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TECHNICAL REPORT

LIVELIHOOD NEED ASSESSMENT IN QUANG NAM AND THUA THIEN HUE PROVINCE

Submitted by

Centre for Rural Development in Central Vietnam (CRD)

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ASSESSMENT TEAM

Centre for Rural Development in Central Viet Nam (CRD)

Dr. Truong Quang Hoang
Prof. Dr. Le Duc Ngoan
Assoc Prof. Dr. Le Thi Hoa Sen
Hoang Thanh Hung, MSc
Mr. Vo Chi Tien
Nguyen Thanh Hien, MSc.
Nguyen Truong Thi, MSc.
Assoc Prof. Dr. Nguyen Van Loi

Centre for Sustainable Rural Development (SRD)

Ms. Tran Thi Thanh Toan
Ms. Nguyen Thi Hoa

CONTRIBUTING PARTNER

World Agroforestry Centre (ICRAF)

Dr. Delia C. Catacutan
Mr. Do Trong Hoan
Dr. Rachmat Mulia

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BMNP	Bach Ma National Park
CarBi	Annamites Carbon Sinks and Biodiversity project
CPC	Commune's People Committee
CRD	Centre for Rural Development in Central Vietnam
DARD	Department of Agriculture and Rural Development
DFID	Department for International Development
DONRE	Department of Natural Resource and Environment
DPI	Department of Planning and Investment
ENR	Elephant Natural Reserve
FGD	Focus Group Discussion
FMB	Forest Management Board
FPD	Forest Protection Department
FSC	Forest Stewardship Council
GO	Gross Output
HH	Household
HS	Effectiveness of capital used
IC	Intermediate Consumption
KII	Key informant interview
ICRAF	World Agroforestry Centre
MVC	Market-value chain
NLNR	Ngoc Linh Natural Reserve
NP	National Park
NPV	Net Present Value
NR	Nature Reserve
NTFPs	Non-timber forest products
PAs	Protected Areas
PDNR	Phong Dien Natural Reserve
PFES	Payments for Forest Environmental Services
PRA	Participatory Rural Appraisal
PPC	Province People Committee
QN	Quang Nam province
RFP	Request for proposal
SLNR	Sao La Natural Reserve
SMEs	Small and medium-sized enterprises
SPSS	Statistical Package for the Social Sciences
SRD	Centre for Sustainable Rural Development
STNR	Song Thanh Natural Reserve
TTH	Thua Thien Hue province
SD	Standard Deviation
SWOT	Strength, Weakness, Opportunity, and Threat
USAID	United States Agency for International Development
USD	United States Dollar
VA	Value Added
VND	Vietnamese Dong
WWF	World Wildlife Fund

Units used:

ha	hectare
m^2	square meter

EXECUTIVE SUMMARY

The Annamites that stretch from east of the Mekong river, from central Laos to southern Viet Nam and to eastern Cambodia comprised the mountainous range of the Indochina region and is considered one of the most biodiverse place in the world with thousands of flora and fauna. The Annamites is also home to human population, primarily ethnic minority groups whose livelihoods partially depend on forest resources. The Central Annamites is a part of greater Annamites, bordering southern Laos and central Viet Nam. Recognizing its importance to local livelihoods as well as to natural biodiversity, the region has been divided into protected areas of cultural and historical sites, natural reserves and national parks. However, despite their protected status, the reserves continue to face challenges and threats due to the livelihood activities of communities living in and around the buffer zones.

A Consortium led by the Centre for Rural Development in Central Viet Nam (CRD) with its key partner, the Centre for Sustainable Rural Development (SRD) and contributing partner, the World Agroforestry Centre (ICRAF) was commisioned by the United States Agency for International Development's (USAID) Green Annamites Project in Viet Nam to implement a livelihoods-needs assessment and develop an action plan to improve the livelihoods of people living in the buffer zones of protected areas and nature reserves of Quang Nam (QN) and Thua Thien Hue (TTH) provinces where the main Central Annamites nature reserves are located. Part of this assessment, a household (HH) survey was conducted to provide baseline information for the subsequent activities of the Green Annamites project and to inform the livelihood-needs assessment.

The assessment commenced in June 2017 and continued for three months, covering six nature reserves and protected areas, namely Phong Dien Nature Reserve (PDNR), Sao La Nature Reserve (SLNR), Back Ma National Park (BMNP), Song Thanh Nature Reserve (STNR), Ngoc Linh Nature Reserve (NLNR) and Elephant Nature Reserve (ENR). The assessment focused on eleven districts within the aforementioned nature reserves, which are located along the biodiversity conservation corridor and protected areas of QN and TTH provinces. It involved 795 HHs from 25 villages within twelve selected communes across the six nature reserves. Assessment activities include literature review and secondary data gathering aimed at obtaining general information about the reserves and the selected communes, field surveys, key informant interviews and expert consultations. Finally, the results of the HH survey and livelihoods-needs assessment were presented to stakeholders and government authorities in QN and TTH provinces, to elicit feedback and suggestions to improve the recommendations of the assessment.

The selected communes had high forest cover, generally above 80% of the commune areas. This area is home to different ethnic minority groups such as Van Kieu, Co Tu, Pa Co, Ta Oi, La Trieng, De Trieng, Ca Dong, Muong, Xe Dang and Mo Nong. The Kinh people is the dominant ethnic group in most of the communes. Based on the official statistical data for each commune, most of the communes had high poverty rate with poor HHs exceeding 50% of the population. Majority of the sample HH's educational level is low, with school attendance up to level II (grade 6-10) only. The small family size and low labor availability may limit the ability of HHs to improve or expand their livelihoods almost in all the reserves. Hence any intervention must address these limiting factors. For instance, recommended technologies or livelihood options must not be labor-intensive.

The average household landholding in the communes is between 1.5 and 3 ha; non-poor HHs usually have bigger landholding compared to poor or near-poor HHs. In classifying the land into either

agriculture or forestry lands, we found that in all communes the HH's agricultural land were higher than their forestry land. This strongly indicate conversion of allocated or designated forest production land into agriculture land for an income. Clearly, local knowledge on land classification and status differs with the official land designation. Local people classify land types based on land use than its official designation. This needs to consider for planning with farmers to invest on sustainable agricultural production, in order to prevent further conversion or expansion of agricultural lands into the forest. Beside the relatively large portion of agricultural land, about 39% of the sampled HHs claimed that they experienced food shortage in the last three years, with a duration of about 55 days (almost two months) per year.

In agricultural lands, usually HHs cultivate annual crops such as paddy and upland rice, maize and cassava, while predominantly acacia is planted in forest production lands. Four-year rotation of mono-culture acacia is commonly planted in forestry lands with inter-crops in the first year. Only few HHs have diversified their forestry activities by planting rubber or cinnamon. Currently, the market for acacia pulp is stable, although interviews with local stakeholders revealed concerns on the massive land conversion into acacia plantation, which might trigger market saturation. Unfortunately, in terms of land use rights, many HHs do not possess land certificates. This ambivalent land tenure situation will certainly influence HH decisions in terms of their investments and practices, and therefore should be addressed to stimulate local people's interest, cooperation and support with any effort to conserve the natural resources.

The average annual income of surveyed HHs in the reserves ranges between 1,182 and 1,758 USD, with non-poor HHs often having much higher incomes than the poor and near-poor HHs. Non-farm and crop production are income sources of 67 to 100% households. Although living in or near to forests, the portion of household who earn income from forest plantation, NTFP collection and PFES is often minimal. A significant income sources came from non-farm and off-farm jobs such as skilled jobs, trading, business, employment, remittance or pension. While this is a pleasant surprise, as one would expect buffer zone communities to be highly forest dependent, follow up assessment is recommended to ensure that non-farm livelihoods such as business and trading are not covertly linked to forest resource extraction. This is pleasantly surprising as one would expect that buffer zone communities are forest-dependent. Nevertheless, we recommend to carefully scrutinize this aspect as the nature of trading and business employed by local people may be linked to, or depending on forest resources. For instance, majority of rattan and medicinal plants were exploited from natural forests.

We investigated HH access to different public services such as education and transportation. In general, the respondents claimed they had relatively good access to some of these services including education, although their educational level is generally low. Three services were claimed to be limited namely vocational training, water supply and environment and sanitation services. Related to the latter two, majority of the surveyed HHs across the twelve communes had no access to water supply, environment and sanitation services. In most of the selected communes, people used self-running water systems that collect water from streams to supply water for living and agricultural production. These are the basic human needs, particularly important for children's growth and development, hence greater attention should be paid to address these issues.

We also explored local knowledge on current threats to the sustainability of the reserves and protected areas. Amongst many threats, most of the surveyed HHs identified illegal logging, wildlife hunting and forest fire as the main threats. Especially more than 90% of the surveyed HHs in all communes identified illegal logging as the most critical threat to the reserves. Illegal logging was done mostly by local people in small-scale for trade and local use, including species of Hopea pierrei,

Sindora tonkinensis. Hunting wild animals and trapping were carried out by outsiders and local people in small-scale for consumption and trading, focusing on high value animals such as wild boar, dear, monkey, serow, bear, samba etc. Therefore, any effort aiming to maintain the integrity of the nature in protected areas in the Central Annamites must be exerted on eradicating illegal logging and wildlife hunting, as well as curtailing both human-induced and nature-driven forest fire.

The selected communes consist of different ethnic groups in Central Viet Nam. The role of the gende in family decision-making vary among them. For instance, in Van Kieu, Pa Hy and Kinh groups in PDNR, women are more involved in family decision making, not only managing the family's day-to day finances (which is a common activity generally handled by women in Viet Nam), but also in other roles such as purchasing or selling family assets. In these three ethnic groups, women have more authority to make decisions independently from other family members whereas in other ethnic groups, such as the Pa Co and Co Tu, this role is often jointly performed. The same ethnic group residing in different reserves may also have different gender roles and dynamics in the family. For example, in the Kinh group in STNR, the role of women is paramount only in terms of managing the family's daily spending and children's education. Generally in all ethnic groups women have more authority in making decisions related to their family's daily finances, while major decisions such as investments or buying and selling goods and assets are often jointly made by the husband and wife.

Local stakeholders comprising local authorities and residents in the selected communes of QN province suggested a number of livelihood models have a potential for upscaling and developing into business models. Based on local preference, five models were prioritized as follows:
(1) planting medicinal plants as a forest understorey;
(2) plantation of FSC certified timber to supply international markets;
(3) community based tourism in connection with production of local specialties (home garden products such as local chicken, pomelo and orange);
(4) planting rattan in allocated forest lands; and
(5) planting local pomelo and oranges with emphasis on developing their market-value chain.

The order of the first four livelihood options were different between QN and TTH provinces. In the latter, the order was
(1) timber plantation;
(2) development of local pomelo and orange;
(3) community based tourism;
(4) medicinal plants; and
(5) local beef production.

Area-specific livelihood options such as beef production in A Luoi district was suggested by provincial officials in TTH.

In addition to the local consultations, we sought expert opinion in relation to livelihood options in QN and TTH province. They identified five livelihood models similar to those identified by local stakeholders in QN province in the following order:
(1) planting medicinal plants as forest understorey;
(2) planting rattan in allocated forest lands;
(3) development of local pomelo and orange;
(4) community-based tourism; and
(5) timber plantation.

The market-value chain (MVC) analysis with *Codonopsis pilosula* and *Homelomena occulata* for QN and TTH province shows that both products likely to have a promising future market. For *Codonopsis*, the current supply is mostly from natural resources while the demand is quite high. The main challenge of current value-chain is unstable production and fragmented farm locations that incur high transaction cost. In relation to *Homalomena*, the presence of new company in TTH that requires a substantial supply of this herb expects to create a stable market. Moreover, this herb is cultivated as forest understorey, so economic benefit can be derived while preserving or restoring the forest as well. For both products, we recommend that group of interested farmers should be created and encouraged to increase production in order to ensure a stable supply.

The raw rattan (*Daemonorops poilanei*) market in QN and TTH provinces are currently stable and llikely to grow in the future. HoweverIn terms of supply, it can not meet the market demand since the local people only collect rattan from natural forests. For instance, some farmers in A Roang commune, A Luoi district, are cultivating rattan in allocated forest lands. However, the plots are not productive yet. In both provinces it confirms that price is stable and farmers know the market price well. The two main challenges of current raw rattan supply from both provinces are
(1) the supply is not stable and insufficient to balance market demand, and
(2) the supply depend heavily on natural forest exploitation.
If carefully planned and properly managed, the development of planted rattan model in the provinces will help to address the challenges, providing more stable supply to the market and most importantly, reduce pressure on the natural forests.

In terms of economic benefits, the annual income that can be derived from long rotation (8 years) of acacia plantation is higher than the income from the current short rotation (4 years). However, income gap will be the main challenge since income from cassava as inter-crop can be derived at the first year only. Therefore, farmers will not have an income for the next 7 years. It is unlikely that farmers can wait 7 years to have a income from the system, especially poor farmers or farmers that largely depend on forest plantation as the main source of family income, unless their income is backed up from other sources such as other agricultural plots or off-/non-farm jobs. Therefore, we identified the need to develop alternative timber plantation models, that can overcome the income gap and provide quicker return. This can be achieved by keeping more space in acacia plantain, that allow integration of inter-crops for several years, or by introducing other annual/perennial plants into the system that can be a source of income. Another option to overcome the income gap is using the short rotation type where farmers are used to manage. A gradual transition model where the system starts with high tree density and ends up as a big timber plantation through thinning will be appropriate and easier to adopt by the smallholder farmers.

In QN, majority of smallholder pomelo farmers are not interacting with end-consumers and they have little control over input cost or product price. Due to the relatively long value-chain, it involves a number of middle-men that induces a high transaction cost. However, most farmers prefer this than a shorter value-chain because their production volume is generally small and farm locations are fragmented. Farmer's poor access to market and market information as well as lack of opportunity to enter new markets is identified as the main challenges of the current pomelo value-chain. The situation is opposite in orange value-chain in Nam Dong district, TTH province. Farmers receive a relatively high proportion of market price thanks to the relatively short value-chain. Seasonal price variability is not significant and farmers are well-informed on the market price. The local knowledge indicates that orange plantation area can likely be expanded by at least 50%, without inducing a risk of market saturation, although a careful examination needed to this claim to define the opportunity for market expansion. For both pomelo in QN and orange in TTH, developing groups of farmers can

be encouraged to open new plantation and allow information exchange. This will ensure more stable production and better access to the market.

The beef production in A Luoi district has a stable but limited market. Smallholder farmers can only have a small proportion of the market price, while the larger proportion goes to the actors at higher level. The potential of expanding local production is very limited. Farmers are confident that they can double the production level without bringing a risk to a market saturation, but in other hands traders and processors claim that they can absorb maximum of 5% increase only. Therefore, any intervention to improve the market should focus on exploring market expanding opportunities and also in branding which will increase the product price.

The local beef production can be associated with local eco-tourism in which the cattle raising will becomes one of the main attractions. Also the beef supply for the catering services should be expanded. This will help farmers to derive more economic benefit from local cattle raising.
Amongst the five livelihood models, selected based on ranking analysis, we recommend three models for piloting namely medicinal plant, eco-tourism and rattan in both QN and TTH provinces. These recommendations were made after considering the MVC and profitability analysis. For other livelihood models such as timber plantation, we recommend that first a small-scale demonstration plot should be established with a group of carefully selected farmers to ensure their committment and success. For pomelo and orange, we consider that their markets are relatively well-developed and the production in the provinces comes from smallholder plantations (compared to rattan and medicinal plants) and a large portion of supply comes from natural forests. Furthermore promoting eco-tourism can associate with the promotion of local pomelo/orange and local beef production as well.

The pilot farms for medicinal plants and rattan in QN and TTH provinces include both HH and community forest lands. For example, the pilot farm for *Homalomena* plant in TTH covers 1.5 ha of community forest land, although the farm is managed by one HH only. Currently, the HH only extracts the herb from natural forests since the planted *Homalomena* are not producing yet. In QN, the pilot HH that allocates land for *Codonopsis* has 10ha land area with 1ha planted. The HH collects Codonopsis from natural forests as well, as much as 50 kg per year, while from cultivation 70 kg per year. For rattan, the pilot farm in QN province is managed by a HH that allocates 0.5 ha of his land for cultivation. Currently the plots are not producing yet and the HH mainly collects rattan from natural forests. In TTH province, the pilot farm for rattan involves one HH that allocates 2ha of his land for cultivation. Similar to QN, currently the plots are not producing yet, so the HH mainly collects rattan from natural forests. The pilot farmers perceive some factors such as lack of technical capacity, low quality planting materials and unstable market as constraints to the development of medicinal plants and rattan cultivation. Examples of main interventions that can be implemented are the development of farmer's groups, assisting in enhancing the capacity of local extension service, assisting in establishing local nursery and exploring new market opportunities to ensure a more stable market.

The pilot ecotourism models are located in A Loui district, TTH province for the community-based ecotourism and in Nong Son district, QN province for the household-based ecotourism. The first was established in 2016, but currently has some challenges for its business development including limited number of tourist attractions and low capacity of the local staff that hinder the expantion of the business. However, in terms of number of visitors, the ecotourism model currently receives around 13,000-19,000 people per year, which is relatively high and this might indicate that the local people and surrounding areas/cities welcome this kind of business model. In QN, the pilot household-based ecotourism model involves one HH that cultivates local (Tru) pomelo trees in 0.75

ha home garden. The garden receives up to 100 visitors per day. This model is likely a good livelihood option for other HHs in the districts or other regions as well, provided some challenges such as lack of quality planting materials, serious impact from extreme weather events and lack of knowledge in marketing, as the HH mentioned during interviews.

Linking the stakeholder preferred livelihood models with the HH socio-economic conditions of the sampled communes, planting medicinal plants and rattan in allocated forest lands is seemingly appropriate since the contribution of both NTFPs to HH income is currently low, despite the wide expanse of forest land in the buffer zone communes. It appears that sustainable production of medicinal plant and rattan is an untapped livelihood option in the vast forest lands of the buffer zone. Developing timber plantation, especially with suitable tree species is also in line with the provincial plans of QN and TTH as well as the national Government's target to increase Viet Nam's timber supply to both domestic and international timber markets. The income contribution from acacia dominates forest plantation and is currently low due to mixed factors such as lower productivity, high transportation costs and smaller farm sizes. However, these can be overcomed with sustainable diversification, good plantation management and nuanced investment planning.

Furthermore, local beef production identified as a scalable livelihood option in TTH province. It appears promising since the current income contribution from animal husbandry is reportedly low. The contribution from this sector, along with the development of community-based eco-tourism can promote the supply of local specialities including the organic meat. The development of local eco-tourism can also boost income generation in the non-farm sector as it creates opportunities for other related services, that can be provided by local residents. However, the scale of production and carrying capacity must be carefully considered, in line with the fragile natural conditions of the buffer zones and low *in-situ* labor supply. Sustainable and natural feed livestock system should be pursued with naturally growing fodder grasses for high-quality organic meat and "cut and carry" feeding techniques to prevent free grazing, which can damage the natural environment.

I. INTRODUCTION

1.1. OVERVIEW

The USAID Green Annamites Project aims at supporting climate-smart, low-emission and sustainable development pathway that protect people, landscape and biodiversity in the Central Annamites of Viet Nam, particularly in the protected areas and nature reserves of two provinces namely Quang Nam (QN) and Thua Thien Hue (TTH). The goal of the Project are threefolds: (i) increased application of low-emission land use; (ii) biodiversity conservation strengthened; and (iii) increased resilience for vulnerable communities.

The Project supports interventions that improve livelihoods of communities living in and around the protected areas through market-based value chain approach and partnerships with private sectors. This isupport is made with the assumption that with increased livelihood, local people living in the forest buffer-zones would reduce the pressure on protected areas and forests, thereby decreasing threats to biodiversity, deforestation and forest degradation. The project also aims at promoting a landscape approach to biodiversity conservation and creating alternative livelihoods for local people and enhancing the capacity of key stakeholders such as government authorities, civil society and the private sector.

Under RFP No. 17-AF-RFP-001, the livelihoods-needs assessment specifically aims to undertake:

1) a socio-economic household survey that will provide baseline data to the Green Annamites project;
2) assessment of the livelihood conditions of the targeted communities in QN and TTH, with a gender sensitive approach, particularly the livelihoods of forest-dependent people;
3) development of at least five viable low-emission livelihoods models adapted to the biophysical and socio-economic conditions of the target areas. The proposed models should be accompanied by market-value chain analysis;
4) realistic and concrete recommendations on the implementation of proposed models, including but not limited to recommendation on social arrangement (community groups, cooperatives, individual initiatives or others), measures to strengthen biodiversity conservation, scale of implementation (community, district, provincial), financial sources and access to markets; and
5) assessment on the willingness to the implementation of the proposed models amongst the target communities and government authorities (DARD, DONRE, agriculture extension services, etc).

A consortium led by the Centre for Rural Development in Central Viet Nam (CRD) and its key partner, the Centre for Sustainable Rural Development (SRD) and contributing partner, the World Agroforestry Centre (ICRAF) was tasked to implement the livelihood needs assessment and develop an action plan to improve livelihoods in the project target areas, particularly on the buffer zones of protected areas and nature reserves in QN and TTH province. After two weeks of preparation, the assessment team completed preparatory activities and carried out field activities. The assessment team submitted the inception report, the first deliverable/outcome required before the field work to the Green Annamites Project for review and approval. It reports the preliminary results of the desk review, technical approaches and detailed design of data collection methods, as well as work plan to implement the socio-economic household survey and livelihoods-need assessment. The list of project team members is in Annex 1.

1.2. SCOPE OF THE ASSESSMENT

The livelihood needs assessment was conducted in eleven districts along the biodiversity conservation corridor and protected areas of QN and TTH provinces, including six reserves namely Phong Dien Nature Reserve (PDNR), Sao La Nature Reserve (SLNR), Back Ma National Park (BMNP), Song Thanh Nature Reserve (STNR), Ngoc Linh Nature Reserve (NLNR) and Elephant Nature Reserve (ENR) (Fig. 1). The sampled communes for the socio-economic household (HH) survey and livelihoods assessment were selected based on cluster sampling method, consisting two samples per nature reserve and protected area, making up a total of twelve sample communes.

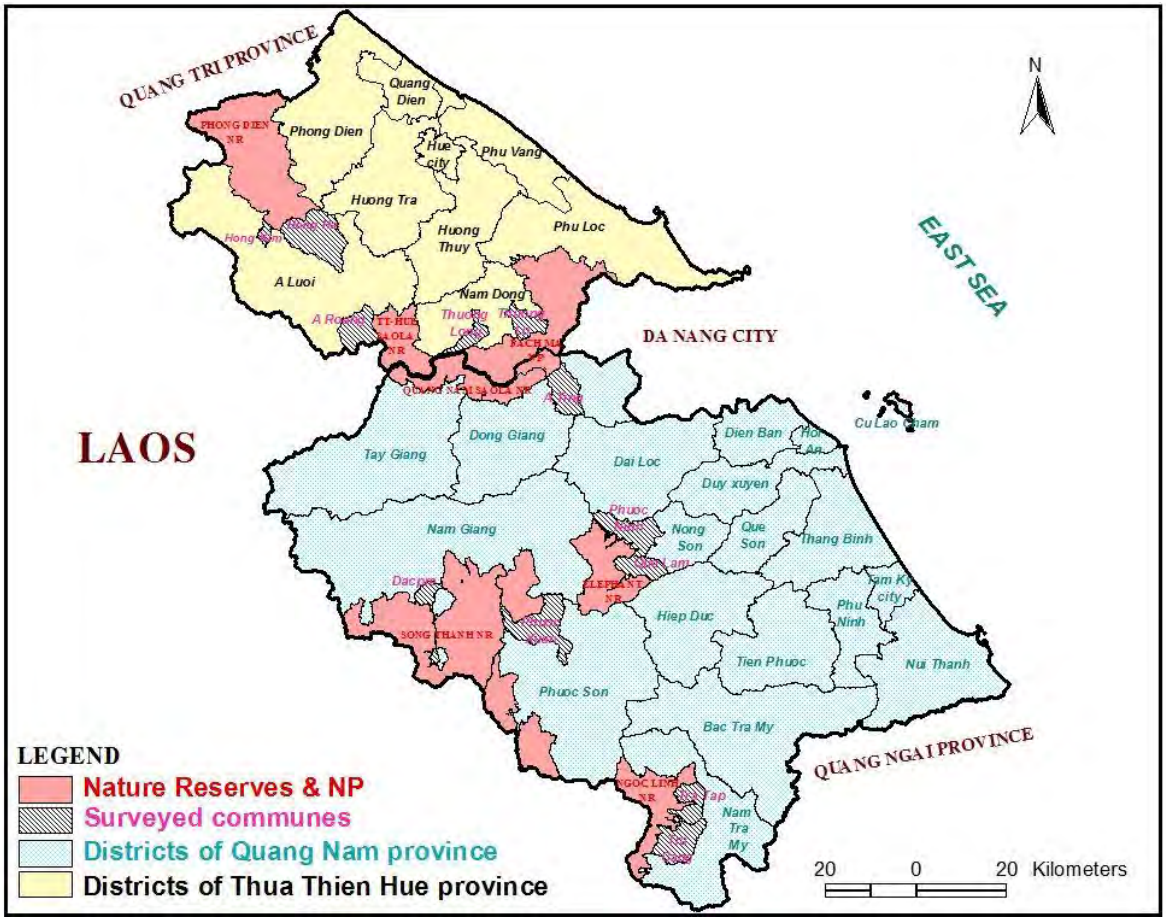


Figure 1. Location of six nature reserves and assessment sites

II. AIMS AND OBJECTIVES

The aim of the livelihood needs assessment is to conduct a HH socio-economic survey to provide baseline data for the USAID Green Annamites Project and to identify environmentally responsible, socially acceptable and economically viable livelihood models for QN and TTH provinces. Specifically the objectives of the livelihood need assessment are twofolds:

- Conduct a baseline study of HH socio-economic conditions in the twelve sampled communes; and
- Analyze the collected information, compile a database, propose alternative livelihood models for the HHs of buffer zone communes of six nature reserves and protected areas in QN and TTH provinces.

III. METHODOLOGY AND PROCESS OF THE HOUSEHOLD SURVEY

3.1. ASSESSMENT DESIGN

3.1.1. CONCEPTUAL FRAMEWORK

The project team adopted the DFID sustainable livelihoods approach and its framework (Fig. 2) to conceptualize the assessment of current livelihood conditions and to formulate livelihood strategies

that help local people in the targeted provinces and to achieve their livelihood goals and expected outcomes.

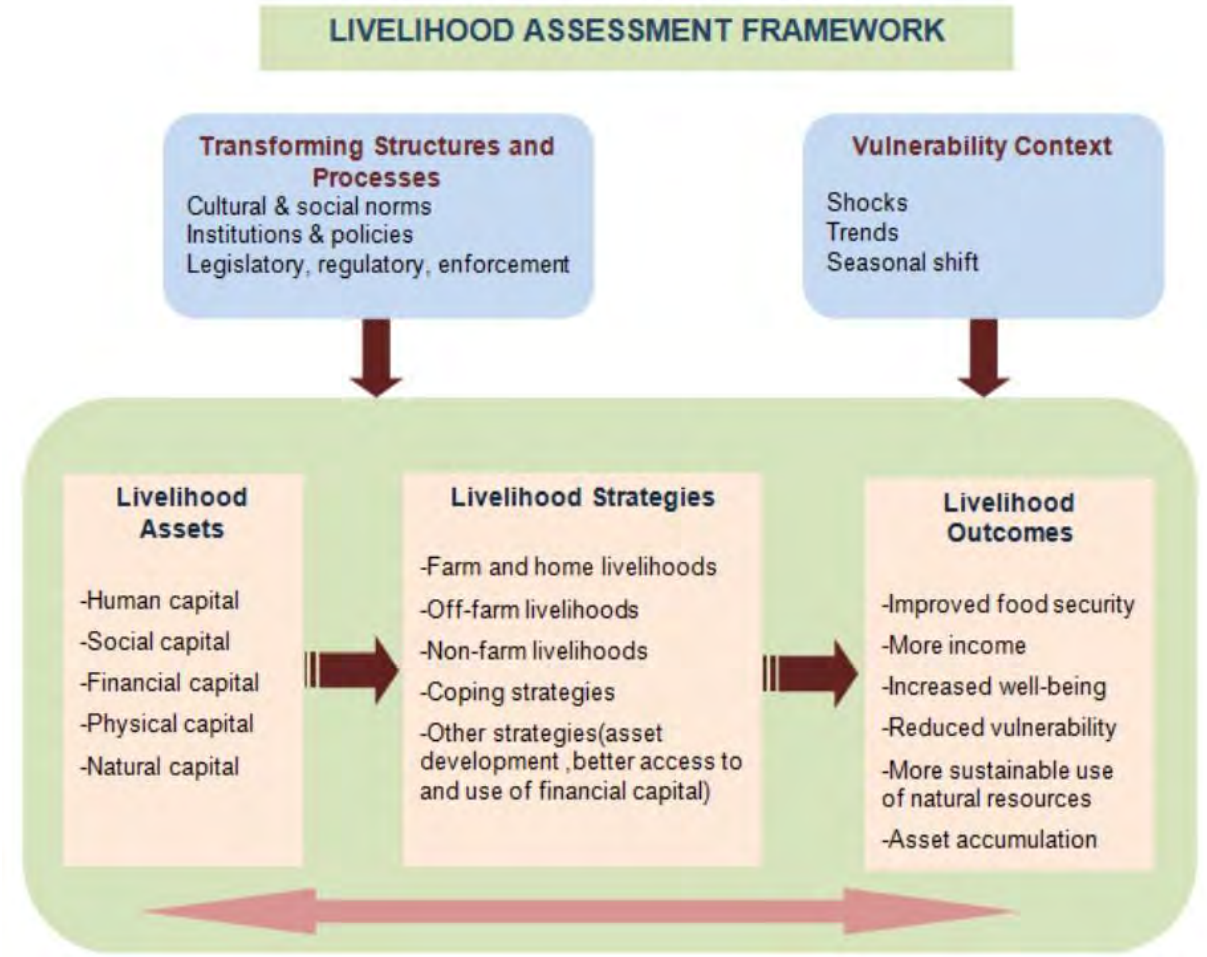


Figure 2. Livelihood Assessment Framework

3.1.2. ASSESSMENT QUESTIONS

The main assessment questions were:

1) What are the current demographic, socio-economic, living standards of local HHs in the target communities?

This question will be answered by demographic information of the surveyed HHs and their socio-economic profile (e.g. sources of income and expenditure, living facilities), and e.g. access to public services.

2) How diverse are the current livelihoods activities in the target communities and what livelihood options that they prefer and have willingness to implement?

The related information in the survey include livelihood diversity and specialization, trend of livelihood shifting, livelihood options preferred by the local households and the target communities' willingness to shift and/or to implement a new livelihood.

3) What are the potential livelihood capitals (of local HHs and community) currently available in target communities that can be used by local people to improve their livelihood outcomes?

This relates to

i) Human capital: amount and quality of available labour, educational level of HH members, number of trained members, access to education and training, administration services, knowledge and skills, capacity to cope with shocks, trends, seasonality, and participation in knowledge networks;

ii) Social capital: social network and connectivity, membership and/or employees of informal or formalized groups, mass organizations, and participation in the community activities;

iii) Financial capital consists of: 1) available stocks: saving, access to credit loans from formal and informal financial service providers and NGOs; 2) regular inflows of cash: remittance, pension, allowance, income from interest, rental income; Physical capital: secure shelter and building, means of transportation, tools and equipment for production, communication, adequate water supply and sanitation, energy such as power, renewable energy; Nature capital: forest land, agriculture land, production land, tree and forest products, water and aquatic resources, and environmental services.

3.1.3. TECHNICAL APPROACHES

3.1.3.1. Collection of Data and information

The HH survey and livelihood needs assessment employed both quantitative and qualitative approaches. The quantitative approach used for both primary and secondary data. The socio-economic HH survey collected primary data for the baseline database, as well as for the analysis of current livelihood conditions and selection of livelihood models. Secondary data were gathered from the statistical data of the local authorities at provincial, district and commune levels. In addition to that, the primary and secondary quantitative data are compiled into a database for project planning, performance targeting, performance monitoring and evaluation.

Two participatory approaches, namely focus group discussion (FGD) and interview with key informants were applied to gather qualitative data/information. Along with these methods, case study and market-based value chain analysis were employed to collect requisite data/information to identify better livelihood and livelihood opportunities for local people.

3.1.3.2. Gender sensitivity and inclusion

Gender sensitivity and related issues were highlighted in all stages of the assessment, from planning to analysis. This was considered in the planning stage, secondary data collection, HH survey sampling, design of HH survey questionnaire and gender-balanced sampling of participants for FGD and key informant interviews.

During field data collection, gender sensitivity and inclusion were emphasized in each of the methods used. A 50-50 male and female ratio was applied to ensure gender balance. Therefore, women and men had equal opportunity to participate in the interviews. In addition to that, gender sensitivity and inclusion were also emphasized in the selection of participants for the farmers' FGD, with 50-50 male and female ratio. For FGD with local authorities and mass organizations, or private small and medium-size entreprises, the assigned experts that facilitated the discussion encouraged female participants to fully engage in the discussion, provide information and share experiences. This ensured that their voice is heard and their ideas are integrated in the conclusion and recomendations. Gender sensitivity was taken into account during data processing and analysis also. The quantitative findings were disaggregated by gender and presented in a gender-specific context. Finally, when identifying and developing the livelihood models, the project team particularly paid attention to gender-specific needs and proposed action plans with gender considerations.

3.1.3.3. Database design

To process and analyze quantitative data primarily collected for the assessment of HH socio-economic and living conditions, the project team firstly stored the data in Statistical Package for the Social Sciences (SPSS) software. The SPSS database was designed according to the content structure of the HH questionnaire and checklist. The questionnaire was structured into eight sections with 84 key questions and pre-coded responses. A checklist method was employed as an additional technique to collect more details on the diversity of livelihood and income sources related to forestry, agriculture and aquaculture/fishing. The pre-coding of questionnaire and checklist made the

data entry, processing and database design convenient. SPSS database was designed not only to facilitate convenient data entry, but also to merge the data easily in another database, for processing and analysis. The SPSS database was designed soon after the HH data collection has been finalized and was available for technical training and data entry, as scheduled. In terms of data management and analysis for project monitoring and evaluation, we used the SPSS database as it allowed updating the data and comparative analysis of data, as well as comparing the baseline and end-line data.

For the purpose of data management, a database in *Microsoft Access* (MS Access) was designed with data import from the SPSS database. MS Access is useful for this purpose and the data can be easily exported to other softwares e.g. MS Excel. The information are stored in separate tables that correspond to each section in the survey questionnaire (e.g. HH demographic profile, income and assets, livelihood sources etc.) and the tables are linked with key variables, for example HH database ID. This ID is included in all tables, to allow data merging or integration from different tables in an accurate and convenient manner. The database format and design in MS Access is a user-friendly and attractive interface and can be easily modified to accomodate new features or items.

3.2. DATA COLLECTION METHODS

3.2.1. DESK REVIEW

Desk review of literature and related documents was conducted from planning, assessment and reporting. The project team reviewed relevant policies and documents available during the preparation stage. These secondary sources included related laws, circulars, decrees, national and provincial policies and programs on poverty reduction, new rural development, biodiversity conservation and sustainable livelihood development, documents and studies of completed and on-going projects on biodiversity conservation and livelihood improvement and provincial socio-economic development plans. The preliminary findings from the desk review were used to conceptualize the assessment framework and design the data collection tools.

3.2.2. SECONDARY DATA COLLECTION

Collection of secondary data was also an important activity for designing, assessment planning and identifying effective livelihood models. During the preparation stage, the project team has collected secondary data on population, poverty rate, forest area, forest cover of 58 communes located in the buffer zones of nature reserves and protected areas in the two targeted provinces. These data was used for the selection of sample communes and to estimate HH survey sample size for each of the sample communes. More secondary data was collected from relevant agencies at provincial/district/commune levels and the private sector during and after the field work, to supplement the primary data collected from surveys and FGDs.

3.2.3. SOCIO-ECONOMIC HOUSEHOLD SURVEY

The main purpose of the survey was to characterize local HHs' socio-economic and livelihood conditions and inform the identification and development of livelihood options/models. The HH data also served as baseline for designing project interventions, performance monitoring and evaluation. The survey was carried out using a non-standardized questionnaire and checklist and administered by trained enumerators. Annex 2 and 3 are the HH questionnaire and checklist.

Sample size and sampling methods

Using the Slovin sampling formula, the project team determined the appropriate sample size which allows a valid inference to the total population in the commune. The multiple-stage sampling method consisted of cluster sampling, stratified sampling and systematic random sampling. While cluster and stratified sampling methods were used to select study communes, systematic random sampling was employed to select sampled HHs.

The cluster sampling was first used to select communes from the districts where the nature reserves and protected areas are located within the territory of QN and TTH provinces. The review of secondary data indicated that five nature reserves, namely Saola, Song Thanh, Ngoc Linh, Elephant, Phong Dien nature reserves and Bach Ma National Park are mainly located within the territory of ten districts, not in eleven districts as mentioned in the RFP. There are 58 communes in these districts, lives in close proximity to the aforementioned nature reserves and protected area. Stratified sampling was then used to sample twelve communes from the 58 communes based on five selection criteria:

1) high poverty rate;
2) low forest cover;
3) high population of ethnic minority people;
4) large forest area covered by the nature reserve;
5) high level of vulnerability;

This criterion was measured in a defined assessment scale of 100 points as follows:
1) high poverty rate=30 points;
2) low forest cover=10 points;
3) high rate of ethnic minority people=10 points;
4) large forest area belongs to nature reserve=30 points; and
5) high level of vulnerability=20 points.

The availability of secondary data for the selection criteria was very limited; hence we used other proxy information. For instance, to determine the level of vulnerability and forest dependency, we combined information on poverty rate and proportion of the ethnic minority people.

The project team developed a criterion to estimate the score for each commune. Communes with the highest score were selected among the communes in close proximity to each nature reserve or protected area. This made up a total of twelve sampled communes (Table 1) selected from seven districts in the two provinces, accounting for 20.7% of total communes in the ten districts of the two provinces. Two or three villages in each commune were selected for HH interviews using stratified sampling. The determining three strata for the village selection were:

1) large area of nature forest;
2) having representative features, for example in terms of poverty rate, forest cover; and
3) not in next to each other.

***Sample size*:** The *Slovin* sampling formula was used to estimate the sample size for each commune: $n=N/[N*(e)^2+1]$ with n=sample size, N=population size, and e=sampling error (i.e. 1- confidence level). With a confidence level of 95%, and a population of 82,297 and 50,000 HHs in the buffer-zone communes of nature reserves and protected areas of QN and TTH provinces, a total sample size of 795 HHs, of which 105 HHs in BMNP; 150 HHs in PDNR; 172 HHs in TTH and QN SLNR; 54 HHs in STNR; 163 HHs in ENR and 125 HHs in NLNR were selected (Table 1). The sample size of selected communes was prorated, based on the probability proportion to size (PPS) approach to obtain a sample size that is proportional to the commune.

TABLE 1. SAMPLE SIZE FOR HH SURVEY

NATURE RESERVES AND NATIONAL PARK	SURVEYED COMMUNES	POPULATION OF HOUSEHOLD	SURVEYED VILLAGES	SAMPLE SIZE
Bach Ma National Park	A Ting	654	Cho Nech	32
			Pa Zih	23
	Thuong Lo	318	Cha Mang	15
			Doi	35
Phong Dien National Reserve	Hong Ha	424	Pa Hy	37
			Pa Ring	30
	Hong Kim	526	Dut 1	43
			A Tia 2	40
Thua Thien Hue and Quang Nam Sao La National Reserve	A Roang	627	Ka Lo	26
			Karon Aho	35
			Amin C9	38
	Thuong Long	629	Village 3	31
			Village 4	35
			Village 8	33
Song Thanh National Reserve	Dac Pre	341	Village 58	29
	Phuoc Xuan	293	Lao Du	16
			Nuoc Lang	9
Elephant National Reserve	Phuoc Ninh	826	Binh Yen	47
			Dui Chieng 2	23
	Que Lam	1,097	Cam La	38
			Phuoc Hoi	55
Ngoc Linh National Reserve	Tra Cang	869	Village 3	37
			Village 4	36
	Tra Tap	617	Village 1	25
			Village 2	27
Total		7,220		795

HH sampling: Based on the sample size of each village, determined using the PPS approach, a systematic random sampling method was used to sample the HHs. To select HHs in a sample frame, an interval coefficient "t" for systematic selection was determined. It was estimated by dividing the total number of HHs in the sample frame by the sample size. Subsequently, an initial HH in the first segment of the list was selected before selecting other HHs in the next segments with an interval of "*t* "coefficient. At least 10% contingency HHs from the sample frame were selected and used in cases where the preselected HHs,

(1) were not available at the time of the interview;
(2) refused to join the interview;
(3) migrated to another area; or
(4) show inappropriate behavior during the interview e.g. inattentive and purposely providing misleading information.

To consider gender-specific responses, the sampling applied a 50-50 ratio for male and female respondents. Respondents had to be either HH head or main HH representative, aged between 18 and 60 years, as they likely have better understanding of HH and livelihood issues and have adequate knowledge and experience. Respondents were interviewed in their full consent and were assured on the confidentiality of their responses. The list of surveyed HHs is given in Annex 5.

Survey questionnaire: The eight sections in the HH questionnaire are:
(1) demographic information;
(2) socio-economic profile;
3) Livelihood assets and living conditions;
4) Access to public services;
5) Access to market and information;
6) Access to sources of financial capital;
7) Division of labor and decision-making;
8) Knowledge, practices and vulnerability.

A checklist was used for eliciting detailed information on the diversity of livelihood and income sources in the areas of forestry, agriculture and aquaculture/fishing. The questionnaire and checklist were further tested in two sampled communes of QN and TTH provinces prior to field administration. A one-day training on the survey tool and field survey procedures was organized for all the enumerators and researchers. Field training planning and logistic arrangements were also discussed and finalized at the end of the training session.

3.3. DATA PROCESSING AND ANALYSIS

3.3.1. DATA ENTRY, PROCESSING AND ANALYSIS

Data collected from the HH survey were stored into a database designed in SPSS version 16. A social science research expert with extensive experience in database design and statistical data analysis was responsible for the database design. The entry of collected data into the SPSS was completed by the designated enumerators. The expert conducted one-day training on techniques of data entry for the enumerators.

After completing data entry, the expert processed and analyzed the SPSS data and presented the results/findings in the form of tables, graphs or charts in Microsoft Excel for presentation and reporting.

3.3.2. DATA QUALITY ASSURANCE

The following measures were taken to ensure data quality and reliability:

1) survey responses were precoded in a way that it facilitates data entry and reduce errors;
2) HH questionnaire with significant errors were eliminated from the sample;
3) survey questionnaire was tested in the field and improved; enumerators were trained on the survey tools and protocols prior to the field work;
4) the content of the questionnaire was reviewed by enumerators and field supervisors on the day of the interview;
5) data collection was coordinated by field coordinator, assisted by field assistants; and
6) supervised by the team leader and key experts.

The entire data collection process was directly supervised by the team leader. Completed questionnaire was carefully filed before, during and after data processing and analysis and the minutes of FGDs, summary of interviews and memo notes were recorded for analysis and carefully filed for auditing. Finally, the entered data were double-checked during data cleaning process to ensure accuracy.

3.4. ASSESSMENT IMPLEMENTATION

Most of the team members of the project were involved in the HH survey, livelihood assessment and development of livelihood models, but not all the members were expected to participate in the fieldwork activities. The number of members proposed in the technical proposal remain unchanged. However, to complete the HH interviews in the twelve communes located in remote areas of QN and TTH provinces in a tight time frame, the project team had to employ 21 enumerators (within the limited budget) in the HH survey interviews and assist in the FGDs. This is as twice as the number mentioned in the proposal.

IV. METHODOLOGY AND PROCESS FOR LIVELIHOOD ASSESSMENT

4.1. METHODOLOGY

The DFID Sustainable Livelihood approach was adopted to the assessment, identification and development of livelihood models. Based on DFID Sustainable Livelihoods framework, the assessment team assessed the *status quo* of local HHs' livelihood conditions, based on available livelihood assets (human, social, financial, physical and natural capitals), vulnerability aspect (shocks, trends and seasonality) and the broader environment of existing relevant organizations, institutions, policies, legislations, cultural and social norms. The assessment of local conditions helped to identify suitable livelihood models and potential livelihood opportunities to recommend the implementation. We identified and developed potential livelihood models in an inclusive manner, enabling participation of a wide-range of stakeholders, particularly poor farmers and forest-dependent people whose livelihoods pose a threat to the forest biodiversity. We expected these people would be willing to implement and manage the models with the support from local authorities. Using results from the HH survey and various other methods such as a desk study, SWOT and PRA tools (ranking, seasonality etc.) to facilitate discussions with different stakeholders such as poor HHs, local authorities and mass organizations, private SMEs and HH business, in-depth interviews with provincial and district authorities (DARD, DONRE, FPD), management of National Reserves and National Park, we identified 'good/best' livelihood practices/models with a potential for new opportunities for livelihood improvements of local HHs in the target communes. This process identified the list of potential products/goods for the MVC analysis also. Our assessment was carried out in seven steps as summarized in Fig. 3 below.

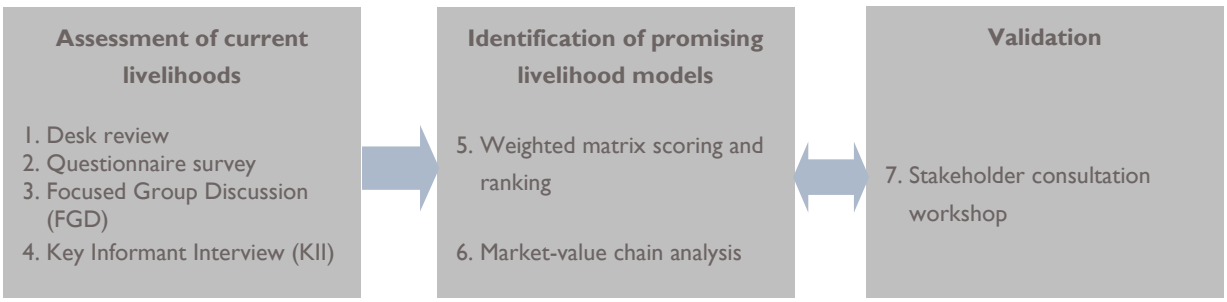


Figure 3. Procedures of systematic analysis, validation and methods for the livelihood assessment

4.2. DESK REVIEW AND SECONDARY DATA COLLECTION

Desk review of literature and policy documents was conducted to gain an overview of current situation and main issues in protected areas of QN and TTH provinces. Reviewed documents include, legal documents (laws, circulars, decrees), policy documents (governmental decisions and proposals on socio-economic development and environmental protection), reports (governmental and project reports on biodiversity conservation, livelihood activities, poverty reduction, socio-economic development), and other publications (scientific articles and working papers on natural conditions, biodiversity conservation, economic analysis, results of livelihood model field tests, social studies, etc.). The preliminary findings from the desk review were used to conceptualize the assessment framework and approaches, design the tools as well as for the assessment plan.

The collection of secondary data was an important activity for designing and planning the assessment, as well as identifying recommended livelihood models. During the preparation, the project team collected secondary data on population census, poverty rate, forest area, forest cover of 58 target communes located in the buffer-zones of nature reserves and protected areas in TTH and QN. This statistical data was first used for the selection of sampled communes and to estimate the HH sample size for each sampled commune. During and after the field survey, more secondary statistical data were collected from relevant agencies at provincial, district or commune levels to supplement the primary data collected from surveys and FGDs.

4.3. SURVEY QUESTIONNAIRE

Information on current production system was partly collected through the HH survey and questionnaire (section 3, Annex 2-3). A number of questions on farmers' production capacity, key farm and forest products, risks, market price, and market access had been embedded in the survey questionnaire.

4.4. FOCUS GROUP DISCUSSION (FGD)

FGD was applied to generate additional information of the current system, collect primary market information (market demand, consumption, competition) and suggest potential/alternative livelihood models, as well as willingness of local people to adopt the livelihood models. FGD was conducted as a semi-structured discussion with 10 HHs for each group. We organized 36 FGD sessions (three sessions/commune) with about 367 participants in total. The FGDs explored local knowledge regarding livelihoods and related challenges, constraints and opportunities. The FGD participants were selected based on their livelihood dependency on forests and their roles and responsibilities with regard to socio-economic development planning, forest management, forestry livelihood development and climate change adaptation and mitigation. The FGD participants were divided into three groups:

(1) poor and near-poor HHs (five men, five women);
(2) commune People's Committee staffs, mass organizations (Women's Union, Youth Union, Farmers' Association), community forest management and village authorities;
(3) business sectors including SMEs, service providers, and HH business (Table 2).

FGD results were analyzed firstly by clustering similar or related ideas or statements (cluster approach), and secondly, by frequency analysis that counts the number of occurrence of similar ideas. The FGDs were led by experienced facilitators, supported by assistants in charge of

documenting the FGD results. Annex 7 and 9 describe guiding questions and list of participants for the FGDs respectively.

TABLE 2. PARTICIPANTS AND SAMPLE SIZE OF FOCUS GROUP DISCUSSIONS (FGDS)

STAKEHOLDER GROUP	PARTICIPANT TO FGDS	NO. OF PARTICIPANT	
		TTH	QN
Representatives of poor and near-poor HHs	Women and men from poor and near-poor HHs	44	63
Representatives of commune and village authorities, mass organizations and community-based organizations	1) CPC leader; 2) Commune staff in charge of labor, invalids and social affairs; 3) Staff in charge of agriculture, forestry, fishery , natural resources; 4) Commune health worker or veterinary staff; 5) Commune Women's Union leader; 6) Youth's Union representative; 7) Farmers' Union representative; 8) Representative of community forest management or Fishery Association; 9) Head of one of the selected villages; 10) Credit staff of banks for social policies/agriculture and rural development	50	65
Representatives of business sectors, including SMEs, service providers, and HH business	A representative of Agriculture Cooperative; two representatives of SMEs of agriculture/forestry/fishery production; two representatives of SMEs or self-employed establishments providing agriculture/forestry/fishery services, 5 HH business establishments or farms doing forest-based and/or agriculture livelihood activities.	44	52
Sub-total		138	180
Total			318

4.5. KEY INFORMANT INTERVIEWS (KIIS)

To explore potential livelihood models, their limitations and strengths and recommendations on how to support their development, we conducted in-depth KIIs with:

(1) leaders/managers/experts from provincial DARD, DONRE, FPD and Extension Center, with fifteen interviews for the two provinces;
(2) leaders/managers/experts from district DARD and DONRE or People's Committees, FPD (three interviews per district, or fifteen interviews);
(3) managers of buffer-zone and nature reserves (six interviews).
In terms of information for market-value chains, we interviewed:
(4) representatives of seven successful businesses and SMEs; and
(5) forest-dependent people (six interviews).

Table 3 provides more description of the KIIs, and Annex 8 and 9 describe the guide questions and list of the participants for the KIIs, respectively.

TABLE 3. PARTICIPANTS AND SAMPLE SIZE OF KEY INFORMANT INTERVIEWS

STAKEHOLDER GROUP	GROUP PARTICIPANTS	NO. OF PARTICIPANTS	
		TTH	QN
Province level stakeholders	DARD leaders and staff	1	1
	DONRE leader sand staff	2	

	FPD leaders and staff		4
	Leader and staff of the Extension Centers	3	4
District level stakeholders	District DARD leaders and staff (A Luoi, Nam Dong, Dong Giang, Nam Giang, Nam Tra My, Nong Son, Phuoc Son districts)	2	5
	District DONRE leaders and staff (A Luoi, Nam Dong, Dong Giang, Nam Giang, Nam Tra My, Nong Son, Phuoc Son districts)	3	5
Commune/village/ household levels	Forest dwellers	2	4
Protected area managers	FMB director and staff of Phong Dien Nature Reserve	1	
	FMB director and staff of Sao La Nature Reserve		1
	FMB director and staff of Bach Ma National Park	1	
	FMB director of Song Thanh Nature Reserve		1
	FMB director of Ngoc Linh Nature Reserve		1
	FMB director of Elephant Nature Reserve		1
Businesses and SMEs	Tourism companies	1	1
	Timber processing companies	1	1
	Medicinal herbs companies/traders	1	2
Sub-total		18	31
Total			49

4.6. WEIGHTED MATRIX SCORING AND RANKING

The list of livelihood models obtained through desk review, FGDs and KIIs were ranked in order to select five best potential livelihood models, for recommendations and reporting. The ranking was based on three main criteria (applicability, profitability and environmental sustainability). Table 4 presents the questions used to evaluate the criteria.

