the communities afterwards, without providing them with further support. They said that communities should not receive more money whatsoever, because it would make them too reliant on financial support. According to the interviewees, that is what WWF is currently trying to achieve by keeping financial help low but trying to expand training courses for people to learn how to take better care of planted rattan. This could lead to faster growth of canes and hence, more benefits.

The CRD employees suggest that PFES should pay people specifically for tending rattan. By paying them, they would take more care of the plants for long-term benefits, which in turn would avoid people becoming more dependent of financial help in the future. As the fund already pays for the protection of forests, different protection activities can be combined.

They added by saying that "ownership should mean that the forest is an asset to them for long-term benefits. Unfortunately, they do not take care of it with this vision". In fact, when patrolling their allocated land, usually they just check if some trees have been cut, without using the opportunity to take care of other things like rattan quality.

Forest Management Board (FMB)

The FMB is the owner of around 11'307ha of forestland in Nam Đông. The area is located on 3 communes, namely Thuong Quang, Thuong Lô and Huong Son.

As the communes' forestland is overlapping with FMB forestland, the FMB collaborates with WWF for the creation of harvesting groups (Huong Son and Thuong Quang) for monitoring the forest, for training local people about harvesting technologies and for financial support and strengthening the value chain by searching for rattan buyers.

The interviewee explained that before, people used to only harvest rattan, but after the implementation of several projects supported by various organisations, rattan also began to be planted. He observed, however, that while some support was beneficial, some strategies are still not sufficient for people to adopt sustainable harvesting practices. For instance, people used to harvest rattan only in their respective allocated forest in the past, but resources being scarce, they now also harvest rattan in the natural forest.

The interviewee also noticed similar aspects as mentioned in the focus groups. He explained that rattan outputs are low for communes, such as Thuong Quang, for which the distance to reach the forest is far. For him, the main incentive of communities is money, and when the forests are far, people are discouraged and end up leaving the harvesting groups. For instance, some people do not harvest rattan due to low benefits even though they follow the trainings from WWF. In fact, some people wish to participate in training courses but never had the opportunity to do so.

But distance does not only make harvesting and planting difficult, in fact it is also an obstacle for the FMB when monitoring and controlling the use of forestland. In fact, the FMB has significantly improved monitoring strategies (e.g. GIS) over the years thanks to the support of WWF, in order for information to be shared faster. Furthermore, the WWF project supports people with tools to harvest rattan, but most of them are in bad condition after only one year of use, and there is not enough money to buy new ones.

In the long-term, the FMB and WWF are working together with the perspective to implement the FSC certificate on rattan, so that companies and communities can earn more money from this NTFP. This project can be implemented in the natural forest, but it would be very hard to monitor and manage, notably because of insufficient laws and money. In fact, the initial area planned for FSC has already considerably been reduced in order to create a more realistic plan. Furthermore, the FMB says that with FSC, the value of rattan would not increase much (around +2000 VND/kg).

Overall, according to the FMB interviewee, more trainings are needed to keep forests and rattan resources more sustainable, especially for people who newly joined the projects.

Forest Protection Department (FPD)

The Forest Protection Department advises the district for forest management, supports problems in community forests, keeps up with administrative procedures, and checks and monitors the forest.

If the FPD is contacted by a project, it will work directly with villagers to explain the laws for instance. In fact, the interviewee said that the FPD collaborates with many stakeholders. Therefore, he also knew about all projects implemented in Nam Đông, except for the CarBi2 project by WWF of which he did not know the objectives.

The employee noticed that rattan had increased in the region, notably because managers have learned from their past mistakes. In his opinion, collaboration between forest actors is sufficient, data is shared, and stakeholders are approved by communities. However, he did not have any information about rattan density or quality in the forests, but rather on the overall forest's state. He said that the money received by communities to protect rattan is very low (only covers food and drinks), but with the support of projects, people take better care of forests nevertheless. Finally, he said that forests are only seen for their economic benefits.

Middleman

A short interview was also conducted with a middleman. He said that he works with another middleman and always buys from the same people. He does not know much about the market, because he is only an intermediary between the harvesters and another middleman he sells the rattan to. He does not sell it directly to a processing factory. He pays 5'000 VND for one kg and sells it for 5'300 VND to the other middleman. Before, he used to take 4'000 VND for the same quantity. The price is set by weight and not by the length of rattan, and it does not depend on the season. Finally, he does not know where the rattan comes from, but he thinks that it is a good long-term beneficial product, as it provides incomes to the people.

