Chapter I

1. INTRODUCTION

1.1 General Background

Natural beauty with varied biodiversity is greatly diverse in Nepal. It is also known for having highest mountain peak Sagaramatha along with other different types of mountain ranges. Natural beauty comprises of ever flowing rivers and dense forest which is the home for varied diversity of flora and fauna.

Complexity and variety of living systems in the Himalayas are not only limited to geographical differences, but also present extreme biological diversity in terms of ecosystem, species and genetic level.

Even though having all these natural beauties, Nepal is least developed country having 147,181 sq.km areas. The average length being 885 km East to average breadth about 193 km from North to South. The country Nepal lies between the two most populated countries of the world, India in the East, South, West and China in the North.

Due to having much diversified flora and fauna and diversified ecosystem the people living here are also varied and diverse. Nepal is one of the countries with different ethnic groups with their religious and cultural heritage. Different products from the biodiversity are wisely and widely used in traditional way by the people for various purposes. As for their food, medicine, raw materials, clothes, fuel energy etc. which implies the fact that human beings, animal and plants are interdependent with each other.

Plants and plant products are the primary source of medicine and a highly valued resource of Nepal. Plant constituents continue to be a vital part of western medicine and are still considered an important source of main compounds in the field of drug discovery.

Population of Nepal is divided in rural and urban area. Urban area people may have modern health facilities, but more of the people living in rural area are dependent on the locally available medicinal plants to cure the diseases as far they are not accessed to modern health facilities. The contribution of biodiversity to the health of the people in the region is extremely important because most of people rely on traditional herbal medicine

for their health care. From the ancient time people have made use of extract from plants and animal parts to cure the disease.

Ayurveda, Amchi, Homeopathy association with Unani, Naturopathy are the important traditional health systems existing in Nepal. Ayurveda medicinal system is developed because of biodiversity. In Nepal, 393 medicinal plants are recorded long back (1969) and Baidhyakhana was established in Singhdurbar. It was supplemented by another volume in (1984) with an additional 178 species of plants (GON, 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 plants and aromatic plants in 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).

The NFDIN Act 2058 (2002AD) has identified 59 ethnic groups as indigenous groups of Nepal. Different ethnic groups live in different regions. They have different religions, customs, habits, habitats, languages etc. They have their own type of the use of the traditional medicine, according to the flora and fauna available in that region, to cure their health problem. The way of the use of the traditional medicine is based on indigenous knowledge system that may be different in same ethnic group on the basis of geographical variation. In the Alpine and Sub-alpine region of Nepal, the traditional practices are highly influenced by the Tibetan medicine because of common culture, religion, language and ethnicity in Tibet and the Northern region of Nepal where the healers are known as Amchi. In Temperate region the healers are known as Dhami and Jhakris and in Tropical region such healers are known as Guruwa, Bharua and Gurau (Rajbhandari, 2001).

1.2 Present Status of Traditional Medicine in Nepal

Traditional Medicine refers to the 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 tradition of each country and have been handed down from generation to generation. TM includes diverse health practices, approaches, knowledge and belief incorporating plants, animals or minerals based medicines, spiritual therapies, manual techniques and exercise applied singularly or in combination to

maintain well being as well as to treat, diagnose disease or prevent illness, WHO Traditional medicine strategy paper (2002-2005), Rishi Ram Koirala, National Ayurved Association, Nepal.

1.2.1 Ayurveda

It is the omnipresent science of our tradition, heritage and century old knowledge. It is the most authentically recorded culturally based health system in Nepal. Furthermore, this traditional knowledge provides great wealth and heritage of our nation.