- The selected livelihood models must be feasible for rural smallholders with technological and investment requirements applicable to their socio-economic context.
- The selected livelihood models should be attractive in terms of livelihood benefits, profitability and cost-benefit ratio.
- The selected livelihood models should be sustainable and environment-friendly.

TABLE 4. GUIDE QUESTIONS FOR DEVELOPING THE CRITERIA OF SELECTED LIVELIHOOD MODELS

Ease of production (applicability)	**Storage/processing (applicability and market)**
Is the product/crop cultivated in the area?	Is the product to be stored?
Can the product/crop be cultivated in the area?	Is the technology available for storage?
Are people cultivating this product/crop?	How long can the product be stored if market changes?
Is the product/crop cultivated in the off-season?	Can the products be further processed for added value? Is the technology locally available?
Does the product/crop need any special inputs such as irrigation, pesticide, and fertilizer?	
Can the product/crop be produced in the off-season?	
Market demand (profitability and market)	**Environment and climate change concerns**
Is there strong market demand?	Does the production come with any hazards or potential harm to the environment?
Is demand based on season or festival?	What is the level of net GHGs emission/sequestration of

And does that fall into the intended production phase? Is the demand for high volume or a niche market? Are there many buyers or only one? What is the financial cost of production? Does the production require a high investment? Is credit required for this production? Are there any local governments' investment programs/orientations/policies supporting this production/market for products?	the production? (e.g. low, medium, high) To what extent the crops/tree systems are resilient to extreme climate events and natural disasters including flooding, typhoon, drought, heatwave, changing rainfall pattern, fire, pest and diseases, etc.? Does the production require a lot of chemical inputs? Does the production affect biodiversity in forest and on farm? Are the effect(s) negative or positive? Are there any specific flora and fauna species to be negatively affected by the production? Are there any alien/invasive flora and fauna species to be introduced/involved in the production? Does the production require any materials exploited from natural forest? Can these materials be replaced by alternatives or can be produced on non-forest land?

The indicators were transformed into a weighted scoring matrix, which was later used by the research team as well as the participants of the feedback workshops in the two provinces, to rank existing livelihood models from the most to the least potential. The five most potential systems were then selected for MVC analysis. Table 5 below describes an example of how a weighted scoring matrix works.

TABLE 5. EXAMPLE OF ASSESSMENT OF LIVELIHOOD MODELS BY WEIGHTED SCORING MATRIX

LIVELIHOODS MODELS	ENVIRONMENTAL FRIENDLINESS (1.5*)	CLIMATE ADAPTATION(1)	FEASIBILITY AND APPLICABILITY (2)	MARKET DEMAND (2)	INVOLVEMENT OF POTENTIAL BENEFICIARIES (1.5)	INCOME IMPROVEMENT (1.5)	BIODIVERSITY (1)	TOTAL SCORE (RANKING)
Timber plantation towards FSC certified timber supply to international markets								
Planting under-story medical plants in natural forest								
Community based tourism in connection with production of local specialties (home garden products: local chicken, pomelo and orange)								
Planting rattan in natural forests								
Bee keeping in natural forest								

* Ranking weight

4.7. MARKET VALUE CHAIN ANALYSIS

Our study team carried out MVC analysis that will help farmers improve their market access and performance through understanding the value-chain. A value-chain consists of a broad variety of activities needed for a product or service to transit across the various stages extending from conception of the product or service through its delivery to consumers (Kaplingsky and Morris

2002)[1]. In this assessment, our initial assumption is that most farmers are smallholders whose products are linked to local informal markets, while there are only a few products ready (or potentially) to be traded in more lucrative, formal markets at national and international levels. We used the MVC to develop market-based strategy/solution for poverty alleviation and livelihood development: encouraging semi-subsistent producers (smallholders) to participate more in local markets and supporting more commercialized producers (better-off, large land-holding farmers and agro-enterprises). The MVC of potential livelihood models were carried out through four steps:

1) analysis of current livelihood models;
2) identification of promising livelihood models;
3) MVC of products of promising livelihood models; and
4) validation.

Throughout these stages, mixed methods were used including secondary data collection, KII, expert knowledge and ranking, FGD, value chain cluster analysis, and participatory market chain analysis (Lundy et al. 2007)[2].

Based on our field observations, many agricultural support programs in QN and TTH have so far focused only on increasing production with little or no focus on market and business relationship. Increasing production was often achieved through the provision of inputs supported by production-based research and agronomic assistance. A typical intervention package comprised of new high yielding varieties, fertilizer, pesticides and information on how to maximize the yield. This type of intervention has led to increased output and is measured in terms of yield per unit area cultivated. For food insecure areas this approach has been highly successful, but economic growth has been less convincing. It's common that local markets are unable to absorb rapid increases in yield from higher input farming systems and thus higher production is often translated into reduced farm-gate prices. The MVC analysis in our study cover 6 livelihood models in QN and TTH provinces, with a view to achieve the right balance between production (supply) and demand (the amount required by the market) that requires attention to all points in the value-chain. Due to the time and resource constrains, the MVC did not cover the whole geographical areas of QN and TTH, but rather restricted to commune/district level with a number of interviewed actors. Interviewing customers and estimation of total market demands were also not possible due to the time and resource limitations. However, we tried to obtain information of current market demand at local level as much as possible, provided it is available. Secondary data was also used to fill up data gaps. Annex 6 describes number of interviewed actors to gather information on MVC in the two provinces.

V. MAIN FINDINGS FROM THE HOUSEHOLD SURVEY

5.1. SAO LA NATURAL RESERVE

5.1.1. OVERVIEW OF TTH SLNR

1. Kaplinsky R and Morris M. 2002. A Handbook for value chain Research. Brighton: Institute of development studies, University of Sussex.

2. Lundy M, Gottret MV, Ostertag C, Best R, Ferris S. 2007. Participatory Market Chain Analysis for Smallholder Producers. International Centre for Tropical Agriculture (CIAT). Cali, Colombia ISBN 978-958-694-092.

The SLNR in TTH was established on October 9th, 2013. It is located in A Luoi district of TTH province, from the northern latitude 1603'7" to 1609'50" and from the eastern longitude 107025'41" to 107033'39". It has a total area of about 15,520 ha divided into three sub-zones:

1) Strictly-protected sub-zone (11,845 ha);
2) Ecological restoration sub-zone (3,550 ha); and
3) Service-administrative sub-zone (125 ha).

Its buffer zone covers an area of 16,554 ha. The buffer-zone stretches over Nam Dong and A Luoi districts and consist of four communes namely A Roang and Huong Nguyen communes in A Luoi district, Thuong Quang and Thuong Long communes in Nam Dong district. The buffer zone consists of 2,096 HHs with two main ethnic minority groups namely Co Tu and Ta Oi. The proportion of poor HHs in the buffer zone communes is as follows: Huong Nguyen (40%), A Roang (34%), Thuong Long (34%), and Thuong Quang (11%) (Table 6). The communes in TTH SLNR have a high forest cover, well above 75% of the communes' areas are forest lands.

TABLE 6. DISTRIBUTION OF POOR HHS AND ETHNIC MINORITY GROUPS IN TTH SLNR COMMUNES

DISTRICT/COMMUNE	TOTAL HHS	% POOR HH	% ETHNIC GROUPS	*% FOREST COVER*
A Luoi district				
A Roang commune	627	35	99.5	76
Huong Nguyen commune	323	40	95	85
Nam Dong district				
Thuong Long commune	629	34	96	78
Thuong Quang commune	517	11	58	89

The policy on payment for forest environmental services in TTH SLNR

According to the TTH's SLNR report in 2016, payments for forest environmental services (PFES) were made to individual HHs and HH groups. Contracted forest protection activities covered 6,889 ha of forest with 10 individual HHs and 5 HH groups. In 2016, the average PFES payment per HH was 3-3.5 VND million (≈ 154 USD with 1 USD equals 22,700 VND) per month. Despite this, TTH SLNR continues to face major threats such as wildlife hunting and trapping, illegal logging and infrastructure development (e.g. hydro-power plant and road development).

5.1.2. OVERVIEW OF QN SLNR

SLNR was established on July 13th, 2012. It is in the center of Central Annamites, some 180km northeast of Tam Ky city and considered one of the prominent places in global biodiversity (WWF Global, 2000). The reserve stretches from the north latitude 17056'57" to 18005'25" and eastern longitude 105051'07"to 106004' 36". It covers 16,000 ha and is connected to TTH SLNR (with area more than 13,000 ha) and BMNP (more than 37,000 ha), constituting a large ecological region. The reserve consists of strictly-protected sub-zones (15,800 ha) and service-administrative sub-zones (22 ha) and its buffer zones, covering 35,135 ha and stretching over Dong Giang and Tay Giang districts of QN province. The buffer zones consist of four communes namely Song Con and Ta Lu in Dong Giang district, A Vuong and Blahee communes in Tay Giang district. The buffer zones accommodate

2,078 HHs belonging to six ethnic minority groups namely Co Tu, Ta Oi, Muong, Thai, Tay and Hre. Co Tu is the dominant ethnic group, accounting over 91% of the total population. The proportions of poor HH in the communes are as follows: A Vuong (75%), Song Con (63%), Ta Lu (60%) and Blahee (44%) (Table 7). The communes in QN SLNR also have a high forest cover, around 80% of the communes' area.

TABLE 7. DISTRIBUTION OF POOR HHS AND ETHNIC GROUPS IN THE FOUR BUFFER ZONE COMMUNES OF QN SLNR

DISTRICT/COMMUNE	TOTAL HHS	% POOR HH	% ETHNIC GROUPS	% FOREST COVER
Dong Giang district				
Song Con commune	660	63	86	82
Ta Lu commune	285	60	94	87
Tay Giang district				
A Vuong commune	510	71	99	80
Bhallee commune	623	44	94	80

The policy on PFES in QN SLNR

According to QN SLNR's report in 2016, PFES were made of individual HHs and HH groups. Contracted forest protection activities covered 8,877ha of forest with the participation of 741 individual HHs or 53 HH groups in four communes, namely A Vuong and Bhallee communes in Ta Giang district and Ta Lu and Song Con communes in Dong Giang district and Prao town. In 2016, the total PFES was 2,886,186,643 VND (≈ 127,145 USD) and the average annual payment for every HH per hectare was 325,131 VND (≈ 14.3 USD). Nevertheless, SLNR is still experiencing major threats such as illegal logging, wildlife hunting, trapping, over exploitation of non-timber forest products (NTFPs), fishing and climate change.

5.1.3. MAIN FINDINGS FROM THE HOUSEHOLD SURVEY

5.1.3.1. Demographic information

The average age of surveyed HH heads in the six sampled villages of TTH and QN SLNR is 38.3 years (Table 8). In terms of education, most of the sampled HHs has level I (grade 1-5) as their highest educational attainment. More attention should be given to Ka Lo and Karon Aho village of A Roang commune since it has the highest illiteracy in contrast to Amin C9, another village in the same commune that has no reported illiteracy. A Roang is a poor commune of A Luoi district dominated by the Ta Oi ethnic minority group, especially in the Karon Aho village, of which, 71% of poor farmers was covered by our survey[3]. With high illiteracy, Ta Oi ethnic minority groups has difficulty in accessing information and technical knowledge and has low ability to apply new knowledge and technologies. In terms of family size and family labour, no contrasting situation was observed

[3] According to Decision No 59/2015/QĐ-TTg dated 19 November, 2015, promulgating multidimensional poverty line applied for the period of 2016 – 2020 provided that (i) the poor households in rural areas are households with average income under VND 700,000 per capita per month (≈ 31 USD per capita per month); ii) the near poor households in rural areas are households with average income between over VND 700.000 and VND 1,000,000 per capita per month (≈31 USD and 44 USD per capita per month) and iii) the none poor households in rural areas are households with average income between over VND 1,000,000 and VND 1,500,000 per capita per month (≈44 USD and 66 USD per capita per month).

amongst villages/communes. The average HH size in all villages is 4 people, which indicates the positive impact of population planning in the area

TABLE 8. BASIC INFORMATION OF THE SURVEYED HHS

ITEMS	UNIT	A ROANG COMMUNE			THUONG LONG COMMUNE			AVERAGE
		KA LO VILLAGE	KARON AHO VILLAGE	AMIN C9 VILLAGE	VILLAGE 3	VILLAGE 4	VILLAGE 8	
Age of HH head	Year	39.8	32.5	37.0	38.1	44.3	41.3	38.8
Level of education								
Illiterate/never had formal education	%	26.3	30.8	-	16.1	17.1	15.2	17.6
Level I (grade 1-5)	%	39.5	11.5	28.5	48.4	37.2	42.3	34.6
Level II (grade 6-9)	%	15.8	34.6	25.7	13.0	11.4	15.2	19.3
Level III (grade 10-12)	%	15.8	15.3	25.8	19.4	25.8	21.2	20.6
Higher education	%	2.6	7.6	5.8	3.2	8.7	6.1	5.7
Average family member per HH	Person	4.5	4.6	4.4	4.0	4.4	4.2	4.4
Average labour per HH	Person	2.2	1.9	2.1	1.9	1.9	1.9	2.0
- Male	Person	1.2	1.1	1.2	1.0	1.0	1.3	1.1
- Female	Person	1.0	0.8	0.9	0.9	0.9	0.6	0.9
Average dependent person per HH	Person	2.0	2.4	2.1	2.1	2.3	2.2	2.2
Economic status								
Poor HH	%	15.4	71.4	18.4	38.7	17.1	27.3	31.4
Near-poor HH	%	30.8	11.4	44.7	9.7	8.6	15.2	20.1
Non-poor HH	%	53.8	17.1	36.8	51.6	74.3	57.5	48.5

5.1.3.2. Household assets and living conditions

Land use types and HH landholding

There is a significant difference in the average landholding of HHs between the two sampled communes (Table 9). In A Roang, the average is around 19,304m2 (or 1.9ha) and 11,566m2 (or 1.1ha) in Thuong Long commune. In the latter, there is a difference amongst the three HH groups. The poor HHs has 6,945m2 average landholding compared to 12,170m2 for near-poor and 15,581m2 for non-poor HHs. The area of agricultural lands of the three HH groups are relatively higher than their forestry lands, perhaps due to agricultural expansion in forest allocated lands by households for food production and short-term income. The poor HHs in Thuong Long commune had the smallest landholding amongst the sampled villages, with an average area of 6,940 m2 per HH.

The HHs or farmers in the sampled communes usually plant annual crops such as paddy and upland rice, maize and cassava in agricultural lands, home garden or forestry lands. In the latter, the crops are mixed with acacia in the first year of the tree plantation. Currently, acacia plantation is most attractive to local people because of the potential income. In fact, more and more HHs are trying to convert bare lands into acacia plantations.

TABLE 9. HH LANDHOLDING FOR TWO TYPES OF LANDUSE

HH GROUP	TYPE OF LAND	A ROANG COMMUNE		THUONG LONG COMMUNE	
		m^2	%	m2	%
Poor HH	Agriculture	12,696	79	3,568	51
	Forestry/Acacia plantation	3,396	21	3,377	49
	Total area	16,091	100	6,945	100
Near-poor HH	Agriculture	12,090	69	7,250	60
	Forestry/Acacia plantation	5,427	31	4,920	40
	Total area	17,517	100	12,170	100
Non-poor HH	Agriculture	15,044	62	8,053	52
	Forestry/Acacia plantation	9,259	38	7,528	48
	Total area	24,303	100	15,582	100
	Average	**19,304**	**100**	**11,566**	**100**

Living conditions of the surveyed HHs

Dwelling facilities are one of the criteria for determining the HH's economic status as being poor, near-poor or non-poor. The surveyed HHs in the buffer zones of SLNR have extremely limited facilities even for simple things like a fan or a radio (Table 10). In Thuong Long commune, there is a slight tendency that non-poor HHs own more household appliances and gadgets than poor or near-poor Hhs. Surprisingly this tendency is not at all apparent in A Roang commune.

TABLE 10. HH FACILITIES

ITEMS	NUMBER OF ITEM/UNIT PER HH

	A ROANG			THUONG LONG		
	POOR HH	NEAR POOR HH	NON-POOR HH	POOR HH	NEAR POOR HH	NON-POOR HH
Radio	0.00	0.00	0.00	0.04	0.00	0.05
Television	0.91	0.93	0.83	0.48	0.75	0.76
CD/DVD video player	0.23	0.14	0.23	0.04	0.17	0.27
Computer	0.11	0.00	0.00	0.04	0.00	0.00
TV cable line	0.11	0.03	0.03	0.04	0.00	0.00
Internet	0.03	0.00	0.03	0.04	0.00	0.00
Landline phone	0.00	0.00	0.00	0.00	0.00	0.00
Mobile phone	0.69	0.59	0.69	0.40	0.50	0.68
Tablet	0.00	0.00	0.00	0.00	0.00	0.02
Laundry machine	0.00	0.00	0.00	0.00	0.00	0.00
Hot water boiler	0.00	0.00	0.03	0.00	0.00	0.00
Air conditioner	0.00	0.00	0.00	0.00	0.00	0.00
Clothes drying machine	0.00	0.00	0.00	0.00	0.00	0.00
Microwave oven	0.00	0.00	0.00	0.00	0.00	0.00
Electric fan	0.66	0.34	0.43	0.56	0.50	0.71
Fridge	0.09	0.07	0.09	0.12	0.00	0.05
Gas stove	0.26	0.17	0.14	0.04	0.00	0.06
Electronic stove	0.00	0.00	0.00	0.04	0.00	0.00
Others	0.17	0.17	0.17	0.08	0.08	0.16

5.1.3.3. Household access to public services

Physical assets are represented by means of transportation, production tools, equipment, communication, adequate water supply, sanitation, energy sources such as power, renewable energy, etc. Additionally, access to public services and communication tools are considered HHs' physical assets.

Table 11 shows the proportion of surveyed HHs in the buffer zone communes of SLNR who had access to these public services.

Most of the surveyed HHs in the two sampled communes claimed they have good or very good access to education services (Table 11). In contrast, most of them could not access vocational training services at all. In general, more than 50% of the sampled HHs in both communes claimed to have good and very good access in terms of health, public administration, legal counseling, telecommunication and electricity services. However, the HHs in A Roang commune claimed limited access to water, environment and sanitation services.

TABLE 11. ACCESS TO PUBLIC SERVICES IN A ROANG AND THUONG LONG COMMUNES

PUBLIC SERVICES	COMMUNE	LEVEL OF HH ACCESS (%) (1=NO ACCESS AT ALL; 5=VERY GOOD ACCESS)					
		1	2	3	4	5	TOTAL
Education services	A Roang	1.3	5.3	32.9	34.2	26.3	100
	Thuong Long	1.4	1.4	18.1	33.3	45.8	100
Vocational training services	A Roang	82.5	11.1	4.8	1.6	0.0	100
	Thuong Long	47.5	12.5	17.5	17.5	5.0	100
Health services	A Roang	1.5	8.8	29.4	41.4	22.1	100
	Thuong Long	3.5	16.3	33.7	26.7	19.8	100
Public administration services	A Roang	7.6	6.3	19.0	43.0	24.1	100
	Thuong Long	8.8	5.3	7.0	56.1	22.8	100
Agriculture extension services	A Roang	17.2	5.4	24.7	30.1	22.6	100
	Thuong Long	3.8	3.8	26.9	23.1	42.3	100
Legal counseling services	A Roang	15.5	3.4	19.0	29.3	32.8	100
	Thuong Long	7.7	7.7	23.1	15.4	46.2	100
Telecommunication services	A Roang	5.0	10.0	22.5	36.3	26.3	100
	Thuong Long	11.1	13.0	9.3	35.2	31.5	100
Transportation services	A Roang	4.8	12.0	34.9	24.1	24.1	100
	Thuong Long	7.7	9.6	9.6	44.2	28.8	100
Electricity services	A Roang	0.0	5.4	13.0	44.6	37.0	100
	Thuong Long	2.6	0.0	9.0	46.2	42.3	100
Water supply services	A Roang	47.1	10.3	8.0	11.5	23.0	100
	Thuong Long	12.5	12.5	16.7	20.8	37.5	100
Environment and sanitation services	A Roang	47.1	10.3	8.0	11.5	23.0	100
	Thuong Long	12.5	12.5	16.7	20.8	37.5	100

Participation of HHs in meetings, trainings and workshops

Social assets consist mainly of social networks and connectivity, membership and/or employees of informal or formalized groups, mass organizations etc. Participation of local people in meetings, trainings and workshop are also considered part of social assets. In terms of participation in

meetings, trainings or workshops related to sustainable and adaptive livelihood models, the surveyed HHs in Thuong Long had higher participation than those in A Roang commune (Table 12). None of the surveyed HHs in A Roang commune has ever attended to a workshop under these themes. Training opportunities under these themes would have been helpful for HHs to improve their livelihood. Low participation of HHs was observed in events with marketing local products and climate change adaptation or mitigation as a theme. In A Roang commune, 10.6% of surveyed HHs has participated in a training about marketing local products while it was only 9.3% in Thuong Long commune. Higher participation was found in relation to forest protection and development laws and community forest management. It is important to note that most meetings, trainings and workshops were conducted in the communes/villages, ensuring that distance does not hamper HH participation and access to these services.

TABLE 12. PARTICIPATION OF HHS IN MEETINGS, TRAININGS AND WORKSHOPS

KEY THEMES/TOPICS	MEETINGS (%)		TRAININGS (%)		WORKSHOPS (%)	
	A ROANG	THUONG LONG	A ROANG	THUONG LONG	A ROANG	THUONG LONG
Sustainable and/or adaptive livelihood models	46.3	78.9	42.6	90.7	0.0	71.4
Marketing for local products	13.4	39.4	10.6	9.3	0.0	4.8
Climate change adaptation	3.7	0.0	27.7	11.6	0.0	14.3
Climate change mitigation	35.4	23.9	31.9	7.0	33.3	4.8
Law on biodiversity	37.8	32.4	36.2	18.6	33.3	9.5
Forest protection and development law	81.7	80.3	83.0	44.2	66.7	33.3
PFES	42.7	23.9	46.8	4.7	66.7	14.3
Community forest management	72	78.9	53.2	41.9	66.7	47.6

5.1.3.4. Livelihood and gender

A Roang and Thuong Long communes are consisting of three ethnic minority groups, namely Co Tu, Ta Oi, and Pa Co beside the Kinh groups. The women in Co Tu, Pa Co and Ta Oi are involved more than men in managing the family's daily finances (Table 13). In general, women play a critical role only in this aspect as all other activities are assumed together with men. The Kinh group revealed more shared responsibilities between men and women in their households. Although in most ethnic groups decision-making related to investment, a new livelihood model, investment to expand existing livelihood options, purchase or selling of HH assets are jointly performed by men and women. It is evident that the men play more dominant roles in some groups.

TABLE 13. GENDER ROLES IN DECISION-MAKING

ACTIVITIES	ETHNIC GROUP	MALE (%)	FEMALE (%)	BOTH (%)	DON'T KNOW (%)	N/A (%)

Daily family expenses	Co Tu	16.7	44.9	38.5	0.0	0.0
	Kinh	50.0	50.0	0.0	0.0	0.0
	Pa Co	0.0	66.7	33.3	0.0	0.0
	Ta Oi	13.7	46.3	40.0	0.0	0.0
Investment to start a new livelihood model	Co Tu	29.5	9.0	60.3	0.0	1.3
	Kinh	0.0	0.0	100	0.0	0.0
	Pa Co	33.3	0.0	66.7	0.0	0.0
	Ta Oi	27.4	4.2	60.0	2.1	6.3
Investment to develop/expand existing livelihood activities/business	Co Tu	23.1	6.4	67.9	0.0	2.6
	Kinh	0.0	0.0	100	0.0	0.0
	Pa Co	33.3	0.0	66.7	0.0	0.0
	Ta Oi	30.5	5.3	58.9	1.1	4.2
Purchase of HH assets	Co Tu	28.2	11.5	60.3	0.0	0.0
	Kinh	0.0	0.0	100	0.0	0.0
	Pa Co	0.0	33.3	66.7	0.0	0.0
	Ta Oi	33.7	9.5	53.7	1.1	2.1
Selling of HH assets	Co Tu	17.9	9.0	73.1	0.0	0.0
	Kinh	0.0	0.0	100	0.0	0.0
	Pa Co	33.3	0.0	33.3	0.0	33.3
	Ta Oi	24.2	3.2	45.3	1.1	26.3
Children's study	Co Tu	7.7	11.5	70.5	0.0	10.3
	Kinh	0.0	0.0	100	0.0	0.0
	Pa Co	0.0	0.0	100	0.0	0.0
	Ta Oi	13.7	12.6	65.3	0.0	8.4
Financial/labor contribution to community/social activities	Co Tu	11.5	14.1	71.8	1.3	1.3
	Kinh	0.0	0.0	100	0.0	0.0
	Pa Co	0.0	33.3	33.3	33.3	0.0
	Ta Oi	10.5	3.2	58.9	2.1	25.3

5.1.3.5. Livelihood and sources of income

Income sources include on-farm, off-farm and non-farm sectors in the survey, based on HH income between June 2016 and June 2017. In all the HH types, crop and non-farm production such as trading, business, skilled jobs, services, pension and remittance contributed to the highest proportion

of household (at least 78%) in comparison to the other income sources, while those who earned income from husbandry and PFES is the smallest proportion (Table 14A). Indeed, many households in the poor and near-poor group had livestock but most of them raised them for self-consumption rather than for income generation. In relation to NTFP, it can be seen that the poorer the HH group, the more popular the income source. The proportion of the poor, near-poor and non-poor groups are 44%, 29% and 20% respectively.

On average, the annual income across all HH groups is 18,318 thousand VND (≈ 807 USD) (Table 14B). The annual income of the non-poor group is almost double than the poor and near-poor groups, while the income of the poor and near-poor groups are similar. Particularly, the poor group had annual income of VND 13,515 thousand (≈ 595 USD), the near-poor group had VND 14,866 thousand (≈ 654 USD, and the non-poor group had VND 26,573 thousand (≈ 1,170 USD).

TABLE 14A. SOURCES OF INCOME FOR EACH HH GROUP

HOUSEHOLD GROUP	INCOME SOURCE	No. of HH	%
Poor	Total	64	100
	Crop production	56	88
	Husbandry	6	9
	Forest plantation	12	19
	NTFPs	28	44
	PFES	8	13
	Other	51	80
Near-poor	Total	41	100
	Crop production	39	95
	Husbandry	4	10
	Forest plantation	7	17
	NTFPs	12	29
	PFES	4	10
	Other	37	90
Non-poor	Total	93	100
	Crop production	89	96
	Husbandry	21	23
	Forest plantation	28	30
	NTFPs	19	20
	PFES	7	8
	Other	73	78

TABLE 15B. AVERAGE INCOME OF HOUSEHOLD				
Household groups	N*	VND	SD	Sig**
Poor	43	13,515,700	7,204,258	0.057
Near-poor	35	14,866,571	9,190,382	0.111
Non-poor	78	26,573,983	17,334,098	0.073
Average		18,318,715		

(*) The number of cases (households) after taking out outliers for normal distribution.
(**) Kolmogorov-Smirnov and Shapiro-Wilk test of normal distribution in which significant value of above 0.05 indicates normal distribution.

5.1.3.6. Constraints to livelihood improvement

In general, the communes in SLNR have a high poverty rate and the poor farmers have low income contribution from on-farm sectors such as crop production, husbandry and forest plantation. We also investigated the potential barriers that the HHs in the communes might have for livelihood improvement. By lumping all sampled villages and communes, the data show that the main constraints were financial limitation (claimed by 70% of the HHs), followed by lack of knowledge in farming technique (10%), health problem (7%), lack of knowledge on better farming system (5%) and labour limitations (5%). Although social policy bank worked well and it was not difficult for people to access, farmers who had borrowed and still had overdue debt could not borrow more. To help farmers overcome financial limitation, more channels of micro finance is needed and loan should be provided along with technical assistances so that farmers can use it effectively.

5.1.3.7. Land tenure and food security

Land allocation to HHs, especially for members of ethnic minority groups for crop production and forestry activities have been implemented for many years in the entire TTH and QN provinces. Land tenure has been considered as a precondition to sustainable land use by local people. Most HHs in A Roang commune have been given certificates for their entire allocated land (Table 15); however, in Thuong Long commune only about half (50%) of HHs in all the villages have had land certificates. In this commune, Village 4 had the highest percentage of HHs without certificates on their entire lands.

TABLE 16. PROPORTION OF SURVEYED HOUSEHOLDS WITH LANDUSE CERTIFICATES						
STATUS	A ROANG (%)			THUONG LONG (%)		
	KA LO VILLAGE	KARON AHO VILLAGE	AMIN C9 VILLAGE	VILLAGE 3	VILLAGE 4	VILLAGE 8
Have land certificate for all land types	77.8	72.4	65.5	45.5	48.3	50.0
Have land certificate for some of land types	11.1	20.7	13.8	27.3	19.4	15.5
Don't have land certificate for all land types	11.1	6.9	20.7	9.1	32.3	28.1
Rented	0.0	0.0	0.0	0.0	0.0	0.0

Don't know	0.0	0.0	0.0	18.2	0.0	6.2

According to Nguyen (2009)[4], "In accordance with Viet Nam food security standards for the delta and midland regions, a HH can be considered as having enough land to achieve food security if each family member has about 400 m2 of crop and paddy field, which means that the required crop-paddy field is 1,600m2 for a HH with four family members. Since the HHs in Thuong Long commune have an average area of 3,183m^2 as agricultural lands (Table 16), they therefore, met the Vietnamese 'criteria of a food secure HH. However, this is not the case for HHs in A Roang commune wherein they only have 800m2 of crop production lands, on average. The lack of land for agricultural production may have pushed people to encroach into the forest frontiers and exploit natural resources. As another measure for food security, we also asked the HHs experience of food shortage in the last three years. In SLNR, by lumping all sampled villages and communes, 67 from 198 sampled HHs (or 34%) reported that they experienced food shortage in the last three years, with duration of about 39 (± 7.8) days per year. It seemed that crop production land cannot be expanded while population tends to increase. In this situation, livelihood activities that use little or no crop production land such as livestock, forest plantation and eco-tourism should be developed to improve livelihood of people in the commune. Meanwhile, more attention should be paid to enhance productivity of crops, especially rice to ensure food security.

TABLE 17. AREA OF AGRICULTURAL LAND PER HH

COMMUNE	AVERAGE PADDY FIELD AREA PER HH (M2)	AVERAGE MAIZE FIELD AREA PER HH (M2)	AVERAGE CASSAVA FIELD AREA PER HH (M2)	TOTAL
A Roang	233	-	567	800
Thuong Long	500	733	1,950	3,183

5.1.3.8. Household awareness on forest biodiversity

HH's awareness on threats to forest biodiversity and natural resources

The surveyed HHs in the two sampled communes considered logging as the main threat to SLNR (Table 17). In A Roang commune, about 93% of the respondents claimed so, while the claim was slightly lower at 90.6%, in Thuong Long. The other threats are wildlife hunting and fire asserted by 58% and 47.7% of surveyed HHs in A Roang commune respectively and 48% and 57.8% in Thuong Long commune, respectively. Mining natural resources is also a threat regarded by 39.5% and 32.8% of surveyed HHs in A Roang and Thuong Long commune, respectively. The logging and hunting were carried out mostly by local people in small-scale extraction for trade and local use.

TABLE 18. LOCAL KNOWLEDGE ON THREATS TO FOREST BIODIVERSITY AND NATURAL RESOURCES IN SLNR

COMMUNE	THREATS (%)

[4] Nguyen AT. 2009. Case study on land rights in Viet Nam. Viet Nam.

	WILDLIFE HUNTING	LOGGING	MINING OF NATURAL RESOURCES	FIRING	OTHER
A Roang	58.1	93.0	39.5	47.7	14.0
Thuong Long	48.4	90.6	32.8	57.8	6.2
Mean	53.3	91.8	36.2	52.8	10.1

HH's awareness on law enforcement in the communes

The surveyed HHs are highly aware on law enforcement related to forest protection and illegal logging (Table 18). This was observed in the two communes wherein 84% and 71.9% of HHs in A Roang commune claimed they were aware on these two issues and 83.6% and 93% in Thuong Long commune. The lowest awareness relates to law enforcement on biodiversity conservation, asserted respectively by 33.7% and 42.5% of HHs in A Roang and Thuong Lon commune.

TABLE 19. LOCAL KNOWLEDGE ON LAW ENFORCEMENT IN THE COMMUNES

COMMUNE	AWARENESS ON LAW ENFORCEMENT (%)					
	ON BIODIVERSITY CONSERVATION	ON FOREST PROTECTION	ON ENDANGERED WILDLIFE SPECIES	ON THE BOUNDARIES OF PROTECTED AREAS IN THE REGION	ON ILLEGAL WILDLIFE HUNTING AND TRAPPING	ON ILLEGAL LOGGING
A Roang	33.7	84.3	58.4	64.0	69.7	71.9
Thuong Long	42.5	83.6	-	56.2	75.3	93.2
Average	38.1	83.9	58.4	60.1	72.5	82.5

5.1.4. CONCLUSION OF HOUSEHOLD CONDITIONS IN SLNR

The sampled communes in SLNR have a forested landscape, with more than 80% of their areas under or with forests. The inhabitants were mostly ethnic minority groups, dominating up to 99% of the total commune population. Most of the HHs belong to the poor category, ranging 44 to 71% of the population. A large number of the HH respondents are illiterates and most have attended school up to level I or II only. The average household size is 4-5, but the average labor force is 2 persons. The average landholding per HH is 1.5 ha and in general, all HHs have both crop production land forestry lands. Agricultural lands owned or cultivated by HHs are generally larger in size (0.9 ha/HH) than forest lands (0.6 ha), and most HHs have certificates for their lands. However, by lumping all sampled villages and communes, 34% of the sampled HHs reported that they experienced food shortage in the last three years, with a duration of about 39 days per year. Financial limitation is claimed as the main constraint to livelihood improvement. In terms of access to public service, the residents lacked access mainly to vocational training, water supply, and environment and sanitation services. In general, the role of women in HH decision-making centered on managing the family's daily finances. The average household income in the reserve is 18,318 thousand VND (≈ 807 USD). Crop production and non-farm are income sources of at least 78% households, while the other sources generated income for 8 to 44% households. In terms of threats to SLNR, interviewed farmers and local officials claimed illegal logging, wildlife hunting and forest fire as the main threats.

5.2. BACH MA NATIONAL PARK

5.2.1. OVERVIEW OF BMNP

BMNP is geographically located in the Central Annamite mountains, with its northern latitude, 15059'28" to 16016'02" and eastern longitude, 107037'22" to 107054'58". It covers a high mountain ridge that stretches from the west to the east, from the Laotian border to the East Sea at the Hai Van pass. This ridge segregates the coastal plains, and thus forms a bio-geographical boundary between northern and southern Viet Nam.

BMNP has a total area of 37,487 ha consisting three sub-zones:

1) Strictly-protected sub-zone (12,064 ha);
2) Ecological restoration sub-zone (20,234 ha); and
3) Service-administrative sub-zone (5,188 ha), with its buffer-zone covering an area of 58,676 ha.

The latter intersects the two province of QN and TTH and expands to three districts, namely Phu Loc, Nam Dong and Dong Giang, fifteen communes and 109 villages. Phu Loc and Nam Dong districts of TTH province have nine communes covered by the park, namely Loc Dien, Xuan Loc, Loc Hoa, Loc Tru, Huong Phu, Huong Loc, Thuong Lo, Thuong Nhat, and Thuong Long, and two towns, namely Phu Loc and Khe Tre. Meanwhile, Dong Giang district of QN province has four communes covered by BMNP, namely A Ting, Tu, Song Con and Ta Lu. The buffer zone of BMNP is home to 16,004 HHs belonging to four ethnic minority groups such as the Kinh, Co Tu, Van Kieu and Muong. The communes in Dong Giang district, QN province, had the highest proportion of poor HHs (Table 19), and similarly inhabited by ethnic minority groups. Thuong Long and Thuong Lo commune of Nam Dong district also had a high proportion of poor HHs. These two communes are also home to ethnic minority groups. In general, the communes in BMNP have a higher forest cover and in some communes about 90% of the area is forest lands.

TABLE 20. PERCENTAGE OF POOR HHS AND ETHNIC MINORITY GROUPS IN THE BUFFER ZONE COMMUNES OF BMNP

DISTRICT/COMMUNE	TOTAL HHS	% POOR HH	% ETHNIC GROUPS	% FOREST COVER
Dong Giang district				
A Ting commune	654	50	91	82
Song Con commune	660	63	86	82
Ta Lu commune	285	60	94	87
Tu commune	397	23	76	90
Nam Dong district				
Khe Tre town	888	2	1	38
Huong Loc commune	582	2	0	89.5
Huong Phu commune	874	2	2.6	72.5
Thuong Long commune	629	34	96	78
Thuong Lo commune	318	24	91	95
Thuong Nhat commune	545	14	93	89

Phu Loc district				
Phu Loc town	2,757	5	0.0	16
Loc Dien commune	3,375	7	0.0	56.5
Loc Hoa commune	741	10	0.0	64.5
Loc Tri commune	1,974	12	0.5	65
Xuan Loc commune	671	11	22	48

The policy on PFES in BMNP

According to BMNP's report in 2016, contracted forest protection activities with HHs were conducted in the three villages of A Ting and Song Con communes of Dong Giang district, in QN province, covering a total area of 3,141 ha. In 2016, the average payment made for every HH was 315,973 VND (≈14 USD) ha-1year-1). Meanwhile, in TTH province, the contracted forest protection activities with HHs were conducted in Thuong Lo commune of Nam Dong district for 10,671 ha and the average payment made for each HH in 2016 was 7,842 VND (≈0.3 USD) ha-1year-1. These payments were much lower compared to the forest protection payment regulated by Decree 99 on PFES. BMNP Vice Director, Vu Thanh Nam disclosed in an interview that BMNP continues to face threats from infrastructure development (e.g. hydropower plant and roads), over exploitation of NTFPs, wildlife hunting and trapping, illegal logging, forest encroachment and fragmentation.

5.2.2. MAIN FINDINGS FROM THE HH SURVEY

5.2.2.1. Demographic information

The average age of surveyed HH-heads in the four sampled villages of BMNP is 40.8 years (Table 20). In terms of education, most of the sampled HHs had level II (grade 6-9) as their highest educational attainment. More attention should be addressed to Cha Mang and Doi villages of Thuong Lo commune as they have higher illiteracy compared to HHs living in the villages of A Ting commune. The latter is poorer compared to the former commune with poor HHs as high as 62.5% of the sampled HHs in Cho Nech village and 43.5% in Pa Zih village. In Thuong Lo commune, the two sampled villages had contrasting conditions in terms of proportion of poor HHs. In Doi village, poor HHs account for 40% of the sample while it is only 6.7% in Cha Mang village. The latter has more non-poor HHs, representing up to 60% of the sample. In terms of family size and family labor, the lowest is found in Pa Zih village with 4.3 family members and 1.9 available labors.

TABLE 21. BASIC INFORMATION OF SURVEYED HHS

ITEMS	UNIT	A TING		THUONG LO		AVERAGE
		CHO NECH VILLAGE	PA ZIH VILLAGE	CHA MANG VILLAGE	DOI VILLAGE	
Age of HH	Year	38.1	38.6	45.4	40.9	40.8
Level of education						
Illiterate/never had formal education	%	3.1	0	6.7	8.6	4.6

Level I (grade 1-5)	%	37.6	26.1	20	22.8	26.6
Level II (grade 6-9)	%	34.3	43.5	33.4	42.8	38.5
Level III (grade 10-12)	%	12.5	8.6	33.4	25.7	20.1
Higher education	%	12.5	21.7	6.7	0	10.2
Average family member per HH	Person	4.6	4.3	4.4	4.7	4.5
Average labour per HH	Person	2.0	1.9	2.7	2.1	2.2
- Male	Person	0.9	1.2	1.6	1	1.2
- Female	Person	1.0	0.7	1.1	1.1	1.0
Average dependent person per HH	Person	2.3	2.3	1.6	2.2	2.1
Economic status						
Poor HH	%	62.5	43.5	6.7	40	38.2
Near-poor HH	%	9.4	13	33.3	31.4	21.8
Non-poor HH	%	28.1	43.5	60.0	28.6	40.1

5.2.2.2. Household assets and living conditions

Landuse types and HH landholding

The HH's landholding in A Ting is lower than in Thuong Lo commune (Table 21). In A Ting, the average is around 17,539m^2 (or 1.7 ha) and 21,751m^2 (2.1 ha) in Thuong Lo. There is a more contrasting difference amongst three HH groups in A Ting commune compared to Thuong Lo commune. The average landholding of poor HHs in this commune is 12,888m^2, 14,900m^2 for near-poor and 24,830m^2 for non-poor HHs. The agricultural lands of HHs in both communes are larger compared to their forestry lands. The smallest landholding belongs to the poor HHs in A Ting commune, with an average of 12,888m^2.

The main annual crop in the communes is cassava, which is cultivated in home gardens or mixed with acacia in the first year of the tree plantation. Like in SLNR, local people are highly attracted to acacia plantations due to perceived high income. An increasing number of HHs are trying to assume bare lands to convert into acacia plantation, while planting the tree in their home gardens also. However, some stakeholders anticipate a declining price trend in acacia pulp due to the market saturation.

TABLE 22. HH LANDHOLDING OF TWO LANDUSE TYPES

HH GROUP	TYPE OF LAND	A TING		THUONG LO	
		m^2	%	m^2	%
Poor HH	Agriculture	10,826	84	12,422	66
	Forestry/Acacia plantation	2,062	16	6,329	34

	Total area	12,888	100	18,751	100	
Near poor HH	Agriculture	12,500	84	13,000	65	
	Forestry/Acacia plantation	2,400	16	6,954	35	
	Total area	14,900	100	19,954	100	
Non-poor HH	Agriculture	23,265	94	15,500	58	
	Forestry/Acacia plantation	1,565	6.3	11,047	42	
	Total area	24,830	100	26,547	100	
Average		**17,539**	**100**	**21,751**	**100**	

Living conditions of surveyed HHs

The surveyed HHs in the buffer zone communes of BMNP had better household facilities compared to those in SLNR, for example in terms of ownership of television, mobile phone and electric fans (Table 22). Amongst the three HH groups, there was a slight tendency that non-poor HHs had higher facilities than poor or near-poor HHs, but this tendency is less apparent in Thuong Lo commune.

TABLE 23. FACILITIES OF SURVEYED HOUSEHOLDS IN A TING AND THUONG LO COMMUNES

ITEMS	NUMBER OF ITEM UNIT PER HH					
	A TING			THUONG LO		
	POOR HH	NEAR POOR HH	NON-POOR HH	POOR HH	NEAR POOR HH	NON-POOR HH
Radio	0.04	0.00	0.00	0.00	0.00	0.12
Television	0.89	0.86	0.80	1.25	1.15	1.24
CD/DVD video player	0.36	0.29	0.50	0.35	0.23	0.12
Computer	0.18	0.00	0.20	0.00	0.00	0.06
TV cable line	0.00	0.00	0.05	0.05	0.15	0.00
Internet	0.04	0.00	0.20	0.00	0.00	0.06
Landline phone	0.00	0.00	0.00	0.00	0.00	0.00
Mobile phone	0.82	0.29	0.75	1.10	0.77	0.76
Tablet	0.00	0.00	0.05	0.00	0.00	0.00
Laundry machine	0.00	0.00	0.05	0.00	0.00	0.00
Hot water boiler	0.00	0.00	0.00	0.00	0.00	0.06
Air conditioner	0.00	0.00	0.00	0.00	0.00	0.00
Clothes drying machine	0.00	0.00	0.00	0.00	0.00	0.00

Microwave oven	0.00	0.00	0.00	0.00	0.00	0.06
Electric fan	0.68	0.71	0.75	0.70	0.85	1.00
Fridge	0.11	0.00	0.15	0.20	0.08	0.18
Gas stove	0.14	0.00	0.15	0.00	0.08	0.24
Electronic stove	0.00	0.00	0.00	0.05	0.00	0.06
Others	0.00	0.00	0.00	0.10	0.08	0.06

5.2.2.3. Household access to public services

In relation to the access to educational institutions, while most of the surveyed HHs in Thuong Lo claimed they had a good or very good access to educational services, most of the HHs in A Ting commune did not have an access (Table 23). About 50% of the HHs in the two communes mentioned they didn't have access at all, or have poor access to vocational training. In Thuong Lo commune, there were many HHs that had poor access to agricultural expansion, legal counseling, water supply and environment and sanitation services whilst in A Ting, there is no specific service with have poor access.

TABLE 24. ACCESS TO PUBLIC SERVICES IN A TING AND THUONG LO COMMUNES

PUBLIC SERVICES	COMMUNE	LEVEL OF HH ACCESS (%) (1=NO ACCESS AT ALL; 5=VERY GOOD ACCESS)					
		1	2	3	4	5	TOTAL
Education services	A Ting	0.0	4.4	57.8	26.7	11.1	100
	Thuong Lo	1.9	0.0	24.1	46.3	27.8	100
Vocational training services	A Ting	25.0	25.0	8.3	25.0	16.7	100
	Thuong Lo	46.7	13.3	6.7	33.3	0.0	100
Health services	A Ting	5.1	5.1	9.0	44.9	35.9	100
	Thuong Lo	4.0	0.0	28.0	40.0	28.0	100
Public administration services	A Ting	0.0	0.0	20.0	56.0	24.0	100
	Thuong Lo	0.0	11.1	48.1	33.3	7.4	100
Crop productionextension services	A Ting	0.0	0.0	40.9	36.4	22.7	100
	Thuong Lo	19.5	41.5	29.3	7.3	2.4	100
Legal counseling services	A Ting	0.0	4.5	27.3	45.5	22.7	100
	Thuong Lo	39.4	12.1	27.3	12.1	9.1	100
Telecommunication services	A Ting	0.0	4.0	16.0	60.0	20.0	100
	Thuong Lo	0.0	0.0	27.3	54.5	18.2	100

Transportation services	A Ting	4.0	20.0	12.0	52.0	12.0	100
	Thuong Lo	0.0	9.1	77.3	9.1	4.5	100
Electricity services	A Ting	0.0	0.0	4.0	68.0	28.0	100
	Thuong Lo	0.0	0.0	3.4	55.2	41.4	100
Water supply services	A Ting	6.7	20.0	13.3	60.0	0.0	100
	Thuong Lo	87.5	7.5	5.0	0.0	0.0	100
Environment and sanitation services	A Ting	6.7	20.0	13.3	60.0	0.0	100
	Thuong Lo	87.5	7.5	5.0	0.0	0.0	100

Participation of HHs in meetings, trainings and workshops

In general, the surveyed HHs in the two sampled communes had better participation when it comes to forest protection and development law, PFES and community forest management issues and concerns (Table 24). In terms of sustainable livelihoods and marketing local products, which are two important themes for improving the livelihood, participation of local people in meetings, training and workshops was very low, especially in A Ting commune where no one has attended to any prgramme. However, those who reported participation in trainings, meetings and workshops mentioned that these activities were conducted in the commune and village centers to ensure their access to local people.

TABLE 25. PARTICIPATION OF LOCAL PEOPLE IN MEETINGS, TRAININGS AND WORKSHOPS

KEY THEMES/TOPICS	MEETINGS (%)		TRAININGS (%)		WORKSHOPS (%)	
	A TING	THUONG LO	A TING	THUONG LO	A TING	THUONG LO
Sustainable and/or adaptive livelihood models	22	18	17	42	0	40
Marketing for local products	2.4	7	0	15	0	20
Climate change adaptation	0	0	33	18	0	20
Climate change mitigation	17	13	17	15	0	20
Law on biodiversity	12	3	0	3	0	0
Forest protection and development law	95	83	17	58	0	0
PFES	61	65	17	48.5	0	20
Community forest management	66	83	67	58	0	40

5.2.2.4. Livelihood and gender

A Ting and Thuong Lo communes are inhabited by three ethnic groups, namely the Co Tu, Kinh and Pa Co. Co Tu and Kinh women were involved more than men, in managing the family's daily finances (Table 25). In general, it is only in this aspect where women clearly played a more important role

than men, except in the Kinh group wherein decisions regarding investment to start a new livelihood, expand existing livelihood options and children's education are taken mostly by women. In this group, the men mostly decide on matters in relation to financial or labour contribution to the community or social activities, while all other activities related to the family are performed by women. The most notable group is Pa Co wherein every activity and responsibility is always assumed jointly by men and women. In Co Tu, although most activities are undertaken together, some activities are clearly dominated by males.

TABLE 26. GENDER ROLE IN DECISION MAKING PROCESS

ACTIVITIES	ETHNIC GROUP	MALE (%)	FEMALE (%)	BOTH (%)	DON'T KNOW (%)	N/A (%)
Daily family expenses	Co Tu	7.4	57	34.7	0.8	0.0
	Kinh	33.3	66.7	0.0	0.0	0.0
	Pa Co	0.0	0.0	100	0.0	0.0
Investment to start a new livelihood model	Co Tu	21.5	10.7	61.2	1.6	4.9
	Kinh	0.0	33.3	0.0	33.3	33.3
	Pa Co	0.0	0.0	100	0.0	0.0
Investment to expand existing livelihood activities/business	Co Tu	28.9	7.4	57.8	1.6	4.1
	Kinh	0.0	33.3	0.0	0.0	66.7
	Pa Co	0.0	0.0	100	0.0	0.0
Purchase of HH assets	Co Tu	31.4	8.3	58.7	0.8	0.8
	Kinh	33.3	33.3	33.3	0.0	0.0
	Pa Co	0.0	0.0	100	0.0	0.0
Selling of HH assets	Co Tu	18.2	9.1	48.7	3.3	20.7
	Kinh	33.3	33.3	33.3	0.0	0.0
	Pa Co	0.0	0.0	100	0.0	0.0
Children's study	Co Tu	9.9	14.9	64.5	0.8	9.9
	Kinh	0.0	33.3	33.3	0.0	33.3
	Pa Co	0.0	0.0	100	0.0	0.0
Financial/labor contribution to community/social activities	Co Tu	17.4	16.5	56.2	6.6	3.3
	Kinh	66.7	33.3	0.0	0.0	0.0
	Pa Co	0.0	0.0	100	0.0	0.0

5.2.2.5. Livelihood and sources of income

In the poor HH group, the proportion of household who earned income from non-farm source is the highest (91%) and from crop production is the second (84%). Households who earned income

from NTFP and PFEST occupies a relatively large proportion, 51% and 33% respectively. Whereas, those who generated income from husbandry and forest plantation make up the lowest proportion, 16% and 22% respectively. This pattern can also be seen in the near-poor and non-poor HH groups. However, households who had income from PFES in these groups make up a higher proportion than in the poor group, 48% in the near-poor and 54% in the non-poor. In relation to husbandry, the proportions of these two groups are higher, 24% and 31% respectively.

On average, the annual income across all HH groups is 30,749 thousand VND (≈ 1,355 USD) (Table 26B). The annual income of the near-poor and non-poor group is similar and it is double than the poor group's. Particularly, the poor group had annual income of VND 18,274 thousand (≈ 805 USD), the near-poor group VND 34,258 thousand (≈ 1,509 USD, and the non-poor VND 39,714 thousand (≈ 1,750 USD).

