CHAPTER I: INTRODUCTION

1.1. Background of the Study

Nepal is very rich in biological diversity because of its geographical location in between Palearctic and oriental realms of the globe and its position at the cross-road of six floristic Regions of Asia. Consequently, FAO defines Non-Wood Forest Products *as all goods of biological origin as well as services from forest or any land under similar use, and exclude wood in all its forms.* There are more than 10,091 types of species in the country (NBS 2014). Of these, about 700 different types of species possess Medicinal and Aromatic (MAP) properties. These species are distributed in all the climatic zones of the country. So far 238 MAP species have been chemically analyzed for their medicinal properties (GoN,2004).Non-timber Forest Products (NTFPs) are very diverse in Nepal. The medicinal plants, one form of very important NTFPs, are contributing to a great extent to the local livelihood of rural people and to the national economy. Himalayan region of Nepal, also harbor's a variety of NTFPs but are less explored about their potentialities and their contribution to rural livelihood. It lays further emphasis on special consideration of herb production, processing and market management as the main source of employment opportunity in the mountain regions. For this purpose, there is a need to conduct field based study to understand how to manage the available economically valuable NTFPs species in a sustainable manner. Harvesting of NTFPs can have a positive or negative impact on the conservation of biodiversity (Bhattarai & Crouches, 1996). However, with the increase in population and associated poverty people are compelled to over harvesting resources for commercial purpose rather than their traditional use. NTFPs are being overused and degraded due to lack of local control over the resources, social and cultural traditions (Shrestha et al., 1998). Manang district is also a mountainous region which lies in Western Development Region of Nepal. This is a Trans - Himalayan district of Nepal with Chame as its district headquarter. According to the National Population and Housing Census 201l), Manang has a population of 6,538 of which 3,661 (55.99%) is male and 2,877 (44.1 %) is

Female. It covers an area of 2246 sq. km. It lies at 28 2º7' - 28 º54' N latitude and 83º 40' – 84 º34' E longitude. The elevation ranges from 1600m (Tal) to 8156 m (Mt. Manaslu). Altitudinal variation have resulted diverse climatic conditions. Amongst the recorded species of fauna, Manang harbors three species of bird and 17 mammal species listed in CITES. Five of the recorded mammal species are protected by the National Parks and Wildlife Conservation Act (1973), and 11 are included in different threat categories of the IUCN Red Data Book. Mammal species symbolic to ACA .are the snow leopard, musk deer, Tibetan Argali, Tibetan Wolf, whereas bird species symbolic of the area are golden eagle, demoiselle crane and various Pheasants (KMTNC 1997).This district is also rich in NTFPs used by the local people in different purposes, and various activities were to conserve and promote NTFPs as a means for the well-being of rural population. However, there was no any information about its impacts on people living in NTFPs growing areas of Nasong RM, and therefore, this study was conducted for general understanding on the socio economic perspective of NTFPs, its collection, use and trading, and their contribution to livelihood improvement of local peoples involved in NTFPs collection, use and trade.

1.2. Statement of the problem

The average income in Nepal is low but many more opportunities and options for income generation can be found in urban areas than in rural areas (United Nations, 2001). The mountain people of Nepal have to rely on more or less one crop per year, with production dependent on timely monsoon and other favorable climatic conditions. Irrigation facilities are also not adequately available in these areas due to difficult terrain. Thus, agricultural production is naturally low. So, wild edible plants are concerned during regular meals to cope with food deficit periods since many generations back. In Nepal, economically

valuable NTFPs species such as medicinal plants have begun to receive attention because of their potential to improve rural and mountainous livelihood and generate cash income (Edward and Bowen 1993 Olsen 1994; Pradhan and Mahajan 1994).In Manang district, agriculture is one of the main sources of livelihoods. However, agricultural Production cannot support to feed every member of household throughout the year. Wild edible Plants available near village settlements and in forests are also an alternative food source. NTFPs collection and trade has become an important source of livelihood in Manang. But it is facing arrange of problems, which are lack of access to roads and markets, lack of knowledge and skill of local collectors about sustainable harvesting of NTFPs, the role of local traders, and the declining availability of commercially valuable NTFPs species, and therefore, one of the main objectives of this study, apart from analyzing the current contribution of NTFPs to local livelihoods, was to analyze these problems and develop strategies for increasing the contribution of NTFPs on livelihoods of local people ,for conserving biodiversity, Human health care, income generating activities.

1.3 Rational of study

Poor households are usually involved in NTFP collection than wealthier households because of landlessness, absence of alternative income sources and low capital required in the NTFPs collection process [Browder 1992; Karki 1995; Thomas, 1996]. Geographic and economic marginalization often mutually reinforce this situation [Balkier and Brookfield, 1987].The mountain regions of Nepal are considered as the reservoir of diversified vegetation's, and NTFPs species which are found in these regions have a higher market demand than the NTFP species found in lowlands. However, people in the uplands, especially poor people, are often notable to take full advantage of economically valuable NTFPs species. The high incidence of poverty in Manang together with the contribute and

development of NTFPs for poverty alleviation was another reason for choosing Manang as the study area. NTFPs species, which are consumed as wild edible plants, are the key sources of supplementary foods during the food deficit periods in Manang. Wild edible plants are consumed with regular meals throughout the year but documentation of these plants species has not yet been done. A special case is NTFPs species which have medicinal properties. Many medicinal plants have high demand in Ayurveda [homeopathic] medicine as well as in pharmaceutical industry in Nepal, India and other countries. Medicinal plants can be traded and thus become secondary sources of income for many families [Bishop, 1990] if the problems of overuse and lack of access are taken into account. The main purpose of this study is, thus, to examine NTFPs species use– both of wild edible plants for daily consumption, and economically valuable medicinal plants which are traded for income generation with a view to sustainable collection, productions, and marketing mechanisms. The use of medicinal plants for household consumptions is outside the scope of this research.

1.4 Objective

General Objectives:

The general objective of the study was to assess the actual and potential contribution of NTFPs

Species to the livelihoods development of local people. The **specific objectives** were:

- To list out NTFP species in Nache CF.
- To find out the socio-economic contribution of NTFPs to livelihood of community people.
- To analyze the livelihood assets in research area.

1.5 Limitations

Livelihood activities are complex phenomenon which can differ from household to household within the same social Soup and/or community - even at individual level. They are further influenced by social, cultural and religious norms and values of different social groups. Moreover the research was conducted only in Nache CF of Manang district due to like topography, in-accessibility, and budget and time. So, the result may not provide accurate situation of the district as a whole. Most NTFPs were collected from high altitude areas. Local people advised not to go to the high altitude area because of altitude sickness, and difficult terrain. So, the collection sites of all NTFPs couldn't be visited and observations couldn't be made for more accurate information.

CHAPTER II: LITERATURE REVIEW

2.1 Environment of Manang

Manang district is situated in the north western corner of Nepal. The district, geographically, belongs to the Gandaki region, and administratively, to the Western Development Region [WDR] of Nepal. It stretches between 28º27' to 28º54' north latitude and 83º40' to 84º34' east longitude, and spans an area of 2,246 km2. The terrain of Manang is rugged with elevations ranging from 1,880 to 8163 masl (meters above sea level). As a result of the elevation differences, the district has three different types of climate: sub-tropical from 1000-2000 m and temperate above 2000 m. The annual rainfall is about 745.4 mm and temperature varies from5.65ºC to 17.11ºC. It borders with China to the North, Gorkha and Lamjung to the East, Lamjung and Kaski to the South, Mustang and Myagdi to the West (DDC, 20l3). Chame is the district headquarters of Manang district, which is situated at an elevation of 2,650 masl and located at latitude of 283º3'7'' N latitude and 84º14'27"8 E longitude. According to the Human Development Index (HDI) 2001, Manang ranked 15th district out of 75 districts of Nepal which scored 0.367 with compare to 0.402 of MWDR and 0.471 of Nepal [UNDP, 2004]. Human Development Index is measured on the basis of parameters such as life expectancy, literacy and standard of living, and score 1 is the highest in the index. Manang district is one of the wealthier districts in Nepal, with a per capita income of $504 to national average of $240 (ICIMOD, 2003).

Another study conducted by ICIMOD/CBS/SNV (2003) identified Manang as one of the richest

And developed district of Nepal. According to this study, it ranks 10th out of 75 districts in Nepal in the overall composite index (OCD that combines 29 different indicators of development performances such as poverty and deprivation, women's empowerment, etc. Manang is rich in biodiversity and water resources, and thus, provides invaluable ecosystem services to the lower hills and the Terai region. Because of variation in altitude and climatic conditions, different vegetation types can be noticed- from subtropical to temperate, xerophilous and alpine formations. Major wildlife habitats in the area are forests

are mixed temperate broadleaved, mixed conifer and deciduous broad-leaved, conifer and birch, subalpine scrublands and grasslands, dry alpine scrublands, alpine meadows and the Tibetan desert steppe. Tilicho Lake,situated at an altitude of 4919 m in Khangsar is the largest wetland of Manang. Gangapurna in Manang, Mringchho Lake in Pisang, Dona/ Manaslu (4700 m) and Ngyamcho Lake in Nache village, Ponkar and Himlung Lake in Bhimthang, Kecho Lake in Bhraka are other important wetlands from biodiversity, religious and tourism perspectives. Major rivers and streams of Manang are Marsyangdi, Dudh khola, Nar khola, Phoo khola Thorang khola Sabje khola, Mada khola and Dona khola (NTNC, 2008).