The history of Ayurveda can be traced to different periods, the earliest being the Vedic period when the Aryas complied the four Veda (1500-800 BC) with maximum reference in Rig-Veda and Arthaveda. Ayurveda originated in heaven from Brahma. Brahma passed this knowledge to Dakshaprajapati then to Ashwinikumars. Then it transmitted to Lord Indra. On the earth Maharshi Bharadwaj approached Lord Indra and got it. Two types of Ayurveda practioners exist in Nepal. First, Ayurveda based traditional healers who are practicing this knowledge since the time immemorial and it has been established as family profession and tradition. Second academic Ayurveda practitioners trained from educational institution, training centers, colleges and universities.

1.2.2 Homeopathy

This system has been recognized as a national health system and a homeopathy hospital is being run by government since 2010 BS. The only one hospital in the country is located in Kathmandu with three graduated doctors studied in India. But the five junior level technicians associated with hospitals are from Allopathic background with refresher training on Homeopathy. There is no separate regulatory body to control and monitor this system of medicine and to register practitioners like in modern medicine (Nepal Medical Council) and Ayurved (Nepal Ayurvedic Medical Council). The Unani System of medicine is also incorporated in this hospital. Nearly one hundred and fifty Homeopathy technicians are practicing in the Kathmandu city registering in Health Professional Council/informal data given by the staff of the hospital. It is learned that this system of traditional medicine has been running with several confusions and dilemma due to the lack clear policy and planning of the state. Recently formal education in Homeopathy has begun in Nepal.

1.2.3 Naturopathy

This is not an official system of medicine, but it has been well practiced by the community. Training in Naturopathy is provided by private sector. There are private hospitals, training centers, clinics and dispensaries in the country.

1.2.4 Amchi

It is a Tibetan medicine or healing practice existing in the upper Himalayan region of the country. This is not an official system of medicine. These are two types of practitioners in this system. Some of them are institutionally trained and others follow the tradition. No official records regarding this system of medicine and manpower involved are available in Government offices. Reports show (as published in print medias) that this system has been remarkably contributing in Northern area, especially Far Western Region, for treatment of various kinds of ailments using the locally available medicinal plants. The practitioners have been claiming official recognition and formation of separate regulatory body since long time.

1.2.5 Faith and Spiritual Therapies

A large number of the population is still dependent on these practitioners. Basically they follow some ethno-traditional, tantrik, spiritual and Ayurvedic knowledge. Though they are not included in the official system of health care system, they are well known by different names in different communities.

The use of traditional medicine by different ethnic group is according to the flora and fauna available in that region. In most of the communities mode of preparation and its use as medicine are highly influenced by folk customs and cultural habits, social practices, religious beliefs and superstitious of the people who prescribe them. Most of the people prefer such medicine due to its availability, locally on the area they live and due to low cost. Hence the use of traditional medicine remains widespread in developing countries.

1.3 Indigenous People and the Traditional Knowledge System

Nepal is the home place for multi-ethnic and multi-lingual people due to its diverse topography, ecosystem and cultures and so far as it is rich in biodiversity. Each native society has their traditional habits of using the plants and animals in their own

ways with distinct language, religion, custom, folklore, cultural knowledge and ancient territory. Fifty nine indigenous nationalities are legally recognized and have formed NEFIN as an umbrella organization (NIPA, 2005) and those people are known as indigenous people.

The kind of knowledge which is born, inherent or innate to the hearts and minds is called indigenous knowledge (Singh, 1995). Indigenous people are living in different geographic area with their own lifestyles, customs and traditions and they are closely associated with the biodiversity, environment and natural resource since the time immemorial.

Anything obtained from the physical environment to meet human needs is the resource or natural resource and its sustained yield depends on a combination of human ingenuity, economics and cultural beliefs. Natural resources provide us direct solar energy, wind, tides, flowing water, air, soil, plants and animals, fossil, fuels, metallic and non-metallic minerals etc. as well as the ritual, intrinsic, spiritual, religion and cultural significance to the society. Biodiversity is used as sustainable resource, in industry, for the health of the people.