TABLE 27A. SOURCES OF INCOME FOR EACH HH GROUP

HOUSEHOLD GROUP	INCOME SOURCE	No. of HH	%
Poor	Total	45	100
	Crop production	38	84
	Husbandry	7	16
	Forest plantation	10	22
	NTFPs	23	51
	PFES	15	33
	Other	41	91
Near-poor	Total	21	100
	Crop production	13	62
	Husbandry	5	24
	Forest plantation	4	19
	NTFPs	12	57
	PFES	10	48
	Other	19	90
Non-poor	Total	39	100
	Crop production	30	77
	Husbandry	12	31
	Forest plantation	10	26
	NTFPs	14	36
	PFES	21	54
	Other	37	95

TABLE 28B. AVERAGE INCOME OF HOUSEHOLD				
Household groups	N	VND	SD	Sig
Poor	41	18,273,878	9,467,500	0.061
Near-poor	21	34,258,571	24,129,723	0.083
Non-poor	32	39,714,688	22,962,927	0.065
Average		30,749,046		

5.2.2.6. Constraints to livelihood improvement

In general, the communes in BMNP also have a high poverty rate and poor farmers have low income contribution from on-farm sector. Concerning constraints to livelihood improvement, by lumping all sample villages and communes, 48% of the sample HHs that responded to the question claimed financial limitation as the main constraint, 38% identified labour limitation, 10% lack of knowledge of better farming system and 5% lack of available land.

5.2.2.7. Land tenure and food security

Most HHs in A Ting commune had no certificate for all their land (Table 27). In Pa Zih village of this commune, all surveyed HHs had no land certificates at all. In contrast, most of the HHs in Thuong Lo commune have land certificates. In Cha Mang village of this commune, the proportion of HHs with land certificates is 71.4% while it is 72% in Doi village.

TABLE 29. PROPORTION OF SURVEYED HOUSEHOLDS WITH LANDUSE CERTIFICATES				
STATUS	A TING		THUONG LO	
	CHO NECH VILLAGE	PA ZIH VILLAGE	CHA MANG VILLAGE	DOI VILLAGE
Have land certificate for all land types	0.0	0.0	71.4	72.0
Have land certificate for some of land types	3.6	0.0	14.3	4.0
Don't have land certificate for all land types	96.4	100.0	14.3	24.0
Rented	0.0	0.0	0.0	0.0
Don't know	0.0	0.0	0.0	0.0

In relation to the food security, the average area of agricultural land managed or cultivated by HHs in A Ting and Thuong Lo communes is more than 1,600m^2 (Table 28), thus meeting the Vietnamese standard requirement for food security HHs. However, 32 from 105 sample HHs in BMNP (30%) reported that they experience food shortage in the last three years, for about 34 (± 5.8) days per year. This indicates that the measure to ensure food security should consider other factors, not merely the size of the agricultural lands.

TABLE 30. AREA OF AGRICULTURAL LAND PER HOUSEHOLD

COMMUNE	AVERAGE PADDY FIELD AREA PER HH (M2)	AVERAGE MAIZE FIELD AREA PER HH (M2)	AVERAGE CASSAVA FIELD AREA PER HH (M2)	TOTAL
A Ting	1,717	900	333	2,950
Thuong Lo	-	581	1,854	2,435

5.2.2.8. Household awareness on forest biodiversity

HH's awareness on threats to forest biodiversity and natural resources

The surveyed HHs in the two sampled communes considered logging as the main threat to BMNP (Table 29). About 94% of the respondents in A Ting and 90% in Thuong Lo claimed so. Other identified threats were wildlife hunting and fire, claimed by 47.9% and 43.8% of surveyed HHs in A Ting commune respectively and 55.9% and 50.8% in Thuong Lo commune, respectively. Mining natural resources such as gold was another threat claimed by 18.8% and 39% of surveyed HHs in A Ting and Thuong Lo commune, respectively. The mining was carried out in streams across reserves and buffer zones by outsiders, creating chemical pollution and disruption to natural habitat. It is hard to stop mining because of its considerable contribution to local economy; however, it should be better controlled to mitigate negative impacts to reserves.

TABLE 31. LOCAL KNOWLEDGE ON THREATS TO FOREST BIODIVERSITY AND NATURAL RESOURCES IN BMNP

COMMUNE	THREATS (%)					
	WILDLIFE HUNTING	ILLEGAL LOGGING	MINING OF NATURAL RESOURCES	FIRING	OTHER	AVERAGE
A Ting	47.9	93.8	18.8	43.8	8.3	42.5
Thuong Lo	55.9	89.8	39.0	50.8	5.1	48.1
Average	51.9	91.8	28.9	47.3	6.7	45.3

HH's awareness of law enforcement in the communes

The surveyed HHs are highly aware on law enforcement activities related to forest protection, boundaries of protected forests and ilegal logging (Table 30). in relation to law enforcement, the lowest awareness was on biodiversity conservation and on endangered wildlife species. Both A Ting and Thuong Lo communes were aware about law enforcement on these issues.

TABLE 32. LOCAL KNOWLEDGE ON LAW ENFORCEMENT IN THE COMMUNES

COMMUNE	AWARENESS ON LAW ENFORCEMENT (%)					
	ON BIODIVERSITY CONSERVATION	ON FOREST PROTECTION	ON ENDANGERED WILDLIFE SPECIES	ON THE BOUNDARIES OF PROTECTED AREAS IN THE REGION	ON ILLEGAL WILDLIFE HUNTING AND TRAPPING	ON ILLEGAL LOGGING
A Ting	13.50	92.30	0.00	71.20	51.90	46.20
Thuong Lo	9.00	82.10	0.00	65.70	68.70	82.10
Average	11.25	87.2	0.00	68.45	60.3	64.15

5.2.3. CONCLUSION OF HOUSEHOLD CONDITIONS IN BMNP

The sampled communes of BMNP also had a forest landscape with 80% forest area. The inhabitants of communes are mostly ethnic minority groups, dominating 91% of the communes' population. About 50% of the HHs in the communes are classified poor. In terms of education, a large portion of HHs had formal education, with most HHs attending school up to level I or II. The average HH size is four with two available family labor. The average HH landholding is around 2ha, and in general, all HHs have both crop production and forestry lands with the former generally being bigger in size (1.5 ha) than the latter (0.5 ha). Most HHs have land certificates in Thuong Lo commune, but not in A Ting commune and by lumping all sampled villages and communes, 30% of the sampled HHs reported that they experienced food shortage in the last three years, with a duration of about 34 days per year. Financial limitation was claimed as the main constraint to livelihood improvement. In terms of access to public services, many residents in Thuong Lo commune lacked access to vocational training, water supply, and environment and sanitation services. Non-farm and crop production were income source of at least 62% and 90% households respectively. NTPF and PFES generated income to at least 36% households. The annual income across all HH groups is 30,749 thousand VND (≈ 1,355 USD) (Table 26B). The difference in annual income between the poor HH group and the other two HH groups is considerable, but minimal between the near-poor and non-poor HH group. In general, the role of women in the family is dominant only in managing the family's daily finances, except in the Kinh group where most decisions were made by women. In terms of threats to BMNP, HH respondents and local authorities claimed illegal logging, wildlife hunting and forest fire as the main threats.

5.3. PHONG DIEN NATIONAL RESERVE

5.3.1. OVERVIEW OF PDNR

PDNR is located northwest of TTH province, with northern latitude 16017' to 16035' and eastern longitude 107003' to 107020'. The total area of the reserve is 41,508ha with 43, 600ha of buffer zone. The buffer zone intersects Phong Dien and A Luoi districts of TTH province and consists nine communes, namely Phong My, Phong Xuan, and Phong Son communes in Phong Dien district and Hong Van, Hong Trung, Hong Kim, Bac Son, Hong Ha and Hong Thuy communes in A Luoi district. In total, the buffer zone includes 69 villages. In 2016, the total population in the buffer zone was 8,794 HHs belonging to five ethnic minority groups, namely Pa Hy, Pa Co, Ta Oi, Van Kieu and Co Tu (Table 31). Most of the communes in PDNR have forest cover above 50% of the total area.

TABLE 33. DISTRIBUTION OF ETHNIC MINORITY GROUPS AND POOR HHS				
DISTRICT/COMMUNE	TOTAL HHS	POOR HHS (%)	ETHNIC MINORITY (%)	FOREST COVER (%)
A Luoi district				
Bac Son commune	298	42	99.3	47.3
Hong Ha commune	424	29	92.0	80.7
Hong Kim commune	526	44	97.9	88.5
Hong Thuy commune	759	35	99.1	56.0
Hong Trung commune	544	54	98.3	72.5
Hong Van commune	780	52	96.5	54.0
Phong Dien district				
Phong My commune	1560	7	0.0	77.9
Phong Son commune	2351	7	0.0	43.4
Phong Xuan commune	1552	5	0.0	73.6

The policy on PFES in PDNR

According to PDNR's report in 2016, PFES payments were disbursed to HHs, individuals and organizations. The contracted forest protection activities covered 14,000ha of forests. In 2016, the average payment per HH was 214,000 VND (≈9.4 USD) ha per year. Forest ranger Tran Xuan Hai revealed that the integrity of PDNR is threatened by forest encroachment with slash and burn practices, fragmentation, forest fire, illegal logging, wildlife hunting and trapping and gold mining.

5.3.2. MAIN FINDINGS FROM THE HOUSEHOLD SURVEY

5.3.2.1. Demographic information

The average age of the surveyed HH heads in the four sampled villages of PDNR is 40.3 years (Table 32). In terms of education, a higher percentage of the sampled HHs in Hong Ha commune have attended school up to level I only, while it is level II or III for HHs in Hong Kim commune. The illiteracy rate in A Tia 2 village in Hong Kim commune is slightly lower compared to other villages. However, Hong Kim commune has higher proportion of poor farmers while A Tia 2 village being the poorest, with 52.5% poor farmers from the total. In this instance poverty was not correlated with educational level or illiteracy. In terms of family size and family labour, the highest available family labourers were found in A Tia 2 village with 4-5 members.

TABLE 34. BASIC INFORMATION OF SURVEYED HHS						
ITEMS	UNIT	HONG HA		HONG KIM		AVERAGE
		PA HY VILLAGE	PA RING VILLAGE	DUT I VILLAGE	A TIA 2 VILLAGE	
Age of HH head	Year	42.8	45.6	37.5	35.1	40.3

Level of education						
Illiterate/never had formal education	%	21.6	20.0	20.0	16.3	19.5
Level I (grade 1-5)	%	35.1	30.0	25.0	16.3	26.6
Level II (grade 6-9)	%	21.6	10.0	15.0	34.9	20.4
Level III (grade 10-12)	%	10.8	23.3	25.0	30.3	22.4
Higher education	%	10.8	16.7	15.0	2.3	11.2
Average family member per HH	Person	4.2	4.3	4.1	4.6	4.3
Average labour per HH	Person	1.8	1.6	1.4	1.9	1.7
- Male	Person	0.9	0.9	0.7	1.0	0.9
- Female	Person	0.9	0.7	0.7	0.9	0.8
Average dependent person per HH	Person	2.3	2.7	2.9	2.4	2.6
Economic status						
Poor HH	%	48.6	16.7	51.2	52.5	42.3
Near-poor HH	%	13.5	6.7	2.3	10.0	8.1
Non-poor HH	%	37.8	76.7	46.5	37.5	49.6

5.3.2.2. Household assets and living conditions

Land use types and HH landholding

A wide difference exists in the average HH landholdings between the two sampled communes (Table 33). In Hong Ha, the average is around 23,674m^2 (or 2.3 ha) while it is 9,450m2 (or 0.9 ha) in Hong Kim commune. In the first commune, the non-poor HHs have much larger landholding compared to poor and near-poor HHs. On average, non-poor HHs have 43,214 m^2 (or 4.3 ha) while the poor and near-poor HH groups have around 10,959m^2 and 16,850m^2 only. In both communes HH landholding of agricultural land are higher than forestry land. Only the near-poor HHs of Hong Kim commune have slightly smaller agricultural land than their forestry land.

TABLE 35. HH LANDHOLDING FOR TWO TYPES OF LANDUSES

HH GROUP	TYPE OF LAND	HONG HA		HONG KIM	
		m2	%	m2	%
Poor HH	Agriculture	7,750	71	4,319	76.5
	Forestry/Acacia plantation	3,209	29	1,323	23.5
	Total area	10,959	100	5,642	100
Near-poor HH	Agriculture	13,750	82	4,125	49
	Forestry/Acacia plantation	3,100	18	4,250	51

	Total area	16,850	100	8,375	100
Non-poor HH	Agriculture	38,845	90	12,354	86
	Forestry/Acacia plantation	4,369	10	1,978	14
	Total area	43,214	100	14,333	100
Average		23,674	100	9,450	100

Living conditions of surveyed HHs

Like in SLNR and BMNP, the surveyed HHs in the buffer zone communes of PDNR generally had better facilities, including television, mobile phones and electric fans (Table 34). Amongst the three HH groups, there was no clear tendency that non-poor HHs have more facilities than poor or near-poor HHs.

TABLE 36. HH FACILITIES OF SURVEYED HHS IN HONG HA AND HONG KIM COMMUNES

ITEMS	NUMBER OF ITEM/UNIT PER HH					
	HONG HA			HONG KIM		
	POOR HH	NEAR-POOR HH	NON-POOR HH	POOR HH	NEAR-POOR HH	NON-POOR HH
Radio	0.00	0.00	0.00	0.02	0.00	0.00
Television	0.86	0.78	0.86	0.73	1.00	0.91
CD/DVD video player	0.09	0.00	0.11	0.18	0.00	0.18
Computer	0.09	0.11	0.22	0.18	0.00	0.15
TV cable line	0.09	0.00	0.08	0.11	0.20	0.15
Internet	0.05	0.11	0.17	0.05	0.00	0.12
Landline phone	0.00	0.00	0.00	0.00	0.00	0.00
Mobile phone	0.68	0.67	0.58	0.82	0.60	0.82
Tablet	0.05	0.00	0.00	0.00	0.00	0.00
Laundry machine	0.05	0.00	0.11	0.02	0.00	0.00
Hot water boiler	0.05	0.00	0.08	0.09	0.00	0.06
Air conditioner	0.00	0.00	0.00	0.00	0.00	0.00
Clothes drying machine	0.00	0.00	0.00	0.00	0.00	0.03
Microwave oven	0.00	0.00	0.00	0.02	0.00	0.00
Electric fan	0.82	0.89	0.75	0.48	0.60	0.47
Fridge	0.14	0.11	0.28	0.07	0.00	0.03
Gas stove	0.18	0.22	0.36	0.23	0.20	0.18

Electronic stove	0.05	0.00	0.03	0.05	0.00	0.03
Others	0.36	0.22	0.44	0.05	0.20	0.06

5.3.2.3. Household access to public services

A higher proportion of surveyed HHs in both communes claimed to have good access to educational institutions, especially in Hong Kim commune with 60% of HHs claiming so (Table 35). For vocational training, majority of surveyed HHs in both communes reported poor access. This was particularly the case in Hong Ha commune with 83.3% HHs claiming to have no access to any vocational training at all. However, in general, they reported good access to health, public transportation, crop production expansion and legal counseling services while Hong Kim HHs have limited access to these services.

TABLE 37. ACCESS TO PUBLIC SERVICES IN HONG HA AND HONG KIM COMMUNES

PUBLIC SERVICES	COMMUNE	LEVEL OF SURVEYED HH'S ACCESS (%) (1=NO ACCESS AT ALL; 5=VERY GOOD ACCESS)					
		1	2	3	4	5	TOTAL
Education services	Hong Ha	0.0	9.1	30.3	39.4	21.2	100
	Hong Kim	0.0	4.4	17.8	60.0	17.8	100
Vocational training services	Hong Ha	83.3	5.6	5.6	2.8	2.8	100
	Hong Kim	23.5	38.2	14.7	23.5	0.0	100
Health services	Hong Ha	0.0	3.8	34.6	51.3	10.3	100
	Hong Kim	0.0	0.0	23.9	49.3	26.9	100
Public administration services	Hong Ha	1.6	3.1	12.5	51.6	31.3	100
	Hong Kim	1.1	7.7	16.5	47.3	27.5	100
Crop productionextension services	Hong Ha	20.0	12.5	10.0	55.0	2.5	100
	Hong Kim	23.3	20.9	18.6	27.9	9.3	100
Legal counseling services	Hong Ha	26.2	4.8	9.5	47.6	11.9	100
	Hong Kim	7.8	10.9	34.4	32.8	14.1	100
Telecommunication services	Hong Ha	1.7	3.3	10.0	41.7	43.3	100
	Hong Kim	11.1	25.0	26.4	30.6	6.9	100
Transportation services	Hong Ha	0.0	12.5	9.4	43.8	34.4	100
	Hong Kim	1.2	15.5	26.2	39.3	17.9	100
Electricity services	Hong Ha	0.0	2.9	4.3	42.0	50.7	100
	Hong Kim	1.1	2.2	24.2	57.1	15.4	100
Water supply services	Hong Ha	79.5	15.4	0.0	2.6	2.6	100

	Hong Kim	70.8	4.2	4.2	13.9	6.9	100
Environment and sanitation services	Hong Ha	79.5	15.4	0.0	2.6	2.6	100
	Hong Kim	70.8	4.2	4.2	13.9	6.9	100

Participation of HHs in meetings, trainings and workshops

In terms of participation in meetings, trainings and workshops, surveyed HHs in the two sampled communes had better participation in meetings, trainings and workshops when it comes to forest protection and development law, PFES and community forest management and sustainable livelihood models as the themes (Table 36). In contrast, participation in trainings related to marketing local products, which is an important aspect of improving livelihoods is none to low in both communes. In Hong Kim, surveyed HHs has never attended a training, workshop or meeting regarding climate change. In Hong Ha commune, nobody has ever attended a training about laws on biodiversity protection or management.

TABLE 38. HH PARTICIPATION IN MEETINGS, TRAININGS AND WORKSHOPS

KEY THEMES/TOPICS	MEETINGS (%)		TRAININGS (%)		WORKSHOPS (%)	
	HONG HA	HONG KIM	HONG HA	HONG KIM	HONG HA	HONG KIM
Sustainable and/or adaptive livelihood models	21.40	43.90	42.90	45.80	16.70	50.00
Marketing for local products	11.90	1.80	0.00	4.20	0.00	0.00
Climate change adaptation	0.00	0.00	14.30	16.70	16.70	0.00
Climate change mitigation	7.10	31.60	21.40	12.50	16.70	0.00
Law on biodiversity	11.90	35.10	0.00	20.80	0.00	33.30
Forest protection and development law	81.00	87.70	57.10	58.30	66.70	50.00
PFES	57.10	36.80	35.70	29.20	33.30	16.70
Community forest management	78.60	70.20	57.10	45.80	33.30	50.00

5.3.2.4. Livelihood and gender

Hong Kim and Hong Ha communes comprised five main ethnic minority groups, namely Co Tu, Pa Hy, Pa Co, Van Kieu and Ta Oi. In all ethnic groups women had a more important role in managing daily family expenses (Table 37). Especially in Pa Hy and Van Kieu ethnic groups, this task is fully handled by women alone. In the Kinh group, most activities are handled by women or assumed jointly by men and women. In the Pa Hy group, decision-making related to children's education and financial or labor contribution to community/social activities are fully assumed by women. Similar to the Pa Hy group, decision-making related to children's education and financial or labor contribution to community/social activities are also fully assumed by women in the Van Kieu group while investments to expand existing livelihoods are jointly decided by the husband and wife.

TABLE 39. GENDER ROLES IN DECISION-MAKING

ACTIVITIES	ETHNIC GROUP	MALE (%)	FEMALE (%)	BOTH (%)	DON'T KNOW (%)	N/A (%)
Daily family expenses	Co Tu	13.64	40.91	45.45	0.00	0.00
	Kinh	0.00	90.00	10.00	0.00	0.00
	Pa Hy	0.00	100.00	0.00	0.00	0.00
	Pa Co	17.53	54.64	26.80	1.03	0.00
	Van Kieu	0.00	100.00	0.00	0.00	0.00
	Ta Oi	11.11	72.22	16.67	0.00	0.00
Investment to start a new livelihood model	Co Tu	18.18	9.09	72.73	0.00	0.00
	Kinh	10.00	40.00	40.00	0.00	10.0
	Pa Hy	0.00	50.00	50.00	0.00	0.00
	Pa Co	24.74	21.65	49.48	1.03	3.09
	Van Kieu	0.00	0.00	100.00	0.00	0.00
	Ta Oi	27.78	44.44	27.78	0.00	0.00
Investment to develop/expand existing livelihood activities/business	Co Tu	13.64	9.09	77.27	0.00	0.00
	Kinh	10.00	40.00	40.00	0.00	10.0
	Pa Hy	0.00	50.00	50.00	0.00	0.00
	Pa Co	26.80	19.59	48.45	1.03	4.12
	Van Kieu	0.00	0.00	100.00	0.00	0.00
	Ta Oi	27.78	38.89	33.33	0.00	0.00
Purchase of HH assets	Co Tu	13.64	9.09	77.27	0.00	0.00
	Kinh	0.00	50.00	50.00	0.00	0.00
	Pa hy	0.00	50.00	50.00	0.00	0.00
	Pa Co	24.74	17.53	46.39	1.03	10.31
	Van Kieu	0.00	100.00	0.00	0.00	0.00
	Ta Oi	27.78	38.89	33.33	0.00	0.00
Selling of HH assets	Co Tu	9.09	9.09	77.27	0.00	4.55
	Kinh	10.00	40.00	50.00	0.00	0.00
	Pa hy	0.00	50.00	50.00	0.00	0.00
	Pa Co	17.53	13.40	42.27	2.06	24.74
	Van Kieu	0.00	100.00	0.00	0.00	0.00
	Ta Oi	33.33	38.89	22.22	0.00	5.56

Children's study	Co Tu	4.55	27.27	59.09	0.00	9.09
	Kinh	0.00	40.00	40.00	0.00	20.00
	Pa hy	0.00	100.00	0.00	0.00	0.00
	Pa Co	15.46	18.56	58.76	0.00	7.22
	Van Kieu	0.00	0.00	100.00	0.00	0.00
	Ta Oi	5.56	44.44	27.78	0.00	22.22
Financial/labor contribution to community/social activities	Co Tu	9.09	18.18	72.73	0.00	0.00
	Kinh	10.00	60.00	30.00	0.00	0.00
	Pa hy	0.00	100.00	0.00	0.00	0.00
	Pa Co	22.68	20.62	49.48	2.06	5.15
	Van Kieu	0.00	100.00	0.00	0.00	0.00
	Ta Oi	22.22	44.44	33.33	0.00	0.00

5.3.2.5. Livelihood and sources of income

Households who earn income from non-farm sector and crop production in all HH groups have the highest proportion of income, 91% and 78% at least. This proportion is at least double than that of households who earned income from the other income sources. In contrast, households who made income from husbandry and forest plantation occupied a relatively small proportion (25% at most). For income from PFES, the proportion of the poor HH group (23%) is much lower than the other HH groups (39% at least). It seems that it is unequal in term of participation in PFES program between the poor HH group and the others.

The annual income across all HH groups is 29,102 thousand VND (≈ 1,282 USD) on average (Table 38B). The non-poor HH group had an average income of 64,752 thousand VND (≈ 2.853 USD), which is 4 times larger the near-poor group (16,448 thousand VND or 725 USD) and over ten times than the poor HH group (6,107 thousand VND or 269 USD).

TABLE 40A. SOURCES OF INCOME FOR EACH HH GROUP

HOUSEHOLD GROUP	INCOME SOURCE	No. of HH	%
Poor	Total	66	100
	Crop production	59	89
	Husbandry	10	15
	Forest plantation	10	15
	NTFPs	13	20
	PFES	15	23
	Other	60	91
Near-poor	Total	12	100

	Crop production	11	92
	Husbandry	1	8
	Forest plantation	3	25
	NTFPs	2	17
	PFES	5	42
	Other	11	92
Non-poor	Total	72	100
	Crop production	57	79
	Husbandry	15	21
	Forest plantation	18	25
	NTFPs	5	7
	PFES	28	39
	Other	69	96

TABLE 41B AVERAGE INCOME OF HOUSEHOLD

Household groups	N	VND	SD	Sig
Poor	25	6,107,320	2,398,797	0.109
Near-poor	11	16,448,182	9,468,422	0.488
Non-poor	58	64,751,919	38,693,470	0.051
Average		29,102,000		

5.3.2.6. Constraints to livelihood improvement

In PDNR, in relation to constraints to livelihood improvement, 37% of the sampled HHs in the communes that responded to the question claimed labour limitation as the main constraint, followed by financial limitation (32%), health problem (16%), lack of knowledge of better farming system (7%) and short loan payback (5%).

5.3.2.7. Land tenure and food security

Most HHs in Hong Kim commune have certificates for all their entire land (Table 39). Particularly in A Tia 2 village, all surveyed Hong Kim HHs had land certificates. However, the situation is different in Hong Kim commune in elsewhere with lower proportion of HHs possessing land certificates. In Pa Ring village, 38% of the surveyed HHs has no certificate for all their entire land.

TABLE 42. PROPORTION OF SURVEYED HHS WITH LANDUSE CERTIFICATES

STATUS	HONG HA (%)		HONG KIM (%)	
	PA HY VILLAGE	PA RING VILLAGE	DUT 1 VILLAGE	A TIA 2 VILLAGE
Have land certificate for all land types	65.4	42.9	81.8	100.0
Have land certificate for some of land types	7.7	14.3	4.5	0.0
Don't have land certificate for all land types	23.1	38.1	4.5	0.0
Rented	0.0	4.8	0.0	0.0
Don't know	3.8	0.0	9.1	0.0

In relation to food security, HHs both in Hong Ha and Hong Kim communes have an average area of agricultural lands more than 1,600 m2 (Table 40). Hence, they pass the Vietnamese definition of a food secure household. However, by lumping all sampled villages and communes, in PDNR 87 from 150 sampled HHs (58%) claimed that they experienced food shortage in the last three years with shortage duration of about 62 (± 7.7) days per year. It again indicates that any intervention in food security should consider other factors, rather than merely the landholding area.

TABLE 43. AREA OF AGRICULTURAL LAND OWNED/CULTIVATED BY HHS

COMMUNE	AVERAGE PADDY FIELD AREA PER HH (M2)	AVERAGE MAIZE FIELD AREA PER HH (M2)	AVERAGE CASSAVA FIELD AREA PER HH (M2)	TOTAL
Hong Ha	2,667	1,978	1,625	6,270
Hong Kim	-	478	6,217	6,694

5.3.2.8. Household awareness of forest biodiversity

HH's awareness on threats to forest biodiversity and natural resources

The surveyed HHs in the two sampled communes considered logging as the main threat to PDNR (Table 41). About 94% of the respondents in Hong Ha and 94.7% in Hong Kim claimed so. Other threats are fire and wildlife hunting supported by 44% and 50% of surveyed HHs in Hong Ha commune respectively and 62.7% and 30.7% in Hong Kim commune, respectively. Mining natural resources is also regarded as a threat to PDNR by 8% and 24% of surveyed HHs in Hong Ha and Hong Kim commune, respectively.

TABLE 44. LOCAL KNOWLEDGE ON THREATS TO FOREST BIODIVERSITY AND NATURAL RESOURCES IN PDNR

COMMUNE	THREATS (%)					
	WILDLIFE HUNTING	ILLEGAL LOGGING	MINING OF NATURAL RESOURCES	FIRING	OTHER	AVERAGE
Hong Ha	50.00	94.00	8.00	44.00	0.00	39.2
Hong Kim	30.70	94.70	24.00	62.70	5.30	43.48

Average	40.35	94.35	16.00	53.35	2.65	41.34

HH's awareness on law enforcement in the communes

The surveyed HHs in the two communes are highly aware on law enforcement related to different issues except endagered wildlife species (Table 42). For the latter, none in both communes were aware on this issue. The highest awareness displayed by HHs relates to law enforcement on forest protection and illegal logging.

TABLE 45. LOCAL KNOWLEDGE ON LAW ENFORCEMENT IN THE COMMUNES

COMMUNE	ISSUES (%)					
	ON BIODIVERSITY CONSERVATION	ON FOREST PROTECTION	ON ENDANGERED WILDLIFE SPECIES	ON THE BOUNDARIES OF PROTECTED AREAS	ON ILLEGAL WILDLIFE HUNTING AND TRAPPING	ON ILLEGAL LOGGING
Hong Ha	21.6	70.6	0.0	80.4	54.9	78.4
Hong Kim	51.5	86.4	0.0	57.6	62.1	63.6
Average	36.5	78.5	0.0	69.0	58.5	71.0

5.3.3. CONCLUSION OF HH CONDITIONS IN PDNR

The sampled communes of PDNR also have la arge forest area with about 72% forest cover. Inhabitants are mostly ethnic minority groups, comprising more than 90% of the population. About 37% of HHs in the commune belongs to the poor category. A large portion of HHs had formal education and the illiteracy rate is comparatively high as 19% of the total HHs. The average HH size is 4-5 with 1-2 available family labor. The average HH landholding is 1.7ha and in general, all HHs have both crop production and forestry lands, generally the former being bigger (1.3 ha) than the latter (0.4 ha). Most HHs are in possession of land certificates, and by lumping all sampled villages and communes, it reveals that 58% of the sampled HHs reported that they have experienced food shortage in the last three years, for a duration of about 62 days per year. Labour and financial limitations have been claimed as the main constraint to livelihood improvement. In terms of access to the public services, more HHs expressed the lack of access to vocational training, water supply and environment and sanitation services. The annual income of a household is 29,102 thousand VND (≈ 1,282 USD) on average. Most of households had income from crop production and non-farm while those who earned income from husbandry, forest plantation and NTFP make up the lowest proportion. PFES is income source for at least 23% households.

In general, the role of women is dominant in terms of managing the family's daily expense, while women's role is minimal in other activities across the three main ethnic groups, namely Kinh, Pa Hy, and Van Kieu. Finally, majority of HHs mentioned illegal logging, wildlife hunting and forest fire as main threats to the PDNR.

5.4. SONG THANH NATIONAL RESERVE

5.4.1. OVERVIEW OF STNR

STNR is located northwest of QN province with a total area of 75,274ha, of which 56,590ha is part of Nam Giang district and 18,683ha in Phuoc Son district. Its buffer zone intersects Nam Giang and Phuoc Son districts and cover 14 communes, namely Ta Bhing, Ca Dy, Ta Poo, Cha Val, La De, Dac Pre, and Da Pring communes of Nam Giang district, and Phuoc Xuan, Phuoc Nang, Phuoc My, Phuoc Cong, Phuoc Duc, Phuoc Thanh communes and Kham Duc town of Phuoc Son district. The buffer zone is inhabited by 7,782 HHs belonging to four main ethnic minority groups such as the Co Tu, Ve, Ta Rieng, and Gie Trieng. Co Tu is the dominant ethnic group after Kinh. Most buffer-zone communes are reportedly very poor (Table 43). Currently, the Management Board of STNR is implementing the policies on PFES and special-use forest development and investment (Decision No 24/QĐ-TTg). In this reserve, in general, the forest lands cover more than 60% of the area.

TABLE 46. DISTRIBUTION OF POOR HHS AND ETHNIC MINORITY GROUPS IN THE BUFFER ZONE COMMUNES OF STNR

DISTRICT/COMMUNE	TOTAL HHS	POOR HH (%)	ETHNIC GROUP (%)	FOREST COVER (%)
Nam Giang district				
Ca Dy commune	883	72	85.0	68.58
Cha Val commune	700	65	99.0	63.36
Dak Pre commune	341	66	99.7	65.55
Dak Pring commune	297	73	100.0	83.75
La Dee commune	396	53	100.0	65.05
La Ee commune	220	59	99.0	59.97
Ta Bhing commune	656	50	92.0	65.99
Phuoc Son district				
Kham Duc town	1761	22	29.0	74.89
Phuoc Cong commune	221	52	95.0	82.87
Phuoc Duc commune	582	44	63.0	76.38
Phuoc My commune	381	62	95.0	82.97
Phuoc Nang commune	632	53	93.0	82.08
Phuoc Thanh commune	418	77	95.4	71.77
Phuoc Xuan commune	293	33	89.0	81.38

The policy on PFES in STNR

According to the 2016 STNR report, PFES payments had been made to individual HHs and HH groups. Contracted forest protection activities covered 46,213ha of forests with 53 HHs participating in the scheme. In 2016, the average payment per HH was 200,000 VND (≈8.8 USD).

Presently STNR is exposed to major threats such as habitat loss and fragmentation, illegal logging, wildlife hunting and trapping and over exploitation of NTFPs.

5.4.2. FINDINGS FROM THE HOUSEHOLD SURVEY

5.4.2.1. Demographic information

The average age of surveyed HH heads in the three sampled villages of STNR is 35.4 years (Table 44). In terms of education, a higher proportion of the sampled HHs had level II as the highest educational attainment. However, in Lao Du village of Phuoc Xuan commune, a higher percentage of HHs have attended school up to level I only. Illiteracy rate is very high in Phuoc Xuan commune in Nuoc Lang village, although 33.3% of the surveyed HHs claimed that they have attended to schools up to level II. Illiteracy was found lower as 6-7% in the other two villages. Both communes had a very high percentage of poor farmers. Village 58 of Dac Pre commune is the poorest with 75.9% poor HHs, 20.7% near-poor, and only 3.4% non-poor HHs. Again, it is evident that poverty is not correlated with educational level or literacy. In terms of family size and family labour, Nuoc Lang village of Phuoc Xuan commune has the highest average family size while Village 58 of Dac Pre commune has more average family labour per HH (Table 44).

TABLE 47. BASIC INFORMATION OF SURVEYED HHS IN STNR

ITEMS	UNIT	DAC PRE	PHUOC XUAN		AVERAGE
		VILLAGE 58	LAO DU VILLAGE	NUOC LANG VILLAGE	
Age of HH head	Year	37.0	37.1	32.2	35.4
Level of education					
Illiterate/never had formal education	%	6.9	6.2	44.4	19.2
Level I (grade 1-5)	%	24.1	37.6	11.1	24.3
Level II (grade 6-9)	%	31.0	37.5	33.3	33.9
Level III (grade 10-12)	%	27.6	18.7	11.1	19.1
Higher education	%	10.3	0.0	0.0	3.4
Average family member per HH	Person	4.3	4.4	5.4	4.7
Average labour per HH	Person	2.3	1.4	1.7	1.8
- Male	Person	1.3	0.8	0.9	1.0
- Female	Person	1.1	0.6	0.8	0.8
Average dependent person per HH	Person	1.9	3.1	3.2	2.7
Economic status					
Poor HH	%	75.9	56.2	66.7	66.3
Near-poor HH	%	20.7	31.2	11.1	21.0

Non-poor HH	%	3.4	12.5	22.2	12.7

5.4.2.2. Household assets and living conditions

Land use and HH landholding

There is a difference in the average landholding of HHs between the two sampled communes (Table 45). In Dac Pre, the average is around 28,164m^2 (or 2.8ha) and 32,597m^2 in Phuoc Xuan commune. In both communes, there is contrasting difference in the total landholdings of HHs between the non-poor, near-poor and poor. The total landholding of non-poor HHs is much higher than that of the poor and near-poor HHs. On average, non-poor HHs in Dac Pre commune has 50,600m2 of land (or about 5.1 ha) per HH, while the near-poor and poor HHs have 22,325m^2 and 11,566m^2 of land, respectively. In Phuoc Xuan commune, non-poor HHs have 50,250m^2, while the near-poor and poor HHs have only 27,167m^2 and 20,373m^2, respectively. In this commune, the three HH groups have larger agricultural land sizes compared to forestry lands.

TABLE 48. HH LANDHOLDING FOR TWO TYPES OF LANDUSE

HH GROUP	TYPE OF LAND	DAC PRE		PHUOC XUAN	
		m^2	%	m^2	%
Poor HH	Agriculture	5,000	43.2	14,000	68.7
	Forestry/Acacia plantation	6,567	56.8	6,373	31.3
	Total area	11,567	100	20,373	100
Near-poor HH	Agriculture	6,625	29.7	16,667	61.3
	Forestry/Acacia plantation	15,700	70.3	10,500	38.7
	Total area	22,325	100	27,167	100
Non-poor HH	Agriculture	50,000	98.8	28,750	57.2
	Forestry/Acacia plantation	600	1.2	21,500	42.8
	Total area	50,600	100	50,250	100
Average		28,164	100	32,597	100

Living conditions of surveyed HHs

Like in other reserves, the surveyed HHs in the buffer zones of STNR generally have more household facilities such as television, mobile phones and electric fans (Table 46). Amongst the three HH groups, there is a slight tendency for non-poor HHs to have more facilities than poor and near-poor HHs in both communes.

TABLE 49. HH FACILITIES OF SURVEYED HHS IN DAC PRE AND PHUOC XUAN COMMUNES

ITEMS	DAC PRE			PHUOC XUAN		
	POOR HH	NEAR-POOR HH	NON-POOR HH	POOR HH	NEAR-POOR HH	NON-POOR HH
Radio	0.25	0.25	1.00	0.00	0.00	0.00
Television	0.88	0.75	1.00	0.92	1.00	1.00
CD/DVD video player	0.13	0.00	0.00	0.23	0.00	0.25
Computer	0.00	0.00	0.00	0.00	0.13	0.00
TV cable line	0.00	0.25	0.00	0.00	0.00	0.00
Internet	0.04	0.00	0.00	0.00	0.00	0.00
Landline phone	0.00	0.00	0.00	0.00	0.00	0.00
Mobile phone	1.00	0.75	1.00	0.69	1.00	1.00
Tablet	0.00	0.00	0.00	0.00	0.00	0.00
Laundry machine	0.00	0.00	0.00	0.00	0.00	0.00
Hot water boiler	0.00	0.00	0.00	0.00	0.00	0.00
Air conditioner	0.00	0.00	0.00	0.00	0.00	0.00
Clothes drying machine	0.00	0.00	0.00	0.00	0.00	0.00
Microwave oven	0.00	0.00	0.00	0.00	0.00	0.00
Electric fan	0.67	0.75	1.00	0.69	0.88	1.00
Fridge	0.17	0.00	0.00	0.31	0.25	0.25
Gas stove	0.08	0.00	0.00	0.38	0.38	0.00
Electronic stove	0.00	0.00	0.00	0.00	0.00	0.00
Others	0.13	0.00	0.00	0.08	0.00	0.00

5.4.2.3. Household access to public services

Concerning education, a high proportion of surveyed HHs in both communes claimed they have good or very good access to educational institutions, especially in Phuoc Xuan commune with around 90% of HHs claiming so (Table 47). For vocational training, majority of surveyed HHs in both communes reported poor or limited access. In general, the HHs in both communes claimed to have relatively good access to other services such as health, public transportation, crop production expansion and legal counseling, but limited in water supply, environment and sanitary services. In both communes, 55% - 65% of the surveyed HHs claimed no access at all to water, environment and sanitary services.

TABLE 50. ACCESS TO PUBLIC SERVICES IN DAC PRE AND PHUOC XUAN COMMUNES

PUBLIC SERVICES	COMMUNE	LEVEL OF ACCESS OF SURVEYED HHS (%) (1=NO ACCESS AT ALL; 5=VERY GOOD ACCESS)					
		1	2	3	4	5	TOTAL
Education services	Dac Pre	0.0	0.0	35.3	35.3	29.4	100
	Phuoc Xuan	0.0	3.7	7.4	59.3	29.6	100
Vocational training services	Dac Pre	26.3	15.8	42.1	15.8	0.0	100
	Phuoc Xuan	21.6	35.1	21.6	16.2	5.4	100
Health services	Dac Pre	0.0	0.0	53.6	32.1	14.3	100
	Phuoc Xuan	0.0	8.2	18.0	42.6	31.1	100
Public administration services	Dac Pre	1.9	1.9	24.1	31.5	40.7	100
	Phuoc Xuan	0.0	4.1	23.0	52.7	20.3	100
Crop productionextension services	Dac Pre	27.3	15.9	29.5	27.3	0.0	100
	Phuoc Xuan	8.1	14.5	27.4	43.5	6.5	100
Legal counseling services	Dac Pre	12.2	12.2	26.8	36.6	12.2	100
	Phuoc Xuan	9.6	19.2	15.4	44.2	11.5	100
Telecommunication services	Dac Pre	29.4	15.7	15.7	31.4	7.8	100
	Phuoc Xuan	5.1	2.6	12.8	41.0	38.5	100
Transportation services	Dac Pre	3.4	11.9	22.0	52.5	10.2	100
	Phuoc Xuan	1.6	4.8	11.3	51.6	30.6	100
Electricity services	Dac Pre	1.6	4.8	17.5	49.2	27.0	100
	Phuoc Xuan	0.0	0.0	2.5	27.8	69.6	100
Water supply services	Dac Pre	55.6	11.1	19.4	8.3	5.6	100
	Phuoc Xuan	64.8	9.3	13.0	9.3	3.7	100
Environment and sanitation services	Dac Pre	55.6	11.1	19.4	8.3	5.6	100
	Phuoc Xuan	64.8	9.3	13.0	9.3	3.7	100

Participation of HHs in meetings, trainings and workshops

In terms of participation in meetings, trainings and workshops, the surveyed HHs in Phuoc Xuan commune had better participation than those in Dac Pre commune (Table 48). In the latter commune, the HHs had better participation only in meetings in relation to the forest protection and development law, PFES and community forest management. Unfortunately, they had never attended any meeting, training or workshop related to sustainable livelihood models, marketing local

products, and climate change. In this commune, the surveyed HHs have attended a training related to community forest management only and in both communes no workshop had been organized.

TABLE 51. HH PARTICIPATION IN MEETINGS, TRAININGS AND WORKSHOPS

KEY THEMES/TOPICS	MEETINGS (%)		TRAININGS (%)		WORKSHOPS (%)	
	DAC PRE	PHUOC XUAN	DAC PRE	PHUOC XUAN	DAC PRE	PHUOC XUAN
Sustainable and/or adaptive livelihood models	0.0	32	0.0	60	-	-
Marketing for local products	0.0	24	0.0	45	-	-
Climate change adaptation	0.0	0.0	0.0	75	-	-
Climate change mitigation	0.0	40	0.0	75	-	-
Law on biodiversity	7.1	60	0.0	35	-	-
Forest protection and development law	93	96	0.0	50	-	-
Payments for Forest Environmental Services (PFES)	64.3	80	0.0	40	-	-
Community forest management	92.9	88	100	45	-	-

5.4.2.4. Livelihood and gender

Dac Pre and Phuoc Xuan communes are dominated by two ethnic minority groups, namely Co Tu and La Trieng. In all ethnic groups including the Kinh group, women had a more important role in managing the family's daily expenses (Table 49). This task is solely handled by women as claimed by all surveyed HHs of the Kinh group. In this group, decisions and activities related to children's education are also managed by women, while most of the other activities are jointly carried out by men and women in the Co Tu and La Trieng groups. In the Co Tu group, only in some activities men assumed more responsibilities than women such as investing on a new livelihood model or purchasing/selling HH assets. Similarly, men in the La Trieng group play a more dominant role in the purchase and selling of HH assets.

TABLE 52. GENDER ROLES IN DECISION-MAKING

ACTIVITIES	ETHNIC GROUP	MALE (%)	FEMALE (%)	BOTH (%)	DON'T KNOW (%)	N/A (%)
Daily family expenses	Co Tu	0.00	50.00	50.00	0.00	0.00
	Kinh	0.00	100.00	0.00	0.00	0.00
	La Trieng	11.76	45.10	43.14	0.00	0.00
Investment to start a new livelihood model	Co Tu	50.00	0.00	50.00	0.00	0.00
	Kinh	100.00	0.00	0.00	0.00	0.00
	La Trieng	17.65	9.80	72.55	0.00	0.00
Investment to expand existing	Co Tu	0.00	0.00	100.00	0.00	0.00

livelihood activities/business	Kinh	100.00	0.00	0.00	0.00	0.00
	La Trieng	13.73	7.84	78.43	0.00	0.00
Purchase of HH assets	Co Tu	50.00	0.00	50.00	0.00	0.00
	Kinh	100.00	0.00	0.00	0.00	0.00
	La Trieng	19.61	9.80	70.59	0.00	0.00
Selling of HH assets	Co Tu	50.00	0.00	50.00	0.00	0.00
	Kinh	19.61	9.80	70.59	0.00	0.00
	La Trieng	75.00	0.00	25.00	0.00	0.00
Children's study	Co Tu	0.00	0.00	100.00	0.00	0.00
	Kinh	0.00	100.00	0.00	0.00	0.00
	La Trieng	9.80	9.80	72.55	0.00	7.84
Financial/labor contribution to community/social activities	Co Tu	0.00	0.00	100.00	0.00	0.00
	Kinh	0.00	0.00	100.00	0.00	0.00
	La Trieng	7.84	7.84	84.31	0.00	0.00

5.4.2.5. Livelihood and source of income

In the poor and near-poor HH groups, non-farm sector, crop production and PFES brought income to more households than the other sources. At least, 92% households had income from non-farm, 80% from crop production and 40% from PFES. Meanwhile, maximum 5% households earned income from husbandry, 25% from NTFP and 27% from forest plantation. However, in the non-poor HH group husbandry, forest plantation and NTFP generated income to a considerable proportion (40-60%) whilst non-farm and crop production generated income to most of the households, 100% and 80% respectively.

The annual income across all HH groups is 34,498 thousand VND (≈ 1,520 USD) on average (Table 50B). There is a big difference in annual income among three HH groups. The non-poor HH group had the average income of 68,140 thousand VND (≈ 3,002 USD), which is 3 times higher than the near-poor group (21,820 thousand VND or 961 USD) and 5 times higher than the poor group (13,533 thousand VND or 596 USD).

TABLE 53A. SOURCES OF INCOME FOR EACH HH GROUP

HOUSEHOLD GROUP	INCOME SOURCE	No. of HH	%
Poor	Total	37	100
	Crop production	36	97
	Husbandry	2	5
	Forest plantation	10	27
	NTFPs	9	24

	PFES	22	59
	Other	36	97
Near-poor	Total	12	100
	Crop production	12	100
	Husbandry	0	0
	Forest plantation	2	17
	NTFPs	3	25
	PFES	8	67
	Other	11	92
Non-poor	Tong thu nhap	5	100
	Crop production	4	80
	Husbandry	2	40
	Forest plantation	3	60
	NTFPs	2	40
	PFES	1	20
	Other	5	100

TABLE 54B. AVERAGE INCOME OF HOUSEHOLD

Household groups	N	VND	SD	Sig
Poor	25	13,533,600	6,546,826	0.074
Near-poor	12	21,820,000	10,691,835	0.133
Non-poor	5	68,140,000	42,926,192	0.484
AVERAGE		34,497,867		

5.4.2.6. Constraints to livelihood improvement

By lumping all sampled villages and communes in STNR, lack of knowledge on better farming system is the main constraint to livelihood improvement, claimed by 40% of the sampled HHs in the communes. The other barriers are financial limitations, health problems and lack of available land, each claimed by 20% of the sampled HHs.

5.4.2.7. Land tenure and food security

Most of the HHs in Dac Pre and Phuoc Xuan communes have no land certificates for the entire land (Table 51). Especially in Phuoc Xuan commune, 80% of surveyed HHs in Nuoc Lang village and 75%

in Lao Du village are without land certificates. In Dac Pre commune, 60% of the surveyed HHs had no land certificates while 40% had certificates only for some lands.

TABLE 55. PROPORTION OF SURVEYED HHS WITH LAND CERTIFICATES

STATUS	DAC PRE	PHUOC XUAN	
	VILLAGE 58	LAO DU VILLAGE	NUOC LANG VILLAGE
Have land certificate for all land types	0	25	20
Have land certificate for some of land types	40	0	0
Don't have land certificate for all land types	60	75	80
Rented	0.	0	0
Don't know	0	0	0

In terms of food security, the HHs both in Dac Pre and Phuoc Xuan had an average area of agricultural land more than 1,600m^2 (Table 52), hence, they meet the Vietnamese standard for food security. However, the data shows that in STNR, 31 out of 54 sample HHs (or 54%) reported that they experience food shortage in the last three years, with a shortage duration of about 69 (± 13) days per year.

TABLE 56. AREA OF AGRICULTURAL LAND OWNED OR CULTIVATED BY HHS

COMMUNE	AVERAGE PADDY FIELD AREA PER HH (M2)	AVERAGE MAIZE FIELD AREA PER HH (M2)	AVERAGE CASSAVA FIELD AREA PER HH (M2)	TOTAL
Dac Pre	4,933	0.00	333	5,266
Phuoc Xuan	0.00	5,596	333	5,930

5.4.2.8. Household awareness on forest biodiversity

HH's awareness on threats to forest biodiversity and natural resources

Surveyed HHs in the two sampled communes considered logging as the main threat to STNR (Table 53). In Dac Pre and Phuc Xuan communes, 100% and 91% of the respondents claimed so, respectively. Another threat is forest fire supported by around 60% of surveyed HHs in both communes. Finally, wildlife hunting and mining of natural resources were regarded as threats to STNR by 39.4% and 35.6% of surveyed HHs, respectively.

TABLE 57. LOCAL KNOWLEDGE ON THREATS TO FOREST BIODIVERSITY AND NATURAL RESOURCES IN STNR

COMMUNE	THREATS (%)					
	WILDLIFE HUNTING	LOGGING	MINING OF NATURAL RESOURCES	FIRING	OTHER	AVERAGE

Dac Pre	31.0	100	27.6	62.1	0.0	44.1
Phuoc Xuan	47.8	91.3	43.5	60.9	0.0	48.7
Average	**39.4**	**95.7**	**35.6**	**61.5**	**0.0**	**46.4**

HH's awareness on law enforcement in the communes

In general, the surveyed HHs in the two communes are highly aware about law enforcement related to different issues except endangered wildlife species (Table 54). For the latter, nobody in both communes are aware on this issue. The highest awareness was related to law enforcement on forest protection and illegal wildlife hunting and trapping.

TABLE 58. LOCAL KNOWLEDGE ON LAW ENFORCEMENT IN THE COMMUNES

COMMUNE	ISSUES (%)					
	ON BIODIVERSITY CONSERVATION	ON FOREST PROTECTION	ON ENDANGERED WILDLIFE SPECIES	ON THE BOUNDARIES OF PROTECTED AREAS IN THE REGION	ON ILLEGAL WILDLIFE HUNTING AND TRAPPING	ON ILLEGAL LOGGING
Dac Pre	19.0	85.7	0.0	47.6	71.4	76.2
Phuoc Xuan	69.6	95.7	0.0	73.9	73.9	60.9
Average	44.3	90.7	0.0	60.8	72.7	68.6

5.4.3. CONCLUSION OF HOUSEHOLD CONDITIONS IN STNR

The sampled communes of STNR have 80% forest area, inhabited by ethnic minority groups, accounting for 94% of the population. About 50% of the HHs in the communes belong to the poor category. A large number of HHs had formal education until level I or II, but 44% illiteracy was found in Phuoc Xuan commune. The average HH size is 4-5, and available family labor is 1-2 persons. The average HH landholding is 3ha, and in general, all HHs have both crop production and forestry lands, with the former being generally larger (1.8ha) than the latter (1.2ha). Most HHs have no certificate for their lands, and by lumping all sampled villages and communes, 54% of the sampled HHs reported that they experienced food shortage in the last three years, with a duration of about 69 days per year. Lack of knowledge of better farming system is claimed as the main constraint to livelihood improvement. Lack of access to water supply and environment and sanitation services are very common. The annual income across all HH groups is 34,498 thousand VND (≈ 1,520 USD) on average and there is a huge difference in annual income among three HH groups. Non-farm and crop production sectors generated income to most HHs. Husbandry and forest plantation contributed to the very small proportion to the poor group but a large proportion to the non-poor group. In general, the role of the women is dominant only in terms of managing the family's daily expenses and on decisions in relation to children's education, especially in the Kinh household. Finally, the integrity of STNR is threatened by illegal logging activities, wildlife hunting and forest fire.

5.5. ELEPHANT NATIONAL RESERVE

5.5.1. OVERVIEW OF ENR

ENR is located in Nong Son district, about 70 km west of Tam Ky city in QN province, with northern latitude 15° 32' 15" to 15° 44' 49" and eastern longitude 107° 50' 8" to 107° 58' 26". It has a total area of 18,977ha, divided into three sub-zones:

1) Strictly-protected sub-zone (13,420ha);
2) Ecological restoration sub-zone (5,518ha) and
3) Service-administrative sub-zone (38ha).

Its buffer zone covers an area of 35,135ha, intersecting three districts in QN province, along six communes, namely Thach My town and Ca Dy commune in Nam Giang district, Phuoc Ninh and Que Lam communes in Nong Son district, and Phuoc Hiep and Phuoc Hoa communes in Phuoc Son district (Table 55). The buffer zone is inhabited by 5,735 HHs with De Trieng as the dominant ethnic minority group. The communes in ENR had a high percentage of forest areas, accounting more than 65% of the total area.

