

# 1. INTRODUCTION

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## 1.1 General Background

Nepal is a country of great natural diversities rich in fauna and flora upon which nature has also bestowed the glories and grandeurs of enchanting scenery presented by green forests and a panorama of high mountains and ever flowing rivers.

Nepal is not only endowed with rich and varied biodiversity but also with scenic splendors and a mosaic of ethnic groups with their rich religious and cultural heritage (Majpuriya, 2006). Such majestic content of biodiversity has been traditionally used by the people for their sustenance, which implies to the fact that nature and human beings are interdependent components of this universe.

Traditional knowledge and practices, acquired by the local ethnic people and inherited from their ancestors, utilize the natural resources widely and wisely for various purposes, e.g. animal and plant products as food, medicine, construction material, clothes, fuel energy, etc.

Medicinal plants, Ayurved and Himalayas are intertwined in a very special manner, and Nepal, located right in the centre of the Himalayan region, has a special significance. Medicinal plants are used in traditional rural remedies, Ayurveda, Homeopathic medicines, and many of them are also included in allopathic medicines.

The resource-strained health services of Nepal, further complicated by unbated population growth, are said to serve only 15% of the 26 million population of the country, giving only this small minority access to modern health facilities. A large section of the population—mainly the rural people—still depend on primitive care such as rational Ayurved, or herbal practitioners. The use of locally available medicinal plants in the healthcare system of people in remote areas is one way to account for their long life span.

Herbs used for medicinal purposes may be traced back as far as the Vedic period from 4500 BC to 1600 BC. Ayurveda, the science of life in Hinduism, remains the main source of medicinal knowledge and skill in most parts of South Asia, including Nepal. The Department of Medicinal Plants has already published the book "Medicinal Plants of Nepal" in 1970, which included 393 medicinal plants. It was supplemented by another volume in 1984 with an additional 178 species of plants (HMGN Nepal, 2001). Malla and Shakya (1984-85) compiled a list of 630 species of medicinal plants from Nepal out of which 510 species are indigenous. Chaudhary (1998) reported approximately 1000 species of medicinal and aromatic plants in Nepal.

Nepal is a land of great attitudinal and ethnic diversity. The "National Foundation for Development of Indigenous Nationalities Act 2058 (2002 AD)" has identified 59 ethnic groups as indigenous groups of Nepal. In Nepal, more than 700 species of medicinal plants used in traditional medicine practices were recorded in the past, and currently 103 species are reported (Tiwari 1999). Many ethnic groups with different customs and languages are residing in this beautiful garden of nature with mutual support and co-operation. Different indigenous group have their own understanding of diseases, practices of indigenous knowledge and use of medicinal plants, minerals, animal parts, and technologies for preparation of drugs, which are highly influenced by their own culture and religion. People have strong belief and faith in the traditional medicinal system, which includes Ayurveda, Amchi, Homeopathic and others. Use of resources in the traditional pattern depends on the availability of plants and animals in the area of their inhabitation so indigenous knowledge may vary, even among the same ethnic group, on the basis of geographic variation. In the alpine and sub alpine region of Nepal the traditional practices are highly influenced by Tibetan medicine because of common culture, religion, language and ethnicity in Tibet and the northern region of Nepal where the healers are known as Amchis. The same task in the temperate region is performed by Dhamis and Jhakris, and in the tropical region such healers are known as Guruwa, Bharua and Gurau (Rajbhandary 2001).

A large percentage of the population is still dependent on these practitioners. Basically they follow some ethnotraditional tantrik, spiritual and Ayurvedic knowledge. However, they are not included in the official system of health care services. They are well known by different names in different communities. Such traditional practice has helped to address a broad range of health problems with locally available resources. There is potential for this traditional medicine to make significant contributions in the areas of, Health service, Drug innovation, Technology development, Economic growth, Greater utilization of local resources.

Conservation of this knowledge and practice is highly important since exclusive reliance on the formal western system of medicine has been recognized as an inadequate solution to the problems of health care delivery, and there is no doubt that health is a fundamental right of every human being. But this knowledge and practice are also threatened by lack of conservation practices and a move of younger generations to modern medicine, and therefore, the loss of traditional, often undocumented knowledge. Integration of traditional medicine into national health care, with maximum utilization of local resources and knowledge in sustainable manner, can definitely contribute most. So the present research work is a small effort to document such content of traditional practice of indigenous knowledge in the Limbu ethnic community of Khejenim VDC of Taplejung district.

There are no reliable government statistics relating to the Limbu population at present, but according to the census of 2058 B.S. (2001, AD), the total population of

Nepal is 2,31,51,423, and out of it 3,59,379 is the population of Limbu which constitutes 1.58% of the total population. According to Bista (1987), among Kiratas, the Limbu culture is second in size to the Rais. Like their Rai cousins, the Limbu have a geographical area traditionally considered their own called pallo Kirat (far Kirat), or even more commonly, just Limbuwan, 'the land of Limbus'. They are the predominant people in Limbuwan. Limbuwan includes the furthest area of the Arun River, extending to Nepal's eastern border with India's west Bengal. In contrast to the larger Majh Kirat of the Rai, the Limbu areas are relatively confined. The districts represented in whole or in part in Limbuwan include Terhathum, Sankhuwasava and Dhankuta in Koshi Zone and Taplejung, Panchthar and Ilam in Mechi zone. Besides this area and there are small groups of Limbu people spread via migration to other districts of the Terai like Jhapa, Morang and Sunsari.

## **1.2 Traditional medicine in Nepal**

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. TM includes diverse health practices, approaches, knowledge and belief incorporating plant, animal and mineral-based medicines, as well as spiritual and manual techniques and exercise, applied singularly or in combination to maintain well being, as well as to treat, diagnose or prevent illness. A significant portion of the population is still dependent on the traditional practitioners. Basically they follow some ethno-traditional tantrik spiritual and ayurvedic knowledge. Although they are not included in the official system of health care system, they are well known by various names in different communities. In most of the communities the mode of preparation and uses of traditional medicinal plants and animals as medicines are highly influenced by folk customs and cultural habits, social practices, religious beliefs and superstitions of the people who prescribe them. Since the practices have been a kind of tradition for people living in remote areas, they are known as traditional medicine. Its preparation and use depends on the accessibility of plants and animals. Most of the people prefer such medicine due to its accessibility, low cost and cultural acceptability.

## **1.3 Indigenous People and the Traditional Knowledge System**

Nepal is a sovereign country with only 0.1% of the world's land, but extremely rich in biodiversity and natural resources due to its diverse geography, ecosystems and cultures. Each native society, with its cultural identity, bears a long historical attachment to its geographical location and biodiversity. With distinct language, religion, custom, folklore, cultural knowledge and ancient territory, 59 indigenous nationalities are legally recognized and have formed Nepal Federation of Indigenous Nationalities (NEFIN) as an umbrella organization (Nepal Indigenous Preservation Association, 2005).

Nepalese indigenous nationalities are excluded from the mainstream of national policies, and have been legally parted from their ancient natural heritage, biodiversity, ethnobiology, foods, medicines, agro-biodiversity, skills, and knowledge of technology, customary law/lore/practice/values, traditional ethnics and sacred sites. Indigenous peoples are contributing their own cultural wisdom on restoration, conservation and wise use of biodiversity, natural resources, and traditional knowledge associated with their life from millennia.

Nepalese indigenous people are residing on different geographic belts with traditional lifestyles that have been closely attached with ecosystem, biodiversity, natural resources and environment for milenia. Indigenous societies bear dynamic ancient epistemology, wisdom, knowledge, skills, technologies, indigenous or cosmological beliefs, folklore, customs, and oral tradition associated with nature, earth, biodiversity and natural resources. In this tradition, biodiversity and natural resources are considered valuable.

Natural resources provide food, medicine, vitamins, minerals, threads, and building materials as well as ritual, intrinsic, spiritual, religious and cultural significance to the society. Biodiversity and natural objects and archaeological symbols are sacred objects, places bear religious, cultural and aesthetic value in the societies. Such biocultural heritages and identities of indigenous peoples need to account in national legislation and have international levels of rights. Since Nepal is a geographically diverse country and consists of a broad range of communities, it is obvious that all these communities have some amount of traditional knowledge. Because of the large number of communities, there has not been any broad research for the documentation of such knowledge. The traditional knowledge system mentioned by Nepal Indigenous Nationalities Preservation Association (NINPA) is a small fraction of the combined traditional knowledge of the communities. This documented knowledge includes:

- Use of grounded pulp of khira leaf to kill common pests of wheat like stem borer (*chillozonellis*). Such practice is done in remote areas by indigenous people (NINPA).
- Ploughing fields approximately fifteen days before plantation so that exposure of ploughed land to the sun will kill the weeds.
- A typical community-level traditional knowledge of the Himalayan people is 'Singi Nawa'. This means to ask someone before cutting any tree or woods. This custom is practiced in the Sherpa communities of the Himalayas where they ask their leader before cutting any trees or wood. Because of this, people maintain their discipline and do not cut at any time. In the long run, this conserves the forest.
- Using Syosim for acclimatization. Syosim is a kind of medicine prepared from milk. It is used by Himalayan people for the treatment of altitude sickness.

- Kwati (mixed cereal soup) is prepared by Newari people during Janai Purnima. Kwati is a kind of soup prepared by the mixture of many types of beans and lentils, which contains a lot of vitamins and is a healthy diet for the body.
- Use of simrik crimson as a medicine for injuries and bone fracture is also a good example of traditional knowledge practice.
- Herbs like pongmar and Yarsagomba are used as medicinal tonic. Pongmar is given to the people who have been poisoned. It is believed that pongmar cuts poison whereas Yarsagomba is used as energy tonic. Both are Himalayan herbs.
- Animal husbandry and crossbreeding of animals are also traditional practices. At the same time, the use of animal dung as an alternative source of fuel is a good example traditional knowledge acquired by the communities.

Although the traditional knowledge used by indigenous peoples has been found to be very useful and effective, it has still been neglected by the world. Traditional knowledge suffers from many threats, including the environment, urbanization, globalization, etc.,. Therefore, different awareness programmes regarding the existence and importance of traditional knowledge of indigenous peoples should be launched through media publications and electronic means. In addition, effective measures should be implemented to recognize, respect, protect and maintain traditional knowledge through NGOs, INGOs, GOs, customary laws of indigenous communities and ratified conventions.

#### **1.4 Justification**

The use of traditional medicine and medicinal plants and animals in most developing countries as a normative basis for the maintenance of good health has been widely observed.

In a developing country such as Nepal, where the major portion of the population is residing in rural and tribal areas that have their own cultural specific medical heritage, it is probably advisable for policy makers and health care planners to reside for a while in these areas to combat the resistance to the setting up of health care programs that is often met. When local people shift to using synthetic medicines, healing traditions are eroded, and traditional knowledge is lost in the process. It is thus important to document and understand the medical heritage of a changing culture before it is lost entirely to future generations.

Nepal is a country with ethnic diversity. 59 indigenous groups are recognized in the country. The ethnic Limbu community accounts for 1.58 percent of the total population of Nepal. They are found mostly in the hilly areas such as Ilam, Panchthar, Dhankutta, Sankhuwasava and Taplejung. These places are highly enriched with the traditional knowledge and practice of the Limbu ethnic community. They have their own special skills and techniques on the utilization of natural resources for traditional healing purposes. Due to the lack of easy access for these people to modern health

facilities, such use of plants and animals plays a key role in primary health care. In rural areas, however, no attempt has been made from the government level for the documentation of such precious knowledge prevalent in the ethnic communities.

This wealth of ethno-biological knowledge persists, and is being transferred, to the next generation in some areas in Taplejung, in a country where this is often not the case. Large populations in rural communities still practice traditional healing using plants and animals found in the local periphery.

Limbus indigenous knowledge and its practices seem un-recognized by the national government and it is at risk of extinction. Loss of plants and animals due to induced human impacts, like habitat destruction, deforestation, and lack of conservation ideas, are the major causes of such extinction. Loss or disappearance of traditional knowledge, particularly from indigenous peoples, is rapidly occurring due to the encroachment (intrusion) of state and market forces and the decease of elders carrying that knowledge. Once lost, orally based knowledge cannot be retrieved, so such knowledge must be preserved and properly documented before it is lost. Thus the present study is the initiation for documentation of such contents for Limbus in Khejenim V.D.C. of Taplejung District of eastern Nepal.

## **1.5 Objectives of study**

- To provide general information and ethnography of Limbus of the study area.
- To explore and document the indigenous knowledge system and practices among Limbus of the study area.
- To document the animals and plants, and their parts used by Limbus in traditional therapy.
- To find out and document the local knowledge on the management of medicinal plant and animal species in the Limbu community of the study area.
- To explore and document the importance of the indigenous knowledge system and its preservation.

## **1.6 Limitations of the study**

- The present research is limited to the utilization, management and protection of natural resources by Limbus using traditional knowledge in Khejenim VDC of Taplejung District in eastern Nepal.
- It has been conducted for the partial fulfillment of the requirements for the Masters Degree in Zoology at Tribhuvan University, Kathmandu, Nepal. It was accomplished within a year and an elaborative study was not possible.

- The researcher had no advanced electronic equipment and experience in social research, so the work may have some methodological and technical limitations, as well as limitations in documentation.
- People of the targeted community had no experience of sharing indigenous knowledge. It was therefore difficult to get knowledge which is only passed down to new generations of healers.
- The whole study/research was focused on the Limbu people of Khejenim VDC, Taplejung District of Nepal, so the outcome from this study area may not be generalized to all parts of Nepal or other countries.

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## 2. LITERATURE REVIEW

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The reliance on and easy access of people to the locally available resources to use as medicine by applying their own traditional indigenous knowledge is significant in remote areas. There are several records of plants, along with their medicinal values and uses, listed through research, but only limited work and research has been done on animals, and their detail study and explanation is still lacking. A brief literature search of plants and animals used for traditional medicine practices is presented here.

Manandhar (1990) carried out his study on Danuwars of Siwalik Hills and documented 60 different plant species which have been used in the folk medicinal practice for the treatment of common diseases. He carried out an ethnobiological research on the traditional medicine practiced among Chepang, Magar, Tamang and Hayu communities from different villages of Chitwan District. He documented 74 medicinal plant species that have been used by the local people for curing 24 different diseases. Manandhar (1991) carried out his study of Tamangs of the midlands and recorded 950 different plant species that have been used for curing a variety of common diseases and disorders. Rijal (1994) conducted his research work on the ethnobotany of Padmapur VDC and the surroundings of forest lands northeast of Chitwan National Park. He documented 185 species of plants with medicinal value, which have been used in the treatment of 126 different diseases. He also documented the indigenous knowledge of people residing in those localities on the use of plants for medicine, fuel wood, fodder, handicrafts, ceremonial and cultural use, by using different techniques. Manandhar (1995) carried out his study on different medicinal plants used by the people in ten villages of Jajarkot District. He reported 60 different species of plants used for treating 25 diseases.

Chhetry (1996) carried out her study on ethnobotany of the Limbus of Panchther District and recorded 162 species of plants with their medicinal and economic values. Adhikari (1996) carried out his study on impacts of some local plant extracts upon mortality and control of aphid (*Lipaphis crysimi*). The host plant selected from 7 different plant species was experimented with. The plants used for extracts were, *Adhatoda vasica*, *Artemesia vulgaris*, *Crysanthemus morifolium*, *Melia azedarach*, *Nicotiana tobacum*, *polygonum hydropiper* and *sapium insigne*. Adhikari (1997) carried out his study on indigeneous healing practices among Tharus of Amrai village of Narayanpur VDC, Dang District. He recorded 34 ailments treated with different species of plants using 1 traditional indigenous knowledge.

Dhakal (1997) carried out an ethnobiological study of the Kumals of Taranagar VDC, Gorkha District, and reported 58 plant species that have been used in



the folk medicine for common diseases like fever, cough and cold, headache, dysentery, minor cuts, etc. Kaundinya (1998) reported 47 species of animals and 195 species of plants used by the Kumal people of Chirtungdhara VDC of Palpa District. Tamang (2003) carried out his study on ethnobiology of Tamangs of Gorsyang VDC of Nuwakot District. He reported that among 183 plant species and 31 animal species used by the local Tamangs of the study area for various purposes, 44 plant species and 5 animal species have been used in folk medicine. Upadhyaya (1999) carried out his study on ethnobiology of Botes (Majhi) in Chhamdighat, Bamgha and Juhang VDCs of Gulmi District and documented diverse uses of 58 animal species and 214 plant species among those people. He reported that the animal and 42 plant species have been used by the Botes in folk medicine for curing different ailments like rheumatism, cough and cold, dysentery, cuts and wounds, bone fracture, etc.

Basnet (1998) carried out his study in 13 VDCs of Sindhuli District where different ethnic groups like Nepali, Tamang, Magar, Danuwar, Newar, Sunwar, etc. reside. He conducted interviews with 101 households using an open-ended questionnaire and 81 key informants' interviews to explore the indigenous health care practices among these peoples. During his study he documented 102 medicinal plant species belonging to 59 families and 92 genera used in traditional medicine by these local people for curing diseases like ear, nose and throat problems, respiratory disease, trauma, jaundice, skin diseases, etc. His study revealed that among the lower castes, the faith healing system (Tantra/Mantra) was more common, whereas among higher caste people, herbal treatment was in practice. Bohara (1998) documented 25 medicinal plant species from 5 VDCs of Bajhang District used by 50 local healers (Dhami's/Jhankri's vaidhyas) for curing different ailments like asthma; bronchitis, body pains, blood purification and dysentery. In addition, he carried out phytochemical screening of medicinal plant species that revealed the chemical constituents of plants. Manandhar (1998) has documented a total of 47 species of plants used for the treatment of 17 types of diseases among the Raute community of Ampani and Rajaura villages of Dadeldhura District. He recorded 15 new plants species in his study, which were unrecorded from other parts of the country.

Ghimire (1999) conducted a study on status, use, sale and conservation of medicinal and aromatic plants in the Nepal Himalaya. He reported 223 species of medicinal plants involved in trade from all development regions of Nepal. Ghimire et al. (1999) conducted an ecological study of some high altitude medicinal and aromatic plants in the Gyasumdo Valley of Manang District, Nepal. The study was focussed on the five most popular high altitude medicinal and aromatic plants (MAP) found in the Gyasumdo valley—*Aconitum orochryseum* (Nirmasi), *Dactylorhiza latgireia* (panchaunle), *Nardostachys grandiflora* (Jatamasi), *Picrorhiza scrophulariflora* (Kutki) and *Rheum anstrale* (Padmachal).

Dangol (2000) carried out an ethnobiological study of the Hayu community of Ramechhap District and reported 22 plants and 21 animal species used in the

locality for various purposes. Ghimire (2000) conducted an ethnobiological study among the Danuwars of Deuvumi Baluwa VDC of Kavrepalanchowk District and reported 7 animal species having medicinal utility, including two mammals, one amphibian, two aves, one mollusca and one arthropoda. Similarly, 37 species of medicinal plants were used in traditional medicine among the Danuwars of the study area. Kafle (2000) documented the indigenous uses of 60 animals and 205 plant species among the Tharu community of Gardi VDC of Chitwan District in his ethnobiological study. Among those species, he reported that 11 animal species and 36 plant species have been used by the Guruwa and other local healers for the home remedy of different illnesses like fever, rheumatism, typhoid, asthma, and many more, by using their indigenous knowledge system. Manandhar (2000) conducted an ethnobiological study of Chepangs of Makwanpur District. He reported 354 plant species and 127 animal species used by the local Chepangs of the study area for various purposes. Among the recorded species, 121 plant species and 33 animal species have been used in their folk medicine.

Shrestha et. al. (2000) published a data base of medicinal and aromatic plants of Nepal. They have documented 1624 species of medicinal and aromatic plants of Nepal, in wild or cultivated state, belonging to 938 genera and 218 families along with their ethno botanical information.