As Nepal is geographically diverse country it consists of different communities and different communities have different type of religious and cultural practices, social beliefs and different kinds of traditional knowledge system. Nowadays few researches have been done for such knowledge, but broad research has not been documented yet. So such knowledge needs to be documented in national legislation and have international levels of rights.

The traditional knowledge system mentioned by the NINPA is a small fraction of the combined tradition of the communities. This documented knowledge includes:

- Use of grounded pulp of Cucumber (khira) leaf to kill common pests of wheat *Chillozonellis* (stem borer). 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 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 woods. Because of this, people maintain their discipline and do not cut at any time. In the long run this helps to conserve the forest.

- Using Syosim for acclimatization. Syosim is a kind of medicine prepared from the 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 contain 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 *Cordyceps sinensis* (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 the animals are also traditional practices. At the same time, the use of animal dung as an alternative source of fuel is a god example of traditional acquired by the communities.

Although the traditional knowledge used by the indigenous people has been found to be very useful and effective, it has been neglected by the world. Traditional knowledge suffers from many threats, including the environment, urbanization, globalization, etc. Therefore, different awareness programme regarding the existence and importance of traditional knowledge of indigenous people 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

In developing countries such as Nepal, mostly the people living in the rural areas are facilitated to the modern health facilities. Moreover they are influenced towards the use of traditional medicine system, due to easy accessibility, low cost, cultural and social beliefs for the maintenance of good health. The people in the rural areas are migrating towards the urban areas, some are using the TM and some are influenced by the modern health facilities. So the use of TM is in the danger condition of exploitation. Therefore, it is necessary and important to conserve such knowledge system to preserve them for future generations.

Among the 59 different indigenous nationalities recognized in the country, the ethnic group Tangbetons is one of them. Tangbetons came from the village of Tangbe which is a part of the Bara Gaunle (12villages) confederation in Mustang district. Tangbe Village is under Chhusang VDC. Most of them have already migrated from Tangbe. They are found mostly in the Pokhara, Kathmandu, and Jomsom. Population is not exactly known but there are about 100 families in Pokhara.

Some of them have their own skills and techniques on the utilization of natural resource for traditional healing purpose. But mainly these groups are influenced by the Tibetan Medicine System. So the healers here are known as Amchi. Amchi is those who prepare the medicine by the use of plants and animals that plays a key role in primary health care. Most of the Tangbetons have already migrated from Tangbe village to other places where there are modern health facilities.

The wealth of ethno-biological knowledge seems to persist on those groups as well, but is at the risk of extinction because those practices are not moreover being transferred to the next generation due to modernization. But also some having the indigenous knowledge about it are using the medicine in traditional way.

The present study is carried out among the Tangbetons people of Pokhara including Srijana chowk, Prithvi chowk, Mahendra pool, Chipledunga and New road in Kaski district, Gandaki Zone. The Tangbetons people in those areas are modernized by modern health facilities, so most of them do not want to talk about it, but also some of them showed interest and shared and discussed about it. From the discussion it was concluded that Amchi and Lama were their health healers. No previous medico-

ethnobiological researches have been carried out by any researchers on the Tangbetons. This is the first research of this type that's why it will be very important and significance to all of us.

1.5 Objectives of the study

- To study and provide general information and ethnography of Tangbetons of the study area.
- To document the use of medicinal plants and animals for the treatment of diseases by Tangbetons.
- To find out and document the local knowledge on the management of medicinal plant and animal species in the Tangbetons Community of the study area.
- To explore and document the importance of the indigenous knowledge system and its preservation in Tangbetons.

1.6 Limitations of the study

- The study was focused on the Tangbetons that migrated from the Tangbe village to Pokhara i.e. Gandaki Zone, Kaski district. Srijana Chowk, Prithvi Chowk, New road, Mahendra Pool and Chipledhunga were the study areas. So the outcome from this study areas may not been generalized to the entire Tangbetons group living in other areas of Nepal or other countries.
- Since the study was mainly focused on ethnomedical aspect, other aspects of their life have not been studied in detail.
- The study was conducted for the partial fulfillment of the requirements for the Master Degree in Zoology at Tribhuvan University, Kathmandu, Nepal.
- People of those communities have no experience of sharing indigenous knowledge. Aged people knew something, but they do not know how to share and some do not want to talk, whereas younger generation does not have much idea about it.