2.2 NTFP Policy in Nepal

2.2.1. Development Policies

2.2.1.1. Master Plan for the forestry sector (1988)

Recognizing the need for a comprehensive long-term plan to meet the basic needs of the people, master Plan for the Forestry Sector (MPFS) was prepared in 1988 which presents a comprehensive strategy for 21 years for management of forestry sector in Nepal. It has mainly four development imperatives: (a) Satisfaction of basic needs including medicinal herbs (b) Sustainable utilization of forest resources (c) People participation in decision making and benefit sharing, and (d) Socio-economic growth. Translating this policy into action, it has emphasized on increasing production of forest products including NTFPs through the promotion of agro-forestry, community and leasehold forestry and research in MAPS. Medicinal and aromatic plants and other non-timber forest products are among six primary programs formulated in the plan. (MPFS, 1988).

2.2.1.2. Tenth Five Year Plan (2003-2007)

The sole objective of the Tenth Plan is to achieve a remarkable and sustainable reduction in the poverty level in Nepal from 38% of the population at the beginning of the period to 30% by the end of the Tenth plan, and to further reduce the poverty ratio to 10% in about fifteen years' time. Taking the sustainable development of forest and watershed component into account, main objective of Tenth Plan is to support the national goal of poverty reduction through management of forest and watershed area and conservation of vegetation, medicinal plants, biodiversity as well as creating employment opportunities based on forest entrepreneurship by adopting people's participatory system.

Major policy statements related to MAPs / NTFPs in the tenth five plan are:

Plant Resources Research and Development shall be carried out keeping in view the development of non-timber forest Products

NGOs, CBOs and private sector shall be inspired for extensive development of Non-timber forest products.

NTFPs development program will be incorporated with community forestry, leasehold forestry and integrated soil and watershed conservation and management and will be implemented.

Forest Product certification shall be carried out for making forest product based business competitive.

For sustainable development of medicinal plants, long term planning will be prepared and national development program will be conducted.

National Medicinal Plants Development Committee will be formulated at central level for planning, implementation and co-ordination.

2.2.1.3. National Conservation Strategy:

The National Conservation Strategy highlighted the necessity to establish appropriate policies, regulation, and management approaches to ensure the sustainable extraction of medicinal plants. The NCS, prepared in 1987 in collaboration with IUCN, has been in the implementation phase since 1988.

The basic objectives of NCS are:

- To satisfy the basic material, spiritual and cultural needs of the Nepalese people,
- To ensure the sustainable use of land and renewable resources, to preserve biological diversity, and
- To maintain ecological and life support systems.

2.2.1.4. Nepal Environmental Policy and Action Plan (NEPAP)

NEPAP (1993) is one of the major HMG's environmental policies to manage efficiently and sustainably natural and physical resources including forest and rangeland resources. It recommended that forestry researchers that address the utilization of lesser-known forest species could include their use as a resource for NTFP. NEPAP II (1998) is the first policy document to recognize as a source of income in rural communities; it recommended that community owned land that is suitable for purposes other than forestry be utilized under community management for the production of NTFP resources.

It has three main components that includes:

1. Immediate follow-up to solve problems pertaining to collection, marketing and related concern.
2. Cultivation of MAP
3. Development of industries based on MAPs and other NTFPs.

2.2.1.5. National Biodiversity Strategy (NBS, 2002)

NBS states that Nepal has a wealth of non-timber forest products (NTFPs) because of its diverse ecosystems. The main components of NTFPs programmes, in accordance with NBS, include:

a. Immediate measures to solve problems regarding collection, marketing and related concerns
b. Cultivation of medicinal and aromatic plants and other selected NTFPs; and
c. Development of industries based on medicinal and aromatic plants and other NTFPs.

2.2.2. Regulatory Policy:

Prior to the Forest Act 1993, Collectors could harvest all medicinal and aromatic plants, except for Yarsagumba, from the areas north of the Mahabharata range without permit or license. The forest regulation of 1995, enforced in accordance with the Forest Act 1993, categorized a number of NTFPs requiring license for their collection.

Permit Regimes: Collection permits have to be obtained from the DFO for the collection of NTFPs from the government forests or in pastureland. Transport/export permits of unprocessed NTFPs have to be obtained from the DFO. The Department of plant resources issue exports permit for the processed products of those plant species that are banned to export in unprocessed form. The cottage industry department issues license to establish a micro-enterprise.

There is a ban on:

- Collection, use, sale, distribution and export of the following species:

1. Panchaule (*Dactylorhizahatagirea)*
2. Bark of Okhar (*Juglansregia*)

- Export to foreign countries and without processing in native country (Nepal) :

1. Jatamansi (*Nordostachys grandiflora*)
2. Sarpagandha (*Rawolfiaserpentina)*
3. Sugandhakokila (*Cinamomumgalucescens)*
4. Sugandhawala (*Valerianawallichii)*
5. Jhyau (*Parmeliaspps.)*
6. Silajit (*Organic exudate)*
7. Talispatra (*Abiesspectabilis)*
8. YarsaGumba (*Cordycepssinensis)*
9. Lauthsalla (*Taxusbaccata)*

2.2 Social groups and their livelihood in Manang

According to. Chamber and Conway, livelihood is 'livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. Livelihood is sustainable when it can cope with and recover from stresses and socks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.' DFID (1999) states that people's ability to escape from poverty is dependent upon their access to different assets which, however, needs to be investigated case by case within given time periods.

The intangible assets such as claim and access to natural resources, especially non-timber forest

Products (NTFPs) can be gained through social networking. Conservation and sustainable utilization of NTFP could be thought as a means of poverty alleviation as stated in the Tenth five-year Plan of Nepal (2002-2007 AD). In 2001, there were only 9587 people living in 1776 households. As Manang is the least populated district, depopulation was visible since 1970s as hundreds of Manangi left the district for better opportunities in trade and other professions. But after 1990, the prospect for business within the district (mainly tourism) increased and they returned to tap these opportunities (NTNC, 2008).

According to National Population and Housing Census (2011), Manang has a population of 6,538 of which 3,661 (55.99%) is male and 2,877 (44.01%) is female. People of Manang are generally known as Manangi, but are composed of diverse group of people. The Nyeshang and Nar-Phoo valleys are occupied by Buddhist people. The people of Nyeshang are called Manangi or Nyeshangba (Gurung) whereas the Nar and Phoo people are called *Narba* and *Phoobha* respectively, and both of them are Lamas. In Gyasumdo, two distinct clans inhabit-the Lamas (Gyasumdopa) and Gurungs, who are said to have migrated from Nyeshang. Ethnically, Gurung (including Ghale), is the dominant group in Manang. Besides this, there are other inhabitants such as Lama (immigrants from Tibet but settled

in Manang for two to three generations) and Bishwakarmas, but their numbers are insignificant. Of the total 1776 families in the district, 35 families are Dalits (mainly Damais and Kamrs) who are concentrated in Lower Manang. Culturally, the Manangi belong to the Tibetan sphere, and their language faces back from the Tibeto-Burman origin. In Lower Manang, which receives high rainfall, houses have sloping roofs, and are strongly built using stone and mud mortar. Frosty and long winter makes it difficult to grow crops all the year round. Availability of Cultivable land is also limited. Crops are grown only in one season in Upper Manang. Most of the lands in this area are used to grow vegetables.

Table 1: Population in different RMs of Manang district

RMs	Population	Percentage
Nasong	1,938	29.64%
Nesyang	2,222	33.98%
Chame	1,129	17.26%
Nar-Foo	538	0.08%
Institutional	711	0.10%
Total	**6,538**	**100**

2.3 Contribution of NTFPs to livelihood in Manang

Beer and McDermott (1989) defined NTFPs as "all biological materials other than timber, which are extracted from forests for human use" (Ahenkan and Boon, 2011). Many studies have documented various functions performed by NTFPs in supporting rural livelihoods

(Angelson et al., 2014; Babulo et al., 2009; Shackleton et al., 2007; Tewari, 2012; Wunder et al., 2014b).

Thus, NTFPs support the livelihoods of rural households broadly in five ways (Shackleton and Pandey,2014). NTFPs use and trade is a traditional phenomenon in Nepal and the rural poor in the hilly and mountainous regions have since time immemorial been involved in collection of NTFPs for sale and household use. Every year 10,000 to 15,000 tons of NTFPs are harvested and traded from the natural sites of the mid hills and high mountains of Nepal (Edwards, 1996).

Value added processing such as grading, extraction of oil, etc., gives more economic benefits and can be used as the semi raw material for final products. In addition, Nepal is one of the main suppliers of NTFPs species to India and many other international markets. About 10,000 to 15,000 tons of plant products from more 1997 than 100 species are exported into India as well as international markets (Bhattarai, 7).In this connection, only 20 NTFPs species which have high economic value and demand are exported (Bhattarai and Olsen, 2000).