IUCN (2000) published a book called National Register of Medicinal Plants in Nepal. 150 different medicinal plants, with their scientific information, medicinal use and sites of availability are explained in the book.

Chaudhary (2001) documented 183 species of medicinal plants used among the Tharu community of Bachhauli VDC of Chitwan District using their indigenous knowledge. Karki (2001) reported 75 species of medicinal plants belonging to 45 families and 68 genera used by the people of Ugrachandi and Tukucha VDC of Kavrepalanchowk District using their traditional knowledge. These different plant species were used for curing 51 diseases.

Ghimire, et. al. (2000) carried out a study on plant resource use and human impact around Bardia National Park, Nepal. They have documented the botanical knowledge of the Tharu people living at the South Western part of Bardia National Park. The participatory rural approach technique was employed to gather information. The forest areas used by the local people around the park were surveyed. The local people have rich knowledge about the use of plants found in the park and adjoining forests. A total of 189 species of plants were documented under 11 use categories. The highest number of plant species was used for medicinal purposes. Lama et.al (2001) have published a book on medicinal plants of Dolpa, emphasizing the Amchis' knowledge and conservation. Indigenous knowledge of Amchis on classification of medicinal plants according to their morphological features, taste and potency has been documented in the book. Among the 407 species recorded so far from Shey Phoksundo National park and its buffer zone, a total of 100 medicinal plants have

been listed, along with their lifecycles, biology and ecology, including distribution, size and vigour of population and the harvesting practice. The indigenous use of these medicinal plants for curing myriad diseases has been reported in the book. Ghimire and Thomas (2002) recorded 529 species of medicinal plant species from Shey Phoksundo National Park of Dolpa. They reported that about 94.3% of the total medicinal plants recorded have been used in traditional medicine by the Amchis for curing more than 50 ailments.

Gurung (2002) carried out her study on the medicinal practice using local plants among Gurung, Kami, Sarki, Pariyar, Chhetri, Bhujel etc. of Chitre VDC, Parbat, and Bahadure VDC, Kaski. She documented 83 medicinal plants species belonging to 51 families and 77 genera used by them for curing 52 different ailments. Shrestha and Shrestha (2002) reported 200 species of medicinal plants used by the local people of Langtang National Park in Rasuwa District of central Nepal. The plants recorded have been used in traditional medicine practices for curing more than 35 types of disease.

Rai (2003) carried out his study on the medicinal plants of Tehrathum District, Eastern Nepal. Tehrathum district was found to be rich in medicinal plants. A total of 105 vascular plants were reported to be used in the treatment of different diseases. Information was collected by discussion with local communities and field observations. Some plants were found to be used for different diseases in different places.

Gurung (2003) carried out his study in three VDCS of Tinjure area of Terhathum District, and reported 32 species of medicinal plants belonging to 25 families used by the local people using their traditional knowledge. Balami (2003) reported 119 species of medicinal plants used by the local people of Pharping for the treatment of 35 types of disease.

Devkota and Karmacharya (2003) reported 101 medicinal plants used by the people in Gwallek VDC of Baitadi District for the treatment of 70 diseases, using their own indigenous knowledge. Panthi and Chaudhary (2003) documented 101 different plant species which were used in the treatment of 56 different diseases in Arghakhanchi District,. Shrestha and Dhillion (2003) reported 58 plant species belonging to 40 families, used to cure 113 different disorders in Bouch VDC of Dolkha district.

Shrestha et. al. (2004) carried out their study among the Kumal community of Chirtungdhara, Palpa, and documented a total of 50 different species of plants belonging to 45 families, which were traditionally used by the ethnic people for the remedy of different human disorders.

Poudel and Uprety (2004) carried out an ethnobotanical survey in Nuwakot District and documented 67 plant species under 9 use categories, including medicinal use. Rai, et.al. (2004) carried out their study in Thumpakhur Village Development Committee, Sindhupalchok, among different communities of Brahman, Chhetri,

Damai, Kami, Tamang and Sarki. The study focused on the utilization pattern of plants as medicine by the local people of Thumpakhar VDC. A cumulative documentation of all the information revealed that there were 42 species of plants belonging to 34 families that were used to cure 45 types of ailments.

Pant and Pant (2004) carried out study on the indigenous knowledge of people of Bhagawati VDC, Darchula, regarding utilization of medicinal plants by ethnic groups of Bhagawati VDC. Altogether, they documented 78 plant species belonging to 50 families. These plants were used to cure 39 different human disorders.

Koirala (2004) carried out study on Musahars of Bachhouli VDC of Chitawan District and documented 180 plant species and 58 animal species used by them. Among these species reported, 30 species of plant and 20 species of animal were found to have medicinal utility. Koirala (2004) carried out the ethnobiological study of satars of Korabari VDC, Jhapa, and documented 182 species of plant and 60 species of animal used by these people. Among the species reported, 34 plant species and 9 animal species were found to have medicinal value and utility.

Dhakal (2004) carried out study on Magars of Thimure VDC of Palpa and documented 43 species of medicinal plants and 10 species of animals along with their indigenous knowledge on the use of plants and animals for different purposes like food, medicine, ceremonies, etc. Kunwar and Adhikari (2005) documented 58 plant species belonging to 42 families and 56 genera from Dolpa District with ethnomedical values. The study was focussed in the Juphal, Sahartara and Majpahal villages of Dolpa District. Greater numbers of species were found to be used in curing fever (17 species) and diarrhea and dysentery (17 species). Shrestha (2005) carried out a study in a Newar community of Tokha area and reported 50 species of plants having medicinal value. He also documented the indigenous knowledge regarding medicinal practice with such plants.

Rokaya, et.al. (2006) documented a total of 274 species and 5 varieties of medicinal plants belonging to 63 families and 172 genera for the treatment of 64 different types of disease. Among the total, 79 species were reported as new medicinal plant species.

Joshi and Joshi (2007) carried out a study on ethnomedicinal plants of Kaligandaki, Bagmati and Tadi Likhu watersheds of Nepal. They documented the traditional uses of 73 plant species belonging to 62 genera, representing 47 families, which were used by the village communities of Kali Gandaki, Bagmati and Tadi Likhu watersheds of Nepal for the treatment of skin diseases.

Thapa (2008) carried out her study on the Magars of Salija VDC of Parbat District, and documented the indigenous knowledge on the use of plants and animals for medicinal purposes, and related practices among the Magars community. She reported 85 species and 52 families of plants and 18 species of animal that were used for the treatment of 49 and 19 different diseases, respectively.

## 3. STUDY AREA

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### 3.1 Location

Taplejung is a Himalayan district, situated in the far northeast of Mechi zone. The name comes from the Bhote or Limbu language. The district was ruled by Bhotes before the Kiratas. Later, the Kiratas defeated the Bhote king, and have ruled this area since King 'Taple' ruled from his fort 'Jung' therefore, the name is Taplejung.

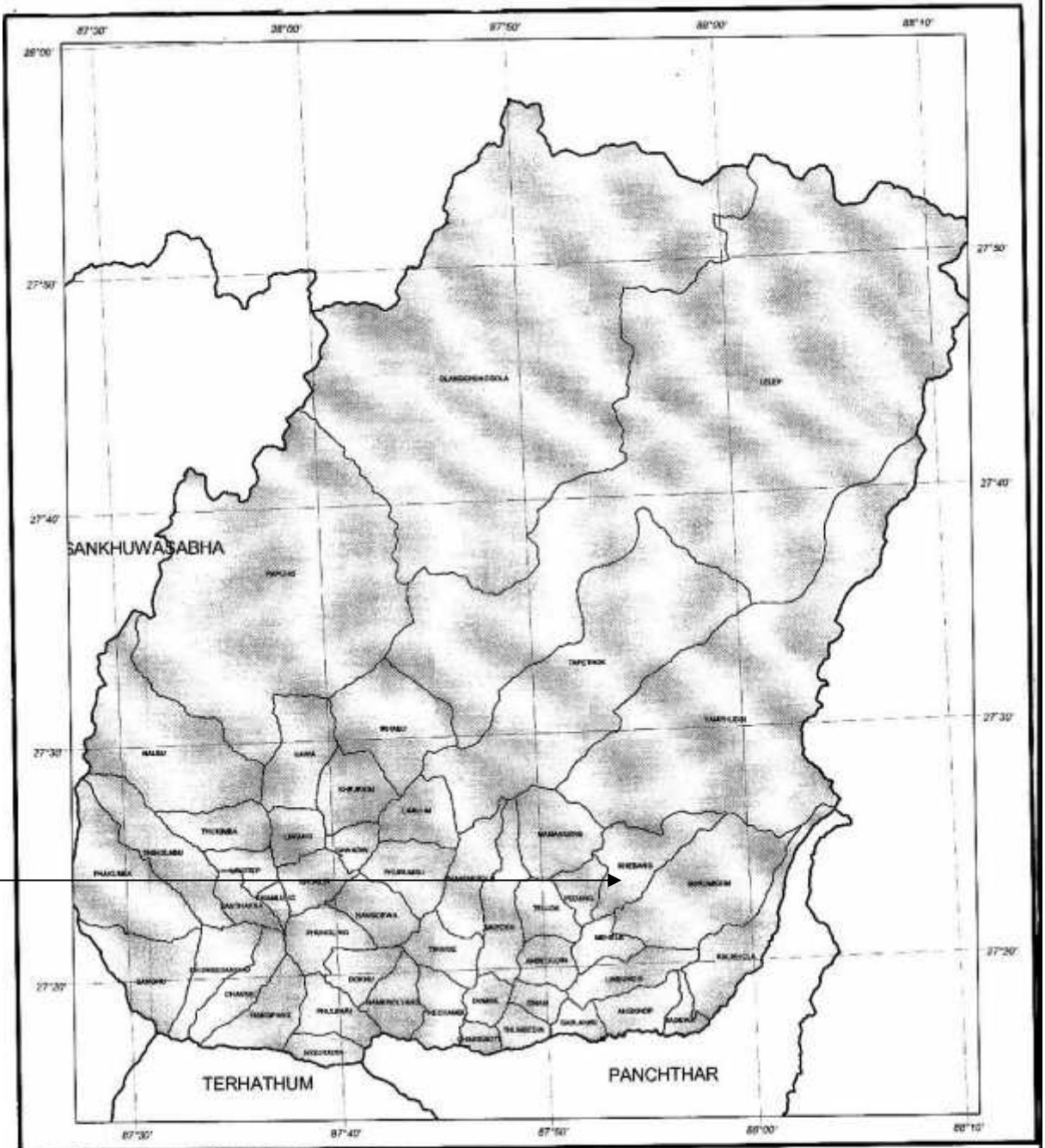
It is the district of Nepal bordering both China and India. It lies within 27°56' north latitude and 87°15' east longitude. Its altitude from sea level is 777m (2550 ft.) to 8598m (28201 ft). The distance from the north point at Tiplaghathi to the south point at Kali Khola is 96 km and from the east point (boundary) at Yampherdin to the west point at Papuny VDC is 12 km. It touches the Sartinkejonz region of Tibet, China, in the north, Gayjing and Sosing Districts (China) in the east, Terhathum and Panchthar Districts in South and the northeast area of Terathum and Sankhuwasabha District in the west. The total area of Taplejung district is 3446 sq. km. Its headquarters is Funling. Administratively, it has been divided into 50 s and 2 electoral regions.

Khejenim is one of the VDCs out of the 50 total VDCs. It is located in the central part of Taplejung at a distance of 13 km from the headquarters. The total area of Khejenim VDC is approximately 29 sq. km. The VDC boundary of Khejenim is Ikhabu VDC on the northeast, Linkhim VDC on the east, Sawadin VDC on the south, Sanwa VDC on the west, and it touches Liwang VDC on the northwest. The VDC is inhabited by different caste and ethnicity like Limbu, Bramhan, Chhetri, Damai, Kami, Sherpa, and Tamang. However Limbus are the most dominant group in the VDC, having a population 1748, i.e. 61.35% of the total population. The major occupation of people inhabiting the VDC is agriculture. The major crops cultivated are rice, maize, millet, wheat, barley, potato etc. Besides cultivating such crops people also cultivate cash crops like, ginger, cardamon etc.



Map 2: Taplejung District

Khejenim  
V.D.C



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SCALE 1 : 450000

**LEGEND**

- District Boundary
- VDC Boundary
- MORANG** District Name
- KHEJENIM** VDC Name



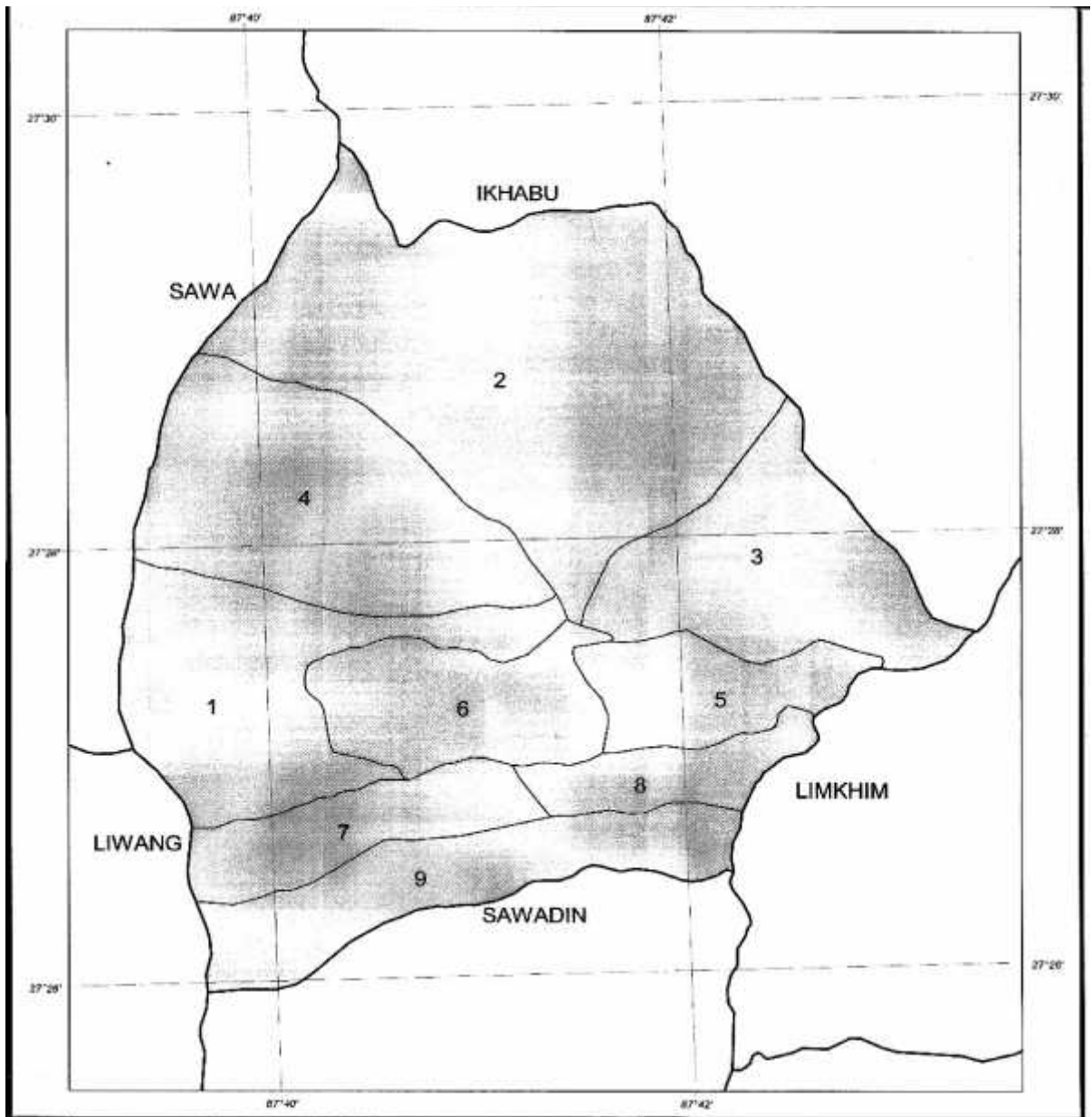
**HORIZONTAL DATUM**  
 Spheroid Everest 1830  
 Projection MUTM  
 Origin Longitude 84° E., Latitude 0° N.  
 False coordinates of origin 500 000 m. Easting, 0 m. Northing  
 Scale Factor at Central Meridian 0.9999



DISTRICT : TAPLEJUNG  
 Area :3646 Sq.Km.(Approx.)

Map compiled from National Topographic Database at scales 1:25 000 and 1:50 000. Internal administrative boundaries are not demarcated on the ground. Map produced by the Survey Department, National Geographic Information Infrastructure

Map 3: Khejenim VDC



Copyright © His Majesty's Government of Nepal, Survey Department

SCALE 1 : 47500

950 0 950 1900 Meters

TAPLEJUNG DISTRICT  
VDC Location Map

| LEGEND        |               |
|---------------|---------------|
|               | VDC Boundary  |
|               | Ward Boundary |
| <b>BUKHEL</b> | VDC Name      |
| <b>5</b>      | Ward Number   |

KHEJENIM VDC  
Area :29 Sq.Km.(Approx.)

**HORIZONTAL DATUM**  
Spheroid Everest 1830  
Projection MUTM  
Origin Longitude 84° E., Latitude 0° N.  
False coordinates of origin 500 000 m. Easting, 0 m. Northing  
Scale Factor at Central Meridian 0.9999

Map compiled from National Topographic Database at scales 1:25 000 and 1:50 000. Internal administrative boundaries are not demarcated on the ground. Map produced by the Survey Department, National Geographic Information Infrastructure Programme, (NGIIP), Kathmandu, 2003





### 3.2 Floral and faunal diversity

Taplejung is one of the most beautiful areas in eastern Nepal with spectacular landscape and a wide range of flora and fauna. Alpine grassland, rocky outcrops, dense temperate and subtropical forest and no river valleys make up the region. Forests are diverse: Conifer forest - 35%, hard wood forest - 35%, mixed hardwood and coniferous forest - 30%

Important flora of this region are various species of *Acer*, *Berberis*, *Castanopsis*, *Crotalaria*, *Desmodium*, *Gaultheria*, *Indigofera*, *Larix griffithiana*, *Primula*, *Quercus*, *Rhododendron*, *Salix*, *Taxus wallichiana*, *Tetracentron sinense*, *Ulmus wallichiana*, *Vaccinium*. (Majpuriya, 2006).

Important fauna includes Black bear (*Ursus thibetanus*), Musk deer (*Moschus moschiferous*), Red panda (*Ailurus fulgens*) Blue sheep or Bharal (*Pseudois nayur*) and Rhesus monkey (*Macaca mulatta*). About 202 species of different kinds of birds, including Impean pheasant etc. are found (Majpuriya, 2006).

### 3.3 Geography and climate

Geographically, Taplejung is divided into Himalayan, hilly and plain (Besi) areas. The Himalayan region consists of Mt. Kanchanjunga, the third highest peak in the world with an altitude of 8586m. Khejenim lies south of Kanchanjunga, with moderate cold climate. The central region of Taplejung is temperate and the besi is warm.

The climate of Khejenim VDC is temperate, where the temperature ranges from 2.7°C to 26.4°C. The weather station at Taplejung shows that mean monthly minimum temperature varies from 3.9°C to 17.90°C, whereas mean monthly maximum temperature varies from 14.56°C to 25.12°C (Taplejung weather station 1998-2007; Fig 1). The average annual rainfall during the last 10 years is 2029.24 mm. The maximum mean monthly rainfall is in August, i.e. 433.56 mm, and the minimum is for the month of December at 6.66 mm (Taplejung weather station, Taplejung 1998-2007, Fig 2).

Mean monthly max. and min. temperature of Taplejung.