Processing factory

There is one processing factory in Nam Đông. In the interview, the owner has provided interesting data. The company only buys rattan in Nam Đông, as sources are quite diverse. Preliminarily processed rattan products are sold to craft villages, of which 70% are sold to craft villages in Hanoi, and 30% in Thai Binh. Currently, the company both makes products (mainly furniture) and sells rattan. Thanks to the diversity of activities, the company has created an additional source of income for the community. There are 100 employees involved in rattan exploitation in the forest now, and 30 employees work at the company. The business works with WWF in order to create more jobs for the community. However, due to limited capital, it has not been able to expand its scale and create livelihoods for people.

In a discussion with a local researcher, it was revealed that WWF and the company will not collaborate in the future, because of diverging interests, and lacking financial support. For now, the company only buys rattan that was harvested in line with the WWF project. Each community group has a specific purchasing intermediary to ensure the sustainable harvesting of rattan. However, it happens that people sell to other middlemen who are not part of the company's purchasers.

The price of rattan ranges from 6300000 VND/ton to 6500000 VND/ton, depending on the type of rattan. For example, if rattan is not soaked after harvesting, the price will be higher than that of wet rattan, because after soaking, the weight of rattan will increase.

The price of rattan depends on exporting companies and their output. In 2021, the price ranged from 8'100'000 VND/ton to 8'650'000 VND/ton. In 2022, however, the price of rattan has decrease to around 7'600'000 VND/ton. Furthermore, the price of rattan also depends on the distance travelled from the place of collection to the factory. For instance, if the rattan processing company is located in Da Nang, the purchasing price of rattan will be lower than that of the factory located in Nam Đông district. On the other hand, the company mentioned that controlling the price of rattan in the market will make harvesting more sustainable. In fact, the company buys Rattan at about 5700 VND per kilogram. However, if the price increases to more than 5700 VND/kg, people will cut down all the rattan trees in the forest. This leads to the degradation of the rattan ecosystem in the forest, directly losing the source of income for the community. Therefore, the company controlled and kept the purchasing price of Rattan stable through purchasing intermediaries, thereby limiting unsustainable exploitation.

Annex 2: Factors affecting the potential for sustainable NTFP harvest (Ticktin and Shackleton, 2011)

Table 7.2 Factors affecting the potential for sustainable NTFP harvest^a

Category	Attributes	Potential for sustainable harvest		
		High	Medium	Low
Ecological	Plant part harvested	Fruit, seeds, short-lived leaves, dead wood	Exudates, phloem sap, long-lived leaves	Whole plants, roots, bulbs, bark, apical meristems
	Distribution and habitat specificity	Widespread, broad; high life history plasticity	→	Restricted, highly specific; low life history plasticity
	Population size and growth rates	Large populations, fast growth	→	Small populations, slow growth
	Reproduction	High rates of sexual and/or vegetative reproduction; continuous recruitment	→	Monocarpic or irregular and periodic sexual reproduction only; low recruitment
	Pollination, dispersal	Abiotic and/or generalist relationships	→	Specialist relationships
	Resilience to natural disturbance	High (e.g., high resprouting, fire tolerance, seedbank and/or good recruitment after disturbance)	→	Low
	Ecological integrity of landscape	Presence of necessary pollinators, dispersers, or other organisms that foster persistence of NTFP	→	Low abundance of lack of other organisms on which NTFP depend
Socio-political	NTFP uses	Single or non-competing uses; harvest of selected size-classes only	→	Multiple conflictive uses and harvest of different or all size classes
	NTFP management	Highly tended wild or maintained populations; farmed or domesticated; secure tenure	→	Uncontrolled collection from wild; open-access resource
	Governance systems	Recognised, respected, implemented	→	Open access, competing claims on resources by locals and outsiders
	Land use context	No major competing land-uses with NTFP harvest	→	Many competing land uses (e.g., logging, livestock grazing, fire, agriculture...)
Economic	Seasonality of harvest	Short season with high abundance	→	Available all year round
	Commercialisation	Local markets, low to medium value	→	High value, external markets
	Substitutability	Many species can provide the same or similar product	→	Only one or few species offer the same product

