

ETHNOBOTANICAL STUDY OF MUCHU VDC IN HUMLA DISTRICT

A Dissertation Submitted to

Khwopa College, Bhaktapur

For the Partial Fulfillment of Requirements for Master's Degree

**in Environment Science (Mountain Environment) according to the Curriculum of Tribhuvan
University**

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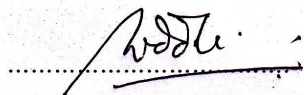
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March, 2012

LETTER OF RECOMMENDATION

The Thesis entitled with “ ETHNOBOTANICAL STUDY OF MUCHU VDC IN HUMLA DISTRICT ” has been prepared by Ms. Meena Prajapati under my guidance and supervision. I hearby recommend this thesis for examination by the research committee as a partial fullfillment of the requirement for the degree of M.Sc in Environmental Science.



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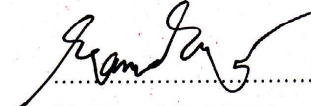
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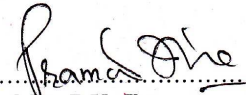
LETTER OF APPROVAL


This dissertation entitled "**Ethnobotanical Study of Muchu VCD in Humla District**" submitted by Ms. Meena Prajapati has been carried out under our supervision. The entire work is based on the results of his research work and has not been submitted for any other degree and organization to the best of our knowledge. We recommend this dissertation work to be accepted for the partial fulfillment of Master of Science degree in Environmental Science.


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ACKNOWLEDGEMENT

I would like to heartily acknowledge my respected supervisor, Prof. Dr. Siddhi Bir Karmacharya, Chairman of Research Committee, Department of Environmental Science, Khwopa College, Tribhuvan University, Dekocha, Bhaktapur for his support, and valuable guidance to carry out the research.

I extend my sincere thanks to Khwopa College for providing me the chance to conduct the dissertation. I would like to thank, my teacher Mr. Narayan Prasad Koju, Sailesh Ranjitkar and MSc. In charge Mr. Kamal Raj Gosai for their boosting guidance and ideas during my study.

I would like to acknowledge Mr. Chembal Lama Chairperson of Kailash Mansarovar Children of Humla and Mr. Bastian Etter Junior researcher of Eawag, Swiss Federal Institute of Aquatic Science and Technology for the co-operation, motivation and support during my field visit and guidance in my research work.

My special thanks go to Dr. Krishna Kumar Shrestha, Former Department head of Botany, Tribhuvan University, Kirtipur, Kathmandu and Yogendra Kayastha, Chairman of Humla Development Index, Simkot Humla for their co-operation and guidance during my research.

I am very much grateful to Amchi of Muchu village Amchi Mr. Jamyamphal Lama and Amchi Nawang Thinley of Sechen Clinic, Bouddha, Kathmandu. Likewise, I would like to heartily thanks to all the traditional healers and local people from upper Humla who shared all the information about their daily life. I will always remember their warm hospitality and support during my study. Especially to Chembal Lama, Lakpa Lama, Dakpa Lama, Wochak Lama, Sonam Lama, Lhamo Tsering and all his family members and Naki Lama as well.

I would like to thank my college friends Raju Jati, Medinee Prajapati, Gyanu Maskey, Chiranjivi Dulal, Anju Shrestha for their co-operation during my field and data analysis work. At last but not the least my everlasting gratitude goes to all the members of my family especially to my brother Prabin Prajapati for his continuous support and every time helping hands.

- Meena Prajapati

ABSTRACT

Humla is one of the remote mountainous districts situated in the northwest corner of Nepal bordering with China. The main objective of research is to assess the ethnobotanical study of Muchu VDC and to know the similarity of ethnobotanical and conservation knowledge of different age people. Research was carried out in 9 wards of Muchu VDC Humla.

Data collection with other required information was collected on June 2010. Semi structured questionnaire was conducted randomly in Muchu VDC. Likewise, the questionnaire survey was supplemented with the interviews, group discussions, different informal interaction, and direct field observation. The data of consensus analysis were analyzed through PAST software.

This study documented the traditional ethnobotanical knowledge of Lama Community of upper Humla. The study could identified and documented 148 species of plants, out of which 17% are cultivated in the fields, 72% are available in nearby forest and lekh and remaining 11 % are found both in wild and cultivated form. Among them maximum 71% of plants are herbs and least 1% of them are Creeper. In lama community there have a wide range of knowledge on the use of plants for various purposes here 69% plants are reported to be of single use, 23% with double use and 8% with triple use.

Especially old age people have very good knowledge of plant species and their uses. This is one of the best technologies in such remote area where there are no facilities of healthcare center. However, the consensus analysis shows no agreement of ethnobotanical and conservation knowledge of different age people.

It is possibly due to the attraction of new generation towards allopathic medicine, commercialization of medicinal herbs and influences of modernization cause the traditional ethnobotanical knowledge diminishing slowly. Therefore, the traditional ethnobotanical knowledge should be preserved, promoted and disseminated.

Keywords: Ethnobotanical knowledge, Medicinal plants, Traditional medicine, Humla, Consensus analysis

TABLE OF CONTENT

Cover Page	i
Recommendation letter	ii
Thesis Approval letter	iii
Acknowledgements	iv
Abstract	v
Table of Content	vi
List of Tables	ix
List of Figures	x
List of Map	xi
List of Photos	xi
List of Abbreviations	xii

CHAPTER ONE: INTRODUCTION

1.1. Background	1
1.2. Rational of study	3
1.3. Objectives	4
1.4. Limitation of study	5

CHAPTER TWO: LITERATURE REVIEW

2.1. Ethnobotany	6
2.2. Medicinal plant	7
2.3. Traditional medicinal practices	9
2.4. Ethnobotanical research in various area of Nepal	11

CHAPTER THREE: STUDY AREA

3.1. Site description	16
3.1.1. Ethnic and social background	17
3.2. Muchu VDC	19

CHAPTER FOUR: MATERIALS AND METHODS

4.1.1. Literature review	20
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4.2. Collection of different ethnobotanical information	20
4.2.1. Selection of site	20
4.2.2. Questionnaire survey	20
4.2.3. Group discussion	20
4.2.4. Interview	21
4.2.5. Direct observation	21
4.2.6. Plant identification	21
4.2.7. Calculation of Secondary information	21
4.2.8. Digital photography	22
4.3. Consensus analysis	22
4.4. Data collection and analysis	22
4.5. Problem of collecting information	23

CHAPTER FIVE: RESULTS AND DISCUSSION

5.1. Result and discussion	24
5.2. Result and discussion of consensus analysis	47

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion	49
6.2. Recommendation	50
REFERENCES	51

LIST OF APPENDIX:

Appendix A: Questionnaire	56
Appendix B: Ethnobotanically important plants used by local lama community of Muchu VDC Humla, Nepal	59
Appendix C: Ethnobotanical knowledge and conservation of plants	67
Appendix D: Festival Celebrated in Humla	68
Appendix E: Photos of field study and ethnobotanically important plants	70

LIST OF TABLES

3.1. Physical characteristics of Humla	16
3.2. Ethnic Composition	17
3.3. Languages Spoken in the District	18
3.4. Religion in the district	18
5.1. Plants used for various purpose	27
5.1.1. Plants used for firewood	27
5.1.2. Edible plants	27
5.1.3. Plants used for Timber	32
5.1.4. Plants used for dyeing purpose	32
5.1.5. Plants used to kill pest	33
5.1.6. Plants used in Ceremonies/religions	33
5.2. Other different uses of plants	34
5.3. Plants used for Medicine	38

LIST OF FIGURES

5.1. Habit of ethnobotanically important plants	24
5.2. Source of availability of ethnobotanically important plants	25
5.3. Plants part used for ethnobotanical purpose	25
5.4. Plants used for various purposes	26
5.4.1. Habit of plants used for various purposes	27
5.4.2. Source of availability of plants used for various purpose	34
5.5. Numbers of Plants with different used categories	36
5.6. Medication forms of medicinal plants	37
5.7. Plants part used for medicinal purposes	37
5.8. Agreement and disagreement of local people	47

LIST OF MAP

3.1. Map of Study Area	15
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LIST OF PHOTOS

1. Group discussion with local people in Yangara Village	70
2. Questionnaire with older people	70
3. Interview with local people	70
4. Herbs collection on the way to Yari	70
5. Myself with Amchi of Yari Mr. Jamyamphal Lama	70
6. Group discussion in Baltakshya lekh	70
7. Chuli (<i>Prunus armenia</i>)	71
8. Horsetail (<i>Equisetum diffusum</i>)	71
9. Kutki (<i>Picrorhiza scrophulaniflora</i>)	71
10. Padamchal on the way to Baltaskya lekh (<i>Rheum australe</i>)	71
11. Padampuskar (<i>Iris decora</i>)	71
12. Godamarcha (<i>Thymus linearis</i>)	71

ABBREVIATION

ANSAB - Asian Network for Sustainable Agriculture and Bio-resource
CEMP - Comprehensive Environmental Monitoring Plan
CITIES - Convention on International Trade in Endangered Species of Fauna and Flora
DOS - Department of Survey
DPR - Department of Plant resource
EPA - Ethnobotanical Participatory Appraisal
ERMC - Environment and Resource Management Consultant
ESON – Ethnobotanical Society of Nepal
ECOS - Ecological Society
FL - Fidelity level
HCDA - Humla Conservation and Development Association
HD - Head Nepal
HMG - His majesty Government
ICF - Informant Consensus Factor
IEE - Initial Environment Examination
KMCH - Kailash Mansarovar Children of Humla
MAP - Medicinal Aromatic Plants
Masl - Meter above Sea Level
MP - Medicinal Plant
MEDE – Macmillan English Dictionary of Environment
NBS - Nepal Biological Society
NIDS - Nepal Institute of Development Studies
PPT - Pro-Poor Tourism
SNV - Netherlands Development Organization
TMC - Traditional Medicine System
UNE - United Nation Environment Program
UV - Use Value
VDC - Village Development Committee
WHO - World Health Organization

CHAPTER I: INTRODUCTION

1.1. Background

Nepal is located at 26° 22' to 30° 27' N latitude and 80° 4' to 88° 12' E longitude occupying an area of 1,47,181 square kilo meter, where the altitude differs from 60 to 8848 m above the sea level and climatic zones ranging from tropical to alpine and shows a resultant biodiversity by 35 forest types, 75 vegetation types and 7000 vascular plants. Nepal consists of Mountain, Hills and Terai. Generally, the altitude increases from south towards north. Mount Everest (8848 m) as highest peak of the world and the lowest point is Kachanakalan (60m) of Jhapa district of Nepal.

Geographically, Nepal can be divided into 5 major regions. Terai, Siwalik, Mid-Mountain, High Mountain and High Himalaya. Tropical, Sub-tropical, Temperate, Sub-temperate and Alpine is the five ecological zones of Nepal. And administratively, the country is divided into five-development region - eastern, central, western, mid-western and far-western which include 14 zones, 75 districts, 58 municipalities and 3912 VDCs. (Aryal, 2009)

Nepal is rich in bio-diversity, ecosystem and cultural heritage because of well variations in physiographic structure and climate. The country is fascinated with more than 10,669 species of flora ranging from fungi to angiosperms and 9,437 species of fauna ranging from invertebrates to advanced vertebrates including mammals. (DPR, 2001)

The use of nature for the livelihood of human has a long history with the origin of the people. The indigenous people in different parts of the Nepal Himalayas have been utilizing medicinal plants in various ways since time immemorial. The medicinal plants are highly threatened due to over and unsustainable harvesting for trade, habitat destruction and encroachment.

Nowadays, people give more priority to NTFPs as it affect in national economy. Similarly, all small herbs can be used as major medicinal herbs. So, all the related institution must know the use and protect of the useful part, sustainable harvesting, preservation, storage and proper use of such resources especially the NTFPs collection and consumer must know about the NTFPs area and its amount so that he/she can manage a plan for sustainable harvesting and sell NTFPs. (ANSAB, 2003).

Nepal is a multiethnic, multilingual and multicultural country so it is rich not only in natural beauty but also in culture, language tradition etc. However, till now the detail survey of the ethnic group on Nepal has not been done. In Nepal more than 75 different languages are spoken and according to mother tongue statistics 61 different ethnic groups. The major ethnic groups of Nepal include Tharu, Tamang, Newar, Magars, Rai, Gurung, Limbu and Sherpa.

Among these ethnic people before few generations the use of wild plants was used to be essential parts of their life. On another hand, many plants serve them as the supplement of food, while on the other hand they were indispensable in the treatment of various diseases. Moreover, especially medicinal herbs are most important for trading product, treating various diseases and also play decisive role to play within material culture. At present the empirical knowledge accumulated by experiences and had down to generation is slowly dying out.

This may be due to increasing use of allopathic medicine, improvement of general economic situation, running toward different development activities. But numbers of years now, numerous attempts have been conducted in order to records and document the treasure of knowledge that still exists among different ethnic groups of people. And in recent years numerous lists of plants used for consumption, medication and narcotic stimulation as fodder, timber and fuel in rituals and for other various purposes. The intentions in one side are to preserve the traditional knowledge, plant as a part of cultural heritage on the other hand to drive it as commercial use too. (Aryal, 2009)

John W. Hershberger introduced the term Ethnobotany. Before many botanists including him mainly focus Ethnobotany as utilitarian and as organization of data followed scientific classification. However, with the adoption of the term by anthropologists also at the end of the last century, the focus changed to the native's point of view, and his rules and categories for ordering the Universe. Ethnobotany deals with the study of plant resources used by people of indigenous communities of an area. This is the study of the uses of plant and plant product as part of people of different culture. (MEDoE, 2002)

1.2. Rational of study

- The Himalayan region shows the highest richness for endemic species and medicinal herbs. The vast ethnic knowledge of tribal people is slowly attenuating. Documentation of the traditional knowledge of ethnic people is very insignificant in far western part of Nepal. There is need to develop a database related to traditional knowledge. So, it is very important to conserve the living resources the medicinal plants and the associates traditional knowledge as if one is lost then other is highly affected.
- Medicinal herbs are very suitable source for local people for treatment as allopathic treatment is not affordable for them.
- Due to change in lifestyle perception of dwellers as well as commercialization and socio-economic changes the indigenous knowledge on the resource use is being degraded severely. So, studies also help to aware the people and conserve the traditional knowledge and herbs.

1.3. Objectives

1.3.1. Main objectives

- To document ethnobotanically important plant of Muchu, VDC Humla

1.3.2. Specific objectives

- To explore and identify the medicinal plants in Muchu, VDC of Humla
- To document different ways of traditional use of such plants for various purposes
- To document and understand the local people perception on their biological resource and ethnobotanical knowledge
- To compare the similarity of ethnobotanical and conservation knowledge of different age people

1.4. Limitation of study

- This study was carried out for the Master's thesis to be submitted in Department of Environment science, Khwopa College, Dekocha, Bhaktapur, thus the detailed study was not possible during a very short period.
- The study basically depends on primary data collected from the indigenous Lama community of the study area, which may not be adequate technically or pharmacologically.
- The accuracy of data is based on the published documents and the first hand information obtain during field survery.

CHAPTER II: LITERATURE REVIEW

2.1. Ethnobotany

John W. Hershberger first introduced the term “Ethnobotany”. For him and most of other botanist only focus on Ethnobotany were of utilitarian nature and the organization of data with scientific classification. But, after the adoption of term by anthropologists, the focus changed to native’s point of view and his rules and categories for ordering the universe.

Ethnobotany reveals historical and present plant use to supply the wide variety of human needs. Ethnobotany is derived from two words where ethno means, “study of culture” and botany means, “study of plants” so we can say that it is the scientific study of the relationship that exist between people and plants. Simply, we can define Ethnobotany as the study of how people of a particular culture and region make of use of their indigenous plants. (MEDoE, 2002)

Ethnobotany is science that studies the relationship of a given society with its environment and with the world. It may be social, economic, ecological, symbolic, religious, commercial or artistic relationship (Aumeeruddy, *et al.* 2003). Today, Ethnobotany plays a crucial role in the study of traditional medicine as it helps in linking nature with culture as well as traditional knowledge with modern technology. So, we can say that as interdisciplinary science Ethnobotany plays a crucial role in preserve the wealth of indigenous knowledge. (Jha, *et al.* 2008)

It includes their knowledge on the utilization and maintenance of different types of plants resources on a long-term basis without damaging or destroying their habitats. So, all the medicinal plants and plants derived medicine are widely used in traditional cultures all over the world and they are becoming increasingly popular in modern society as natural alternatives to synthetic chemicals.

Documenting the indigenous knowledge is very important for conservation of species, sustainable uses of resources, and also it leads in discovering a crude drugs contributing to economic development of the country. Actually all the indigenous people living in

their traditional territory largely depends on the medicinal plants for their health care so they are rich in indigenous ethno botanical knowledge. (Kunwar, 2006)

In Encyclopedia of Ecology and Environment states that Ethnobotany is the studies among the tribal and rural people for recording, their own unique traditional knowledge about plant wealth and search of new resources of herbal drugs, edible plants and other different aspects of plants, including conservation. It can be studied in two different ways, (a) the cultural one that focus plants into cultural aspect of ethnic group and (b) the economic one, mainly focusing on commercial exploitation of plants.