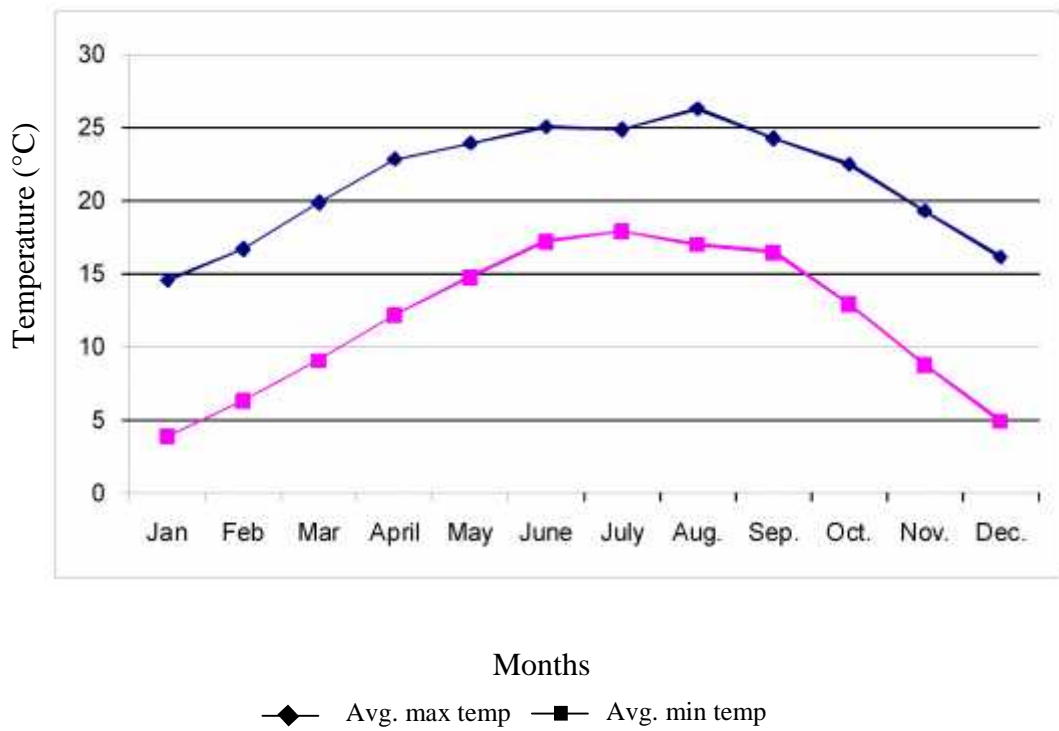


Fig. 1: Mean Monthly Max. and Min. Temperature of Taplejung (1998-2007)

Mean Monthly rainfall of Taplejung (1998-2007)

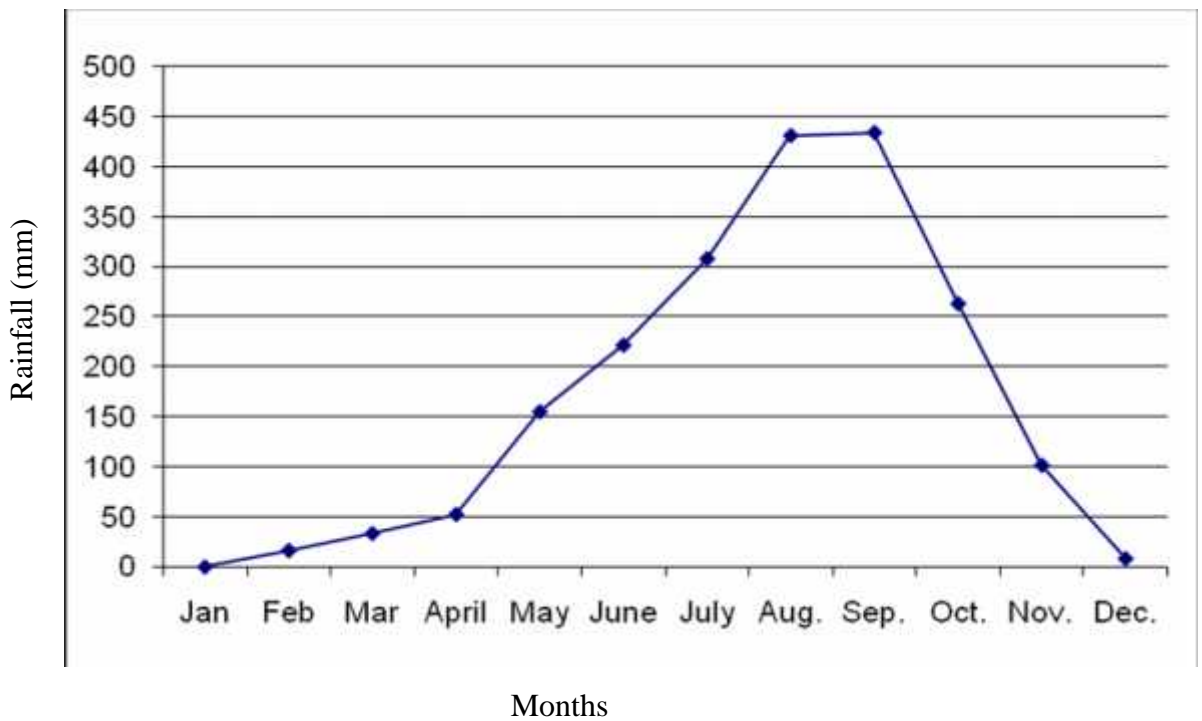


Fig. 2: Mean Monthly rainfall of Taplejung (1998-2007)

### **3.4 Demography**

According to the census 2058 (2001, AD), total population of Nepal is 2,31,51,423. Limbus comprise 3,59,379 of the population, which constitutes 1.58 percent of the total population. The total population of Taplejung is 1,34,698 (CBS 2001). The populations of most of VDCs of Taplejung are dominated by Limbus.

The total population of Khejenim VDC is 2849, with the composition of 51.73% male and 48.26% of female. The total households of the VDC are 476. The VDC is inhabited by different ethnic/caste groups like Limbu, Brahmin, Chhetri, Damai, Kami, Sarki, Tamang etc. Limbus are the most dominant group in the VDC with a population of 1748 i.e. 61.35% of the total population in the VDC.



## 4. METHODOLOGY

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### 4.1 Selection of Site

Taplejung is one of the remote districts of Nepal where Limbus comprise a majority of the population. Rather than utilizing modern health care facilities, most of the population in such a remote area depends on their own traditional and ethnic custom for recovery from disease and injury. Khejenim is a remote village of this remote district where documentation of such traditional healing practices and indigenous knowledge has not been done. So this area has been chosen for study.

### 4.2 Nature and Sources of Data:

To accomplish this dissertation work, two types of data were used

#### a. Primary Data Collection:

Primary data are first-hand and were collected by using following methods:

##### i. Questionnaire:

Simple, lucid and precise questions were prepared (questionnaire is tabulated as an ANNEX of this study), so that respondents' answers could meet the objective of the study.

##### ii. Interview with key informants:

Key informants of the related subject, including local people like farmers, youth, elder people, knowledgeable and traditional healers like Dhamis, Jhankris, and Fedangba were interviewed, and their information was noted, which is the valuable content of the research.

##### iii. Field visit and observation:

To be able to conclude from the data acquired, two field visits were made for about one month each on September/October of the year 2006 and 2007 respectively, where detailed information for the fulfillment of research objectives was collected.

##### iv. Photography and sample collection:

Samples of different known and unknown species of plants and animals which were available in the study area were collected. The collected samples were brought to Kathmandu and were identified with standard reference literature (Malla *et. al*; 1976 Mani, M.S., 1994 Polunin and Stanton, 1987) with the help of botanists and zoologists from the Central Department of Botany

and Zoology (T.U.) and the National Herbarium, Godawari, Kathmandu. The plant species are taxonomically classified into division, family, genera and species. Similarly the animal species were classified into order, family, genera and species. Available samples were collected with their photograph to prove the relevancy of the collected data.

**b. Secondary data:**

Secondary data were very important for the comparison and justification of the primary data. It was collected from different sources like books, journals, theses, research articles of different authors.



## 5. RESULTS

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### 5.1 Ethnography of the Limbus

Most of the Limbus populate the eastern region of Nepal, called Limbuwan, or the land of the Limbu. While they live in the hills and the plains of the terai, they are also found in the areas east of Nepal in place like Darjeeling and Sikkim, in India. They are found in a majority in areas of Dhankutta, Sankhuwasava and Terhathum in the Koshi zone and Taplejung, Panchthar and Ilam in the Mechi zone. Besides these areas, there are other parts of the country where pockets are found. (Gautam and Thapa Magar, 1994).

According to Swami Prapanacharya, the Kirata were one race before the coming of Prithvi Narayan Shah in Nepal. (Lama et. al, 2004). The Khambuhans (Group of Kiratas) once possessed considerable power and territory in the eastern hills, but were speedily reduced to submission by Prithvi Narayan Shah after his conquest. Many Limbus serve in the military services of Nepal, India and UK. Limbus are one of the largest indigenous nationalities of Nepal, comprising 1.58 percent of the total population (CBS, 2001). Limbus comprise a majority of the total population of 1, 34,698 in Taplejung District (CBS 2001). Khejenim VDC also has the highest percentage of Limbus among 50 VDCs of Taplejung.

#### 5.1.1 Origin

The Limbus belong to the Mangol or Kirat tribe 'Kir' i.e. pig or boar. (Lama et. al, 2004). The Kiratas were hunters and their favourite animal for hunting was boar. According to Bista (2024), Limbus is second in size to the Rai among Kiratas. Like their Rai cousins, the Limbu have an area traditionally considered their own called Pallo Kirat (far Kirat), or even more commonly, just Limbuwan. Limbuwan includes the area east of the Arun River extending to Nepal's eastern border with India's west Bengal. In contrast to the larger Manjh Kirat of the Rai, the Limbu areas are relatively confined. The districts represented in whole or in part in Limbuwan include Terathum, Sankhuwasava and Dhankuta in Koshi zone and Taplejung, Panchthar, and Ilam in Mechi zone. Locally, we find the designation Limbuwan prefixed by class as 'Das Limbuwan' meaning the 'Ten Limbu-Lands' referring to the common belief that at one time in the early days there were ten Limbu Rajas.

#### 5.1.2 Physical features

The Limbu are a purely Mongoloid people and they exhibit the features clearly with the skin stretched across the face and the eyes which exhibit the Mongoloid or epicanthic fold, the molar bones makes the cheeks appear high, the

nasal roots are low and the noses are small and flat among some. (Gautam and Thapa Magar, 1994). They have sturdy and strong bodies and are of short to medium stature. Facial hair is scarce and their complexion is fair to pinkish, the lips are thin and prominent.

### **5.1.3 Language**

Limbu is a Tibeto-Burmese language spoken in Nepal, Sikkim, Kashmir and Darjeeling Districts in West Bengal, India, by the Limbu community. Virtually all Limbus are bilingual in Nepali.

The name Limbu is an exonym of uncertain origin. Limbus refer to themselves as Yakthunba and their language as Yakthun Pan. It has four main dialects: Panthare, Phedape, Chhathare and Tambakhole. Panthare dialect is the standard dialect of Limbu language while Phedape is spoken and understood by most (Driem, 1987).

### **5.1.4 Dress and ornaments**

The Limbu men typically wear Nepali dress i.e. dhaka topi (cap) and daura suruwal with istakot or juhari kot (half coat) during festivals but, casually, they generally wear T-shirts and pants. The women wear a chaubandi cholo (blouse of cotton) and phariya (sari), they wear a circular full moon-shaped ornament over the head made of gold or silver called chandrahara similarly, dhungri (ear-rings) in ear, bulaki (nose-rings), chura (bangles) as well as aunthi (finger-rings) made of gold.

However, nowadays most of the Limbus dress in a little more sophisticated manner and are more influenced by the market and industrial towns of Birtamod, Dharan, and Darjeeling.

### **5.1.5 Population**

According to the census 2058 (2001, AD), total population of Nepal is 2,31,51,423 and out of it 3,59,379 is the population of Limbu, which constitute 1.58 percent of the total population. The total population of Taplejung is 1,34,698 (CBS 2001). Among the total population of 50 VDCs in Taplejung, most of VDCs are dominated by Limbus.

The total population of Khejenim VDC is 2849, of which 51.73% are male and 48.26% are female. The total households of the VDC are 476. The VDC is inhabited by different ethnic/caste groups like Limbu, Brahmin, Chhetri, Damai, Kami, Sarki, Tamang etc. Limbus are the most dominant group in the VDC with population of 1,748 i.e. 61.35% of the population.

### 5.1.6 Septs of clans

The Limbu also have a tribal structure and there are septs and subsepts lined up in their social order. The Yakthumba are split into ten septs, namely: Panhthar, Chhathar, Anthari, Yangrup, Chaibasa, Terathar, Charkola, Miakhola, Phedap, and Tambakholae. Among these above septs or thars, there are different sub septs. Some of the sub septs found in Khejenim VC are Anglah, Anglabang, Baidohang, Bakhim, Chemjong, Chungbang, Yongyah, Tumbahangfe, Angdembe, Madden, Lawati, Kangdangwa, Angbang, Chabeguhang, Mangyak, Thebe, Hukpha, Sambahang, Lingdenbeh, and Pheyak.

### 5.1.7 Education

There are seven schools in Khejenim VDC with a total of 1,188 students and 29 teachers, including government and temporary. There are total 670 Limbu students in seven schools of Khejenim, similarly from the total 29 teaching staffs, there are 7 Limbu teachers. There are about 35 students completing SLC, 10 students completing Intermediate and about 5 students with completion of their graduation as well as post graduation. This shows that although there is majority of Limbu people in the VDC and students in the schools, there are not many Limbus employed as teacher. Among seven schools of Khejenim VDC, 5 are primary and only two are lower secondary. There are not any secondary schools in the VDC. For the secondary level education, students need to join the secondary level school of the nearest VDC of Sinwa. In total 5 students were recorded to complete masters and above education, 11 students completing intermediate and 30 students completing SLC level of their education.

**Table 1: List of Schools of Khejenim VDC**

| S.N. | Name of the School                    | Status     | Class | Location |
|------|---------------------------------------|------------|-------|----------|
| 1.   | Manakamana Primary School             | Government | 1-3   | Ward - 3 |
| 2.   | Tulasi Primary School                 | Government | 1-5   | Ward - 5 |
| 3.   | Siwu Primary School                   | Government | 1-5   | Ward - 1 |
| 4.   | Adarsha Lower Secondary School        | Government | 1-7   | Ward - 3 |
| 5.   | Himali Ratna Nawajyoti Primary School | Government | 1-4   | Ward - 2 |
| 6.   | Khejenim Lower Secondary School       | Government | 1-8   | Ward - 8 |
| 7.   | Chawakhu Primary School               | Government | 1-2   | Ward - 2 |

**Table 2: Number of Students and Teachers in the school of Khejenim VDC**

| S.N. | Name of Schools                      | Total no. of Students | Total no. of Teachers |
|------|--------------------------------------|-----------------------|-----------------------|
| 1.   | Manakamana Primary School            | 91                    | 1                     |
| 2.   | Tulasi Primary School                | 199                   | 4                     |
| 3.   | Siwu Primary School                  | 123                   | 4                     |
| 4.   | Adarsha Lower Sec. School.           | 292                   | 8                     |
| 5.   | Himaliratna Nawajyoti Primary School | 71                    | 3                     |
| 6.   | Khejenim Lower Secondary School      | 337                   | 8                     |
| 7.   | Chawakhu Primary School              | 75                    | 1                     |



### **5.1.8 Economy**

The Limbu practice traditional subsistence farming. Rice, millet and maize comprise their principal crops. Though there is an abundance of arable land, productivity is greatly limited by insufficient technology. Excess crops are often traded for food that cannot be grown in the region.

A sizable number of Limbu youths used to enlist in the British and Indian Gurkha regiments, providing their families with a steady stream of income. The Limbus of Khejenim VDC are of mixed economic status: some are engaged in farming cash crops, some of them have family members in Gurkha regiments of Britain and India, whereas some have their own local business for the export and import of goods and materials needed daily.

### **5.1.9 Limbu Religion and Festival**

The Limbus follow the Kirat Mudhum oral 'scripture', similar to the Bon, shaman. However, their religion is also influenced by later Tibetan Buddhism and Hinduism. They have many different classes of ritual specialists, of which 'Phedangma', 'Yema/Yeba' and 'Samba' are some. Their supreme deity is 'Tazera Ningwaphuma', but the deity 'Yuma' is the most important and popular among the Limbu and is worshipped on all occasions. 'Yuma' is the mother of all the Limbus; therefore, one regards his or her mother as a goddess. Their religion is enshrined in the evergreen cynodactylon (Dubo) grass. Traditionally, they bury their dead, but due to the influence of their Hindu neighbours, cremation is gaining in popularity as well. Their priests include the Fedangba, Shamba and Yewa Yema. According to the Nepal census of 2001, out of 259,379 Limbu, 86.29% were practicing traditional Kiranti religion and 11.32% were Hindu and other religions. Modern Limbus, especially those living in parts of India, has also been influenced by Christianity. Most of the Limbus in Taplejung follow their traditional Kiranti religion.

### **5.1.10 Life Cycle Rites**

#### **5.1.10.1 Birth Rites**

After the confirmation of a women's pregnancy, the phedangma (priest) begins to offer prayers to the Gods so as to ward off the evil and spirits that may try to attack the child, even in its foetal stage. The birth of a son causes observation of birth pollution for 4 days, while for a daughter it is 3 days. It is believed among these Limbu people that during the pollution period, the souls of 8 ancient Hang kings come to establish the destiny of the newborn. The last day of the pollution period is set for the nwaran or naming ceremony. The household and the child are purified together by the phedangma, who simultaneously names the newly born child.

Similarly, rice-feeding or pasni is also done after the completion of six months and Mama (maternal uncle) presides over this occasion. Chhewar is also

celebrated by Hinduised Limbu people and the hair is shaved by the Mama. The Limbu do not perform the ritual bratabandh (Thread-wearing Ceremony).

### **5.1.10.2 Wedding Practices**

Limbus, in general, marry within their own community. Boys are at liberty to choose a girl and girls are equally free to decide whether to spend life with boy in question or not. Cross-cousin marriage is not allowed in Limbu culture. Marriage between a man and the widow of his elder brother can take place if they mutually agree. Marriage between a man and a woman outside family relations and having different thars (clans) is also possible either by arrangement or by mutual consent of the boy and the girl in question. It is conventionally said that the customs and traditions of Limbus were established in the distant past by sawa Yethang (Council of Eight Kings). The marriages are mostly arranged by parents or result when a boy elopes with a girl. Asking for a girl's hand is most important ceremony. In that system, the girl can ask for anything—an unlimited amount of gold, silver, etc. This confirms to the girl's family that the boy is financially secure enough to keep their daughter happy. A few days after the wedding, the boy's family members have to visit the girl's house with a piglet and some alcoholic and non-alcoholic drinks, depending upon the financial standard of his house. The key ceremonies of a Limbu wedding take place in the groom's house rather than that of the bride because the girl has to stay with her husband. There are two special dances in this ceremony, one called "Yalakma", or "dhan nach" in Nepali (rice harvest dance), and another called "kelangma", or chyabrung in Nepali. Yalakma is characterized by men and women dancing in a slow circle, while kelangma involves complex footwork that goes with the beat of the drums. Anyone can join the dances and they can go for long hours. Yalakma also celebrates the harvest season, in addition to being a feature of other social occasions.

In the case of arranged marriage, a middle man called "ingmiva" is employed by the boy's parents to approach the parents of the girl. After consent for the match is obtained, he returns to the boy, who in turn goes to bring the bride from her parent's house to a resting place near his home. The boy dresses in a white Nepali shirt and trousers, wears a Nepali cap, and puts a khukuri knife in his waistband before he sets out to fetch the girl the rest of the way home. The girl will also be well dressed with choubandi (blouse) and sari, and ornaments like rings, golden bangles (chura), necklace (tilahari) and other jewelry. After the ceremony of sindhur in the bride's home, they return to groom's home.