- Mainly the plants and animals used in medico-ethnobiology referred from their native place – Mustang, but access to those was not possible due to financial and time constraint. So, photographs from Pokhara were only used.
- The researcher had no advanced electronic equipment and experience in social research, so the work may have some methodological and technical limitations in documentations.
- Mainly males were involved in sharing the knowledge; females do not seem interested in sharing all those things.

Chapter II

2. LITERATURE REVIEW

The uses of the locally available resources are more in the remote areas than in the urban areas. The use of plants and animals as the medicinal values or for some other purposes by applying their own indigenous knowledge system is done by different ethnic groups. There are several records of those plants, animals by different ethnic groups listed through the researches. Brief literature review of such plants and animals used for traditional medicine practices are discussed here.

Rijal (1994) conducted his ethnobotanical study in Padampur VDC and the surrounding North-East forest of Chitwan National Park and has documented the indigenous knowledge of people inhabiting those areas on the use of plants for medicine, fuel wood, fodder, handicrafts, oil extracts and ceremonial and cultural uses. He reported 185 plant species to treat 126 combinations of diseases by the local people. Three species are used in veterinary medicine.

Singh (1995) began ethnobiological research by presenting research paper on the Raute tribe. He opened the door for the further research on ethnobiology of the different ethnic groups of Nepal. He reported 48 different animal species and 188 different plant species used by the Raute for the fulfillment of their daily needs.

Adhikari (1996) carried out his study on impacts of some local plant extracts upon mortality and control of *Liapahis crysimi* (Aphid). The host plant selected from 7 different plant species was experimented with. The plants used for extracts were, *Adhatoda asica*, *Artemesia vulgaris*, *Chrysanthemums morifolium*, *Meslia azedarach*, *Nicotina tobacum*, *Polygomum hydropiper* and *Sapium insigne*.

Chhetry (1996) carried out her study on ethnobotany of the Limbus of Panchther District and recorded 162 sps of plant with their medicinal and economic values.

Adhikari (1997) carried out his study in indigenous healing practices among Tharus of Amrai village of Naranpur VDC, Dang District. He recorded 34 ailments treated with different species of plants using traditional indigenous knowledge.

Dhakal (1997) from his ethnobiological study of Kumals of Taranagar VDC, Gorkha district, and reported 58 plant species that have been used by the community for common diseases like fever, cough, 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.

Upadhaya (1999) carried out the ethnobiological study of the Bhotes (Majhi) in Chhamdighat, Bamgha and Juhang VDCs of Gulmi District and documented the different uses of 58 animal species and 214 plant species among those people. They used 16 animal and 42 plant species in folk medicine for curing different ailments like rheumatism, cough and cold, dysentery, cuts, bone fracture and wounds etc.

Ghimire (1999) conducted a study on status, use, sale and conservation of medicinal and aromatic plants in the Nepal Himalaya. He reported 223 sps of medicinal plants involved in trade for all development regions of Nepal.

Ghimire et al. (1999) conducted an ecological study of some high altitude medicinal and aromatic plants in Gyasumdo Valley of Manang District, Nepal. The study was focused on the most popular high altitude medicinal and aromatic plant found in the Gyasumdo Valley were *Aconitum Orochryseum* (Nirmashi), *Dactylorihiza latigera* (Panchaunle), *Nardostachys grandiflora* (Jatamashi), *Picorhiza scrophulariflora* (Kutki) and *Rheum anstrale* (Padmachal).

Ghimire (2000) documented 7 animal species and 37 plant species used for curing both, animal and human ailments, using traditional knowledge by the Danuwar community of Kavrepalanchowk District, Deuvumi Baluwa.