NTFPs species are important source of income for subsistence livelihood at household level. In

Nepal, NTFPs are used in subsistence livelihood such as foods, spices, herbal medicine, tannins,

natural dye, gums, resins, incenses, oils, fibers and construction materials(Edward,1996).NTFP sare considered to be open resources and collected from the wild Bhattarai and Karki, 2004), thus very little capital is required collecting and extracting them from the forest.Generally, primary collectors of NTFPs species are from poor households and living in the isolated areas. Primary collectors are uneducated and have less access to market information regarding the demand and supply of the NTFPs species along with their market prices. Moreover, poverty and illiteracy further limit their bargaining power over the pricing of the NTFPs species with local traders and brokers

(Kanel, 1999). Hence, there are high chances of Over-exploitation of NTFPs species with local traders and brokers influencing farrners to collect more quantities for the increasing market demand (Edward 1994, 1996, 1996; Hertog 1995; Karki, 1996; Sharma, 1996).
Manang is also rich in different NTFPs species such as wild edible and medicinal plants. This can be taken as the opportunity for a betterment of livelihood. In Manang, people collect and consume wild edible plants to fulfill their day-to-day food demands as well as to meet thenutritional needs for good health. Shrestha and Sah (1995) recorded 40 species of plants used by (dalechuk), local people for medicinal purpose in Gyasumdo valley. Yarsagumba, salep (panchaunle),spikenard (jatamasi), silajit, jimbu, seabuckthorn gentian (kutki), satuwa, larkspur(nirmasi), sweet root (bojho), tikka, valerian (sugandhwal), Himalayan rhubarb (padamchal),ephedra (somalata), chirayato, tejpat, morel mushroom (guchchechyaun), timur,Himalayan yew (launth salla), wild asparagus (kurilo) are prominent medicinal herbs.

In Manang, the NTFPs species are collected to support everyday livelihood of local people as supplementary foods during food scarcity periods and to generate of additional household income during off-farm seasons.

2.4 Conceptualizing Rural Livelihood assets

Consistent with the livelihood strategy literature (Babulo et al., 2008; Kusters et al., 2005; Martinez, 2004; Van Gevelt, 2013) a sustainable livelihoods approach was used to in this study to understand the activities of rural households and the factors influencing households to engage in certain activities. The sustainable livelihood framework shows various elements that shape the livelihoods of households, the factors affecting them, and

the connections between these different factors (Babulo et al., 2008; DFID, 1999) (Figure 1). Thus, it focuses on the assets of the households, their capacity to weather shocks, and institutions and policies that reflect the priorities of households (Babulo et al., 2008). Therefore, the framework shows how sustainable livelihoods are attained based on the ability of households to access various types of capital (natural, social, physical, financial and human), which are put together in the undertaking of various livelihood activities (Martinez, 2004). One of the notable features of the livelihoods framework is that rather than focusing on the economic poverty line and what people lack, it focusses on assets; hence what households can achieve with the assets they have (Adato and Mainzen-Dick 2002).

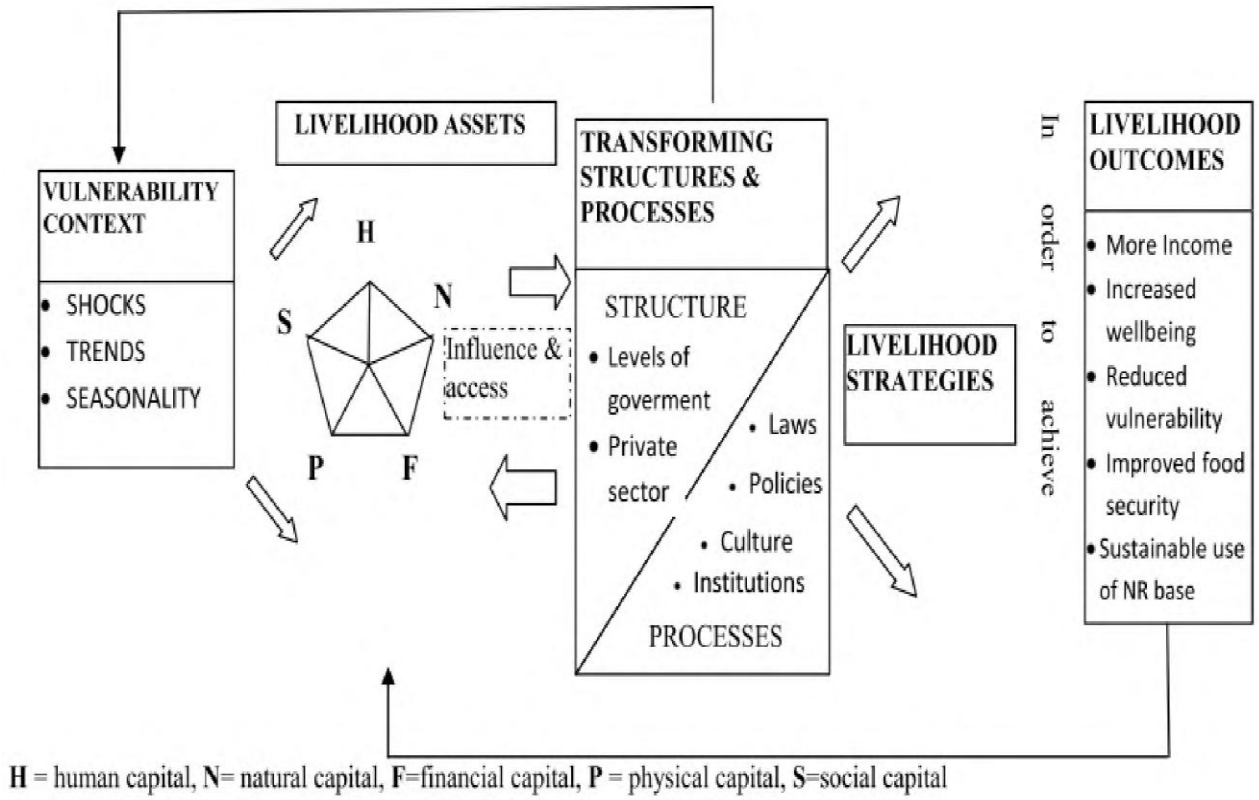


Figure 1: The sustainable livelihoods framework (Source: DFID, 1999)

CHAPTER III. METHODOLOGY

3.1. Description of the Study Area

Manang is located on the broad valley of the Marshyangdi River to the north of Annapurna mountain range. A study conducted by Himalayan Resources reveals that the total area of Manang is 2242sq.km, of which 0.02% (0.44sq.km) is fallow land; 0.48% (10.78sq.km) is agriculture; 67.78% (1919.6sq.km) is uncultivated land or rocks; 6.87% (154sq.km) is forest; 22.50% (504.43sq.km) is pasture; 0.17% (3.81sq.km) is water; and 2.18% (48.82sq.km) is shrub. It has a unique natural landscape, socio-cultural and religious features. It is rich in b.iodiversity and water resources, and thus, provides invaluable ecosystem services to the lower hills and the Terai region. Manang district has been divided into three broad ecological-cultural zones, viz: Nyeshang (Upper Manang), Nar-Phoo and Gyasumdo (Lower Manang) (NTNC 2008). It is extended up to Kaski and Lamjung in South, Myagdi and Mustang in West, Gorkha in East and Tibet in North. Manang District is the lowest populated district in Nepal.

Manang is one of the working districts of Annapurna Conservation Area Project (ACAP). ACAP was initiated as a form of integrated conservation and development programmed in 1986, and covers an area of 7629 sq. km that spans over five of the seventy five disfficts of Nepal. ACAP has been designed and managed by NTNC. Manang lies in the largest protected area of Nepal and covers 25% of the region called' Annapurna', located in west central Nepal, harboring some unique natural and cultural features, including 57 endemic species of flowering plants. Some of the world's highest peaks and deepest valley are located in this region (NTNC, 2008). ACAP is home to over 100,000 residents of different cultural and linguistic groups. ACAP is rich in biodiversity and is a treasure house for 1,226 species of flowering plants, 102 mammals, 474 birds, 39 reptiles and 72 amphibians. The

biological diversity of the Annapurna region is equally rivaled by cultural diversity. The natural and cultural features of ACA have made it the most popular trekking destination in the country, drawing more than 60 percent of the country's total trekkers (NTNC).
Manang consists of 4 RMs and each RM is the smallest administrative unit in Nepal. For the purposes of the study, Nasoong RMs of Nache CF were chosen.

Nache CF is located at 28.5ºN 84.52ºE with an altitude of 1850 meters (5550 ft.). According to household surveys 2015, it had a population of 250 people living in 60 individual households. The average annual temperature in Nache is 13.7 ºC. About 1574 mm of precipitation falls annually. Ethnically, Gurung (including Ghale), is the dominant group in Nache. Besides this, there are other inhabitants such as Lama (immigrants from Tibet but settled in Manang for two to three generations) and Bishwakannas, but their numbers are insignificant. Culturally, the Manangi belong to the Tibetan sphere, and their language traces back from the Tibeto-Burman origin. Nache CF still has very strong and effective traditional system of village governance, managing natural resources and main taining cultural and social fabrics.