Ethnobotanist is the one who explore how plants are used for such things as food shelter, clothing, medicine and religious ceremonies. So, its main aim is to document, describe and explain the relationship between the culture and uses of different plants mainly focusing on how these plants used, managed and also to aware about it or used it in our societies. For example, as food, as dyeing, as cosmetics, as medicine and many more in our social life. (Veilleus, *et al.* 1996)

Ethnobotanical participatory Appraisal (EPA) is a collective approach of Ethnobotany that guides and also evaluates the ethnobotanical study of an area. In EPA there is direct involvement of local tribal and rural people for the study. The tribal and rural people not only the primary informants but also take part in research design as well as research work. They help in data collection, data analysis and discussions of the findings, which will be benefited for the community. (Aryal, 2009)

The ethnobotanical information not only lists the traditional uses of plants but also help in ecologists, pharmacologists, taxonomists, watershed and wildlife managers in their efforts for improving the wealth of area. Ethnobotanical research addresses the characterizing traditional knowledge to establish priorities with the local community to ensure that the local values are translated into rational use of resources and effective conservation of biological diversity and cultural knowledge. (Ibrar, *et al.* 2007)

2.2 Medicinal plants

Medicinal and aromatic plants (MAP) have been considered as one of the major important (NTFPs) that is contributing to national economy. It is also the important

source of medicine for the local healers in village and also the raw materials for Ayurvedic, Tibetan and allopathic medicine as well. It has been estimated that approximately 80% of developing country depends on traditional medicine and also 85% of traditional medicine contain plants and their extract. In Nepal as well 70.86% mountain people depends on the traditional medicines for the healthcare. About 700 species constituting about 10% of total flowering plants of Nepal is listed as MAP found in Nepal. (Ghimire, *et al.* 1999)

The Himalayan region is the one of the largest reserves of medicinal herbs. It has large number of population traditionally engaged and help in conservation, cultivation and collection of medicinal plants. Normally, poor people earn their livelihood from medicinal plants in three ways - (i) by earning cash income through the sale of raw medicinal plants material (ii) satisfaction of household needs such as medicine (both human and animal) food, nutrient and minerals and (iii) as a component of biodiversity to maintain ecological integrity.

The use of medicinal plants recorded in “Rig-Veda” written between 4500 BC and 1600 BC is believed to be the oldest repository of human knowledge in Indian subcontinent. In Nepal, although such old documentation is still not rediscovered but the knowledge on plant utilization is believed to be very old. There are over 2000 species of plants with ethnobotanical importance out of which about 1,600 species of plants have been estimated to be used in traditional medicine and a majority of which waits from documentation. (Shrestha, *et al.* 2003)

With the increasing extraction of medicinal plants for commercial purposes, the degradation of these resources increasing. The communities of Humla have been harvesting a large number of medicinal herbs from government owned national forest and grasslands. Since these forest and grasslands were considered to be under the government property regime and not under the control of the communities there was more harvest.

So, the threats to these resources were linked to human activities such as uncontrolled harvesting (over harvesting, inappropriate timing and methods of harvest) over grazing,

burning, shifting cultivation and other activities cause deforestation and habitat loss. All these human activities were the result of several socioeconomic factors such as poverty, immediate cash needs of local people, lack of incentives for conservation, limited knowledge on conservation and increasing market demand for these products. (ANSAB, 1999)

Medicinal and aromatic plants in the mountains of Nepal can contribute to the local economy and subsistence health needs with conserving the ecosystem and biodiversity of an area. The indigenous knowledge and traditional skill of limited individuals on harvesting medicinal plants at a subsistence use level were not enough to apply to the harvesting of commercially demanded species. The same was true on production management, post harvest operations, processing and marketing. (Subedi, 1998)

Harvesting can be sustainable if the harvest has little or no long-term harmful effect on the population being extracted when compared to equivalent natural population not subjected to harvest. Baseline data about the size class structure and yield characteristics of the population must be collected, regeneration surveys must be conducted harvest levels must be periodically adjusted and in some cases remedial treatments such as enrichment planting or weeding must be initiated. Awareness creating, skill based training and capacity building are necessary pre-requisite for the conservation compatible management of medicinal plants. (Bhattari and Karki, 2006).

2.3. Traditional medicinal practices

Nepal is one of the major important sources of medicinal plants in South Asia. Every year more than 15-20 thousand tons of wild plants products of more than 100 species valued at 15-20 million us dollars collected and exported. In Nepal plants and plants products are the major primary source of medicine and highly valued resource in Nepal. In between 35,000 and 70,000 plants species have been used for medicinal purposes throughout the world and about 6500 species of which occur in Asia. In Nepal at least 1600 to 1900 species of plants are commonly used in Traditional medicine practices. (Bhattarai, *et al.* 2010)

The term Traditional Medicine (TM) refers to way of protecting and restoring health that existed before the arrival of modern allopathic medicine. As the term implies, these approaches to health belong to the traditions of each country, and have been handed down from generation to generation. The collection and trade of medicinal plants is an important source of revenue to the government and a major source of cash income to rural people. Traditional medicine in Nepal that is used by majority of population includes Ayurveda, traditional Chinese medicine, Unani and Tibetan Amchi medicine practices based on belief of hundreds to thousands of years ago before the development of modern medicine and which is still in practice in Nepal. (Koirala, 2005)

Traditional medicinal plants are the highly used resources in the study area. Most of the people depends on Amchi medicine, both it is culturally and socially very accepted, and also because modern biomedical services are virtually absent. The immediate users of the MPs in Phoksundo are medical practioners known as Amchi, who practice the codified Tibetan medical system. (Lama, *et al.* 2001).

From the beginning of the civilization people have been utilizing various lands and other for the treatment of their illness. More than 85 % population in underdeveloped country does not have access of modern health care service so they depend on traditional health care system in public health. So, in our country more than 80% people live in rural area and we have no sufficient hospitals and doctors for health services and also they have no access of modern health services. So, traditional medicine plays a vital role in public health.

But now the traditional knowledge on medicinal plants and their uses is slowly become less available due to over harvesting and also as, it is limited to oral tribal folklore. So, documentation of all these indigenous knowledge is very important which can also leads to a wider application of such plants in modern medicine. (Raj bhandary and Ranjitkar, 2006).

In Lama Communities in Muchu VDCs, traditional practices are still in common. Traditional healers, the Amchi are highly respected in Lama Communities. Usually they help the diseased person by providing herbal medicines with which they are familiar. But

nowadays, some of them also look forward medical system. Lama communities are not except to the present stream of modernizations. Thus, the traditional medicinal practice also seems to be disappearing even away in the Lamas

2.4. Ethnobotanical research in various area of Nepal

In the past decades several researches have been conducted in the field of Ethnobotany. Similarly, many books, booklets, journals, reports and bulletins have been published pertaining to Ethnobotany. Thus, a brief review of the literature on Ethnobotany was made to have good knowledge about subject matter. The review is focused on ethnobotanical knowledge of different ethnic groups. The summaries of outcomes of some of these studies have listed below:

In the ethnobotanical study of Sarmoli VDC Joshi, (2005) shows tribal methods of utilization of 73 different plant species belonging to 43 families under 62 genera. The healers of the area have also practiced treatment for epilepsy and cancer. Normally, the medicinal plants recorded have been used to treat different ailments like; anthelmintic, asthma, blood pressure, boils, bone fracture, cough, diarrhea, diabetes, dysentery, cancer, fever, gastritis, kidney stone, nose bleeding, skin disease, tongue boils, urinary problem, women disease and wounds. So, this village has a very good source of indigenous knowledge.

Any plant if it can be used for the treatment of any kind of human diseases then it is known as herbal medicine. In Nepal, it is known as “Jadibuti” the words itself is derived from two Sanskrit words “jadi” meaning roots and “buti” meaning doses (Gurung, R. and Karunaratnadayan, 2007).

The study conducted by (Manandhar, 2002 and Bhattarai, 1999) describe due to poor economy, lack of modern health facility, impressive development more than 80-90% of people of rural areas of Nepal depends on traditional medicine system for the primary health care. Even there is tremendous development in allopathic medicine plant still remain as one of the major sources of drug in modern as well as traditional system

through out the world. Different ethnic groups without Nepal use about 23% of flowering plants in Nepal for medicinal purpose

Shrestha, *et al.* (2003) explains despite gradual socio-cultural transformation, local communities still possess substantial knowledge of plants and their uses. The dependence on folk medicines for health care is associated with the lack of modern medicines and medication, poverty and the traditional belief of its effectiveness. With setting up management plans for their extraction, these medicinal resources can provide for both subsistence needs and income. This however, requires detail assessment of resource quantities, productivity potential, sustainable harvesting methods, domestication possibilities, market value of potentially promising species, and importantly, equitable benefit sharing regimes.

Rajbhandary, (2001) have studied about medicinal plants of himalayan region such as Humla, Jumla, Dolpa, Manang, Mustang etc where medicinal properties exists in its root that means when they are harvested in wild the whole plant is dug out of the ground so it cannot grow again the following years. Likewise, different raw materials are over harvested for e.g. immature plants; roots, tubers, rhizomes and bark are taken.

Even protected areas liked national parks facing the problem of indiscriminate collecting of the plant resources. One of the major issues in the conservation of plant resources is over and unsustainable harvesting of medicinal plants for trade. In the same way due to not effectively harvested from wild and traded without proper management and control. Cultivation practices of MAPs are also not common in Nepal.

So, it is very important to conserve all these medicinal plants. But it is very difficult to regulate the collection and trading of medicinal plant. Many people in village throughout himalayan region depend on the income they earn from medicinal plants. So, for the conservation the exploration of the sustainable alternatives is very important.

Humagain and Shrestha, (2011) have conducted the study entitled *Community based conservation and sustainable utilization of potential medicinal plants in Rasuwa district in Nepal*, is one of the important trade centers of medicinal plants. 60 species of

important medicinal plants with 6 species involved in trade among which 12 most potentially trade species which have been given high priority by the collectors and traders. Around 41% of medicinal plants are collected for their underground part while 15% is collected for whole part and other rest is collected for other parts.

About 40% household of Chilime VDC found to be involved in the collection and trade of medicinal plants. 90% of the collection was for trade, which supports 40% of family income i.e. average household net profit of NRs 9000 per year. But unfortunately only 50% of actual traded quantity was registered at DFO resulting low revenue collection, which is expected only 43%. So, the illegal trade is very common in the area by which the local traders increase their profit, as they do not have to pay revenue.

Rokaya, *et al.* (2010) documented uses of plants in traditional herbal medicine for the treatment of both human and veterinary ailments in four village development committees on Humla of western Nepal. The study also help to determine the homogeneity of informant's knowledge on medicinal plants suitable for different ailment and also the most preferred plant species used to treat each ailment in the study area.

The data was analyzed through informant consensus factor (ICF), fidelity level (FL) and use value (UV). He documented 161 plants species of 61 families and 106 genera used for treating 73 human and 7 veterinary ailments. Most medicine were prepared in the form of powder and used orally. Roots were most frequently used plant parts. The used of 93 medicinal plants were not previously mentioned. Gastro-intestinal ailments have the highest ICF (0.40) where ophthalmological uses have the lowest (zero) ICF. *Mentha spicat* and *Rumex hastatus* have the highest FL (100% each) both being used for gastro-intestinal ailments and *Delphinium himalaya* has the lowest (47.4%) for veterinary uses.

Shrestha, (2011) made a detail study on Ethnobotany of Bhaktapur along with the description of 213 species of plants with 72 known families with some unknown families were identified and documented from the study area out of which 154 were cultivated 48 were wild and 13 were both cultivated and wild. They included 74 species of medicinal plants with their used parts and disease cured, 74 species edible, 64 species ornamental, 70 species ritual, 30 species fodder, 24 species firewood, 16 species timber and 42 species

with miscellaneous use such as fiber, colour, firewood, timber fencing, roof thatching, spice, vegetable oil, food, pulse, poisoning etc are documented in this study.

Rawal, *et al.* (2009) made a detail study entitled. Some high value medicinal plants of Khumbu region Nepal. Among the description explain visualizing the present biodiversity status of Nepal, an integrated approach comprising of biodiversity documentation, sustainable utilization and conservation has become an urgent need. Altogether 45 medicinal plants were recorded from Khumbu region with the altitudinal variation of 2582 m to 4470 m. Among the collected plant species 12 have been characterized as highly valuable.

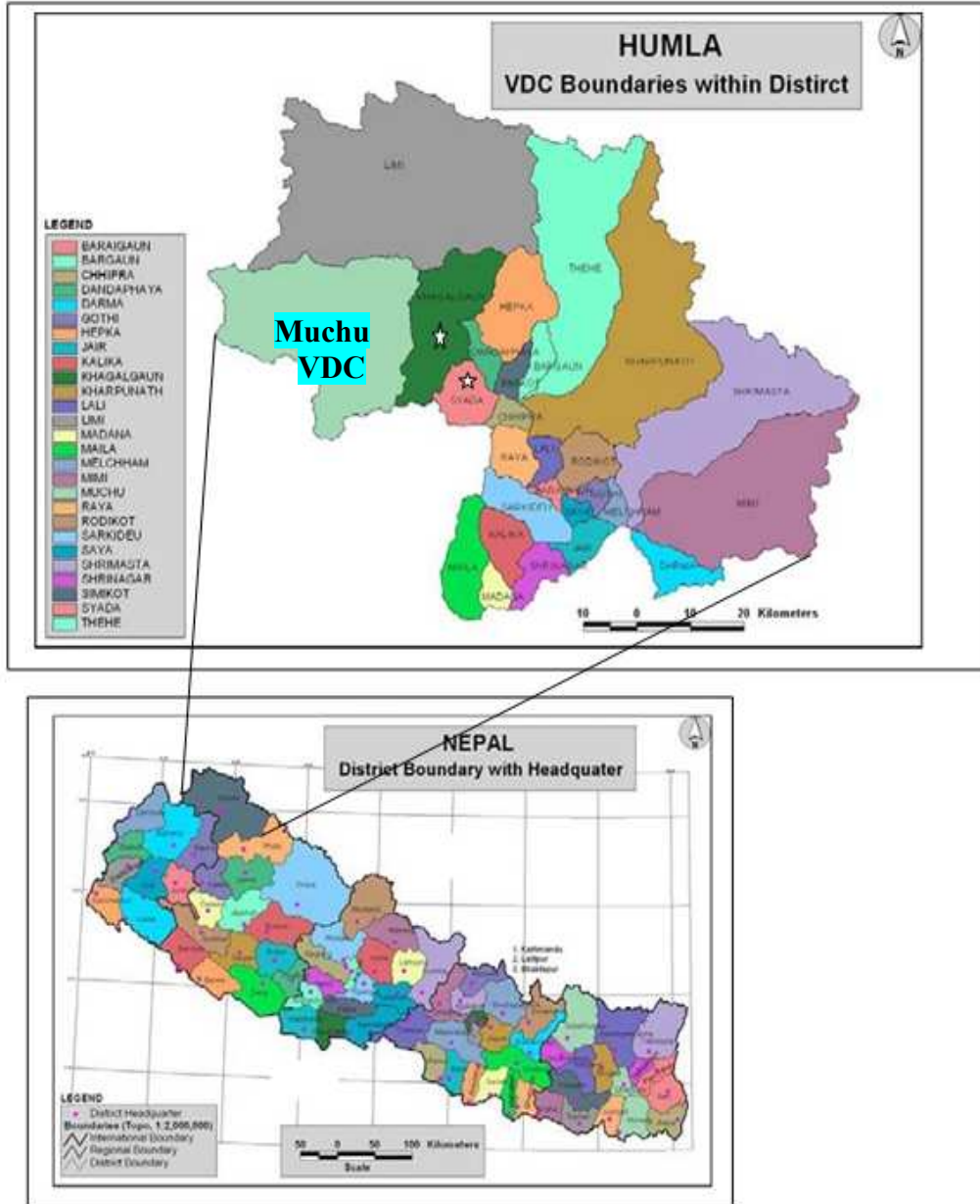
Pandey, (2006) The paper deals with 93 species of medicinal plants belonging to 74 genera spread over 35 families, which are used in traditional Tibetan therapy system by *Amchis* (medical practitioners) in Upper Mustang. Among them, Compositae is the largest family containing 9 species, followed by Labiatae (7 species). Gentianaceae, Polygonaceae and Ranunculaceae containing 6 species each and Primulaceae 5, where as Boraginaceae, Leguminosae, Rosaceae, Scrophulariaceae and Umbelliferae has 4 each.

Roy, (2010) studied entitled Contribution of NTFPs to livelihood in upper Humla, Nepal, found that 47 NTFPs species were used for food, medicine and other purposes. Out of this number 22 species were wild edible plants, 15 species were used as medicine and 10 species were harvested for uses other than consumption and medicinal. Wild edible plants were consumed with daily meals whereas medicinal plants were used for primary main tradable and economically valuable NTFPs species were Atis, Jatamansi, Kutki, and Guchchi Chyau. Likewise, Adhikari (1998) documented 65 plants which have been used by tribes of Koshi Tappu area along with their taxonomic description.

Singh, (1995) found 188 plant species being used by the Raute tribe of western Nepal and India. Similarly, Tamang, (1998) studied on topic entitled *Ethnobiological study of the Tamangs of Gorsyang VDC in Nuwakot*, which explain 183 wild and cultivated plant species being used by the local. Likewise, Siwakoti, *et al.* (1997) documented the used of 52 wild food plant species used by Satars of eastern Nepal.