In the case of a properly arranged marriage, the girl will be accompanied from her home by a group of fifty to sixty people, mostly young women like herself, dressed in colorful dresses and ornaments. These young women and a few young men wait with the bride while the groom goes to inform his parents and change his clothes.

A party called mixsama stays overnight at the groom's house, entertained by all the relatives and friends.

The bride and groom are seated in a corner throughout the night while the fedangma priest recites Mundhum, the Kiranti religious text, and ceremony is ended. After a few days the new couple goes back to the girl's parent's house with gifts of spirit and a whole pig. When all the wedding ceremonies are completed the girl usually stays on with her parents for a few months or a year before coming to live permanently with her husband in his home.

### **5.1.10.3 Death Rites**

When a Limbu dies, they are supposedly polluted for 4 days in case of a man and 3 days in case of a woman. The corpse is placed stretched out on the floor and covered with a white cloth with two oil lamps burning at the sides. One rupee coin is placed in a row from head to foot. A wooden coffin is called khongkhi and a bamboo one is called a chhetap. During the construction of the coffin, 4 horizontal pieces of wood or bamboo are placed breadth wise in the case of a deceased male and three pieces in the case of a female. The corpse is bathed, bound in the white cloth shroud and placed in the coffin, and is accompanied by loved and cherished personal items like ornaments, weapons, etc. The corpse is carried to the burial ground called the lepung daen. Women accompany the funeral procession, but do not help in carrying the corpse. The procession is led by a fedangma carrying a naked khukuri, chanting and simultaneously shouting and jumping.

The grave is dug to a depth of approximately 7 feet and is lined with flat stone slabs reminiscent of the primitive sarcophagus. Once the grave is prepared the coffin is lowered and covered with stones.

During the pollution period, salt and oils are abstained from by family members. On the final day of death pollution, there is compulsorily a feast of meat, alcohol, etc., known as samdakhung and all those who had attended the funeral are invited for this feast, where they all are seated parallelly and facing the group which has been under observance of the pollution.

Fedangma purifies members under pollution through different Tantra and Mantra. Finally, he turns to the observers of the pollution and says that from that day they are purified, so now they are able to perform all religious and social functions normally.

There is a custom of observing a one year observance of death called 'barkhi barne' which is done by the close kin of the deceased, like the son. On the yearly time of barkhi, economically sustained Limbus build a sort of memorial in the name of the deceased, which is called a 'song taen'. In this way, death rites are performed in Limbu community.

### **5.1.11 Tradition and Ceremony**

Traditionally, Limbu celebrate Chasok Tangnam festival at home with the harvest being offered to Yuma Samung (Limbu Ancestor Goddess) and other deities. They worship and thank the Ancestor Goddess Yuma, God Theba, and other deities for a successful harvest for the year. The festival is not celebrated in a social group; traditionally chasok worshipping is done at home by individual families and especially by the female member of the household who has born a child. In fact, Limbus conduct chasok worshipping according to their will, and scheduled throughout the month of senchengpa/Mangshir, and not on any specific date. Now, a majority of Limbus try to finish or conduct their chasok worshipping on the day of the full moon.

During the ceremony, a Limbu priest also recites the story of the Limbu ancestors who survived great hardships leading the life of hunting and gathering. Then they were taught by the spirit of Yuma Sammang to plant and harvest various crops. When the crops were harvested, Limbus decided to place a small portion of the harvest as an offering to their supreme God, Tagera Ningwaphumang, and the ancestor Goddess Yuma Sammang for the knowledge of agriculture and harvest. It is strongly and widely believed that any harvest eaten without first performing chasok worship and without offering to the Gods is cursed with bad luck and misfortune.

## **5.2 Ethnomedical biology**

The use of animals and plants as medicine is widespread throughout the world. In many areas of rural Nepal, medicinal knowledge and practice are passed down entirely through the oral tradition and personal experience. The total population of Nepal is 23.1 million, and about 90% of the Nepalese people reside in rural areas where access to government health care facilities is lacking. It is estimated that there is one physician for 30,000 people, whereas there is one healer for fewer than 100 people in Nepal. Many studies have investigated the uses of medicinal plants and animals in Nepal, although only a few studies have been done to document the knowledge about the plants in Taplejung district. In the present study, a detailed ethnomedicinal survey was carried out in the Khejenim VDC of Taplejung district. This present research adds to that knowledge base, and this paper will be helpful to document important medicinal plants of Nepal, which are often used by the Limbu communities for primary healthcare.

### **5.2.1 Medico-ethnozoology**

Animals have been contributing to mankind in curing many diseases from the ancient times, and the people of Khejenim VDC have also been using animals and their different parts, together with traditional knowledge, to cure different diseases. They use different animal species, including vertebrates and invertebrates. Findings of this research revealed that, altogether, 15 animal species, both wild and domesticated,

belonging to 9 orders and 10 families, have been used for the remedy of 12 different ailments by using Limbu traditional knowledge.

The list of animal species used in the traditional cure of disease by the local Limbu people of the Khejenim VDC area is shown below, along with their order, family and habit.

**Table 3: List of animals used for Folklore Medicine by the local Limbu People of Khejenim VDC**

| S.N. | Order          | Family      | Latin name                  | English Name | Nepali name/Local Name | Habit         |
|------|----------------|-------------|-----------------------------|--------------|------------------------|---------------|
| 1.   | Artiodactyla   | Bovidae     | <i>Bos indicus</i>          | Cow          | Gai/pit                | Domesticated  |
| 2.   | Artiodactyla   | Bovidae     | <i>Capra hircus</i>         | Goat         | Bakhro/Menda           | Domesticated  |
| 3.   | Artiodactyla   | Bovidae     | <i>Ovis Vigeni</i>          | Sheep        | Bheda/Khen             | Domesticated  |
| 4.   | Carnivora      | Felidae     | <i>panthera tigris</i>      | Tiger        | Bagh/Kedda             | Wild          |
| 5.   | Carnivora      | Canidae     | <i>Canis aureus</i>         | Jackal       | Syal                   | Wild          |
| 6.   | Carnivora      | Canidae     | <i>Canis familiars</i>      | Dog          | Kukur/Kocho            | Domesticated  |
| 7.   | Rodentia       | Hystricidae | <i>Hystrix brachura</i>     | Porcupine    | Dumisi/Ai              | Wild          |
| 8.   | Rodentia       | Hystricidae | <i>Rattus rattus</i>        | Rat          | Musa/suwa              | Wild          |
| 9.   | Columbiformes  | Columbidae  | <i>Teron bicineta</i>       | Pigeon       | Parewa                 | Domesticated. |
| 10.  | Galliformes    | Phasinidae  | <i>Gallus domesticus</i>    | Hen          | Kukhura/wa             | Domesticated  |
| 11.  | Paseriformes   | Sturnidae   | <i>Acridotherus tristis</i> | -            | Rupi                   | Wild          |
| 12.  | Stylomatophora | Helicidae   | <i>Anadenus species.</i>    | Molluscs     | Chiplekira/Meghakrin   | Wild          |
| 13.  | Hymenoptera    | Apidae      | <i>Apis cerano</i>          | Honey Bee    | Ghar mouri/Himsawa     | Domsticated   |
| 14.  | Hymenoptera    | Apidae      | <i>Apis sps.</i>            | Wild Bee     | Putka/Stratengwa       | Wild          |
| 15.  | Acarina        | Argasidae   | <i>Ornithodourus sp.</i>    | -            | Kirno                  | Wild          |

### 5.2.2 Diversity of Animal Species

From the findings among 15 different animal species used for the folk medicine by the local Limbu of Khejenim VDC, 8 species were mammals, 3 species were aves and 4 species were invertebrates. On the basis of habit, 7 species were found to be domesticated and 8 species were wild. The 15 animal species identified were of 9 orders and 10 families.

### 5.2.3 Diseases/ailments treated

The 15 recorded animal species from the study area have been found to be used for the treatment of 12 different diseases and disorders by the local people using their own traditional knowledge. The list of diseases along with the animal species is shown in the table below.

**Table 4: List of Diseases with the animal species used**

| S.No. | Name of the disease                              | Name of animals used                                                                                                                          |
|-------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1.    | Body Itching (Jiu chilaune))                     | <i>Bos indicus</i> (Domestic cattle, calf)                                                                                                    |
| 2.    | Burn (Dadheko)                                   | <i>Ornithodoros</i> sps. (Kirno), <i>Gallus domesticus</i> (Hen/kukhura) <i>canis familiars</i> (Dog/Kukur), <i>ovis vigeni</i> (Sheep/Bheda) |
| 3.    | Body pain (Jiu dukheko)                          | <i>Apis cerana</i> (Honey bee/ Ghar Mouri)                                                                                                    |
| 4.    | R.Arthritis (Bath)                               | <i>Canis aureus</i> ( Jackal/Syal)                                                                                                            |
| 5.    | Bleeding (Harsa)                                 | <i>Acridotheres tristis</i> , (Rupi)                                                                                                          |
| 6.    | Asthma (Dam)                                     | <i>Hystrix brachura</i> (Porcupine/Dumsi)                                                                                                     |
| 7.    | Pain of bones (Had dukhne)                       | <i>Panthera tigris</i> (Tiger/Bagh)                                                                                                           |
| 8.    | Leg, hand pain (Hat Khutta dukhne)               | <i>Capra bircus</i> (Goat/Bakhra)                                                                                                             |
| 9.    | Lack of energy (Saktihin)                        | <i>Teron bicineta</i> (Pigeon/parewa)                                                                                                         |
| 10.   | Broken bones (Had vachiako)                      | <i>Anadenus species</i> (Chiplekia)                                                                                                           |
| 11.   | Snake bite (Saple tokeko)                        | <i>Apis species</i> (Wild bee/Putka)                                                                                                          |
| 12.   | Wounds or cuts. (Dhikile kuteko, Okhalle kuteko) | <i>Rattus rattus</i> (Rat /Muso)                                                                                                              |

### 5.2.4 Parts or organs of animals used

On the basis of findings of research, peoples of study area were found to use different parts or organs of animals for various medicinal purposes. Widely used organs among the people under research are meat & blood. The other organs used include intestine, feces, hair, stomach, wax and sometimes whole body of the organism.

### 5.2.5 Routes of Administration

Medical use or administration included installation and oral absorption, which are internal medication, and topical application i.e. external medication. Most of the process of medication was oral administration, followed by application and instillation.

### 5.2.6 Detailed study of Animal Species:

The different species of animals recorded during research from the study area are described primarily based on the information collected during the field survey. The descriptions are given in alphabetical order of family of the animal species.

#### 1. **Apidae**

*Apis carana* 'Gharmauri'

Type: Insect

Products used: Wax, honey

Form of medication: Raw, diluted drug.

Medicinal uses: Two to four spoonfuls of honey is mixed with 10-20 gram ground paste of *Bergenia ciliata* (Pakhanbet) or *Astilbe rivularis* (Thulo okhat), and the prepared mixture is taken once or twice in a day for curing body pain.

Similarly, three to five spoonfuls of honey mixed with 15 to 25 gm of ground paste of *zingiber officinale* (Aduwa) and is taken once or twice in a day for curing cough

#### 2. **Apidae.**

*Apis sps.* (Putka)

Type: Insect

Product used: Honey

Form of medication: Raw

Medicinal use: Around a spoonful or half spoonful of honey is applied around the bite of snake to lower the pain.

#### 3. **Bovidae:**

*i. Bos indicus* 'Gai/Goru'

Type: Mammal

Product used: Urine

Form of medication: Raw

Medicinal use: 100 to 200 ml of calf's urine is boiled to massage the whole body for curing itching in the body and then abath is taken with hot water.

*ii. Capra hircus* 'Bakhra/Khasi'.

Type: Mammal

Organs used: Meat, feet

Form of medication: Soup/cooked.

Medical use: Bones (Tibia and fibula) are cooked and boiled to prepare soup for curing of pain in the limbs.

**iii. *Ovis vegeni* 'Bheda'**

Type: Mammal.

Product used: Ghee

Form of Medication: Raw

Medicinal use: Small amount of sheep's ghee is applied over the burnt area or wound for curing burn. The amount of ghee depends on the area burnt.

**4. Canidae**

**i. *Canis aureus* 'Syal'**

Type: Mammal.

Organ used: Meat

Forms of medication: Cooked, liquor.

Medicinal use: The meat is cooked properly and taken regularly for the treatment of rheumatism. Similarly, about a glass of alcohol made from the meat of animal is taken once a day before going to bed for curing rheumatism.

**ii. *Canis familiars* 'kukur'**

Type: Mammal.

Organ used: Blood.

Form of medication: Raw

Medicinal use: Fresh blood of dog is used for curing burn. Amount of blood depends on the area of burn in the body.

**5. Columberidae**

*Teron bicineta*. 'Parewa'

Type: Aves

Organ used: Meat

Form of medication: Cooked.

Medicinal use: Cooked meat of pigeon is eaten to supplement the energy for energyless children and adults after recovery from any disease.

**6. Felidae**

*Panthera tigris*: 'Bagh'

Type: Mammal.

Organ used: Bones.

Forms of medication: Cooked.

Medicinal use: Bones of tiger are cooked/boiled to prepare soup, and are taken for curing body pain and pain of bones.

**7. Helicidae**

*Anadenus sps.* 'Chiplekira'

Type: Mollusk.



Organ used: Whole organism

Form of medication: Raw, dried

Medicinal use: Whole organism of *Anadenus* sps is taken orally for curing bone fracture or crack. Sometimes dried pieces of *Anadenus species* are placed inside fruit like '*Musa paradisiaca*' (banana) and is taken orally for curing bone crack and fracture.

8. **Hystricidae.**

i. *Hystrix brachura* 'Dumsi'

Type: Mammal.

Organs used: Intestine, stomach

Form of medication: Powder.

Medicinal uses: Stomach and intestinal parts of animal are dried and ground, and the powder is given to the children suffering from the stomach disorders as well as for the treatment of asthma.

ii. *Rattus rattus*. 'Musa'

Type: Mammal.

Product used: Excreta.

Form of medication. Raw.

Medicinal use: Excreta of rat is ground with the root of *urtica dioica* (sisnu) and the paste is applied over the wound or cut by dhiki or okhli (wooden materials used for grinding raw crops) for cure.

9. **Phasinidae:**

*Gallus domesticus* 'kukhura'.

Type: Aves

Organ used: Blood

Form of medication: Raw

Medicinal use: Fresh blood of hen is applied over the burnt area for the cure of burn.

10. **Sturnidae**

*Acridotheres tristis* 'Rupi'

Type: Aves

Form of medication: cooked.

Medicinal use: Meat of *Acridotheres tristis* is cooked properly and taken for curing frequent diarrhoea with blood (Harsa).

### 5.2.7 Medico-ethnobotany

The findings of the present research show that Limbu people are well enriched with the knowledge of using different medicinal plant species for their own local health care system. It was found that they make use of 64 species of medicinal plants belonging to 44 families and 61 genera, curing 38 different ailments using their own indigenous knowledge.

The list of plant species used in folk medicine by the local Limbu people of the study area is shown below, along with their family and habit.

**Table 5: List of medicinal plants used by local people of Khejenim VDC, Taplejung**

| S.N. | Family                     | Latin Name                       | Nepali/Local Name        | Life Form |
|------|----------------------------|----------------------------------|--------------------------|-----------|
| 1.   | Amaranthaceae              | <i>Achyranthus bidentia</i>      | Dattiu/Titiri            | Herb      |
| 2.   | Apiaceae/<br>Umbellifereae | <i>Heracleum neaplansae</i>      | Chimfin                  | Smal tree |
| 3.   | Aspidiceae                 | <i>Dryoathyrium boryanum</i>     | Kalo Niuro               | T. fern   |
| 4.   | Asteraceae                 | <i>Tagetus patula</i>            | Sayapatri/<br>Thapathung | Herbs     |
| 5.   | Asteraceae/<br>Compositae  | <i>Agaratum conyzoides</i>       | Ilame Jhar               | Herb      |
| 6.   | Araceae                    | <i>Acorus calamus</i>            | Bojho/<br>Sidakpa        | Herb      |
| 7.   | Campanulaceae              | <i>Lobelia pyramidalis</i>       | Eklebir                  | Herb      |
| 8.   | Caprifoliaceae             | <i>Viburnum erubescens</i>       | Asare                    | Shrub     |
| 9.   | Caryophyllaceae            | <i>Drymaria cordata</i>          | Avijalo                  | Herb      |
| 10.  | Combretaceae               | <i>Terminalia belerica</i>       | Barro                    | Tree      |
| 11.  | Combretaceae               | <i>Terminalia chebula</i>        | Harro                    | Tree      |
| 12.  | Compositae/<br>Asteraceae  | <i>Eupatorium adenophorum</i>    | Kalijhar/<br>Namsusyuna  | Herb      |
| 13.  | Compositae/<br>Asteraceae  | <i>Duhaldea cappa</i>            | Bakhrakane               | Shrub     |
| 14.  | Compositae/<br>Asteraceae  | <i>Artemisia indica</i>          | Titepati<br>/Namyewa     | Herb      |
| 15.  | Convolvulaceae             | <i>Cuscuta reflexa</i>           | Pahela Jhar              | Herb      |
| 16.  | Cruciferae                 | <i>Lepidium sativum</i>          | Chamsur                  | Herb      |
| 17.  | Cucurbitaceae              | <i>Cucumis setivus</i>           | Kankro/Pait              | Herb      |
| 18.  | Cucurbitaceae              | <i>Coccinea grandis</i>          | Ban Ghiraulo             | C. Herb   |
| 19.  | Cyperaceae                 | <i>Carex cruciata</i>            | Harkatta                 | Shrub     |
| 20.  | Ericaceae                  | <i>Gaultheria fragrantissima</i> | Dhasingre                | Sherub    |
| 21.  | Ericaceae                  | <i>Rhododendron arboreum</i>     | Gurans/<br>Thoset        | Tree      |
| 22.  | Equisetaceae               | <i>Equisetum debile</i>          | Kurkure<br>Ghans         | Grass     |