TABLE 59. DISTRIBUTION OF POOR HHS AND ETHNIC MINORITY GROUPS IN THE BUFFERZONE COMMUNES OF ENR

DISTRICT/COMMUNE	TOTAL HHS	POOR HH (%)	ETHNIC GROUP (%)	FOREST COVER (%)
NAM GIANG DISTRICT				
Thach My town	1959	27	55	68.5
Ca Dy commune	883	72	85	68.6
Nong Son district				
Phuoc Ninh commune	826	31	0.7	79.6
Que Lam commune	1097	32	0.0	68.8
Phuoc Son district				
Phuoc Hiep commune	646	46	59	87.3
Phuoc Hoa commune	325	53	93	87.9

5.5.2. MAIN FINDINGS FROM THE HOUSEHOLD SURVEY

5.5.2.1. Demographic information

The average age of the surveyed HHs in the four sampled villages of ENR is 39.4 years (Table 56). In terms of education, most of the sampled HHs had level II as the highest education attained. In Phuoc Hoi village of Que Lam commune, a high percentage of HHs attended to school up to level I. Illiteracy is quite high in Cam La village of Que Lam commune. However, illiteracy was found low in the other sampled villages and none in Dui Chieng 2 village of Phuoc Ninh commune. Que Lam commune has very high percentage of poor HHs, with Phuoc Hoi village being the poorest with 63.3% poor HHs, 30.9 near-poor and only 5.5% non-poor HHs. In Dui Chieng 2 village of Phuoc Ninh commune, the proportion of poor HHs is only 21.7% while the near-poor HHs is 60.9%, which contrasts Binh Yen wherein the percentage of non-poor HHs reached up to 51%. In terms of family size, Cam La village of Que Lam commune has the largest with 4.6 members per HH compared to

other sample villages. However, Dui Chieng 2 village of Phuoc Ninh commune has the highest average of family labour.

TABLE 60. BASIC INFORMATION OF THE SURVEYED HHS

ITEMS	UNIT	PHUOC NINH		QUE LAM		AVERAGE
		BINH YEN VILLAGE	DUI CHIENG 2 VILLAGE	CAM LA VILLAGE	PHUOC HOI VILLAGE	
Age of HH head	Year	41.1	39.5	34.4	42.5	39.4
Level of education						
Illiterate/never had formal education	%	8.7	0.0	21.1	10.9	10.2
Level I (grade 1-5)	%	30.4	6.4	29.0	49.1	28.7
Level II (grade 6-9)	%	47.8	63.8	42.1	32.7	46.6
Level III (grade 10-12)	%	4.3	19.1	7.9	1.8	8.3
Higher education	%	8.6	10.6	0.0	5.5	6.2
Average family member per HH	Person	3.9	4.1	4.6	4.3	4.2
Average labour per HH	Person	1.7	2.0	1.6	1.6	1.7
- Male	Person	1.0	1.1	0.9	0.9	1.0
- Female	Person	0.7	0.9	0.6	0.8	0.8
Average dependent person per HH	Person	2.3	2.1	2.9	2.7	2.5
Economic status						
Poor HH	%	10.6	21.7	50.0	63.6	36.5
Near-poor HH	%	38.3	60.9	31.6	30.9	40.4
Non-poor HH	%	51.1	17.4	18.4	5.5	23.1

5.5.2.2. Household assets and living conditions

Land use types and HH landholding

There is a difference in the average landholding of HHs between the two sampled communes (Table 57). In Phuoc Ninh, the average is 26,752m^2 (or around 2.6ha) and 11,880m^2 (or around 1.2ha) in Que Lam. In Phuoc Ninh, there is a glaring difference in total landholdings between the non-poor and the two other HH groups. On average, the non-poor HHs have 39,592m^2 (or about 3.9ha), while the near-poor has 17,670m^2 and the poor HHs have 22,994m^2. In Que Lam commune, non-poor HHs have a landholding of 15,500m^2 (or about 1.5ha) whereas the near-poor has 9,175m^2 and poor HHs have 10,965m^2. In both communes, HH landholding for forestry land is much lower than the agricultural lands.

TABLE 61. HH LANDHOLDING FOR TWO TYPES OF LAND					
HH GROUP	TYPE OF LAND	PHUOC NINH		QUE LAM	
		M^2	%	M^2	%
Poor HH	Agriculture	20,667	90	9,611	88
	Forestry/Acacia plantation	2,327	10	1,354	12
	Total area	22,994	100	10,965	100
Near-poor HH	Agriculture	14,450	82	7,620	83
	Forestry/Acacia plantation	3,220	18	1,555	17
	Total area	17,670	100	9,175	100
Non-poor HH	Agriculture	34,375	87	11,250	73
	Forestry/Acacia plantation	5,217	13	4,250	27
	Total area	39,592	100	15,500	100
Average		26,752	100	11,880	100

Living conditions of surveyed HHs

Surveyed HHs in ENR generally have better household facilities such as television, mobile phones, electric fans, refrigerators and gas stoves (Table 58). Amongst the three HH groups, there is a slight tendency that non-poor HHs have more facilities than the poor or near-poor HHs.

TABLE 62. HH FACILITIES OF SURVEYED HHS IN PHUOC NINH AND QUE LAM COMMUNES						
ITEMS	PHUOC NINH			QUE LAM		
	POOR HH	NEAR-POOR HH	NON-POOR HH	POOR HH	NEAR-POOR HH	NON-POOR HH
Radio	0.00	0.00	0.07	0.02	0.00	0.09
Television	1.00	0.97	0.86	0.74	0.83	0.91
CD/DVD video player	0.36	0.33	0.41	0.23	0.24	0.27
Computer	0.09	0.10	0.17	0.02	0.00	0.00
TV cable line	0.00	0.03	0.07	0.02	0.10	0.09
Internet	0.00	0.10	0.31	0.02	0.00	0.00
Landline phone	0.09	0.00	0.00	0.02	0.00	0.00
Mobile phone	0.91	0.93	0.79	0.94	0.86	1.00
Tablet	0.00	0.00	0.00	0.00	0.00	0.00

Laundry machine	0.09	0.03	0.07	0.02	0.00	0.00
Hot water boiler	0.00	0.00	0.00	0.00	0.00	0.00
Air conditioner	0.00	0.00	0.00	0.00	0.00	0.00
Clothes drying machine	0.00	0.00	0.00	0.00	0.00	0.00
Microwave oven	0.00	0.00	0.00	0.00	0.00	0.00
Electric fan	0.82	0.97	0.97	0.92	0.90	1.00
Fridge	0.45	0.50	0.66	0.23	0.28	0.18
Gas stove	0.64	0.73	0.83	0.30	0.41	0.45
Electronic stove	0.18	0.27	0.38	0.04	0.03	0.00
Others	0.00	0.07	0.00	0.45	0.45	0.45

5.5.2.3. Household access to public services

When it comes to education, generally the surveyed HHs in both communes claimed to have relatively good access to educational institutions, especially in Phuoc Ninh commune with around 66% of HHs had access. For vocational trainings, majority of surveyed HHs in both communes reported poor or limited access. In general, the HHs in both communes claimed relatively good access to various services such as health, public transportation and telecommunication services, but limited in terms of water supply, environment and sanitary services in Que Lam commune. In this commune, 90.9% of surveyed HHs claimed they had no access to water, environment and sanitation services.

TABLE 63. ACCESS TO PUBLIC SERVICES IN PHUOC NINH AND QUE LAM COMMUNES

PUBLIC SERVICES	COMMUNE	LEVEL OF HH ACCESS (%) (1=NO ACCESS AT ALL; 5=VERY GOOD ACCESS)					
		1	2	3	4	5	TOTAL
Education services	Phuoc Ninh	1.0	9.0	24.0	39.0	27.0	100
	Que Lam	7.1	12.5	23.2	26.8	30.4	100
Vocational training services	Phuoc Ninh	72.3	17.0	6.4	0.0	4.3	100
	Que Lam	67.2	18.8	7.8	3.1	3.1	100
Health services	Phuoc Ninh	1.1	15.6	30.0	41.1	12.2	100
	Que Lam	0.0	6.8	23.7	40.7	28.8	100
Public administration services	Phuoc Ninh	7.9	13.2	21.1	47.4	10.5	100
	Que Lam	0.0	8.1	40.5	40.5	10.8	100
Crop productionextension services	Phuoc Ninh	7.5	12.5	32.5	42.5	5.0	100
	Que Lam	12.2	22.0	36.6	14.6	14.6	100
Legal counseling services	Phuoc Ninh	14.3	14.3	28.6	42.9	0.0	100

	Que Lam	11.1	22.2	38.9	5.6	22.2	100
Telecommunication services	Phuoc Ninh	13.9	5.6	8.3	30.6	41.7	100
	Que Lam	0.0	0.0	32.4	62.2	5.4	100
Transportation services	Phuoc Ninh	12.1	18.2	27.3	30.3	12.1	100
	Que Lam	0.0	2.0	27.5	58.8	11.8	100
Electricity services	Phuoc Ninh	4.9	8.2	18.0	42.6	26.2	100
	Que Lam	0.0	3.8	42.3	50.0	3.8	100
Water supply services	Phuoc Ninh	9.7	6.5	3.2	35.5	45.2	100
	Que Lam	90.9	4.5	4.5	0.0	0.0	100
Environment and sanitation services	Phuoc Ninh	9.7	6.5	3.2	35.5	45.2	100
	Que Lam	90.9	4.5	4.5	0.0	0.0	100

Participation of HHs in meetings, trainings and workshops

In terms of participation in meetings, trainings and workshops, the surveyed HHs in Phuoc Ninh commune had better participation than HHs in Que Lam commune (Table 60). In the latter commune, the HHs had better participation only in meetings and trainings about forest protection and development law. Both communes unfortunately had low participation in meetings, trainings or workshops related to sustainable livelihood models and marketing local products, which are important for livelihood improvement. In both communes, none had ever attended meetings about climate change mitigation.

TABLE 64. PARTICIPATION OF LOCAL PEOPLE IN MEETINGS, TRAININGS AND WORKSHOPS

KEY THEMES/TOPICS	MEETINGS (%)		TRAININGS (%)		WORKSHOPS (%)	
	PHUOC NINH	QUE LAM	PHUOC NINH	QUE LAM	PHUOC NINH	QUE LAM
Sustainable and/or adaptive livelihood models	27.1	40.2	36.8	33.3	33.3	40.0
Marketing for local products	23.7	14.6	21.1	12.8	22.2	13.3
Climate change adaptation	0.0	0.0	28.9	10.3	22.2	20.0
Climate change mitigation	32.2	20.7	28.9	10.3	22.2	6.7
Law on biodiversity	23.7	39.0	15.8	33.3	0.0	6.7
Forest protection and development law	86.4	89.0	73.7	64.1	44.4	53.3
Payments for Forest Environmental Services (PFES)	71.2	13.4	60.5	2.6	33.3	6.7
Community forest management	84.7	29.3	73.7	7.7	44.4	6.7

5.5.2.4. Livelihood and gender

Phuoc Ninh and Que Lam communes are dominated by Kinh and De Trieng ethnic groups. Between the two, De Trieng has clearly distinguished men and women's tasks in the household (Table 61). For example, managing the family's daily expense and children's education are purely a woman's job, while the men fully assume roles relating to investments in new livelihood models or expanding existing livelihoods and purchasing/selling HH assets. In the Kinh group, most of the tasks are assumed jointly by men and women.

TABLE 65. GENDER ROLE IN DECISION-MAKING

ACTIVITIES	ETHNIC GROUP	MALE (%)	FEMALE (%)	BOTH (%)	DON'T KNOW (%)	N/A (%)
Daily family expenses	Kinh	12.96	64.81	19.75	0.00	2.47
	De Trieng	0.00	100	0.00	0.00	0.00
Investment to start a new livelihood model	Kinh	27.78	11.73	55.56	1.85	3.09
	De Trieng	100	0.00	0.00	0.00	0.00
Investment to expand existing livelihood activities/business	Kinh	27.78	12.35	55.56	1.85	2.47
	De Trieng	100.00	0.00	0.00	0.00	0.00
Purchase of HH assets	Kinh	20.37	12.35	63.58	0.62	3.09
	De Trieng	100.00	0.00	0.00	0.00	0.00
Selling of HH assets	Kinh	18.52	13.58	64.81	0.62	2.47
	De Trieng	100	0.00	0.00	0.00	0.00
Children's study	Kinh	12.96	20.37	51.85	0.62	14.20
	De Trieng	0.00	100.00	0.00	0.00	0.00
Financial/labor contribution to community/social activities	Kinh	18.52	18.52	59.88	0.62	2.47
	De Trieng	100	0.00	0.00	0.00	0.00

5.5.2.5. Livelihood and source of income

The proportion of households who had income from crop production is slightly smaller in Elephant Reserve while the households who had income from husbandry is much larger. Almost all households had income from non-farm sector, while households had income from forest plantation and NTFP occupy a small proportion, 2-3% and 8-19% respectively. In relation to the income from PFES, it is evident that the poorer the HH group, the larger the proportion.

The annual income across all HH groups is 39,897 thousand VND (≈ 1,758 USD) on average (Table 62B). There is a slight difference in annual income between the poor and near-poor groups, 27,972 thousand VND (≈ 1,232 USD) and 28,269 thousand VND (≈ 1,245 USD) respectively. However, the non-poor group had an annual income of VND 63,496 (2,797 USD), much higher than the two other groups.

TABLE 66A. SOURCES OF INCOME FOR EACH HH GROUP			
HOUSEHOLD GROUP	INCOME SOURCE	No. of HH	%
Poor	Total	63	100
	Crop production	36	57
	Husbandry	19	30
	Forest plantation	1	2
	NTFPs	12	19
	PFES	6	10
	Other	59	94
Near-poor	Total	61	100
	Crop production	48	79
	Husbandry	21	34
	Forest plantation	1	2
	NTFPs	8	13
	PFES	16	26
	Other	60	98
Non-poor	Total	39	100
	Crop production	25	64
	Husbandry	13	33
	Forest plantation	2	5
	NTFPs	3	8
	PFES	13	33
	Other	38	97

TABLE 67B. AVERAGE INCOME OF HOUSEHOLD				
Household groups	N	VND	SD	Sig
Poor	58	27,926,759	18,357,770	0.053
Near-poor	34	28,269,618	9,784,513	0.066
Non-poor	37	63,496,135	42,064,974	0.629
Average		39,897,504		

5.5.2.6. Constraints to livelihood improvement

In ENR, 34% of the sample HHs that responded to the question claimed that financial limitation is the main constrain to livelihood improvement. Other constraints include labour limitation (23%), health problem (23%), lack of land (9%), lack of knowledge on farming techniques (7%) and lack of knowledge on better farming systems (5%).

5.5.2.7. Land tenure and food security

Most HHs in Que Lam commune have certificates for all their lands (Table 63). In this commune, all surveyed HHs in Phuoc Hoi village and 96% in Cam La village are in possession of land certificates for their entire land. In Phuoc Ninh commune, 63% and 41.2% of surveyed HHs in Binh Yen and Dui Cheng village, had land certificates for their entire land, while 52.9% in the latter village have land certificates for some of their land only.

TABLE 68. PROPORTION OF SURVEYED HHS WITH LAND-USE RIGHTS FOR DIFFERENT LAND TYPES

STATUS	PHUOC NINH		QUE LAM	
	BINH YEN VILLAGE	DUI CHIENG 2 VILLAGE	CAM LA VILLAGE	PHUOC HOI VILLAGE
Have land certificate for all land types	63	41	96	100
Have land certificate for some of land types	15	53	0	0
Don't have land certificate for all land types	19	6	4	0
Rented	0	0	0	0
Don't know	4	0	0	0

In terms of food security status, the HHs in Phuoc Ninh commune has an average area of agricultural lands more than 1,600m^2 (Table 64), hence, they meet the Vietnamese definition of food security. However, this is not the case for most HHs in Que Lam that have agricultural lands less than 1,600m2. By lumping all sampled villages and communes, 60 from 163 sampled HHs in ENR (or 37%) reported that they experienced food shortage in the last three years, with a duration of about 69 (± 16) days per year.

TABLE 69. AREA OF AGRICULTURAL LAND PER HOUSEHOLD

COMMUNE	AVERAGE PADDY FIELD AREA PER HH (m^2)	AVERAGE MAIZE FIELD AREA PER HH (m2)	AVERAGE CASSAVA FIELD AREA PER HH (m2)	TOTAL
Phuoc Ninh	1667	1,902	437	2,505
Que Lam	333	972	167	1,472

5.5.2.8. Household awareness on forest biodiversity

HH's awareness on threats to forest biodiversity and natural resources

Surveyed HHs in the two sampled communes considered logging as the main threat to ENR (Table 65). In Phuoc Ninh commune, 93% of the respondents claimed so, supported by 91% of respondents in another commune. Other threats were wildlife hunting and forest fire, supported by around 61% and 53% of the surveyed HHs, respectively. Mining natural resources is also regarded as a threat by around 35%.

TABLE 70. LOCAL KNOWLEDGE ON THREATS TO FOREST BIODIVERSITY AND NATURAL RESOURCES IN ENR

COMMUNE	THREATS (%)					
	WILDLIFE HUNTING	ILLEGAL LOGGING	MINING OF NATURAL RESOURCES	FIRING	OTHER	AVERAGE
Phuoc Ninh	70.70	93.10	50.00	50.00	3.40	53.44
Que Lam	52.20	91.00	19.40	56.70	7.50	45.36
Average	61.45	92.05	34.7	53.35	5.45	49.4

HH's awareness on law enforcement in the communes

In general, the surveyed HHs in the two communes were fully aware about law enforcement in relation to various issues except biodiversity conservation, particularly endangered species (Table 66). For the latter, none in both communes were aware on this issue. High awareness rate was found in terms of law enforcement on forest protection, illegal wildlife hunting and trapping and boundaries of protected areas in the region.

TABLE 71. LOCAL KNOWLEDGE ON LAW ENFORCEMENT IN THE COMMUNES

COMMUNE	ISSUES (%)					
	ON BIODIVERSITY CONSERVATION	ON FOREST PROTECTION	ON ENDANGERED WILDLIFE SPECIES	ON THE BOUNDARIES OF PROTECTED AREAS IN THE REGION	ON ILLEGAL WILDLIFE HUNTING AND TRAPPING	ON ILLEGAL LOGGING
Phuoc Ninh	37.10	79.00	0.00	75.80	82.30	91.90
Que Lam	51.80	84.30	0.00	65.10	72.30	75.90
Average	44.45	81.65	0.00	70.45	77.3	83.9

5.5.3. CONCLUSION OF HH CONDITIONS IN ENR

The sampled communes of ENR also had a high percentage of forest area, accounting 80% of the total commune area. However, unlike in other reserves, the communes are not inhabited by ethnic minority groups, but the majority, Kinh group. About 31% of the population belongs to the poor category. A large portion of HHs had formal education up to level II and only in Que Lam commune had a high illiteracy rate (21%). The average HH size is 3-4 people, with an average labour force of 1-

2 people. The average HH landholding is 1.9ha, and in general, all HHs have both crop production and forestry lands, with the former being generally larger in size (1.6ha) than the latter (0.3ha). Most HHs have certificates for their lands. Moreover 37% of the sampled HHs reported that they experienced food shortage in the last three years, with a duration of about 69 days per year. Financial and labour limitations are claimed as the main constraint to livelihood improvement. In terms of access to public services, many HHs have no access to vocational training, water supply and environment and sanitation services. The annual income across all HH groups is 39,897 thousand VND (≈ 1,758 USD). From 57% to 97% households had income derived from non-farm and crop production. In contrast, forest plantation and NTFP are income sources for only to 2 to 19% households. In general, the role of the women is dominant in terms of managing the family's daily finances. Finally, the threats to ENR are illegal logging, wildlife hunting and forest fire.

5.6. NGOC LINH NATURAL RESERVE

5.6.1. OVERVIEW OF NLNR

The Management Board of NLNR was established in November 2016. The reserve is located in Nam Tra My district of QN province, with northern latitude 15° 45' 00" to 15° 15' 00" and eastern longitude 107° 21'00" to 108° 20' 00". The total area under the Management Board of NLNR is 54,010ha, consisting 14,917ha of special use forests, 28,278ha protection forest, 8,096ha production forest, and 2,718ha of 'other' lands. Its buffer zone covers six communes in Nam Tra My district, namely Tra Linh, Tra Cang, Tra Mai, Tra Tap, Tra Don and Tra Leng. The buffer zone has 4,379 HHs in total with four major ethnic minority groups, namely Xe Dang, Ca Dong, Muong and Mo Nong. The distribution of poor HHs in the buffer zone communes is as follows: Tra Cang (83%), Tra Tap (76%), Tra Leng (67%), Tra Linh (63%), Tra Don (61%) and Tra Mai (31%) (Table 67). More than half of the areas in communes of NLNR are forest lands.

TABLE 72. PROPORTION OF POOR HH AND ETHNIC MINORITY GROUPS IN THE BUFFERZONE COMMUNES OF NLNR

COMMUNES	TOTAL HHS	POOR HH (%)	ETHNIC GROUP (%)	FOREST COVER (%)
Tra Cang commune	869	83	98	50
Tra Don commune	651	61	98	71
Tra Leng commune	546	67	98	75
Tra Linh commune	635	63	99.8	64
Tra Mai commune	1,061	31	61	55
Tra Tap commune	617	76	97	50

The policy on PFES in NLNR

According to the 2017 report of NLNR, PFES payments were delivered to individual HHs and HH groups. The contracted forest protection activities covered 39,992ha of forest lands with the participation of 2,777 HHs or 72 HH groups. In 2016, the average payment was 200,000 VND (≈ 8.8 USD) per hectare.

Based on the interview with Mr. Hoan (Director of NLNR), NLNR currently experiences threats from forest encroachment (slash and burn) and fragmentation, illegal logging, over exploitation of NTFPs, wildlife hunting and trapping, and gold mining.

5.6.2. FINDINGS FROM THE HOUSEHOLD SURVEY

5.6.2.1. Demographic information

The average age of the surveyed HH heads in the four sampled villages of NLNR is 38.5 years (Table 68). In terms of education, more than 50% of the sampled HHs had attended school up to level II. In Village 4 of Tra Cang commune, 66.6% of HHs had attended level II education. Illiteracy is relatively low in both communes and no illiteracy was found in the Village 2 of Tra Tap commune. Tra Cang commune has more poor Hhs, being the poorest commune. The village 3 has 64.9% poor HHs while Village 4 has only 50%. In Village 4, the proportion of poor and non-poor HHs is almost similar, with 47.2% non-poor HHs. In terms of HH size, Tra Tap commune in Village 1 had 4.6 persons. In terms of family labour, Village 2 of Tra Cang commune had the highest, with 2 persons per HH.

TABLE 73. BASIC INFORMATION OF SURVEYED HHS

ITEMS	UNIT	TRA CANG		TRA TAP		AVERAGE
		VILLAGE 3	VILLAGE 4	VILLAGE 1	VILLAGE 2	
Age of HH head	Year	37.1	40.6	37.4	38.9	38.5
Level of education						
Illiterate/never had formal education	%	2.7	2.8	4.0	0.0	2.4
Level I (grade 1-5)	%	37.8	16.6	32.0	22.2	27.2
Level II (grade 6-9)	%	21.6	66.6	28.0	37.0	38.3
Level III (grade 10-12)	%	27.0	11.1	32.0	37.0	26.8
Higher education	%	10.8	2.8	4.0	3.7	5.3
Average family member per HH	Person	4.4	4.2	4.6	4.1	4.3
Average labour per HH	Person	2.2	2.0	1.8	2.0	2.0
- Male	Person	1.2	1.2	1.0	0.9	1.1
- Female	Person	1.0	0.8	0.8	1.1	0.9
Average dependent person per HH	Person	2.0	2.1	2.6	2.1	2.2
Economic status						
Poor HH	%	64.9	50.0	32.0	37.0	46.0
Near-poor HH	%	5.4	2.8	12.0	7.4	6.9
Non-poor HH	%	29.7	47.2	56.0	55.6	47.1

5.6.2.2. Household assets and living conditions

Land use and HH landholding

The average HH landholding in Tra Cang commune is lower than the Tra Tap commune (Table 69). In Tra Cang, the average landholding is 18,263m^2 (or around 1.8ha) while it is 23,712m^2 in Tra Tap. Surprisingly in both communes, non-poor HHs had lower total landholding compared to near-poor HHs, implying that landholding is not always correlated with poverty. In Tra Cang commune, on average, the non-poor HHs own 22,304m^2 of land (or 2.2ha) while the near-poor has a slightly bigger land, around 22,943m^2 while the poor HHs has only 9,541m^2. In Tra Tap commune, non-poor HHs had 26,944m^2 of land (or around 2.7ha), while the near-poor and poor HHs have 31,500m^2 and 12,690m^2, respectively. In Tra Cang commune, HH landholdings on agricultural land were lower than forestry land. In contrast, the landholding of HHs on forestry land in Tra Hap was much lower than agricultural lands. In both communes, the forestry lands were planted with acacia and cinnamon.

TABLE 74. HH LANDHOLDING FOR TWO TYPES OF LANDUSE

HH GROUP	TYPE OF LAND	TRA CANG		TRA TAP	
		m^2	%	m2	%
Poor HH	Agriculture	4,497	47	9,029	71
	Forestry/Cinnamon and Acacia plantation	5,044	53	3,662	29
	Total area	9,541	100	12,690	100
Near-poor HH	Agriculture	10,200	44.5	25,000	79
	Forestry/Cinnamon and Acacia plantation	12,743	55.5	6,500	21
	Total area	22,943	100	31,500	100
Non-poor HH	Agriculture	9,344	42	19,510	72
	Forestry/Cinnamon and Acacia plantation	12,960	58	7,435	28
	Total area	22,304	100	26,944	100
Average		18,263	100	23,712	100

Living conditions of surveyed HHs

Similar to other reserves, in NLNR the surveyed HHs have more home appliances and gadgets such as television, mobile phones and electric fans (Table 70). Amongst the three HH groups, there is no clear tendency that non-poor HHs have more facilities than poor or near-poor, in both communes.

TABLE 75. HOME APPLIANCES AND GADGETS OF SURVEYED HHS IN TRA CANG AND TRA TAP COMMUNES

ITEMS	TRA CANG			TRA TAP		
	POOR HH	NEAR-POOR HH	NON-POOR HH	POOR HH	NEAR-POOR HH	NON-POOR HH
Radio	0.00	0.00	0.00	0.00	0.00	0.00
Television	0.54	0.40	0.38	0.68	1.00	0.64
CD/DVD video player	0.03	0.20	0.00	0.05	0.00	0.18
Computer	0.05	0.00	0.00	0.00	0.00	0.00
TV cable line	0.00	0.00	0.00	0.00	0.00	0.00
Internet	0.00	0.00	0.00	0.00	0.00	0.00
Landline phone	0.00	0.00	0.00	0.00	0.00	0.00
Mobile phone	0.69	0.60	0.55	0.74	0.60	0.64
Tablet	0.03	0.00	0.00	0.00	0.00	0.00
Laundry machine	0.00	0.00	0.00	0.00	0.00	0.00
Hot water boiler	0.00	0.00	0.00	0.00	0.00	0.00
Air conditioner	0.00	0.00	0.00	0.00	0.00	0.00
Clothes drying machine	0.00	0.00	0.00	0.00	0.00	0.00
Microwave oven	0.00	0.00	0.00	0.00	0.00	0.00
Electric fan	0.03	0.20	0.10	0.53	1.00	0.61
Fridge	0.10	0.20	0.00	0.11	0.40	0.14
Gas stove	0.00	0.00	0.03	0.16	0.40	0.07
Electronic stove	0.00	0.00	0.00	0.00	0.00	0.00
Others	0.41	0.40	0.14	0.47	1.00	0.50

5.6.2.3. Household access to public services

In terms of education, more than 70% HHs in both communes claim to have good and very good access (Table 71). For vocational training, while around 71% of surveyed HHs in Tra Tap communes reported good or very good access, 69% of HHs in Tra Cang claimed no access to such service. Like in other reserves, access to water supply, environment and sanitary services were very limited. In Tra Cang commune, as high as 92.6% of the surveyed HHs claimed they had no access at all to these services, while only 54.9% of HHs in Tra Tap claimed so.

TABLE 76. ACCESS TO PUBLIC SERVICES IN TRA CANG AND TRA TAP COMMUNES

PUBLIC SERVICES	COMMUNE	LEVEL OF HH ACCESS (%) (1=NO ACCESS AT ALL; 5=VERY GOOD ACCESS)					
		1	2	3	4	5	TOTAL
Education services	Tra Cang	3.0	4.5	17.9	34.3	40.3	100.0
	Tra Tap	0.0	2.6	25.6	33.3	38.5	100.0
Vocational training services	Tra Cang	69.0	11.9	0.0	11.9	7.1	100.0
	Tra Tap	14.3	0.0	14.3	57.1	14.3	100.0
Health services	Tra Cang	0.0	6.3	66.7	22.9	4.2	100.0
	Tra Tap	4.2	11.3	35.2	26.8	22.5	100.0
Public administration services	Tra Cang	7.8	3.9	19.6	33.3	35.3	100.0
	Tra Tap	0.0	3.8	38.5	23.1	34.6	100.0
Crop productionextension services	Tra Cang	28.0	10.0	22.0	24.0	16.0	100.0
	Tra Tap	17.4	14.6	26.5	27.7	13.7	100.0
Legal counseling services	Tra Cang	22.7	0.0	13.6	45.5	18.2	100.0
	Tra Tap	16.8	11.1	21.2	31.4	19.5	100.0
Telecommunication services	Tra Cang	20.3	15.6	12.5	21.9	29.7	100.0
	Tra Tap	0.0	0.0	11.9	26.2	61.9	100.0
Transportation services	Tra Cang	7.4	24.1	24.1	27.8	16.7	100.0
	Tra Tap	13.0	17.4	30.4	26.1	13.0	100.0
Electricity services	Tra Cang	7.0	25.4	26.8	28.2	12.7	100.0
	Tra Tap	10.6	14.9	25.5	29.8	19.1	100.0
Water supply services	Tra Cang	92.6	7.4	0.0	0.0	0.0	100.0
	Tra Tap	54.9	9.9	9.2	12.3	13.7	100.0
Environment and sanitation services	Tra Cang	92.6	7.4	0.0	0.0	0.0	100.0
	Tra Tap	54.9	9.9	9.2	12.3	13.7	100.0

Participation of HHs in meetings, trainings and workshops

In terms of participation in meetings, trainings and workshops, surveyed HHs in Tra Cang commune had better participation rate than those in Tra Tap (Table 72). In the latter commune, the HHs had better participation only in meetings and trainings about forest protection and development law and sustainable and/or adaptive livelihood models. Unfortunately, the commune had a low participation in meetings, trainings or workshops related to marketing local products, which is an important aspect of improving livelihood and finally, nobody had ever attended a meeting about mitigation on climate change.

TABLE 77. HH PARTICIPATION IN MEETINGS, TRAININGS AND WORKSHOPS						
KEY THEMES/TOPICS	MEETINGS (%)		TRAININGS (%)		WORKSHOPS (%)	
	TRA CANG	TRA TAP	TRA CANG	TRA TAP	TRA CANG	TRA TAP
Sustainable and/or adaptive livelihood models	71.2	43.2	63.2	52.2	41.7	33.3
Marketing for local products	49.3	9.1	26.3	8.7	16.7	0.0
Climate change adaptation	0.0	0.0	10.5	26.1	8.3	0.0
Climate change mitigation	16.4	13.6	10.5	26.1	8.3	0.0
Law on biodiversity	16.4	2.3	15.8	0.0	16.7	0.0
Forest protection and development law	97.3	77.3	63.2	47.8	33.3	0.0
PFES	76.7	36.4	34.2	30.4	0.0	33.3
Community forest management	98.6	38.6	57.9	34.8	25.0	33.3

5.6.2.4. Livelihood and gender

Tra Cang and Tra Tap communes are inhabited by four main ethnic groups, namely Ca Dong, Muong, Xe Dang, and Mo Nong. In all ethnic groups, women have a dominant role in managing the family's daily expenses (Table 73). Especially in Mon Nong group, all surveyed HHs belonging to this group claimed that this activity is handled by women. In all ethnic groups, the decisions in all activities are mostly performed jointly by men and women. For the Mo Nong group however, all the surveyed HHs could not specify men or women's responsibility in terms of investment to start a new livelihood model and selling HH assets.

TABLE 78. GENDER ROLES IN DECISION-MAKING						
ACTIVITIES	ETHNIC GROUP	MALE (%)	FEMALE (%)	BOTH (%)	DON'T KNOW (%)	N/A (%)
Daily family expenses	Ca dong	17.31	53.85	28.85	0.00	0.00
	Muong	0.00	33.33	66.67	0.00	0.00
	Xe Dang	18.84	43.48	37.68	0.00	0.00
	Mo Nong	0.00	100.00	0.00	0.00	0.00
Investment to start a new livelihood model	Ca dong	23.08	19.23	44.23	3.85	9.62
	Muong	0.00	33.33	33.33	0.00	33.33
	Xe Dang	34.78	11.59	52.17	0.00	1.45
	Mo Nong	0.00	0.00	0.00	0.00	100.00
Investment to	Ca dong	25.00	17.31	46.15	3.85	7.69

develop/expand existing livelihood activities/business	Muong	0.00	33.33	66.67	0.00	0.00
	Xe Dang	34.78	11.59	50.72	0.00	2.90
	Mo Nong	0.00	0.00	100.00	0.00	0.00
Purchase of HH assets	Ca dong	25.00	11.54	46.15	1.92	15.38
	Muong	33.33	0.00	66.67	0.00	0.00
	Xe Dang	30.43	14.49	55.07	0.00	0.00
	Mo Nong	0.00	0.00	100.00	0.00	0.00
Selling of HH assets	Ca dong	11.54	3.85	36.54	5.77	42.31
	Muong	0.00	0.00	66.67	0.00	33.33
	Xe Dang	30.43	11.59	57.97	0.00	0.00
	Mo Nong	0.00	0.00	0.00	0.00	100.00
Children's study	Ca dong	5.77	17.31	51.92	0.00	25.00
	Muong	0.00	0.00	100.00	0.00	0.00
	Xe Dang	13.04	15.94	66.67	0.00	4.35
	Mo Nong	0.00	0.00	100.00	0.00	0.00
Financial/labor contribution to community/social activities	Ca dong	9.62	7.69	51.92	5.77	25.00
	Muong	0.00	0.00	33.33	0.00	66.67
	Xe Dang	15.94	11.59	69.57	1.45	1.45
	Mo Nong	0.00	0.00	100.00	0.00	0.00

5.6.2.5. Livelihood and sources of income

In all three HH groups, HHs who had income from crop production and non-farm make up the highest proportion (at least 75%) whilst the other income sources (except from husbandry in the poor HH group) brought income to a considerable part of households. Especially, relatively large proportion of households (35% to 63%) derived their income from forest plantation, NTFPs and PFES.

The annual income across all HH groups is 26,845 thousand VND (≈ 1,183 USD) on average (Table 74 B). The annual income of the near-poor and non-poor groups is similar, 35,342 thousand VND (≈1,557 USD) and 33,157 thousand VND (≈ 1,460 USD) respectively, and is almost double than the poor group's.

TABLE 79A. SOURCES OF INCOME FOR EACH HH GROUP

HOUSEHOLD GROUP	INCOME SOURCE	No. of HH	%
Poor	Total	60	100
	Crop production	58	97

	Husbandry	6	10
	Forest plantation	22	37
	NTFPs	27	45
	PFES	35	58
	Other	50	83
Near-poor	Total	8	100
	Crop production	8	100
	Husbandry	2	25
	Forest plantation	3	38
	NTFPs	3	38
	PFES	5	63
	Other	6	75
Non-poor	Total	57	100
	Crop production	52	91
	Husbandry	17	30
	Forest plantation	26	46
	NTFPs	20	35
	PFES	25	44
	Other	53	93

TABLE 80B. AVERAGE INCOME OF HOUSEHOLD

Household groups	N	VND	SD	Sig
Poor	56	12,037,111	8,157,298	0.2
Near-poor	8	35,342,000	33,961,794	0.119
Non-poor	28	33,157,143	15,527,488	0.056
Average		26,845,418		

5.6.2.6. Constraints to livelihood improvement

By lumping all sampled villages and communes in NLNR, labour limitation is claimed by 40% of the sampled HHs as the main constraint to livelihood improvement. Other constraints include financial limitation (35%), lack of knowledge in farming technique (10%), lack of knowledge of better farming system (10%) and lack of land (5%).

5.6.2.7. Land tenure and food security

Most HHs in Tra Cang commune had no certificate for their entire land (Table 75). In this commune, 94.6% of surveyed HHs in Village 3 and 97.1% in Village 4 had no land certificate for their entire land. In Tra Hap wherein 42.1% and 31.6% of surveyed HHs in Village 1 and Village 2 had no certificate for their entire land.

TABLE 81. PROPORTION OF SURVEYED HHS WITH LANDUSE CERTIFICATES

STATUS	TRA CANG (%)		TRA TAP (%)	
	VILLAGE 3	VILLAGE 4	VILLAGE 1	VILLAGE 2
Have land certificate for all land types	0.0	0.0	15.8	36.8
Have land certificate for some of land types	2.7	0.0	0.0	0.0
Don't have land certificate for all land types	94.6	97.1	42.1	31.6
Rented	0.0	0.0	0.0	5.3
Don't know	2.7	2.9	42.1	26.3

When it comes to food security, the HHs in both communes had an average area of agricultural land more than 1,600m^2 (Table 76), hence, they meet the Vietnamese criteria for a food security. However, in relation to the experience of food shortage in the last three years in NLNR 22, from 125 sampled HHs (or 18%) reported that they experienced food shortage in the last three years, with a duration of about 59 (± 12) days per year.

TABLE 82. AREA OF AGRICULTURAL LANDS OWNED OR CULTIVATED BY HHS

COMMUNE	AVERAGE PADDY FIELD AREA PER HH (M2)	AVERAGE MAIZE FIELD AREA PER HH (M2)	AVERAGE CASSAVA FIELD AREA PER HH (M2)	TOTAL
Tra Cang	2,102	1,984	4,603	8,690
Tra Tap	1,000	133	4,250	5,383

5.6.2.8. Household awareness on forest biodiversity and natural resources

The surveyed HHs in the two sampled communes considered logging as the main threat to NLNR (Table 77). In Tra Cang commune, 98.5% of the respondents claimed so while 84.1% of HHs in Tra hap supported this claim. Another important factor considered as threat to NLNR is wildlife hunting supported on average, by 52% of surveyed HHs in both communes. Mining natural resources is also regarded as a threat to the well-being of NLNR by around 36% and 24% of surveyed HHs respectively.

TABLE 83. LOCAL KNOWLEDGE ON THREATS TO FOREST BIODIVERSITY AND NATURAL RESOURCES IN NLNR

COMMUNE	THREATS (%)

	WILDLIFE HUNTING	ILLEGAL LOGGING	MINING OF NATURAL RESOURCES	FIRING	OTHER	AVERAGE
Tra Cang	31.8	98.5	25.8	33.3	7.6	39.4
Tra Tap	72.7	84.1	22.7	38.6	13.6	46.3
Average	52.3	91.3	24.3	35.9	10.6.	42.9

HH's awareness on law enforcement in the communes

In general, the surveyed HHs in the two communes were fully aware on law enforcement related issues except biodiversity conservation and endangered wildlife species (Table 78). For the latter, none in both communes were aware on this issue. High HH awareness was observed in relation to law enforcement on illegal logging, illegal wildlife hunting and trapping and forest protection.

TABLE 84. LOCAL KNOWLEDGE ON LAW ENFORCEMENT IN THE COMMUNES

	ISSUES (%)					
COMMUNE	ON BIODIVERSITY CONSERVATION	ON FOREST PROTECTION	ON ENDANGERED WILDLIFE SPECIES	ON THE BOUNDARIES OF PAS	ON ILLEGAL WILDLIFE HUNTING AND TRAPPING	ON ILLEGAL LOGGING
Tra Cang	16.9	93.	0.0	84.5	78.9	70.4
Tra Tap	2.6	50	0.0	44.7	73.7	86.8
Average	**9.8**	**71.5**	**0.0**	**64.6**	**76.3**	**78.6**

5.6.3. CONCLUSION OF HOUSEHOLD CONDITIONS IN NLNR

About half of the landscape in the sampled communes of NLNR are forest land. The communes are consisting of ethnic minority groups, accounting 97% of the population. About 80% of HHs in the communes belong to the poor category. In terms of education, a large portion of HHs had formal education until level III, particularly in Tra Tap commune. Illiteracy is relatively low with maximum 4% of the population. The average HH size is 4 people and the average labour force is 1-2 persons. The average HH landholding is 2.1ha and in general, all HHs have both crop production and forestry lands with the former being generally larger (1.2ha) than the latter (0.9ha). However most HHs have no certificates for their land and by lumping all sampled villages and communes, 18% of the sampled HHs reported that they experienced food shortage in the last three years with a duration of about 59 days per year. Labour and financial limitations are claimed as the main constraints to livelihood improvement. In terms of access to public services, lack of access to vocational training, water supply, environment and sanitation services were mentioned. The annual income of households is 26,845 thousand VND (≈ 1,183 USD). Most of the households had income from non-farm and crop production sources, while the other sources of forest plantation, NTFP, PFEST contributed to at least 35% households. Generally, the role of women in the family is dominant in managing daily expenses. The threats to NLNR are illegal logging, wildlife hunting and forest fire.

VI. ANALYSIS OF LIVELIHOOD MODELS

6.1. THE FIVE MAIN LIVELIHOOD MODELS FOR QN AND TTH

The five main livelihood models identified by way of group discussions with farmers, commune leadership and mass organizations during the survey and interviews with important stakeholders (see Annex 9). A high consensus was given to consultation workshops with government authorities. The selected three models (out of five) for each province were discussed with farmers to seek their acceptance. This ensured that not only farmers but also other important stakeholders are willing to implement these models.

Table 79 describes the different livelihood models and their ranking by the stakeholders in QN province. The main five models with the highest scores are as follows:

(1) planting medicinal plants as forest under-story;
(2) timber plantation, FSC certified timber to supply international markets;
(3) community based tourism in conjunction with production of local specialties (home garden products: local chicken, pomelo and orange);
(4) planting rattan in natural forests; and
(5) planting local pomelo and orange with emphasis on value chain.

TABLE 85. WEIGHTED MATRIX SCORING AND RANKING OF LIVELIHOOD MODELS IN QN

LIVELIHOODS MODELS	ENVIRONMENTAL FRIENDLINESS (1.5*)	CLIMATE ADAPTATION(1)	FEASIBILITY AND APPLICABILITY (2)	MARKET DEMAND (2)	INVOLVEMENT OF POTENTIAL BENEFICIARIES (1.5)	INCOME IMPROVEMENT (1.5)	BIODIVERSITY (1)	TOTAL SCORE (RANKING)
Timber plantation towards FSC certified timber supply to international markets	6.8	4.3	6.4	8.3	5.5	5.8	3.6	40.8 (2)
Planting under-story medical plants in natural forest	7.3	4.7	7.4	7.7	5.9	6.1	4.0	43.2 (1)
Community based tourism in connection with production of local specialities (home garden products: local chicken, pomelo and orange)	6.4	4.2	6.1	7.1	5.2	5.5	3.6	38.0 (3)
Planting rattan in natural forests	6.0	3.9	6.2	7.2	5.3	5.3	3.4	37.4 (4)
Bee keeping in natural forest	5.5	3.5	4.6	6.7	3.8	4.3	3.1	31.4 (9)
Value chain development of Ba Trang rice variety	5.3	3.5	7.2	7.1	4.7	4.3	2.8	34.9 (7)
Value chain development of bamboo shoot	5.8	3.6	6.8	5.9	4.3	4.3	2.9	33.6 (8)
Development of local pomelo and orange with emphasis on value chain	6.0	3.7	6.4	6.9	4.8	5.0	3.1	36.0 (5)
Raising local pigs (black pigs) at household scale	5.0	3.8	6.9	6.9	5.2	5.1	3.1	35.9 (6)

*Weighting factor

Table 80 shows the appraisal of different livelihood models by stakeholders in TTH province. The main five livelihood models are:

(1) timber plantation towards FSC certified timber to supply international markets;
(2) development of local pomelo and orange with emphasis on value chain in Nam Dong;
(3) community-based tourism in conjunction with production of local specialties (home garden products: local chicken, pomelo and orange);
(4) planting medicinal plants as forest under-story; and
(5) intensification of cattle meat production in A Luoi district with emphasis on market value chain development.

Four livelihood options identified in TTH are similar to QN, namely long-timber plantation, medicinal plant, pomelo and orange plantation and eco-tourism. A livelihood model specific to QN is planting rattan in natural forests, while it is cattle production for TTH.

TABLE 86. WEIGHTED MATRIX SCORING AND RANKING OF LIVELIHOOD MODELS IN TTH

LIVELIHOODS MODELS	ENVIRONMENTAL FRIENDLINESS (1.5*)	CLIMATE ADAPTATION(1)	FEASIBILITY AND APPLICABILITY (2)	MARKET DEMAND (2)	INVOLVEMENT OF POTENTIAL BENEFICIARIES (1.5)	INCOME IMPROVEMENT (1.5)	BIODIVERSITY (1)	TOTAL SCORE (RANKING)
Timber plantation towards FSC certified timber supply to international markets	7.0	4.4	6.7	8.4	6.0	6.4	4.4	43.3 (1)
Development of local pomelo and orange with emphasis on value chain in Nam Dong	6.1	3.9	8.7	8.3	5.9	6.4	3.6	42.9 (2)
Intensification of beef cattle production in A Luoi district with emphasis on market value chain development	4.7	3.4	8.0	8.4	5.5	5.9	3.1	39.0 (5)
Planting under-story medical plants in natural forest	6.3	4.1	7.7	6.4	5.5	5.4	4.2	39.6 (4)
Community based tourism in connection with production of local specialities (home garden products: local chicken, pomelo and orange)	6.1	4.1	6.9	7.4	6.1	5.9	3.9	40.3 (3)
Value chain of local chicken and Momordica cochinchinensis	5.3	3.5	8.1	7.0	5.5	5.7	3.0	38.0 (6)
Planting rattan in natural forests	5.9	4.1	6.9	6.9	5.4	5.1	3.7	37.9 (7)
Value chain development of bamboo shoot	4.8	3.6	7.0	6.1	4.0	4.7	3.1	33.3 (8)
Bee keeping in natural condition	4.7	2.9	5.7	6.6	4.9	5.0	3.1	32.9 (9)
Value chain development of Ra Du local rice variety	3.6	2.6	6.7	6.3	4.2	4.6	2.5	30.6 (10)

*Weighting factor

Table 81 describes the scores and ranking of livelihood models according to the experts' team. The five main recommended livelihood options according to the team are as follows:

(1) planting medicinal plants as under-story in natural forest;
(2) planting rattan in the natural forest;
(3) developing local pomelo and orange;
(4) community-based tourism; and
(5) timber plantation towards producing FSC certified timber to supply international markets.

Therefore, the five recommended livelihood options by the expert team are similar with those suggested by stakeholders in QN province and overlap with the suggestions by stakeholders in TTH province.

TABLE 87. WEIGHTED MATRIX SCORING AND RANKING OF LIVELIHOOD MODELS BY THE TEAM OF SPECIALISTS

LIVELIHOODS MODELS	ENVIRONMENTAL FRIENDLINESS (1.5*)	CLIMATE ADAPTATION(1)	FEASIBILITY AND APPLICABILITY (2)	MARKET DEMAND (2)	INVOLVEMENT OF POTENTIAL BENEFICIARIES (1.5)	INCOME IMPROVEMENT (1.5)	BIODIVERSITY (1)	TOTAL SCORE (RANKING)
Timber plantation towards producing FSC certified timber supply to international markets	4.9	4.0	2.7	4.1	3.0	3.1	3.4	25.3 (5)
Planting under-storey medical plants in natural forest	5.0	4.6	3.6	3.3	4.1	3.6	4.6	28.7 (1)
Community based tourism in connection with production of local specialities (home garden products: local chicken, pomelo and orange)	4.1	4.0	2.9	3.4	3.7	4.0	3.3	25.4 (4)
Planting rattan under the natural forest	5.0	4.3	3.7	3.9	4.0	3.4	3.9	28.1 (2)
Bee-keeping in natural condition	4.3	3.4	3.3	3.3	3.0	3.0	3.6	23.9 (9)
Value chain development for Ba Trang rice variety	2.0	2.4	3.1	3.6	3.1	2.4	3.6	20.3 (11)
Value chain development of bamboo shoot cultivation	3.7	4.0	4.3	2.4	3.4	2.9	3.0	23.7 (10)
Development of local pomelo and orange with emphasis on value chain	4.6	4.0	4.0	4.6	3.6	4.1	3.1	28.0 (3)
Development of local swine (black pigs) farms at household scale	3.0	3.3	3.7	3.3	3.7	3.9	3.9	24.7 (6)

Intensification of beef cattle production in A Luoi district with emphasis on market value chain development	2.9	3.1	3.6	4.1	3.3	4.1	3.0	24.1 (8)
Value chain of local chicken and Momordica cochinchinensis	4.1	3.7	3.7	2.9	3.6	3.3	3.1	24.4 (7)

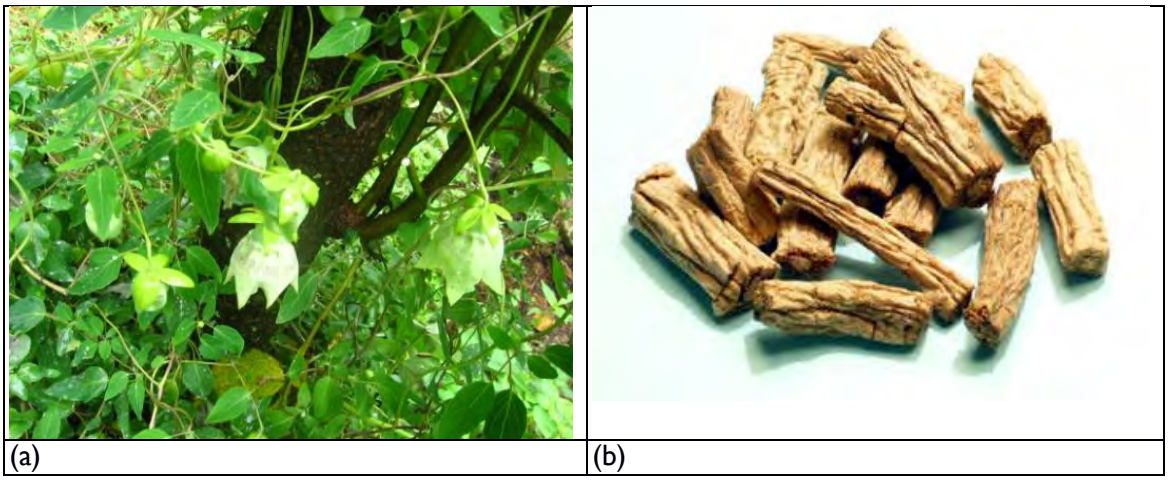
*Weighting factor

The ranking analysis above considered both environmental and livelihood benefits that each livelihood option can contribute. Below, we provide an economic assessment by analyzing the market-value chain (MVC) and where data is available, profitability of the top five livelihood models in QN and TTH province, except for community-based tourism due to complexity in identifying actors for the MVC and cost component for profitability analysis. The data used for assessment were gathered from desk study, secondary data collection, KII, and FGDs. Due to similarity in productivity and market condition, no separate profitability analysis for both provinces were made in relation to some livelihood options such as rattan and timber plantation.

6.2. ECONOMIC ANALYSIS OF THE FIVE MAIN LIVELIHOOD MODELS

6.2.1. MEDICINAL PLANTS IN QN AND TTH

In terms of potential for a market, the suitable medicinal plant to expand for QN is Codonopsis pilosula (or dang-shen) (Fig. 4), also known as poor man's ginseng since it is historically being used as replacement for the costly Panax Ginseng. It grows well in moist, light sandy, medium loamy and well-drained soils with acidic or neutral soil pH (http://www.pfaf.org/user/plant.aspx?latinname=Codonopsis+pilosula). In relation to shading, it can grow in partial or without shade, so it's suitable to develop as forest under-story or in plantation.