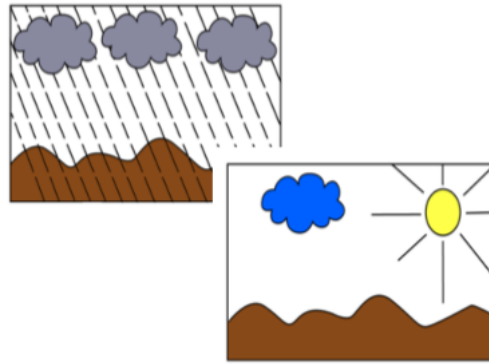
^aAdapted and modified from Cunningham (2001) and Peters (1994)

Recognition time for rattan harvesting:

- ✓ Black thorn, fallen leaf.
- ✓ Leaves in the root is dried and fallen.
- ✓ Cane is changed color from light yellow to dark green.
- ✓ Cane has both flower and fruit.
- ✓ Length over 5m.

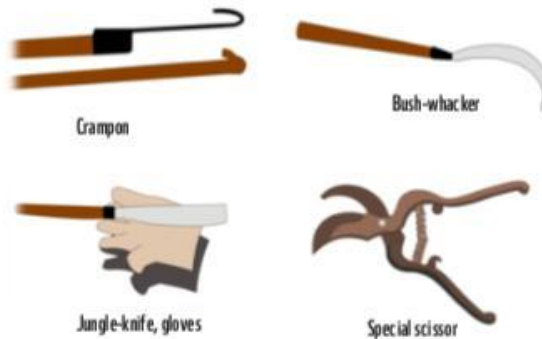
Best season for harvesting:

- ✓ The best season for harvesting is dry for easy drying, avoid mould, wet and insects.
- ✓ Easy for transportation.
- ✓ No effect to the rattan growing.



Popular harvesting tools:

- ✓ Suitable harvesting rattan tools are bush-whacker, special scissor, crampon.

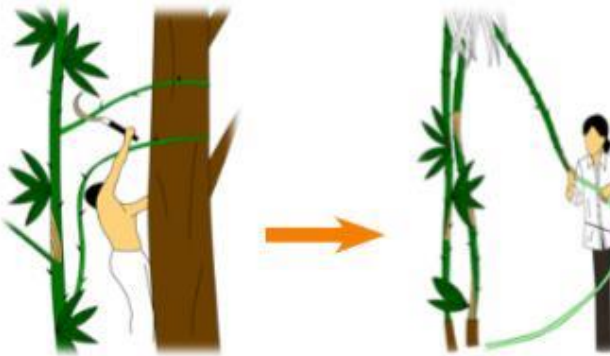


Harvesting techniques:

- ✓ **Step 1:** Identify the right species to avoid the wrong cutting, harvested areas to areas.
- ✓ **Step 2:** Cut the mature cane above root 10 cm and the nutrient after that support to young cane. Avoid clashing to hurt the young cane and shoot. No digging to the root.



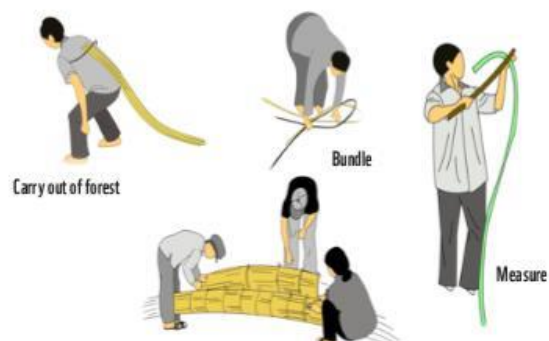
Harvesting techniques:



- ✓ **STEP 3:**
 - Take the cane out by pulling from the root.
 - Remove the outer layer from the root and pull after that.
 - Remove the handle of rattan cane before pulling

Harvesting techniques:

- ✓ **STEP 4:** Classify canes , bundle of cane.





Harvesting techniques:

- ✓ **STEP 5.1:** Pile up the rattan waste to the bush for fertilizing to avoid the fire.

Harvesting techniques:

- ✓ **STEP 5.2:** Chopping the rattan leaf for composting