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 Guwa and other local healers for the home remedy of different illness 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.

IUCN (2000) published a book called National Register of Medicinal Plants in Nepal. One hundred and fifty different medicinal plants, with their scientific information, medicinal use and sites of avaibility 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 Tukhucha VDC of Kavreplanchowk District using their traditional knowledge. These different plant species were used for curing 51 diseases.

Lama et.al (2001) has 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 life cycles, biology and ecology, including distribution, size and vigor of population and the harvesting practice.

Gurung (2002) carried out her study on the medicinal practice using local plants among Gurung, Kami, Sarki, Pariyar, Chettri and Bhujel etc. of Chitre VDC, Parbat and Bahadure VDC, Kaski. She documented 83 medicinal plant species 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 Therathum District, Eastern Nepal. Therathum district was found to be rich in medicinal plants. Total of 105 vascular plants were reported to be used in the treatment of different disease. Information was collected by discussion with local communities and field observations. Some plants were found to be used for different disease in different places.

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.

Balami (2003) reported 119 species of medicinal plants used by the local people of Pharping for the treatment of 35 types of disease.

Panthi and Chaudhary (2003) documented 101 different plant species which were used in the treatment of 56 different diseases in Arghakhanchi district.

Dhakal (2004) carried out his 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 on 50 ailments.

Koirala (2004) documented 59 animal species and 180 plant species. Among them 30 species of plants were used for medicinal purpose and 20 species of animals were used for medicinal purpose.

Koirala (2004) mention use of fruit bat *Pteropus sps* for meat by Satars of Korabari VDC, Jhapa district and documented 182 species of plant and 60 species of animals used by these people. Among the species reported, 34 plant species and 9 animal species were found to have medicinal value and utility.

Pant and Pant (2004) carried out study on the indigenous knowledge of people of Bhagwati 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 to cure 39 different human disorders.

Poudel and Uprety (2004) carried out an ethnobiological 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 Thunpokhari Village Development Committee, Sindhupalchowk, 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 Thunpokhari 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.

Bista and Bista (2005) documented fifty one high altitudinal species, i.e. Medicinal Plants of Mustang district, in the book 'Himalayan Doctors and Healing Herbs; The Amchi Tradition and Medicinal Plants of Mustang, Lo Kumphen Mentsikhang and School, Lo Manthang, Mustang, Nepal.

Kunwar and Adhikari (2005) documented 58 plant species belonging to 42 families and 56 genera from Dolpa District with ethnomedical values. Greater numbers of species were found to be used in curing fever (17 species) and diarrohea and dysentery (17 species).

Pangeni (2005) documented 227 plant species and 47 plant species, among them 39 plant species were used for dysentery, common cold, scabies, asthma etc. and 12 faunal species were of medicinal value to treat different disease.

Upadhya (2005) conducted her research on the ethnobiology of the Meches of Jalthal VDC of Jhapa district. She has mentioned use of Chamero (*Rhinolopus sps*.) for meat and treating tuberculosis.

Pokhrel (2006) carried out study on ethnobiology of Bankariya of Makawanpur district and has reported that among the 58 animal species and 268 plant species used by the Bankariyas of Makwanpur District, 8 animal and 82 plant species have been considered to be of medicinal utility that find use in the treatment of 42 different diseases like tuberculosis, rheumatism, urinary trouble, diabetes, blood and heart related diseases etc. He has also given brief account of Bankariya culture, rituals, beliefs, their social organization etc.

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 diseases. 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 Kaligandaki, Bagmati and Tadi-Likhu watersheds of Nepal for the treatment of skin diseases.

Thapa (2008) carried out her study on medico-ethnobiological knowledge of the Magars: A case study of Salija VDC of Parbat District, Central Nepal and found out 85 species of medicinal plants belonging to 52 families and 80 genera and 18 animal species both wild and domesticated, belonging to 13 order and 13 families for medicinal purposes for their primary healthcare services.