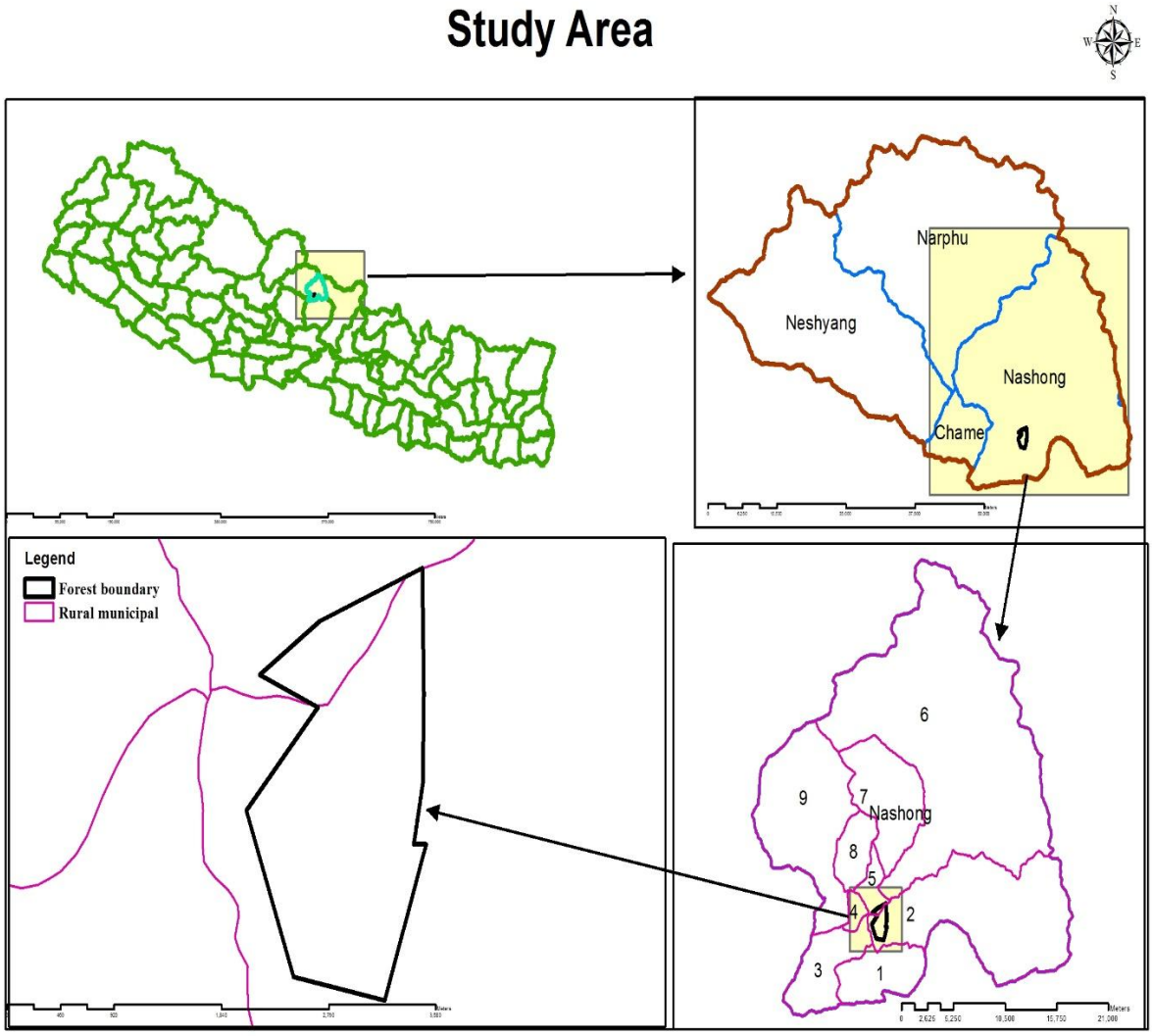


Figure 2 Map showing study area

3.2 Selection criteria

To meet the objective of the study some criteria for the selection of the study villages were developed, these included:

- Availability of employment opportunity in the area, if there is an availability of daily wage then people may go for it instead of NTFP collection.

- Usage of NTFPs in their daily lives such as food, fuel, fodder and medicines etc.
- Involvement of both men and women in NTFP collection, its use and marketing.
- Availably of NTFPS.
- Accessibility of study areas for observation and information documentation.

3.3 Study Methods and Framework

Study methods presented in figure 2 and conceptual frame work was given in figure 3, which showed four different livelihood activities found in the study areas that were agriculture, trading, tourism and employment. True to the focus of this study on NTFPs, only social networks facilitating the collecting and trading of NTFPs will be under closer scrutiny. To cope with livelihood constraints, people in the studied areas, supplement agriculture with other activities such as collecting wild edible plants, trading timber, NTFPs, running homestay and lodges and employment in Government. Organizations (GOs) and Non-Government Organizations (NGOs.

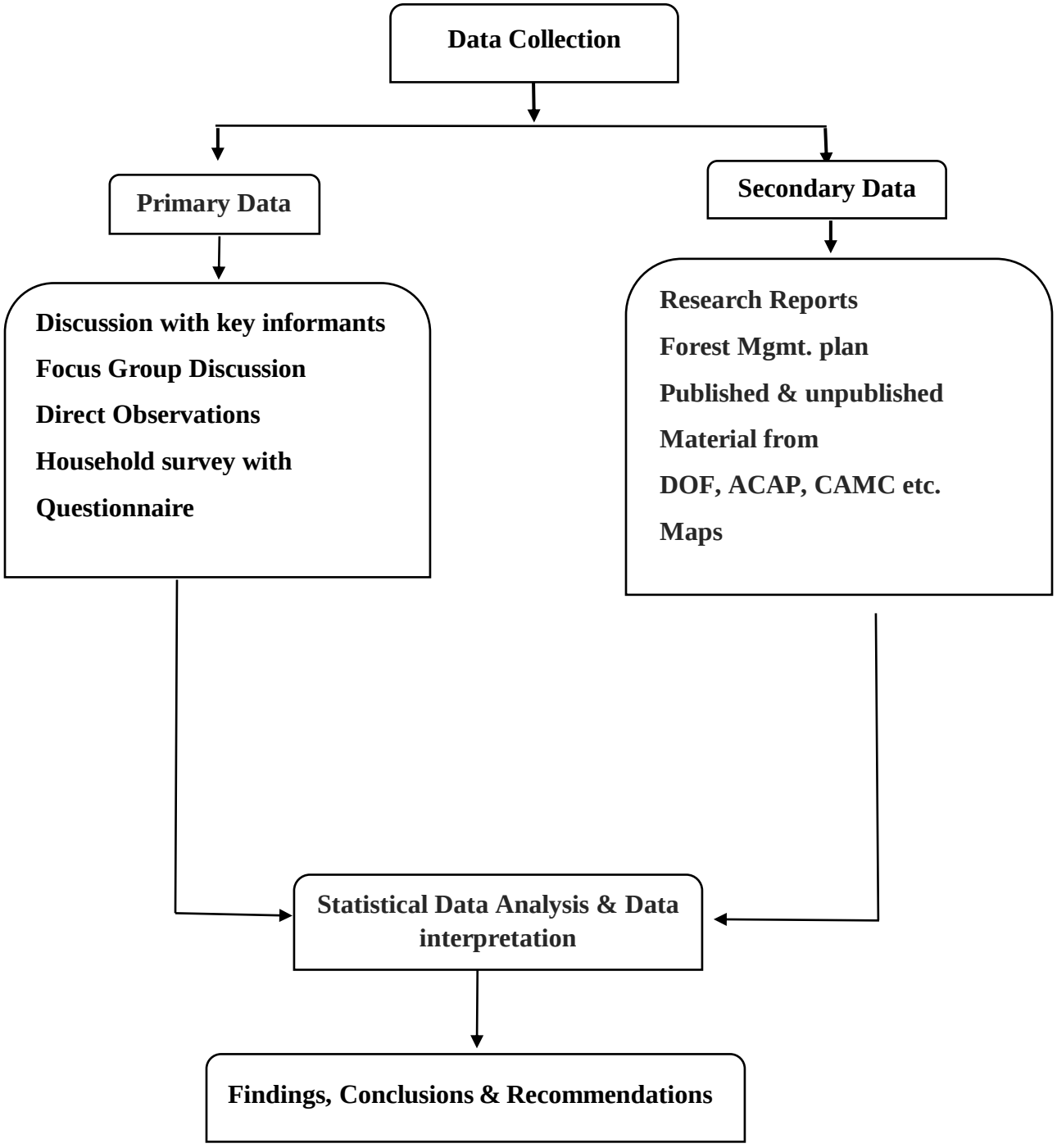

Data Collection
Primary Data
Secondary Data
Discussion with key informants
Focus Group Discussion
Direct Observations
Household survey with
Questionnaire
Research Reports
Forest Mgmt. plan
Published & unpublished
Material from
DOF, ACAP, CAMC etc.
Maps
Statistical Data Analysis & Data interpretation
Findings, Conclusions & Recommendations