|     |                             |                               |                                    |                          |
|-----|-----------------------------|-------------------------------|------------------------------------|--------------------------|
| 23. | Euphorbiaceae               | <i>Urtica dioca</i>           | Sisnu/ Sikwa                       | Herb                     |
| 24. | Euphorbiaceae               | <i>Emblica officinalis</i>    | Amala                              | Tree                     |
| 25. | Gentianaceae                | <i>Swertia chirayita</i>      | Chiraito/<br>Sukhingwa             | Herb                     |
| 26. | Gramineae                   | <i>Saccharum officinarum</i>  | Ukhu/Sot                           | Grass/Shrub              |
| 27. | Gramineae                   | <i>Imperata cylindrica</i>    | Siru/Siro                          | Grass/Herb               |
| 28. | Juglandaceae                | <i>Englhardtia spicata</i>    | Mahuwa/<br>Yakpama                 | Tree                     |
| 29. | Lauraceae                   | <i>Lindera nessiana</i>       | Siltumur/<br>Meding                | Small tree               |
| 30. | Liliaceae                   | <i>Aloe barbadensis</i>       | Gheukumari                         | Herb                     |
| 31. | Liliaceae                   | <i>Smilax aspera</i>          | Kukurdaino/<br>Thangthangk<br>erok | Climber                  |
| 32. | Loranthaceae                | <i>Viscum articulatum</i>     | Hadjoda                            | Shrub                    |
| 33. | Leguminosae                 | <i>Bauhinia variegata</i>     | Koiralo/<br>Ajiwa                  | Tree                     |
| 34. | Lycopodiaceae               | <i>Lycopodium clavatum</i>    | Nagbeli                            | Creeping<br>Pteridophyte |
| 35. | Menispermaceae              | <i>Cissamples pareira</i>     | Gujargano/<br>Afani                | Climber                  |
| 36. | Moraceae                    | <i>Artocarpus lakoocha</i>    | Badahar/<br>Muchhe                 | Tree                     |
| 37. | Moraceae                    | <i>Ficus religiosa</i>        | Peepal                             | Tree                     |
| 38. | Moraceae                    | <i>Ficus sycomorus</i>        | Kimbu/<br>Khaeyuwa                 | Tree                     |
| 39. | Musaceae                    | <i>Musa paradisiaca</i>       | Kera/Peplase                       | Tree                     |
| 40. | Myricaceae                  | <i>Myrica esculenta</i>       | Kaphal                             | Tree                     |
| 41. | Nephrolepidaceae            | <i>Nephrolepis auriculata</i> | Paniamala                          | T.fern                   |
| 42. | Orchidaceae                 | <i>Dactylorhiza hatagirea</i> | Panch aunle<br>/Hukchuknga<br>siwa | Herb                     |
| 43. | Oxalidaceae                 | <i>Oxalis corniculata</i>     | Chariamilo                         | Perennial Herb           |
| 44. | Papilionaceae/<br>Fabiaceae | <i>Dolichos biflorus</i>      | Gahat/Fellise                      | Herb                     |
| 45. | Pteridaceae                 | <i>Cheilanthes dahousiae</i>  | Ranishinka                         | T.fern                   |
| 46. | Plumbagonaceae              | <i>Plumbago zeylanica</i>     | Chittu                             | Perennial Shrub          |
| 47. | Polygonaceae                | <i>Persicaria hydropiper</i>  | Pirepat                            | Perennial Herb           |
| 48. | Polygonaceae                | <i>Rumex nepalensis</i>       | Halhale                            | Perennial Herb           |
| 49. | Polypodiaceae               | <i>Dryopteris filixmas</i>    | Hade Unyu/<br>Katewa               | T.fern                   |
| 50. | Ranunculaceae               | <i>Aconitum bisma</i>         | Bikhma/<br>Chaning                 | Herb                     |
| 51. | Rosaceae                    | <i>Rubus ellipticus</i>       | Aiselu/<br>Tingese                 | Shrub                    |
| 52. | Rutaceae                    | <i>Citrus aurantifolia</i>    | Kagati                             | Tree                     |
| 53. | Rutaceae                    | <i>Citrus sinensis</i>        | Suntala/<br>Sarimse                | Tree                     |
| 54. | Rutaceae                    | <i>Evodia frazinifolia</i>    | Khanakpa                           | Tree                     |

|     |                           |                                       |                      |                |
|-----|---------------------------|---------------------------------------|----------------------|----------------|
| 55. | Rutaceae                  | <i>Zanthoxylum armantum</i>           | Timur                | Tree           |
| 56. | Saxifragaceae             | <i>Astilbe rivularis</i>              | Thulo Okhat          | Herb           |
| 57. | Saxifragaceae             | <i>Bergenia ciliate</i>               | Pakhanbet            | Herb           |
| 58. | Saxifragaceae             | <i>Bergenia purpurascens</i>          | Khokim               | Shrub          |
| 59. | Scrophulariaceae          | <i>Neopicrorhiza scropulariiflora</i> | Kutki/<br>Pangwofung | Herb           |
| 60. | Umbelliferae/<br>Apiaceae | <i>Centella asiatica</i>              | Ghortapre            | Herb           |
| 61. | Valerianaceae             | <i>Nordastachys grandiflora</i>       | Jatamasi             | Perennial Herb |
| 62. | Verbenaceae               | <i>Callicarpa macrophylla</i>         | Gualo                | Tree           |
| 63. | Zingiberaceae             | <i>Ammomum subulataum</i>             | Alainchi             | Herb           |
| 64. | Zingiberaceae             | <i>Zingiber officinale</i>            | Aduwa/<br>Hambet     | Herb           |

### 5.2.8 Diversity of the Medicinal Plants

Among the total 64 medicinal plants species found to be used in the folk medicine in the study area, 18 species were small or large trees, 8 species were shrubs, 26 species were herbs, 16 species were fern, 3 species were grass and 4 species were climber, based on the life forms.

### 5.2.9 Diseases/Ailments Treated

The different species of plants recorded for medicinal use have been found to be used for the cure of 38 different ailments/diseases by the local Limbu people of Khejenim VDC using their indigenous knowledge. The list of diseases, along with the plant species, is shown in the table below.

**Table 6: List of Diseases with the Plant species used**

| S.N. | Name of disease/Ailments                                                                | Name of Plants used                                                                                                                                                                                                                                                                                                                                              |
|------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Diarrhoea (pakhala lageko)<br>Dysentary (mansi pareko)<br>and Stomachache (pet dukheko) | <i>Achyranthus bidentia</i> (Dattium), <i>Dryothyrium boryanum</i> (Kalo niuro), <i>Englhardtia spicata</i> (Mahuwa), <i>Bahunia purpurea</i> (Koiralo), <i>Cisampelis pareira</i> (Gujaragano), <i>Oxalis corniculata</i> (chari amilo), <i>Acomitum bisma</i> (Bikhma), <i>Astible rivularis</i> (Thulo okhat), <i>Neopicrohiza scrophulariifolia</i> (kutki). |
| 2.   | Pneumonia                                                                               | <i>Citrus aurantifolia</i> (kagati), <i>Artemisia indica</i> (Titepati), <i>Callicarpa macrophylla</i> (Gualo), <i>Viburnum erubescens</i> (Asare), <i>Drymaria cantoniense</i> (Avijalo), <i>Cucumis sativus</i> (kankro), <i>Swertia chirayita</i> (Chiraito), <i>Persicaria hydropiper</i> (pirepat), <i>Citrus sinensis</i> (suntala).                       |
| 3.   | Intestinal worms (juka pareko)                                                          | <i>Imperata cylindrica</i> (Siru), <i>Citrus aurantifolia</i> (Kagati), <i>Fiscus sycomorus</i> (Kimbu).                                                                                                                                                                                                                                                         |
| 4.   | Common cold (rugha lageko)                                                              | <i>Hiracleum nepalense</i> (Chimfin).                                                                                                                                                                                                                                                                                                                            |
| 5.   | Cough (khoki lageko)                                                                    | <i>Heracleum nepalense</i> (Chimfin), <i>Terminalia belerica</i> (Barro), <i>Terminanlia chebula</i> (Harro), <i>Carex Cruciata</i> (Harkatta), <i>Zingiber officinale</i> (Aduwa), <i>Aconitum bisma</i> (Bikhama), <i>Neopicrorihiza scrophulariifolia</i> (kutki),                                                                                            |

|     |                                                         |                                                                                                                                                                                                                                                                                                                              |
|-----|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                         | <i>Nordastachys grandiflora</i> (Jatamasi).                                                                                                                                                                                                                                                                                  |
| 6.  | Bleeding (ragat bagne)                                  | <i>Artemisia indica</i> (Titepati) <i>Eupatorium adenophorum</i> (Kolijhar).                                                                                                                                                                                                                                                 |
| 7.  | Insect bites (kirale tokeko)                            | <i>Ageratum conyzoides</i> (Ilame jhar)                                                                                                                                                                                                                                                                                      |
| 8.  | Scabies (luto niskeko)                                  | <i>Acorus calamus</i> (Bojho)                                                                                                                                                                                                                                                                                                |
| 9.  | Throat pain (ghanti Ddukheko)                           | <i>Acorus calamus</i> (Bojho), <i>Terminalia chebula</i> (Harro), <i>Terminalia Belerica</i> (Barro).                                                                                                                                                                                                                        |
| 10. | Body pain (jiu dukheko)                                 | <i>Englhardtia spicata</i> (Mahuwa), <i>Berginia cillita</i> (Pakhanbet), <i>Lepium sativum</i> (chamsur), <i>Dactylorhiza hatagirea</i> (Panchaunle), <i>Zingiber officinale</i> (Aduwa).                                                                                                                                   |
| 11. | Wounds (ghau)                                           | <i>Lobelia pyramidalis</i> (Eklebir), <i>Dryopteris filixmus</i> (Hade unyu), <i>Artocarpus lakoocha</i> (Badahar).                                                                                                                                                                                                          |
| 12. | Vomit (ulti hune)                                       | <i>Lobelia Pyramidalis</i> (Eklebir), <i>Citrus aurantifolia</i> (kagati), <i>Smilax aspera</i> (Kukurdaino), <i>Ammomum subulatum</i> (Alainchi).                                                                                                                                                                           |
| 13. | Fever (jwaro aune)                                      | <i>Viburnum erubescens</i> (Asare), <i>Duhaldea cappa</i> (Bakhra kane), <i>Swertia chirayita</i> (chiorito), <i>Neprolepis auriculata</i> (Pani amala), <i>Persicaria hydropiper</i> (piprepat), <i>Aconitum bisma</i> (Bikhma), <i>Neopicrorhiza scroppularifolia</i> (kutki), <i>Nordastachys grandiflora</i> (Jatamasi). |
| 14. | Tonsils                                                 | <i>Drymaria cantoniense</i> (Avijalo), <i>Duhaldea cappa</i> (Bakre kane), <i>Equisetum debile</i> (kurkure ghans), <i>Neprolepis auriculata</i> (Pani amala).                                                                                                                                                               |
| 15. | Cuts (kateko)                                           | <i>Eupatorium adenophorum</i> (Kalijhar), <i>Dryopteris filixmas</i> (Hade unyu), <i>Urtica dioca</i> (Sisnu).                                                                                                                                                                                                               |
| 16. | Headache (Tauko Dikheko)                                | <i>Dudhaldea cappa</i> (Bakhra kane), <i>Lindera neesiana</i> (siltimur).                                                                                                                                                                                                                                                    |
| 17. | Jaundice (pafele)                                       | <i>Cuscuta reflexa</i> (Pafele Jhar), <i>Saccharum officinarum</i> (Ukhu), <i>Coccinea grandis</i> (Ban Ghiraulo).                                                                                                                                                                                                           |
| 18. | Dog bite (kukurle tokeko)                               | <i>Carex cruciata</i> (Harkatta).                                                                                                                                                                                                                                                                                            |
| 19. | Rhenumatic pain (had-jorni dukehko) or Arthritis (bath) | <i>Gaultheria freagrantissima</i> (Dhasingre).                                                                                                                                                                                                                                                                               |
| 20. | Fish bone stuck in throat (ghantima kanda bijheko)      | <i>Rhododendron arboreum</i> (Gurans).                                                                                                                                                                                                                                                                                       |
| 21. | Asthma (dam)                                            | <i>Equisetum debile</i> (kurkure ghans) <i>Bahunia purpurea</i> (Koiralo).                                                                                                                                                                                                                                                   |
| 22. | Sore throat (ghanti baseko)                             | <i>Equistetum debile</i> (Kurkure ghans) <i>Astilbe rivularis</i> (Thulo okhat).                                                                                                                                                                                                                                             |
| 23. | Low appetite (hhana naruchne)                           | <i>Lindera neesiana</i> (siltimur), <i>Evodia frazinifolia</i> (khanakpa).                                                                                                                                                                                                                                                   |
| 24. | Piles (harsa)                                           | <i>Bahunia purpurea</i> (Koiralo).                                                                                                                                                                                                                                                                                           |
| 25. | Burns (dadheko)                                         | <i>Aloe barbadensis</i> (Gheukumari).                                                                                                                                                                                                                                                                                        |
| 26. | Fracture (vachiako, markeko)                            | <i>Musa paradisisca</i> (kera), <i>Viscum articulatum</i> (Hadjoda), <i>Myrica esculenta</i> (Kaphal), <i>Plumbago zeylanica</i> (chittu), <i>Berginia purpurascens</i> (Khokim), <i>Artemesia indica</i> (Titepati), <i>Berginia ciliata</i> (Pakhanbet).                                                                   |
| 27. | Old infected wounds (purano ghau)                       | <i>Lycopodim clavatum</i> (Nagbeli).                                                                                                                                                                                                                                                                                         |
| 28. | Boils (pilo)                                            | <i>Artocarpus lakoocha</i> (Badahar).                                                                                                                                                                                                                                                                                        |

|     |                                           |                                                                    |
|-----|-------------------------------------------|--------------------------------------------------------------------|
| 29. | Ring worm (dad niskeko)                   | <i>Fiscus religiosa</i> (Peepal), <i>Rumex dentatus</i> (Halhale). |
| 30. | Food poisoning                            | <i>Dactylorhiza hartagirea</i> (Panchaule).                        |
| 31. | Kidney stone (pathriya)                   | <i>Dolichos biflorus</i> (Gahat).                                  |
| 32. | Piercing ear                              | <i>Cheilantheis dahousia</i> (Ranishinka).                         |
| 33. | Toothache (dant dukhene)                  | <i>Astiblbe rivularis</i> (Thulo okhat).                           |
| 34. | Delivery problem (sutkeri huna caro hune) | <i>Berginea ciliata</i> (Pakhanbet).                               |
| 35. | Typhoid                                   | <i>Neopicrorhiza scrophularifolia</i> (Kutki).                     |
| 36. | Snake bite (sarpale tokeko)               | <i>Centella asiatica</i> (Ghortapre).                              |
| 37. | Allergy caused by insect and larvae       | <i>Nordastachys gradiflora</i> (Jatamasi).                         |
| 38. | Indigestion (khana- napachne)             | <i>Ammomum subulatum</i> (Alainchi).                               |

### 5.2.10 Plant parts used

Different parts of the plants were used in the folk medicine by the local Limbu people of the study area, either in the raw form or through processing to extract important drugs. The roots, leaves and seeds were the most widely used parts of the plant. In some cases a whole plant, including roots, was used. In the same way, bark, seeds, rhizome, stem, flower, young shoots and latex were the other parts and products of plants that were used for medicinal purposes.

### 5.2.11 Forms of Medication:

Similar to the use of different animal species, the plant species utilized in traditional medicine were also used in different forms, like juice, decoction, infusion, diluted drugs, raw, paste and powder. Among the Limbu of the study area, the process of preparation was by crushing, pounding and grinding the parts to be used or the whole plants to extract important drugs out of them.

### 5.2.12 Routes of Administration

Administration of medicinal extract included inhalation, instillation, oral administration and massage. Most of the medication were administrated orally (21 remedies), topical application (15 remedies) and by massage with the extract (2 remedies).

### 5.2.13 Detailed Study of Medicinal Plants

The plants which were used in the folk medicine by the local Limbu of the study area were described primarily based on the information collected during the field survey. The descriptions are given in alphabetical order of families of plant species.

#### 1. Amaranthaceae

*Achyranthes bidentia* Bl. 'Datiwan'

Habit: Herb.

Part used: Root

Forms of medication: Juice, raw.

Medicinal use: The root is crushed and the juice extracted is given twice or thrice a day for the cure of diarrhoea.

**2. Apiaceae:**

*Heracleum nepalense* 'Chimfin'

Habit: Herb

Part used: Fruit

Forms of medication: Solid, Fruit

Medicinal use: The fruit is eaten once or twice in a day for the cure of cough and common cold.

**3. Aspidiaceae**

*Dryoathyrium boryanum* L. 'Kallo niuro'

Habit: T. fern

Part used: Root

Form of medication: Juice, Raw

Medicinal use: The root is crushed and the juice extracted is given twice or thrice in a day for the cure of diarrhoea, dysentery and stomachache.

**4. Asteraceae**

*i. Ageratum conyzoides* L. 'Ilame Jhar'

Habit: Herb

Part used: Leaves

Form of medication: Juice, raw.

Medicinal use: The juice extracted from the leaves is applied over the skin to treat the bite of insects

*ii. Tagetes petula* 'Sayapatri'

Habit: Herb

Part used: Flower

Forms of medication: Ground paste, raw.

Medicinal use: The flower of tagetus petula is ground, along with the cover of *Citrus aurantium* (suntala), seeds of *Cucumis setivus* (kankro), and root of *Citrus aurantifolia* (kagati) and about 15 to 20 gm of the paste thus prepared is given to children twice a day to cure pneumonia.

**5. Araceae**

*Acorus calamus* L. 'Bojho'

Habit: Herb

Part used: Root

Form of medication: Paste, Raw

Medicinal use: Root paste is applied in infected portion to cure scabies and sores, after cleaning the infected part with hot water. A small piece of root is also chewed to cure throat pain.

**6. Campanulaceae**

*Lobelia pyramidalis* Wall. 'Eklebir'

Habit: Herb

Part used: Root

Form of medication: Paste, Juice

Medicinal use: Root paste is applied in wounds. Root juice is also taken in vomit bowels, stomachache and gastric pain.

**7. Caprifoliaceae**

*Viburnum erubescens* Wall. ex.Dc. 'Asare'

Habit: Herb

Part used: Root

Forms of medication: Juice, Raw.

Medicinal use: The root is crushed and the juice extracted is filtered using a thin piece of white cloth and is taken to cure fever and pneumonia.

**8. Caryophyllaceae.**

*Drymaria Cantoniense* L. 'Avijalo'

Habit: Herb

Parts used: Whole plant.

Form of medication: Juice

Medicinal use: The juice of the plant is extracted by crushing whole plant and is taken for the cure of tonsils, pneumonia and cold.

**9. Combretaceae**

*i. Terminalia belerica* Roxb. 'Barro'.

Habit: Tree

Parts used: Fruit

Form of medication: Powder

Medicinal use: The fruit of *Terminalia belerica* (Barro) is taken out and dried along with the fruit cover of *Terminalia chebula* (Harro) and *Embelica officinale* (Amala) for few days. The dried fruits are ground to make powder; this powder is taken one spoonful at a time twice a day with hot water to cure gastric problems and low appetite.

Raw fruit of *Terminalia belerica* (Barro) is also directly taken for the cure of throat pain and cough



*ii. Terminalia Chebula Retz.* 'Harro'

Habit: Tree

Part used: Fruit

Forms of medication: Powder

Medicinal uses: The fruit is dried, along with the fruits of *Terminalia belerica* (Barro) and *Embelica officinale* (Amala) for a few days. The dried fruits are ground to make powder. A teaspoonful of this powder is taken with a glass of hot water twice a day for the cure of gastric issues.

Raw fruit of *Terminalia chabula* (Harro) is also taken for the cure of throat pain and cough.

## 10. **Compositae**

*i. Artemisia indica* Willd. 'Titepati'

Habit: Herb

Parts used: Root and Shoot

Form of medication: Juice

Juice prepared from root and tender shoots is taken to cure pneumonia. Leaf juice is also applied to stop nose bleeding and bleeding in cuts and wounds. Leaf paste mixed with ghee is applied to fractured bones.

*ii. Duhaldea Cappa* A. Anderb. 'Barkhrakane'

Habit: Shrub

Part used: Root

Forms of medication: Juice, Raw

Medicinal uses: Root juice or extract is taken to cure fever, headache and tonsils.

*iii. Eupatorium adenophorum* 'spreng' Kalijhar.

Habit: Herb

Part used: Leaves

Forms of medication: Paste, Juice

Medicinal use: The paste or juice extracted or prepared from leaves is applied in cuts and wounds to stop bleeding.

## 11. **Cruciferae**

*Lepidium sativum* L. 'Chamsur'.

Habit: Herb

Parts used: Seeds, whole plant

Forms of medication: Cooked, powder

Medicinal use: The whole plant body is cooked and taken as vegetable to cure body pain. Sometimes seeds of the plant are mixed with rice grain and cooked and then taken in the form of meal which helps to cure back pain.

**12. Convolvulaceae**

*Cuscuta reflexa* Roxb. 'Pahele Jhar'

Habit: Parasitic herb.

Parts used: Whole plant

Form of medication: Juice.

Medicinal use: The juice prepared from the twining parts of the plant is taken to cure jaundice and yellow fever.

**13. Cucurbitaceae**

**i.** *Coccinea grandis* L. 'Banghiraulo'

Habit: Climbing herb

Parts used: Fruits, seeds

Form of medication: Juice.

Medicinal use: The juice extracted from the fruit is taken for the cure of jaundice.

**ii.** *Cucumis setivus* L. 'Kankro'

Habit: Climbing herb.