According to Acharya, (2008) Chepang use bat as a delicious food item. They use dried flesh and skins in ethnomedicines to cure gastric aliments, psychosomatic diseases and reduce high blood pressure. For Bat hunting they use latex derived from chiuri. At the flowering time chiuri bats come to take juice at night and they catch by net. They have historical, cultural myth to worship chiuri as the milk giving buffalo. Their holy plant; the Chiuri will stop to fruit due to lack of pollinating agents like Bats.

Niroula (2009) carried out his study on Limbu people of Khejenim VDC of Taplejung district. He reported 64 species of medicinal plants belonging to 44 families and 61 genera whereas 15 animal species of animals belonging to 9 order and 10 families. 15 animal species were used to cure 12 different ailments and 64 plant species to cure 38 different diseases.

Tamang (2009) carried out study on medico ethnobiology and Indigenous knowledge system of Lapcha of Fikkal VDC, Illam district, 19 animal species were used to cure 21 different diseases and 61 plant species to cure 36 different ailments.

Dhami (2010) documented 38 animal species as wild and domesticated, 284 species of flora for various use in different requirements. Eight faunal species were used for treatment of different 7 ailments, 80 floral species with medicinal importance to cure 31 different diseases as diabetes, typhoid, jaundice etc.

Timilsina (2010) carried his study on the ethnobiology of Balami of Nuwakot mentioning use of *Rhinolopus species* (Chamero) for meat and *Madhuca butyracea* (Chiuri) *(Roxb))* for fruit.

Nepal (2011) carried out his study on the Chepangs and chiuri as well.

Chapter III

3. STUDY AREA

3.1 Location

Tangbetons are original inhabitants of the Mustang district, Dhawlagiri Zone. They came from the village of Tangbe which is the part of the Bahra Gaunle (12 Villages) confederation in Mustang district and lies in Chhusang VDC. As the study is based on the migratory Tangbetons of Pokhara Sub-metropolitan City from the Mustang so some of the information was necessary to carry out from the Mustang area as well. The old aged Tangbetons gave some of the information about Mustang district i.e. of their village Tangbe as well as their lifestyle, culture, floral and faunal diversity.

But as the study area is Pokhara, the information was also gained from Pokhara. Among 75 districts, Kaski is one of them which have Pokhara as headquarter. Annapurna range can be seen from most of parts of the Kaski district. Pokhara is one of the best tourist destinations of Nepal. Phewa, Begnas, Rupa, Seti, Gandaki are among the main lakes and river of Kaski. Kaski district falls on the Western Development Region in Gandaki Zone. Area of Kaski is 2,017 km^2 with the population of about 380,527 according to Census, 2001. There are 48 VDC's in Kaski district. Pokhara is third largest city after Kathmandu and Biratnagar. It is a city close to 2,500,000 inhabitants in Central Nepal located at 28.25^0 N, 83.99^0 E, 198 km West of Kathmandu.

There are 18 wards in Pokhara Sub-Metropolitan City. The study area is Srijanachowk, Prithvichowk, New Road, Chipledhunga and Mahendrapool. These areas are inhabited by different caste and ethnicity like Brahmin, Chettri, Newar, Gurung, Magar, Thakali, Damai, Kami, and Tangbetons etc. Tangbetons are more in those areas compared to other areas.

Tangbe, the village of Tangbetons falls on the Dhawlagiri zone, Mustang district in the western Nepal, Jomsom being it's headquarter. Tangbe Village is small village that lies in Chhusang VDC. Area of Mustang is 3,573km^2 and population is 14,981 according to Census 2001. The district is famous for apples, marpha brandy, hot springs and is known as village of Muktinath. Other castes are also living in those areas.