Figure 3: Flow chart of Study Methods

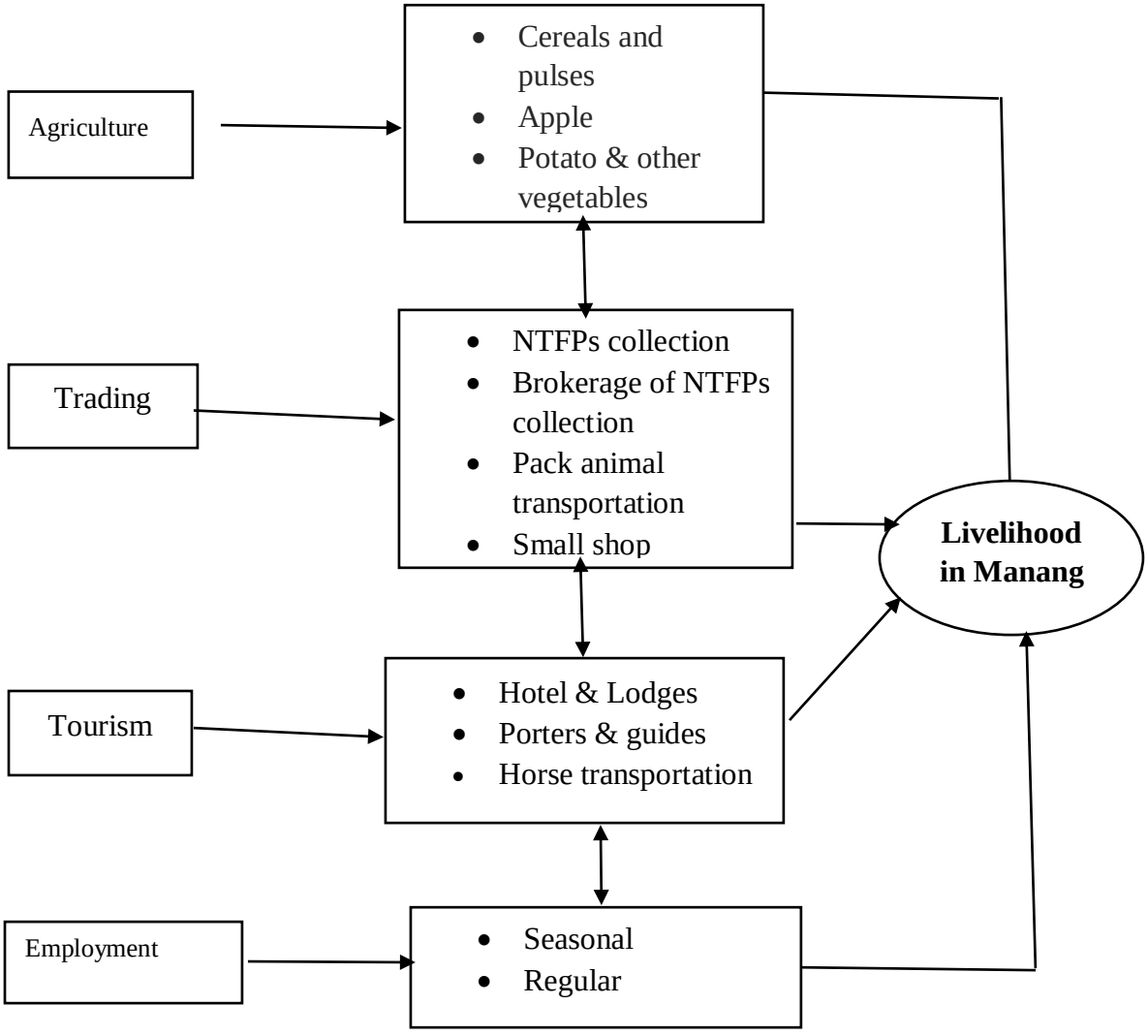


Figure 4: Conceptual framework of the study

3.4 Data Collection

Both primary and secondary data were collected. Primary data was collected from the study sites while secondary data was collected from published and unpublished documents regarding NTFPs, its collection, uses and marketing. Both primary and secondary data were collected using Participatory Rural Appraisal (PRA) tools and techniques discussed in following section.

3.4.1 Primary Data Collection

Primary data were collected from the field using different Participatory Rural Appraisal (PRA) tools and techniques, which are semi-structure interviews or questionnaire survey, key informants and focus or interest group discussion, semi-structure transect walk or direct observation, and cross-checking of information etc.
Following information was collected from the primary sources:

- Listing of all NTFP species that were being collected in CF done.

- Contribution of NTFP collection and exportation, and trade to local livelihood were estimated.

Following PRA tools and techniques for primary data collection will be used based of the study, which are discussed below:

i. Discussion with Key Informants

Open ended interview was carried out with the District Forest Officer of DFO, Manang;

Chairman of CAMC, Rangers and other staffs of DFO Manang and ACAP, CAMC executive committee members, teachers, and aged persons of the study areas, and experienced NTFP collectors and traders. The information about NTFP resources and their existing' condition, market price and market pattern of the NTFPs was obtained from the key informants. Discussions were carried out in an informal and friendly manner to motivate respondents.

ii. Focus Group Discussion

The focus group discussion was conducted to obtain qualitative information. In order to collect a variety of information and ideas regarding the identification of NTFPs and their collection methods and uses, FGD was organized with selected CFUG members, NTFP collectors and traders. Discussion focused on existing and potential NTFPs for the collection and trade and livelihood. During discussion participation of women, poor and Dalit's were also ensured. This social sincere tool helped to triangulate the information collected through semi-structured questionnaires. Checklist for this discussion is given in Annex 1.

iii. Household survey with Questionnaires

Primary data was collected through household survey by administrating semi-structured questionnaire in the sampled households involved in NTFPs collection, use and marketing. Samples were selected for household questionnaire survey from each of the villages. Selection was based on the discussion with the Forest users groups.

iv. Direct observation

The benefits' of NTFPs to different categories of the respondents were also be analyzed from direct observation. Direct observation was also made during the identification of NTFP species collected and traded from study sites. It was made around the research site for additional information and field verification of collected information.

v. Cross checking of information

Information collected from the field was also cross-checked adopting triangulation methods; in which confusing information was verified with several sources within CAMC, DFO and the ACAP.

3.4.2. Secondary Data Collection

Secondary data for this study were collected to supplement 'primary data and for some new information as well. The main source of secondary data was CAMC plan and other official records of CAMC, NTFP export list available in the District Forest Office of Manang, annual report of the DFO and ACAP, and related published and unpublished document's and literatures and journals. Research publications on NTFPs of Manang District were studied and reviewed from library of different academic and nonacademic organizations like: NTNC, IoF, TU, IUCN, and ICIMOD etc. Furthermore, essential information was also downloaded from related websites.

3.5 Data Analysis

The collected information has been compiled, processed and analyzed both in qualitative and quantitative ways Excel 2013 version have been used to analyze the data. The 3 point Likert scale was used to perception of the respondents. Information collected from the field survey, focus group discussion, and direct observations etc. will be compared and analyzed with descriptive methods. The data collected from different sources were processed, tabulated and analyzed qualitatively as well as quantitatively by using simple statistical tools making many discussions and taking suggestions with the advisor, and then the information were presented in the forms of tables, figure (Pie charts and diagrams), and descriptive texts in different sections.

CHAPTER IV: RESULTS AND DISCUSSION

4.1 Characteristics of Respondents

For this study, 2 sample households were selected for questionnaire survey from a selected villages Nache CF. the characteristics of respondents were categorized on the basis of age, education, religion, occupation and gender, which were discussed in following section:

4.1.1 Education

The education of respondent was categorized into four groups namely illiterate, primary education (class I to 7), secondary education (class 8 to 10) and higher education (above S.L.C). Among them 78% respondents were literate (Figure 5), and therefore it was very important to introduce any NTFPs development and management practice in a demonstrative way to have effective diffusion in study areas.

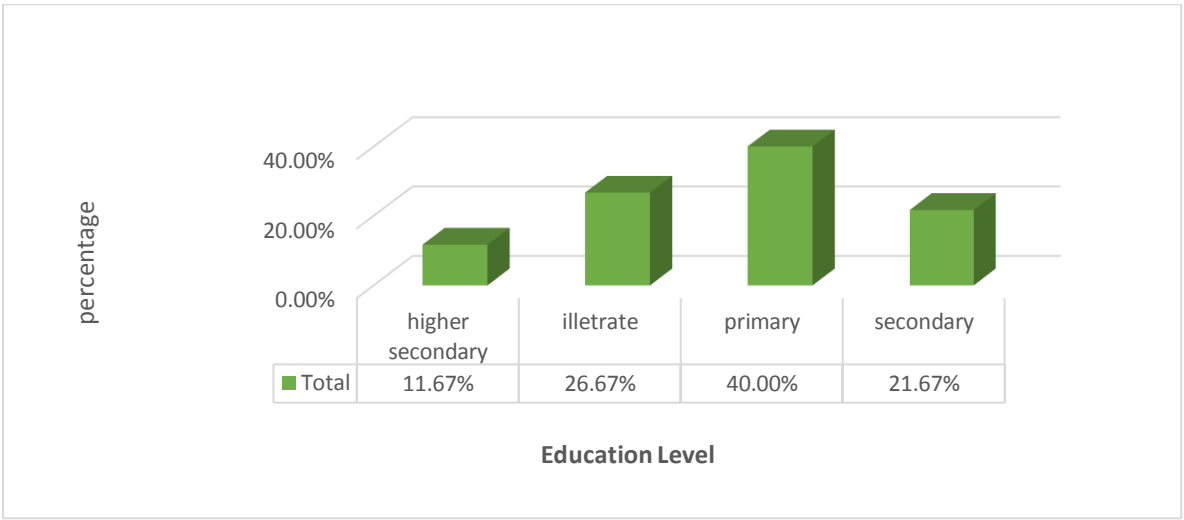


Figure 5: Education of the Respondents

This figure shows that only a small number of respondents (11.67%) involved 'in NTFPs collection, use and trade were illiterate, and further highlights that quite good number of people (40%) of primary education were also involved in NTFPs collection, use and trade.