Part used: Seeds

Forms of medication: Paste.

Medicinal use: The seed of *Cucumis sativus* are ground along with the cover of *Citrus auantium* (suntala), flower of *Tagetes petual* (sayapatri) and root of *Citrus aurantifolia* (kagati) to prepare a paste, which is given in doses of about 10 to 15 gm twice a day to children to cure pneumonia.

**14. Cyperaceae:**

*Carex cruciata* wahl. 'Harkatta.'

Habit: Shrub.

Part used: Root

The paste prepared from the root of *Carex cruciata* along with the root paste of *Urtica dioica* (sisnu) and mouse stool is applied in the area of a dog bite to get relief from the related pain.

Root juice is also taken to cure cough and cold.

**15. Ericaceae**

**i.** *Gaultheria fragrantissima* Wall. 'Dhasingre'

Habit: Shrub

Part used: Leaves

Form of medication: Paste

Medicinal use: The paste prepared by crushing the leaves is rubbed on the body to get relief from rheumatic pain

**ii.** *Rhododendron arboreum* Sm. 'Gaurans'

Habit: Tree.

Part used: Flower

Forms of medication: Flower solid, raw juice

Medicinal use: The flower of *Rhododendron arboreum* or juice extracted is taken to remove or dissolve fish bones stuck in the throat.

Fresh flower juice or paste is also taken once or twice a day for two days to cure diarrhoea and dysentery.

**16. Equisitaceae**

*Equisetum debile* Roxb. 'Kurkure ghans'

Habit: Terrestrial fern.

Part used: Root

Form of medication: Juice

Medicinal use: The juice extracted from the root is taken for the cure of fever, asthma, tonsils and sore throat.

**17. Euphorbiaceae**

*i. Embelila officinale* Gaertn. 'Amala'

Habit: Tree

Part used: Fruit

Form of medication: Powder

Medicinal use: The fruit is dried along with the fruits of *Terminalia chebula* (Harro) and *Terminalia belerica* (Barro) for a few days and ground to make powder. A teaspoon full of this powder is taken with hot water twice a day to treat gastric problems.

**ii.** *Urtica dioica* 'Sisnu'

Habit: Shrub

Part used: Root

Form of medication: Paste

Medicinal use: Excreta of *Rattus rattus* and the root of *urtica dioica* is crushed to make paste. This paste is applied over the wound or cut for cure.

**18. Gentinaceae**

*Swertia chirayita* Roxb.ex Fleming. 'Chiraito'

Habit: Herb

Part used: Whole plant

Form of medication: Juice/Decoction.

Medicinal use: The juice or extract prepared from the whole plant by boiling is taken to cure fever and pneumonia

- 19. Graminae**  
*i. Saccharum officinarum* 'Ukhu'  
Habit: Grass/Shrub  
Part used: Stem  
Form of medication: Juice  
Medicinal use: The juice extracted from the stem of *saccharum officinarum* is taken frequently for quick recovery from jaundice.
- ii. Imperata cylindrica* L. 'Siru'  
Habit: Herb/Grass  
Part used: Root  
Form of Medication: Juice  
Medicinal use: The juice extracted from the root is taken to treat worms.
- 20. Juglandaceae**  
*Englhardtia spicata* Isch. ExIB. 'Mahuwa'  
Habit: Tree  
Part used: Bark  
Form of medication: Juice  
Medicinal use: The juice extracted from the bark is taken to cure diarrhoea/dysentery and body pain.
- 21. Lauraceae**  
*Lindera nesiiana* Benth. 'Siltimur'  
Habit: Tree  
Part used: Fruit  
Forms of medication: Raw, Oil.  
Medicinal use: Fruits of the plant is taken to cure gastric problems and low appetite. Oil extracted from fruit or seed is used to massage head during headache.
- 22. Leguminosae**  
*Bahunia variegata* Linn. 'Koiralo'  
Habit: Tree  
Part used: Buds  
Form of medication: Solid buds.  
Medicinal use: Dried buds of *Bahunia variegata* are taken to cure asthma, diarrhoea, dysentery and piles.
- 23. Liliaceae**  
*i. Aloe barbadensis* 'Gheukumari'  
Habit: Shrub  
Part used: Leaves

Form of medication: Juice

Medicinal use: The juice extracted from the leaves is applied over the burnt area for its cure.

ii. *Smilax aspera* L. 'Kukurdaino

Habit: Prickly climber

Part used: Root

Form of medication: Juice

Medicinal use: The juice prepared by crushing the root is taken to cure stomachache, as well as vomiting.

**24. Loranthaceae**

*Viscum articulatum* Burn f. 'Hadjoda.'

Habit: Shrub

Part used: Whole plant

Form of medication: Paste

Medicinal use: The paste prepared by crushing the whole plant is applied over a fracture and wrapped with a cloth for quick recovery.

**25. Lycopodiaceae**

*Lycopodium clavatum* L. 'Nagbeli'

Habit: Creepling pteridophyte

Part used: Spore

Form of medication: Paste

Medicinal use: The paste prepared by crushing the spores is applied to old infected wounds for their recovery.

**26. Menispermaceae**

*Cissampelis pareira* L. 'Gujargano'

Habit: Twiner

Parts used: Root, Tuber

Form of medication: Juice

Medicinal use: The juice or the extracted solution prepared from the root or tuber of the plant, in combination with the bark of *myrica esculenta* (kaphal), pulp of *Aegle marmelos* (Bel) and rhizome of *Dryothyrium boryanum* (Kalo niuro) is take once a day for 4 to 5 days to cure diarrhoea and dysentery.

**27. Moraceae**

i. *Artocarpus lakoocha* Roxb. 'Badahar'.

Habit: Tree

Part used: Latex

Form of medication: Gum

Medicinal use: The latex of the plant is applied in small amounts over newly appeared wounds or boils and covered by a small piece of paper for speedy recovery.

*ii. Fiscus religiosa* Eng. 'Peepal'

Habit: Tree

Part used: Bark

Form of Medication: Paste

Medicinal use: The paste prepared by crushing bark of the tree is applied over areas affected by ring worm for its recovery or cure.

*iii. Fiscus sycomorus*. Eng. 'Kimbu'

Habit: Tree

Part use: Root

Form of medication: Juice

Medicinal use: The juice extracted from the root is taken to cure worms.

**28. Musaceae**

*Musa paradisiaca* 'Linn' kera

Habit: Tree

Part used: Fruit

Form of medication: Raw

Medicinal use: Dried pieces of *Anadenus species* (chiplekira) are inserted in ripe fruit of banana and is taken to cure bone fracture.

**29. Myricaceae**

*Myrica esculenta* Ham.exD. 'Kaphal'

Habit: Tree.

Part sued: Bark

Form of medication: Paste

Medicinal use: Bark paste, in combination with paste of bark of *Englhardtia spicata*, is applied over to a fracture for 2/3 times in 6/7 days for quick recovery. Bark paste is also applied to cuts and wounds. Bark juice is also taken in diarrhea, dysentery and tonsil and gastric problems

**.30. Nephrolepidaceae**

*Neprolepis auriculata* L.'Paniamala'

Habit: Terrestrial fern.

Part used: Tubers

Form of medication: Raw

Medicinal use: Three to four tubers of *Neprolepis auriculata* are taken each day for three to four days to cure fever, tonsils and pneumonia

- 31. Orchidaceae**  
*Dactylorhiza hatagirea* D.Don 'Panchaunle'  
Habit: Terrestrial erect herb.  
Part used: Root  
Form of medication: Paste  
Medicinal use: The paste prepared from the root, mixed with milk, honey and egg is taken to cure body pain and strain. Root juice is also taken to cure food poisoning.
- 32. Oxalidaceae**  
*Oxalis corniculata* L. 'Chariamilo'  
Habit: Perennial herb.  
Part used: Leaves  
Form of medication: Juice.  
Medicinal use: The juice extracted from the leaves is taken to cure diarrhoea, dysentery and stomachache.
- 33. Papilionaceae**  
*Dolichos biflorus* L. 'Gahat'  
Habit: Herb.  
Part used: Seeds  
Form of medication: Juice boiled.  
Medicinal use: Seeds are boiled for a long time and the juice extracted is taken as dal 1/2 glass every day for 1 to 3 months to remove stones from kidneys.
- 34. Pteridaceae**  
*Cheilanthes dahousiae* Hook. 'Ranishinka'  
Habit: Terrestrial fern.  
Part used: Stem  
Form of medication: Raw solid.  
Medicinal use: Small piece of the stem is inserted into the newly made earhole in order to keep safe from infection.
- 35. Plumbagonaceae**  
*Plumbago zeglantica* L. 'chittu'.  
Habit: Shrub.  
Part used: Root and leaves  
Form of medication: Paste.  
Medicinal use: The paste prepared from roots and leaves is applied over fractures and swollen portion of the body and is bandaged over for its speedy recovery.

**36. Polygonaceae**

*i. Persicaria hydropiper* L. 'Pirepat'

Habit: Perennial herb.

Parts used: Root and leaves

Form of medication: Juice raw.

Medicinal use: The juice extracted from the root and leaves is taken to cure fever, pneumonia and diarrhoea/dysentery.

*ii. Rumex nepalensis* Spreng. 'Halhale'

Habit: Perennial herb.

Part used: Root

Form of medication: Paste

Medicinal use: The paste prepared from the root is applied to cuts, wounds and ring worm for quick recovery.

**37. Polypodiaceae**

*Dryopteris filixmas* 'Hade unyu'

Habit: Terrestrial fern.

Parts used: Leaves

Forms of medication: Juice.

Medicinal use: The juice extracted from leaves by rubbing is applied to cuts to stop bleeding.

**38. Ranunculaceae**

*Aconitum bisma* Buch-Ham. 'Bikhma'

Habit: Herb

Part used: Root

Form of Medication: Juice.

Medicinal use: The juice extracted from the root is taken to cure fever, cough, diarrhoea, and gastric.

**39. Rutaceae**

*i. Citrus aurantifolia* Christm. 'Kagati'

Habit: Small tree

Part used: Fruit

Form of medication: Juice

Medicinal use: Small quantity of fruit juice is taken to stop vomiting. Root paste prepared with the seeds of *cucumis setivus* (Kankro), fruit cover of *Citrus aurantium* (suntala) and the flower of *Tagetes petula* (sayapatri) is given to children for the cure of pneumonia.

*ii. Citrus aurantium* Linn. 'Suntala'

Habit: Tree



Part use: Fruit cover

Form of medication: Paste

Medicinal use: The paste prepared by crushing the fruit cover, along with the flower of *Tagetes petula* (sayapatri), seeds of *cucumis setivus* (kankro) and the root of *citrus aurantifolia* (kagati) is given to the children for the cure of pneumonia.

*iii. Xanhoxylum armatum* Dc. 'Timur'

Habit: Shrub

Part used: Fruit

Form of medication: Raw

Medicinal use: Fruit is directly taken or chewed to cure stomachache and gastric problems.

*iv. Astibe rivularis* Buch-Ham exID. Don. 'Thulo okhat'

Habit: Herb

Part used: Root

Form of medication: Juice

Medicinal use: The juice extracted from root mixed with silajit (a kind of stone extract) and a small quantity of alcohol (rakshi) is taken to cure diarrhoea. Similarly, small pieces of root are chewed for toothache and to treat sore throat and cough.

*v. Evodia frazinifolia* Hook. F. 'Khanakpa'

Habit: Small tree.

Part used: Fruit

Form of Medication: Raw.

Medicinal use: The fruit of *Evodia frazinifolia* is taken as raw fruit to increase the appetite.

**40. Rosaceae**

*Rubus ellipticus* Sm. 'Ainselu'

Habit: 'Shrub'

Part used: Root

Forms of medication: Juice, paste

Medicine use: The juice extracted from the root part is taken to cure gastric issues.

Root paste is also applied to snake bites to reduce the pain.

**41. Saxifragaceae**

*i. Berginia ciliata* Howorth. 'Pakhenbed'

Habit: Herb

Part used: Root

Form of medication: Juice

Medicinal use: The juice extracted from root is given to women during menstrual haemorrhage. It is also given during delivery difficulties to loosen the muscles and release body pain.

Root paste of the plant is also applied to cure fractured bones.

*ii. Berginia purpurascens* Hook. F. Thoms 'Khokim'

Habit: Shrub

Part used: Root

Form of medication: Paste

Medicinal use: Root paste in mixed form with paste of shoots of *viscum articulatum* (Hadjoda) is applied in bone fractured area and bandaged for soon recovery. Root juice is also taken to cure wounds, diarrhoea and dysentery.

**42. Scrophulariaceae**

*Neopicrorhiza scrophulariifolia* Hong. 'Kutki'

Habit: Herb.

Part used: Root

Form of medication: Juice

Medicinal use: The juice extracted from root is taken for the cure of fever, cough, diarrhoea, typhoid and headache as well.

**43. Umbelliferae**

*Centella asiatica* L. 'Ghortapre'

Habit: Herb.

Part used: Leaves

Forms of medication: Paste and juice

Medicinal use: The juice extracted from leaves of the plant is taken for the cure of cough, cold and fever.

Similarly, paste prepared from leaves in combination with leaf paste of *Oxalis corniculata* (chariamilo) is applied to treat snake bite and skin allergies caused by insects and larvae.

**44. Valerianeaceae**

*Nordastachys grandiflora* DC. 'Jatamasi'

Habit: Perennial herb.

Parts used: Root/Rhizome.

Form of medication: Juice

Medicinal use: The juice extracted from root of the plant is taken to cure cough, cold and fever.

**45. Verbinaceae**

*Callicarpa macrophyla*. 'Gualo'

Habit: Tree

Part used: Bark.

Form of medication: Powder. Medicinal use: The bark of the plant is dried for a few days and ground to make powder. Thus prepared powder is taken a teaspoonful twice or thrice in a day till recovery to cure pneumonia in adults.

**46. Zingiberaceae**

*i. Ammomum subulatum* Roxb. 'Alainchi'

Habit: Herb

Part used: Seeds

Form of medication: Powder or raw.

Medicinal use: Seeds of the plant are taken directly or chewed during indigestion. Similarly, powder made by grinding is mixed with hot water and given to control vomiting.

*ii. Zingiber officinale* Ross. 'Aduwa'

Habit: Herb

Part used: Rhizome

Form of medication: Paste

Medicinal used: The paste prepared from the rhizome of ginger mixed with honey is taken to cure body pain, cough and throat pain.



## **6. INDIGENOUS KNOWLEDGE SYSTEM**

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Indigenous knowledge of the Limbus of Khejenim VDC was found to support the livelihood of people to maximum extent. People of the study area were found to use

their own knowledge in different livelihood activities like agriculture, biodiversity conservation, preparation and use of domestic materials, storage of food grains for a long time and use of organic insecticides and pesticides. The knowledge system and its use are described under different headings below.

### **6.1 In agriculture**

(a) Preparation and use of organic manure:

The excreta or dung of domesticated animals like cow, buffalo, goat, pigeon, hen etc. is collected in a pit for few days or months and used in the field to increase the fertility of soil.

(b) Preparation of agricultural tools:

People of the study area make the essential agricultural tools, such as plough (halo), juwa, pataha and dande from locally available resources. These are prepared from the wooden log of chilaune (*Schima wallichii*).

(c) Selection and use of wild edible foods:

People in the local community were found to use wild edible foods like ban tarul, simal tarul, chayau etc. People in the Limbu community collect such food while working in the periphery and consume after cooking.

### **6.2 Conservation of Biodiversity**

Through their entire history Limbu people have been highly conscious of the conservation of biodiversity. The local Limbu people widely cultivate cash crops. For example, *Ammomum stubulatum* (Alainchi) is cultivated in the terraced fields, which itself conserves soil from erosion. Supporting such farming, plants like Uttis (*Ulnus nepalensis*) that maintains the greenery, as well as being helpful in conserving soil for cultivation, are planted in the terrace fields.

The Limbu people of the study area have planted many plants in the periphery of their residential area which are used as animal fodder or as fire wood for cooking. Widely cultivated plants are, uttis (*Ulnus nepalensis*), gualo (*Callicarpa macrophylla*), chilaune (*Schima wallichii*) etc. The plants like *Fiscus religiosa* (peepal) and *Fiscus bengalensis* (*bar*) are untouched as sacred plants. This is due to the influences from the myths of Hindu religion. The medicinal plants like *Berginia Ciliata* (pakhabet) and *citrus aurantifolia* (kagati) are planted and well conserved. Most of the medicinal plants are found in wild or terrestrial habit, which are also conserved and used by the people. In case of faunal use and conservation, people of the study area have kept a variety of domestic animals which are used in various purposes like agriculture and animal products like meat, milk, leather and fur. The only difference in use is during the sacrifice of animals in mundhum and other purposes, they sacrifice only the male of the species, which shows their consciousness in conservation.

### **6.3 Preparation and use of materials from locally available resources:**

The most widely used plant among the locally available resources was bamboo. Though bamboo has no special religious value, different species of bamboos are used in making various tools for domestic purposes, which are explained below:

(a) Bhalu bans (*Dedrocalamus species*) is used in making different tools like water container to fetch water. It has large circumference and a big hollow space which can hold 10-15 litres of water if made of three nodes. Similarly, this is used to keep milk for the processing of sour milk, butter and ghee by making a single node container called a dhungro.

In the same way, a single node bamboo is also used for drinking of Tongba which is a common alcoholic drink among Limbus of local community.

(b) Mal bans (*Dendrocalamus species*) is another species of bamboo which is widely used in making pillars during construction, local bridges and handles of agricultural tools like spades. The root of the plant is used in making handles for knives.

(c) Choya bans (*Dendrocalamus species*) is taken as soft bamboo. Various bamboo crafts are made with this such as 'doko' (used in carrying grass, firewood, manure and food grains), 'thunche' (used in carrying food grains like millet, maize, rice, etc.), 'koko' (used in keeping small baby as baby sitter), 'nanglo' (used in separating cover or coat of food grains after grinding) and 'ghum' (used as raincoat by weaving with the leaves of bhorlo).

#### 1. Leather/skin of animals:

Skin of animal like buffalo is used after drying for a long time in making tools for sitting. It is made from bamboo sticks and skin.

#### 2. Trees

People of the study area use the logs of plants like Uttis (*Ulmus nepalensis*), Chilaune (*Schima wallichii*), etc to make grinding tools for food grains like rice, maize, called 'dhiki' and 'okhal'. Raw rice is ground and the husk is peeled out by using such tools before preparation for cooking. Wheat, millet and other food grains are also processed in the same way.

### 6.4 Storage of seeds and food grains

The dust powder of Neem (*Bhumea lacera*) helps to preserve the seeds of wheat, maize and beans. The leaves of the neem plant are dried in the sun for a few days and ground to make powder. The powder thus prepared is mixed with the seeds of grains to be stored. This powder thus mixed prevents the seeds from the insects like ghun (seed borer). A small amount of such powder is used. Similarly, seeds of beans are kept above the oven in the kitchen packed in a thin cloth. The continuous strike of carbon dioxide prevents the seeds from boring insects.

### 6.5 Preparation and use of insecticides

The Limbu people of the study area were found to have their own knowledge in the preparation and use of insecticides and pesticides.

#### (a) Insecticides for agricultural crops against aphid (lai kira)

The fresh tobacco leaves (*Nicotinna tobacco*) are ground, and the juice extracted is prepared in a solution with water by mixing in the ratio of 1:2 to desired quantity of need. Thus prepared solution is sprayed over the infected plants.

(b) Similarly, for the same purpose of killing insects, people of the study area spray the powder of ash (kharani) left after the burning of firewood early in the morning so that the powder sticks over the infected leaves and pests are killed.

### 6.6 Preparation of indigenous drink 'Tongba'

Tongba is a millet-based alcoholic beverage found in the mountainous and hilly regions of Nepal among the Limbu people.