CHAPTER THREE: STUDY AREA

3.1. Map of study area



(Source: DoS, 2001)

3.1. Site description

Humla the far western district with area of 5655 sq. km lies beneath the Himalayas is one of the most remote lies between 29° 35' to 30° 70' north latitude and 81° 18' to 82° 10' east longitude and has an elevation of 1,524 masl to 7,337 masl (DDC, 2010). Life in Humla is extremely challenging due to remoteness of the region, harsh terrain and climatic condition as well. Humla a high region in Nepal, considered as most isolated regions. It is also the gateway to holy mount Kailash and lake Manosarobar trek. It is bordered with the Tibet and Mugu in east, Bajura and Mugu in south and Bajhang and Darchula in the west and in the north with the Tibet being the poorest area of Nepal. Humla lacks modern facilities for transportation, health, sanitation and education. (DDC, 2006/2007)

Humla is particularly rich in diversity of crop varieties. Eight different types of Finger millet, five types of Barley and several varieties of Wheat, Millet, Buckwheat occur in the region. The region is also famous for beans. (GoN and ICIMOD, 2010)

Table 3.1. Physical characteristic of Humla

SN.	Parameters	Humla
1	Area (sq.km)	5655
2	Latitude	29° 25' - 30° 57' N
3	Longitudes	81° 25' - 82° 10' E
4	Altitude (m)	1220 - 7336
5	Annual mean temperature (°C)	10 -25/ -10
6	Average annual rainfall (mm)	25.4 - 146.9

(Source: CBS, 2001)

Administratively, Humla district lies in the Karnali Zone of the Mid-Western Development Region in Nepal. It is also known as Himalayan district. It was further divided into 27 Village Development Committees (VDCs) before. Currently there are total 30 VDCs in Humla: Barai, Bargaun, Chhipra, Darma, Dandafaya, Gothi, Hepka, Jaira, Kalika, Kermi, Khagalgaun, Kharpunath, Lali, Limi, Madana, Maila, Melchham, Mimi, Muchu, Raya, Ripa, Rodikot, Sarkeedeu, Saya, Shree Nagar, Shreemastha,

Simikot, Syada, Thehe, and Yanchu. In the same way, each VDC consists of nine wards. Simkot is the district headquarters of it, which is situated at elevation of 2945 meter from above sea level. It is situated on a ridge high above the Humla Karnali River and is surrounded by high snow-covered peaks. (DDC, 2010)

3.1.1 Ethnic and social background

The people of Humla are known as Humlis. The ethnic composition of Humla is complex but not unique. The majority of villages are populated by Hindus, mainly Chhetris, Brahmins, Thakuris and occupational castes (Kami, Damai, Sarki) particularly in the southern part of the district. However, like other mountainous districts, the northern part of district is populated by Tibetan ethnic group, which is referred as Lama in the region.

Table 3.2. Ethnic compositions

SN	Castes	Percentages (%)
1.	Chhetri/Thakuri	31.5
2.	Lama	14.5
3.	Brahmin	27.8
4.	Dalit	13.6
5.	Byasi	11.1
6.	Other ethnic group	0.3
7.	Remaining	1.3

(Source: DDC, 2008)

Two distinct cultural groups (between whom there is little communication) dominate the area: Tibetan extraction (Bhotiya) Buddhists belonging to the Lama caste, and who speak a Tibetan dialect are concentrated at the highest altitudes nearest the Tibetan border. Hindu caste Nepali - speaking people of the local 'Khas'. Ethnic subgroup belongs to castes such as Bahun (Brahmin), Shahi, Thakuri, Chhetri and Occupational castes such as Damai, Sunaar, Kami and Sarki. The latter are treated as untouchable and are traditionally called 'low caste'. Nowadays they are more politely referred to as 'Biswa Karma'

The Lama ethnic groups practice polyandry marriage system, which is now disintegrating gradually due to various internal and external factors such as modernization, education, social and cultural-mixed with other caste groups and so on. However, this system is good in terms of economic aspect and make family bond strong. A family is not separated after marriage and lives together as a joint family. Therefore, they do not have to divide their parent's properties after they get married. In contrary, Chhetri and Thakuri caste generally separated from the parent's family after their marriage. This is how, Lama ethnic group seems to be economically stronger than Chhetri, Thakuri and other cast people.

The Dalits (locally called Dom) such as Kami, Sarki and Damai are the lowest caste of Hindu society. They are known as untouchables. This group has the higher maternal mortality and the highest originally based on their occupation. They endure social exclusion, discrimination, food shortages, lack of education, and violence. About 70% of total Dalit population in the country lives below the poverty line. Most of them are deprived of an education, and those who do go to school often suffer segregation and discrimination in the classroom. (HN, 2011)

Table 3.3. Language spoken in the district

SN.	Languages	Percentage (%)
1.	Nepali	85.5
2.	Lama Kham (Closed to Tibetan language)	14.5

(Source: DDC, 2008)

Table 3.4. Religions in the district

SN.	Religion	Percentage (%)
1.	Hindu	83.90
2.	Buddhist	16.06
3.	Christian	0.04

(Source: DDC, 2008)

3.2 Muchu VDC

Muchu VDC in Humla district in Karnali Zone of north western Nepal. Muchu VDC occupied area of 754.86 square kilometer. According to (DDC, 2008) it had a population of 1563 persons living in 252 individual households. Muchu VDC consists of 9 wards they are Yalbang, Chala 1, Chala 2, Chala 3, Yangara, Muchu, Tumkot, East Yari and South Yari. The main occupation of the people dwelling in this region is farming and timber export to Tibet, seasonal collection of valuable medicinal herbs and different services. The major crops found here are *Triticum aestivum* (Wheat), *Cucurbita muschata* (Pumpkin), *Hordeum sp* (Barley), *Brassica rugosa* (Mustard), *Phaseolus vulgaris* (Bean), *Solanum tuberosm* (Potato), Green leafy vegetables, *Brassica cleraciavar* (Cabbage) etc. And the major vegetation are *Malus domestica* (Apple), *Prunus sp* (Khambu), *Prunus armenia* (Chuli), *Pinus parvifora* (Blue pine), *Abies spectabilis* (Birch), *Picea sp* (Spruce), *Pinus roxburghii* (pine), *Quercus languginose* (Banjh), *Juniperus communis* (Dhupi), *Juglan regia* (Hande Okhar). And the animals over here are *Uncia uncia* (Snow leopard), *Panthera pardus* (Leopard), *Selenarctos thibetanus* (Himalayan Black Bear), *Felis chaus* (Jungle Cat), *Nemorhaedus goral* (Ghoral), *Semnopithithecus hector* (Hanuman Langur), *Bosgrunniens* (Yak), *Equusmulus* (Mule), *Equusasinus* (Donkey), *Moschus moschiferus* (Musk deer). Similarly, Birds are *Lophura lencomelana* (Kalij pheasant), *Columba livia* (Pigeon), *Corvus macrohynchos* (Crow), *Streptopelia sp* (Common dove), *Pycnonotus cafer* (Bulbul). (GoN, and ERM, 2008)

The local inhabitants of Muchu follow the culture and religion of Tibet including Tibetan Buddhism. The area is far from government hospitals and health posts or health care centers. Thus, the local people largely depend on herbal remedies for treatment of disease. Amchi, Tibetan doctors who provide health care service to them. Most of the plant species are not used alone but are mixed with other herbs in specific amount by Amchi. The medicine are mostly consumes in powdered form and decoction form as the local people believe this form to be more effective than any other form. (DDC, 2010).

CHAPTER FOUR: MATERIALS AND METHODS

4.1.1 Literature review

A brief review on Ethnobotany was made for a good knowledge and idea on the subject matter. The review is especially focused on ethnobotanical knowledge of different ethnic groups and different analysis of previous work on the subject matter. The summaries of different outcomes of the studies have been illustrated in chapter two.

4.2 Collection of different ethnobotanical information

4.2.1 Selection of site

The study was conducted in Muchu VDC of upper Humla in Lama Community with the co-operation of tribal healers or Tibetan doctor (Amchi), local people, Elders, Students. The information was collected with people from all 9 wards of the Muchu VDC. Lama is the major inhabitant in these wards. The teacher, local people, students, traditional healers (Amchi), NGO workers, Buddhist monk were interviewed especially focusing on their knowledge on food, medicine from the plants and their uses, different parts use, their vernacular/local name, common name, mode of use, medicinal purpose, conservation aspects etc.

4.2.2. Questionnaire survey

Questionnaire survey is conducted randomly to obtain the information on people's perception on conservation use of plants parts, the methods they used for the treatment of various illnesses. Especially, about the Ethnobotany, problem in conservation, uses, availability etc.

4.2.3. Group discussion:

Local people are directly involved in the study. They help to develop different research, data collection, data analysis and even discussions of the findings, which will be benefited to the community. Two group discussions were conducted: one in Yangara village, where around 20 local people involved and next is in Baltakshya lekh where nearly 30 local people participated.

4.2.4. Interview

An unstructured interview method was used for the study. Traditional healers (Tibetan doctors), farmers, herbs collectors interviewed using a set of questions. Teacher, student, elders are interviewed using an unstructured interview that was basically focused on history, culture, tradition, socio-economic, ethnobotanical knowledge and present condition of the study.

4.2.5. Direct observation

A direct participant observation was applied to collect the information. Different medicinal herbs have been observed in Baltakshya lekh of Humla of 4,500 altitude and lies north of Yangara village with the local people. Identified various trees and plants, herbs, shrubs with knowledgeable informant Mr. Chembal Lama and junior researcher Mr. Bastian Etter. On the way we identify lots of herbs and plants and get opportunity to know herbs by its structure and even its taste and smell.

4.2.6. Plant identification

Different plants are identified with the help of the experts local Amchi, local herbs collectors by pictures and photographs in book, digital photographs and standard literatures. And here it was taken as reference for the herbs identification and to document different plants species found in the study. Different photographs are also taken during questionnaire survey, interview and group discussion.

4.2.7. Calculation of secondary information

The study was based on primary data collected from field visit and Secondary information will be also used to accomplish this study. During field visit the secondary data was collected from different reports of ethnobotanical studies done in different place available in Central library of Tribhuvan University, Khwopa College, Forestry department, Babarmahal, ANSAB. Similarly, various books, journal published by native and foreign institutions newspapers and different documents from related literature. Data will consider valid when the informants gave a similar answer and compare them with different literature. On the field I utilized a book name Commercially Important Non

Timber Forest Products (NTFPS) of Nepal by ANSAB and SNV Nepal to various people with special plant knowledge for identification and confirmation etc. on vernacular names.

4.2.8. Digital photography

Digital photography was used for collecting the primary data. And here it is taken as reference for the herbarium identification and to document different plants species found in the study. It was also used to document and to illustrate the field situation of people living in the study area. Different photographs are also taken during household survey and group discussion.

4.3. Consensus Analysis

Consensus analysis is the one to estimate individual informant's knowledge on different domains. Nowadays, due to different process like modernization, globalization, urbanization, migration and more activities cause change in individual knowledge and overall reduction in traditional knowledge obtained by individual within the group.

The main research question and hypothesis in this study was to test empirically about the relationship between the individual's positions within ethnobotanical and conservation knowledge of plants. And also to analyze about their characteristics in Lama Community of Humla.

All the questions are mainly focus on.

1. To determine the ethnobotanical knowledge of people
2. To know the distribution of different individual herbal knowledge
3. To know the relationship between different factor or characteristic of individual and their herbal knowledge

4.4. Data collection and analysis:

Different local people were selected for questionnaire with some expert having knowledge regarding ethnobotany and conservation of plants. The 3 teachers, 3 NGO

workers, 5 Amchis and monk as traditional healers, students and more than 50 local villagers were interviewed and questionnaire to get the information. For consensus analysis sets of 20 questions or statements are made to measure the ethnobotanical and conservation knowledge of people in Muchu VDC Humla. All together 30 people with 15 above age of 30 and 15 below age of 30 were questionnaire including School children, traditional healers, Teachers, Farmers, NGO workers to either Yes or No to the 20 statements.

The interview was conducted with the people in different village of Muchu VDC, Muchu, Yalbang, Yangara, Yari, Tumkot, Chala. This analysis helps to measure the agreement of people of two different age groups. It also helps to measure the degree of agreement among the people about their knowledge, beliefs or practices.

Percentage, bar diagram, table and pie chart were used to summarize the data of ethno botanically important plants, which are used for various purposes like medicine, firewood, timber, coloring and more. Similarly, the analysis of variance was used to test the similarity of knowledge of local people above 30 and below 30 ages. The Consensus analysis was done using PAST software in order to estimate the similarity of ethnobotanical knowledge of different age local people.

4.5. Problems of collecting information

- The study area is located in geographically harsh and wider so it is economically expensive
- Some of the villagers hesitate to provide information of proper use of plants as before many NGOs collect lots of information from them.
- For me it is difficult to understand their language so most of the time I need my friend for the language translation

CHAPTER FIVE: RESULTS AND DISCUSSION

The Lama community of Muchu VDC, Humla district possesses a very rich ethno botanical knowledge. Even to till dates, they have been using large number of plants species for various purposes like medicine, firewood, timber, ceremonies, dyeing etc. A total 148 plant species representing known 58 families and 13 unidentified families have been reported to be use in Lama Community of the study area. The use of same plant or different plants parts was found to be little more varying in some cases away the Lama community.

Plants categorizations:

The ethnobotanically important plant used by the lama community has been categorized under different subheads as follows:

5.1.1. Habit

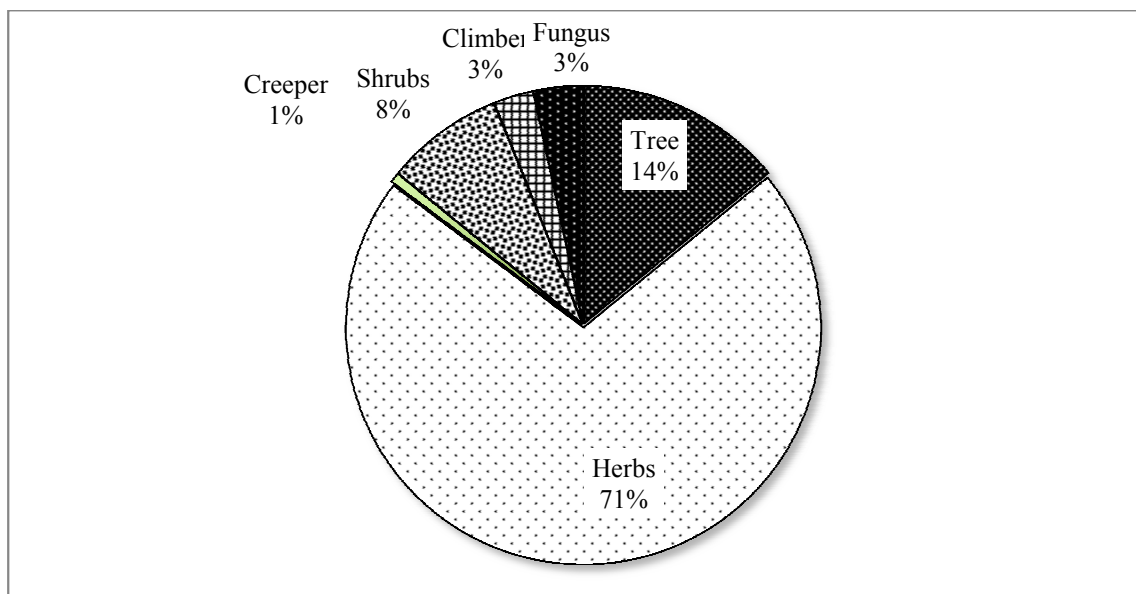


Fig. 5.1. Habit of ethnobotanically important plant

Among 148 plants species the herbs occupies maximum 71%, which is followed by tree 14%, and least 1% are Creeper.

5.1.2. Source of availability

The availability of plant may categorize as cultivated, wild and both. Plants that grow in

private land are termed as cultivated plants and those plants which are not cultivated by human are termed as wild and some relative species of cultivated plants grow in wild or sometime also cultivated by people is termed as both too.

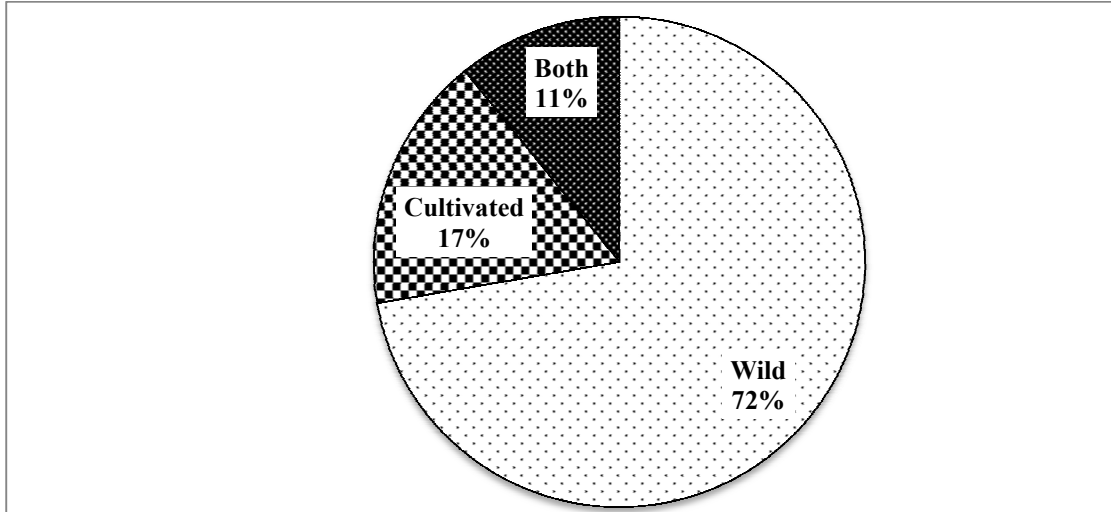


Fig. 5.2. Source of availability of ethnobotanically important plant

Among the total plant species 72% of them are wild while only 11% are found as both cultivated and wild form and only 17% of them are in cultivated.