4.1.2 Religion

Respondent's religion was categorized into three groups namely Hindu, Buddhist and Christian, and majority of peoples involved in NTFPs development, collection, use and trade in study areas were Buddhist followed by Hindu and Christian. This figure clearly indicates that NTFPs were equally important to all religions because it was linked day to day livelihoods even high number of Buddhist peoples live in Nache CF so usage NTFPs was going to high.

Figure 6: Religion of respondent

4.1.3 Occupation

The occupation of respondent was categorized into four groups namely agriculture, business, labor and service (government office, NGOs and other offices). Figure 7 shows that majority of peoples involved in NTFPs were from employment background, and only small portion were from business, livestock and they were mostly collectors.

Figure 7: Occupation of the Respondents

4.1.4 Gender

Women were also involved in NTFPs collection, use and trade in study areas (Figure 8), but they their involvement was very low (18%) compared with the involvement of men, which was 82%.

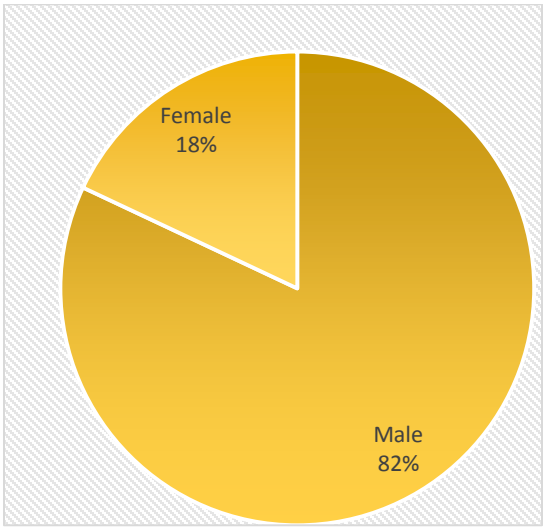


Figure 8: Gender of the Respondents

According to the women responds, NTFPs were playing important role in their lives because it had provided food and money for them. They further highlighted that this situation can be improved by promoting women empowerment programs such as training

and cross visits regarding NTFPs harvesting and marketing, and even domestication of some of the important NTFP species.

4.2 List of NTFPs

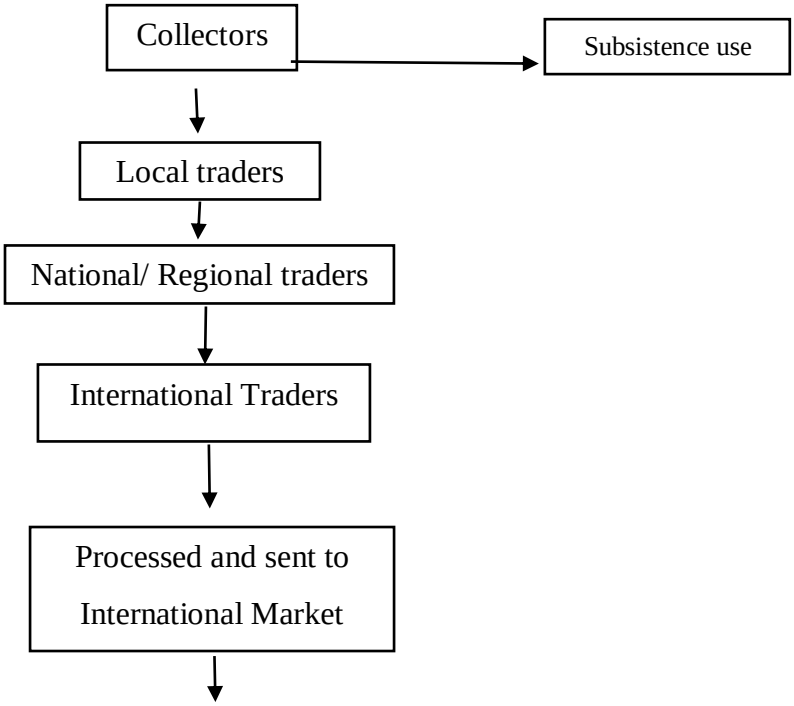
According the respondents, more than 30 NTFPs were found in the study areas. According to them, 15 species had been found important and tabulated (Table 2). This list of important NTFPs was developed from household survey, field visit and key informant survey as well as from focus group discussion, case study (plant identification).

Table 2: List of NTFPs found in study area

S.N.	Local Name	Scientific Name
1	Bikha	Aconitum bikha
2	Ban lasun	Allium wallichi
3	Bojho	Acoros calamus
4	Chiraito	Swertia chiraita
5	Guchhi chaayu	Morchella species
6	jatamasi	Nardostachys grandiflora
7	kutki	Piccorrhiza scrophulariflora
8	Lauth salla	Taxus baccata
9	Nigalo	Arundinare falcate
10	Okhar	Juglans regia
11	padamchal	Rheum austral
12	pakhanbed	Bergiana ciliate
13	satuwa	Paris pollyphyla
14	Timur	Zanthoxylum armatum
15	nirmashi	Delphinium dendatum

4.2 NTFPs Marketing

The potential market of NTFPs of study sites of Manang district mainly consists of countries like China, Hong Kong, Japan, Singapore, Taiwan, Malaysia, Thailand, India etc. The species collected were sometimes passed to China through Larke pass of Tilche VDC. Similarly, they were also passed to China through Thorong-la pass and Lo-manthang of Mustang. But NTFPs traded by both of these routes were done illegally without export license getting from the DFO, Manang. Comparatively little amount of the species collected was taken to Kathmandu and sometimes pokhara (about 25%). For this, they had to get a trading license (chodpurji) from the DFO office. Then, they export the NTFPs to the international markets. A flow of commodity from NTFPs collectors to local traders, and to national traders and then to international traders of the Tibetan side had been presented in figure 10



Consumers

Figure 9:The existing market channel of NTFPs in District

Marketing Problems

- Fluctuations in the demand of NTFPs in market, and lack of information about the actual price of NTFPs are the major problem faced by local collectors, and therefore, they were not getting the real price of their own product i.e. getting low price for the products.
- Market price depends on limited traders only. So the collectors were price takers rather than price maker. The number of wholesalers were few, and they controlled the price NTFPs.
- Lack of communication between the producers/collectors and exporters, and thus the brokers' secondary traders were getting relatively more benefits compared with collectors.
- Collectors were unknown about the sustainable production of NTFPs. In addition, they were unskilled and untrained in scientific methods for NTFPs harvesting, storage and marketing.
- Price fluctuation had occurred due to the lack of stable market and marketing.

4.3 Contribution of NTFPs

There was no hesitation for saying that study sites were good place of different NTFPs used for different purposes as household use and commercial use, and the stock really had the efficiency making a relevant contribution on the livelihood of local peoples. Local

peoples were using NTFPs for subsistence and for commercial purposes, which were discussed in following section.

4.4.1 Subsistence use

Wild edible food plants are used as common household food and make a substantial contribution to the subsistence livelihood of people of study Nashong valley of Manang district. Wild mushrooms and garlic were quite common and widely used in their daily diet. Similarly, juice made from seabuck thorn (*Hipphohphae spps*) was also consumed by the people. Timur and jimbu were also part of daily diet of many of the local people. Roots and inflorescence of sugandawal are used for essential oil. Similarly, tenders shoots of Kurilo (Asparagus racemose) are also cooked as vegetables. Agriculture production was not sufficient to support the household level food supply even for six months, and therefore, local people had to depend upon wild edible food which acts a supplementary food during the food deficit season. Similarly, there were many medicinal plants found in studied RMs of Manang district which were used by Amchii (traditional healers) to cure a wide range of diseases. Local people prefer traditional medicine over the modern ones, local people had knowledge about the medicinal values of the NTFPs and make use of it when they were ill or wounded. For example- Local people take half a spoonful of ground root powder of Nirmasi (*Aconitum orocltryseum*) is taken with a cup of hot water 2-3 times a day until recovery for fever, diarrhea, dysentery, cough and cold, tonsillitis, headache and high altitude sickness problems.

Similarly, they take half spoonful of root powder of Jatamasi (*Nardostachys grandiflora*) is taken with a cup of hot water two times a day after meal for gastritis, headache, anthelmintic, edema (swelling of the body), dyspepsia, and rib pain. And so on.

4.4.2 Commercial Use

Manang is a popular tourist destination as it is part of the Annapurna circuit. So, the richer households were involved in running hotels, restaurants, etc., and they were getting a good income from this. However, those who were belonging to the medium and poor households were mainly engaged in agriculture and often were depend on NTFPs as an alternative source of income.