(a) (b)

Figure 4. Codonopsis plant (a) and its ginseng-type dried roots (b)

In Nam Tra My district of QN, there are around 1,200 HHs involved in either harvesting this herb from natural forests or purposely planting them under forest canopy. A total production in the district, over 90% came from natural forests, which is about 8.2 ton for a year. For dang-shen planted under forest canopy, it normally takes 4 years to harvest and the yeal is estimated by local planters 8,000 to 9,000 tons per ha. Within the district, the main producer is Tra Cang commune with a production of 5.6 ton a year, or 68% of district production. There are about 36 Codonopsis traders in the district and each can collect about 200 kg annually. Furthermore, there are seven whole-sellers in the district who absorb the product from those traders and sell to consumers.

Table 82 provides information of Codonopsis market in the district. Annex 10.1 describes diagram of MVC analysis for Codonopsis.

TABLE 88. MARKET INFORMATION OF CODONOPSIS IN NAM TRA MY DISTRICT OF QN PROVINCE

MARKET INFORMATION	VALUE
Market price	170,000 VND kg-1
Farmer-gate price	120,000-140,000 VND kg-1
Average production per farm	20 kg year-1
Farmer profit margin	35,000 VND kg-1
Total production in the district	8.2 ton year-1
Maximum production can be absorped by whole-sellers	30-40% higher than current production
Farmer organization	None
Contracted selling/farming	None
Link with agro-business	- Fertilizer and pesticide supply - No contract between agro-business and farmers
Market price stability	- Relatively stable price - Price reaches 220,000 VND kg-1 in January-February due to high demand for Tet (i.e. new year)
Import from other region	Kon Tum province with price of 90,000 VND kg-1

Source: KII in Tra Cang commune

Traders collect the product from farmers with the price of 110,000 – 130,000 VND per kg and sell them to whole-sellers at 150,000-170,000 VND per kg (Table 83). The net profit received by the traders is about 15,000 VND per kg, after transportation cost and cost for other factors. According to one of the traders, Codonopsis has a good market. She (the trader) can easily market 400-500 kg per year compared to 200 kg per year that she usually collects from farmers. There is currently no selling/buying contract between farmers and market players within the district, and the product can be sold to the whole -sellers anytime during the year. A major challenge for the traders is that the collected Codonopsis products are easily rotten so careful maintenance and storage is needed.

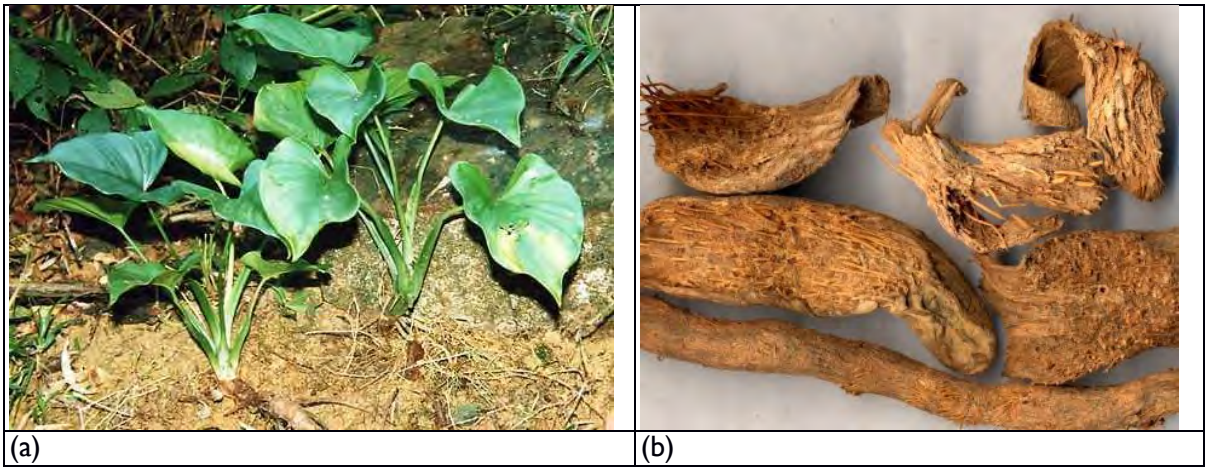
TABLE 89. CODONOPSIS COLLECTION BY TRADER IN NAM TRA MY DISTRICT OF QN PROVINCE

ITEM	UNIT	VALUE
Supply from farmers to each trader	kg year-1	200
Buying price	VND kg-1	110,00 – 130,000
Selling price	VND kg-1	150,00 – 170,000
Buying committment with farmers	-	None

Selling committment with whole-sellers	-	None
Annual warehouse cost	VND	15,000,000
Annual equipment cost (weight, knife)	VND	200,000
Annual labor cost	VND	45,000,000
Annual transportation cost (truck)	VND	50,000,000

Source: KII (Ms. Duong Thi Huong, Village 5, Tra Cang commune)

For TTH province, the potential medicinal plant to expand is Homalomena occulata (thien nien kien as vernacular name). It is a rhizomatous aromatic perennial herb within the family of Araceae (Fig. 5). It can be used for economic, medicinal and aromatic purposes. In traditional medicine, its dried rhizomes are useful in treating skin diseases, deafness and blood purifier. Another well-known use of this plant includes its medicinal properties associated with liver and kidney meridians, strengthen tendons and bones and used to treat pain and weakness in lower back and knees (http://imc.net.vn/ingredients-en/homalomena-aromatica/?lang=en). In relation to growing condition, being a sub-tropical species, it can grow well under warm and humid climate with annual rainfall ranging from 2,000-3,000mm, and 40-60% shading. Based on interviews with some Homalomena cultivators in TTH, local people consume it as a vegetable daily and hardly used as a medicinal plant.



(a) (b)

Figure 5. The Homalomena occulata (a) and its dried rhizomes (b)

It's value chain is very simple as farmers sell it directly to consumers at local markets and currently there is no demand for this plant beyond the local market. However, recently established Green Allience Limited company has targeted producing oil from this herb. The company can potentially buy 10 tons of fresh Homalomena annually for this purpose. In TTH and QN, this herb has actually been exploited as a NTFP for a long time without any conservation and/or cultivation measures. Planting Homalomena as forest under-story could be a good and sustainable livelihood option. There is no further market information available for Homalomena supply chain and demand. We therefore suggest the need of a further market investigation to increase the current production and economic contribution of this plant.

Profitability analysis

For the Codonopsis in QN, with the average production of 20 kg farm-1 year-1 mostly from natural forest the market price of 120,000-140,000 VND kg-1 and the reported profit margin of 35,000 VND kg-1, thus a HH can potentially derive a gross income of 2.4-2.8 million VND (105-123 USD) year-1 and a net profit of 700,000 VND (31 USD) year-1. This economic benefit can be higher when

the HH expands the Codonopsis planting into larger areas. Currently no information on the average land area per HH, cultivated this plant.
According to the locals, Homalomena plant can be productive from the 2nd year until to the year 5, although according to NEDFI (http://assamagribusiness.nic.in/NEDFi/map10.pdf) it can be productive from the 3rd year until year 10. We provide the profitability analysis for one hectare of Homaloma, with production cycle based on local knowledge, planted with 45cm x 30cm spacing as a forest under-story (Table 84).

TABLE 90. THE PROFITABILITY ANALYSIS OF HOMALOMENA FOR 5-YEAR CYCLE

	YEAR				
	1	**2**	**3**	**4**	**5**
Production (ton ha-1)	0	5	3	2	2
Components (million VND)					
Establisment cost	-6.2	0.0	0.0	0.0	0.0
Maintenance cost	-1.8	-1.6	-0.8	-0.8	-0.8
Cost of harvest	0.0	-1.8	-1.4	-1.0	-1.0
Revenue	0.0	25.0	15.0	10.0	10.0
Profit	-7.9	21.6	12.8	8.2	8.2
Cumulative profit	42.8				
NPV	34.2				

The production of Homalomena rhizome decreases by year, that makes the gross income that can be derived from the system also decreases (Table 96). According to the agricultural department of Nam Dong district, the product price (i.e. dried rhizome) is 5 million VND ton-1 (220 USD ton-1). A positive profit can be obtained starting from the 2nd year and the cumulative profit for the whole cycle (5 year) is 42.8 million VND (1,885 USD), or 8.57 million VND year-1. The NPV of the system reaches 34.2 million VND with an interest rate of 6.8% (i.e. Agribank rate in 2017). Annex 11.1 describes a detailed component cost to calculate the profitability analysis.

Summary and recommendations for medicinal plant

The Codonopsis market is relatively new and will potentially grow in the future. Current demand is quite high, while supply is mostly from natural resources. The total product supply is currently 8 ton year-1 from Nam Tra My district, and based on KII and this can be expanded to 16 ton year-1 (i.e. double supply) without causing a risk of market saturation. The main challenge of current value chain is unstable production and fragmented farm locations that incur high transaction costs (i.e. transportation, storage loss, larger number of traders involved etc.). Farmer's access to market information is currently poor. We recommend that groups of interested farmers should be formed and encouraged to increase the production in order to ensure more stable supply. Information from group discussions during the survey claimed that farmers would be highly interested to work as group for implementation of livelihood models. In addition to that, existing groups of household for forest protection indicates there might be high potential for community to buy-in for this implementation.

In relation to Homalomena, the presence of new company that require a substantial supply of this herb expected to create a stable market. The estimated net income for one hectare planted as a forest under-story reaches 8.57 million VND (377 USD) year-1 which is higher than the average income from short-term acacia plantation, as the most popular forest plantation in Viet Nam reported to be around 250 USD ha-1 year-1. Moreover, this herb is cultivated as forest under-story, so economic benefit can be derived while preserving or restoring forests as well.

6.2.2. PLANTING RATTAN IN QN AND TTH

The rattan value-chain in QN and TTH appears simple and has been quite stable since 2014. The natural forest is the main source for raw rattan with an annual supply of around 8,300 ton from the two provinces. The total estimated value of rattan market from the two provinces is about 41.5 billion VND, assuming the rattan price is around 5,000 VND kg-1. There are nine rattan processing companies operating in the two province (two in TTH and seven in QN) and each company annually buys 300-3,000 ton of rattan from middle-men. The largest rattan processor is Ngoc Minh company in Hue city. After processing, rattan fiber is sold to suppliers of IKEA and other large-scale enterprises located outside TTH and QN, namely Rapexco (Khanh Hoa province), Ngoc Son (Ha Noi), Phu Ninh (Hung Yen province) and Vinh Long (Vinh Long province). Table 85 describes a list of rattan processing companies in both provinces and their total production.

TABLE 91. VOLUME OF RATTAN PROCESSED BY SMALL AND MEDIUM ENTERPRISES IN QN AND TTH PROVINCE

COMPANY NAME	FIELD OF BUSINESS	PROVINCE	TOTAL PRODUCTION 2014 (TON)	TOTAL PRODUCTION 2015 (TON)	TOTAL PRODUCTION 2016 (TON)	PRODUCTION JAN- JUNE 2017 (TON)	IKEA'S SUPPLIERS
Ngoc Minh enterprise	Rattan fiber production	TTH	3,000	3,000	2,800	1,400	Ngoc Son, Rapexco
Hoang Tan enterprise	Rattan fiber production	TTH	1,000	900	950	450	Ngoc Son Rapexco, Vinh Long
Luc Dong company	Rattan fiber production	QN	900	1,100	1,000	400	Ngoc Son, Rapexco, Vinh Long
Nghia Tin company	Rattan fiber production	QN	700	1,000	900	450	Rapexco
Duy Phuoc cooperative	Rattan fiber production	QN	900	1,000	1,000	400	Ngoc Son, Phu Minh, Vinh Long
Duy Son 2 cooperative	Rattan fiber production	QN	500	400	400	200	Ngoc Son, Phu Minh, Vinh Long
Dong Huy company	Rattan fiber & handicraft	QN	600	400	380	200	Ngoc Son
Nam	Rattan	QN	350	350	400	200	Rapexco

Phuoc company	fiber & handicraft						
Au Co company	Rattan fiber & handicraft	QN	300	600	900	440	Rapexco, Phu Minh, Ngoc Son
		Total	8,250	8,750	8,730	4,140	

Source: WWF's Sustainable Rattan, Bamboo and Acacia Project, July 2017

The MVC analysis of rattan for both QN and TTH is relatively well-defined. The analysis for A Roang commune (TTH) and Ta Bhinh commune (QN) are provided in Annex 10.2 and 10.3. The value-chains are relatively short, with only four middle-men in A Luoi district (amongst, the 2 middle-men collecting rattan in A Roang commune) who buy raw rattan from farmers. Farmers harvest raw rattan from the natural forests and also plant them in their allocated forest lands. However, the planted rattan has not reached productive cycle. In A Roang commune, 40 HHs are harvesting raw rattan from the forests (Table 86) and do not seem to pay any tax or compensation for natural forest exploitation. There is no contract between farmers and the middlemen, as farmers can sell raw rattan to middlemen anytime for the price of 3,000-3,500 VND kg-1. This price is quite stable all year round and has not changed since 2013. For around 6 ton of raw rattan harvested from the natural forests annually, a HH can earn 18-21.5 million VND (793-947 USD), which is a significant income. Farmers receive a farm-gate price of about 58-67% of the mill-gate price, due to poor transportation network in the area.

TABLE 92. PRODUCTION AND MARKET INFORMATION OF RATTAN IN A ROANG COMMUNE, TTH PROVINCE

INFORMATION	UNIT	VALUE
Total harvested from natural forests per HH	ton year-1	6
Total volume of cultivated rattan	ton year-1	0
Total area of rattan plantation per HH	ha	2
Total area of rattan plantation in the commune	ha	150
Number of HH harvesting rattan in forests	HH	40
Farm-gate price (2013-2017)	VND kg-1	3,000-3,500
Selling price at Minh Ngoc company	VND kg-1	4,700
Contract with middlemen	-	None

Source: KII (Mr. Blup Choan, A Roang commune, A Roang district, TTH province)

The middle-men can earn about 1,700 VND kg-1 for raw rattan (Table 87). Hence, for a volume of 100-ton year-1 of raw rattan, a middleman can obtain an income of 170 million VND year-1. In A Luoi district, four middle-men are collecting rattan from farmers with a total absorption of 400-ton year-1. The main challenge to middlemen is the unstable supply provided by farmers who collect rattan from the natural forests occasionally and thus the income from collected products often cannot cover the transportation and maintenance cost. The interviewed middle-man has no contract with the farmer from whom he obtains the supply and has also no contract with the processing company.

TABLE 93. RAW RATTAN COLLECTED BY MIDDLE-MEN		
INFORMATION	UNIT	VALUE
Collected rattan from farmer per middle-men	ton year-1	100
Buying price	VND kg-1	3,000-3,500
Contract with farmers	-	None
Selling price	VND kg-1	4,700-5,200
Contract with processing company	-	None
Maximum increase of rattan supply to sell to processors	%	200%
Annual unsold product	%	0
Which time of the year when rattan cannot be sold	-	None
Annual warehouse cost	VND	15,000,000
Annual equipment cost (weight, knife)	VND	200,000
Annual labor cost	VND	45,000,000
Annual transportation cost (truck)	VND	50,000,000

Source: KII (Mr. Chau Van Hung, A Min village, A Roang commune, A Luoi district)

According to our interview with Ngoc Minh company, the largest rattan processing company in Hue city, their main source of raw rattan is actually neither from QN nor TTH, but from Ha Tinh province. Only 800 out of about 3,000 tons of rattan processed by the company annually comes from TTH. The company buys raw rattan mostly from middle-men at 4,700-5,200 VND kg-1 (Table 88), however only 15% of raw rattan can be used for further processing. The price of processed rattan is around 7,400 VND kg-1. The sources of rattan for the processing company are Nam Dong district: 100-ton year-1, A Luoi district: 300-ton year-1, Huong Tra district: 300-ton year-1, Phong Dien district: 100-ton year-1, Quang Tri province: 400 ton year-1, Ha Tinh province: 1,300 ton year-1, Quang Binh province: 500 ton year-1.

TABLE 94. RAW RATTAN ABSORPED BY NGOC MINH PROCCESSING COMPANY		
INFORMATION	UNIT	VALUE
Total volume absorped annually	ton	3,000
Buying price	VND kg-1	4,700-5,200 based on quality
Contract with rattan collector	-	Some
Selling price of products from rattan	VND kg-1	22,000 – 50,000 VND kg-1
Increase of rattan volume that can be absorped by the company	%	70%
Annual unsold product volume	%	0
Which time of the year when rattan cannot be sold?	-	Rainy season (Oct. – Feb.)
Main clients	-	Phu Ninh, Ngoc Son, Rapexco

Source: KII (Ngoc Minh company, TTH)

Profitability analysis

According to local knowledge, the rattan species Daemonorops poilanei (may nuoc as vernacular name) can be harvested from 5 years after plantation until the year 8. The growth and production cycle is actually longer than 8 years, but production rate will significantly decrease thereafter. It is therefore recommended to rejuvenate after harvesting at year 8. The profitability analysis of an 8-year rotation cycle of Daemonorops rattan planted under forest canopy is provided in Table 89. The rattan is planted with a density of 1,650 trees ha-1 and 1 ha scale. Due to similarity in productivity and market condition, no separate profitability analysis is conducted between QN and TTH provinces.

TABLE 95. THE ECONOMIC ANALYSIS OF RATTAN AS FOREST UNDERSTOREY FOR 8-YEAR CYCLE

	YEAR							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Production (ton ha-1)	0	0	0	0	3	4	5	5
Components of economic analysis (million VND)								
Fundamental cost	-11.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maintenance cost	-3.3	-1.9	-1.2	-0.8	-0.8	-0.8	-0.8	0.0
Cost of harvest	0.0	0.0	0.0	0.0	-2.0	-2.4	-3.0	-3.0
Revenue	0.0	0.0	0.0	0.0	10.5	14.0	17.5	17.5
Profit	-15.0	-1.9	-1.2	-0.8	7.7	10.8	13.7	14.5
Cumulative profit	27.8							
NPV	12.7							

According to the agricultural department of Nam Dong district, the price of rattan in QN and TTH is about 3.5 million VND ton-1. Under this market price, the cumulative profit for 8 years of rattan planting is 27.8 million VND (1,224 USD) and annual profit of 3.47 million VND (152 USD). The NPV with 6.8% interest rate is 12.7 million VND (559 USD). Annex 11.2 describes a detail component cost for the profitability analysis.

Summary and recommendations for rattan livelihood option

The raw rattan market in QN and TTH provinces seems to be stable in the last 3 years and likely to grow in the future. Currently, market demand is not meeting the supply, which is almost solely dependent on natural forests as the primary source. Farmers are enjoying a large share of the market price without any investment. Price uncertainty is quite low and farmers know well about the market price, with almost no seasonal price fluctuation. There is no buying or selling contract either by middlemen or processing companies in the two provinces (Ngoc Minh company does have a contract with middlemen). This could be due to the fact that raw rattan is exploited directly from natural forests and the rattan exploitation area is open for farmers who can exploit it. The weaknesses of raw rattan value-chain include;

(1) the supply is not stable and insufficient to balance market demand, and
(2) the whole chain is depending heavily on natural forest exploitation.

Surprisingly, none of interviewed actors reported that they had to pay any tax, fee, or any compensation for exploiting natural forest products. If carefully planned and properly managed, the development of planted rattan model in the area will help to address these weaknesses, providing more stable supply to the market and most importantly, reduce pressure on the natural forests. In terms of future market, the increase in production by 70% can still be absorbed by the Ngoc Minh, as the largest rattan processing industry in TTH province.

6.2.3. TIMBER PLANTATION IN QN AND TTH

For this profitability analysis, the hybrid Acacia mangium x auriculiformis trees are planted with 1,650 trees ha-1, with cassava as inter-crop in the first year of plantation. The trees will be harvested at year 8 after plantation for timber purpose and the economic analysis was conducted for 1 ha scale (Table 90).

TABLE 96. PROFITABILITY ANALYSIS OF ACACIA TIMBER PLANTATION FOR 8-YEAR CYCLE

	YEAR							
	1	2	3	4	5	6	7	8
Acacia production (ton ha-1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	150.0
Components of economic analysis (million VND)								
Fundamental cost	-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maintenance cost	-6.9	-4.5	-4.5	-2.4	-2.4	-2.4	-2.4	0.0
Cost of harvest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-26
Cost for planting cassava	-10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Revenue Cassava	26.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Revenue Acacia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	210
Profit	-0.8	-4.5	-4.5	-2.4	-2.4	-2.4	-2.4	183
Cumulative profit	164							
NPV	96							

According to the agricultural department of Nam Dong district, the price for acacia timber is 1.4 million VND ton-1 and for cassava 1.2 million ton-1. With this market price, the cumulative profit for 8 years of acacia-cassava plantation is 164 million VND (7,224 USD) ha-1, or 20.5 million VND (903 USD) ha-1 year-1. The NPV with 6.8% interest rate is 95.7 million VND (4,216 USD). Annex 11.3 describes the cost in details to calculate the economic benefit.

Summary and recommendations for acacia plantation

In terms of economic benefits, the annual income of 903 USD ha-1 that can be derived from the 8-year rotation of acacia plantation is higher than about 250 USD ha-1 year-1 that the current short-term (i.e. 4-year rotation cycle). However, there will be an issue of income gap since income from cassava as intercrop can be derived at the first plantation year only. Therefore, farmers will go without an income from this system for 7 years before timber harvesting. Unless their income can be backed up from other sources such as other agricultural plots or from off-/non-farm jobs, it is unlikely that farmers can wait until 8 years to get income from the system, especially poor farmers or farmers that largely depend on forest plantation as the main source of family income. We therefore identify the need to develop alternative acacia timber plantation models, that can overcome the income gap, likely by exploring tree spacings that allow integration of intercrops for several years, or by introducing other annual/perennial plants into the system that can be source of income before timber harvesting.

6.2.4. POMELO PLANTATION IN QN

The pomelo MVC analysis is conducted for the case of Phuoc Ninh district, and includes producers (farmers), middle-men (collectors), retailers, and consumers as actors (please see Annex 10.4 for Pomelo MVC diagram). There are three value-chain types of pomelo in this district as follows:

Chain 1: producers to consumers. Some HHs directly sell their products to consumers in local markets. This value-chain, although provides highest proportion of profit to farmers, is not popular because most HHs do not have enough labor for selling, and local market demand for pomelo is not high. This type of value-chain only contributes to about 2% of total pomelo market in the district.

Chain 2: producers -> retailers -> consumers. This type of value-chain accounts for about 33% of total pomelo market in the district. Following this chain, the farmers harvest and bring the pomelo to retailer shops in Tam Ky city of QN province. By this way, farmer will get an extra of 3,000 VND fruit-1 from the farm-gate price of 17,000 VND fruit-1. However, farmers often do not have a link to the retailer shops, and there is a high risk that they cannot sell their products to the retailers.

Chain 3: producers -> collectors -> retailers -> consumers. This type of value-chain is most common (about 65% of total pomelo market) although farmers do not get the highest economic benefit. The middlemen (traders) buy pomelo from farmers and sell to whole-sellers in Tam Ky, Da Nang, and Ho Chi Minh city. The difference between farm-gate price and market price (paid by consumers) is about 7,000-10,000 VND fruit-1. Most farmers favor this chain since it demands less labor for selling.

According to a middle-man in the district, the number of middle-men of pomelo market is increasing and cannot be estimated exactly since they often collect several products from farmers at the same time. A major middleman can absorb around 5,000 pomelo year-1 while a secondary one about 300 pomelo year-1. Around 70% of pomelo production are sold to retail shops in Tam Ky and Da Nang city and the rest to retail shops in Ho Chi Minh city. There are two sizes of pomelos: big size (above 1kg fruit-1) can be sold at 20,000 VND fruit-1 to the retail shops while smaller size at 17,000 VND fruit-1. Some statistics of pomelo market through the middle-man is shown in Table 91. Major challenges to pomelo market include pomelo farms are scattered which results a large number of middle-men involved in the value-chain and market price is relatively unstable.

TABLE 97. POMELO MARKET THROUGH MIDDLE-MEN (TRADERS)

INFORMATION	UNIT	VALUE

Total fruits collected from farmer annually	Fruit year-1	6,500
Big pomelo (>1kg)	Fruit year-1	5,000
Small pomelo (<1 kg)	Fruit year-1	1,500
Buying/selling price for big pomelo	VND fruit-1	17,000-20,000
Buying/selling price of small pomelo	VND fruit-1	13,000-17,000
Buying committment with farmers	-	Verbally, cover 70% of total collected fruits, no commitment for the rest
Selling committment with whole-sellers	-	Only verbally
Increase in production that can sell to whole-sellers		
Big pomelo	%	100 (or 5,000 fruits)
Small pomelo	%	100 (or 1,500 fruits)
Annual unsold product	%	0
Which time of the year when pomelo cannot be sold	-	None
Annual warehouse cost	VND	None
Annual equipment cost (weight, knife)	VND	None
Annual labor cost	VND	4,500,000
Annual transportation cost (by truck)	VND	19,000,000

Source: KII (Mr. Nguyen Van Son, Que Trung commune, Nong Son district, QN province)

Through an interview with Ms. Dinh Thi Hoa, a fruit retailer in Cam Ha market, Hoi An city, it reveals that there are about 8-9 retailers selling Tru pomelos in Cam Ha market. Each retailer absorbs around 1,000 fruits year-1 (Table 92). About 40% of these pomelos are bought directly from farmers, and 60% are supplied by middle-men. In Hoi An city, there are about 7-8 markets at similar size of Cam Ha market, thus total marketed pomelo in the city alone reaches about 72,000 fruits year-1. It is reported that the Tru pomelo market has been growing since 2015 and market demand in 2016 has increased about 40% compared to 2015.

TABLE 98. POMELO MARKET THROUGH RETAILER

INFORMATION	UNIT	VALUE
Total marketed fruits annually (big pomelo only)	Fruit year-1	1,000
Buying price (big pomelo)	VND kg-1	20,000
Contract with traders	-	Only verbally
Selling price	VND fruit-1	25,000
Additional production can still absorp by retailers	%	0
Annual unsold product volume	%	0
Which time of the year when pomelo cannot be sold	-	Not easy to sell outside season of July – September.

Source: KII (Ms. Dinh Thi Hoa, Ben Tre village, Cam Ha commune, Hoi An city)

Profitability analysis

Table 93 describes the profitability analysis of pomelo plantation that has a tree density of 500 trees ha-1 during 10 years of plantation. The pomelo trees start to be productive at year 6 with a production about 30-48 ton of fruits ha-1. According to the Center for Extension of QN province, the price of 1 kg of pomelo fruit is 20,000 VND and this figure is used in the analysis. With this market price, the cumulative profit for 10 years of pomelo planting is 4,027 million VND (117,401 USD) and annual profit of 402.7 million VND (17,740 USD). The NPV with 6.8% interest rate is 2,323 million VND (102,335 USD). This is however, estimate under optimal production level where all trees are assumed to be productive in the same time and the system is under appropriate plot management for 10 years. Furthermore, no effect from any pest or disease is considered. Annex 11.4 describes a detail component cost used in the analysis.

TABLE 99. ECONOMIC ANALYSIS OF POMELO PLANTATION FOR 10 YEARS

	YEAR									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Production (ton ha-1)	0	0	0	0	0	30	40	48	48	48
Components of economic analysis (million VND)										
Establishment cost	-82	0	0	0	0	0	0	0	0	0
Maintenance cost	-6	-4	-4	-4	0	0	0	0	0	0
Harvesting cost	0	0	0	0	0	-21	-28	-35	-35	-35
Revenue	0	0	0	0	0	600	800	960	960	960
Profit	-88	-4	-4	-4	0	579	772	925	925	925
Cumulative profit	4,027									
NPV	2,323									

Summary and recommendations for pomelo plantation

Within the supply chain, majority of pomelo producers (farmers) are isolated from end-users (consumers) and there is a little control over input cost or product price. The transaction cost is high, but most farmers accept it because their production volume is small and fragmented. Farmer's poor access to market and market information, as well as their potential to enter new markets, are also the disadvantages of this type of supply chain.

The proposed interventions to this value-chain are as follows:

(1) develop groups of interested farmers on pomelo plantation to increase production level and ensure more stable supply;
(2) register trade-mark for the local pomelo variety to expand its markets; and
(3) combine pomelo production with community-based eco-tourism to improve market access and volume.

6.2.5. ORANGE PLANTATION IN TTH

The orange MVC analysis for TTH is focused in Nam Dong district and described in Annex 10.5. The total orange production in the province is unknown, but total production in the district is around 30-35 ton and in Huong Loc commune is about 8-10 ton with about 30 HHs planting orange on their lands.

The average farm-gate price is 25,000 – 30,000 VND kg-1, while market price (fruits bought by consumers) is about 30,000–45,000 VND kg-1. The proportion of market price received by farmers is relatively high, between 67-83%. Farmers sell their product to 10-12 middle-men in the district (each middle-man can absorb around 1.5-2 ton orange), the middle-men then sell the fruits to whole-sellers in Hue city. There was no form of contract between these actors that we found during interviews. The market players are optimistic about the district market demand for orange and estimated the demand increases by 25-30% per year and there are no unsold products. Basic market information of Nam Dong's orange is shown in Table 94 below. However, the cost-benefit of each actor of this value chain could not be estimated due to lack of information. Nam Dong orange originated from Sai Gon orange more than 30 year ago.

TABLE 100. MARKET INFORMATION FOR ORANGE IN NAM DONG DISTRICT, TTH

INFORMATION	UNIT	VALUE
Market price	VND kg-1	30,000 – 45,000
Farm-gate price	VND kg-1	25,000 – 30,000
Proportion of final selling price received by farmer	%	67-83
Average annual production	kg farm-1	270-330
District production	Ton	35 ton
Orange productivity	ton ha-1	10-20
Average revenue	VND farm-1	6,750,000 – 9,900,000
Number of middlemen in Nam Dong district	Middle-men	10-12
Market demand estimation	%	Increasing 25-30% by year
Contracted selling/farming	-	None
Link with agro-business	-	None
Price variability	-	Higher price in early season

Source: KII of actors across Nam Dong's orange value-chain

Profitability analysis

For the economic analysis (Table 95), the trees are planted with a density of 500 trees ha-1. The productive stage starts at the 5th year after planting and the profitability analysis is for 10 years and 1 ha scale. The production level increases annually and represents an optimal production where all trees are productive and under appropriate plot management option. It is assumed no effect from any pest or disease.

TABLE 101. THE ECONOMIC ANALYSIS OF ORANGE PLANTATION FOR 10-YEAR CYCLE

	YEAR

	1	2	3	4	5	6	7	8	9	10
Production (ton ha-1)	0	0	0	0	10	14	18	18	20	20
Components of economic analysis (million VND)										
Establishment cost	-57	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maintenance cost	-14	-11	-9	-0.6	-9	-9	-9	-9	-9	0.0
Cost of harvest	0.0	0.0	0.0	0.0	-1.6	-2.4	-4.0	-4.0	-4.0	-4.0
Revenue	0.0	0.0	0.0	0.0	200	280	360	360	400	400
Profit	-72	-11	-9	-0.6	190	269	347	347	387	396
Cumulative profit	1,843									
NPV	1,075									

The cumulative profit for 10 years of orange plantation reaches 1,843 million VND (81,189 USD) or 184.3 million VND of annual profit (8,119 USD year-1). The NPV under the 6.8% interest rate is 1,075 million VND (43,357 USD). Annex 11.5 describes a detail component cost for the profitability analysis.

Summary and recommendations for orange plantation

Demand for Nam Dong's orange is likely to grow in the future. Farmers receive a high proportion of market price (compared to other agricultural products) thanks to the market price and a relatively short value chain. Seasonal price variability is not significant and farmers are well-informed on the market price. The local knowledge informs that orange plantation area can likely be expanded by at least 50% without inducing a risk of market saturation. The value-chain can be improved by developing groups of interested farmers to open new plantation.

6.2.6. BEEF PRODUCTION IN TTH

The MVC analysis of cattle production can be done up to district level only. The analysis includes producers (farmers), traders (middle-men who buy cattle from farmers and sell to slaughter-houses), processors (slaughter-houses), whole-sellers and customers. In Hong Phong commune there are about 50 HHs raising cattle and each HH has 1-30 cattle. The cattle are sold at 85,000 VND kg-1 as farm-gate price. There are a total of 5 traders in the district who buy cattle from farmers and sell to slaughter-houses at 95,000 VND kg-1. For example, one trader (Mr. Nguyen Van Truong) can buy about 300 cattle (about 15 tons in total) a year. There are three slaughter-houses in the district with total estimated capacity of 50 tons (about 1,000 cows year-1). The meat is then sold to whole-sellers with a price of 210,00 VND kg-1 and to final consumers in A Luoi with a price of 240,000 VND kg-1. The market information of cattle is summarized in Table 96 below.

TABLE 102. MARKET INFORMATION FOR CATTLE IN A LOUI DISTRICT

INFORMATION	UNIT	VALUES
Selling price	VND kg-1	240,000
Farm-get price	VND kg-1	85,000

Proportion of selling price received by farmer	%	35
Average production per farm	ton year-1	0.5
Increased in production that can still sell to market	%	100%
Average revenue per farm	VND year-1	46 million
Number of middle-men in A Luoi district	Person	No information
Contracted selling/buying	-	None
Link with agro-business	-	None
Price variability	-	Relatively stable market price

Source: KII of actors across A Luoi cattle value-chain

In terms of price variability, farm-gate price has been relatively stable from 2013 until 2017, except a slight decline in 2016. In 2013-2015 and 2017, the price was 90-95 thousand VND kg-1 while in 2016 was 80-85 thousand VND kg-1. In relation to the price variability by market players, the producers who are often most susceptible to market price in value-chain of other agricultural products have the most stable price of 80-85 thousand VND kg-1. For traders, the range of market price is 80-95 thousand VND kg-1, for processors 230-250 thousand VND kg-1 and for whole-sellers 180-250 VND kg-1. The cattle production in A Luoi district is relatively small to affect the larger-scale cattle market, but at the same time cannot be easily replaced by other products. Therefore, the strategy should not aim at increasing production level, but instead accessing higher market price through branding and other market strategies.

Summary and recommendations for cattle production

The cattle MVC in A Luoi district can be described as a "niche" market that relies on a small but specific and well-defined segment of market demand. In this value-chain, producers access a stable but a small proportion of market price, while the larger proportion is captured by actors at higher level. The potential of expanding local production is indeed limited. Farmers are confident that they can double the production level and can still sell, but traders and processors can absorb a 5% increase only. Therefore, we recommend that the intervention should focus on branding and exploring new market strategies to increase product price rather than escalating the production level. This will help farmers to derive more economic benefit from cattle raising, compared to the current annual income of 46 million VND (2,026 USD) farm-1.

6.3. PROPOSED MODELS FOR PILOTING

6.3.1. RECOMMENDED MODELS FOR PILOTING IN QN AND TTH

Within the framework of the Green Annamites project, and by consolidating local stakeholders and the expert team's recommended livelihood models, as well as the MVC and profitability analysis to the five main livelihood models for both QN and TTH provinces, we recommend three models for piloting namely medicinal plant, eco-tourism and rattan. As for forest plantation, by lumping surveyed households 62% had acacia plantation, mostly for wood chips and field observation showed that they have replanted after harvesting. However, it is noted that during our stakeholder consultation, farmers were rather reluctant to the timber plantation model as it appears to them a new cultivation

method with large investments required and takes a long time to obtain full financial returns. Therefore, although this model obtains a high ranking from the perspective of local authorities and the expert's team, we suggest that it should be first demonstrated at a small scale with a group of carefully selected farmers to ensure their commitment and success. A demonstration, if any, will be key to farmers' interest and adoption. Being reluctant to timber plantation, farmers could have not been interested in FSC yet due to its high technical requirements and high risks of disasters and market. However, this does not mean impossible to introduce FSC timber plantation to households but it would take quite long times to seek for their willingness and need some encouragements such as financial support and risk sharing mechanism.

In relation to pomelo and orange plantations, we consider that their markets are relatively well-developed, and the production in the provinces comes from small holder plantations, compared to rattan with a large portion of total supply comes from natural forests. Due to this, there is a need to develop planted rattan product as well. For eco-tourism, developing this sector expectedly can promote and develop other sectors as well such as promoting local pomelo/orange, local cattle production etc.

6.3.2. DESCRIPTION OF PILOT FARMS/MODELS

6.3.2.1. Pilot farm 1 – Medicinal plant in TTH province

The pilot farm is located in Thuong Lo commune, Nam Dong district, TTH province. The farm-owner cultivate Homalomena on a 1.5 ha community forest (CF) land (Table 97). This land is part of 58 ha CF allocated to 6 HHs. The HH has two laborers working on the Homalomena plantation. Currently, the plantation is not in productive stage, but the HH has been harvesting and earning income from this herb by extracting from nearby forests. However, it only contributes less than 5.6% (together with some other NTFPs such as honeybee and bamboo shoots) to family income. Based on KII in Thuong Lo commune, there are about 100 HHs interested to plant the medicinal plant within CF. The total potential CF area in the commune for Homalomena plantation is about 500 ha. The raw herb's products from the natural forests can be marketed through local traders in Khe Tre district, with a market price of 5,000 VND kg-1. Currently, there is no buying/selling contract between cultivators and traders. The proposed intervention for improving Homalomena production and market access in this district is to develop farmer's groups. Each group can consist 6-20 HHs.

TABLE 103. HOUSEHOLD AND PILOT-FARM INFORMATION FOR MEDICINAL PLANT IN TTH

HOUSEHOLD INFORMATION		PRODUCT INFORMATION	
Name of HH head	Vuong Van Ga	Product	Homalomena occulta
Ethnicity	Co Tu	Program	Planting medicinal plant under forest storey
HH's labor	2	Farm-gate price	5,000 VND kg-1 for raw products
Education	High school	Annual volume	Not yet haversted
Site	Thuong Lo commune	Cultivation area	1.5 ha
Distance to market Farthest distance	3 km 6 km	Access to credit	Yes

between farm plots

Source: KII, Mr. Vuong Van Ga, Thuong Lo commune, Nam Dong district, TTH province

The HH currently has different income sources both on-farm and off-/non-farm (Table 98), with a total annual income of about 70.75 million VND (3,116 USD). Amongst potential constraints to develop the medicinal herb planting, he considers poor infrastructure (road network to farm areas) and poor market access as the prime ones, followed by the absence of community cooperation, poor quality planting materials, lack of knowledge on Homalomena planting and lack of access to the credit facility. In relation to risk after planting, he considers unstable market, extreme weather events, pest and disease, inability to commit to loan payback and change in agricultural development policy as main factors.

Recommended supports from the project include:

(i) setting up a revolving fund to help farmers access to credit,
(ii) link farmers to market,
(iii) develop farmer's groups into cooperatives to obtain a legal entity,
(iv) enhance capacity of extension staffs,
(v) help to find quality Homalomena planting materials, and (vi) provide market information channel to farmers.

TABLE 104. INCOME OF PILOT HOUSEHOLD FOR MEDICINAL PLANT IN TTH

SOURCES OF INCOME	ANNUAL INCOME (THOUSAND VND)
On-farm	
Banana	2,000
Acacia plantation	10,000
Food crops (rice, maize)	1,500
Livestocks (pig, chicken)	5,000
Off-farm	
Wage labor	30,000
Forest	
NTFPs	4,000
Timber (Acacia)	10,000
PFES/Forest patrolling	8,250
Total	70,750

Source: KII, Mr. Vuong Van Ga, Thuong Lo commune, Nam Dong district, TTH province

6.3.2.2. Pilot farm 2 – Medicinal plant in QN province

The pilot farm is located in Tra Cang commune, Nam Tra My district, QN province. The farm-owner allocates 1 ha out of 10 ha of his lands for Codonopsis cultivation. The farmer has two labors to harvest 120 kg of the medicinal herb annually, of which 70 kg are extracted from natural forests and 50 kg from his land, contributing to about 27% of total family income. Information of the pilot

farm is given in Table 99. Based on KII, 280 HHs in the commune plant Codonopsis with area ranges from 500 m2 to 1 ha, while 200 HHs harvest from natural forests. The total cultivated area in the commune is about 84 ha, and the total production of the commune reach 5.6 ton year-1, both from planted and harvested from natural forests. The market price is reported at 150,000 VND kg-1. No concession or marketing contract has been made between farmers and market players. The pilot HH has an annual income of about 66.5 million VND (Table 100).

TABLE 105. HOUSEHOLD AND PILOT-FARM INFORMATION FOR MEDICINAL PLANT IN QN

HOUSEHOLD INFORMATION		PRODUCT INFORMATION	
Name	Ho Van Vua	Product	Codonopsis pilosula
Ethnicity	Ka Dong	Program	Cultivation under forest canopy
HH labor	2	Farm-gate price	150,000-160,000 VND kg-1
Education	High school	Total annual harvest	50 kg (from natural forests) 70 kg (from the farm land)
Site	Tra Cang commune	Cultivation area	1 ha
Distance to market	17 km	Access to credit	Yes
Farthest distance between farm plots	1 km		

Source: KII, Mr. Ho Van Vua, Tra Cang commune, Nam Tra My district, QN province

The HH considers lack of access to inputs such as fertilizer, technical support and quality planting materials as prime constraints to Codonopsis planting, followed by poor infrastructure and access to low-interest credits. After planting, there are several risks such as unstable market and pest and disease, but the HH didn't consider both as serious threats. Recommended supports from the project include:

(i) create farmer's groups to consist of about 15 members per group, and link them to trustworthy whole-sellers to ensure stable market,
(ii) help to enhance capacity of extension staffs especially related to Codonopsis planting,
(iii) help to find quality planting materials, and
(iv) help farmers to access to the credit facility.

TABLE 106. INCOME OF PILOT HOUSEHOLD FOR MEDICINAL PLANT IN QN

SOURCES OF INCOME	INCOME (THOUSAND VND)
On-farm	
Tree crops	
Pomelo	1,000
Orange	1,500
Food crops Upland rice (rain-fed)	1,400
Livestock	

Chicken	1,000
Local Pig	20,000
Off-/non-farm	
Business	15,600
Officer	6,000
Forest	
NTFPs (Codonopsis)	18,000
PFES/Contracted forest patrolling	2,000
Total	66,500

Source: KII, Mr. Ho Van Vua, Tra Cang commune, Nam Tra My district, QN province

6.3.2.3. Pilot farm 3 – Community-based eco-tourism in TTH province

The pilot for community-based eco-tourism model is located in Hong Ha commune, A Luoi district, TTH province. It was established in 2016 with 28 members, of which 11 members belong to the management board. Currently, the main tourist attraction is the Parlee water stream. The gong-performance, restaurant and home-stay are also part of attraction and facilities (Table 101). Visitors are mainly local residents in the district and university students. This eco-tourism business however, has no collaboration with tour companies.

TABLE 107. PILOT COMMUNITY-BASED ECOTOURISM INFORMATION IN TTH

GROUP INFORMATION		PRODUCT INFORMATION	
Name	Hong Ha commune tourism management board	Product	Eco-tourism services
Ethnicity	Co Tu	Current activities	Sight-seeing (waterstream), Gong-performance, restaurant (lunch), homestay (18)
Total member	28	Annual revenue	1.1 billion VND (2016); 1 billion VND (2017)
		Net profit	500 million VND (2017)
Education	Bachelor (highest)	Record of visitors	19,000 in 2016; 13,000 in 2017 so far
Location	Hong Ha commune	Total area	No information
Distance to nearest city	45 km (Hue city)	Access to credit	No

Source: KII (Hong Ha commune tourism management board)

The management board has a plan to expand tourism services and activities, including the opening of more sight-seeing spots (hydro-power reservoir, the holly rock, two tunnels built during the Vietnamese war), agro-ecotourism (livestock farm, home-garden with native species, rubber plantation with honey bee and rattan forest) and cultural tourism (food, gong-culture, local dance performance, weekend market and the Guol-house of Co Tu). This plan would involve a 2-5 ha farm for native chickens, pigs, etc., a 2 ha rattan cultivation inside forest to demonstrating sustainable

system, and about 20 ha of rubber plantation. However, there is no indication whether a financial resource is secured for this plan.

It is likely that establishment cost of this eco-tourism model was shared among the commune and district budgets, as well as local residents, and the investment in cash is reported at about 1.2 billion VND. The annual revenue is between 1 and 1.1 billion VND (Table 101) and the net profit is about 500 million VND. The net cash income is allocated as follows: 10% to the common fund managed by the CPC, 10% as investment and development budget, and 80% to the members based on their role and actual contribution in the business operation.

Interview with the management board reveals the main challenge to the business development is the market, since currently only one tourist attraction (i.e. the water stream), it is difficult to attract more visitors especially from other cities. The plan to expand tourism and activities in order to boost the market, should also be accompanied by enhanced staff capacity since currently lack of capacity to manage the business is also perceived as the second constraint to the eco-tourism development. The board also faces some difficulties in accessing credits. More details on limitations of the current model are shown in Table 102.

TABLE 108. LIMITATIONS OF COMMUNITY-BASED ECOTOURISM MODEL

LIMITATION	DESCRIPTION	SCORE*
Access to fund/credit	Since the group has no legal identity recognized by the laws, this model has difficulty in acceessing credit sources	2
Access to inputs	None. Inputs are readily available at the commune	0
Policy constraint	None	0
Training and technical assistance	Lack of knowledge and skills to provide good services.	3
Organization of production activity	Weak organizational structure. The group was not designed as enterprise or cooperative to obtain legal entity. The management board and other members were not trained professionally in tourism services	3
Infrastructure	Poor road network to the site. Electricity supply is not sufficient for tourist activities during night-time. Even basic facility such as toilet is lacking.	2
Marketing	Very weak although there is a staff responsible for marketing. No connection with tour agents and companies.	4

Source: KII (Hong Ha commune tourism management board) *0: not serious; 1: very minor, 5: very serious

In terms of risk assessment, the climate condition such as long and early rainy season is perceived as the most serious threat to the business. A long and heavy rain will cause sharp decline in terms of number of visitors and raises safety issues, especially in and around Parlee water stream. Market risk was also an important consideration to the management board, but it seems rather a limitation than a risk to the model itself.

The community-based eco-tourism is still potential to develop in Hong Ha commune, especially since it has received support from the whole community, either in cash or in kind. The current number of visitors (13,000 to 19,000 per year) is indeed an impressive figure for such a model with relatively small investment. However, there is a strong need to develop strategies to diversify

tourism programs and activities to attract more visitors. This strategy has to reconcile livelihood and environmental pressure. Recommended supports from the project mainly include

(i) help in developing agro-ecotourism as planned by the board (i.e. livestock farm, home-garden with native species, rubber plantation with honey bee and rattan forest),
(ii) help to develop the group as cooperative or rural enterprise so that they can access credit to expand the business, and specialize in tourism service delivery, and
(iii) help in capacity building of the staff.

6.3.2.4. Pilot farm 4 – Household-based agro-ecotourism in QN province

The pilot of household-based eco-tourism model for QN is located in Que Trung commune, Nong Son district. This model is managed by farmers who plant pomelo in their home gardens. Visitors to the model are mainly local residents from Da Nang city, Hoi An town, Tam Ky, Duy Xuyen and Dai Loc districts. This model can become a pilot for Que Trung commune with other existing household-based agro-ecotourism farms as well and can be replicated in Phuoc Ninh that has home gardens with Tru pomelo.

Que Trung commune has several attractions to agro-ecotourism visitors. It is located along the riverside with a stunning view, fresh air and it is well known as home for Tru pomelo, the local home garden's specialty. Many villagers in the commune plant fruit trees, including pomelo in their garden and develop agro-eco-tourism business. Table 103 below describes a home garden model of Mr. Nguyen Quang Soan with a total area of 0.75 ha that can receive up to 100 visitors daily. The HH can provide lunch to visitors and also sell the local fruits.

TABLE 109. PILOT HOUSEHOLD-BASED ECOTOURISM INFORMATION IN QN

HOUSEHOLD INFORMATION		PRODUCT INFORMATION	
Name of HH head	Nguyen Quang Soan	Product	Eco-tourism services, local pomelo
Ethnicity	Kinh	Program	Tour with fruit and lunch services, using homegarden and local products
Total family member	5	Annual revenue	447 million VND (services and agro products)
		Net profit	No information
Education	High school	Visitors	100 people daily
Employee	3 (full time)		
Location	Que Trung commune	Total area	0.75 ha
Distance to nearest city	60 km (Da Nang city)	Access to credit	Yes

Source: KII, Mr. Nguyen Quang Soan, Que Trung commune, Nong Son district, QN province

It is hard to exactly estimate the establishment cost for this model because the family uses their own house and garden to receive visitors. The family often hires local labor to maintain their home-garden. Lunch service usually costs 150,000-200,000 VND person-1. However, the family does not record the number of visitors annually and the associated costs. A rough estimate of the net benefit from the model is about 200 million VND (8,811 USD) year-1. Based on interview with the owner, the challenge to develop the model includes lack of access to quality germplasm for fruit trees and

lack of marketing knowledge. In terms of risk, extreme weather events such as heavy rain and strong winds can cause fruits falling into the river and landslides at the river bank near the garden. The HH is also uncertain about the number of visitors expected to visit the model and seems reluctant on further investment due to this risk. To mitigate the risks, the HH suggested:

(1) ensure fruit tree growth and quality with grafted seedlings from reputable nurseries;
(2) carefully monitor weather conditions and forecast; and
(3) enhance interaction with visitors through social networks (e.g. Facebook).

A household-based agro-ecotourism has a potential to develop in Nong Son district due to the local home gardens and a beautiful landscape scenery along the river. The interviewed HH obtains a significant revenue from tourism activities, contributing to about 67% of total family income. Thus, from an economic perspective, the model seems to be attractive. The local authority is planning to use the HH model as a demonstration site of home garden development in the district. A new highway from Da Nang to Tam Ky will facilitate the visitors to access the site with other tourist attractions in Que Trung and Phuoc Ninh communes (e.g. Hon Kem Da Dung, Le pass, My Son tower). The main challenges of this model are susceptibility to climate condition and variability. It is recommended that the HHs involved in this agro-ecoturism model are pooled into an association to better access market information and further developing a collective nursery garden, thus can better control the quality of planting materials.

6.3.2.5. Pilot farm 5 – Planting rattan in QN province

The pilot farm is located in Ta Bhing commune, Nam Giang district, QN province. The farm-owner has allocated 0.5 ha out of his 4 ha land for rattan cultivation (Table 104). Currently, the planted rattan has not reached the productive stage yet. The HH has two laborers who can harvest 1.4 ton of rattan annually from natural forests, that contributes to 10% of family income. The farm represents a typical mountainous rural farm of Nam Giang district, characterized by scattered cultivation plots that can be 7 km away from each other. Based on KII, in Ta Bhing commune, there are about 50 HHs planting rattan in their lands, and about 30 HHs harvest from natural forests. The rattan planted area is between 0.2-1 ha per HH, and the total rattan cultivation area in the commune is about 20 ha. The total production of planted rattan in the commune, however, cannot be estimated since the plots have not been harvested yet. For harvested rattan in the natural forest, farmers are selling them to one agent in Ta Bhing commune with a price of 4,000 VND kg-1 without any marketing or concessional contract.

TABLE 110. INFORMATION OF PILOT RATTAN PLANTING IN QN

HOUSEHOLD INFORMATION		PRODUCT INFORMATION	
Name	To Ngol A Ping	Product	Rattan (raw)
Ethnicity	Ko tu	Cultivation method	Harvesting as NTFPs and cultivation
HH's labor	2	Farm-gate price	4,000 VND kg-1
Education	Secondary	Annual harvest	1.4 ton (from natural forest) 0 ton (from private land – not productive stage yet)
Site	Ta Bhing commune	Cultivation area	0.5 ha
Distance to market	0.5 km		

Source: Farmer interview.

At the moment, a cost-benefit analysis for rattan cultivation cannot be conducted since the plots have not been harvested yet. However, based on farmer interview, the establishment cost for 1 ha of rattan cultivation is estimated to be around 12 million VND, and the maintenance cost about 3 million VND year-1 through the whole cycle. The farm-owner has perceived some constraints to planting rattan such as lack of guidance on sustainable rattan harvesting, poor access to credit, poor quality planting material, lack of knowledge and skills on plot management, lack of market information, and poor infrastructure (Table 105). Surprisingly, the farmer considers lack of sustainable rattan harvesting plan as the prime constraint to model's development. Similar to the rattan model in A Luoi district, this farm also has problems with poor rattan growth, pest (termite), lack of rattan nursery and poor infrastructure.