Tongba is prepared by cooking and fermenting whole grain millet. The millet is then dried, traditionally it is stored under a roof for about six months, after which it is consumed in a unique way: the fermented millet is put in a container, also traditionally called a Tongba and boiled water is poured in it to the brim. It is then left

undisturbed for about five minutes. Once the five minutes has passed it is ready to drink, a fine bamboo straw with a blind end but perforated on the side to act as a filter is inserted into the container to suck out the warm water and alcohol from the millet grains. More hot water is added as the Tongba becomes dry and process is repeated until the alcohol is exhausted.

## 7. DISCUSSION

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The Limbu or Yakthumba are an indigenous ethnic group that belongs to the Kiranti group or Kirat confederation. Their population according to the census 2058 B.S. (2001 AD) is 3,59,379 which constitute 1.58 percent of the total population.

Most of the population of Limbu is centred on the districts of Sankhuwashaba, Teherathum, Dhankutta, Taplejung, Panchathar and Ilam, all with in the Mechi and Koshi zones in Nepal, also known as Limbuwan. The Limbu are a purely Monogolid people and they exhibit the features clearly with the skin stretched across the face and the eyes which show clearly the Monogolid or epicanthic folds, the molar bones make the cheeks appear high, the nasal roots are low and the noses are small and flat among some (Gautam and Thapa Magar, 1994). They have sturdy and strong bodies and are of short to medium stature and body hair is scarce and their complexion is fair to pinkish. Since Limbu are residing in the districts of hill, so they have an easy access to the natural resources and products, so they have rich knowledge, skills and techniques on the traditional utilization of natural resources, especially the locally found plant and animal species for traditional healing purposes.

The use of plants and plant products, and animal products as medicines could be traced as far as the beginning of human civilization. Similarly, the local Limbu people of Khejenim VDC of Taplejung district possess rich traditional and indigenous knowledge on the utilization of different plant and animal species for medicinal purposes at local level. The present study shows that they make the use of 64 species of medicinal plants belonging to 44 families and 61 genera and 15 animal species both wild and domesticated belonging to 9 order and 10 families for medicinal purposes where plant species were used in large number in comparison to animal species.

Study and analysis from data shows that the recorded 15 animal species from the area of study were used for the treatment of 12 different ailments by the local Limbu people of the area using their own traditional knowledge. Among 15 animal species recorded 8 species were mammals, 3 species were aves and 4 species were invertebrates. On the basis of their traditional and folk knowledge different organs and products of animal species were used. Organs and products used are meat, blood, stomach, wax etc for medicinal purposes. In some cases whole organism was utilized. Meat of the animal species were widely used for 5 medical remedies, 2 ailments were treated with honey, 1 ailment was treated with the blood of animal species, similarly urine, excreta, bones of animal species, were used for the treatment of single ailments. A single species was used for the treatment of respiratory tract infection such as asthma, gastrointestinal disorder like bleeding (Harsa), body itching, Rheumatic arthritis, Snake bite, wounds and cuts, energyless, broken bones or bone dislocation respectively. Similarly 3 species were used for burn, 3 for skeleton muscular problem



that included back pain, body pain and rheumatic pain. Medicinal use or administration of animals products and organs included instillation and oral absorption which are internal medication. and applying which is external medication. Most of the medications were administrated orally (8 remedies). Similarly by applying remaining (6 remedies).

Animal species used for medicinal purposes were both domesticated and wild, among the total 15 species used 7 species of animals were domesticated and 8 species were wild. *Bos indicus*, *Capra hircus*, *Canis familiars*, *Teron bicineta*, *Gallus domesticus* and *Apis cerana* were domesticated while *Panthera tigris*, *Canis aureus*, *Hystrix brachura*, *Rattus rattus*, *Acridotheres tristis*, *Anadenus species*, *Apis speices*, and *Ornithodoros species* were wild species.

The different species of animal reported with their traditional medical therapy or utility in the present research work are also supported by the findings of other researchers, like for the treatment of rheumatism cooked meat and alcohol of meat of *Canis aureus* was used in the present work or study which was also reported by Kaundinya (1997), Acharya (1999), Dhakal (2004) and Koirala (2004) in their studies. Thakur (2003) reported the use of urine of this species in the treatment of insanity and epilepsy. Similarly the stomach and intestine of *Hystrix brachura* was used for the treatment of asthma in the present study which was also reported by Tamang (2003), Thapa (2008), Kaundinya (1998), Acharya (1999) Dhakal (2004), Koiral (2004) and Thapa (2008) in their study..

Some of the animal species reported from the present study have been used for different medical purposes which differs from others study for example *Apis cerana* have been used for curing body pain in the present study while koirala (2004) reported the use of honey of *Apis cerana* for curing cough, similarly Thapa (2008) also reported the use of honey of *Apis cerana* for curing cough and menstrual disorder. The meat of *Treron bicineta* was used to cure energyless in present study, while meat of *Treron bicineta* was reported to be used for the cure of cough and backache by Koirala (2004), like wise same species was used to cure cold in the study of Thapa (2008). The liver of *Capra hircus* was reported to be used for night blindness by Dhakal (2004) while the urine of the same species have been used to cure body itching in the present study similarly blood of same species was used in menstrual disorder reported by Thapa (2008)

From the study, 64 species of medicinal plants were used for the treatment of 38 different ailments. Among 64 different medicinal plants 76.56% of the species were dicotyledons, 15.62% monocotyledons and 7.8% pteridophytes. On the basis of habit 28.12% plant species were trees, 12.5% shrub, 40.62% herb, 7.81% were fern, 6.25% climber and 4.68% Grass. The different parts used for medicinal purpose included, root leaves, seeds, bark, rhizome, stem, flower, spore, tubers, whole plant and buds. Widely used part was the root which was used for different remedies like

diarrhoea, dysentery, stomachache, fever, pneumonia, headache, nose bleeding, Dog bite, cough, Asthma, tonsil, sore throat, wounds, worm in intestine, etc., leaves of plants were used in the remedy of different ailments like Rheumatic pain, cuts, wound bleeding, insect bite, diarrhoea, dysentery, snake bite etc. Similarly bark of medicinal plants was used for the cure of ailments like gastric and cough, etc. Whole plant species were used for the cure of different ailments like tonsil, pneumonia, cold Jaundice, Yellow fever etc.

Respiratory tract infections, gastro-intestinal disorder, skeleton muscular problems and dermatological infections were the prevalent diseases and disorders treated with the locally available medicinal plants by using their own traditional knowledge. 16 different species were used for the gastrointestinal remedies, 36 species were used for the cure of respiratory tract infections, 15 different species were used for the cure of dermatological infections, 6 species of medicinal plants were used for the cure of skeletomuscular problems, similarly 2 species each were used for the cure of bleeding, Headache and jaundice, 1 species each were used for the cure of dog bite, toothache, fish thorn striking on throat, delivery problem, snake bite, kidney stone and making ear whole; respectively.

The local Limbu people have been utilizing the different medicinal plants in different forms like, Juice, decoction, Raw, paste, powder, cooked vegetable, oil, Gum or latex and extracted drug. The people of the study area use locally prepared mortar and pestle for grinding and crushing of required parts or whole plant to extract juice or prepare paste for the remedy or cure. For the preparation of powder, parts of the plant were dried at first and grinded in mortar and then used. For the preparation of decoction parts required were boiled with liquid for a long time and then juice extracted is used or taken. For the preparation of paste parts of plant were grinded with small amount of water if needed and applied over the infected part or area. In some of the cases fruits and seeds are taken orally in raw form. Among different forms of medication juice comprises of 50%, paste 25%, raw 9.37%, powder 6.25%, decoction 4.68% and 1.56% each cooked, oil raw and gum or latex. Medical administration included oral administration (22 remedies), applying (14 remedies) massage (1 remedy) and instillation (2 remedies).

Most of the medicinal plants reported from the study area have multiple medicinal uses. *Terminalia belerica*, *Terminalia chebula*, *Artemisia indica*, *Carex cruciata*, *Swertia chirayita*, *Englhardtia spicata*, *Bahunia variegata*, *Neopicrorhiza scrophulariifolia* are some of the medicinal plants with multiple medicinal use. During medication either the products were used. Like fruits of *Embelila officinale*, *Terminalia belerila*, and *Terminalia chebula* were dried for few days. The dried fruits are then grinded to make powder which is taken a tea spoonful in the morning and evening after meal with a glass of warm water, for the treatment of gastric problem stomachache, and indigestion. Similarly the flower of *Tagetus petula* is grinded along with the fruit cover of *Citrus aurantium*, seeds of *Cucumis setivus*, and root of *Citrus*

*aurantifolia* and the paste thus prepared is given twice a day for children to cure pneumonia.

The reported medicinal plants and their traditional utility in the cure of different ailments in the present study area are also supported by the findings of other researchers. For example, *Terminalia belerica* and *Terminalia chebula* are used for the treatment of digestive disorders like gastric and cough in the present study. Ghimire (1999) reported the same species for the cure digestive disorder as well as diarrhoea and dysentery and Tamang (2003) reported these species for the cure of cough. *Aloe barbadensis* is used for the treatment of burn in the present study. Ghimire (1999), Rai (2003), Tamang (2003) also reported the use of the species for curing burn similar to the present findings. However Ramana (2008) from university of Hyderabad reported the use of *Aloe barbadensis* for the cure of eye infection. *Swertia chirayita* was reported to be used in fever, pneumonia, diarrhoea and dysentery in the present study. Thapa (2008) reported the use of this species in the treatment of fever, high fever and blood pressure which was similar to the present findings. However Ghimire (1999) reported the same species as antihelminthic remedy as well as Rai (2003) reported this species for the treatment of hypertension, and diabetes. *Plumbago zeylanica* was found to be used in fracture and swallow portion in the present study. However Rai (2003) reported the use of the same species in cure of leprosy, skin diseases, bactericide and fungicide. In the same way Beg and Ahamad (2000) reported the use of alcoholic extract of *Plumbago zeylanica* as an antibacterial agent. Joshi and Joshi (2007) reported the use this species in curing ring worm. Ramana (2008) reported the use of the same species in treatment of boils. *Artemisia indica* has been reported to be used in bleeding, pneumonia and fractured in the present study. Kunwar and Adhikari (2005), Thapa (2008) reported the use of this species in cuts and wounds to stop bleeding which supports the present findings. However Ghimire (1999) reported this species in helminthic cure. Rai (2003) reported the same species as nervous fresher. Joshi and Joshi (2007) reported the same species in cure of itching. *Rumex nepalensis* was reported to be used in cuts, wounds and ring worm in the present study. Rai and Adhikari (2009) reported the use of this species in cut, wound and swellings which shows the similar use of the species. However Ghimire (1999) and Tamang (2003) reported the use of this species in pain and rheumatism. Thapa (2008) also reported the same species used in cure of dental problem. *Lepium setivum* was reported to be used in the cure of body pain. Thapa (2008) reported this species in the cure of pain at back which supports the present findings. However Rai (2004) reported the same species in the cure of Asthma, cough, piles and diuretic. *Berginia Ciliata* has been reported to be used in body pain, delivery problem, hemorrhage and fracture in the present study. Rai (2003) reported the same species used in uterine contraction, ulcers, fever and kidney stone. Thapa (2008) reported the same species for the cure of back pain. Both of the findings show

similarity to the present findings. However Kunwar and Adhikari (2005) reported the use of this species in, diarrhoea, fever and respiratory problems.

Similarly the present findings for the use of *Fiscus religiosa*, *Coccinea grandis*, *Acorus calamus*, *Heracleum nepalensis*, *Achyranthus bidentia*, *Viscum articulatum*, *Artocarpus lakoocha* were also supported by the findings of other researchers for similar uses.

The present findings have reported the use of few plant species in combination with the products of animal species. Like, the extracted juice of *Zingiber officinale* mixed with few teaspoonful of honey is taken to cure body pain throat pain and cough. Similarly the grinded paste of the root of *Urtica dioica* and excreta of mouse is applied over the cuts and wounds for its cure. Dried meat pieces of *Anadenus species* are placed inside the fruit of *Musa paradisiaca* and taken orally to cure bone crack and fracture.

The Limbu people of the study area had two different kinds of religious leaders or priest known as Samba and Fedangba however some of the people were found to rely upon the local healers, and Dhami. Most of the people have few knowledge of traditional use of different medicinal plants and animal species. A Samba or Fedangba dressed in a long white skirt, white blouse and a hat with feathers on his head and beaded necklace jumps around beating his drum. A couple of teenage boys, hoping to learn the acts of the priest, follow him around beating brass plates. Those who begin to shake hysterically after a while are considered to have been selected by their god and are therefore fit to be taught others fail to reach ecstasy and are dismissed. Fedangba is involved in the rituals that use incantations, amulets, magic, sacrifices and religious verses, however Dhami or Jhankri have some knowledge about the uses of medicinal plant and animal species.

Dhami/Jhankri check and examine the patient either in the early morning or during evening and in some cases they use their own tantrik during night time i.e. 'Dhami basne'. people of the study area have knowledge regarding the use of plants and animals for the treatment of common ailments like diarrhoea dysentery, fever headache, common cold, cuts and wounds etc But in the special cases like bone crack, fracture haemorrhage, gastric pain, they visit the local healers.

The modern facility, of health post and hospital has attracted the local people to prefer the allopathic remedy to some extent however Khejenim VDC is one of the very remote VDC in Taplejung so people of this village were found to rely upon the traditional medical therapy equally. In some of the acute disorders people visit hospital. Even local healers and Dhami refer the patient to have treatment in the hospital. From the study it was found that local people of the study area are not totally dependent on the local healers and traditional medical therapy.

The local people of the study area were conscious regarding the use and conservation of medicinal plant species. For this they have managed the specific site

and place for the cultivation of some medicinal plant species like Chamsur, Pakhanbet, Bojho, Ukhu, Sisnu, Chiraito, etc near the residence in the kitchen garden. Medicinal plant trees like Gualo, Harro, Barro etc are protected in the forest as well in the agricultural field. The local healers as well as the people collect the required part of medicinal plant in specific day and time like full moon or new moon and in the early morning or evening which also contribute in the conservation and sustainable use of medicinal plants.



## 8. CONCLUSION AND RECOMMENDATIONS

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### 8.1 Conclusion

From the research it shows that Limbu people of Khejenim VDC have a rich folklore and indigenous knowledge in the utilization of different plants and animals against various common diseases like asthma, pneumonia, jaundice, gastro-intestinal problems, minor cuts and wounds etc. Comparatively maximum plant species were used than animal species for different remedies. Local healers, vaidhyas and some elder people were found to have more knowledge on the traditional use of medicinal plants and animals in medical therapy where as young people and students were not much aware about use of such species of medicinal plants and animal. Dhami/Jhankri were found to use their own tantra and mantra gifted by their Guru or god.

Due to the provision of modern health post and hospital such traditional and indigenous use of medicinal plants and animal was found to decline day by day. Lack of interest among youngsters in acquiring such knowledge and practice is major cause for decline in such practice and therapeutic use of medicinal plants and animals. Due to this gap of knowledge and practice total people of the study area were not found to rely completely in the traditional medical practice. Still due to geographical complication and remoteness of the village most of the common ailments and disorders like fever, head ache, diarrhoea, dysentery, minor cuts and injuries, wounds etc are cured through traditional medical therapy. The local people of the study area have shown their consciousness through conservation, protection and plantation of essential medicinal plants in the forest as well as in their own nursery and garden. The local healers and people have also contributed in the conservation as well as sustainable use of such species by collecting the required parts of medicinal plants and protecting the remaining body of it.

### 8.2 Recommendations:

- Document and record of the diversified utilization of various plants and animal species.
- Initiation of conservation action works with appropriate measures involving local articulation.
- Implementation of awareness activities with integrated approach for sustainable development.

- Encourage people for commercial cultivation of medicinal plants and provide required guidelines and trainings for such large scale cultivation.
- Provide institutional support for production and dissemination of the species for cultivation.
- Encourage the youngsters to adopt the knowledge regarding the importance of traditional medical practice and sustainable use of such important medicinal plants
- Provide trainings and guidelines for youngsters on modern cultivation technology.
- Motivate traditional healers to inherit their knowledge to growing generation.
- Awareness programme regarding conservation, management and utilization of medicinal plants in a sustainable way.
- Adequate research with regards to best form of propagation techniques.



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### **Annex 1: Checklists:**

Check list for the key informant interview for the preparation of traditional medicine and treatment.

1. Name:
2. Gender:
3. Locality:
4. Literacy:
5. Education:
6. Occupation:
7. How long it has been you are doing such treatment?
8. Source or inspiration of knowledge acquired?
9. Common prevalent diseases in the society?
10. What are the common diseases treated at home traditionally?
11. Which plants do you use for treating each diseases and how? Detail information about the preparation of medicine from plant.

### **Preparation and use of Medicine**

- a. Name of disease:
- b. Symptoms of disease
- c. Name of Medicinal plants/ parts of animal used:
- d. Procedure of preparing medicine:
- e. Process of treatment along with required does and duration of intake.
- f. Source of medicinal plants and animals.

Check list for the focus group discussion and local knowledge on the management of medicinal plants and animals.

1. How is the use of traditional medical therapy working in the present context?
2. Is there more influence of modern health facilities among the people?
3. Is there any difficulty or barrier to pass such traditional knowledge to new generation?
4. How curious are the youngsters to get and adopt such knowledge or they don't care about learning such knowledge?
5. How is the belief of youngsters towards such traditional medicinal practice?
6. What is the status of medicinal plants and animals being used, are they rare in number or excuse?
7. Are people facilitated with modern health facilities like hospital, health post and primary health care center?
8. Is there any documentation done so far on the plant and animal species of medicinal values found in your area, as well as their traditional knowledge?