Study sites of Manang district was rich in biodiversity, and can be considered as the best home to several valuable NTFPs. These NTFPs were important source of income to many people in the district. Selling of NTFPs species was a key livelihood opportunity found in the study area. Every year NTFPs were harvested in large quantity. Out of the total NTFPs collected, they only keep about 4-5%, of total collection at home for subsistence use and sell the rest. The local traders come to buy the NTFPs at individual house and the price was fixed by the traders. Overall, the people seemed satisfied with the existing marketing system. The three most traded species of study areas were Yarshagumba, Nirmashi, Satuwa and Ban lasun (Table 4).

Table 3: Selling price of the most traded species Last year (by collectors)

Species	**Selling price**
Satuwa	10000-12000/kg
Ban lasun	Dry(12000-15000)/kg
Nirmashi	4000-5000/kg
Yarshagumba	200-700 per piece

Among these, yarsagumba had the greatest contribution to the livelihood in study sites of Manang district due to its very high demand and high market value but it was also the

hardest to collect as it was present at high altitudes with difficult terrain. Based on report of ACA, about l79.2 kg of yarsgumba was exported legally from the district this year. The study revealed that men were more involved in the collection of NTFPs species than women (18%) because women - at the same time - had to look after both productive and social reproductive responsibilities at home.

The contribution of NTFPs on livelihoods of local peoples had been presented in following section:

Nashong valley

In Nashong valley; a lot of people are involved inNTFP collection. The mainNTFPs colletcted for sommercial use by locals in Dharapani are Satuwa, Ban Lasun, Jatamasi Nirmasi, Kutki and Guchi chyau. For yarsagumba collection, they have to go to the upper parts of Manang and mainly youths go for yarsagumba collection. In Nache village, almost all the lnen go for NTFP collection together during the season. The contribution of NTFPs to the household income was found to be 20.54%. The detailed figure of percentage income from different sources in Nashong valley based on the survey is given below.

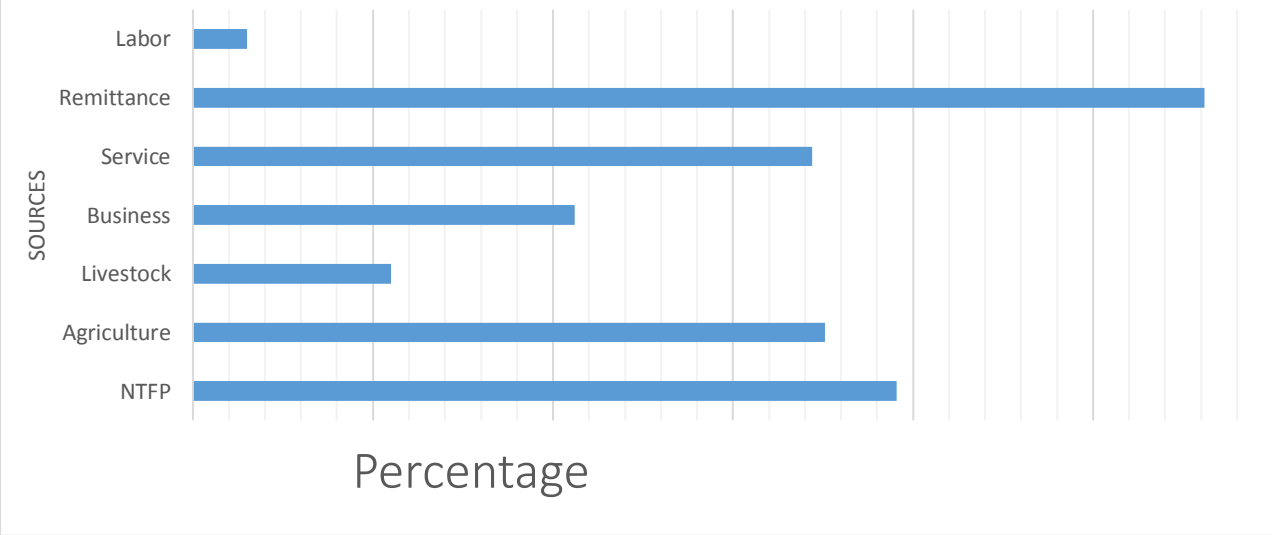


Figure 10:Percentage of income from different sources in Nashong valley

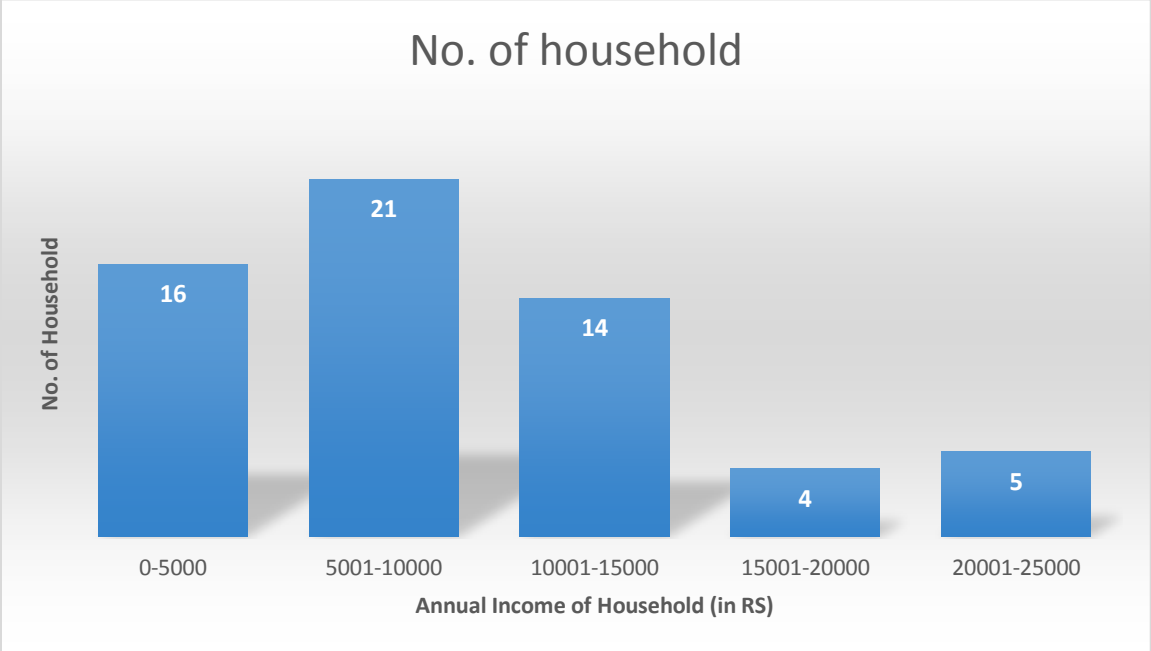


Figure 11: Annual income of Household from NTFPs Only.

Figure 12: Value of NTFPs of people meet in Daily Life

CHAPTER V: CONCLUSION AND RECOMMENDATIONS

The major NTFPs found in Manang district that were collected and traded by local people are Ban lasun, Satuwa and Yarsa gumba. Other NTFPs with potentiality for trade were panchaunle, jatamasi, silajit, jimbu, dalechuk, kutki, nirmasi, bojho, tikka, sugandhwal, padamchal, somalata,chirayato, tejpat, guchchechyaun, timur, launth salla, kurilo, etc. A majority of the NTFPs collectors were from poor class family and medium class accordingly, and collect for sale, household consumption and medicinal purposes. The study found that trading of NTFPs species was basically operated by two actors: primary

collectors and 'local brokers. Local brokers had more access to market information business and social networking so they usually try to reduce the price of NTFPs species to make more profit. Most of the NTFPs collected from the study sites were sold. So, the commercial usage of NTFPs was greater than the subsistence use. The case study NTFPs plant species are done through semi-structured reconnaissance survey.

- Out of the most important 30 NTFPs found in the CF 15 spps. The most economical three NTFPs includes Satuwa, Ban lasun and Nirmashi respectively.
- The total annual income of 60 households is Rs.5, 65,500 while average income is PRs. 9,425.
- Perception of Respondent through medium of Education status, local business, income and biodiversity scenery beauty & physical assets.
- The contribution of NTFPs is highest to the human health care (26%) and least to the physical assets (4%).
- The amount of NTFPs collected is highly by Female respondent and mainly income through satuwa, ban lasun & nirmashi. Value of NTFPs is neither good nor bad to meet in their daily life.
- The primary collectors and farmers in the study area are lacking technical and financial support, processing technology and promotion of NTFPs from the related institutions and organizations.