5.1.3. Plants part used

Different parts of plant may use in different purposes. Same part of plant may used in number of purposes, likewise various plants part may use for single purposes. Use of different parts varies as represented by below figures: People use maximum leaves with 46 numbers while latex found to use only one time.

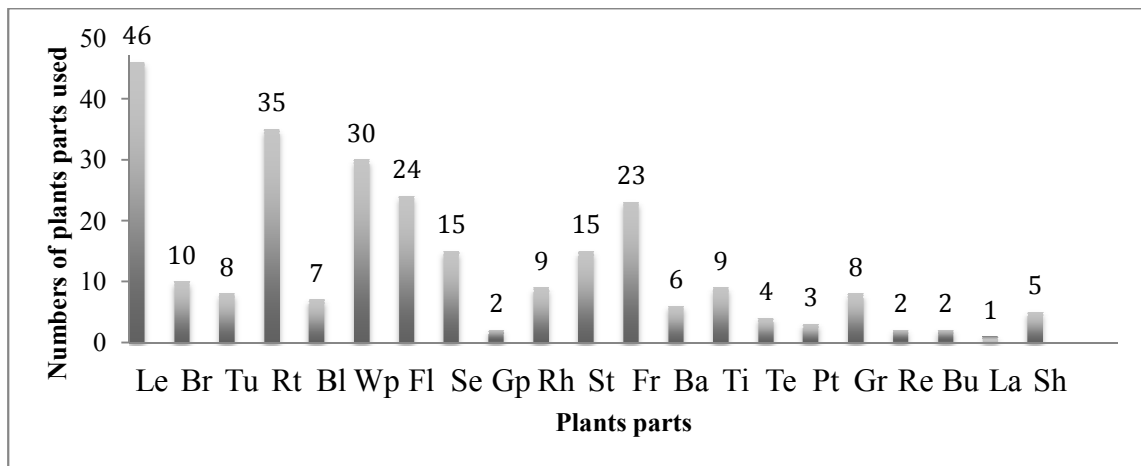


Fig. 5.3. Plant parts used for ethnobotanical Purposes

Le: Leaves, Br: Branches, Tu: Tuber, Rt: Root, Bl: Bulb, Wp: Whole plant, Fl: Flower, Se: Seed, Gp: Green plant, Rh: Rhizome, St: Stem, Fr: Fruits, Ba: Bark, Ti: Timber, Te: Tender, Pt: Planttip, Gr: Grain, Re: Resin, Bu: Bud, La: Latex, Sh: Shoots

5.1.4. Ethnobotanical use:

Different plants in study area have been categorized into eight different groups on the basis of their uses. For the convenience, the group consisting large number of plant species have been presented separately while the groups consisting only a few plant species with different use have been grouped under the miscellaneous use group. Among which 85 plants for medicinal use and least 5 plants for ceremonies and dyeing purpose too.

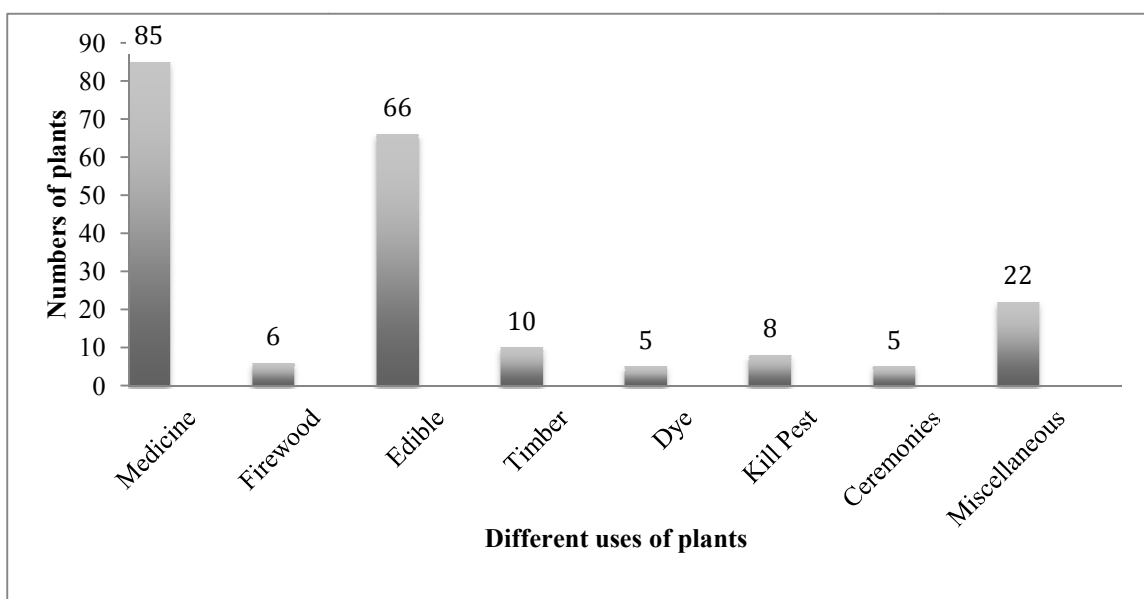


Fig. 5.4. Plants used for various purposes

5.1.4.1. Habit

Among the plants medicinal plants is with larger habit with 62 herbs, 4 shrubs, 17 tree, 1 fungus, 1 climber, 1 creeper while and least timber with only one habit tree.

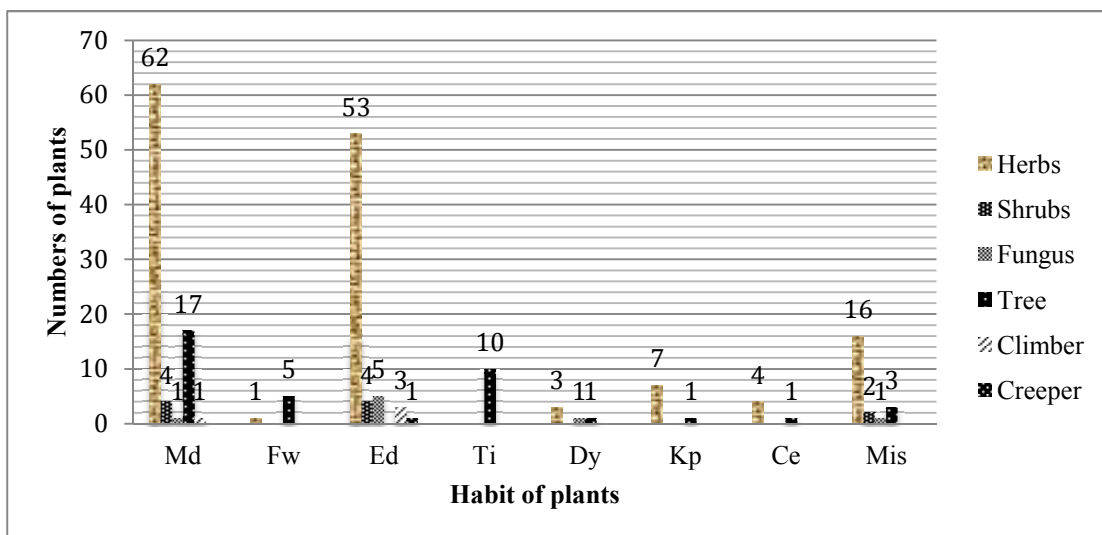


Fig. 5.4.1. Habit of plants used for various purposes

Table 5.1. Plants used for various purposes

5.1.1. Plants used for firewood

SN.	Scientific name	Family	Common name	Uses
1.	<i>Lyonia ovalifolia</i>	Ericaceae	Angeri	Used as firewood
2.	<i>Pinus roxburghii</i>	Pinaceae	Khote Salla	Used as firewood
3.	<i>Quercus lanuginose</i>	Fagaceae	Banjh	Used as firewood
4.	<i>Quercus semicarpifolia</i>	Fagaceae	Khasru	Use as firewood
5.	<i>Salix babylonica</i>	Salicaceae	Bainsh	Used as firewood
6.	<i>Tsuga dumosa</i>	Pinaceae	Thigre Salla	Used as firewood

(Field study, 2010)

5.1.2. Edible plants

SN	Vernacular name	Common name	Family	Scientific name	Part use	Mode of use
1.	Aunthe Chyau	Dhu Chyau	Agaricaceae	<i>Agaricus sp</i>	Whole plant	Consume as Vegetable
2.	Thuk Chyau	-	Agaricaceae	<i>Agaricus sp</i>	Whole plant	Consume by frying, protenus

3.	Pyang Chyau	-	Agaricaceae	<i>Agaricus sp</i>	Whole plant	Consume by frying, protenous
4.	-	Onion	Alliaceae	<i>Allium cepa</i>	Green plant, Bulb	Consume as vegetable
5.	Faraang	Jimbu	Amaryllidaceae	<i>Allium hypristurn</i>	Bulb	Also use as condiment
6.		Garlic	Liliaceae	<i>Allium sativum</i>	Bulb, Green plant	Garlic is considered as something of a miracle food and uses it as a home remedy for many home items.
7.	Taakchya	Dino	Amaryllidaceae	<i>Allium sp</i>	Bulb, Rhizome	Consume as remedy in vegetable
8.		Jangali Lasun	Amaryllidaceae	<i>Allium wallichii</i>	Bulb, Whole plant	Used as flavoring and condiment
9.	Marshyaa	Pigweed	Amaranthaceae	<i>Amaranthus sp</i>	Dry seed, Leaves	Their leaves are the most nutritious of vegetable and mixed with barley to make porridges
10.	Jibra	Orchid	Orchidaceae	<i>Anthogonium gracile</i>	Roots, Whole plant	They are first grinded and mixed with buckwheat flour and make bread, roti
11.	DhowaYaal u	Sarpakoma kai	Araceae	<i>Arisaema flavum</i>	Tuber	Tuber taken as vegetable too
12.	Dhowa,Dolo		Araceae	<i>Arisaema jacquemontii</i>	Tuber	Tuber are also taken as vegetable
13.		Kurilo	Liliaceae	<i>Asparagus racemosus</i>	Stem	Stem is taken as for tonic; Fruits are taken to treat pimples.
14.	Kirmudo	Chutro	Berberidaceae	<i>Berberis aristata</i>	Fruit	Fruit are edible and also taken as juice.
15.	Aaraache	Silpaari , Pakhanved	Saxifragaceae	<i>Bergenia ciliate</i>	Rhizome	Rhizome is consume
16.	Jhhyangсах	Lekh Sisnu	Urticaceae	<i>Boehmeria sp</i>	Leaves	Consume as vegetable
17.	-	Cabbage	Brassicaceae	<i>Brassica oleraciavar. capitata</i>	Flower, leaves	Consume as vegetable
18.	-	Cauliflower	Brassicaceae	<i>Brassica oletaciavar. botrytis</i>	Flower, leaves	Consume as vegetable
19.	-	Broad	Brassicaceae	<i>Brassica</i>	Seed,	Seed is also used whole

		leaves mustard		<i>rugosa</i>	Leaves, Stems	in curries and pickles, An edible semi-drying oil is obtained from the seed, Flowers and young flowering stems as raw or cooked
20.	Kohirochoti	Turnip	Brassicaceae	<i>Brassica sp</i>	Root, Stem, Leaves, Flower, Stem	Consume as vegetable
21.	Sawale,Chh yaamaa	-	Brassicaceae	<i>Capsella bursa</i>	Whole plant, Seed	For food come time mix with pancake to supplement animal feed
22.	-	Chilly	Solanaceae	<i>Capsicum annum</i>	Fruit	Chili is used in everyday cooking for its pungent taste and flavor. It is also used in pickles.
23.	Bhote Jeera	-	Apiaceae	<i>Carum carvi</i>	Fruits, whole plant	Fruit is chewed to increase appetite, whole plants also use as condiment
24.	Chyaum	-	Apiaceae	<i>Chaerophyllu m villosum</i>	Root, Leaves, tender, Shoots	Root are used as wild carrot, leaves, tender and shoot cooked as vegetables
25.	Bethu, Nyooou	Lamb's quarter	Chenopodia ceae	<i>Chenopodium album</i>	Whole plant	Consumed as food
26.	Dhaniya	Coriander	Apiaceae	<i>Coriandrum sativum</i>	Seed, root, leaves	Root use as condiment
27.	-	Jangali dhaniya	Apiaceae	<i>Coriandrum sativum</i>	Whole plant	Plant is taken as chatani
28.	-	Cucumber	Cucurbitace ae	<i>Cucumis sativus</i>	fruit	Cylindrical edible fruit. Three main varieties of cucumber: "slicing", "pickling" and "burpless"
29.	-	Pumpkin	Cucurbitace ae	<i>Cucurbita muschata</i>	Tender Shoot, Flower and Fruits	Consume as daily vegetable
30.	Hatijare, Anpolakcha	Panchaule	Orchidaceae	<i>Dactylorhiza hextagirea</i>	Rhizomes	Rhizome is eaten raw as tonic.
31.	Tuk	Muga	Dioscoracea e	<i>Dioscora sp</i>	Tuber	Used as potato as potato in food value
32.	Lingure	Bhaaluunyo o, Fern	Woodsiaceae	<i>Diplazium</i>	Plant tip	Consume as vegetable

				<i>giganteum</i>		
33.	Taakulgaahi malayan Teasel	Khanike, phuli	Dipsacaceae	<i>Dipsacus inermis</i>	Flower	Consume as vegetable
34.	Kodo	Finger millet	Gramineae	<i>Eleusine coracana</i>	Grain	Seed - cooked. Used as Millet, the seed can be cooked whole or ground and used as flour. It is used in cakes, puddings, porridge etc. Finger Millet is considered an especially whole some food for diabetics.
35.		Sallejari	Ephedraceae	<i>Ephedra gerardiana</i>	Fruit	Ripe fruit is eaten to maintain blood pressure, altitude sickness
36.	Mithe faper	Sweet buckwheat	<i>Polygonace ae</i>	<i>Fagopyrum esculentum</i>	Grain	Used to make pancakes
37.	Titefapar, Bhaande, Paaltaa	Bitter buckwheat, Tausuraa	<i>Polygonace ae</i>	<i>Fagopyrum tartaricum</i>	Leaves, Grain, Plant tip	Leave, raw or cooked. Use to prepare curry
38.	Bhuikafal, Bhuinainse lu	Strawberry	Rosaceae	<i>Fragaria nubicolas</i>	Fruit	Fruit are edible
39.	Bhatta	Soya bean	<i>Fabaceae</i>	<i>Glycine max</i>	Seed	Seed oil is used to cook, sprouted raw seed is eaten
40.	Chichi, Khurpu, Tora, Asuk	Tarechuk/S ea buck throne	Elaeagnacea	<i>Hippophae salicifolia</i>	Fruit	Fruits are edible and also taken as juice
41.	Uwaa	Barley	Poaceae	<i>Hordeum nudum</i>	Grain	It is used as flour or as grains to make porridge.
42.	Jau	Barely	<i>Poaceae</i>	<i>Hordeum vulgare</i>	Seed	Seed is taken as major grains
43.	Kaa	Ban pidaalu	Liliaceae	<i>Lilium nepalensis</i>	Bulb	Bulb is stemmed and cooked as vegetable
44.	-	Tomato	Solanaceae	<i>Lycopersicon esculentum</i>	Fruit	Varieties of cucumber: “slicing”, “pickling”
45.	Chyaablwa	Majino	Malvaceae	<i>Malva verticellata</i>	Flower, Leaves	Leaves is edible as vegetables
46.	-	Bitter gourd	Cucurbitaceae	<i>Momordi cacharantia</i>	Ripe fruit, Leaves, Seed	Taken as juice in tea