TABLE 111. CONSTRAINTS TO RATTAN PLANTING IN QN PROVINCE

CONSTRAINTS	DESCRIPTION	SCORE*
Access to fund/credit	Collateral is required by the bank. The HH needs to settle previous loans before accessing another.	3
Access to inputs	None	0
Policy	Lack of sustainable rattan harvesting plan	4
Training and technical assistance	Due to lack of cultivation techniques, growth performance is rather poor, and is susceptible to termite infestation.	3
Poor germplasm quality	Lack of rattan nursery to provide quality rattan saplings.	3
Organization of production activities	Lack of knowledge on organization and management of rattan plantation and harvesting.	3
Infrastructure	Poor road network challenges transportation of rattan seedlings into the plots.	2
Marketing	Low access to information	3

Source: KII, Mr. To Ngol A Ping, Ta Bhinh commune, Nam Giang district, QN province *0: not serious; 1: very minor, 5: very serious

The rattan farms in QN have risks from natural hazards such as drought in dry season and flood in rainy season, as well as from pest and diseases and unstable market (Table 106). Among other risks, those three are considered as the most serious. Due to this condition, the farm-owner prefer to expand the model for up to 1 ha only. The rattan planting in Ta Bhing commune, although has a good farm-gate price, has some constraints such as the lack of technical capacity to manage plantation (i.e. inducing slow growth rate and susceptible to pest and disease). Hence, the capacity of extension services should be enhanced, and they should be effective to deliver the technique to farmers. The farm also needs to link to neighboring farms to increase local production and market efficiency (as market price highly depends on supply). Some recommendations for the project include:

(1) provide a revolving fund to address credit limitation,
(2) help to improve the extension services;
(3) establish a rattan nursery to provide access to quality planting materials;
(4) develop a sustainable rattan harvesting plan; and (5) help to create farmer's group for collective production and marketing.

TABLE 112. RISKS RELATED TO THE RATTAN PLANTING MODEL IN QN PROVINCE

RISKS	DESCRIPTION OF RISKS	SCORE*
Credit	With the poor growth of rattan, the risk for not being able to pay the loan is considered high	3
Climate/natural disaster	Drought in the dry season and flooding in the rainy season.	4
Pest and disease	Pest and disease occur indicates the rattan saplings purchased from other places do not match with the local climate.	4
Policy	Project/programs end midway through	2
Market	Raw rattan's market may not be stable	4

Source: KII, Mr. To Ngol A Ping, Ta Bhinh commune, Nam Giang district, QN province *0: not serious; 1: very minor, 5: very serious.

6.3.2.6. Pilot farm 6 – Planting rattan in TTH province

The pilot farm is located in A Roang commune, A Luoi district, TTH province. The farm-owner has allocated 2 ha out of 6 ha of his lands for rattan cultivation (Table 107). Currently the cultivated rattan has not been in productive stage yet. The HH has two labors who can harvest 6 ton of rattan annually from natural forests, that contributes to around 30% of total family income. The farm represents a typical mountainous rural farm of A Luoi district, characterized by scattered cultivation plots that can be 10 km away from each other.

Based on KII, in A Roang commune, there are about 100 HHs planting rattan, and about 40 HHs harvest rattan only from natural forests. The rattan cultivation area is between 1-2 ha per HH, and the total rattan cultivation area in the commune is about 150 ha. The total commune production, however, cannot be estimated since the plots are still not in productive stage. For rattan harvested from natural forests, farmers are selling to one agent in A Roang commune at 3,500 VND kg-1 without any contract or concession. The pilot HH has an annual family income of about 65 million VND.

TABLE 113. INFORMATION OF PILOT RATTAN PLANTING IN TTH

HOUSEHOLD INFORMATION		PRODUCT INFORMATION	
Name of HH's head	Blup Choan	Product	Rattan (raw)
Ethnicity	Ta Oi	Cultivation method	Harvesting as NTFPs and cultivation
HH's labor	2	Farm-gate price	3,000-3,500 VND kg-1
Education	Primary	Annual volume	6 tons (harvested from natural forests)
Site	A Roang commune	Cultivation area	2 ha
Distance to market	3 km	Access to credit	Yes
Farthest distance between farm plots	10 km		

Source: KII, Mr. Blup Choan, A Roang 2 village, A Roang commune, A Luoi district, TTH province

At the moment, the cost-benefit analysis of rattan cultivation for this HH or for the commune cannot be conducted since we don't know the rattan production. However, based on farmer interview, it reveals that the establishment cost for 1 ha of rattan cultivation is around 12 million

VND and the maintenance cost is about 3 million VND year-1 through the whole cycle (Table 108). The maintenance cost does not include cost for fertilizer and pesticide. The largest component in the establishment cost is the cost for external labors. Similarly, external labor cost constitutes more than 70% of total maintenance cost.

TABLE 114. ESTABLISHMENT AND MAINTENANCE COST FOR RATTAN CULTIVATION IN TTH

ITEM	UNIT	AMOUNT	UNIT PRICE (VND)	TOTAL (VND)
Establishment costs				
Seedling	Plant	1,650	2,600	4,290,000
Labour	Person day	60	150,000	7,000,000
Equipment (usable in 1 year)	Piece	6	120,000	720,000
Maintainance costs				
Seedling	Plant	330	2,600	858,000
Labour	Person day	15	150,000	2,250,000

Source: KII, Mr. Blup Choan, A Roang commune, A Luoi district, TTH province)

The main constraints to development of rattan farm, as perceived by the HH, are mainly lack of credit support and lack of technical capacity. Poor access to inputs such as fertilizer and poor infrastructure are considered as minor. The HH didn't see any problem with market access or seedling quality, and he is willing to expand rattan cultivation area to 3 ha or even 10 ha if more forest lands are allocated to HHs. In another hand, the HH is aware of the risk that the slow growth of cultivated rattan can induce delay in loan payback. Pest and disease (i.e. termites) also poses a risk to production.

In the commune, rattan product has a relatively short-value chain, and farmers can capture a high portion of market price (i.e. the farm-gate price of rattan is 3,500 VND kg-1, while mill-gate price is 4,700 VND kg-1). since the model is developed for forest, it can also be highly resilient to climate change and natural disaster. The main challenge to this farm model is actually not related to credits, but lack of technical capacity to manage the cultivation. Therefore, need more effective extension services to overcome the knowledge gap. We acknowledge a possibility that the cultivated rattan has a lower product quality compared to wild rattan harvested from natural forests, and thus generates a lower income. The proposed intervention for improving rattan production and market access is to create groups rattan cultivators and each group may consist of about 20 HHs whose lands are close each other. Through these groups, the farmers can exchange ideas and knowledge, and can have better negotiation power for rattan market since they come to market with a larger production volume.

VII. CONCLUSIONS AND RECOMMENDATIONS

7.1. GENERAL CONCLUSIONS

7.1.1. HH SOCIO-ECONOMIC SURVEY

The socio-economic HH surveys were conducted in the selected buffer zone communes of six nature reserves and protected areas with high forest cover and dominated by ethnic minority groups (79.2%). Generally, the respondents have a low educational level, though the illiteracy is very high in few reserves. A large portion of HHs in the reserves belong to the poor category, although there was no statistical evidence that low education and high illiteracy rate is correlated with high poverty rate. The low educational level of majority of the household's points to the need for significant investments in long-term capacity development, especially if poor households are to engage in farm-business.

The average HH size is 4-5 and available labour is low with two people per HH. This implies a lack of labor, limiting the ability of households to improve their livelihoods, enter into new ventures, as well as to participate in community level activities such as forest protection. The sheer lack of family labor is a critical issue when it comes to designing interventions. Unless the household is able to hire laborers, or returns to labor of any new venture is high, efforts to introduce new livelihood ventures may not fruitful. This should be an important consideration in the design of livelihood models in buffer zones. The sampled HHs also claimed that labour and financial limitation are the two main constraints to livelihood improvement.

The average HH landholding is 1.5-3ha with non-poor HHs having bigger land sizes compared to poor or near-poor HHs. The average landholding of agricultural lands per HH was found to be higher than forestry lands. Approximately 68% of surveyed households have forestry lands of less than 1ha, 27.4 % have forestry lands of 1-3ha, 3.7% have forestry lands of over 3ha. This was observed in all reserves, despite the fact that the buffer zone communes have high forest cover. This is possibly a reflection of misunderstanding of land status by local people against the official land designation, or simply a manifestation of on-going conversion and expansion of forest-allocated lands to crop production and income. It is important to note that in some reserves, many HHs are without land certificates, which might influence decisions on land investments and management practices. When the local people has allocated the land use certificate, they will have a motivation to conserve the forest. In addition to that, they are confident in investing and improving the efficiency of land use. Thus, it is essential to clarify the land tenure of households living in the buffer zone as this relates to their livelihoods. Therefore, land allocation and provision of land use right certificate is one of the first steps to implement proposed livelihood models. It is also important to improve current agricultural practices employed by farmers to ensure sustainability, due to the fact that it is an income than conserving the environment. Sustainable intensification of agricultural systems should be supported to prevent further conversion of forest lands or expansion of crop production into the forest frontiers. Moreover, the percentage of local HHs that experienced food shortage in the last three years is relatively high, with about 39% from the total with a duration of about 55 days per year.

The average annual income of surveyed HHs in the reserves ranges between 1,182 and 1,758 USD, with non-poor HHs often having much higher incomes than the poor and near-poor HHs. Non-farm and crop production are income sources of 67 to 100% households. Although living in or near to forests, the portion of household who earn income from forest plantation, NTFP collection and PFES is often minimal. A significant income sources came from non-farm and off-farm jobs such as skilled jobs, trading, business, employment, remittance or pension. While this is a pleasant surprise, as one would expect buffer zone communities to be highly forest dependent, follow up assessment is

recommended to ensure that non-farm livelihoods such as business and trading are not covertly linked to forest resource extraction.

Amongst different types of basic services such as education, transportation, vocational training, water supply and environment and sanitation services, lack of access is common across the six reserves. More attention is needed to address the latter since it is a basic human necessity.

Amongst many threats to the integrity of the reserves, surveyed HHs identified illegal logging, wildlife hunting which are mainly carried out by local people in small-scale extraction and forest fire as the main threats. Therefore, any effort to maintain the reserves should focus more on overcoming these threats, including active law enforcement on illegal activities. Specifically, illegal logging and wildlife hunting should be regulated if not fully eradicated as this could be linked to the business activities, which was reported as non-farm source of income.

In general, the role of women in different ethnic groups is paramount only in terms of managing the family's daily finances. However, in many cases, women are involved in decision-making over important activities such as children's education, purchasing and selling HH assets.

7.1.2. LIVELIHOOD ASSESSMENTS

The scoring and ranking analysis as part of the livelihoods-need assessment resulted in a list of preferred livelihood models by local stakeholders in QN and TTH provinces, as well as by a team of experts. We found much similarity on the five livelihood models identified by local stakeholders in QN and TTH provinces, although the order of priority was different. By order of priority, local stakeholders in QN province selected the following livelihood models: (1) planting medicinal plants as forest under-story; (2) timber plantation; (3) community-based tourism; (4) planting rattan in natural forests; and (5) planting local pomelo and orange.

Similarly, local stakeholders in TTH province selected the medicinal plant model, timber plantation, community-based tourism, and planting pomelo and orange as the four main livelihood models with one other model that is specific to the province, such as local beef/cattle production. The order of preference of the four main livelihood models is as follows: (1) timber plantation; (2) planting local pomelo and orange; (3) community-based tourism; (4) planting medicinal plants; and (5) the cattle production.

The expert's team preference over the five livelihood models was similar to the choices of local stakeholders in QN and TTH province. The order of preference is as follows: (1) planting medicinal plants; (2) planting rattan in the natural forest; (3) planting local pomelo and orange; (4) community-based tourism; and (5) timber plantation.

The MVC and profitability analyses of the five livelihood models in QN and TTH reveal some key challenges to include:

(1) Farmers lack access to a reliable market information. Farmers have no clear information on the overall demand of their products in the market. In all of 6 investigated value chains, it is only in rattan and pomelo wherein farmers appear to have a better understanding of the market situation.

(2) Farmers do not understand all the costs associated with running a farm and the potential profit. Many farmers in QN and TTH do not know how much profit they can make by growing different crops. Many farmers fail to include farm-wide costs when calculating the cost of producing their

crops. As a consequence, most value-chains lack detailed information for cost-benefit estimation at farm level, and farmers' marginal profit could not be quantified.

(3) Farmers lack of access to reliable supply of agricultural inputs and planting materials. In rural areas there are very few agro-shops that can provide sufficient, high quality inputs and planting materials to farmers.

(4) Farmers suffer a high risk of change in natural conditions, especially weather. Many supply chains such as eco-tourism, rattan, medicinal plant, orange, and pomelo have been heavily dependent on weather conditions and other climate risks. Some value-chains are currently solely dependent on existing resources from natural forest.

(5) In most of value-chains, the farms are small in production and scattered. The supply volume is often insufficient for proper storage and transportation to the nearest market.

(6) Most farmers sell their products to middle-men (except a few farmers in rattan and pomelo value chains) because transportation is costly, and they lack connection to retails or whole sellers in big market outlets. Poor road network is often mentioned as significant limitation of many supply chains.

(7) Farmers in most value-chains are providing raw materials to the market without having the knowledge on how to add value to their products. In most value-chains, farm-gate price received by farmers are stable but low. Even if farmers are the only producers of "niche" markets such as A Luoi beef and Tru pomelo, they were not able to bargain for a better price due to lack of market information and low volume of production.

(8) Farmers are unable to guarantee to supply a large volume. Farmers lack the scale to reliably grow and supply the volumes and types of product required to fulfill the demands of collectors and whole-sellers.

(9) Link between value chain actors are very loose. In many value-chains there are not any form of commitment and contracts between farmers, middle-men, processors and whole-sellers. This is partly due to the fact that supply volume is always unstable.

Based on the scoring and ranking of the models by stakeholders in the two provinces, as well as the experts' team and consolidating the MVC and profitability analysis, we recommend three livelihood models for piloting in the context of the Green Annamites project, namely the medicinal plant, eco-tourism, and rattan cultivation. The selected models aim to simultaneously improve livelihood condition and reduce threats to forest and biodiversity conservation. These three models can be applied in QN or TTH province.

The pilot farms for medicinal plants and rattan in QN and TTH provinces involve both HH and community forest lands. For example, the pilot farm for Homalomena plant in TTH covers 1.5 ha of community forest land. In QN, the pilot HH that allocates land for Codonopsis has 10 ha land area with 1 ha planted by this herb. For rattan, the pilot farm in QN province is managed by a HH that allocates 0.5 ha of his land for rattan cultivation. In TTH, the pilot farm for rattan also involves one HH that allocates 2 ha of his land for rattan cultivation. In both provinces, the plots have not been productive yet, so the HHs mainly collect rattan from natural forests. The pilot farmers perceive some factors such as lack of technical capacity, poor quality planting materials and unstable market as constraints to the development of medicinal plants and rattan cultivation.

The pilot eco-tourism models are located in A Loui district, TTH province for the community-based eco-tourism model and in Nong Son district, QN province for the household-based eco-tourism. The first was established in 2016, which has a number of visitors around 13,000-19,000 per year. Although it has some challenges for business development such as limited number of tourist attractions and low capacity of the local staff, the number of visitors indicates that the local people and surrounding areas/cities welcome this kind of business model. In QN, the pilot household-based eco-tourism model involves one HH that cultivates local (Tru) pomelo trees in 0.75ha home garden received up to 100 visitors per day. This model is likely to be a good livelihood option to develop in the district and other regions as well, provided some challenges that the HH mentioned during interview such as lack of quality planting materials, severe impact of extreme weather events and lack of knowledge in marketing can be overcomes.

7.2. KEY RECOMMENDATIONS

The following recommendations provide a starting point for organizations wishing to use the analysis contained in this report to assist small-holder farmers in QN and TTH province to establish sustainable livelihoods:

- Since most farmers have low educational level, it is important to support them with trainings on how to develop their 'farm as a business'. This include training farmers on how to use available market information to make informed decisions (e.g. crop selection) and good agricultural practices.
- Assist farmers to access agricultural loans or financing from various financing institutions, such as local banks. It may be necessary to establish an alternative micro-finance for farmers who cannot borrow money from existing banks due to overdue-debt. In addition to that, loans should be given along with technical assistances in order to ensure its effective use.
- Assist farmers in accessing high quality planting materials, which is a cost-effective way to improve their overall production. This could include establishing a nursery or upgrading existing ones.
- Support farmers in organizing into producer groups to achieve economies of scale or production and marketing. This should include training farmers in group management and leadership.
- Encourage and incentive farmers to adopt practices that are economically viable and environmentally-friendly. Explore a range of applicable incentives to induce change in farmer behaviors toward sustainable production and forest protection.
- Enhance the capacity of existing local eco-tourism industry to ensure their viability and sustainability. Conduct in-depth feasibility studies of current and future expansion of the eco-tourism model to determine their limits and potential.
- Accelerate the creation of a mobile platform to deliver market information services to farmers. Delivering information through cellphones could help farmers respond to market signals quickly and increase their bargaining power.
- Provide farmers more information about proposed livelihood models such as what and how the Green Annamites project will support farmers, what farmers will contribute and effectiveness of models so that they can show clearly their willingness to involve in these models.

In terms of analytical approach:

- Our analysis is based on current market price and demand. Sensitivity analysis is needed to determine the model's resilience to production and market changes.

- Some livelihood models, especially community based eco-tourism are site specific, hence, measures should focus on intensifying existing ones before upscaling or replicating the model in other sites.

ANNEX 1 LIST OF ASSESSMENT TEAM MEMBERS

Name	Position & Institution	Expertise	Roles and Responsibility
Dr. Truong Quang Hoang	Director, CRD	Forestry, Natural resource management, and community development	Project Coordinator: general coordinate and monitor project activities
Prof. Dr. Le Duc Ngoan	Team Leader, Crop productionScientist, CRD	Rural and Agro-forest Livelihood Development, Biodiversity Conservation, Climate Change,	Team Leader: lead the survey design survey and development of tools, organize and supervise the implementation of HH survey and livelihood need assessment, review the inception report and the comprehensive report, review and finalize other reports
Assoc Prof. Dr. Le Thi Hoa Sen	Crop productionScientist, CRD	Rural and agriculturedevelopment, climate change, biodiversity conservation	Expert: support in developing survey methodology and tools, conduct "key informant" interviews and group discusstion,
Ms. Tran Thi Thanh Toan/Ms. Nguyen Thi Hoa	Livelihood and climate change specialist, SRD	Agriculture, livelihoods, community development, climate smart agriculture, value-chain, biodiversity conservation, project management	Expert: support in developing survey methodology and tools, conduct "key informant" interviews and group discusstion
MSc Hoang Thanh Hung	Senior Social Scientist, CRD	Social Work, Community Development, Baseline Survey, Quantitative data analysis,Monitoring and Evaluation	Expert: support in developing survey methodology and tools, review documments and draft the inception report, supervise data entry and cleaning, compiling database
Mr. Vo Chi Tien	Livelihood specialist, CRD	Livestock production, rural and livelihood development, climate change adaptaion	Expert: review document, conduct "key informant" interviews and group discusstion, analyze survey data and develop livelihood models,
MSc. Nguyen Thanh Hien	Economic specialist, CRD	Economics on Rural Development, Environmental Sciences and Management	Expert: conduct "key informant" interviews and group discusstionanalyze survey data aboutproduct market and value chain for developing livelihood models, involve in writing reports
MSc. Nguyen Truong Thi	Researcher and Project Officer, CRD	Natural resources management, agro-forest livelihood development, research design and conduct	Field coordinator: coordinate field works, work with authorities and private sectorsto arrange survey plan and schedule, supervise HH

			survey and collect secondry data
Assoc Prof. Dr. Nguyen Van Loi	Forestry, Remote Sensing, GIS Scientist, CRD	Forestry, forest-based livelihood, land use, biodiversity conservation,	Expert: develop survey methodology and tools, conduct "key informant" interviews and group discusstion, analyse survey data aboutbiodivesity conservation and climate change for livelihood models, desinging and writing the report No. 1
Dr. Delia C. Catacutan	Senior Social Scientist/Country Rep, ICRAF	Natural resources management and social science research	Support data interpretation, desining
Dr. Rachmat Mulia	Scientist, ICRAF	Statistics, agroforestry and landscape modeling	Support HH data analyses and database design
Mr. Do Trong Hoang	Scientist, ICRAF	Forestry, livelihood assessment	Supported livelihood anylysis and writing
21 Enumerators	Field officers and staff of CRD and SRD and Faculties of UFA		Conduct HH questionnare survey , clean and enter data in the SPSS file.

ANNEX 2 SOCIO-ECONOMIC HOUSEHOLD SURVEY AND CHECKLIST

Management Information	
1. Quest. Code No:..... (Use this code for the picture taken)	2. GPS coordinates:.X.....Y.....WGS 84
4. Name of surveyed household's head:	5. Phone No.:.....
Enumerator's name:.....	Enumerator's signature:.....
Field supervisor's name:.....	Field supervisor's signature:.....

QUESTIONNAIRE

Good morning/afternoon, my name is ____. I am a member of the research team assigned to conduct the socio-economic household survey within the framework of USAID Green Annamites. This survey has been approved by your provincial authorities. Your household was randomly chosen to represent other households in your village to provide information which serves the development of appropriate & effective strategies and interventions for improvement of livelihoods in your community. The information you provide will be kept confidential and only used for the study purpose. It will probably take you about 60 minutes to complete the questionnaire. Do you agree to participate in the survey? (*Note: the enumerator only starts the interview when the respondent gives his/her consent to the interview)*

The enumerators do not read out the responses unless there is an instruction below the question

I. DEMOGRAPHIC INFORMATION				
Q.1	Respondent's contact information			
1	Respondent's name:.....			
2	Phone number:.....	3	Email (if any):.....	
4	Household Address:			
	4.1 Village:.....	4.2 Commune:.....		
	4.3 District:.....	4.4 Province:.....		
Q.2	What is the respondent's sex?		1. Male	2. Female
Q.3	How long has your household been living in the village?		.....year(s)	
Q.4	What is the relationship between you and the head of your household? (Single answer)			
	1. Myself, I am the household head	2. Spouse of the household head	3. Son of household's head	
	4. Daughter of household's head	5. Others, specify:.....		
Q.5	How old are you?	……in years		
Q.6	What is your ethnicity? *(Single answer)*			
	1. Kinh	2. Ethnic group, specify:		
Q.7	What is your current marital status? *(Single answer)*			

	1. Single	2. Married	3. Divorced	4. Single parent	5. Others, specify:.....

Q.8	What is the highest level of education you have completed? *(Single answer)*		
	1.Illiterate/never attended school	5. Level II (Grade 9)	9. Undergraduate (BA, BS)
	2. Grade 1-4	6. Grade 10-11	10. Graduate (Master, PhD) or higher
	3. Level I (Grade 5)	7. Level III (Grade 12)	11. Others, specify: .....
	4. Grade 6-8	8. Associate/College/Technical degree	

II.HOUSEHOLD SOCIO-ECONOMIC PROFILE

Q. 9	What is the current economic status of your household assessed under the National Multidimensional Poverty Line 2016-2020?*(Single answer)*		
1.Poor *(Certified by commune P.C))*	2. Near poor *(Certified by commune P.C)*	3. Not poor or near poor	

Q. 10 How many persons are currently living in your house including yourself? *(Encircle and write the number of members)*

	Household members	Total Number	No. of male	No. of female
1	Number of household members (including yourself)	.....	.....	.....
a	*No. members <5 years old*	.....	.....	.....
b	*No. members 5-14 years old*	.....	.....	.....
c	*No. members 15-49 years old*	.....	.....	.....
d	*No. members 50-60 years old*	.....	.....	.....
e	*No. members > 60 years old*	.....	.....	.....
2	Number of members currently participating in household income-generating activities	.....	.....	.....
3	Number of main laborers in your household	.....	.....	.....
4	Number of members currently employed			
5	Number of members currently unemployed	.....	.....	.....
6	Number of people with disabilities	.....	.....	.....
7	Number of household members completed high school education level	.....	.....	.....
8	Number of household members completed the Associate/College/Technical degree	.....	.....	.....
9	Number of household members completed the undergraduate level	.....	.....	.....
10	Number of household members completed the graduate level or higher	.....	.....	.....
11	Number of household members completed a vocational training	.....	.....	.....

Q. 11	Who are the main laborers in your household? *(Multiple answer)*		
1. Husband	2. Wife	3. Son	4. Daughter
5. Parents	6.Grandparent	7. Others:	

Q.12	What is the livelihood of your household? *(Encircle the response that applies)*					
No	Household livelihoods *(Multiple answers)*	Please specify	Please rank the livelihood activity with the number 1,2,3,4 indicating its contribution level to your household's income			
1	Salaried jobs	.....	1	2	3	4
2	Wage paid work/casual labor	.....	1	2	3	4
3	Self-employed services	.....	1	2	3	4
4	Services (tourism, commerce, construction,...)	.....	1	2	3	4
5	Trade/business	.....	1	2	3	4
6	Art & Handicraft	.....	1	2	3	4
7	Forestry	.....	1	2	3	4
8	Crop production	.....	1	2	3	4
9	Fishing and/or aquaculture	.....	1	2	3	4
10	Others, specify:.....	.....	1	2	3	4

Q.13	Which are the sources of your household's income earned from the period of one year from 6/2016 to 6/2017? *Please select the livelihoods that apply to the survey household first and then go to the appropriate questions for detailed sources of income as instructed.*		
No	Sources of income earned from 6/2016 to 6/2017 *(Multiple answers)*		Total amount (VND)
1	Salaried jobs, specify the job:		.....
2	Wage paid work/casual labor, specify the work:		.....
3	Self-employed services, specify the service:		.....
4	Services (tourism, commerce, construction,etc.), specify the service:		.....
5	Trade/business	1. Large scale business, specify the goods/products:	.....
		2. Small & Medium scale business, specify the goods/products:	.....
		3. Petty trades, specify the goods/products:	.....
6	Art & Handicraft, specify the product:		.....
7	Regular remittance, specify who make it:		.....
8	Subsidy/allowance, specify the individual/institution:		.....
9	Interest income from bank deposits		.....
10	Property/land rentals, specify:.....		.....

11	Pensions of household members	.....
12	Fees from service contracts (forest protection and management) Specify the service:.....	.....
13	Forestry activities (Use Checklist HH2-Part A to ask more detailed information)	.....
14	Crop productionactivities (Use Checklist HH2-Part B to ask more detailed information)	.....
15	Fishing and/or aquaculture (Use Checklist HH2-Part C to ask more detailed information)	.....
16	Others, specify:	.....

Q.14 What are the items of expenses that your household has to pay in the period from 6/2016 to 6/2017? The enumerator reads out the responses and encircle the one that applies
(Note: the expense for each item is roughly estimated by the respondent)

No	Items of expenses	Total amount (VND)	Daily paid		Monthly paid		Annually paid	
			1. Yes	2. No	1. Yes	2. No	1. Yes	2. No
1	Rice and food	.....	1	2	1	2	1	2
2	Spices	.....	1	2	1	2	1	2
3	Fuel for cooking (gas, oil, firewood,...)	.....	1	2	1	2	1	2
4	Electricity bill	.....	1	2	1	2	1	2
5	Water bill	.....	1	2	1	2	1	2
6	Shampoo, soaps	.....	1	2	1	2	1	2
7	Desk phone bill	.....	1	2	1	2	1	2
8	Cell phone bill	.....	1	2	1	2	1	2
9	Internet	.....	1	2	1	2	1	2
10	Cable TV	.....	1	2	1	2	1	2
11	Fuel for vehicles (for motorbike, car,....)	.....	1	2	1	2	1	2
12	Sanitation/environment service fee	.....	1	2	1	2	1	2
13	Cigarettes/ beer/alcohol/coffee/tea	.....	1	2	1	2	1	2
14	Education (tuition, tutoring, books, pens,...)	.....	1	2	1	2	1	2
15	Health check and care	.....	1	2	1	2	1	2
16	House/land rentals	.....	1	2	1	2	1	2
17	Traveling/visiting friends/relatives	.....	1	2	1	2	1	2
18	Family activities/events(funeral, wedding, birth & death anniversary,...)	.....	1	2	1	2	1	2
19	Entertainment/recreational activities	.....	1	2	1	2	1	2
20	Others, specify:	.....	1	2	1	2	1	2

	.....							

Q.15	In what month (s) does your household have the highest income? *Encircle multiple answers/months that apply*			
Month (s) of highest income (Western Calendar Months)				
1. January	2. February	3. March	4. April	
5. May	6. June	7. July	8. August	
9. September	10. October	11. November	12. December	
13	No month of highest income, our household's monthly income remains stable through out the year			
Q.16	Which way does your household do to meet the need for daily food?*(Single answer)*			
1. Produce food for self-consumption	2. Produce food but have to purchase more	3. Completely purchase daily food	4. Others, specify:	
Q.17	Has your household ever been in the shortage of food/rice in the last three years ?*(Single answer)*			
1. Yes (Go to Q.18, Q.19, Q.20, Q.21)		2. No, never (Go to Q.22)		
Q.18	If Yes, what is the duration of your household's food shortage per year?		.....day(s)	
Q.19	What has been the trend of your household's food shortage duration in the last three years? *(Single answer)*			
1. Remain unchanged	2. Decreased	3. Increased		
Q.20	How did such food/rice shortage crisis affect your household's living? *(Single answer)*			
1. Not very badly	2. Badly	3. Very badly		
Q.21	During that crisis time, what of the following strategies did your household do to cope with the situation of food shortage? *(Multiple answers)*			
1. Reduced quantity of daily food	2. Collected wild vegetables to eat	3. Ate twice a day		
4. Parents skipped a meal or eat less for children	5. Reduced quality of food	6. Used up the money from savings		
7. Took food loans	8. Sold livestock and/or poultry	9. Ate once a day		
10. Took money loan to buy food	11. Asked relatives/families to provide food	12. Asked local authorities for food support		
13. Others, specify:				
Q.22	What would you like to improve your household's current livelihood activity? *(Single answer)*			
1. Yes (Go to Q.23)	2. No (Go to Q.21.1)	3. Don't know (Go to Q.23)		
21.1	Please state the reasons why you would not like to improve your household's current livelihood activity:			
Q.23	Would you like to start a new livelihood model? *(Single answer)*			
1. Yes (Go to Q.23.1)	2. No (Go to Q.23.2)	3. Don't know (Go to Q.24)		
23.1	Please specify what new livelihood model you want to start:			
23.2	Please state the reasons why/difficulties that you would not like to start a new livelihood model:			

Q.24	Is your household planning to start a new income-generating activity or improve the existing one? *(Single answer)*				
1. Yes (Go to Q.24.1, Q.24.2, Q.24.3)		2. No (Go to Q.25)		3. Don't know (Go to Q.25)	
24.1	Please specify what income-generating activity:				
24.2	How much money does your household plan to invest in this new income-generating activity or existing livelihood activity?	1. Total amount: .....VND 2. Don't know/don't answer			
24.3	What are the limitations/constraints that your household currently encounter? *(Multiple answers)*				
1. Financial constraint	2. Technical difficulties	3. Limited human resources	4. Difficulty to find/purchase raw/input materials		
5. Have no knowledge of market demand & supply and product prices	6. Difficulty with the source of water supply	7. Difficult to find the outlet for the product/service	8. Encouter no limitations/cóntraints		
9. Others, specify:.....					
Q.25	What would be the conditions/requirements for your household to be able to improve existing livelihood activity/shift to a new livelihood model? *(Multiple answers)*				
1. Granted funds to cover a portion of total cost	2. Collaborate/partner with another household	2. Able to access a credit loan	3. Given technical support		
4. Updated with information on market demand & supply, product prices	6. Given support of tools/equipment	7. Improved access to irrigation & drainage system	8. Others, specify:		
Q.26	If supported to start a new livelihood activity, is your household willing to invest money to implement it? *(Single answer)*				
1. Yes (Go to Q.26.1)		2. No (Go to Q.27)		3. Don't know (Go to Q.27)	
26.1	Under what conditions your household would be willing to invest money to implement a new livelihood activity? *(Multiple answers)*				
1. No conditions required	2. Granted a portion of the total cost	3. Provided technical support	4. Provided technical and material support		
5. Others, specify:					
26.2	How much money would your household can afford to invest in the new livelihood?	.....VND	98. Don't know		
Q.27	Are you or is any of your household members currently implementing in the following economic activities related forest and natural resources? *The enumerator reads out the livelihood activities and encircle the response that applies*				
	Livelihood activities	a. Implemented		b. If Yes, how often?	
		1. Yes	2. No	*1. Sometimes*	*2. Frequently*
1	Wildlife hunting, please	1	2	1	2

	specify:				
2	Wildlife trading, please specify:	1	2	1	2
3	Collection of forest products (firewood, fruits, bee honey,mushroom, rattan,...) please specify:	1	2	1	2
4	Logging	1	2	1	2
5	Charcoal burning	1	2	1	2
6	Coal mining	1	2	1	2
7	Gold mining	1	2	1	2
8	Other, specify:.....	1	2	1	2

III. LIVELIHOOD ASSETS & LIVING STANDARDS

Q.28	Does your household own any of the following goods/assets? *(Multiple answers)* *(The enumerator reads out the list of goods/assets and encircle the responses that apply)*
a	Equipment/facilities

1. Radio	2. Television	3. CD/DVD Video Player	4. Computer	5. TV cable line
6. Internet	7. Landline phone	8. Mobile phone	9.Tablets	10. Laundry machine
11. Hot water boiler	12. Air conditioner	13. Clothes drying machine	14. Microwave oven	15. Electric fans
16. Fridge	17. Gas stove	18. Electronic stove	19. Others, specify:	

b	Means of transportation/travel/production

1. Bicycle	2. Tricycle	3. Electric bike	4. Motorbike	5. Car/van
6. Truck	7. Bus	8. Tractor/bulldozer	9. Motorized boat	10. Others, specify: .....

Q.29	What are the characteristics of the survey household's current homestead?*(The enumerator asks the respondent or observes the house & circle the response that applies)*
1	Housing
a	House ownership status*(single answer)*

	1. Owned	2. Rented	3. Free use
b	Type of house*(single answer)*		
	1. Permanent	2. Semi-permanent	3. Makeshift

c	Construction time			
1	How long ago? .....month(s)		2. Don't know/remember	
d	Area (m^2)			
1.	Area (m^2) of the house	.....m^2	2.	Don't know/don't remember
2	Homestead Land			
a	*Land area*	1.Area:.....m^2		2.Don't know/don't

				remember
b	*Is your household .....?*	1. The landlord (Go to sub-question c below)	2. The tenant (Go to Q.30)	3. Allowed to use free of rental charge (Go to Q.30)

c	*If the landlord, has your household been issued the Certificate of Land Use Rights yet?*	1. Yes	2. Not yet

Q.30	Does your household own any of the following real property other than your homestead? *(Multiple answers)*		
1.Rent-out house & land	2. Rent-out homestead land	3. Rent-out production land	
4. Parking lot	5. Warehouse	6. Gas station	
7. Others, specify:.....		8. Do not have any other real property	

Q.31	Please roughly estimate the monetary values of your current household assets?		
No	Household assets	1. Rough estimated value (VND)	98. Don't know
1	Homestead assets (house and land)	.....	98
2	Real property other than homestead assets	.....	98
3	Equipment and facilities	.....	98
4	Means of transportation/production	.....	98
5	Livestock and/or poultry	.....	98
6	Others, specify:.....	.....	98

Q.32	Is your household currently using any of productive lands?		
1. Yes (Continue to ask Q. 32.1)		2. No (Go to Q. 33)	
32.1	If Yes, what is the current legal status of the productive land being used by your household?		

No	Type of productive land	What is the current legal status? *(Single answer)*				
		1. Issued land use right certificate for all the land area	2. Issued land use right certificate for part of the land area	3. Not yet issued land use right certificate	4. Rented	5. Don't know
1	Crop productionland	1	2	3	4	5
2	Aquaculture land	1	2	3	4	5
3	Forestry land	1	2	3	4	5

Q.33	Was your household involved in a group assigned to manage natural forest land?				
1. Yes (Go to Q.33.1, 33.2, 33.3, 33.4)		2. No (Go to Q.34)			
33.1	If Yes, how much forest land allocated to your household?	.....hectare			
33.2	Has your household been issued the Forest Certificate yet?	1. Yes	2. Not yet	3. Don't know	
33.3	If Yes, how much forest land certified ?	.....hectare			
33.4	When was your household issued the Forest Certificate?	.....year			

Q.34	Do you know about Payment for Forest Environmental Services (PFES) policy? *(Single answer)*		
1. Yes	2. No		
Q.35	Does your household currently receive Payments for Forest Environmental Services (PFES) payment?		
1. Yes (Go to Q.35.1, Q.35.2, Q.35.3, Q.35.4)	2. No (Go to Q.36)	3. Don't know (Go to Q.36)	
35.1	What do your household have to do to receive PFES payment? *(Multiple answers)*		
1. Forest patrolling	2. Forest plantation	3. Assisting natural forest regeneration	
4. Others, specify:.....	5. Don't know		
35.2	How much did your household get paid for the PFES ?		
a. How much was the last payment ?-How many months:.....	.....VND		
b. How much totally paid last year (2016)?	.....VND		
35.3	How many percent of this PFES payment contributed to to your household income annually? *Single answer*	.....%	
35.4	Do you know how long your PFES contract is?		
1. Yes, how long?.....month(s)	2. No		
Q.36	Is your household's productive land connected to use an irrigation system? *(Single answer)*		
1. Yes (Go from Q.36.1 to Q.36.7)	2. No (Go to Q.37)		
36.1	If Yes, what irrigation system is your household's productive land connected to?	1. My household's own system	2. Private system owned by other households	3. Public system
		4. Others, specify:		
36.2	Is the water available for irrigation throughout the year?	1. Yes	2. No	
36.3	How does the water supplied from this irrigation system meet your household's demand ?	1. Enough all year round	2. Not enough in a few months of summer time	3. Not enough all the time
		4. Others, specify:.....		
36.4	How much water on average is estimated for your household's irrigation per day?	1. Water quantity: .....m^3/day		
36.5	How do you assess the quality of the water supplied by the existing irrigation system? *(Single answer)*		
	1. Good	2. Bad	3. Don't know
32.6	What is the current condition of the existing irrigation system?		
1. Function well	2. Functions but still needs to be improved/upgraded	3. Badly damaged/cannot be used	
37.7	Does your household pay for the irrigation cost?		
1. Yes, how much money to be paid''		2. No (Go to Q.38)	
a. Monthly:.....VND	b. Annual: .....VND		
(Go to Q. 38)			
Go to Q.38			

Q.37	If not connected to an irrigation system, how does your household water the crops? *(Multiple answers)*			
1. Connect the tap water pipeline	2. Pump water from wells	3. Pump water from river/spring/lake/pond		
4. Connect water from a gravity/gutter/adequate pipeline	5. Others, specify:.....			
Q.38	Does your household have any member currently involved as a member or an employee of the following organizations/institutions?			
a	Social-economic-political organizations *(Multiple answers)*			
1. Women's Union	2. Youth Union	3. Farmer Union	4. Veterans Association	
5.Fatherland Front	6. Red Cross	7. Crop productioncooperative	8. Others, specify:	
b	Community-based organizations/groups *(Multiple answers)*			
1. Women's Clubs *(gender equality, happy family,...)*	2. Sports Clubs	3. Entertainment Clubs	4. Community forest management unit/group	
5. Interest/self-help groups *Please specify:*	6. Credit-saving groups	7. Women's business group	8. Others, specify:	
c	Charitable/non-profit organizations *(Multiple answers)*			
1. National organizations	2. International organizations	3.Others, specify:.....		
d	Public service institutions*(Multiple answers)*			
1. College/university	2. Research Institution	3. Hospital/health center	4. Vocational center/school	
5. Plant Protection Center	6. Crop productionExtension Station	7. Commercial Bank (Vietcom,Sacom,VP,ACB,...)	8. Bank for social policies	
9. Bank for Crop productionand Rural Development	10.Others, specify:			
Q.39	Does your household have any member currently working as an employee/manager/leader of government agencies/enterprises?			
a	Provincial level agencies*(Multiple answers)*			
1. People's Committee	2. People's Council	3. Communist Party	4. Professional Departments (DARD, DONRE, DOLISA, DoF,DoHA,DoIC, DPI, DoET,etc.)	
5. State-own enterprises	6. Others, specify:.....			
b	District level agencies*(Multiple answers)*			
1. People's Committee	2. People's Council	3. Communist Party	4. Professional Divisions(DARD, DONRE, DOLISA, DoF,DoHA,DoIC, DPI, DoET,etc.)	
5. State-own enterprises	6. Others, specify:.....			

c	Commune and village *(Multiple answers)*			
1. People's Committee	2. People's Council	3. Communist Party	4. Village authorities	
Q.40	Are you interested in being part of an existing/new association/club/cooperative?			
1. Yes	2. No			
IV. ACCESS TO PUBLIC SERVICES				
Q.41	Is your household currently connected to the power line?			
1. Yes	2. No (Go to Q.44)			
Q.42	If Yes, is your household sharing the power line connection with other household?			
1. Yes	2. No			
Q.43	Is your household currently subsidized for electricity supply by the government budget?			
1. Yes	2. No			
Q.44	Does your household currently use any of renewable energy facilities/equipment for domestic activities *(cooking, lighting, water heating)*?			
1. Yes	2. No			
If Yes, what are the renewable energy facilities/equipment being used (Multiple answers)				
1. Solar panel	2. Biogas digester	3. Solar lights	4. Biomass stove	
5. Others, specify:.....				
Q.45	What type of stove is your household currently using for cooking? *(Multiple answers)*			
1. Tripodal stove	2. Building stove	3. Husk stove	4. Double chamber stove	
5. Gas stove	6. Electric stove	7. Others, specify:.....		
Q.46	What type of fuel/firing is your household currently using for cooking stove? *(Multiple answers)*			
1. Firewood, dry leaves	2. Husk	3. Straw	4. Charcoal	
6. Oil	7. Gas	8. Biogas	9. Electricity	
Q.47	Does your household have to pay for monthly costs of cooking fuel/firing?			
1. Yes, how much per month:.....VND	2. No			
Q.48	What source of water does your household currently use for drinking/cooking/washing? *(Multiple answers)*			
1. Tap water	2. Drill/bored well	3. Dug well	4. Gravity system with aqueduct/gutter	
5. Rain water	6. Water from pond, lake, river, spring	7. Bought water	8. Other, specify:.....	
Q.49	In general, How do you evaluate the quality of water that your household is using for drinking and cooking? *(Single answer)*			
1. Bad	2.Fair	3. Good	4. Don't know	
Q.50	Does your household treat the water before drinking & cooking? *(Single answer)*			
1. Yes (Go to 50.1)	2. No (Go to Q.51)	3. Don't know (Go to Q.51)		
50.1	How does your household treat the water? *(Single answer)*			
1. Boil it	2. Filter it	3. Both filter and boil it		

Q.51	How available is the water that your household is using for domestic activities? *(Single answer)*			
1. Not enough all year round (Go to Q.51.1)	2. Not enough in the dry season only (Go to Q.51.2)	3.Enough all year round (Go to Q.52)	4. Don't know (Go to Q.52)	
51.1	What is the duration of water shortage in a year?			.....day(s)
51.2	What is the duration of water shortage a dry season?			.....day(s)
Q.52	Does your household have a toilet facility/latrine?			
1. Yes		2. No (Go to Q.54)		
Q.53	If Yes, What kind of latrine does your household use? (*Single answer)* *The enumerator reads out responses and encircle the response that applies*			
1. Bucket, bridge or hanging latrine		6. Soakage pits		
2.Unimproved pit latrine		7. Septic tank		
3. Single vault latrine		8. Latrine connected with biogas system		
4. Ventilated Improved Pit (VIP) latrine		9. Other, specify: ……		
5. Double-vault compost latrine		10. Do not know		
Q.54	If having no toilet facility/latrine, where do your household members defecate? *(Single answer)*			
1. Share a latrine with another household	2. Use the public toilet	3. Practice open defecation	4. Others, specify:	
Q.55	Where does your household dispose of solid waste?*(Multiple answers)*			
1. Burn/burry solid waste in your garden	2. Burn/burry solid waste at an open land outside your house		3. Directly dump into local paddy-fields	
4. Directly dump into the river/pond/lake	5. Directly dump into the lagoon/sea		6. Directly dump into a collection handcart of private/public service	
7. Directly dump into an open public dumpsite	8. Others, specify:.....			
Q.56	Does your household use organic solid waste (straw, manure, leftovers, etc.) for composting?			
1. Yes (Go to Q.56.1)	2. No (Go to Q.57)		3. Don't know (Go to Q.57)	
56.1	What does your household use the compost for? *(Single answer)*			
1. Fertilize household crops	2. Selling	3. Selling and fertilizing household crops	4. Others, specify:	
Q.57	Does your household use pesticide or herbicide for agricultural production?			
1. Yes (Go to Q.57.1)		2. No (Go to Q.58)		
57.1	How does your household treat the pesticide/herbicide packing or containers? *(Single answer)*			
1. Do not reuse and recycle them (Go to Q.57.2)	2. Reuse (Go to Q.57.3)	3. Sell them to scrap buyers/dealers (Go to Q.57.3)	4. Both reuse and sell to scrap buyers/dealers (Go to Q.57.3)	

57.2	If do not reuse or recycle the pesticide/herbicide packing or containers, where does your household dump/burry/burn/throw them? *(Multiple answers)*		
1. Burn/burry as solid waste in your garden	2. Burn/burry as solid waste at an open land outside your house	3. Directly dump into local paddy-fields	
4. Directly dump into the river/pond/lake	5. Directly dump as solid waste into a collection handcart of private/public service	6. Directly dump into an open public dumpsite	
7. Others, specify:.....			
57.3	Where does your household store the herbicides/pesticides?		
1. Store them at home	2. Store them at the farm	3. Store them at the crop productioncooperative premises	
4. Do not store them because we directly buy them from shops	5. Others, specify:		

Q.58	Has your household ever received the technical assistance for composting/pesticide use/crop production/animal husbandry before?			
No	Activities	1. Yes	2. No	3. Don't know/remember
1	Composting	1	2	3
2	Pesticide use	1	2	3
3	Crop production	1	2	3
4	Animal husbandry	1	2	3

Q.59	Does your household have any member currently being in school?
1. Yes	2. No
Q.60	Do you think you or your household member can take a vocational training in your commune or district if you or he/she wants?
1. Yes	2. No (Go to Q.62)
Q.61	Did you or any of your household members take a vocational training course in your commune or district in the last 24 months?
1. Yes	2. No

Q.62	How do you assess the level of your household's access (use/benefiting) to the following public services based on a rating scale 1-5 points (1=No access at all; 5=Very good access)		
No	Public services	Rating scale 1-5 points for access levels (1=No access at all; 5=Very good access)	98. Don't know
1	Education services	.....	98
2	Vocational training services	.....	98
3	Health services	.....	98
4	Public administration services	.....	98
5	Crop productionextension services	.....	98
6	Legal counseling services	.....	98
7	Telecommunications	.....	98
8	Transportation	.....	98
9	Electricity	.....	98
10	Water supply	.....	98
11	Environment and Sanitation	.....	98

V.ACCESS TO MARKETS FOR LOCAL PRODUCTS & INFORMATION					
Q.63	Do you currently sell any product produced by your household?				
1. Yes (Go to Q.63.1 through Q.63.9)		2. No (Go to Q.64)			
63.1	If yes, What is the product that your household is producing? please specify:				
63.2	Where does your household often sell the product?*(Multiple answers)*				
1.At home	2. At your farm	3. At wholesale shops in your village/commune	4. At a marketplace in your village/commune		
5. At a marketplace and/or wholesale shops outside your commune		6. Others, specify:.....			
63.3	How does your household market the product? *(Multiple answers)*				
1. Advertize your product through mass media	2. Network with other peer farmers	3.Partner/team up with other peer farmers	4. Open up a shop in your village/commune		
5. Open a counter at local market	6. Carry our product to target marketplaces	7. Others, specify:			
63.4	How do you assess the current market access of your household product? *(Single answer)*				
1. Easy/Convenient	2. Difficult/Inconvenient	3. Very difficult/inconvenient	4. Don't know		
63.5	What are the constraints of market access that your household currently encounters? *(Multiple answers)*				
1. No means of transportation	2. Bad or non-existing roads	3. Long distance	4. Low production volume		
6. Difficult packaging	7. Low market price	8. Others, specify:			
63.6	How do you assess the current market demand and supply of your household's product in general? *(Single answer)*				
No	Market demand and supply of product	1.Low	2. Medium	3. High	4. Don't know
1	Market demand	1	2	3	4
2	Market supply	1	2	3	4
63.7	Does your household store non-perishable products or animals waiting for a better price?				
1. Yes		2. No			
63.8	If Yes, where does your household store them? *(Multiple answers)*				
1. At home	2. At your farm	3. At your families/relatives' house or farm	4. At a rented space	5. Others, specify:	
63.9	Do you or your household member usually agree with other peer farmers upon the following issues?				
No	Issues	1. Yes	2. No		
1	What crop to plant	1	2		
2	When to sell the products	1	2		
3	Where to sell the products	1	2		
Q.64	Which of the following methods of communication is the good way that you and/or your household members can receive updates on general crop productioninformation? *(Multiple answers)*				

1. Village/commune P.A system	2. Mass organization meetings/workshops	3. Village/commune meetings	4. Trainings/workshops	5. Leaflets/fliers
6. Posters	7. Billboards	8. Counseling services	9. TV news	10. Radio
11. Phone calls	12. Text SMS	13. Internet (email/face book,...)	14. Others, specify:	

Q. 65 Please indicate how often you and/or your household members use the following models of communication?
The enumerator reads out each model of communication and encircle the single response that applies

No	Models of communication	1.Never	2.Seldom	3. Sometimes	4. Often	5. Very often	6. Daily
1	TV (local)	1	2	3	4	5	6
2	TV (cable/intl)	1	2	3	4	5	6
3	Radio	1	2	3	4	5	6
4	Email	1	2	3	4	5	6
5	Skype	1	2	3	4	5	6
6	Face book	1	2	3	4	5	6
7	Phone (landline)	1	2	3	4	5	6
8	Phone (mobile/cell)	1	2	3	4	5	6
9	Others:.....	1	2	3	4	5	6

Q. 66 Have you or your household members ever attended/participated in the meetings, trainings, workshops on the following themes/topics?
The enumerator reads out each theme/topic and encircle the single response that applies to each activity

No	Key themes/topics	a. Meetings	b. Trainings	c. Workshops

		1.Yes	2. No	1.Yes	2. No	1.Yes	2. No
1	Sustainable and/or adaptive livelihood models	1	2	3	4	5	6
2	Marketing for local products	1	2	3	4	5	6
3	Climate change adaptation	1	2	3	4	5	6
4	Climate change mitigation	1	2	3	4	5	6
5	Law on biodiversity	1	2	3	4	5	6
6	Forest protection and development law	1	2	3	4	5	6
7	Payments for Forest Environmental Services (PFES)	1	2	3	4	5	6
8	Community forest management	1	2	3	4	5	6

VI. ACCESS TO THE SOURCES OF FINANCIAL CAPITAL

Q.67	If you need to money for your household livelihood activities, where can you borrow a loan? *(Multiple answers)*	
1. Commercial Banks (Sacom,ACB,VP,Vietcom,...)	2. Bank for Crop productionand Rural Development	3. VN Bank for Social Policies
4. NGO project revolving funds	5. Government funded credit schemes (Women's Union, Farmers' Union, etc.)	6. Saving and credit groups established by village/commune WU
7. Informal lenders	8. Donor-funded /revolving funds	9. I don't know where to borrow loan

10. Others, specify:.....

Q.68	Does your household currently borrow money from a bank or a credit scheme?
1. Yes(Go to Q.68.1, Q.68.2, Q.68.3, Q.68.4)	2. No(Go to Q.69)

68.1	If yes, could you please provide information about your loan as follows			
1	Loans	a. Loan No.1, Specifybank/creditscheme:	b. Loan No. 2 Specifybank/creditscheme:	
2	Loan duration	.....month(s)	.....month(s)	
3	Interest rate /year	.....%	.....%	
4	Loan amount	.....VND	.....VND	
5	Interestmoneymonthlypaid	..... VND	.....VND	
6	Did yourhousehold have to pledge a colateral?	1. Yes	2. No	1. Yes	2. No

68.2	What did your household use the loan money for? *(Multiple answers)*		
1.Built/upgraded/repairedtheh ouse	2.Built/repaired sanitation facilities (latrine, bathroom, drainage)	3.Installed/repaired the water supply system/dug a well	4.Invested on agricultural production (cultivation& animal husbandry)
5.Invested on forestry production	6.Invested on aquaculture production	7. Invested on fishing catching	8. Invest on commercial business

9.Invested on tourism services business	10.Invested on children's studies	11. Paidfor medical treatment of familymembers	12. Other, specify: .....