9. What are the risks you have noticed for raring such traditional medical practice and what is your opinion for the conservation of such knowledge?
10. What are your expectations from the government and other organizations in order to preserve such knowledge?
11. What are the sources of medicinal plants and animals?
12. How are the medicinal plants and animals collected?
13. Are there any specific guidelines and techniques for the harvesting and collection of medicinal plants?
14. Are there specific sites for collecting medicinal plants and animals where they are found excess?
15. In which season medicinal plants are collected excessively?
16. Are there any social or cultural rules limiting harvesting to specific period? If yes, what are they and why so?
17. Which parts of plant are excessively harvested?
18. Are there any effort taken at local level towards conservation of medicinal plants?
19. Do you have taken any initiation for conserving medicinal plants?
20. Your last words?
21. Any suggestions for policy makers towards conservation of medicinal plants

**ANNEX2: List of Tables**

**Table 7: Categorization of animal species used in folk medicine by the local Limbus of Khejenim VDC Taplejung**

| S.N. | Order          | Family      | Latin Name                  | Type     | Nep/Local Name       | English Name | O      |
|------|----------------|-------------|-----------------------------|----------|----------------------|--------------|--------|
| 1.   | Acorina        | Argidaceae. | <i>Ornithodoros species</i> | Parasite | Kirno/<br>Stratengwa | Ornithodoros | B      |
| 2.   | Artiodoctyla   | Bovidae     | <i>Bos indicus</i>          | Mammals  | Gai/ Pit             | Calf         | U      |
| 3.   | Artiodactyla   | Bovidae     | <i>Capra hircus</i>         | Mammals  | Bakhra/<br>Menda     | Goat         | F      |
| 4.   | Artiodactylas  | Bovide      | <i>Ovis vigeni</i>          | mammals  | Bheda/<br>Khen       | Sheep        | C      |
| 5.   | Carnivora      | felidae     | <i>panthera tigris</i>      | Mammals  | Bagh/<br>Kedda       | Tiger        | B      |
| 6.   | Carnivora      | Canidae     | <i>Canis aureus</i>         | Mammals  | Syal                 | Jackal       | M      |
| 7.   | Carnivora      | Canidae     | <i>Canis familiars</i>      | Mammals  | Kukur/<br>kocho      | Dog          | B      |
| 8.   | Columbiformes  | Columbidae  | <i>Teron bicineta</i>       | Aves.    | Parewa               | Pigeon       | M      |
| 9.   | Galliformers   | Phasinidae  | <i>Gallus domesticus</i>    | Aves     | Kukhura/<br>Wa       | Hens         | B      |
| 10.  | Hymenoptera    | Apide       | <i>Apis cerana</i>          | Insect   | Mouri/<br>Himsawa    | D. Bee       | H      |
| 11.  | Hymenoptera    | Apidae      | <i>Apis sps.</i>            | Insect   | Putka.               | Wild bee     | H      |
| 12.  | Passeriformers | Sturnidae   | <i>Acridotheres tristis</i> | Aves     | Rupi.                | Common Myna  | M      |
| 13.  | Rodentia       | Hystricide  | <i>Hystrix brachura</i>     | Mammals  | Dumsi/Ai             | Percupine    | M      |
| 14.  | Rodentia       | Hystricidae | <i>Ratuts rattus</i>        | Mammals  | Musa/Suwa            | Rat          | S      |
| 15.  | Stylomatophora | Helicidae   | <i>Anadenus species</i>     | Mollusk  | Chiplekira           | Slug         | W<br>b |

**Table 8: Catagorization of plant species used in folk medicine by the Local Limbus of Khejenim VDC, Taplejung.**

| S.N. | Divison     | Family          | Latin Name                   | Nep/Local Name     | Life form | Parts used | Fo<br>Med |
|------|-------------|-----------------|------------------------------|--------------------|-----------|------------|-----------|
| 1.   | Dicotyledon | Amaranthaceae   | <i>Achyranthus bidentia</i>  | Dattiu/<br>Titiri  | Herb      | Root       | J         |
| 2.   | Dicotyledon | Ranunculaceae   | <i>Aconitum bisma</i>        | Bikhma/<br>Chaning | Herb      | Root       | J         |
| 3.   | Dicotyledon | Cucurbitaceae   | <i>Cucumis setivus</i>       | Kankro/pait        | Herb      | Seeds      | F         |
| 4.   | Dicotyledon | Verbinaceae     | <i>Calicarpa macrophyla</i>  | Gualo              | Tree      | Bark       | Po        |
| 5.   | Dicotyledon | Combretaceae    | <i>Terminalia belerica</i>   | Barro              | Tree      | Fruit      | Pow       |
| 6.   | Dicotyledon | Ericaceae       | <i>Rhododendron arboreum</i> | Gurans/<br>Thoset  | Tree      | Flower     | J         |
| 7.   | Dicotyledon | Scrophulariceae | <i>Neopicrorhiza</i>         | Kutki/             | Herb      | Root       | J         |



|     |             |                 |                                  |                          |            |                        |           |
|-----|-------------|-----------------|----------------------------------|--------------------------|------------|------------------------|-----------|
|     |             |                 | <i>scropularifolia</i>           | Pangwofung               |            |                        |           |
| 8.  | Dicotyledon | Asteraceae      | <i>Agaretum conyzoids</i>        | Ilame Jhar               | Herb       | Leaves                 | J         |
| 9.  | Dicotyledon | Asteraceae      | <i>Tagetus petula</i>            | Sayapatri/<br>Thapathung | Herb       | Flower                 | P         |
| 10. | Dicotyledon | Valerianeceae   | <i>Nordastachys grandiflora</i>  | Jatamasi                 | P.Herb     | Root/<br>Rhizome       | J         |
| 11. | Dicotyledon | Caprifoliaceae  | <i>Viburnum erubescens</i>       | Asare                    | Shrub      | Root                   | J         |
| 12. | Dicotyledon | Cyperaceae      | <i>Carex cruciata</i>            | Harkatta                 | Shrub      | Root                   | P         |
| 13. | Dicotyledon | Apiaceae        | <i>Heracleum neplanse</i>        | Chimfin                  | Small tree | Fruit                  | P         |
| 14. | Dicotyledon | Companulaceae   | <i>Lobelia pyramidalis</i>       | Eklebir                  | Herb       | Root                   | J         |
| 15. | Dicotyledon | Caryophyllaceae | <i>Drymaria cantoniense</i>      | Avijalo                  | Herb       | Whole Plant            | J         |
| 16. | Dicotyledon | Combretaceae    | <i>Terminalia chebula</i>        | Harro                    | Tree       | Fruit                  | pow       |
| 17. | Dicotyledon | Compositae      | <i>Eupatorium adenophorum</i>    | Kalijjhr/Na<br>msyusyuna | Herb       | leaves                 | P<br>j    |
| 18. | Dicotyledon | Compositae      | <i>Duhaldea cappa</i>            | Bakhrakane               | Shrub      | Root                   | J         |
| 19. | Dicotyledon | Compositate     | <i>Artemisia indica</i>          | Titepati/Na<br>myowa     | Herb       | Root/<br>shoot         | J         |
| 20. | Dicotyledon | Convolvulaceae  | <i>Cuscuta reflexa</i>           | Pahale Jhar              | Herb       | Whole plant            | J         |
| 21. | Dicotyledon | Cruciferae      | <i>Lepium sativum</i>            | Chamsur                  | Herb       | Whole plant/<br>Seeds. | Co<br>veg |
| 22. | Dicotyledon | Cucurbitaceae   | <i>Coccinea grandis</i>          | Ban<br>Ghiraulo          | C. Herb    | Fruit                  | J<br>P    |
| 23. | Dicotyledon | Ericaceae       | <i>Gaultheria fragrantissima</i> | Dhasingre                | Shrub      | Leaves                 | P         |
| 24. | Dicotyledon | Euphorbiaceae   | <i>Urtica dioca</i>              | Sisnu/Sikwa              | Herb       | Root                   | P         |
| 25. | Dicotyledon | Euphorbiaceae   | <i>Embelica officinalis</i>      | Amala                    | Tree       | Fruit                  | po        |
| 26. | Dicotyledon | Gentinaceae     | <i>Swertia chirayita</i>         | Chiraito/<br>Sukhingwa   | Herb       | Whole plant            | J<br>Dec  |
| 27. | Dicotyledon | Juglandaceae    | <i>Englhardtia spicata</i>       | Mahuwa/<br>Yakpama       | Tree       | Bark                   | J         |
| 28. | Dicotyledon | Lauraceae       | <i>Lindera neesiana</i>          | Siltumur/<br>Meding      | Small tree | Fruit                  | Oi        |
| 29. | Dicotyledon | Loranthaceae    | <i>Viscum</i>                    | Hadjoda                  | Shrub      | Whole                  | P         |

|     |               |                |                               |                        |                    |                  |  |
|-----|---------------|----------------|-------------------------------|------------------------|--------------------|------------------|--|
|     |               |                | <i>articulatum</i>            |                        |                    | plant            |  |
| 30. | Dicotyledon   | Leguminosae    | <i>Bahunia variegata</i>      | Koiralo/<br>Ajiwa      | Tree               | Buds             |  |
| 31. | Dicotyledon   | Menispermiceae | <i>Cisampelis pareira</i>     | Gujargano/<br>Afani    | Climber            | Root/<br>Tuber   |  |
| 32. | Dicotyledon   | Moraceae       | <i>Artocarpus lakoocha</i>    | Badahar/<br>Muchhe     | Tree               | Latex            |  |
| 33. | Dicotyledon   | Moraceae       | <i>Fiscus religiosa</i>       | Peepal                 | Tree               | Bark             |  |
| 34. | Dicotyledon   | Moraceae       | <i>Fiscus sycomorus</i>       | Kimbu/<br>Khaiyuwa     | Tree               | Root             |  |
| 35. | Dicotyledon   | Myricaceae     | <i>Myrica esculenta</i>       | Kaphal                 | Tree               | Bark             |  |
| 36. | Dicotyledon   | Oxalidaceae    | <i>Oxalis corniculata</i>     | Chariamilo             | Perrineal<br>Herb  | Leaves           |  |
| 37. | Dicotyledon   | Papilionaceae  | <i>Dolichos biflorus</i>      | Gahat/<br>Fellise      | Herb               | Seeds            |  |
| 38. | Dicotyledon   | Plumbagonaceae | <i>Plumbago Zeylanica</i>     | Chittu                 | Perrineal<br>shrub | Root/<br>leaves  |  |
| 39. | Dicotyledon   | Polygonaceae   | <i>Perasicaria hydropiper</i> | Pirepat                | Perineal<br>Herb   | Root &<br>leaves |  |
| 40. | Dicotyledon   | Polygonaceae   | <i>Rumex nepalensis</i>       | Halhale                | Perineal<br>herb   | Root             |  |
| 41. | Dicotyledon   | Rosaceae       | <i>Rubus elliptuicus</i>      | Ainselu/<br>Tingire    | Shrub              | Root             |  |
| 42. | Dicotyledon   | Rutaceae       | <i>Citrus aurantifolia</i>    | Kagati                 | Tree               | Fruit            |  |
| 43. | Dicotyledon   | Rutaceae       | <i>Citrus sinensis</i>        | Suntala/<br>Sarimse    | Tree               | Fruit<br>cover   |  |
| 44. | Dicotyledon   | Rutaceae       | <i>Evodia fraczinifolia</i>   | Khanakpa               | Tree               | Fruit            |  |
| 45. | Dicotyledon   | Rutaceae       | <i>Zanthoxylum armatum</i>    | Timur                  | Tree               | Fruit            |  |
| 46. | Dicotyledon   | Saxifragaceae  | <i>Astilbe rivularis</i>      | Thulo Okhat            | Herb               | Root             |  |
| 47. | Dicotyledon   | Saxifragaceae  | <i>Berginia ciliata</i>       | Pakhanbet              | Herb               | Root             |  |
| 48. | Dicotyledon   | Saxifragaceae  | <i>Berginia purpurascens</i>  | Khokim                 | Shrub              | Root             |  |
| 49. | Dicotyledon   | Umbelliferae   | <i>Centella asiatica</i>      | Ghortapre              | Herb               | Leaves           |  |
| 50. | Monocotyledon | Equisitaceae   | <i>Equisetum debile</i>       | Kurkure<br>ghans       | Grass              | Root             |  |
| 51. | Monocotyledon | Musaceae       | <i>Musa paradistica</i>       | Kera/Fellese           | Tree               | Fruit            |  |
| 52. | Monocotyledon | Orchidaceae    | <i>Dactylorhiza hatagirea</i> | Panchaunle/<br>Hukchuk | Herb               | Root             |  |

|     |               |                      |                              |                                    |                              |         |      |
|-----|---------------|----------------------|------------------------------|------------------------------------|------------------------------|---------|------|
|     |               |                      |                              | Ngasiba                            |                              |         |      |
| 53. | Monocotyledon | Araceae              | <i>Acorus calamus</i>        | Bojho/<br>Sidakpa                  | Herb                         | Root    | P    |
| 54. | Monocotyledon | Graminae             | <i>Saccharum officinarum</i> | Ukhu/Sot                           | Grass/<br>shrub              | Stem    | J    |
| 55. | Monocotyledon | Graminae             | <i>Imperata cylindrica</i>   | Siru/Sot                           | Grass/herb                   | Root    | J    |
| 56. | Monocotyledon | Liliaceae            | <i>Aloe barbedensis</i>      | Gheukumari                         | Herb                         | leaves  | J    |
| 57. | Monocotyledon | Zingiberaceae        | <i>Ammomum subultaum</i>     | Alainchi                           | Herb                         | Seeds   | Powd |
| 58. | Monocotyledon | Zingiberaceae        | <i>Zingiber officinate</i>   | Aduwa/<br>Hambet                   | Herb                         | Rhizone | Past |
| 59. | Monocotyledon | Liliaceae            | <i>Smilax aspera</i>         | Kukurdaino/<br>Thangthang<br>kerok | Climber                      | Root    | J    |
| 60. | Pteridophyte  | Aspidiceae           | <i>Dryoathyrium boryanum</i> | Kalo niuro                         | T. fern                      | Root    | J    |
| 61  | Pteridophyte  | Lycopodiaceae        | <i>Lycopodium clavatum</i>   | Nagbeli                            | Creeping<br>pteridophyt<br>e | Spore   | P    |
| 62. | Pteridophyte  | Nephrolepidacea<br>e | <i>Neprolepis auriculata</i> | Paniamala                          | T.fern                       | Tubers  | F    |
| 63. | Pteridophyte  | Polypodiceae         | <i>Dryopteris filixmas</i>   | Hade<br>unyu/Hatewa                | T.fern                       | Leaves  | J    |
| 64. | Pteridophyte  | Pteridaceae          | <i>Cheilanthes dahosiae</i>  | Ranishinka                         | T.fern                       | Stem    | F    |

**Table 9: Mean monthly rainfall (mm) of Taplejung from 1998 to 2007**

| Year | Jan  | Feb    | Mar   | Apr   | May   | June  | July  | Aug   | Sept  |
|------|------|--------|-------|-------|-------|-------|-------|-------|-------|
| 1998 | 8.40 | 13.1   | 118.5 | 189.6 | 204.7 | 296.6 | 357.1 | 543.0 | 244.5 |
| 1999 | 9.50 | 0.00   | 18.2  | 77.8  | 252.5 | 274.8 | 485.2 | 321.9 | 295.9 |
| 2000 | 11.5 | 34.2   | 30.0  | 136.9 | 254.8 | 148.3 | 512.0 | 496.0 | 190.0 |
| 2001 | 0.90 | 26.6   | 45.8  | 187.6 | 215.1 | 231.0 | 335.6 | 469.7 | 215.9 |
| 2002 | 50.0 | 6.30   | 90.3  | 159.0 | 232.5 | 231.8 | 606.1 | 523.6 | 246.2 |
| 2003 | 34.8 | 103.10 | 69.8  | 207.7 | 199.3 | 558.2 | 595.5 | 324.2 | 281.0 |
| 2004 | 21.0 | 15.60  | 28.1  | 232.9 | 228.7 | 251.9 | 335.8 | 306.4 | 248.7 |
| 2005 | 27.4 | 9.50   | 48.6  | 89.4  | 287.3 | 447.9 | 306.6 | 333.6 | 206.8 |
| 2006 | 0.00 | 7.50   | 35.0  | 114.4 | 205.3 | 780.3 | 255.3 | 693.9 | 351.0 |

|                    |       |       |       |        |        |        |        |        |        |
|--------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| 2007               | 0.00  | 118.4 | 39.0  | 153.6  | 133.4  | 255.9  | 515.6  | 323.3  | 346.9  |
| Sum                | 163.8 | 334.3 | 523.3 | 1548.9 | 2213.6 | 3076.7 | 4305.6 | 4335.6 | 2626.9 |
| Avg. rainfall (mm) | 16.38 | 33.43 | 52.33 | 154.89 | 221.36 | 307.67 | 430.56 | 433.56 | 262.69 |

**Table 10: Maximum Temperature (0°C) of Taplejung from (1998 to 2007)**

| Year    | Jan   | Feb   | Mar   | April | May   | June  | July  | Aug.  | Sep.  |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1998    | 13.7  | 16.3  | 17.7  | 21.9  | 24.2  | 25.7  | 24.6  | 24.1  | 24.7  |
| 1999    | 15.9  | 19.8  | 21.6  | 25.5  | 23.8  | 25.0  | 24.6  | 24.2  | 24.3  |
| 2000    | 14.2  | 13.7  | 18.5  | 22.7  | 23.8  | 24.8  | 24.5  | 24.4  | 23.4  |
| 2001    | 13.9  | 16.6  | 20.0  | 22.8  | 23.0  | 25.2  | 25.7  | 25.4  | 24.0  |
| 2002    | 14.3  | 17.0  | 19.6  | 21.3  | 23.1  | 24.7  | 24.3  | 25.2  | 24.0  |
| 2003    | 14.7  | 15.1  | 18.5  | 22.5  | 23.7  | 24.4  | 24.7  | 25.6  | 24.6  |
| 2004    | 13.6  | 16.1  | 21.5  | 21.6  | 23.7  | 24.6  | 24.0  | 25.9  | 23.5  |
| 2005    | 13.7  | 18.1  | 20.7  | 24.0  | 23.8  | 26.1  | 25.4  | 25.9  | 25.9  |
| 2006    | 16.7  | 19.7  | 20.9  | 23.0  | 24.7  | 24.8  | 26.3  | 26.4  | 24.1  |
| 2007    | 14.9  | 14.5  | 19.7  | 23.0  | 25.6  | 25.5  | 24.7  | 36.0  | 24.2  |
| Sum     | 145.6 | 166.9 | 198.7 | 228.3 | 239.4 | 250.8 | 248.8 | 263.1 | 242.7 |
| Average | 14.56 | 16.69 | 19.87 | 22.83 | 23.94 | 25.08 | 24.88 | 26.31 | 24.27 |

**Table 11: Minimum Temperature (0°C) of Taplejung from (1998 to 2007)**

| Year | Jan | Feb | Mar | April | May  | June | July | Aug. | Sep. |
|------|-----|-----|-----|-------|------|------|------|------|------|
| 1998 | 3.9 | 6.3 | 8.1 | 11.9  | 15.5 | 18.4 | 18.4 | 17.9 | 16.9 |
| 1999 | 3.8 | 8.3 | 9.6 | 14.5  | 14.9 | 16.6 | 17.6 | 17.3 | 16.5 |
| 2000 | 3.6 | 3.2 | 7.2 | 11.8  | 15.0 | 17.2 | 17.4 | 17.1 | 15.7 |
| 2001 | 3.5 | 5.8 | 7.9 | 10.9  | 13.9 | 16.6 | 17.3 | 17.1 | 15.9 |

|         |     |     |      |       |       |       |       |       |       |
|---------|-----|-----|------|-------|-------|-------|-------|-------|-------|
| 2002    | 2.7 | 5.7 | 9.4  | 11.1  | 14.4  | 17.7  | 18.5  | 17.7  | 16.0  |
| 2003    | 4.0 | 5.7 | 8.7  | 12.7  | 13.6  | 17.0  | 17.8  | 18.2  | 17.2  |
| 2004    | 3.5 | 5.7 | 11.2 | 12.1  | 15.0  | 16.6  | 17.1  | 17.5  | 16.2  |
| 2005    | 3.9 | 6.5 | 9.9  | 11.7  | 14.1  | 17.2  | 18.2  | 11.3  | 17.2  |
| 2006    | 5.2 | 9.6 | 9.3  | 11.8  | 15.5  | 17.4  | 18.4  | 17.5  | 16.5  |
| 2007    | 4.9 | 6.2 | 9.5  | 13.2  | 15.7  | 17.7  | 18.3  | 18.3  | 16.9  |
| Sum     | 39  | 63  | 90.8 | 121.7 | 147.6 | 172.4 | 179   | 169.9 | 165   |
| Average | 3.9 | 6.3 | 9.08 | 12.17 | 14.76 | 17.24 | 17.90 | 16.99 | 16.50 |

**Annex3: List of Photographs**



**Figure1: General gathering of Limbus in Taplejung**  
*Ammomum Subulatum*



**Figure2:**



**Figure 3:** *Rhododendron arboreum*



**Figure4:**  
Field of cultivating *Ammomum subulatum*



**Figure 5:** *Embelics officinale*  
**Figure 6:** *Artemisia indica*





**Fig7: *Acorus calamus***

**Fig8: *Aloe barbadensis***







**Fig9: Limbu priest (Fedangba)**  
**Limbu couple in a traditional dance**

**Fig10:**



**Fig11: *Dryamaria cordata***

**Fig12: *Rubus ellipticus***



**Fig13: *Anadenus species***  
**Fig14: *Dryaotherium boryanum***



**Fig15: A ceremony to look for a new priest (Fedangba)**  
**Fig16: *Dendrocalamus species***



*Fig17: A group discussion with the people of study area  
Limbu woman preparing alcohol*



*Fig18: A*



*study area*

*Fig19: View of Kanchanjunga from the  
Fig20: Way to go to the study area with landslide*



*Fig21: Researcher with one of the key informants  
of a school of study area attending*

*programme of childrens day*

*Fig22: Students*

*a*