47.	Kalamarshidhaan	Rice	Poaceae	<i>Oriza sativa</i>	Grain	Consume as food
48.	Chino	Panicum millet, Hogmillet	<i>Poaceae</i>	<i>Panicum miliaceum</i>	Grain	Grain is fry and taken as lunch
49.	Simi	Kidney bean	<i>Leguminosae</i>	<i>Phaseolus vulgaris</i>	Elongated legumes (pod), dry bean	Consume as vegetable
50.	-	Duneri	-	<i>Pimpinella sp</i>	Whole plant	Consumption help as health boosting benefits
52.	Laghupatra	May apple	Berberidaceae	<i>Podophyllum hexandrum</i>	Fruit	Ripe fruit is edible
53.	Chuli	Apricot	Rosaceae	<i>Prunus armenia</i>	Fruit	Consume as fruit
54.	Choti	Radish	Brassicaceae	<i>Raphans sativus</i>	Tap Root, leaves	Leaves and root taken as vegetable and root use to prepare salad
55.	Halyaachuk	-	Polygonaceae	<i>Rumex aratosa</i>	Tender, leaves, shoots	Used as vegetables
56.		Bhutkesh	Apiaceae	<i>Selinum tenuifolium</i>	Fruit	Use as spices
57.	Kaaguno	Foxtail millet	Poaceae	<i>Setaria italica</i>	Grain	Seed is cooked. It can be eaten as a sweet or savory food, a flour and made into porridge, cakes, puddings
58.	-	Bringal	Solanaceae	<i>Solanum melongena</i>	<u>Fruit</u>	Commonly used in cooking
59.	Aalu	Potatoes	Solanaceae	<i>Solanum tuberosum</i>	Tuber	Tuber consume as most staple vegetables
60.	-	Spinach	Amaranthaceae	<i>Spinacia oleracia</i>	Leaves	Nutritious leaves consume as vegetable
61.	Khedaalu	-	<i>Caryophyllaceae</i>	<i>Stellaria monosperma</i>	Tender, Leaves	Consume as wild vegetable
62.	-	Ghodamarcha	Labiatae	<i>Thymus linearis</i>	Leaves	Leaves used as spices
63.	Ganhu	Wheat	<i>Poaceae</i>	<i>Triticum aestivum</i>	Grain	Make bread, roti,
64.	Aoul, Sah	Sisnu	Urticaceae	<i>Urtica dioica</i>	Leaves	Cooked and taken as vegetable
65.	-	Chiriko	-	-	Whole plant	Consume as pickle
66.	-	Gajarani	-	-	-	Used as spices

(Field study, 2010)

5.1.3. Plants used for Timber

SN.	Scientific name	Family	Common name	Uses
1.	<i>Betula utilis</i>	Betulaceae	Bhojpatra	Used as timber
2.	<i>Cedrus deodara</i>	Pinaceae	Deodar	It is most important tree providing soft wood
3.	<i>Picea sp</i>	Pinaceae	Spruce	Spruce wood resists decay so can used for piles under water
4.	<i>Pinus roxburghii</i>	Pinaceae	Khote Salla	Used as timber
5.	<i>Pinus wallichiana</i>	Pinaceae	Gobre Salla	Pinewood is hard and tough except white pine which is soft. It is used for frames of doors and window and for packing material
6.	<i>Quercus lanuginose</i>	Fagaceae	Banjh	Used as timber
7.	<i>Quercus semicarpifolia</i>	Fagaceae	Khasru	Use as timber
8.	<i>Quercus sp</i>	Fagaceae	Oak	It is used for making cheap furniture, packing boxes, structural works
9.	<i>Salix babylonica</i>	Salicaceae	Bainsh	Used as timber
10.	<i>Tsuga dumosa</i>	Pinaceae	Thigre Salla	Used as timber

(Field study, 2010)

Table 1.1.3. Plants uses as dyeing purpose

SN.	Vernacular name	Common name	Family	Scientific name	Part use	Mode of use
1.	Chutro	Kirmudo	<i>Berberidaceae</i>	<i>Berberis aristata</i>	Root and bark	Used as yellow dyeing agent
2.	Syarokpa	Nirvisi	Ranunculaceae	<i>Delphinium denudatum</i>	Fruit, Seed	Colorings of finishing in wooden bowl
3.	Chot			<i>Mytilusgallo provincialis</i>	Root	Dye red color root and boil with Bakhu
4.	Lichen		Parmeliaceae	<i>Pormelia utilis</i>	Whole plant	Used in dyeing wool
5.	Majitho		Rabiaceae	<i>Rubia manjith</i>	Root	Root used as dyeing Bakhu

(Field study, 2010)

Table 5.1.4. Plants used to kill pest

SN.	Vernacular name	Common name	Family	Scientific name	Part use	Mode of use
1.	-	Bishk	Ranunculaceae	<i>Aconitum spicatum</i>	Root, Leaves	Used to kill rodents and wild animals, to treat animal feeds on poison
2.	Himalayan cedar	-	Pinaceae	<i>Cedrus deodara</i>	Latex	Latex use to keep away the harmful insects, It is also applied as antileech.
3.	Metokjakong	-	Ranunculaceae	<i>Delphinium grandiflorum</i>	Leaves	Use to kill the lice
4.	Pore	-	Ericaceae	<i>Pieris formosa</i>	Flower, Fruit	Use as insecticides
5.	-	Jangali Sayapatri	Compositae	<i>Tagetes minuta</i>	Whole plant	The plants are dried and added to bedding and strewn in houses to deter insects and bedbugs, or also dried and hung to deter flying insects.
6.	Gajarani	-	-	-	Stem	Used to keep away snake from house
7.	Gholemedu	-	-	-	Whole plant	Use as insecticides
8.	Marmal	-	-	-	Leave, Whole plant	Whole plant juice use as insecticides in wound, use its hammering leaves juice of leaves by in stone

(Field study, 2010)

Table 5.1.5. Plants used in ceremonies /religious purpose

S.N	Vernacular name	Common name	Family	Scientific name	Part use	Mode of use
1.	Rombu	-	Polygonaceae	<i>Bistorta affinis</i>	Flower	Flower offered in monasteries during religious function
2.	Somlata	-	Ephedraceae	<i>Ephedra gerardiana</i>	Branches, whole plant	Used in special puja during sick
3.	Dhupi	-	Cupressaceae	<i>Juniperus indica</i>	Berries, Leaves	Used as incense
4.	Kalthaple	Dhupjadi	Compositae	<i>Jurinea dolomiaea</i>	Leaves, Berries	Used to made a essence incense
5.	bhutle	Jatamasi	Valerianaceae	<i>Nardostachys grandiflora</i>	Root	Used to prepare incense

(Field study, 2010)

5.1.4.2. Source of availability

Among the plants more medicinal plants are found in wild condition with 72 in number followed by edible plant with 36 and least is firewood which is only 3. Edible plants are found more in cultivated form that is found 23 in number while with total number of 11 medicinal plants is found in both wild and cultivated form.

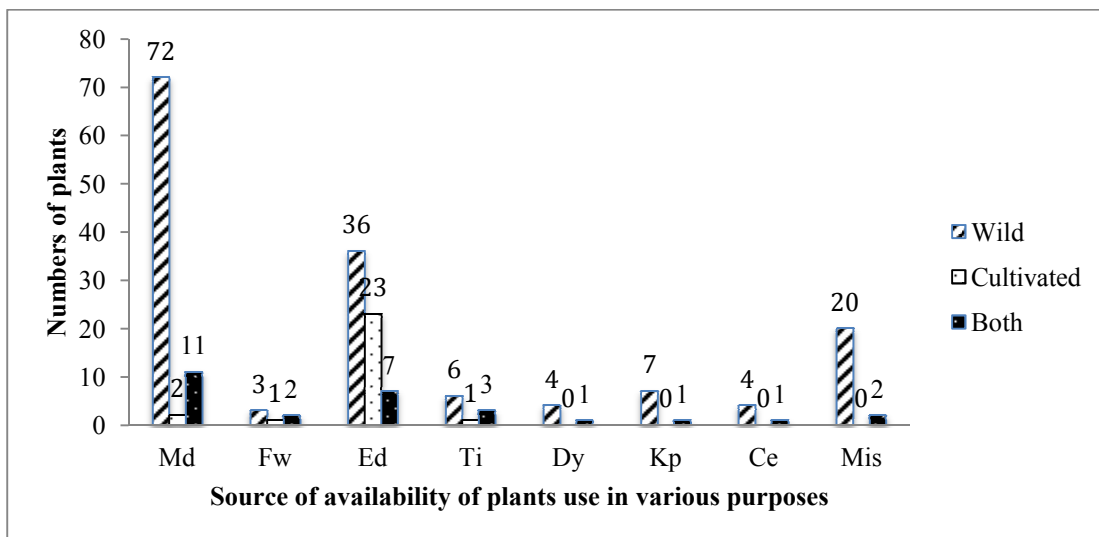


Fig. 4.2. Source of availability of plants used for various purposes

Table 5.2. Other different uses of plants

S N.	Vernacular name	Common name	Family	Scientific name	Part used	Mode of use
1.	Duk	Bikha	Ranunculaceae	<i>Aconitum sp</i>	Root, Leaves	Used as poison for hunting and for warfare
2.	Jangalilasun		Amaryllidaceae	<i>Allium wallichii</i>	Bulb	Also use as stimulant
3.	Poita	Bukiphul	Compositae	<i>Anaphalis sp</i>	Whole plant, Flower	Use in decoration
4.	-	Bhojpatra	Betulaceae	<i>Betula utilis</i>	Branch, Bark	For the storage of food grains, the hole is dug in ground and it is covered by papery barks in all sides and supported by branches of <i>Pinus wallichiana</i> . The hole filled with grain and cover with soil and store for further use a portion of papery bark

						is kept in indoor spaces to get harmony in families.
5.	Yarshagumba	Jivonbuti, Sanjeevani	Hypocraceae	<i>Cordyceps sinensis</i>	Whole plant	Expectorant and sex stimulant.
6.	<i>Anpolakcha</i>	Panchaule	Orchidaceae	<i>Dactylorhiza hextagirea</i>	Rhizomes, Roots, Tubers	It is also used to increase sexual strength
7.	Atis	Alisyo	Ranunculaceae	<i>Delphinium himalayai</i> Munz	Root	Mix with other herbs remedies
8.	-	Maaurimulo	Ranunculaceae	<i>Delphinium vestitum</i>	Flower, Root	Flower extract used in eye redness, particularly for eye infections, root decoction used for heart problem, cough, fever.
9.	Allo/Vallo, Himalayan nettle	Thulo Sissnu	Urticaceae	<i>Girardinia diversifolia</i>	Whole plant, Bark, Root	Bark of stem is used to prepare namla, carpet clothes. Root is hammer and used as soap for bathing purposes
10.	-	Padampuskar	Iridaceae	<i>Iris decora</i>	Root, Leaves	Used to prepare rope by wetting its dry leaves
11.	Bhutle, Nakha, Balanchad	Jatamasi	Valerianaceae	<i>Nardostachys grandiflora</i>	Root, Stem	Also use to prepare perfume, incense, purpose of hair growth and color restoration
12.	Pine	-	Pinaceae	<i>Pinus sp</i>	Roots, Leaves, Branches	Root use to light fire, leaves as fertilizer and young branches to prepare rope
13.	Lichen	-	Parmeliaceae	<i>Parmelia utilis</i>	Whole plant	Essence oil preparation
14.	Apricot	Chuli	Rosaceae	<i>Prunus armenia</i>	Seed	Prepare body lotion, Cream
15.	Padmachal	Himalayan rhubarb	Polygonaceae	<i>Rheum australe</i>	Root	Root, stem used to clean teeth by brushing
16.	Kbolapaana akpo	Bhutkesh	Apiaceae	<i>Selinum tenuifolium</i>	Tender, Leaves, Shoots	Consumed by cattle especially Ox
17.	Nara, Shoo	Horse chestnut	-	<i>Strackegi sp</i>	Root, Shoot	Used for washing woolen clothes Bakhhu. Serves as raw material for the manufacturing of soap, roots, shoots are harvested and dried under sunlight and make powder later used as detergent powder in future
18.	-	Jangali sayapatri	Compositae	<i>Tagetes minuta</i>	Whole plant	Essential oil and perfume

19.	-	Sisnu	Urticaceae	<i>Urtica dioica</i>	Leaves, Seed, Root	This nettle is used in shampoo to control dandruff and is said to make the hair glossier.
20.	Taa	Pate Jhhulo	-	-	Leaves	Leaves are used to make fire
21.	Syaurakpaa	Fatfate	-	-	Seed	Oil of seed is used as varnish to expose the natural wooden textures of the knot in furu.

(Field study, 2010)

5.1.5. Plants with different number of used

Plants reported in this study most of them have more than one used. So, it can be categorized under only one species groups. And the plants have also been categorized on the basis of the number of uses they have: Here, 69% plants with single use and only 8% with 3 different uses.

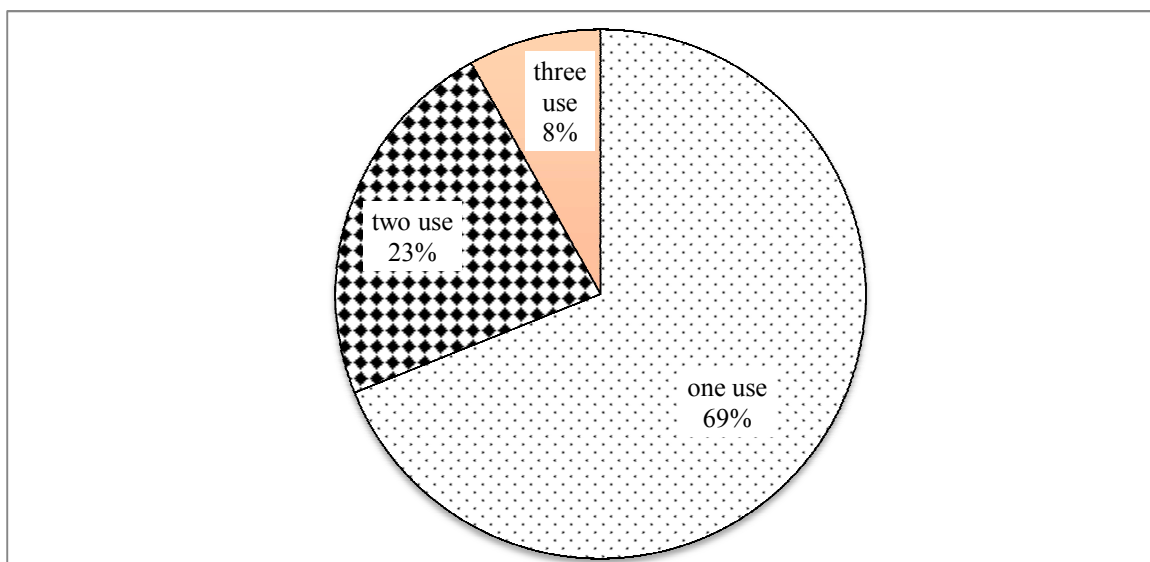


Fig. 5.5. Numbers of plants with different use categories

5.2. MEDICINAL PLANT

5.2.1. Forms of medication of herbs (medicinal plants).

Most of the medicinal plants use in paste form with highest 24 in number and only one medication form found is infusion, soup, smoke, smell.

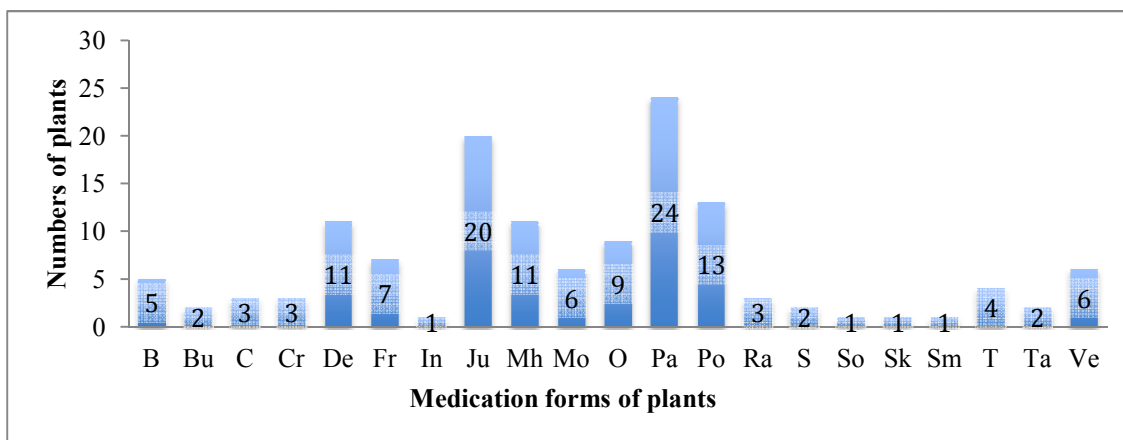


Fig. 5.6. Medication forms of medicinal plants

B: Boil with water, Bu: Burn, C: Chewed, Cr: Crushed, De: Decoction, Fr: Fruit, In: Infusion, Ju: Juice, Mh: Mixed with other herbs, Mo: Mixed with other materials like Alcohol, Ghee, Sugar, O: Oil, Pa: Paste, Po: Powder, Ra: Eaten raw, S: Spices, So: Soup, Sk: Smoke, Sm: Smell, T: Tea, Ta: Tablet, Ve: Vegetable

5.2.2. Plants part used

Different parts of medicinal plants are used for different purposes. Same plant part may be used for a number of purposes and various parts of a plant may also be used for a single purpose.