68.3	What is the current status of your household's loan payment?*(Single answer)*

1. We have already paid up the loan	2. We just paid a part of the loan amount	3. We have not been able to pay back any amount of money yet	4. The loan payment is not due yet
5. Others, specify:.....			

68.4	Did your household encounter any of the difficulties or constraints when borrowing the recent loan(s)? *(Single answer)*

1. Yes (Continue to ask the question below)	2. No (Go to Q.70)	3. Don't know (Go to Q.70)
1.1 If Yes, what difficulties/constraints did your household encounter?		

Q.69	Why did <u>your household not borrow</u> any loan from a bank or a credit? *(Multiple answers)*

1. My family has no need to borrow a loan	2. We applied for a loan from local banks or credit but were not eligible	3. Loan amount is little, not enough for our need
4. The time to return the loan is too short	5. Had to pay high interest rate	6. The application procedure requires so many documents/papers
7. The time to complete the procedures is too long	8. We were afraid that we would not be able to pay back the loan on due time	9. We have nothing valuable to put as a collateral for the loan
10. Others, specify:		

Q.70	Does your household have a plan to borrow a loan to invest on livelihood activities/business?

1. Yes (Go to Q.70.1, Q.70.2, Q.70.3)	2. No(Go to Q.71)

70.1	How much money does your household want to borrow for a loan?	.....VND
70.2	How much money can your household pay for the loan interest per month?	.....VND
70.3	How long is the loan duration that your household want for the loan?	.....month(s)

Q.71	Does your household currently keep savings? *(Single answer)*

1. Yes (Go to Q.71.1)	2. No (Go to Q.72)	3. I don't know (Go to Q.72)

71.1	If Yes, In what form does your household currently keep savings? *(Multiple answers)*

1. Livestock and/or poultry	2. Cash	3. Jewellery
4. Bank deposit	5. Others, specify:	

Q.72	In your opinion, what can be done to improve local households' access to existing financial services? *(Multiple answers)*

1. Allow for a longer loan duration	2.More simplified procedures formulated	3. Higher amount of loan
4. Offer a lower interest rate	5. Counsel and update information regularly	6. Loan applications guaranteed by commune P.Cs

7. Loan applications guaranteed by mass organizations (WU, FA, YU...)	8.Do not know	9. Others, specify: .....

VII. DIVISION OF LABOR, DECISION-MAKING IN HOUSEHOLD

Q.73	Please estimate your time (in hour) used for the following activities in a day (24 hours) *(The enumerator reads out the activities and record the time used for each activity)*	
1	Time for work/labor/production/business	.....hours
2	Time for householdchores	.....hours
3	Time for sleep	.....hours
4	Time for entertainment/recreationalactivities/sociableactivities	.....hours
5	Time for taking care of elderly/sick family members	.....hours
6	Time for care and teaching of children	.....hours
	Total	24 hours

Q.74 In your household, who made <u>most of the decision</u> on the following activities?
(The enumerator reads out the activities and circle a single answer for each activity)

No	Activities	1.Male	2.Female	3. Male & Female	4. Don't know	5. N/A
1	Daily family expenses	1	2	3	4	5
2	Investment to start a new livelihood model	1	2	3	4	5
3	Investment to develop/expand existing livelihood activities/business	1	2	3	4	5
4	Purchase of household assets	1	2	3	4	5
5	Selling of household assets	1	2	3	4	5
6	Children's study	1	2	3	4	5
7	Financial/labor contribution to community/social activities	1	2	3	4	5

Q.75 How the decision on a livelihood activity is made in your household? *Single answer*

1. Male household head makes most of the decision	2. Female household head makes most of the decision	3. Husband & wife discuss to make decision
4. All the household members meet to decide	5. Decision is made on the advice from other people who have relevant experience	6. Other, specify: .....

Q.76 Who is the trusted adviser of your household? *Multiple answer*

1. Community leader	2. Religious leader	3. Extension service provider	4. Relatives
5. Experienced farmers	6. Neighbor	7. Others, specify:.....	

Q.77 Who was named as the owner in the legal ownership certificates of your household assets?
(The enumerator reads out the household assets and circle a single answer for each asset)

	Household assets	1. Husband	2. Wife	3. Husband & wife	4. Other family members	5. Don't know	6. N/A

1	Homestead (house & land)	1	2	3	4	5	6
2	Production land	1	2	3	4	5	6
3	Real estate other than homestead	1	2	3	4	5	6
4	Car/van/truck/bus	1	2	3	4	5	6
5	Motorbike	1	2	3	4	5	6
6	Stocks	1	2	3	4	5	6
7	Bank passbook	1	2	3	4	5	6

Q.78	In case that your household encounters financial dificulty, who would be prioritized to attend school or to continue being in school? *(Single answer)*		
1. Son (s) or daughter (s)	2. Son (s)	3. Daughter (s)	
4. Don't know	5. Not applicable	7. Others, specify:	

VIII.KNOWLEDGE, PRACTICE, VULNERABILITY

Q.79	To your knowledge, what are the threats to biodiveristy, forests and natural resources? *(Multiple answers)*			
	1. Wildlife Hunting	2. Logging	3. Mining of natural resources	4. Firing
	5. Others, specify:.....		6. Don't know	

Q.80	Are you aware of the following issues currently happening in your community ? *(The enumerator reads out the issues and circle a single answer for each issue)*		
No	Issues	`1.Yes	2.No
1	Law inforcement on biodiversity conservation	1	2
2	Law inforcement on forest protection	1	2
3	Endangered wildlife species	1	2
4	The boundaries of protected areas in the region	1	2
5	Poaching	1	2
6	Illegal logging	1	2

Q.81	What do you believe are <u>the causes</u> of the following issues? *(Mulitiple answers)*			
81.1	Forest loss	1. Natural disasters	2.Human behaviors (logging, firing, mining of natural resources,...)	3. Changes in land use plan
		4. Tourism development	5. Changes in economic and social policies	98. Don't know
		6. Others, specify:		
81.2	Forest degradation	1. Climate change	2.Forest fire	3. Impacts of diseases on plants and wilflife animals
		4. Air pollution	5. Land pollution	6. Soil erosion
		7. Habitat fragmentation	8. Others, speficify:	98. Don't know

81.3	Biodiversity loss/declines	1. Deforestation	2. Forest degradation	3. Rainforest destruction
		4. Changes in land use plan	5. Human behaviors (logging, hunting,firing,...)	98. Don't know
		6. Others, specify:		
81.4	Climate change	1. Burning fossil fuels (such as oil, coal, nature gas,...)	2. Deforestation	3. Natural events, such as ocean currents
		4. Carbon emission from vehicles/manufactures	5. Burning crop productionwaste	6. Changes in land use plan
		7. Others, specify:		98. Don't know

Q.82	Have you and/or your household member ever implemented or participated in any community actitvities?

1. Yes (Go to Q.82.1)	2. No, never (Go to Q. 83)

82.1	If Yes, what are the community actions that you and/or your household members have implemented or participated in? *(Multiple answers)*

1. Planted trees	2. Maintained/cared trees	3. Cleaned/maintained public waste drainage system
4. Built or helped to build green spaces such as parks or gardens	5. Built/renovated irrigation and drainage system	6. Built/renovated dam/dyke
7. Others, specify:		

Q.83	Did any of natural disasters occur in your community in the last 3 years?

1. Yes (Go to Q.83.1, Q.83.2, Q.83.3)	2. No (Go to Q.84)

83.1	If yes, please name what disasters have taken place in your community in the last 3 years? *(Multiple answers)*

1. Flood	2. Splash flood	3. Storm	4. Typhoon
5. Tornado	6. Drought	7. Erosion	8. Others, specify: .....

83.2	What effects did the disasters have on your household? *(Multiple answers)*

1. Damage to property	2. Loss in livestocks and/or poultry	3.Loss in crop productionproducti on	4. Loss in foresty production
5. Loss in fishery production	6. Loss in income	7. Health hazards	8. Loss in human life
9. Others, specify:.....			

10. None (Go to Q.84)	11. Don't know (Go to Q.84)

83.3	Could you please have a rough estimate of total value for your household's damage and loss caused by natural disasters in the last 3 years ?

No	Damages/loss	1. Amount (VND)	2. Don't know/remember	3. Not applicable
1	Damage to property	.....	2	3
2	Loss in livestocks and/or poultry	.....	2	3

3	Loss in husbandry, production (agriculture, foresty, fishery, aquaculture)	.....	2	3
4	Loss in income	.....	2	3
5.	Health hazards	.....	2	3
	Total	.....		
Q.84	What are your recommendations/proposals that help to improve and/or better protect local household's livelihoods from forest loss, forest degragation and climate change impacts?			
....				
THANK YOU VERY MUCH FOR YOUR PARTICIPATION!				

ANNEX 3 CHECKLIST: LIVELIHOOD DIVERSITY AND INCOME SOURCE

Management Information	
1. Questionnaire Code:.....	2. GPS coordinate:.....
4. Name of surveyed household's head:	5. Phone No.:.....
Enumerator's name:.....	Enumerator's signature:.....
Field supervisor's name:.....	Field supervisor's signature:.....

Note: This includes detailed questions for Q.13 in the Household Survey Questionnaire

PART A: FORESTRY							
	Livelihood activities	Area of cultivation land (m^2)	Productivity/ ha or Sao (kg/ton)	Yield per year (kg/ton)	Total investment cost/ year (Total investment includes capital and other costs such as seeds, labor cost, transportation cost, fertilizer...) (VND)	Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)* *(VND)*	Total income/year *(Note: Total income= total revenue/year – total investment/ year)* *(VND)*

1	Cultivation of trees (acacia, rattan, bamboo…) Specify what plants/trees:	.....	.....	.....	.....	.....	.....
2	Husbandry of (wild pigs, porcupines, bee...) specify what animals:	Area of husbandry land (m^2)	Yield per year (kg/ton)	Total investment cost/ year (Total investment includes capital and other costs such as species labor cost, food, transportation cost, fertilizer...) (VND)		Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)* *(VND)*	Total income/year *(Note: Total income= total revenue/year – total investment/ year)* *(VND)*
		.....	.....	.....		.....	.....
3	Exploitation of non-timber forest products (bamboo, rattan, thatch, herbs, bee honey, fruits, mushroom, bamboo shoots, etc.). Please specify what:	Yield per year (kg/ton)		Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)* *(VND)*			Total income/year *(Note: Total income= total revenue/year –total investment/year)* *(VND)*
		.....		.....			.....
4	Production/processing of forest products (timber and non-timber	Gross output per year	Total investment cost/ year (Total investment includes capital	Total revenue per year *(Total revenue/turnover is the total amount of*			Total income/year *(Note: Total income= total revenue/year – total investment/year)*

	products)	(m^3/ton/kg)	and other costs such as seeds, labor cost, transportation cost, fertilizer...) (VND)	*money earned from selling products per year)* *(VND)*	*(VND)*
		.....	.....	.....	.....
5	Provision of services Please specify what services:	Total investment cost/ year (Total investment includes capital and other costs such as seeds, labor cost, transportation cost, fertilizer...) (VND)	Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)* *(VND)*	Total income/year *(Note: Total income= total revenue/year –total investment/year)* *(VND)*	
		.....	.....	.....	
6	Exploitation of timber, specify the wood type:	Gross output per year (m^3/ton/kg)	Total investment cost/ year (Total investment includes capital and other costs such as seeds, labor cost, transportation cost, fertilizer...) (VND)	Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)* *(VND)*	Total income/year *(Note: Total income= total revenue/year – total investment/year)* *(VND)*
		.....	.....	.....	.....
7	Wildlife hungting, please specify the wild animals:				.....
8	Wildlife trading, please specify the wild animals:				.....
	TOTAL INCOME				.....

PART B: AGRICULTURE							
	Livelihood activities	Area of cultivation or	Productivity /ha or Sao (kg/ton)	Yield per year (ton/kg)	Total investment cost/ year (Total	Total revenue per year *(Total revenue/turnover is the total amount of*	Total income/year *(Note: Total income=*

		land (m^2)			investment includes capital and other costs such as seeds, labor cost, transportation cost, fertilizer...) (VND)	*money earned from selling products per year) (VND)*	*total revenue/year –total investment/ year)* *(VND)*
1	Cultivation (rubber tree, rice, maize, potatoes, cassavas,), specify what plant?	....	....	....	....	....	....

		Area of husbandry land (m^2)	Quantity	Total investment cost/ year (Total investment includes capital and other costs such as species. varieties, labor cost, transportation cost, fertilizer...) (VND)	Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year) (VND)*	Total income/year *(Note: Total income= total revenue/year –total investment/year)* *(VND)*
2	Animal Husbandry (pig, buffaloes, cow, ducks...), specify what animals:	....	....	....	....	....

3	Production/processing of crop productionproducts Please specify what crop productionproducts:	Gross output per year (m^3/ton/kg)	Total investment cost/ year (Total investment includes capital and other costs	Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)*	Total income/year *(Note: Total income= total revenue/year – total investment/year)*

	....		such as seeds, labor cost, transportation cost, fertilizer...) (VND)	*(VND)*	*(VND)*
		.....	.....	.....	.....
4	Provision of agricultural services Please specify what agricultural services:	Total investment cost/ year (Total investment includes capital and other costs such as seeds, labor cost, transportation cost, fertilizer...) (VND)	Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)* *(VND)*	Total income/year *(Note: Total income= total revenue/year –total investment/year)* *(VND)*	
		.....	.....	.....	
5	Trade in crop productionproducts/goods Please specify what crop productionproducts/goods:	Gross output per year (m^3/ton/kg)	Total investment cost/ year (Total investment includes capital and other costs such as seeds, labor cost, transportation cost, fertilizer...) (VND)	Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)* *(VND)*	Total income/year *(Note: Total income= total revenue/year – total investment/year)* *(VND)*
		.....	.....	.....	.....
	TOTAL INCOME				....

PART C : AQUACULTURE						
	Livelihood activities	Area of productive land (m^2)	Productivity /ha or Sao (kg/ton)	Yield per year (ton/kg)	Total investment cost/ year (Total investment includes capital and other costs such as seeds, labor cost, transportation cost, fertilizer...) (VND)	Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)* *(VND)*
1	Husbandry, specify what aquatic species:	.....	.....	.....	.....	.....

2	Production/processing of aquatic products Please specify what aquatic products:	Gross output per year (m^3/ton/kg)	Total investment cost/ year (Total investment includes capital and other costs such as seeds, labor cost, transportation cost, fertilizer...) (VND)	Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)* *(VND)*	Total income/year *(Note: Total income= total revenue/year – total investment/year)* *(VND)*
		.....	.....	.....	.....
3	Provision of aquaculture services Please specify what aquaculture services:	Total investment cost/ year (Total investment includes capital and other costs such as seeds, labor cost, transportation cost, fertilizer...) (VND)	Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)* *(VND)*	Total income/year *(Note: Total income= total revenue/year –total investment/year)* *(VND)*	
		.....	.....	.....	
4	Trade in aquaculture products/goods Please specify what aquaculture products/goods:	Gross output per year (m^3/ton/kg)	Total investment cost/ year (Total investment includes capital and other costs such as seeds, labor cost, transportation cost, fertilizer...) (VND)	Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)* *(VND)*	Total income/year *(Note: Total income= total revenue/year – total investment/year)* *(VND)*
		.....	.....	.....	.....
5	Fishing, please specify the fish or other aquatic species:	Gross output per year (m^3/ton/kg)	Total investment cost/ year (Total investment includes capital and other costs such as seeds, labor cost, transportation cost, fertilizer...) (VND)	Total revenue per year *(Total revenue/turnover is the total amount of money earned from selling products per year)* *(VND)*	Total income/year *(Note: Total income= total revenue/year – total investment/year)* *(VND)*
		.....	.....	.....	.....
	TOTAL INCOME				.....

ANNEX 4 LAND TYPES AND SURVEYED HOUSEHOLDS GROUPS IN TTH AND QN PROVINCE

Thua Thien Hue province

HH group	Types of land	Phong Dien NR				Sao La NR				Bach Ma NP			
		Hong Ha commune		Hong Kim commune		A Roang commune		Thuong Long commune		A Ting commune		Thuong Lo commune	
		Average (ha)	No.HH	Average (ha)	No.HH	Average (ha)	No.HH	Average (ha)	No.HH	Average (ha)	No.HH	Average (ha)	No.HH
Poor HH	Forestry	7,750	13	4,319	21	12,696	23	3,568	15	10,826	23	12,422	9
	Agriculture	3,209	16	1,323	43	3,396	35	3,377	21	2,062	29	6,329	12
	-Wet rice	1,000	1	866	42	1,176	35	895	10	1,559	27	408	6
	-Hill rice	.	-	.	-	700	1	.	-	1,650	10	.	-
	-Rubber	7,150	5	.	-	7,700	10	3,360	15	.	-	13,800	5
	-Banana	.	-	.	-	.	-	.	-	1,000	1	1,000	1
	-Cassava	1,100	11	1,140	15	.	-	2,105	5	.	-	1,167	3
	-Maize	833	3	680	5	.	-	40	1	200	1	.	-
	Other	.	-	50	1	.	-	1,000	1	.	-	.	-
Near-poor HH	Forestry	13,750	4	4,125	4	12,091	21	7,250	9	12,500	4	13,000	11
	Agriculture	3,100	6	4,250	5	5,427	30	4,920	10	2,400	5	6,954	11
	-Wet rice	750	2	1,200	5	1,520	30	519	8	1,660	5	580	5
	-Hill rice	.	-	.	-	.	-	.	-	2,500	1	.	-
	-Rubber	7,500	2	.	-	8,336	14	5,000	8	.	-	14,750	4
	-Banana	.	-	.	-	.	-	.	-	.	-	600	2
	-Cassava	750	2	15,000	1	500	1	2,500	2	1,000	1	2,042	6
	-Maize	500	1	.	-	.	-	.	-	.	-	575	2
	Other	100	1	250	1	.	-	50	1	200	1	.	-
Non-poor HH	Forestry	38,845	29	12,354	24	15,044	25	8,053	48	23,265	17	15,500	15
	Agriculture	4,369	21	1,979	34	9,259	32	7,528	58	1,565	17	11,047	16
	-Wet rice	1,042	6	1,157	34	1,519	31	1,170	40	1,124	17	400	5
	-Hill rice	.	-	.	-	.	-	.	-	1,000	2	.	-
	-Rubber	4,417	6	.	-	20,667	12	7,132	52	.	-	13,583	12
	-Banana	.	-	.	-	.	-	1,000	1	3,000	1	1,500	1
	-Cassava	3,269	13	2,284	11	1,200	1	1,750	9	.	-	750	9
	-Maize	1,231	13	700	4	.	-	1,000	2	2,500	1	1,167	3
	Other	500	1	.	-	.	-	250	1	.	-	.	-

Quang Nam province

HH	Types of	Ngoc Linh NR	Song Thanh NR	Elephant NR

group	land	Tra Cang commune		Tra Tap commune		Dac Pre commune		Phuoc Xuan commune		Phuoc Ninh commune		Que Lam commune	
		Average (ha)	No.HH	Average (ha)	No.HH	Average (ha)	No.HH	Average (ha)	No.HH	Average (ha)	No.HH	Average (ha)	No.HH
Poor HH	Forestry	4,497	36	9,029	7	5,000	4	14,000	13	20,667	3	9,611	9
	Agriculture	5,044	41	3,662	17	6,567	12	6,373	13	2,327	11	1,353	28
	-Wet rice	2,577	33	1,504	13	1,260	5	3,458	6	1,891	11	892	18
	-Hill rice	1,778	18	1,500	1	5,464	7	4,000	2	.	-	1,000	1
	-Rubber	.	-	.	-	.	-	30,000	1	.	-	.	-
	-Banana	1,294	37	3,838	8	.	-	.	-	.	-	.	-
	-Cassava	1,738	13	9,000	1	.	-	.	-	.	-	.	-
	-Maize	2,833	3	.	-	.	-	3,443	7	1,200	4	926	21
	Other	2,697	4	1,500	1	5,708	6	.	-	.	-	467	3
Near-poor HH	Forestry	10,200	2	25,000	2	6,625	4	16,667	6	14,450	10	7,620	15
	Agriculture	12,743	3	6,500	2	15,700	4	10,500	6	3,220	28	1,555	20
	-Wet rice	3,167	3	1,500	2	1,800	1	2,500	6	1,738	28	719	16
	-Hill rice	.	-	.	-	9,333	3	.	-	.	-	.	-
	-Rubber	.	-	.	-	.	-	13,667	3	12,000	2	.	-
	-Banana	2,625	2	10,000	1	.	-	.	-	.	-	.	-
	-Cassava	7,660	3	.	-	1,000	1	.	-	.	-	500	1
	-Maize	500	1	.	-	.	-	2,333	3	1,550	10	1,191	16
	Other	.	-	.	-	16,000	2	.	-	1,000	2	50	1
Non-poor HH	Forestry	9,343	24	19,509	21	50,000	1	28,750	4	34,375	14	11,250	4
	Agriculture	12,960	27	7,435	23	600	1	21,500	4	5,217	24	4,250	4
	-Wet rice	6,217	15	1,533	18	600	1	4,250	2	1,276	19	1,250	2
	-Hill rice	5,950	10	1,500	2	.	-	.	-	.	-	.	-
	-Rubber		-	.	-	.	-	30,000	2	14,833	6	10,000	1
	-Banana	4,594	24	8,240	15	.	-	2,500	1	.	-	.	-
	-Cassava	5,020	10	3,750	4	.	-	.	-	1,000	1	500	1
	-Maize	3,025	4	400.0	2	.	-	7,500	2	1,028	9	1,250	2
	Other	3,517	7	1,000	1	.	-	.	-	850	2	750	2

ANNEX 5 LIST OF PEOPLE PARTICIPATED IN THE SURVEY

Sao La NR

A Roang commune			Thuong Long commune		
Amin C9 village	Ka Lo village	Karon Aho village	Village 3	Village 4	Village 8
A King Kheo	A Ho Nghien	A Doan Niem	Doan Van Can	Ho Tan Thanh	Ho Duc Lien
A King Xuat	A Hos No	A King Thi	Doan Van Dong	Ho Thi Bem	Ho Van Nac
A Viet Ly	Ho Van Arang	A Kinh Oi	Doan Van Vo	Ho Van Boloor	Ngoc Van Dooc

Aking A Riu	Ho Van Bloc	Aking Khu	Doan Van Voi	Ho Van Dien	Ngoc Van Muoc
Blup Man	Ho Van Di	Aking Phai	Ho Van A Vach	Ho Van Linh	Ngoc Van Nho
Blup Nhon	Ho Van Ha	Aking Phut	Ho Van Bong	Ho Van Lu	Nguyen Thi Ngong
Bo Lup Bu	Ho Van Hat	Blup Choh	Ho Van Deo	Ho Van Mong	Pham Van Hur
Ho Van Bit	Ho Van Hien	Blup Phu	Ho Van Ngung	Ho Van Muoi	Pham Van Noi
Ho Van Bon	Ho Van Lieu	Ho A Chu	Ho Van Nung	Ho Van Nim	Pham Van Nom
Ho Van Co	Ho Van Nac	Ho Van A Muc	Ho Van Pin	Ho Van Poch	Pham Van Nung
Ho Van De	Ho Van Net	Ho Van Bai	Ho Van Vol	Ho Van Quy	Pham Van Phe
Ho Van Dieu	Ho Van Nghe	Ho Van Ban	Ho Van Vuon	Ho Van Thang	Pham Van Xi
Ho Van Dinh	Ho Van Nghin	Ho Van Che	Ho Van Vy	Ho Van Tuy	Ta Rung Dhang
Ho Van Diu	Ho Van Nhoan	Ho Van Chui	Ho Xuan Rut	Ho Van Van	Ta Ruong Van Set
Ho Van Dui	Ho Van Nhum	Ho Van Hut	Nguyen Van Bror	Ngoc Van Chinh	Tran Dinh Vi
Ho Van Hanh	Ho Van Nia	Ho Van Khop	Nguyen Van Klot	Nguyen Thi Thom	Tran Minh Duc
Ho Van Hoi	Ho Van No	Ho Van Nam	Nguyen Van Thieu	Nguyen Van Cach	Tran Thu
Ho Van Huong	Ho Van Nong	Ho Van Ngoc	Nguyen Van Thuoi	Nguyen Van Chon	Tran Van A Hing
Ho Van Luc	Ho Van Not	Ho Van Ranh	Pham Ba Lin Ngon	Nguyen Van Danh	Tran Van Bap
Ho Van Me	Ho Van Plam	Ho Van Ro	Pham Van Gao	Nguyen Van Keu	Tran Van Bong
Ho Van Nhuoi	Ho Van Sau	Ho Van Sy	Pham Van Lay	Pham Van Bang	Tran Van Cay
Ho Van Sinh	K Piu Ngom	Ho Van Xia	Pham Van Via	Pham Van Bong	Tran Van Cong
Ho Van Xa	Ka Lum Sinh	Ka Lum U	Rapat Hai	Pham Van Hao	Tran Van Dang
Ho Van Yeng	Nguyen Piu Vom	Ke Dien But	Ta Ruong A Bep	Pham Van Tien	Tran Van Dao
Ho Van Yeu		Ke Dien Hong	Ta Ruong Ao	Pham Van Tin	Tran Van Dinh
Ho Viet Cuong		Ke Dien Trang	Ta Ruong Mat	Ta Ruong Dam	Tran Van Khung
Ke Bang		Ke Van Kia	Ta Ruong Nao	Tran Thi Thu Han	Tran Van Nam
Ke Dien		Ke Van Net	Ta Ruong Not	Tran Van Ai	Tran Van Nao
Ke Van Vom		Ke Van Nhiem	Ta Ruong O	Tran Van Dieu	Tran Van Roi
Ke Xuyen		Nguyen Van Khay	Ta Ruong Trung	Tran Van Dinh	Tran Van Tu
Nguyen Van Co		Nguyen Van Trung	Tran Thi Doch	Tran Van Hoi	Tran Van Tuop
Nguyen Van Conh		Nguyen Van Trung		Tran Van Minh	Tran Xuan Bot
Ra Pat Bom		Vien A Ploc		Tran Van Pol	Vuong Van Cuong
Ra Pat Nghia		Vien A Tuou		Tran Van Sot	
Ra Pat Nghiem		Vien Ngoan		Tran Xuan Hai	
Ra Pat Ngo					
Rapat Ngai					
Rapat Ngheo					

Phong Dien NR

Hong Ha commune		Hong Kim commune	
Pa Hy village	Pa Ring village	A Tia 2 village	Dut 1 village
A Co Xien	Dinh Xuan Nghi	Can Ngoa	Cu Lai
Cang Hung	Ho Cong Tam	Dang Huan	Cu Teh'
Chau Thi Than	Ho Minh Du	Dang Van Bao	Ho A Dut
Chau Van Hoang	Ho Thi Tich	Ho Anh Minh	Ho A Phue
Chau Van Huu	Ho Thuong Kit	Ho Thuong Boi	Ho Cu Ran
Dang Van Son	Ho Thuong Mien	Ho Van Bien	Ho Minh Nhu
Ho Dinh Cu	Ho Van Bac	Ho Van Dung	Ho Sy Nhat
Ho Dinh Thang	Ho Van Loc	Ho Van Hoa	Ho Thi Doi
Ho Thi Hinh	Ho Van Phieh	Ho Van Hoang	Ho Thi Lan
Ho Thi Kha	Ho Van Phin	Ho Van Ngoan	Ho Thi Nhan
Ho Thi Trinh	Hoai Eu	Ho Van Nha	Ho Thi Nhoai
Ho Van Chien	Kan Dac	Ho Van Nho	Ho Thi Tam
Ho Van Giay	Le Minh Cui	Ho Van Nien	Ho Thi Thi
Ho Van Huong	Le Minh Truong	Ho Van No	Ho Van Cha
Ho Van Khi	Nguyen Hoai Det	Ho Van Tan	Ho Van Chien
Ho Van Kho	Nguyen Hoai Duong	Ho Van The	Ho Van Chuan
Ho Van Linh	Nguyen Hoai Nam	Ho Xuan Ca	Ho Van Hien
Ho Van Loi	Pi Hoi Dai	Ho Xuan Ron	Ho Van Hom
Ho Van Me	Pi Hoih Duan	Hoang Thanh Da	Ho Van Khong
Ho Van Prong	Ra Pat Cuong	Hoang Van Nhan	Ho Van Kim
Ho Van Rao	Ra Pat Meng	Hoang Van Phay	Ho Van Lam
Ho Van Sa	Ra Pat Oan	Kan Hen	Ho Van Lan
Ho Xuan Hiem	Ra Pat Thang	Kan Phuoi	Ho Van Lap
Ho Xuan Lu	Ra Pat Thao	Le Hong Nam	Ho Van Luong
Ho Xuan Thiep	Tran Minh Sang	Le Ngoc Hanh	Ho Van Nguon
Hoang Dinh Thao	Tran Minh Sanh	Le Thanh Hom	Ho Van Nhien
Kan E	Tran Minh Soan	Le Van Mac	Ho Van Sau
Kan Khoan	Tran Minh Xieng	Le Van Ngan	Ho Van Tham
Le Thanh Do	Tran Minh Xuong	Le Van Ngu	Ho Van Thang
Le Thanh Inh	Tran Xuan Dung	Le Van Pien	Ho Van Tinh
Le Thanh Oai		Le Van Thinh	Ho Van To
Le Thanh Pong		Linh	Ho Van Vinh
Le Thanh Uong		Nguyen Quynh Non	Le Quang Bay
Nguyen Thi Hong		Nguyen Van Nam	Le Quang Nhuan
Nguyen Thi Thu		Nguyen Van Quach	Le Thi Luong
Nguyen Van Son		Nguyen Vinh	Le Thi Xuan
Phuong Hong Nghia		Nguyen Xuan Thinh	Le Van Hinh
		Thai Thi Su	Le Van Hoi
		Tran Van Be	Le Van Sinh
		Tran Van Hoanh	Nguyen Xuan Tieu
			Quynh Uom
			Tran Van Hun
			Tran Van Nghiep

Bach Ma NP

A Ting commune		Thuong Lo commune	
Cho Nech village	Pa Zih village	Cha Mang village	Doi village
A Lang Bruoi	A Lang Ha	Ho Minh Lang	Ho Thi Dai
A Lang Che	A Lang Han	Ho Van Minh	Ho Trong Ninh
A Lang Lon	B Nuoch Duong	Ho Van Nhu	Ho Van Chung
A Lang Lua	B Nuoch Thuong	Ho Van Top	Ho Van Chuoc
A Lang Nheech	B Riu Nhien	Nguyen Duc Trinh	Ho Van Huy
A Lang Pup	B Riu Sa Pa	Pham Van Anh	Ho Van Lang
B Nuoc Danh	Bnuoch Bu	Pham Van Kheo	Ho Van Mao
B Nuoc Thi On	Bnuoch Cong	Pham Van Khuong	Ho Van Minh
B Nuoc Toan	Briu A Tet	Pham Van Son	Ho Van Nho
Co Lau Beet	Briu Thi Ly	Pham Van Trai	Ho Van Phan
Co Lau Du	Briu Ty	Phan Van Chien	Ho Van Su
Co Lau G Rop	Co Lau Bo	Phan Van Trien	Ho Van Suoi
Co Lau Ngai	Co Lau Crai	Ton Nu Thi Phuong	Ho Van Tien
Co Lau Nghieu	Co Lau Let	Tran Van Minh	Ho Van Vay
Coor Lon	Co Lau Quynh	Tran Van Tho	Hoang Van Dot
Coor Lum	Co Lau Ta		Hoang Van Duc
Ho A Chon	Co Lau Thi Plu		Hoang Van Thanh
Hoih Chou	Coor Luc		Hoang Van Tru
Po Long Buoc	Nguyen Thi Thu		Le Van Lung
Po Long Chi	Po Long Nai		Lo Van Hoa
Po Long Him	Po Loong Am Lot		Tran Van Binh
Po Long Hy	Zo Ram Tuu		Tran Van Cau
Po Long Lap			Tran Van Chan
Po Long Nho			Tran Van Do
Po Loong Bat			Tran Van Giong
Po Loong Bun			Tran Van Minh
Po Loong Buon			Tran Van Nhen
Po Loong Mui			Tran Van Nho
Zo Ram A Pia			Tran Van Phuc
Zo Ram Hoi			Tran Van Thang
Zo Ram Tat			Tran Van Thoan
			Tran Van Thu
			Tran Van Thue
			Vuong Van Bon
			Vuong Van Ga

Song Thanh NR

Dac Pre commune		Phuoc Xuan commune	
Village 58		Lao du village	Nuoc Lang village
Brol Nhan	Po Long Uy	A An	Ho Thi Toi
Brol Thi Chom	Un Che	A Ben	Ho Van Dang
Brol Thi Trang	Un Chen	A Dieu	Ho Van Lien
Brol Tram	Un Chun	A Huong	Ho Van Suc
Hien Can	Un Chuon	A Huu	Ho Van Tiet
Hien Kieu	Un So	A Lanh Boi	Ho Van Xi
Hien Lon	Zo Con Ram Chung	A Nghiet	Ho Van Y
Hien Toi	Zo Muon Bup	A Nghin	Xieng Lang Khut

Po Long Hech	Zo Ram Bao	A Phong	
Po Long Heo	Zo Ram Bung	A Thanh	
Po Long Hom	Zo Ram Choan	A Vu	
Po Long Kien	Zo Ram He	Ho Thi Mia	
Po Long Lam	Zo Ram Nhung	Vu Dinh Hiep	
Po Long Lan		Vu Dinh Yen	
Po Long Thi		Y Pep	
Po Long Thi Tham		Y Thuy	

Elephant NR

Phuoc Ninh commune		Que Lam commune	
Binh Yen village	Dui Chieng 2 village	Cam La village	Phuoc Hoi village
Bui Thanh Long	Chan Minh Phuoc	Dinh Thi Phap	Cao Duc Quang
Dang Ngoc Minh	Chan Trung Yen	Dinh Van Ba	Cao Thi Vinh
Dang Sau	Dang Thi Thao	Huynh Cuong	Dang Van Ba
Dang Van Nam	Doan Ngoc Kim	Luong Van Binh	Dao Di Vinh
Ho Nguyen Thi Hue	Ha Minh Trung	Luong Van Hung	Dao Thi A
Ho Thi Thien Nga	Ho Nghia	Luong Van Huong	Dao Thi Thanh
Ho Van Sinh	Le Ngoc Thanh	Luong Van Trung	Dinh Trung Phuong
Huynh Ngoc Anh	Le Sau	Luong Van Vinh	Dinh Van Ba
Huynh Van Dung	Le Van Sau	Nguyen Cong	Ho Ngoc Chau
Le Duc Minh	Ngo Thi Sinh	Nguyen Huy Tan	Ho Thi Bon
Luu Duc Tuan	Nguyen Hai	Nguyen Ngoc Son	Ho Van Nam
Luu Van Bien	Pham Chin	Nguyen Thanh Minh	Hua Van Sanh
Luu Van Lang	Pham Cong Binh	Nguyen Thi Anh	Huynh Duc
Nguyen Dinh Manh	Pham Cong Hoa	Nguyen Thi Em	Ko Duc Tinh
Nguyen Dinh Quoc	Pham Cong Thanh	Nguyen Thi Lanh	Le Hoang Mui
Nguyen Dinh Tai	Pham Minh Le	Nguyen Thi Thanh	Le Van Hung
Nguyen Dinh Tuan	Pham Van Nghi	Nguyen Tuan Son	Le Van Long
Nguyen Hong Ha	Phan Thi Kim Chung	Nguyen Tuu	Le Van Tai
Nguyen Hong Son	Tran Minh	Nguyen Van Bac	Luong Quang Tam
Nguyen Hong Tu	Tran Phi Bang	Nguyen Van Binh	Luu Ngoc Bay
Nguyen Ngoc Duy	Tran Van Them	Nguyen Van Chung	Luu Vi Tuyen
Nguyen Tien Dung	Truong Tan Vinh	Nguyen Van My	Mai Dinh Sau
Nguyen Tuong Ninh	Vo Thi Tam	Nguyen Van Tu	Ngo Tan Sinh
Nguyen Van Cong		Nguyen Van Tuong	Nguyen Chi Linh
Nguyen Van Hai		Nguyen Van Vinh	Nguyen Ha
Nguyen Van Nam		Pham Thi Minh Tam	Nguyen Mot
Nguyen Van Tham		Pham Thi Oanh	Nguyen Quoc Phung
Nguyen Van Thang		Pham Thuan	Nguyen Son
Nguyen Van Thien		Tang Minh	Nguyen Thanh Sang
Nguyen Van Vinh		To Van Vinh	Nguyen Thi Dung
Nguyen Viet Vuong		Tran Viet Amnh	Nguyen Thi Luyen
Pham Dinh A		Tran Viet Phap	Nguyen Thi Mai
Pham Dinh Dai		Tran Viet Tau	Nguyen Thi Thach
Pham Van Chin		Truong Hong Khoi	Nguyen Van Quang
Pham Van Thanh		Truong Hung Quoc	Nguyen Van Quy
Phung Van Bich		Truong Minh Duc	Nguyen Van Trung
Tran Duy Linh		Truong Thi My Hanh	Pham Men
Tran Duy Nghiem		Truong Viet Hoang	Pham Minh Thien

Tran Ngoc Hieu			Pham Thi Muoi
Tran Ngoc Ty			Pham Van Khanh
Tran Thi Chung Ba			Quynh Thao
Tran Van Thuong			Tan Tan Binh
Truong Nhuoc			Tran Ngoc Hoang
Truong Tam			Tran Ngoc Tan
Truong Thi Toi			Tran Thi
Truong Ty			Tran Thi Ly
Vo Quy			Tran Thi Phuoc
			Tran Thi Thang
			Tran Thi To Nga
			Tran Van Hung
			Tran Van Muoi
			Tran Van Sy
			Tran Van Xanh
			Truong Dich
			Truong Duc

Ngoc Linh NR

Tra Cang commune		Tra Tap	
Village 3	Village 4	Village 1	Village 2
Bui Van Thoai	A Duc Thu	Dinh Van Thanh	Ho Thi Canh
Ho Duc Huy	A Va Thanh	Dinh Van Tien	Ho Thi Thoi
Ho Thi Thien	Dinh Ba Phu	Ho Thi Len	Ho Van Bien
Ho Van Binh	Dinh Huu Quang	Ho Van Chien	Ho Van Diu
Ho Van But	Dinh Van Toan	Ho Van Chung	Ho Van Dung
Ho Van Cu	Ho Duy Luan	Ho Van Diep	Ho Van Giap
Ho Van Dam	Ho Van Cuong	Ho Van Din	Ho Van Ha
Ho Van Don	Ho Van Dinh	Ho Van Giac	Ho Van Huan
Ho Van Dung	Ho Van Lai	Ho Van Hang	Ho Van Lam
Ho Van Dung	Ho Van Lieng	Ho Van Len	Ho Van Luc
Ho Van Duong	Ho Van Loi	Ho Van Quyet	Ho Van Nem
Ho Van Hang	Ho Van Nu	Ho Van Rua	Ho Van Nen
Ho Van Hung	Ho Van Tieng	Ho Van Thi	Ho Van Nhat
Ho Van Khuyen	Huynh Hong Hieu	Ho Van Tuong	Ho Van Niem
Ho Van Len	Huynh Hong Nin	Ho Van Ty	Ho Van Niep
Ho Van Nui	Huynh Hong Tuan	Le Dinh Thiec	Ho Van Phai
Ho Van Nuon	Huynh Thi Kieu Lien	Le Thai Truong	Ho Van Sanh
Ho Van Phuoc	Le Thi Hong Van	Le Van Niem	Ho Van Tuan
Ho Van Sang	Nguyen Hanh Chinh	Le Van Nut	Ho Van Vien
Ho Van Thieu	Nguyen Ngoc Quynh	Nguyen Dinh No	Nguyen Dinh Mot
Ho Van Tho	Nguyen Thanh Bay	Nguyen Thi Hang	Nguyen Thi Minh
Ho Van Thuan	Nguyen Thanh Long	Quach Van Hau	Nguyen Truong Doanh
Ho Van Vien	Nguyen Thanh Neo	Tran Quoc Doi	Nguyen Xuan Hong
Ho Van Vinh	Nguyen Thanh Non	Tran Van Hung	Phung Xuan Khoi
Ho Van Vua	Nguyen Thanh Tang	Tran Van Ut	Tran Dinh Khoi
Le Hong Nguyen	Nguyen Thi Hue		Tran Dinh Noa
Le Quang Hong	Nguyen Thi Thien		Vu Dinh Luc
Nguyen Cao Bang	Nguyen Van Chien		

Nguyen Dinh Thu	Nguyen Van Deo		
Nguyen Hong Ut	Nguyen Van Luc		
Nguyen Ngoc Xanh	Nguyen Van Thang		
Nguyen Thanh Hoi	Pham Dinh Son		
Nguyen Thanh Ut	Pham Xuan Hai		
Nguyen Thanh Vien	Tran Thi Kim Hoa		
Nguyen Van Ban	Tran Van Thang		
Nguyen Van Bang	Tran Xuan Minh		
Pham Van Thu			

ANNEX 6 ACTORS INTERVIEWED FOR MVC ANALYSIS IN QN AND TTH

Product	Site	Producer	Middleman	Processor/Wholeseller
Rattan (exploited from and planted in natural forest)	A Roang commune, A Luoi district, TTH	1	1	1
Community-based ecotourism	Hong Ha commune, A Luoi district, TTH	4	0	0
Medicinal plant under foresty storey (Thien Nien Kien)	Thuong Lo commune, Nam Dong district	1	0	0
Orange	Huong Loc commune, Nam Dong district, TTH	1	2	1
Beef cow	A Luoi district, TTH	1	1	2
Rattan (exploited from and planted in natural forest)	Ta Bhinh commune, Nam Giang district, QN	1	1	0
Pomelo (buoi tru)	Phuoc Ninh commune, Nong Son district, QN	1	2	1
Dang-shen (dang sam)	Tra Cang commune, Nam Tra My district, QN	1	1	1

ANNEX 7 GUIDING QUESTIONNAIRE FOR FOCUS GROUP DISCUSSIONS

FOCUS GROUP DISCUSSION WITH TRADERS AT THE LOCALITY

1. Date and place: …….

2. Name of facilitator: ……. Male/female……

3. Number of participants: …….. (Male: ....., Female: .....)

Objective: To obtain market information for some potential products

1. Which products are mainly being traded or produced locally? (choose 3 products based on current yield and potential trends)
2. Demand for some of the current locally traded products (trend)
3. Supply (trend)
4. Level of consumption (where, high or low)? Quality and purchasers and consumers
5. Competitive advantage of the products (regional typical products)
6. Comparative advantage (production)
7. The market has demand yet local interest is low (potential)
8. Selection of priority products (max 3)
9. Supportting services
10. Role of stakeholders
11. Risks, obstacles facing local products
12. Solution to product development

FOCUS GROUP DISCUSSION WITH FARMERS

1. Date and place: …….

2. Name of facilitator: ……. Male/female……

3. Number of participants: …….. (Male: ....., Female: .....)

Objective: To understand current farming/product systems and people's suggestions on potential farming/product systems.

1. Key local income generating activities
   List and order by income level (importance?)

1.1 List local major crops and farming seasons (crop calendar - drawings) - with technical details and market information.

1.2 List livestock

1.3 List aquatic species (wild fish)

1.4 Timber products

1.5 Medicinal plants

1.6 Other non-timber products

2. What do women generally do in agriculture, in production and in the family? Who generally makes decision on things like family affairs/investment on production/children's education, etc.?

3. The current advantages and disadvantages of each model (**Seasonal shock, periodical shock, price and disease …)**

4. Current products sold at market

5. List potential products/livelihood models (can be planted, marketable, high profit, low cost, etc.)

6. Who participates and which stages in the chain of potential products? (selling products, buying seeds, etc.)

7. SWOT for potential livelihood model
   Potential livelihood model

Advantages	Disadvantages
……..	……
Opportunities	Challenges
……	……

8. Suggest solutions for potential product/livelihood model development (based on SWOT results)

8.1 Capital

8.2 Techniques

8.3 Institution

8.4 Market

8.5 Services

FOCUS GROUP DISCUSSION WITH COMMUNE OFFICERS

1. Date and place: …….

2. Name of facilitator: ……. Male/female……

3. Number of participants: …….... (Male: ....., Female: .....)

Objective: To understand the local direction as well as difficulties and solutions for the development of potential livelihood models.

1. Key local income generating activities
2. (in order of priority and income)
3. Current livelihood models (specify)
4. What do women generally do in agriculture, in production and in the family? Who generally makes decision on things like family affairs/investment on production/children's education, etc.?
5. The current advantages and disadvantages of each model (Seasonal shock, periodical shock, price and disease …)
6. Institutions/policies affecting livelihood models
7. Commune's direction for the development of livelihood models
8. Specify the models, reasons, risks or obstacles?
9. Solutions to develop potential livelihood models (role of stakeholders)
10. Impact/opportunity for improving income and estimation of the extent to which income can be improved
11. Scale and scope of impact: how many households participated, percentage of poor households participated in and benefited from the models.

ANNEX 8 GUIDING QUESTIONNAIRE FOR KEY INFORMANT INTERVIEWS

INTERVIEWS WITH CONSERVATION/NATIONAL PARK AREAS OFFICERS

1. Date and place: ……

2. Name of facilitator: …… Male/female……

3. Number of participants: …….. (Male: ....., Female: .....)

More guiding question for KII who are Conservation/Park zones

- Current status of biodiversity: seedlings, genes of trees and animals; Desktop review??
- Current status of gradually degraded and/or possibly lost species;
- What kinds of new / hybrid varieties are available? Influencing level? Local reception?
- Any potential and/or already happened impact to the current livelihood by the Government/local government's policies relating to re-planning the conservation/buffer-zone/protection vs production forests.

1) Status quo and risks to biodiversity:
- Status quo
- Risks: major risks; level of impact

2) Which conservation solutions have been being implemented?
3) Which livelihood activities of the conservation areas have been being implemented?
4) How is the community involvement in biodiversity conservation of the conservation areas/National Park?
5) Collect information on (national and international) programs/projects of the Conservation areas/National Park supporting biodiversity conservation and buffer zone livelihood development.
   (Note: communes in the buffer zone of Bach Ma National Pack in particular benefit from Decision No. 24 on buffer zone livelihood development through selected livelihood models for each hamlet)

- Implemented programs
- On going programs
- Intended programs

6) Proposed new livelihood models for biodiversity conservation and livelihood development

INTERVIEWS WITH GOVERNMENT STAFF AT PROVINCE/DISTRICT DARD

1. Date and place: …….

2. Name of facilitator: ……. Male/female……

3. Number of participants: …….... (Male: ....., Female: .....)

Objective: To know the local orientation as well as difficulties and solutions in the development of current and potential livelihood models.

1. List and describe main income generating livelihood activities in the buffer zone
2. Order (priority and income)
3. Province's/district's direction regarding the development of livelihood models for buffer zone
4. Discussion on proposed livelihood models

   The advantages and disadvantages of each model (**Seasonal shock, periodical shock, price and disease …)**

   The role of stakeholders, including Institutions/policies affecting livelihood models
   Evaluate gender roles in the proposed livelihood models.

   Assess current markets and potential markets for existing products

   (Impact/opportunity for improving income and estimation of the extent to which income can be improved; Scale and scope of impact: how many households participated, percentage of poor households participated in and benefited from the models; Difficulties, risks or obstacles of livelihood models).

INTERVIEWS WITH GOVERNMENT STAFF AT PROVINCE/DISTRICT DONRE

1. Date and place: …….

2. Name of facilitator: ……. Male/female……

3. Number of participants: …….... (Male: ....., Female: .....)

DONRE's comments on suggestions of the commune and people related to the livelihood models, impact on the environment protection, biodiversity, land use planning, the province's action plan on climate change response.

Local programs and projects that have been being implemented related to livelihood in buffer zones, environmental protection and climate change response.