Table 4: The overall contribution of NTFPs

Livelihood Assets & Indicators	Mean of Weighted Mean	Final Mean

Natural ▪ Access over the Resources ▪ Biodiversity	0.68 1.00	0.84
Financial ▪ Average Annual Income	1.70	1.70
Physical ▪ Infrastructures Development	0.28	0.28
Human ▪ Awareness about the Policy, Rules & Regulation ▪ Human Health care ▪ Knowledge & Skill	0.28 1.00 0.45	1.73
Social ▪ Network & Connection with Stakeholders	1.71	1.71

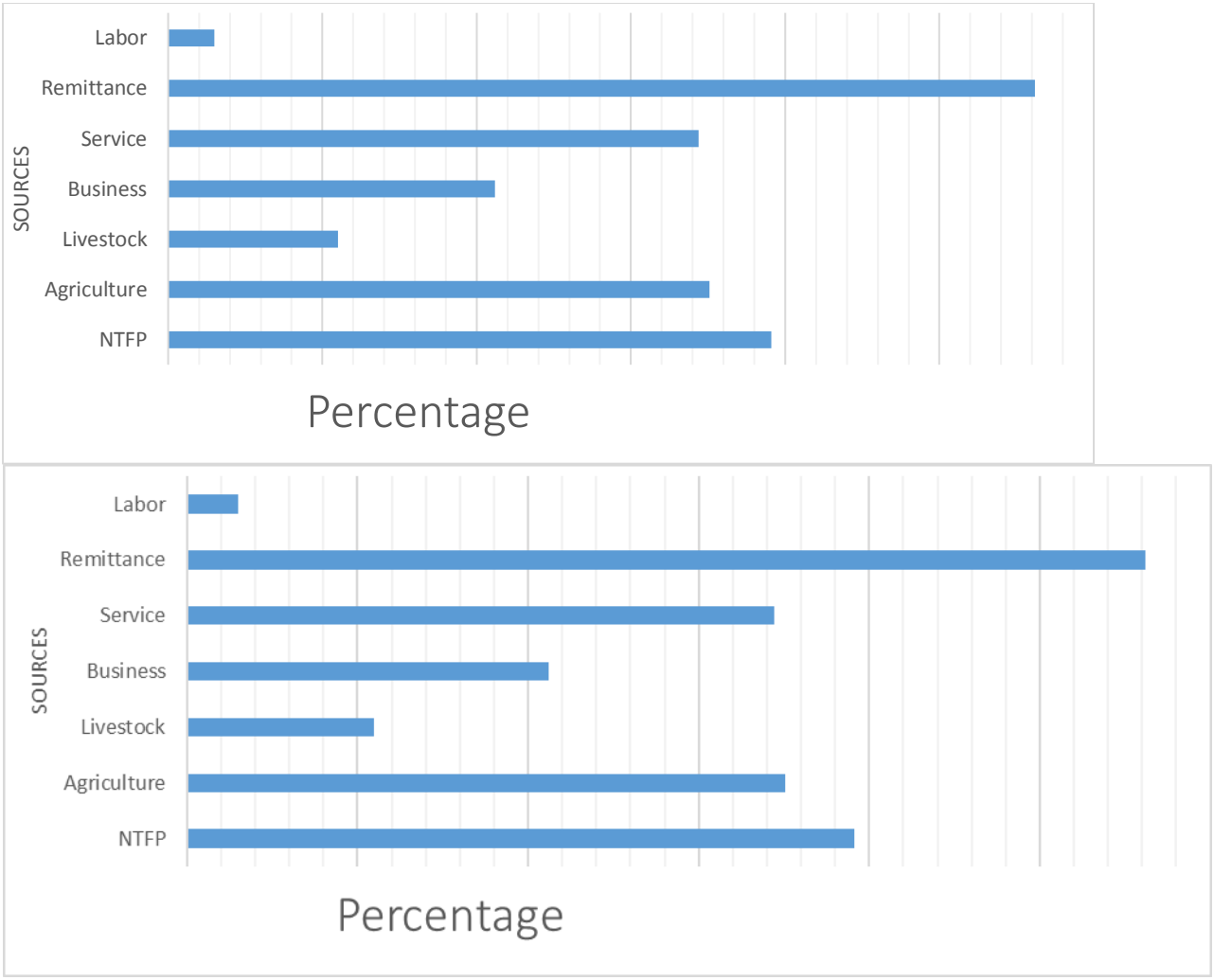


Figure 13: Overall Role of NTFPs

Maximum respondents depends upon NTFPs with regard to livelihood improvement. All primary collectors realized that there was less availability of NTFPs species in the forest since it had now taken more time to collect for the demanded species.

The major traded NTFPs of study areas were Nirmashi, Ban Lasun and Satuwa. In case of Yarshagumba, majority of the collectors come from outside the district especially from Gorkha and Lamjung districts during the collection season and its often young people who

go to collect them due to higher altitude and difficult terrain. It had the greatest contribution to the livelihood of people involved in this business. Based on the report of ACAP (2017), 339.l62 kg of Yarsagumba was traded from Manang district in 2013. There was ban on the trade of other NTFP species besides Yarsagumba, Ban lasun, Satuwa and Dhupi by ACAP. However, they were being traded illegally. Most of the collectors had not received any formal training on NTFPs and their collection, storage and marketing. They were also not aware about the existing policies on trade of NTFPs.

The overall contribution of NTFPs on livelihood of local peoples in studied CF was good with more (25%).However, the status of NTFPs was declining so there was an urgent need for stronger and clear policies and laws to address this issue. There were so many NTFPs with potentiality for livelihood improvement of local which were yet to be explored.

5.2 Recommendations

- The study had recommended that the cultivation of valuable NTFPs in community and private lands.
- Technical and financial assistance should be given to those farmers who want to cultivate NTFPs in their private land Trainings, seminars, workshops, etc. should be conducted regarding cultivation, harvesting, processing and marketing of NTFPs. Collectors need to' be trained in post harvesting techniques (drying, storage) to minimize wastage and unnecessary loss, so that they can get good price.

- Poor class people must be given high priority for NTFPs management rather than limited well off persons in the district; this will uplift the socioeconomic status of poor people.

- Village base cooperative would be better options to provide mutual benefits for both primary collectors and local brokers of NTFPs trading. Under the cooperative scheme, the village based cooperatives would collect economically valuable NTFPs species from every primary collector and store them in a warehouse. Later on, the cooperatives would fix the price of every NTFPs species on the basis of last year's price and the current year's market demand.
- Researches regarding growth pattern and growing stock of important species found in Manang district should be carried out.
- Policy change should be made for sustainable use and management of the NTFP resources.

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Appendix 1: GPS co-ordinate of CF Boundary

WP	Longitude=x	Latitude=y	Remarks
1	84.3799	28.5241	
2	84.3709	28.5209	
3	84.3656	28.5176	
4	84.3707	28.5156	
5	84.3644	28.5093	
6	84.3685	28.4991	
7	84.3765	28.4976	
8	84.3802	28.5072	
9	84.3791	28.5072	
10	84.3799	28.5109	
11	84.38	28.5164	

Appendix: 2 Questionnaire for household survey

The collected information is fully for the academic purpose and information provided by the respondent will not be disclosed for other purposes. Therefore we expect correct information as possible.

Name of CFUG:

Respondent's Name:

Age: Sex:

Caste:

Occupation: Wealth Ranking Category:

Educational status:

a. Illiterate b. literate c. higher education d. university education

Post in executive committee (If applicable):

A. 1. Household Information:

Sex	Age Group				Educational Status				
	<5	6-20	21-40	>40	Primary	Secondary	SLC	Higher degree	Remarks
Male									
Female									
Total									

2. Physical assets:

Assests	Own	In Lease	Remarks
House			
Land	Khet		Units is to be identified
	Bari		

Domestic animals			
	Cows/Ox		
	Goats		
	Horses		
	Yak/Jhopa		
Others	Others		

3. What are your existing sources of income?

a.Agriculture b. Salary based job c.daily wages d. business e. others……

4. How long have you been residing here??

1yr……..less than 5yr…….more than 5yr……..

5. How often do you go to the forest??

Once in a day……..Once in a week……..Once in a month……

6. What are the major dependencies upon the forest??

Wood……water……..leaves…….jadibuti…….all

7.Walking distance(minutes) Nearest forest where your family collects NTFPs……..

8 distance to nearest market for forest producrs (NTFPs) sell……

Section 2:NTFP collection and trade

1.Do your family collect any types of NTFPs from forest ??

YES NO

If YES

From which manangement regime

a.ACAP

b.Community forest

c.National forest

d.Other Specify……..

2. Do collection of NTFPs requires permission??

YES NO

Type of permission

i. Oral
ii. Written permission without any charge
iii. Written permission with specified charge
iv. Other specify……..

3. For what prpose your family collect NTFPs??

i.for HHs consumption(food,etc)

ii.For medicinal use

iii.for cash income

iv.other specify……..

4.If your family sell NTFPs what is average annual income through it(NRS)

RS……

5. In last year, how much NTFPs were collected, consumed and sold to market by your family??

SN	Name of NTFP	Use value*1	Rank*2	Importance	Purpose of collection	QTY. collected	Collected by whom*3

				High	Medium	Low			
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Use*1 may be for food medicinal, religious etc

Rank*2 perception within a use value different ntfp may have different rank may according resource availability, economic, food etc.

Collected by whom: husband,wife,son,daughter,other

6. If you more likely to local NTFP traders, contractors?

YES NO

If no….What is the main reason for choosing not to collect NTFPs??

i. Lack of knowledge
ii. Lack of available resources
iii. Not physically able
iv. Too risky, highly unstable
v. Not economically profitable
vi. Other specify……..

Section 3: Resources condition and market potential of the NTFPs (from last five years)

Sn.	Name of The NTFPs	Resource condition	Market potentiality

		Good /increasing	Moderate /same	Low /decreasing	High	Medium	Low

Section:4 Income structure of HHs in last year

Sn	Income source	Approximate Amount

Some Photo plates During Field visit

Focus Group Discussion

Timur Drying