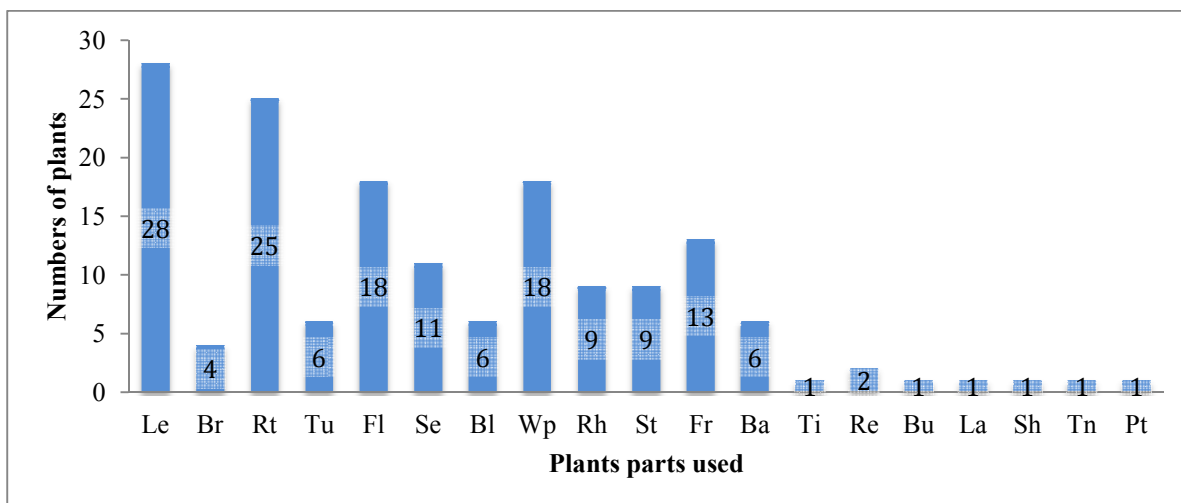


Fig. 5.7. Plants part used for medicinal purposes

L: Leaves, Br: Branches, Rt: Root, Tu: Tuber, Fl: Flower, S: Seed, Bl: Bulb, Wp: Whole plant, Rh: Rhizome: St: Stem, Fr: Fruits, Ba: Bark , Ti: Timber, Re: Resin, Bu: Bud, La: Latex, Sh: Shoots Tn: Tender, Pt: Plant tip

Table 5.3. Plants used as Medicine

S N.	Ailments	Botanical name of plants	Family	Common name	Local name	Part used	Mode of Used
1.	Cough, Asthma	<i>Abies spectabilis</i>	Pinaceae	Himalayan fir, Birch	Thingre Salla	Leave, Branch	Leaves use in prevention of infection , leaves juice taken to stop menstruation, Leaves and branch juice used in cough and as tonic too
2.	-	<i>Acer cambellii</i>	Aceraceae	-	Yali	Leaves	Used as anesthesia, Drink as Tea
3.	Body pain, Toothache	<i>Aconitum ferox</i>	Ranunculaceae	Setobikh/Aconite	Mamud	Young tuber, Roots	Extract of tuber in mustard oil used for body pain, roots are smoked in tooth ache and body pain
4.	Cough, Cold, Headache	<i>Aconitum spicatum</i>	Ranunculaceae	Bishk	-	Root, Leaves	Use to treat animal feeds on poison. Root juice is used in cuts & wounds, cough & cold and liver problems. Leaves paste is applied in fever and headache.
5.	Strong <u>antioxidant</u> , anti microbial and insecticidal	<i>Acorus calamus</i>	Acoraceae	Sweet Flag	Bojho	Roots and leaves	Chewed directly, effective control measure against throat problems
6.	Skin problem, Fever, menstrual disorders, Epilepsy	<i>Ajuga lupulina</i>	Labiatae	Bugleweed	Khangsumetog	Leave, Flower, Seeds	Used with other herbs
7.	Gastritis, Stomach problem	<i>Allium carolinianum</i>	Amaryllidaceae	Banlassun	-	Bulb, Whole plant	Bulb are taken directly or making paste
8.	Gastric, Stomach problem	<i>Allium hypristurn</i>	Amaryllidaceae	-	Jimbu	Bulb, Whole plant	The powder of whole plant is taken with hot water for killing worms in stomach and to cure cough and cold.
9.	High blood pressure, Whooping Cough, altitude sickness	<i>Allium wallichii</i>	Amaryllidaceae	-	-	Whole part, Rhizomes, Bulb	Raw bulb is used in high blood pressure, its smell and raw form use for high altitude sickness

10.	Cut wounds by weapons	<i>Alliums sp</i>	-	Taakchya	-	Bulb	Used in wound making paste
11.	Cold and flu	<i>Arctium sp</i>	Asteraceae	Pijinchhu bo	Jantikuro	Whole plant	It is taken as soup during cold
12.	Worm infection, Stomachache, Scabies, Swelling, Bone disease, Menstrual disorder	<i>Arisaema flavum</i>	Araceae	Sarpakomakai	Dhowa	Root, Tuber, Flower	Used with other herbs, tubers used in worm infection, stomachache, scabies swelling, used in uterus and menstrual disorder
13.	Infection, Stomachache, Toothache, Rheumatism, Menstrual disorders	<i>Arisaema Jacquemontii</i>	Araceae	-	Dhowa, dolo	Root, Tuber	Used with other herbs
14.	Fever, tonic	<i>Asparagus racemosus</i>	Liliaceae	Kurilo,	Satawari	Root, Stem, Fruit	Root powder with milk drinks by mother; increase milk for baby. Root powder is given as tonic. Paste of root is also used in fever, cough & cold.
15.	-	<i>Aster asperulus</i>	Asteraceae	-	Chhyaman, Tite	Fresh root	Root powder taken as tonic
16.	Used in wounds, poisoning, fever and headache	<i>Aster strachegi</i>	Compositae	Metog. Lugmig		Leaves, Flower	Used with other herbs
17.	Jaundice, Malaria, Skin disease	<i>Berberis aristata</i>	Berberidaceae	Chutro	Kirmudo	Roots, Fruit and Barks	Leaves are grinded and squeezed to get juice, dropped in eye to cure Problem. Juice is also take for fever jaundice
18.	Diarrhea, Fever, Stone and Kidney problem, Sprain of joints, Bone fracture in animal	<i>Bergenia ciliata</i>	Saxifragaceae	Simpati/pakhanvet, Aaraache	Dhung ephool	Roots, Flower, Rhizomes	Dry roots are powdered and used for diarrhea, dysentery, thirst, vomiting and indigestion. Root infusion is given to babies to decrease excessive heat; dry rhizome is chewed to remove stone. Root decoction is used in diarrhea, dysentery, fever and respiratory problems.
19.	Pneumonia	<i>Betula utilis</i>	Betulaceae	-	Bhojpatra	Branch, Bark	Boil with water for vitamin and pneumonia; Wounds are covered by papery barks for antiseptic purpose. Bark

							paper is used to cure fever
20.	Diarrhea, Dysentery, To increase blood	<i>Bistorta affinis</i>	Polygonaceae	-	Rambu	Root, Leaves, Flower, Fruits	Used with other herbs, paste mixed with water is consumed for various ailments for consumption
21.	Fever, Cough, Cold, Stomach problem	<i>Carum carvi</i>	Apiaceae	Bhote Jeera	-	Fruits, Whole plant	Fruit is chewed
22.	Fever, Diarrhea, Dysentery, Joint pain, Bone fracture, Skin problem	<i>Cedrus deodara</i>	Pinaceae	Himalayan Cedar	-	Leaves, Timber, bark	Bark decoction used for fever, diarrhea, dysentery, oil used for skin problem, wood is also used to treat swelling due to T.B Wood oil is used in skin diseases and respiratory troubles extract is massaged to get relief pain.
23.	Diarrhea, Jaundice, Scabies, Skin disease, joint pains	<i>Chlorophytum borivillionam</i>	Liliaceae	Safed musli	Seto musli	Tuber, Roots	Consume with sugar and ghee benefits to respiratory problem, roots powder mix with milk benefit to piles
24.	Joint pains, Heart diseases, Mental diseases	<i>Cordyceps sinensis</i>	Hypocriteae	Yarsha gumba	Jivonbuti, Sanjeevani	Whole part	Dried shoot portion is used as tonic and increase immune power, relief joint pains, heart and mental problems, Used in diarrhea and rheumatism with mixing water and alcohol
25.	Food poison, cough and cold, Fever, Indigestion Diarrhea	<i>Coriandrum sativum</i>	Apiaceae	Jangali dhaniya	-	Whole plant, Root, Stem, Seed	Paste of plant is boiled with water, consumed for food poison, dried seed used to control diarrhea
26.	Appetizer, chronic Small pox, to induce menstruation, treat period pains, migraine	<i>Crocus sativus</i>	Iridaceae	Kumkum	Keshar	Flower styles and stigmas	Its paste is applied on wounds. For weak eye sight, a mixture rosewater and Kesar is put in the eyes. Its paste is also used in hepatitis
27.	Urinating, Jaundice, Muscle pain and Coughs	<i>Cuscuta reflexa</i>	Convolvulaceae	-	Akash beli	Seed, Stem	The juice of the plant, mixed with the juice of <i>Saccharum officinarum</i> is used in the treatment of jaundice
28.	Anemia, Diarrhea,	<i>Dactylorhiza</i>	Orchidaceae	Panchaaul/hatijar	Hatijara,	Rhizomes,	Paste of root is applied externally to cuts, wounds and

	Diabetes, Dysentery	<i>hextagirea</i>		a	Anpola kcha	Tubers	burn. Dry or fresh roots consumed with hot water or milk to treat gastritis and intestinal ulcer. Paste of the rhizome is applied on fever, cuts & wounds. . Powder of rhizome sprayed on wounds to control bleedings.
29.	Diarrhea, Intestinal problem, Fever and wound	<i>Delphinium grandifloru m</i>	Ranunc ulaceae	-	Metokj akong	Leaves , Flower	It dries up lymph fluid pus and blood, used with other herbs
30.	Jaundice, Snake bite, Diarrhea, Cough	<i>Delphinium himalayai Munz</i>	Ranunc ulaceae	Alisyo	Atis	Roots	Decoction of root is used in cough, fever and stomach pain. Root juice is also used in snakebite. Root paste is considered as antiseptic properties.
31.	Tooth decay, fever, Body pain	<i>Dhaturo stramoni m</i>	Solanac eae	-	Dhatu o	Seed	Dry fruit, leaves and seed are used in powered form
32.	Anthelmintic, tonic	<i>Dioscorea bulbifera</i>	Urticace ae	Pidalu	Githa	Leaves , Tuber	Tuber are eaten raw form or in boiled way
33.	Dysentery, Gastritis, Piles, Constipation, Jaundice, Tumor, Respiratory problem, cuts and wounds, tonic	<i>Dioscorea deltoidea</i>	Dioscor eacere	Ban tarul	kukurt arul	Rhizo me	Diosgenn in bantarul used in medicine which prevent conception as tablet
35.	Asthma, Altitude sickness	<i>Ephedra sp</i>	Ephedra ceae	-	Salleja ri	Leaves , Stem, Fruit	Leaves and stem powder is taken to control asthma. Ripe fruit is eaten to maintain blood pressure, altitude sickness and indigestion.
36.	Diarrhea, Fever, Urinary and kidney problems, Scabies and skin disease	<i>Equisetum diffusum</i>	Equiset aceae	Horse tail	Che /aakhal ejhar	Whole plant	Root juice given in fever and urinary trouble, plant ash used to treat burns, scabies and skin disease
37.	Cough cold, to check excessive	<i>Fragaria nubicolas</i>	Rosacea e	Strawber ry	Bhuika fal, Bhuina	Leaves , Flower	Used with other herbs. Root paste is used in controlling bleeding, cough & cold. Fruit

	bleeding during menstruation, inflammation of nerves and draw out impure fluid from lungs, used in foot and mouth disease of cattle				inselu	, Fruit	is taken as digestive and laxative.
38.	Cough and cold, Lung disease, Eye disease, Fever Backbone, Joint pain, Swelling of limbs	<i>Geranium pratense</i>	Geraniaceae	Meadow cranesbill	Pallo	Whole plant	Used with other herbs
39.	Common cold, Burn, Menstrual disorder	<i>Hippophae salicifolia</i>	Elaeagnaceae	Tarechuk \Seabuck throne	Chichi, Khurpu, Tora	Fruit	Used in burns from fire, oil, hot water as paste, juice from fruit used in menstrual disorder
40.	Cholera	<i>Hordeum vulgare</i>	<i>Poaceae</i>	-	Barely	Seed	Seed ash of barley, powdered flowers of <i>Calotropis procera</i> , rose water, fruit of <i>piper nigrum</i> and other herbs are taken orally
42.	Anthelminthes, Scabies, ringworm, Joints pain, Swelling	<i>Juglans regia</i>	Juglandaceae	Himalayan walnut	Okhar	Bark, Root Leaves	Bark paste of stem used in joints pains swelling, stem used to brush the teeth, leaves juice in cuts and wounds, roots juice in boils and pimples
43.	Joints pain	<i>Juniperus indica</i>	Cupressaceae	-	Dhupi	Leaves, Seed	Power of dry leaves and berries used as incense, oil used in massaging joints pain. Seed is eaten to get relief from the kidney disorders, cough and cold.
44.	Diarrhea, Dysentery, Stomach	<i>Jurinea dolomiaea</i>	Compositae	-	<i>Dhupjadi</i>	Root	Root juice is used in diarrhea, dysentery and stomach pain.
45.	Lungs and Kidney problem, difficult in urination,	<i>Lycopodium clavatum</i>	Lycopodiaceae	Common club moss	Nagbeli	Whole plant	Use as paste form

	Asthma						
46	Cancer, Liver problem,	<i>Lycopersicon esculentum</i>	Solanaceae	Tomato	-	Fruit	Tomato juice is taken as tonic and eaten raw and in cooked form for Cancer and liver problem
47.	Skin disease	<i>Lyonia ovalifolia</i>	Ericaceae	Angeri	-	Leaves	Use it in Paste form
48.	As tonic	<i>Morchella esculenta</i>	Morchellaceae	-	Guchichyau	Whole plant	Consume by frying, powder is used in cut wound
49.	Colds, Backaches	<i>Myricaria rosea</i>	Tamaricaceae	-	Hombu	Fruit	Antibiotics in animal bite, consume by making paste
50.	Epilepsy, Indigestion, Stomachache, Headache, Ulcer, Common cold, Leprosy, Cholera, Urine problem, Scurvy	<i>Nardostachys grandiflora</i>	Valerianaceae	Jatamasi	Bhutle, Nakha, Balanchad	Root, Stem	Used in the form of oil in skin conditions and is believed to contain anti-aging properties.
51.	Stomach pain, Diarrhea, Gastritis, Toothache	<i>Origanum vulgane</i>	Labiatae	-	Ramtulasi	Leaves, Whole plant	Boiled leave serves as tea and cure for stomach pain, gastritis, diarrhea, toothache
52.	Ascaris, Kidney and Respiratory problems, Indigestion, Gastritis, Loss of appetite, Menstrual pain	<i>Paris polyphylla</i>	Liliceae	-	Satuwa	Roots, Rhizome, Flower	Taking its rhizome with warm water acts as tonic, used as alternatives of diosgenin medicine. Decoction of root is used as anthelmintic and antiseptic. Root paste is applied to cuts & wounds. Root powder is used for fever and sprain.
53.	Menstruation disorder, remove food poisoning	<i>Parmelia nepalensis</i>	Parmeliaceae	Lichen	-	Whole plant	Consume it mixing it with alcohol
54.		<i>Parnassia nubicola</i>	Saxifragaceae	Nirbikha	Pongmar	Root	Roots are grinded with water & apply on wound
55.	Liver problem, Stomachache, Fevers, Jaundice	<i>Picrorhiza scrophulariiflora</i>	Scrophulariaceae	Gentian	Kutki, katuke	Root	3 times taking as juice
56.	Headache, Sooth back	<i>Pieris formosa</i>	Ericaceae		Pore	Flower, Fruit	Leaves and flower nectar may cause severe discomfort if

	and muscle pain			-			ingested, consider as poisons but used in crushed form
57.	Fracture	<i>Pinus roxburghii</i>	Pinaceae	Rani salla	Khote Salla	Resin, Plant tip	Used in blood clotting, bandage in wounds, fracture as plaster
58.	Body pain, Stomachache	<i>Pinus wallichiana</i>	Pinaceae	-	Gobre Salla,	Resin	Resin is employed to treat stomachache and body pain. It is also used to cure snake bite
59.	Constipation, Stomach problem, Snakebite, Insect bite, Uterine bleeding after child birth	<i>Plantago major</i>	Plantaginaceae	Isabagol	Plantain	Leaves, Seed	Taken as tea, douche and wound dressing in battle so also known as soldier's herb. Flower and fruits are used to cure cough and cold, indigestion, diarrhea & dysentery. Root paste is applied in boils, joints, fever and headache.
60.	Cancer	<i>Podophyllum hexandrum</i>	Berberidaceae	May apple	Laghu patra	Root, Fruit, Rhizome	Fruit is eaten to control menstrual disorder, cold and cough. Paste from rhizomes is applied for worms infection and controlling bleeding
61.	Bone fracture	<i>Polygonatum verticillatum</i>	Liliaceae	-	Kerua	Leaves, Branch	Rejoins the fracture joints, green foliage used as nutritive
62.	Breast disease, Stomach, Lungs disorder	<i>Potentilla fruticosa</i>	Rosaceae	Bushcinquefoil	Pemmanakpa	Stem, Leaves, Flower	Used singly or with other herbs, oil used in joint pain, herbal tea to cure different disease
63.	Joints pain	<i>Prinsepia utilis</i>	Rosaceae	Dhatelo		Seed, Fruit	Oil from the seed is applied externally for rheumatism and muscular pain caused by hard work. The heated oilcake is applied as a poultice to the abdomen in the treatment of stomachache. A paste of this seedcake is used as a poultice to treat ringworm or eczema
64.	Sprain	<i>Prunus sp</i>	Rosaceae		Khambu	Seed	Khambu oil used massage in sprain
65.	Joints pain, sprain	<i>Prunus armenia</i>	Rosaceae	Apricort	Chuli	Seed	Oil massage to relief pain
66.	Ulcers, Diarrhea, Epilepsy,	<i>Rheum australe</i>	Polygonaceae	Himalayan	Padamchal	Rhizomes, Root,	Stem consume directly, decoction of root prepared