1. The role of DONRE with respect to the above objective
2. Institutions/policies related to land and climate change affecting livelihood models
3. Province's/district's direction regarding land use planning/forest land allocation affecting the development of livelihood models
4. Province's/district's direction regarding the implementation of the action plan on climate change affecting the development of livelihood models
5. Local programs/projects to support climate change response and adaptive livelihoods (if known)

INTERVIEWS WITH FOREST-DEPENDANT PEOPLE

1. Date and place: ……..

2. Name of facilitator: …….. Male/female……

3. Name and age of interviewee: …….... (Male: ....., Female: .....)

Objective: case study – approximately ½ A4 page length

1. Description of the household: *socio-economic characteristics, demographics, resources, livelihood resources, types of household, how long they have lived here*
2. Livelihood of the household, including forest-dependent livelihoods (description + income)
3. Methods of exploiting non-timber forest products (NTFP), including difficulties, advantages and challenges
4. What is the trend of forest products (increasing, decreasing or becoming rarer)?
5. Possible conflicts
6. Desire of the household
7. The impact of conservation/buffer zone planning policy to the livelihood of the household
8. The household's views about their livelihood/exploitation activities with consideration to state regulations on buffer zone conservation/planning (ask them why they still do wrong even when they know what is right)
9. The household's intention or plan for livelihood development in the coming time/Why do they choose that/what difficulties do they expect.
10. Any more questions or information the interviewer want to ask or share

ANNEX 9 LIST OF PARTICIPANTS FOR FGD AND KIIS

Name and surname	Address/Organization	Handphone	Male	Female
I. Quang Nam Province				
Enterprises				
Đặng Công Quang	Forexco Quang Nam	0905050757	X	
Trần Hưng Thành	Quang Nam Pharmaceutical Materials JSC	02353777097	X	
Võ Thị Trợ	Nam Tra My	0974726759		X
Local partners				
Nguyễn Văn An,	Quang Nam Provincial DONRE		X	
Lê Minh Hường	Quang Nam Provincial DARD		X	
Nguyễn Thị B. Lợi	Quang Nam Agricultural Extension Center	914313238		X
Võ Thị Nhung	Quang Nam Agricultural Extension Center	941888911		X
Phan Đăng Danh	Quang Nam Agricultural Extension Center	905159599	X	
Từ Văn Khánh	Quang Nam Forest Protection Department	983810540	X	
Hà Phước Phú	Quang Nam Forest Protection Department	905356687	X	
Huỳnh Hùng	Quang Nam Forest Protection Department	1299357292	X	
Bùi Văn Toàn	Quang Nam Forest Protection Department	986612360	X	
Natural reserves (NR)				
Mai Văn Dương	Song Thanh NR		X	
Đặng Bá i p	Sao La NR		X	
Trịnh Minh Hải	Ngoc Linh NR		X	
g ễn g Nguyên	Elephant NR		X	
I.1 Nong Son District				
Nguyễn Thị Cẩm Tú	District Division of Natural Resources and Environment	905445098		X
Trần Văn Lưu	District Division of Crop productionand Rural Development	905726955	X	
Nguyễn Ng c Nguyên	District FPD, official of Elephant NR	903550223	X	
I.1.1. Que Lam District				
Interview with government officials				
Trần Văn Ch ng	Vice Chairman of the Commune P.C	0988373328	X	
Lưu Ng c Chung	Chairman of the Farmers Union	01648750090	X	
Phạm Anh Tùng	Forestry official	0973444690	X	
Đồng Phước Tam	Head of Health Station	0985713045	X	
Nguyễn Thị Thùy Trinh	Official in charge of Labor, War Invalids and Social Affairs	01669045557		X
Nguyễn Thị Thanh Tâm	Vice Chairwoman of the Women's Union	0979139781		X

Nguyễn Thị Hồng	Youth Union	0934996961		X
Nguyễn Quang Minh	Officer of the District Bank for Social Policies	0971500064	X	
Trần Công Vũ	Head of Phuoc Hoi Hamlet	0944532875	X	
Nguyễn Công	Forest management group	0972800327	X	
Interview with farmers				
Nguyễn Ng c Vấn	Phuoc Hoi Hamlet	01632750270	X	
Mai Ng c Bình	Phuoc Hoi Hamlet	0962167276	X	
Phạm Văn Bình	Phuoc Hoi Hamlet	0909917132	X	
Nguyễn Thị Lanh	Cam La Hamlet	01635810853		X
Mai Thị Hai	Tu Nghia Hamlet	01697005169		X
Nguyễn Thị Thúy Loan	Phuoc Hoi Hamlet	01697015648		X
Huỳnh Thị Kim Lanh	Thach Binh Hamlet	01636031511		X
Trần Thị Trí	Tu Trung II Hamlet	01666718839		X
Interview with business sectors				
Hồ Đình Miên	Tu Trung I Hamlet	0935863844	X	
Phạm Thị Bích	Phuoc Hoi Hamlet	01684206765		X
Nguyễn Văn hâ n	Tu Nhu Hamlet	01057808789	X	
Huỳnh Lâm	Tu Nhu Hamlet	01682286001	X	
Đào Thị Y	Phuoc Hoi Hamlet	0968004848		X
Nguyễn Ng c Anh	Phuoc Hoi Hamlet	0984394842		X
Interview with forest-dependent people				
Nguyễn Phúc	Cam La Hamlet		X	
I.1.2. Phuoc Ninh Commune				
Interview with government officials				
Nguyễn Văn Công	Chairman of the Commune Farmers Union	0968488539	X	
Nguyễn Thị Kiều Sa	Communal official in charge of Labor, War Invalids and Social Affairs	0972313080		X
Bùi Văn Th	Forestry official	01656532723	X	
Đoàn Công Lâm	Communal secretary	0905546677	X	
Võ Thị Hoài Như	Administrative and Statistical officer	0975756024		X
Trần Thị Ân	Vice Chairman of the Commune P.C	0973256782		X
Phạm Công Thạch	Chairman of the Commune P.C	0964611972	X	
Trần Thị Tố Tâm	Vice Chairwoman of the Women's Union	0976145041		X
Interview with farmers				
Nguyễn Văn Thành	Phuoc Ninh Commune	01255912117	X	
Trần Ng c Hi u	Phuoc Ninh Commune	01697304289	X	
Thác Thị Hồng Thỉ	Phuoc Ninh Commune	01662885442		X
Nôi Thị Bich Ly	Phuoc Ninh Commune			X
Lê Thị Trang	Phuoc Ninh Commune	01644173893		X
Dinh Thị Nhung	Phuoc Ninh Commune			X
Nguyễn Thanh Hải	Phuoc Ninh Commune	0961297477	X	
Trần Thị Bản	Phuoc Ninh Commune			X
Già Thị Phương	Phuoc Ninh Commune			X

Lê Văn oà	Phuoc Ninh Commune	0944176774	X	
Interview with business sectors				
Võ Thị Lan	Phuoc Ninh Commune	01693366601		X
Trần Thị Ky	Phuoc Ninh Commune	01668693802		X
Trần Văn L	Phuoc Ninh Commune	01697759245	X	
Nguyễn Thị Hu	Phuoc Ninh Commune	01657843510		X
Trương Thị Mười	Phuoc Ninh Commune	09357993744		X
Bùi Thanh Long	Phuoc Ninh Commune	01655410980	X	
Võ Quy	Phuoc Ninh Commune	0985497347	X	
Interview with forest-dependent people				
Nguyễn Viết Một	Phuoc Ninh Commune	0934733286	X	
I.2. Dong Giang District				
Phan Văn Thành	District DARD		X	
Nguyễn Minh Bảo	District DORNE		X	
I.2.1. A Ting Commune				
Interview with government officials				
Hôôi Chêm	Communal official in charge of Labor, War Invalids and Social Affairs		X	
BRíu A Tét	Forestry official		X	
A Lăng Chế	Communal Veterinary Officer		X	
Đinh thị Hồng Nghi p	Chairwoman of Commune Women's Union			X
B Ríu Công	Secretary of Communal Youth Union		X	
Pử Loong Hưng	Communal Farmers Union		X	
Bloong Hinh	Head of Chờ Nét Hamlet		X	
Cờ Lâu C rênh	Head of Pờ Zíh Hamlet		X	
A Lăng Phương	Contracted Forest Protection Group		X	
Interview with farmers				
Pơ Long Thị Renh	A Rích			X
Pơ Long Thị Chơng	A Rích			X
Đỗ Hải Đăng	Rơ Vấh		X	
B Ling Thị Ng t	Chờ Cớ			X
Cơ Lâu Thị Miên	Chờ Cớ			X
A Lăng Doo	A Rớch		X	
Pơ Loong Chờ Ráo	A Rớch		X	
B Hơ Nước Kia	A Rớch		X	
B Ling Nghĩa	Chờ Cớ		X	
B Hơ Nước Nhắt	Ra Vấh		X	
Interview with business sectors				
Trần Văn Bằng	A Ting commune		X	
Cơ Lâu Tinh	A Ting commune		X	
A Lăng Chân	A Ting commune		X	
Ploong Lên	A Ting commune		X	
Huỳnh Thị Tuyết Nga	A Ting commune			X
Lê Văn ăm	A Ting commune		X	
Hoih ấp Lét	A Ting commune		X	
Nguyễn Thị Kim	A Ting commune			X

Lai				
Interview with forest-dependent people				
A Lăng Phương	Contracted Forest Protection Group		X	
I.3. Phuoc Son District				
Mai Văn Dương	Song Thanh NR		X	
Nguyễn Văn Thanh	District DARD	0965644456	X	
Nguyễn Đức Toàn	Phuoc Son District	0905165186	X	
I.4. Nam Giang District				
Nguyễn Đăng Chương	District DARD		X	
Zơ Rôm Lươn	Nam Giang District	0962261009	X	
I.4.1 Phuoc Son District				
Interview with communal government officials				
Đoàn Minh Hải	Phuoc Xuan commune		X	
Mai Văn g hi p	Phuoc Xuan commune	969007074	X	
A Cường	Phuoc Xuan commune		X	
A Cơm	Phuoc Xuan commune		X	
Y Nỡ	Phuoc Xuan commune	1673560921	X	
Y Tín	Phuoc Xuan commune		X	
A Thương	Phuoc Xuan commune		X	
Hồ Văn ạ	Phuoc Xuan commune	16560072246	X	
Nguyễn Thị Thanh Bình	Phuoc Xuan commune			X
Interview with farmers				
A Hương	Phuoc Xuan commune	1634151637	X	
Vũ Đình Hi p	Phuoc Xuan commune	1653774168	X	
A Vũ	Phuoc Xuan commune	1642935427	X	
A Lăng Bôi	Phuoc Xuan commune	868472693	X	
A Phát	Phuoc Xuan commune		X	
A Thớ	Phuoc Xuan commune	1697027284	X	
A Thấp	Phuoc Xuan commune		X	
Interview with business sectors				
Nguyễn Ánh	Phuoc Xuan commune	1642051442	X	
Đinh Văn Sửu	Phuoc Xuan commune	1674286417	X	
Huỳnh Thị Ng c	Phuoc Xuan commune	165550364		X
Nguyễn Thị Liên	Phuoc Xuan commune	985237718		X
Phan Thị Thanh Tâm	Phuoc Xuan commune	168740480		X
A Sáng Dí	Phuoc Xuan commune	978748380	X	
I.4.2 Đă Pre commune				
Interview with communal government officials				
Hiên Viến	Vice Chairman of the Commune P.C	973063673	X	
Brôl Chinh	Chairman of the commune Farmers' Union	983406142	X	
Hiên Hôn	Culture and Social official	1635411746	X	
Hiên Thị Húp	Chairwoman of the commune Women's Union	1626114960		X
Hiên Tú	Deputy Head of Commune Forestry Department	1638523273		X
Hiên Hiêu	Vice Chairman of the Commune	986624384	X	

	P.C			
Zơ Râm Tạm	Commune Health Station	1656575032	X	
Brôl Pung	Community forest management board	1677792142	X	
Pơ Long Lặm	Head of Hamlet 58	961296306	X	
Hiên Xưng	Secretary of Communal Youth Union	1678879845	x	
Interview with farmers				
Hiên Xứu	Đắc Pre commune	1698525821	X	
Hiên Vũ	Đắc Pre commune	1634057615	X	
Pơ Long Lặm	Đắc Pre commune	961296306	X	
Pơ Long Bê	Đắc Pre commune		X	
Pơ Long Thị Thắm	Đắc Pre commune	1664899857		X
Zơ Râm Dên	Đắc Pre commune	984054261		X
Zơ Râm Chiếu	Đắc Pre commune	985154533		X
Zơ Râm Chẹm	Đắc Pre commune	1644539272		X
Interview with business sectors				
Brôl Ên	Đắc Pre commune		X	
Hiên Dêng	Đắc Pre commune	1655410444	X	
Hiên Thị Hươm	Đắc Pre commune	1664865037		X
Zơ Râm H m	Đắc Pre commune		X	
Un Khăn	Đắc Pre commune		X	
Hiên Thị Tây	Đắc Pre commune	1668216534		X
Un Sô	Đắc Pre commune	1698898819	X	
Pơ Long Hếch	Đắc Pre commune	1658451652	X	
I.5 Nam Tra My district				
Trịnh Minh Hải	DARD of Nam Tra My district		X	
Nguyễn Hải Đồng	DORNE of Nam Tra My district		X	
I.5.1 Tra Cang commune				
Interview with communal government officials				
Trần Xuân Mố	Chairman of Tra Cang Commune PC	1667870145	x	
Võ Hồng Siêu	Vice Chairman of Tra Cang Commune P.C	976946526	X	
Nguyễn Bá Tuyên	Poverty reduction Official	987012749	X	
Đinh Thị Hoa	Chairwoman of Commune Women's Union	1655436408		X
Hồ Văn Thơm	Chairman ofFarmers Union	966255570	X	
Hồ Văn Lương	Communal Veterinary Officer		X	
Nguyễn Văn T ấn	Secretary of Communal Youth Union	972402824	X	
Tạ Cao Hùng	Commander of the military command of Tra Cang commune	1664459430	X	
Nguyễn Chí Công	Land administration official	965773023	X	
Võ Thanh Bình	Civil status judicial official	979559688	X	
h m nông ân				
Hồ Văn Thi	Hamlet 6, Tra Cang commune	1692908491	X	
Hồ Thị Dên	Hamlet 5, Tra Cang commune	1678978596		X
Huỳnh Thị Huấn	Hamlet 4, Tra Cang commune	-		X
Hồ Thị Vi t Tiến	Hamlet 4, Tra Cang commune	-		X
Hồ Thị Thiếp	Hamlet 3, Tra Cang commune	-		X
Hồ Thị Quyên	Hamlet 5, Tra Cang commune	-		X
Hồ Thanh Đề	Hamlet 1, Tra Cang commune	1687085763	X	

Hồ Văn Vũ	Hamlet 7, Tra Cang commune	1666369305	X	
Hồ Thị Hu	Hamlet 7, Tra Cang commune	1656873353		X
Hồ Thị Vang	Hamlet 6, Tra Cang commune	-		X
Interview with business sectors				
Đinh Thị Hường	Hamlet 5, Tra Cang commune	1699205939		X
Trần Thị Bích Trâm	Hamlet 7, Tra Cang commune	1678293184		X
Đỗ Thị Xanh	Hamlet 4, Tra Cang commune	986777617		X
Hồ Thị Đẻo	Hamlet 5, Tra Cang commune	1628531059		X
Bùi Huy Vương	Hamlet 4, Tra Cang commune	965566860	X	
Nguyễn Thị Hồng Thương	Hamlet 3, Tra Cang commune	975305124		X
Hồ Văn Tá	Hamlet 5, Tra Cang commune	1626058459	X	
Bùi Văn Chiến	Hamlet 3, Tra Cang commune	1672111354	X	
Hồ Văn Vừa	Hamlet 3, Tra Cang commune	-	X	
Phạm Văn Th ận	Hamlet 5, Tra Cang commune	968423990	X	
I.5.1 Tra Tap commune				
Interview with communal government officials				
Hồ Văn Giáp	Tra Tap commune		X	
Đinh Thị Cơ	Tra Tap commune			X
Vũ Đình Lý	Tra Tap commune		X	
Nguyễn Thị Hoàng	Tra Tap commune			X
Vũ Đình Lực	Tra Tap commune		X	
Hồ Văn Phong	Tra Tap commune		X	
Đinh Văn Đức	Tra Tap commune		X	
Đồ Văn Thế	Tra Tap commune		X	
Hồ Văn Linh	Tra Tap commune		X	
Nguyễn Văn Thanh	Tra Tap commune		X	
Interview with farmers				
Nguyễn Thị Minh	Tra Tap commune			X
Trần Văn Út	Tra Tap commune		X	
Hộ Thì Thôi	Tra Tap commune		X	
Trần Thị Diêm	Tra Tap commune			X
Hồ Thị Hinh	Tra Tap commune			X
Hồ Thị Hưng	Tra Tap commune			X
Hồ Thị Mới	Tra Tap commune			X
Nguyễn Thị Hợp	Tra Tap commune			X
Nguyễn Đình M t	Tra Tap commune		X	
Hồ Văn Viên	Tra Tap commune		X	
Interview with business sectors				
Hồ Văn Tương	Tra Tap commune		X	
Trần Vũ Luẫn	Tra Tap commune		X	
Hồ Văn Lâm	Tra Tap commune		X	
Trường Thị Hồ Thuỷ	Tra Tap commune			X
Trần Thị Thành Hải	Tra Tap commune			X
Hồ Văn ằng	Tra Tap commune		X	
Nguyễn Trường Vinh	Tra Tap commune		X	
Interview with forest-dependent people				

Đinh Văn Đức	Tra Tap commune		X	
II. Thua Thien Hue province				
Provincial government officials				
Bùi Thị ải ến	Thua Thien Hue Agricultural Extension Center			X
Châ g Phi	Thua Thien Hue Agricultural Extension Center		X	
Phạm Tài	Thua Thien Hue Agricultural Extension Center		X	
g ễn Thế Luân	DORNE		X	
g ễn Thị Thanh Th	DORNE			X
V Văn Dự	DARD		X	
II.1. A Luoi District				
Trần Ng c Chinh	DARD of A Luoi district		X	
Đoàn Văn Pháp	General Department of A Luoi district		X	
II.1.1 Hong Ha commune				
Interview with forest-dependent people				
oàng Văn Â	Cân Sâm Hamlet		X	
Nguyễn Văn Lân	Pa Hy Hamlet	01657705296	X	
Interview with government officials				
Nguyễn Thị Hạnh	Commune PC	01669976107		X
Lê Văn ợi	Commune PC	01225448352	X	
Lê Thác	Commune PC	0966757781	X	
Nguyễn Văn Lý	Commune PC	0979320968	X	
Hồ Như Thí	Pa Hy Hamlet			X
Rapat Thao	Commune PC	01662709467	X	
Hồ Minh Giới	Pa Ring Hamlet		X	
A Moong Tỵ	Commune PC	01665026799	X	
Hoài Minh Hoà	Commune PC		X	
Nguyễn Thị Chanh	Commune PC	01683764826	X	
Interview with farmers				
Đặng Thị Lam	Hong Ha commune			X
Hồ Thị Thuý	Hong Ha commune			X
Pi Riu Liên	Hong Ha commune		X	
Lê Thị Hoa	Hong Ha commune	01657860774		X
Trần Thị Mỹ Nương	Hong Ha commune			X
Ra Pat Mưa	Hong Ha commune	01682114540	X	
Lê Quang Mây	Hong Ha commune	01633310723	X	
Hồ Xuân Xi t	Hong Ha commune	01675487270	X	
Ra Pat Thanh	Hong Ha commune	01645069773	X	
Trần Văn U	Hong Ha commune	01668318040	X	
Interview with business sectors				
Nguyễn Hoài Giang	Hong Ha commune	01692780731	X	
Hồ Thị Tít	Hong Ha commune	01636020402		X
Lê Thị Mới	Hong Ha commune	01694633258		X
Hồ Minh Dư	Hong Ha commune	01657490419	X	
Lê Minh Trường	Hong Ha commune	01655675327	X	
Pa Pat Thân	Hong Ha commune	0982815653	X	
Nguyễn Thuý Nga	Hong Ha commune	01692002026		X

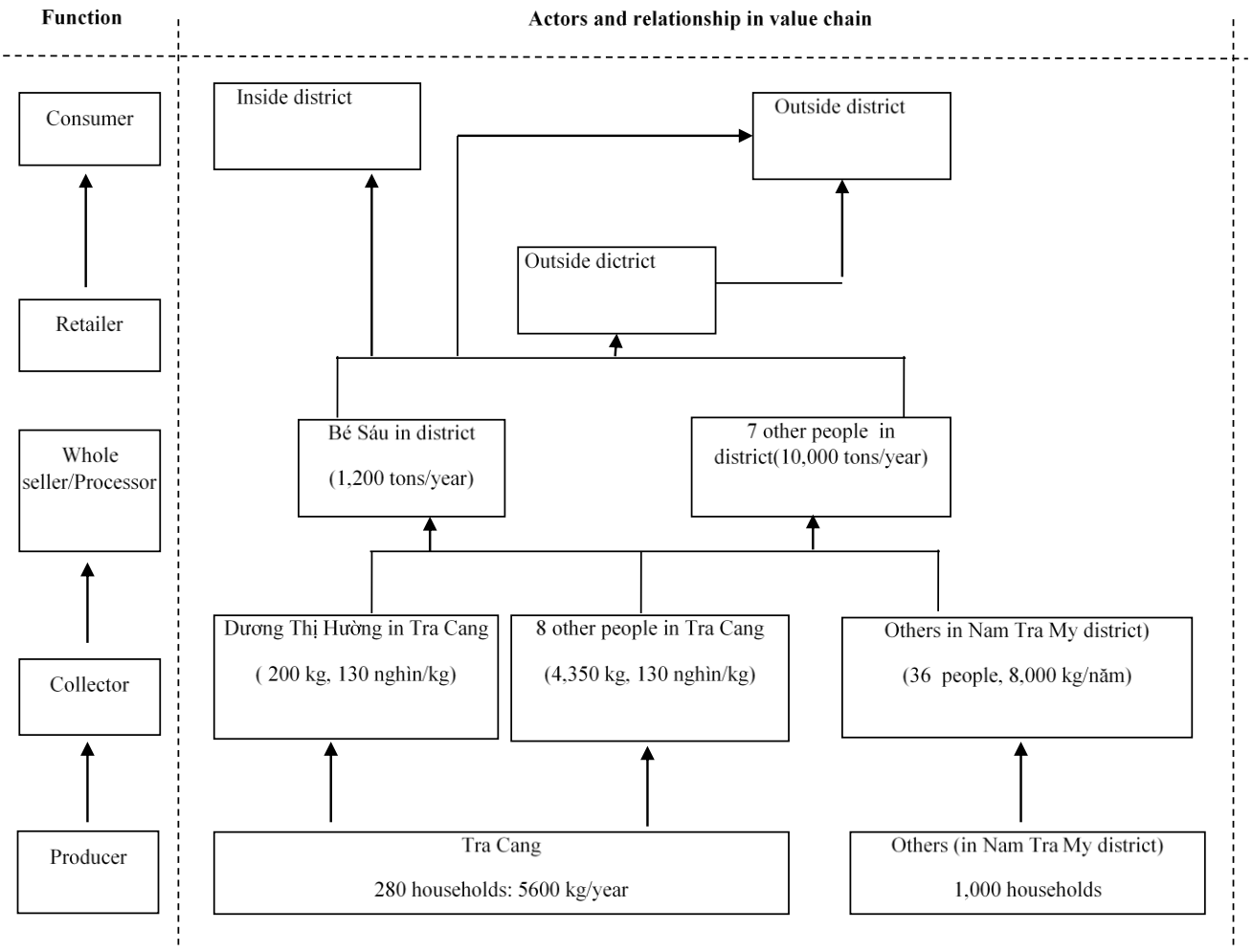
II.2. Nam Dong district				
Trần Xuân Hai	Department of planing and Economics		X	
Trần Công Thành	District DARD		X	
Trần Hoàng	District DORNE		X	
II.2.1. Thuong Long commune				
Interview with copmmunal government officials				
Trần Văn Trĩ	Chairman of the Commune P.C		X	
Trần Văn Rô	Official in charge of Labor, War Invalids and Social Affairs		X	
Lê Quốc Hữu	Crop productionofficial		X	
Trần Văn Châ	Communal Veterinary Officer		X	
Tràn Thị Lụt	Women's Union			X
Hồ Văn o	Secretary of Communal Youth Union		X	
Nguyễn Văn Rinh	Dep t Chairman of Farmers' Union		X	
Ng c Thị Đào	Community forest management board in Hamlet 5			X
Trần Văn Mới	Hamlet 8		X	
Trần Thị Cái	Credit official			X
Interview with farmers				
Hồ Văn B ng	Thuong Long commune		X	
Phạm Xuân Sử	Thuong Long commune		X	
Ra Rát Tựa	Thuong Long commune		X	
Hồ Văn ồ	Thuong Long commune		X	
Trần Văn Chức	Thuong Long commune		X	
Hồ Văn g oài	Thuong Long commune		X	
Lê Đức Hồng Vinh	Thuong Long commune		X	
Ng c Thị Ninh	Thuong Long commune			X
Hồ Thị Ríp	Thuong Long commune			X
Interview with business sectors				
Nguyễn Thị Hền	Thuong Long commune			X
Đoàn Văn Đ p	Thuong Long commune		X	
Phạm Thị Tiếc	Thuong Long commune			X
A Lăng Ka Lê	Thuong Long commune		X	
Hồ Văn Phá h	Thuong Long commune		X	
Phạm Văn Sơn	Thuong Long commune		X	
Hồ Thị Ngân	Thuong Long commune			X
Hồ Thị Nguy t	Thuong Long commune			X
Phạm Văn Ten	Thuong Long commune		X	
Hồ Thị Nía	Thuong Long commune			X
II.2.2. Thuong Lo commune				
Interview with communal government officials				
Hồ Văn Chính	Thuong Lo commune		X	
Hồ Văn Tiến	Thuong Lo commune		X	
Phạm Thị Ninh	Thuong Lo commune			X
Hồ Thị Huý Hằng	Thuong Lo commune			X
Trần Văn Lân	Thuong Lo commune		X	
Trần Văn ù ng	Thuong Lo commune		X	
Trần Văn Khôi	Thuong Lo commune		X	
Trần Văn Biên	Thuong Lo commune		X	

Vương Văn Viên	Thuong Lo commune		X	
Phạm Văn KHương	Thuong Lo commune		X	
Interview with farmers				
Hồ Văn Vảy	Thuong Lo commune		X	
Vương Văn Gã	Thuong Lo commune		X	
Hồ Văn S ối	Thuong Lo commune		X	
Lê Thị Ai	Thuong Lo commune			X
Vương Thị Lam	Thuong Lo commune			X
Hồ Thị Hiền	Thuong Lo commune			X
Hồ Thị Nhía	Thuong Lo commune			X
Trần Văn X ân	Thuong Lo commune		X	
Interview with business sectors				
Trần Văn h ơn	Thuong Lo commune		X	
Phạm Thị Khoai	Thuong Lo commune			X
Tràn Thị Xoan	Thuong Lo commune			X
Trần Văn Biên	Thuong Lo commune		X	
Lê Thị Hương	Thuong Lo commune			X
Trương TP Thuỷ	Thuong Lo commune			X
Hộ THị Thong	Thuong Lo commune			X
Hồ Thị Đạt	Thuong Lo commune			X
PHạm Thị Thuỷ	Thuong Lo commune			X
Hộ Thị Thơ	Thuong Lo commune			X
Interview with forest-dependent people				
Trần Văn Thỏa	Cha Măng amlet, Th o ng Lo commune			
II.2.3. Hong Kim commune				
Interview with communal government officials				
Hồ Thanh Dũng	Chairman of the Commune P.C	1253962311	X	
Hoàng Thị Lành	Official in charge of Labor, War Invalids and Social Affairs			X
Hoàng Thị Lê	Comm nal Women's Union	1656539334		X
Hồ Văn h ớ	Communal Veterinary Officer	1683029804	X	
Hồ Văn Biên	Chairman of communal Farmers Union	981330159	X	
Hồ Văn ôm	Accountant	947810551	X	
Trần Thị Hẹp	Deputy Chairwoman of Comm ne W omen's Union	1698345869		X
Hồ Văn T ấn	ea of amlet Đ t 1	976124171	X	
Hồ Văn X ôi	Secretary of Youth Union	1648854466	X	
Hồ Văn Cốc	Official of land administration - environment	913180400	X	
Interview with farmers				
Lê Văn Diên	Hong Kim commune	977714250	X	
Lê Thị Hảo	Hong Kim commune	1292277381		X
Hồ Văn Q ý	Hong Kim commune	1214544508	X	
Hồ Cu Hoa	Hong Kim commune	949435582	X	
Hồ Văn h ớ	Hong Kim commune	1683029804	X	
Hồ Văn Dinh	Hong Kim commune	1685357361	X	
Hồ Văn Chang	Hong Kim commune	1658563610	X	
Hồ Thị Mon	Hong Kim commune	1629331925		X
Hồ Thị Huế	Hong Kim commune	1658532998		X
Hồ Thị Ngơm	Hong Kim commune	1292228120		X

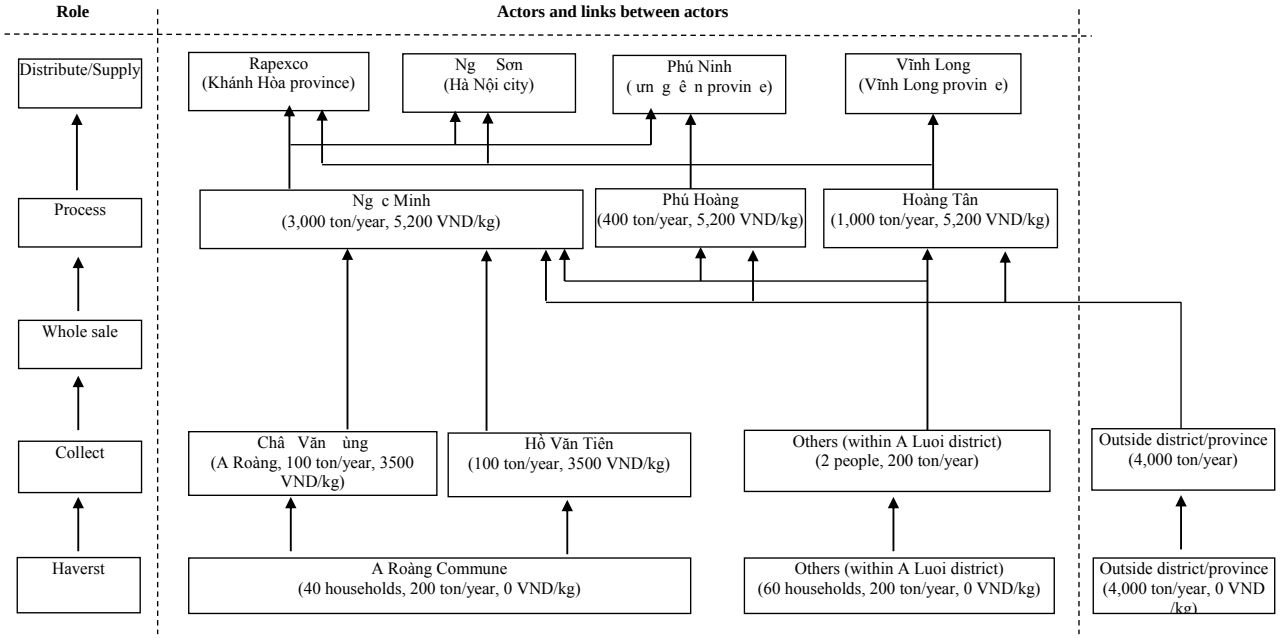
Interview with business sectors				
Hồ Văn Tiến	Hong Kim commune	961553312	X	
Hồ Văn Giang	Hong Kim commune	1296884480	X	
Hồ Văn h iên	Hong Kim commune	1678171801	X	
Hồ Thị Lành	Hong Kim commune	1658021134		X
Hồ Văn g oai	Hong Kim commune		X	
Hồ Thị Vế	Hong Kim commune	1663793206		X
Đặng Vân	Hong Kim commune	1652574260	X	
Lê Văn ồng	Hong Kim commune	1633536365	X	
Lê Thị Vi Na	Hong Kim commune	962845291		X
II.2.5. A Roang commune				
Interview with government officials				
Pê Kê Thị Kans	A Roang commune			X
Nguyễn Thị Hích	A Roang commune			X
Hồ Thị Hân	A Roang commune			X
A Viết Sơn	A Roang commune		X	
Hồ Văn h am	A Roang commune		X	
Lê Thí Sái	A Roang commune			X
Hồ Văn h àn	A Roang commune		X	
Interview with farmers				
Trần Viết ăng	A Roang commune		x	
Hồ A Lua	A Roang commune		X	
Pi Lúc Từng	A Roang commune		X	
A Viết Hồ	A Roang commune		X	
Viên Văn Tới	A Roang commune		X	
B Lúp Thị Non	A Roang commune			X
Nguyễn Piu Cheng	A Roang commune		X	
B Lúp Dương	A Roang commune		X	
Nguyễn Văn Khâ	A Roang commune		X	
Hồ Văn ở	A Roang commune		X	
Interview with business sectors				
Pi Lúc Nhắc	A Roang commune		X	
Hồ Văn Plo s	A Roang commune		X	
Trần Viết ăng	A Roang commune		X	
Ngô Triều	A Roang commune		X	
A Viết Thị Nhi	A Roang commune			X
Hồ Văn A Cước	A Roang commune		X	
Viên Đăng Minh	A Roang commune		X	
Châ Văn ùng	A Roang commune		X	
Interview with forest-dependent people				
Pi Lúc Nhắc	A Roang commune		X	
TOTAL			244	123

ANNEX 10 DIAGRAM OF MARKET-VALUE CHAIN

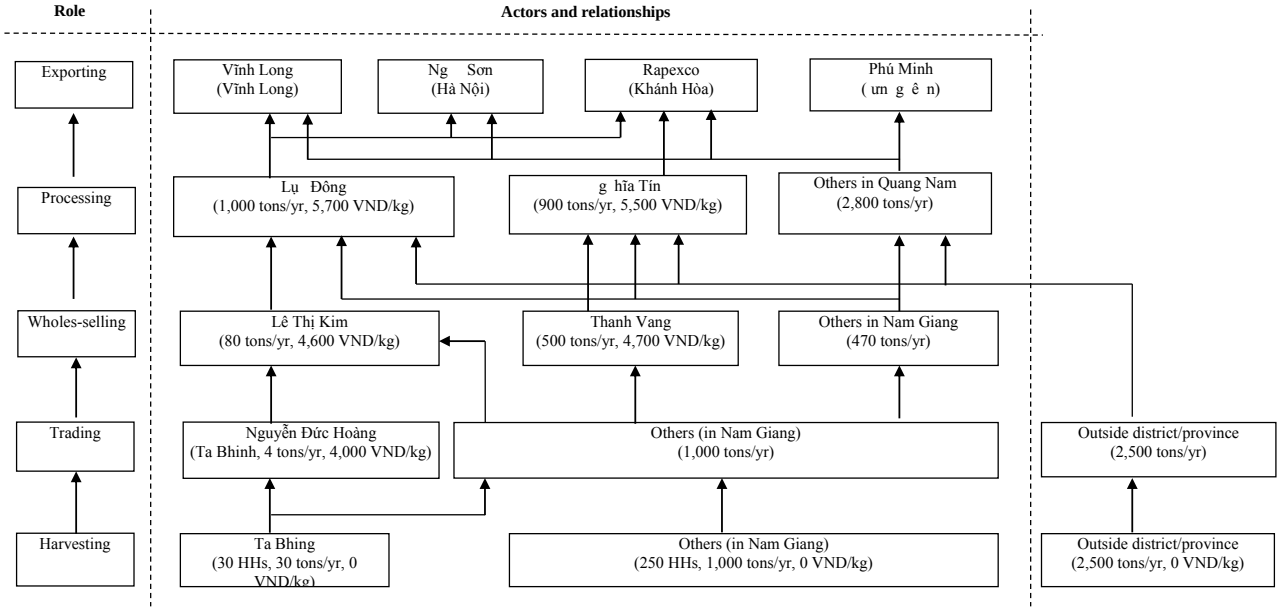
10.1 *Codonopsis* market-value chain (Nam Tra My district, QN)



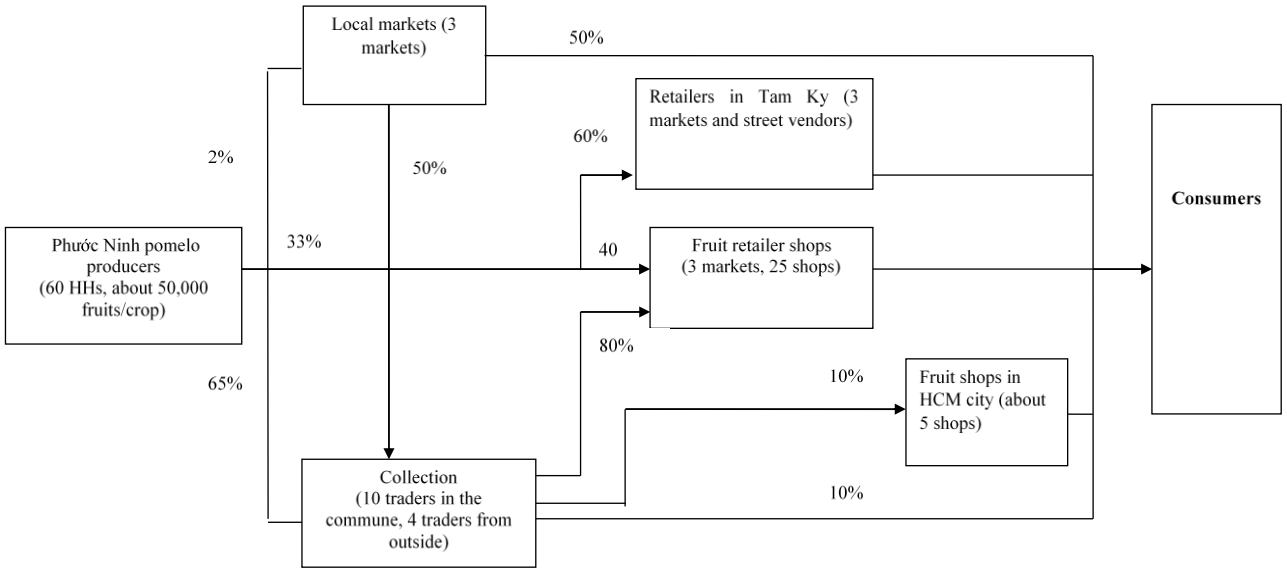
10.2 Raw rattan market-value chain (A Loui district, TTH)



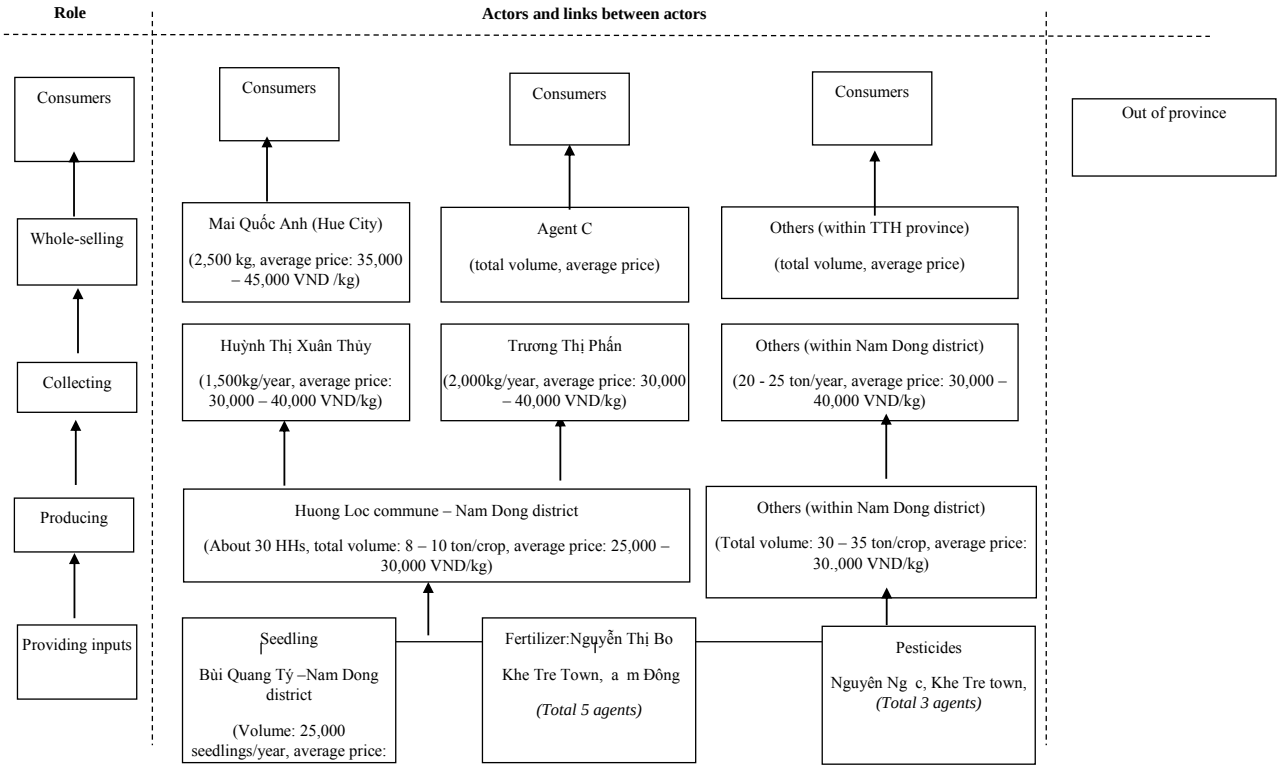
10.3 Raw rattan market-value chain (Nam Giang district, QN)



10.4 Tru pomelo market-value chain (Phuoc Ninh commune, QN)



10.5 Orange market-value chain (Nam Dong district, TTH)



ANNEX 11 COST COMPONENT FOR ECONOMIC ANALYSIS

11.1 Medicinal plant (*Homalomena*)

	Unit	Amount	Price	Total price
I,Fundamental cost				82,150,000
1. Labour cost				*15,600,000*
Land preparation	labour	15	200,000	3,000,000
Digging	labour	50	180,000	9,000,000
Filling	labour	20	180,000	3,600,000
2. Seedling and fertilizer				*66,550,000*
Acanthopanax	tree	7,150	7,000	50,050,000
Transport the seedling	time	1	4,000,000	4,000,000
Microorganic	kg	2,100	5,000	10,500,000
Transport the fertilizer	time	1	2,000,000	2,000,000
II. Maintenance cost				38,500,000
1. The first year				*27,440,000*
Beating up	labour	6	180,000	1,080,000
Planting new trees	labour	85	180,000	15,300,000
1st Weeding	labour	9.5	180,000	1,710,000
2nd Weeding	labour	9.5	180,000	1,710,000
Hilling,fertilize	labour	33	180,000	5,940,000
Management	labour	8.5	200,000	1,700,000
2. The second year				*11,060,000*
1st Weeding	labour	9.5	180,000	1,710,000
2nd Weeding	labour	9.5	180,000	1,710,000
Hilling,fertilize	labour	33	180,000	5,940,000
Management	labour	8.5	200,000	1,700,000
II. Cost for harvest				
3. The third year				*14,000,000*
- Harvest,package	labour	50	200,000	10,000,000
- Transportation	time			4,000,000
Cost for establishment				82,150,000
Total cost for the first year				27,440,000
Total cost for the second year				11,060,000
Total cost for the third year				14,000,000
Total cost for 1ha				134,650,000

11.2 Rattan planting

	Unit	Amount	Price	Total price
I.Fundamental cost				33,080,000
1. Labour cost				12,380,000
Land preparation	labour	25	200,000	5,000,000
Digging	labour	30	180,000	5,400,000
Filling	labour	11	180,000	1,980,000
2. Seedling and fertilizer				20,700,000
Acacia	tree	1600	4,000	6,400,000
Transport the seedling	time	1	4,000,000	4,000,000
N - P - K fertilizer	kg	450	14,000	6,300,000
Transport the fertilizer	time	2	2,000,000	4,000,000
II. Maintenance cost				34,890,000
1. The first year				17,270,000
Beating up	labour	1.5	180,000	270,000
Planting new trees	labour	21	180,000	3,780,000
1st Clean up natural vegetation and take care	labour	17	180,000	3,060,000
1st Weeding	labour	18	180,000	3,240,000
2nd Clean up natural vegetation and take care	labour	11	180,000	1,980,000
2nd Weeding	labour	18	180,000	3,240,000
Management	labour	8.5	200,000	1,700,000
2. The second year				10,160,000
Transportation and fertilize	labour	11	180,000	1,980,000
1st Clean up natural vegetation and take care	labour	18	180,000	3,240,000
1st Weeding	labour	18	180,000	3,240,000
2nd Clean up natural vegetation and take care	labour	11	180,000	1,980,000
2nd Weeding	labour	18	180,000	3,240,000
Management	labour	8.5	200,000	1,700,000
3. The third year				7,460,000
1st Clean up natural vegetation and take care	labour	14	180,000	2,520,000
1st Weeding	labour	14	180,000	2,520,000
2nd Weeding	labour	18	180,000	3,240,000
Management	labour	8.5	200,000	1,700,000
II. Cost for harvest				
1. In the fifth year				21,000,000
- Harvest,package	labour	30	200,000	6,000,000
- Transportation				15,000,000
2. In the sixth year				42,000,000
- Harvest,package	labour	60	200,000	12,000,000
- Transportation				30,000,000
3. In the seventh year				42,000,000
- Harvest,package	labour	60	200,000	12,000,000
- Transportation				30,000,000
4. In the eighth year				42,000,000
- Harvest,package	labour	60	200,000	12,000,000

- Transportation				30,000,000
5. In the ninth year				42,000,000
- Harvest,package	labour	60	200,000	12,000,000
- Transportation				30,000,000
6. In the tenth year				42,000,000
- Harvest,package	labour	60	200,000	12,000,000
- Transportation				30,000,000
Total cost for the first year				17,270,000
Total cost for the second year				10,160,000
Total cost for the third year				7,460,000
Total cost for the fifth year				21,000,000
Total cost for the sixth year				42,000,000
Total cost for the seventh year				42,000,000
Total cost for the eighth year				42,000,000
Total cost for the ninth year				42,000,000
Total cost for the tenth year				42,000,000
Total cost for 1ha				298,970,000

11.3 Acacia plantation

	Unit	Amount	Price	Total price
I,Fundamental cost				44,600,000
1. Labour cost				14,900,000
Land preparation	labour	25	200,000	5,000,000
Digging	labour	40	180,000	7,200,000
Filling	labour	15	180,000	2,700,000
2. Seedling and fertilizer				29,700,000
Acacia	labour	2200	2,000	4,400,000
Transport the seedling	time	1	4,000,000	4,000,000
N - P - K fertilizer	kg	1200	14,000	16,800,000
Transport the fertilizer	time	3	1,500,000	4,500,000
II. Maintenance cost				34,800,000
1. The first year				15,080,000
Beating up	labour	2	180,000	360,000
Planting new trees	labour	21	180,000	3,780,000
1st Clean up natural vegetation and take care	labour	17	180,000	3,060,000
1st Weeding	labour	12	180,000	2,160,000
2nd Clean up natural vegetation and take care	labour	12	180,000	2,160,000
2nd Weeding	labour	12	180,000	2,160,000
Management	labour	7	200,000	1,400,000
2. The second year				12,290,000
1st Clean up natural vegetation and take care	labour	17	180,000	3,060,000
1st Weeding	labour	12	180,000	2,160,000
Transportation and fertilize	labour	7.5	180,000	1,350,000
2nd Clean up natural vegetation and take care	labour	12	180,000	2,160,000
2nd Weeding	labour	12	180,000	2,160,000
Management	labour	7	200,000	1,400,000

3. The third year				7,430,000
1st Clean up natural vegetation and take care	labour	14	180,000	2,520,000
1st Weeding	labour	12	180,000	2,160,000
Transportation and fertilize	labour	7.5	180,000	1,350,000
Management	labour	7	200,000	1,400,000
6. In the tenth year				77,000,000
- Harvest,package		175	200,000	35,000,000
- Transportation				42,000,000
III. Cost for intercroping				
Cost for establishment				44,600,000
Total cost for the first year				15,080,000
Total cost for the second year				12,290,000
Total cost for the third year				7,430,000
Total cost for the tenth year				77,000,000
Total cost for 1ha				156,400,000

11.4 Pomelo plantation

	Unit	Amount	Price	Total price
I,Fundamental cost				82,380,000
1. Labour cost				*7,430,000*
Land preparation	labour	25	200,000	5,000,000
Digging	labour	9	180,000	1,620,000
Filling	labour	4.5	180,000	810,000
2. Seedling and fertilizer				*74,950,000*
Pomelo	tree	550	55,000	30,250,000
Transport the seedling	time	1	2,000,000	2,000,000
Buy ferterlizer (4 years)				36,700,000
Urea	kg	*1,100*	*10,000*	*11,000,000*
Phosphate	kg	*2,000*	*4,000*	*8,000,000*
Kali Clorua	kg	*1,500*	*11,000*	*16,500,000*
Powdered lime	kg	*600*	*2,000*	*1,200,000*
Transport ferterlizer	time	4	*1,500,000*	6,000,000
II. Maintenance cost				17,570,000
1. The first year				*5,540,000*
Beating up	labour	1	180,000	180,000
Planting new trees	labour	10	180,000	1,800,000
1st Weeding	labour	5	180,000	900,000
2nd Weeding	labour	7	180,000	1,260,000
Management	labour	7	200,000	1,400,000
2. The second year				*4,010,000*
Transportation and ferterlize	labour	4.5	180,000	810,000
1st Weeding	labour	5	180,000	900,000
2nd Weeding	labour	5	180,000	900,000
Management	labour	7	200,000	1,400,000
3. The third year				*4,010,000*
Transportation and ferterlize	labour	4.5	180,000	810,000
1st Weeding	labour	5	180,000	900,000
2nd Weeding	labour	5	180,000	900,000
Management	labour	7	200,000	1,400,000
4. The fourth year				*4,010,000*
Transportation and ferterlize	labour	4.5	180,000	810,000
1st Weeding	labour	5	180,000	900,000
2nd Weeding	labour	5	180,000	900,000
Management	labour	7	200,000	1,400,000
II. Cost for harvest				
2. In the sixth year				21,000,000
- Harvest,package	labour	30	200,000	6,000,000
- Transportation	time			15,000,000
3. In the seventh year				28,000,000
- Harvest,package	labour	40	200,000	8,000,000
- Transportation	time			20,000,000
4. In the eighth year				34,600,000
- Harvest,package	labour	48	200,000	9,600,000
- Transportation	time			25,000,000
5. In the ninth year				34,600,000
- Harvest,package	labour	48	200,000	9,600,000

- Transportation	time			25,000,000
6. In the tenth year				34,600,000
- Harvest,package	labour	48	200,000	9,600,000
- Transportation	time			25,000,000
Cost for establishment				82,380,000
Total cost for the first year				5,540,000
Total cost for the second year				4,010,000
Total cost for the third year				4,010,000
Total cost for the fourth year				4,010,000
Total cost for the sixth year				21,000,000
Total cost for the seventh year				28,000,000
Total cost for the eighth year				34,600,000
Total cost for the ninth year				34,600,000
Total cost for the tenth year				34,600,000
Total cost for 1ha				252,750,000

11.5 Orange plantation

	Unit	Amount	Price	Total cost
I. Establishment cost				57,400,000
1. Labour cost				*13,200,000*
Land preparation	labour	25	200,000	5,000,000
Digging	labour	12	200,000	2,400,000
Fertilize, filling	labour	5	200,000	1,000,000
Planting tree	labour	8	200,000	1,600,000
Transport the seedling and fertilizer	labour	10	200,000	2,000,000
Spray chemicals	labour	6	200,000	1,200,000
2. Seedling and fertilizer				*44,200,000*
Orange Nam Dong	tree	500	40,000	20,000,000
Nitrate (0.2 kg/tree)	kg	100	12,000	1,200,000
Phosphate (1.0 kg/tree)	kg	500	5,000	2,500,000
Potassium fertilizer (0.2 kg/tree)	kg	100	15,000	1,500,000
Micro-organic (1.0 kg/tree)	kg	500	3,000	1,500,000
Farmyard manure (30 kg/tree)	ton	15	1,000,000	15,000,000
Powdered lime (0.5 kg/tree)	kg	250	2,000	500,000
Pesticide	tree	500	4,000	2,000,000
II. Maintenance cost				79,600,000
1. The first year				*14,200,000*
Beating up	tree	50	40,000	2,000,000
1st Weeding	labour	8	200,000	1,600,000
2nd Weeding	labour	4	200,000	800,000
NPK fertilizer	kg	500	10,000	5,000,000
Pesticide	tree	500	2,000	1,000,000
Pruning	labour	10	200,000	2,000,000
Take care of tree, hilling	labour	5	200,000	1,000,000
Preventing pests disease	labour	2	200,000	400,000
Transport the seedling and fertilizer	labour	2	200,000	400,000
2. The second year				*11,400,000*
1st Weeding	labour	6	200,000	1,200,000
2nd Weeding	labour	3	200,000	600,000
NPK fertilizer	kg	500	10,000	5,000,000
Pesticide	tree	500	2,000	1,000,000
Pruning	labour	10	200,000	2,000,000
Hilling	labour	5	200,000	1,000,000
Preventing pests disease	labour	2	200,000	400,000
Transport the seedling and fertilizer	labour	1	200,000	200,000
3. The third year				*8,900,000*
1st Weeding	labour	6	200,000	1,200,000
2nd Weeding	labour	3	200,000	600,000
NPK fertilizer	kg	250	10,000	2,500,000
Pesticide	tree	500	2,000	1,000,000
Pruning	labour	10	200,000	2,000,000
Hilling	labour	5	200,000	1,000,000
Preventing pests disease	labour	2	200,000	400,000
Transport the seedling and fertilizer	labour	1	200,000	200,000
4. The four year				*600,000*
1st Weeding	labour	6	200,000	1,200,000

2nd Weeding	labour	3	200,000	600,000
NPK fertilizer	kg	250	10,000	2,500,000
Pesticide	tree	500	2,000	1,000,000
Pruning	labour	10	200,000	2,000,000
Hilling	labour	5	200,000	1,000,000
Preventing pests disease	labour	2	200,000	400,000
Transport the seedling and fertilizer	labour	1	200,000	200,000
5. From the fifth year to nine year				*44,500,000*
1st Weeding	labour	30	200,000	6,000,000
2nd Weeding	labour	15	200,000	3,000,000
NPK fertilizer	kg	1,250	10,000	12,500,000
Pesticide	tree	2,500	2,000	5,000,000
Pruning	labour	50	200,000	10,000,000
Hilling	labour	25	200,000	5,000,000
Preventing pests disease	labour	10	200,000	2,000,000
Transport the seedling and fertilizer	labour	5	200,000	1,000,000
II. Cost of harvest				20,000,000
1. The first harvest (in the fifth year)				*1,600,000*
- Harvest, package	labour	4	200,000	800,000
- Transportation	labour	4	200,000	800,000
2. The second harvest (in the six year)				*2,400,000*
- Harvest, package	labour	6	200,000	1,200,000
- Transportation	labour	6	200,000	1,200,000
3. From the third to the six harvest (from the seven year to the ten year)				*16,000,000*
- Harvest,package	labour	40	200,000	8,000,000
- Transportation	labour	40	200,000	8,000,000