	Bathrog, Sprain, Bone fracture, Anemia			rhubarb		Leaves and Stem	
67.	Liver inflammation, cough, cold Fever, Bronchitis, appetizer	<i>Rhododendron antopogen</i>	Ericace a	Anthopo gon	Sunpat i	Flower	Ovary of flower is used in inflammation of the liver. Root paste is applied in sprain & fractures. Juice of shoot portion is taken in dysentery and intestinal problems. Petiole consume for appetizer
68.	-	<i>Rosa macrophyle</i>	Malvac eae	-	Jungali gulab	Bud, Flower	Use as gulabjal as rose water for skin problem, juice contain more vitamin C
69.	Jaundice, fever, boils, ulcers, urine infection of children	<i>Rosa sp</i>	Rosacea e	-	Jurri/w ild rose	Flower , Leaves , Fruits	Juice of flower used in fever, boil fruit in jaundice, leaves paste is applied on boils and ulcers, juice extracted from leaves is taken against urine infection of children Juice of Flowers, fruits and stem barks are used in menstrual and lymph disorders. Decoction of leaves is used to wash wounds. Flower paste is taken to treat headache.
70.	Fever, Stomachache, Dysentery	<i>Rubia manjith</i>	Rubiace ae	-	Majith o	Leaves , Root, Flower , Stem	Leaves and root juice use in fever, stomachache and dysentery. Fruit is use to lower body temperature and used as laxative.
71.	Dislocation of bone, Swollen gum, Headache	<i>Rumex nepalensis</i>	Polygon aceae	-	Halyaa , syuiwa a	Young leaves, Roots	Decoction of roots used in dislocation of bone, paste of root used in swollen gum, juice of leaves used for relief of headache
72.	Stomachache,	<i>Selinum tenuifolium</i>	Apiacea ce	-	Bhutke sh/ Gandar ani	Fruit	Used as spices in meat, reduce infection of infectious meat
73.	Gastritis, Indigestion, Skin infections	<i>Tagetes minuta</i>	Compos itae		Jangali Sayapa tri	Whole plant	Oil is used
74.	Cancer, Skin diseases, Bronchitis	<i>Taxus baccata</i>	Taxacea e	Lauth Salla	-	Latex, Leaves	Leaves extract is used in skin diseases and breast, ovary cancer and also used in asthma and bronchitis

75.	Appetite, Stimulant, Blood purifier, Digestive, Gum problem	<i>Thymus linearis</i>	Labiatae	Ghodam archa	-	Leaves, Flower	Used with other herbs, also taken as tea, leaves uses as spices. Leaves juice is used as blood purifier, digestive and appetizer. Young flower is taken to cure gum and toothache
76.	Toothache, Asthma, Skin disease	<i>Urtica dioica</i>	Urticaceae	-	Sisnu	Leaves, Seed, Root	Root juice is drinking in skin diseases and kidney problems. Root extract is used in toothache, asthma and easy delivery, it is taken as juice, Leaves is taken as vegetables
77.	Headache, Eye problem, Sore throat	<i>Valeriana jatamansi</i>	Valerianaceae	Sugandh wal	Samaya, Sugandhabala	Rhizome, Leaves	Rhizome paste is used in headache, sore throat and also taken as tonic. Leaves and rhizome extract is applied in common cold, boils & scalds, eye problems and stomachache
78.	Blood purifier, Infection, Cuts and bleeding wounds	<i>Verbascum thapsus</i>	Scrophulariaceae	Cow's lungwort	Ngo serjedeber	Leaves, Stem and Flower	Used singly or mixed with other herbs
79.	-	-	-	-	Ajaaks herngon	Flower	Use in brain problem, headache, fever, bile and lungs disorder
80.	-	-	-	-	Arksan gala	-	Use to make faint
81.	-	-	-	-	Bhankar (white) and Bhonmor (red)	Whole plant	Use in metallic poisoning, wound by rusting materials
82.	Joints pain, Ribs fracture	-	-	-	Bhasabhuse	Whole plant	Make a ball and then burn in joints or knee. makes skin tight so used in ribs fracture
83.	-	-	-	-	Khiluwala	Bark	Infection control, Use in Bhochu disease (whitish parch below lips)
84.	-	-	-	-	Pipsil	Bark	Use as antibiotics, dressing the wound, bark is boil with water
85.	Jaundice	-	-	-	Serchimento	Whole plant	Daily 7 pellets of it is taken

(Field study, 2010)

5.3. Result and discussion of consensus analysis

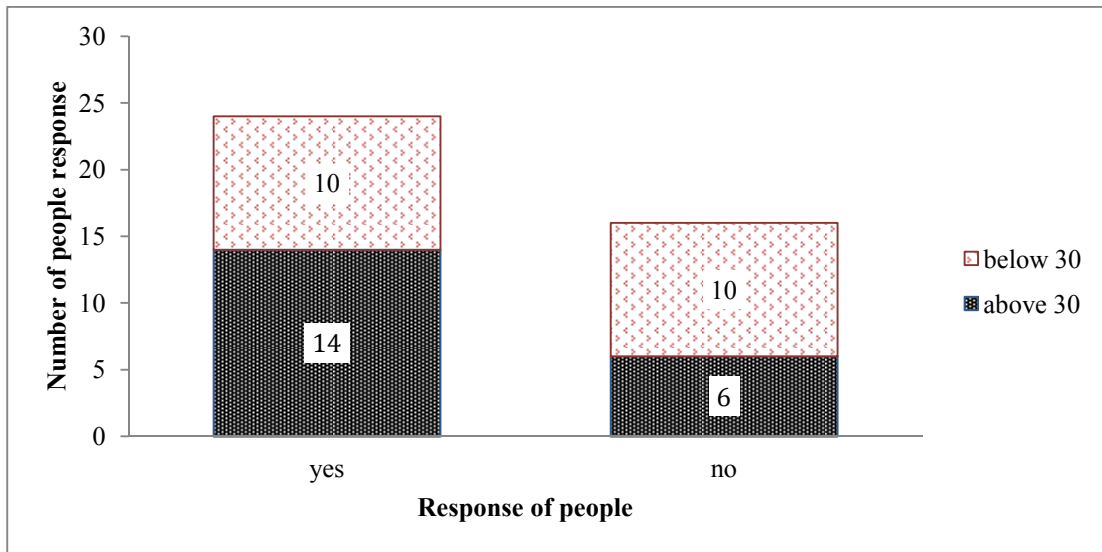


Fig. 5.8. Agreement and disagreement of local people

As analytical tools for measuring the knowledge of people, consensus analysis has both strengths and weakness. Its strengths lie in its quantitative analysis of people's knowledge and beliefs. It allows one to assess in quantitative terms that agree, with whom about, what and to what degree.

On the other hand, consensus analysis is a significant challenge. Careful preparation is needed in designing and carrying out the two phases of fieldwork. The wording of the question must be well thought out in order to capture people's beliefs and knowledge regarding conventional truth and not their personal preferences (Gate wood, 1999 and Horowitz, 2009).

Other challenges for applying consensus analysis revolve around the analysis and interpretation of the results. As pointed out by Garro, (2000) and Handwerker, (2002) the three assumptions of the cultural consensus are highly restrictive. One must ensure that:

- i. There is common culture or domain of knowledge that people in the group share
- ii. The responses of individuals in a group are given independently of others
- iii. All the questions asked are on a single topic and are at the level of difficulty

These are often not met in field research (Garro, 2000). The agreement between local people (similarity of response) is a function of each person's knowledge of the subject matter at least under identical conditions. In my findings among the questionnaire between two different age groups there was no consensus as a whole group or as separate groups, regarding ethnobotanical and conservation knowledge. With Eigen value ratios of less than 3 to 1 recommended cutoff for consensus, the groups did not have a shared consensus regarding these issues while there may not have been consensus, the data suggested that there may be "weak agreement" i.e. a tendency towards agreement but with great variability in beliefs or knowledge (as evidenced by Eigen value ratio of 2 to 2.9 to 1) (Caulkins, 2004).

In my study lack of consensus suggests that one or more of these assumptions as mentioned above were not met or that something else went wrong. Even though the data was collected from independent questionnaires with local people it is likely that the lack of consensus was due to the generation gap of people or people of different ages whom were taken for questionnaires. At present due to modernization and education of people, normally young age people are not much interested in medicinal herbs. They are not using these herbs for different ailments. They are attracted towards allopathic medicine as they are easy to use and easily available in the market and show its reaction faster. Even though some young people know the use or knowledge about medicinal herbs they only know but never have experienced it practically.

However, old age people seem no influences of modernization and development. They are very rich in ethnobotanical knowledge. They are using these herbs for different ailments from their childhood. Despite of modernization and other social changes they are not seem to change. They seem happy in their own life. Therefore, this may be the reason for the disagreement of people about the ethnobotanical and conservation knowledge

CHAPTER SIX: CONCLUSION AND RECOMMENDATION

6.1. Conclusion

Humlis invest huge amount of time and labor in agriculture throughout the year, Government, donor agencies, and NGOs working in Humla have also given more priority and put more money on the improvement of agricultural production even though agriculture has limited potential for improvement due to the harsh climatic condition and rugged geographical terrain. Hence, the study concludes that the cultivation of economically valuable NTFPs species in the unproductive private agricultural land has a greater potential to improve the livelihood in Humla, which does not yet, receive due attention from both government and donor agencies.

The findings of study show Lama People living in upper Humla including Muchu VDC, which is one of the ethnobotanically rich areas. Lama community use different plant resources for food, as firewood, coloring purposes, medicine, timber, pesticides and other various purposes like decoration, fencing, brooming, sticks, washing and other different domestic items.

All together 148 species were identified including 58 known families and 13 families are not identified during my study. Some species still need to be identified scientifically. Lama community depends both on agriculture and animal husbandry for their living they greatly depend on the plants that are not cultivated in their fields. The use of medicine for various ailments with ritual mantras is the application of herbs. So, from the ancient time they are using it for large number of human and animal ailments. Even a single ailment is treated by remedy of various herbs while they have a traditional belief on herbal treatment for this they visit to Amchi (Tibetan doctor). He is the one who is very rich in knowledge of herbal medicine.

According to the study among 148 plant species 17 % are cultivated in the fields, 72 % are available in nearby forest and lekh and remaining 11 % are found both in wild and cultivated form. Among them maximum 71 % of plants are herbs and least 1 % of them are Creeper. In lama community there have a wide range of knowledge on the use of

plants for various purposes 69 % plants are reported to be single use, 23 % with double use and 8 % with triple use. Different plants parts may be used in different purposes among which leaves is abundantly used part for various purposes including 46 species with the use of Latex and plant tip are the least used part only 1. Likewise, on the basis of different purpose of uses the plants in study area is categorized in 8 different groups. That include medicinal plants, edible plants, timber plants, dye plants, plants use to kill pest, plants used in ceremonies, firewood plants, plants used in other purposes. Among which there is maximum 85 medicinal plants and minimum ceremonies used plants and plant used for dyeing purpose, which is with 5 in number.

6.2. Recommendation

Lamas are the indigenous people of upper Humla. They have a very good knowledge of plants species and their uses. This is one of the best technologies in such remote area where there are no facilities of healthcare center. So, the traditional ethno botanical knowledge should be conserved and for this a few recommendation are made

- Cultivation of economically valuable NTFPs on private land should be encouraged.
- Amchi and other traditional healers should be provided with additional training in herbal medicine.
- A complete detail study of “Ethnobotany” should be carried out to disseminate the indigenous knowledge and practices. These knowledge and practices should be verified scientifically as well.
- The forest area of upper Humla should be protected as National park or wildlife conservation area to conserve the natural biodiversity of the area.
- Considering the increasing trade of NTFPs Public awareness about the importance and proper use with conservation of NTFPs is necessary

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APPENDIX: A

Questionnaire for survey of Ethnobotany in Muchu VDC in Humla district, Nepal

Questionnaire sheet

Name of Respondent: Ethnic group:

Age: Address:

Occupation: Date:

1. Do you know about medicinal plants?

Yes [] No []

2. Do you know any medicinal plants found in your area?

Yes [] No []

3. If Yes, What medicinal plants are found and for what they are used?

S.N.	Plants name	Parts used	Used for
1			
2			
3			

4. Do these plants have any ethnomedicinal values in your ethnic group?

Yes [] No []

If yes, How?

5. Have you collected medicinal plants yet? If yes why?

i. For sale ii. For house hold private use iii. Both

6. Have you planted any medicinal herbs in your own field? If Yes, How?

7. What is the major disease that the people suffer about?

8. Which herbs you used for fever?

9. How you treat for headache?

10. For which purpose you used Kutki? i. Liver and lungs problem

11. How you treat for snakebite?

12. Which herbs are used for diarrhea? i. Horse tail

13. What are the herbs used for wound by sharp weapons? i. Pachaule ii. Takshya

14. What you used for cough problem? i. Padampuskar

15. What you do for joints pain? i. Dhatelo ii. Bhasabhuse iii. Dhupiko gedako tel

16. Is there any medicine for menstruation disorder or problem?

17. For which purpose you use Guchi Chyau? i. Tonic ii. Power in cuts wound
18. For what and how you used Yarsagumba? i. Gastric ii. Tonic
19. What are the herbs used for Jaundice?
i. Kutki ii. Kanakali iii. Sae (wild rose) iv. Atis v. Serchimento
20. How you treat for burns by boil water, oil, fire? i. Tarechuk
21. What is the treatment for high blood pressure? i. Silajeet
22. What is the treatment for sprain? i. Khambu oil ii. Chuli oil
23. What is the treatment or bone or ribs fracture?
i. Silajeet ii. Bhasabhuse iii. Keruwa iv. Ranisalla
24. Which herbs you used for Gastric? i. Ghodamarcha ii. Bhasabhuse
25. Which medicine you used for Stomachache? i. Gajarani
26. Which herbs you used for wound by rust weapons? i. Bhankar or Bhomar
27. Is there any herbs used for antiseptic? i. Pipsil
28. What you used for kidney and urine problem? i. Resin of Horse tail
29. What you do during undigestion? i. Ghandharani (Bhutkesh)
30. How you treat during animal bite? i. Hombu

Questionnaire related to conservation

1. Do you know different biological resources of your area?
2. How often you collected these resources or valuable herbs?
3. How you collect these resources or herbs is there any special technique?
4. How you utilize these resources collected by, selling or other household work?
5. In average what amount of resources or herbs you collected in a time or in a Season?
6. Do you know its volume or its condition in environment?
7. Do you have any training regarding harvesting of resources or herbs from any Institutes?
8. Do you think these resources or herbs should be harvested and managed properly?
9. Did you cultivated herbs in your private land?
10. Till today what you practice for conservation of resources?
11. What you think is the main problems of depleting these resources?

12. Do you know the sustainable harvesting of these herbs?
13. Do you have any idea regarding its conservation and management of resources or herbs?

Question for Consensus analysis

1. Do you know various way of using medicinal plants?
2. Can you collect more than 10 ethno botanically important plants?
3. Kutki used to treat liver and lungs problems?
4. Panchaule used for treat wound by sharp weapons?
5. Different plants also use for coloring purpose.
6. Plants use in religious purpose easily available in your area?
7. Yarsagumba is endangering due to business purpose.
8. People collect medicinal herbs only for business purpose.
9. Nowadays must of people depend on allopathic medicine for treatment.
10. Do you know medicinal purpose of Yarsagumba, Kutki?
11. Do you know any herbs used for antiseptic purpose?
12. People collect plants hap hazardously due to lack of knowledge.
13. Did you cultivate herbs in private land?
14. You know more wild edible plants that provide nutrient.
15. Community forest helps to conserve the plant resource.
16. Did you take any training regarding harvesting of resource or herbs from any Institutes.
17. Different project from different NGOs and INGOs help in conservation of resources and public awareness.
18. People used plants to kill the pest.
19. Do you know for which Khambu oil used?
20. Padmachal is used in various ailments

APPENDIX: B

ETHNOBOTANICALLY IMPORTANT PLANTS USED BY THE LAMA COMMUNITY OF MUCHU VDC, HUMLA

S N	Botanical name	Family	Common name	Vernacular name	Parts used	H T	S A	M A	F W	E d	T m	D y	K p	C e	Mis
1.	<i>Abies spectabilis</i>	Pinaceae	Himalayan fir, Birch	Thingre Salla	Leaves, Branch	T	W	X							
2.	<i>Acer cambellii</i>	Aceraceae		Yali	Leaves	H	W	X							
3.	<i>Aconitum ferox</i>	Ranunculaceae	Setobikh/Aconite	Mamud	Young tuber, Roots	H	W	X							
4.	<i>Aconitum sp</i>	Ranunculaceae	Duk	Bikha	Root, Leaves	H	W								X
5.	<i>Aconitum spicatum</i>	Ranunculaceae	Bishk	-	Root, Leaves	H	B	X					X		
6.	<i>Acorus calamus</i>	Acoraceae	Sweet Flag	Bojho	Roots and Leaves	H	B	X							
7.	<i>Agaricus sp</i>	Agaricaceae	-	Thuk Chyau	Whole plant	F	W			X					
8.	<i>Agaricus sp</i>	Agaricaceae	Aunthe Chyau,	Dhu Chyau	Whole plant	F	W			X					
9.	<i>Agaricus sp</i>	Agaricaceae	-	Pyang Chyau	Whole plant	F	W			X					
10.	<i>Ajuga lupulina</i>	Labiatae	Bugle weed	Khangsumetog	Leaves, Flower, Seeds	H	W	X							
11.	<i>Allium carolinianum</i>	Amaryllidaceae	Ban lassun	-	Bulb, Whole plant	H	W	X							
12.	<i>Allium cepa</i>	Alliaceae	Onion	-	Bulb, Green plant	H	C			X					
13.	<i>Allium hypristurn</i>	Amaryllidaceae	-	Jimbu	Bulb, Whole plant	H	W	X		X					
14.	<i>Allium sativum</i>	Liliaceae	Garlic	-	Bulb, Green plant	H	B			X					
15.	<i>Allium sp</i>	Amaryllidaceae	Dino	Taakchya	Bulb, Rhizome	H	W	X							
16.	<i>Allium wallichii</i>	Amaryllidaceae	-	-	Whole plant, Rhizomes, Bulb	H	W	X		X					X
17.	<i>Amaranthus sp</i>	Amaranthaceae	Pigweed	Marshyaa	Dry seed, Leaves	H	W			X					
18.	<i>Anaphalis sp</i>	Compositae	Poittaa	Bukiphul	Whole plant, Flower	H	W								X

19.	<i>Anthogonium gracile</i>	Orchidaceae	Orchid	Jibraa	Root, Leaves, Stem	S	W	X				
20.	<i>Arctium sp</i>	Asteraceae	Pijinchhubo	Jantikuro	Whole plant	H	W	X				
21.	<i>Arisaema flavum</i>	Araceae	Sarpakomakai	Dhowa	Root, Tuber, Flower	H	W	X	X			
22.	<i>Arisaema jacquemontii</i>	Araceae	-	Dhowa, dolo	Root, Tuber	H	W	X	X			
23.	<i>Asparagus racemosus</i>	Liliaceae	Kurilo,	Satawari	Root, Stem, Fruit	H	B	X	X			
24.	<i>Aster asperulus</i>	Asteraceae	-	Tite, Chhyaaman	Fresh root	H	W	X				
25.	<i>Aster strachegi</i>	Compositae	Metog. Lugmig	-	Leaves, Flower	H	W	X				
26.	<i>Berberis aristata</i>	Berberidaceae	Chutro	Kirmudo	Roots, Fruit and Barks	H	B	X	X	X		
27.	<i>Bergenia ciliata</i>	Saxifragaceae	Simpatipakhanve	Dhungephool	Roots, Flower, Rhizomes	H	W	X	X			
28.	<i>Betula utilis</i>	Betulaceae	-	Bhojpatra	Branch, Bark, Timber	T	W	X	X			X
29.	<i>Bistorta affinis</i>	Polygonaceae	-	Rambu	Root, Leaves, Flower, Fruits	H	W	X	X			X
30.	<i>Boehmeria sp</i>	Urticaceae	Lekh Sisnu	Jhhyangсах		S	W		X			
31.	<i>Brassica oleraciavar.capi tata</i>	Brassicaceae	Cabbage	-	Flower, Leaf	H	C		X			
32.	<i>Brassica oleraciavar.botrytis</i>	Brassicaceae	Cauliflower	-	Flower, Leaf	H	C		X			
33.	<i>Brassica rugosa</i>	Brassicaceae	Broad leaf mustard	-	Seed	H	C		X			
34.	<i>Brassica sp</i>	Brassicaceae	Turnip	KohiroChoti	Leaves and Stems	H	C		X			
35.	<i>Capsella bursa</i>	Brassicaceae		Sawale, Chhyaamaa	Root, Stem, Leaf, Flower	H	B		X			
36.	<i>Capsicum annum</i>	Solanaceae	Chilly		Whole plant, Seed	H	B		X			
					Fruit	H	C		X			

37.	<i>Carum carvi</i>	Apiaceae	Bhote Jeera	-	Fruits, Whole plant	H	W	X	X				
38.	<i>Cedrus deodara</i>	Pinaceae	Himalayan Cedar	-	Leaf, Bark, Timber	T	W	X	X				X
39.	<i>Chaerophyllum villasum</i>	Apiaceae	-	Dhaneri	Root	H	W						X
40.	<i>Chenopodium album</i>	Chenopodiaceae	Lamb's quarter	Bethu, Nyooou	Whole plant	H	W		X				
41.	<i>Chlorophyllum orivillionam</i>	Liliaceae	Safedmusli	Setomusli	Tuber, Roots	H	W	X					
42.	<i>Cordyceps sinensis</i>	Hypocraceae	Yarshagumba	Jivonbuti, Sanjeevani	Whole plant	H	W	X					X
43.	<i>Coriandrum sativum</i>	Apiaceae	Jangalidhaniya	-	Whole plant, Root, Stem, Seed	H	W	X	X				
44.	<i>Crocus sativus</i>	Iridaceae	Kumkum	Keshar	Flower styles and stigmas	S	W	X	X				
45.	<i>Cucumi sativus</i>	Cucurbitaceae	Cucumber	-	Fruit	Cl	C		X				
46.	<i>Cucurbita muschata</i>	Cucurbitaceae	Pumpkin	-	Tender shoot, Flower and Fruits	Cr	C		X				
47.	<i>Cuscuta reflexa</i>	Convolvulaceae	-	Akashbeli	Seed, Stem	Cl	W	X					
48.	<i>Dactylorhiza hextagirea</i>	Orchidaceae	Panchaale/hatijar a	Hatijara, Anpolakcha	Rhizomes, Roots, Tubers	H	W	X	X				X
49.	<i>Delphinium denudatum</i>	Ranunculaceae	Nirmasi	Syarokpa	Fruit, Seed	H	W			X			
50.	<i>Delphinium grandiflorum</i>	Ranunculaceae	-	Metokjakong	Leaves, Flower	H	W	X					X
51.	<i>Delphinium himalayai Munz</i>	Ranunculaceae	Alisyo	Atis	Roots	H	W	X					X
52.	<i>Delphinium vestitum</i>	Ranunculaceae	-	Maaurimulo	Flower, Root	H	W						X
53.	<i>Dhaturo stramonium</i>	Solanaceae	-	Dhaturo	Seed	S	W	X					
54.	<i>Dioscora sp</i>	Dioscoraceae	Muga	Tuk	Tuber	H	W		X				
55.	<i>Dioscorea</i>	Urticaceae	Pidalu	-	Leaves, Tuber	H	W	X					

91.	<i>Pamassia nubicola</i>	Saxifragaceae	Nirbikhar	Pongmar	Root	H	W	X						
92.	<i>Phaseolus vulgaris</i>	Leguminosae	Kidney bean	Simi	Elongated legumes (pod), Dry bean	Cl	C		X					
93.	<i>Picea sp</i>	Pinaceae	Spruce	-	Timber	T	W			X				
94.	<i>Picrohiza scrophulariiflora</i>	Scrophulariaceae	Gentian	Kutki, Katuke	Root	T	W	X						
95.	<i>Pteris formosa</i>	Ericaceae	-	Pore	Flower, Fruit	H	W	X					X	
96.	<i>Pimpinella sp</i>	Asteraceae	Duneri	-	Whole plant	H	W		X					
97.	<i>Pinus roxburghii</i>	Pinaceae	Rani salla	Khote Salla	Resin, Plantip, Timber, Branch	T	W	X	X					
98.	<i>Pinus sp</i>	Pinaceae	Salla	-	Roots, Leaf, Branches	T	W							X
99.	<i>Pinus wallichiana</i>	Pinaceae	-	GobreSalla	Resin, Timber	T	W	X		X				
100.	<i>Plantago major</i>	Plantaginaceae	Isabgol	Plantain	Leaf, Seed	H	W	X	X					
101.	<i>Podophyllum hexandrum</i>	Berberidaceae	May apple	Laghupatra	Root, Fruit, Rhizome	H	W	X	X					
102.	<i>Polygonatum verticillatum</i>	Liliaceae	-	Keruwa	Leaves, Branch	H	W	X						
103.	<i>Parmelia utilis</i>	Parmeliaceae	-	Lichen	Whole plant	F	W				X			
104.	<i>Potentilla fruticosa</i>	Rosaceae	Bushcinquefoil	Pemmanakpa	Stem, Leaves, Flower	S	W	X						
105.	<i>Prinsepia utilis</i>	Rosaceae	Dhatelo	-	Seed, Fruit	S	W	X						
106.	<i>Prunus armenia</i>	Rosaceae	Apricort	Chuli	Seed, Fruit	S	B	X	X					X
107.	<i>Prunus sp</i>	Rosaceae	-	Khambu	Seed	S	B	X						
108.	<i>Quercus lanuginosa</i>	Fagaceae	Banjh	-	Timber, Branch	T	B		X					
109.	<i>Quercus semicarpifolia</i>	Fagaceae	Khasru	-	Timber, Branch	T	B		X					
110.	<i>Quercus sp</i>	Fagaceae	Oak		Timber	T	B						X	
111.	<i>Ramaria botrytis</i>	Gomphaceae	Sasilchyaau	Nangrechaau	Fruit	F	W		X					

130.	<i>Thymus linearis</i>	Labiatae	Ghodamarcha	-	Leaves, Flower	H	W	X	X				
131.	<i>Triticum aestivum</i>	Poaceae	Wheat	Ganhu	Grain	H	C		X				
132.	<i>Tsuga dumosa</i>	Pinaceae	Thigre Salla	-	Branch	T	W		X				
133.	<i>Urtica dioica</i>	Urticaceae	-	Sisnu	Whole plant	H	W	X	X				X
134.	<i>Valeriana jatamansi</i>	Valerianaceae	-	Sugandhwal	Rhizome, leaves	H	B	X					
135.	<i>Verbascamthapus</i>	Scrophulariaceae	Cow's lungworth	Ngo Serje Deber	Leaves, Stem, Flower	H	W	X					
136.	-	-	-	Ajaaksherngon	Flower	H	W	X					
137.	-	-	-	Arksangala	-	H	W	X					
138.	-	-	-	Bhankar (white) and Bhonmor(red)	Whole plant	H	W	X					
139.	-	-	-	Bhasabhuse	Whole plant	H	W	X					
140.	-	-	-	Chiriko	Whole plant	H	W		X				
141.	-	-	-	Gajarani	Stem	H	W		X			X	
142.	-	-	-	Gholemedu	Whole plant	H	W					X	
143.	-	-	-	Khiluwa	Bark	T	W	X					
144.	-	-	-	Marmal	Leaves, Whole plant	H	W					X	
145.	-	-	-	Pipsil	Bark	T	W	X					
146.	-	-	-	Serchimento	Whole plant	H	W	X					
147.	-	-	Fatfate	Syaaurakpaa	Seed	S	W						X
148.	-	-	Pate Jhhulo	Taa	Leaves	H	W						X

HT - Habit of plants, SA - Source of availability of plants, Md - Medicinal plants, Fw - Plants used as firewood, Ed - Edible plants, Tm - Timber plants, Dy - Plants used as dye purpose, Kp - Plants used to kill pest, Ce - Plants used for ceremonial purpose, Mis - Plants used in other different purposes, H - Herbs, S - Shrubs, T - Tree, F - Fungus, W - Wild, C - Cultivated, B - Both, Cl - Climber, Cr - Creeper

APPENDIX: C
ETHNOBOTANICAL KNOWLEDGE AND CONSERVATION OF PLANTS

SN	Question/Statement	People above 30	People below 30
1.	Do you know various way of using medicinal plants?	Yes	No
2.	Can you collect more than 10 ethno botanically important plants?	Yes	No
3.	Kutki used to treat liver and lungs problems	Yes	Yes
4.	Panchaule used for treat wound by sharp weapons	Yes	Yes
5.	Different plants also use for coloring purpose.	Yes	No
6.	Plants use in religious purpose easily available in your area?	No	Yes
7.	Yarsagumba is endanger due to business purpose.	No	Yes
8.	People collect medicinal herbs only for business purpose.	No	Yes
9.	Nowadays, must of people depend on allopathic medicine for treatment?	No	Yes
10.	Do you know medicinal purpose of Yarsagumba, Kutki?	Yes	Yes
11.	Do you know any herbs used for antiseptic purpose?	Yes	No
12.	People collect plants hap hazardously due to lack of knowledge	Yes	No
13.	Did you cultivate herbs in private land?	No	Yes
14.	You know more wild edible plants that provide nutrient.	Yes	No
15.	Community forest helps to conserve the plant resources.	Yes	No
16.	Did you take any training regarding harvesting of resources or herbs from any institutes	No	No
17.	Different project from different NGOs and INGOs help in conservation of resources and public awareness.	Yes	No
18.	People used plants to kill the pest.	Yes	Yes
19.	Do you know for which Khambu oil is used?	Yes	Yes
20.	Padmachal is used in various ailments?	Yes	No

(Field study, 2010)

APPENDIX: D

FESTIVAL CELEBRATED IN HUMLA

Rinchenling Gompa

SN.	Name of festival	Celebration time (Month/Days)	Reason of celebration
1.	Kun Dig	1 st	Monks recite the mani prayer in the Gompa, for 9 days and 9 nights then offer special prayers to the central statue in the Ding room. Followed by 2 weeks of prayers for those away from home
2.	-	2 nd	Rituals and prayers
3.	Sejung Metupa	3 rd / 10 th -16 th	Prayers to celebrate moving the responsibility of organising prayers for the next year to a new person
4.	Dunjang Chambo	3 rd / 7 th -15 th	Just before sowing the crops masked dances and plays are performed to hope for a good growing year
5.	Kurby Tucheng	4 th / 25 th	Display of the thanka of Kyorpar Lama above the Gompa steps. It is the height of the Gompa
6.	Kangur	5 th	After the first weeding. The women invite the men to drink and dance to celebrate
7.	Chumbee Dunjang	7 th / 10 th -13 th	Just before starting to water the fields
8.	Marriages	9 th	The 'Marriage Month'
9.	Dunjang	10 th / 3 rd -4 th	Celebration before the departure of some villagers to work away
10.	-	10 th / 24 th	Monks expected back at the Gompa for winter rituals
11.	Nara	10 th / 25 th	Puja by all monks
12.	Goodorr Puja	10 th / 26 th -29 th	Special Gompa puja. Butter cake offerings are made to dispel evil spirits
13.	Losar	11 th / 1 st -3 rd	New Year celebrations
14.	Nara Konshak	11 th / 4 th -6 th	Puja in Gompa
15.	Sorlga	11 th / 6 th -7 th	Prayer for health and well being of those away from the village
16.	-	11 th / 8 th -10 th	Monks visit every household offering prayers
17.	Rimju	12 th	10 th -17 th day: regular dances, prayers, rituals. Flagpole is erected with new flags amidst offerings

			and prayers. 18 th day: people are assigned masks and start practising dances 27 th -29 th : main dancing / celebration of Rimju
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Til Gompa, Dongark Chuling

SN.	Name of festival	Celebration time (Month Days)	Reason of celebration
1.	Dunjang	1 st / 8 th -9 th	Celebration of the deities. Offerings made, prayer flags changed
2.	Dunjang	2 nd	To celebrate the safe return of those who have been working away from home.
3.	Dunjang	10 th	End of harvest; departure of some villagers to work away
4.	Losar	11 th / 1 st -3 rd	New Year celebrations
5.	Rinju	11 th / 27 th -29 th	To protect against bad spirits and bad health
6.	Dunjang	12 th / 28 th -29 th	In support of Rimju in Halji

Pfelgling Gompa in Jang

SN.	Name of festival	Celebration time (Month Days)	Reason of celebration
1.	Tuila	1 st / 8 th	Puja for good fortune for those travelling away from home
2.	Kungur Dunjan	6 th	After the crops are sown
3.	Chumber Dunjan	7 th / end of month	After irrigation is complete
4.	Yalung Dunjan	8 th	For men only – prayer for those going to work away from home.
5.	Rimju	10 th	Monks do puja at the Gompa
6.	Losar	11 th / 1 st -3 rd	New Year celebrations

(Source : www.thegreathimalayatrail.org)

APPENDIX: E

PHOTOS OF FIELD STUDY AND ETHNOBOTANICALLY IMPORTANT PLANTS



1. Group discussion in Yangara Village



2. Questionnaire with older people



3. Interview with local people.



4. Herbs collection on the way to Yari.



5. Myself with Amchi Mr. Jamyamphal Lama



6. Group discussion in Baltakshya lekh



7. Chuli (*Prunus species*)



8. Horse tail (*Equisetum diffusum*)



9. Kutki (*Picrorhiza scrophularianiflora*)



10. Padmachal (*Rheum australe*)



11. Padampuskar (*Iris decora*)



12. Ghodamarcha (*Thymus linearis*)