Figure No.1 Map of Nepal

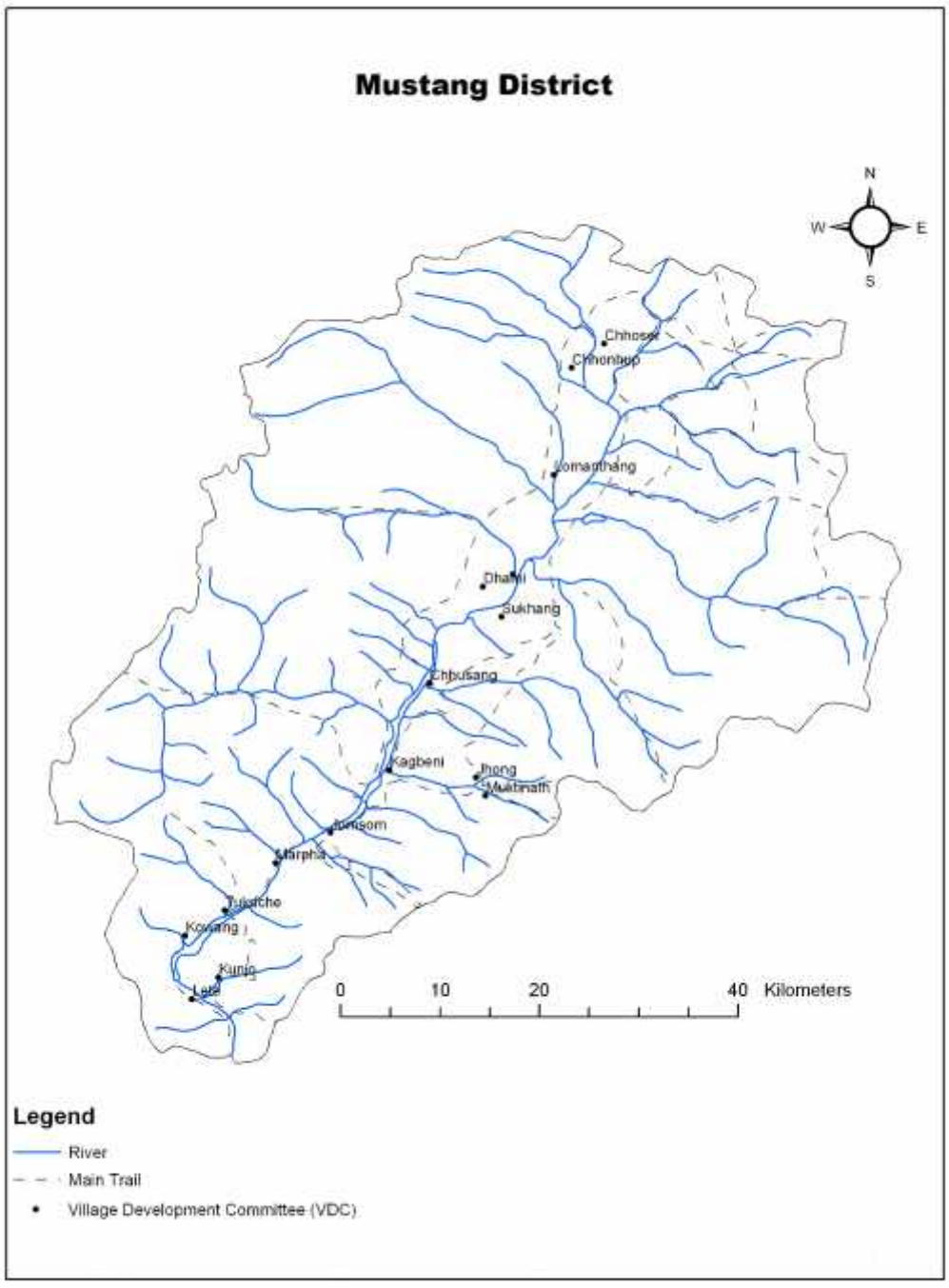

Figure No .2 Map of Mustang district

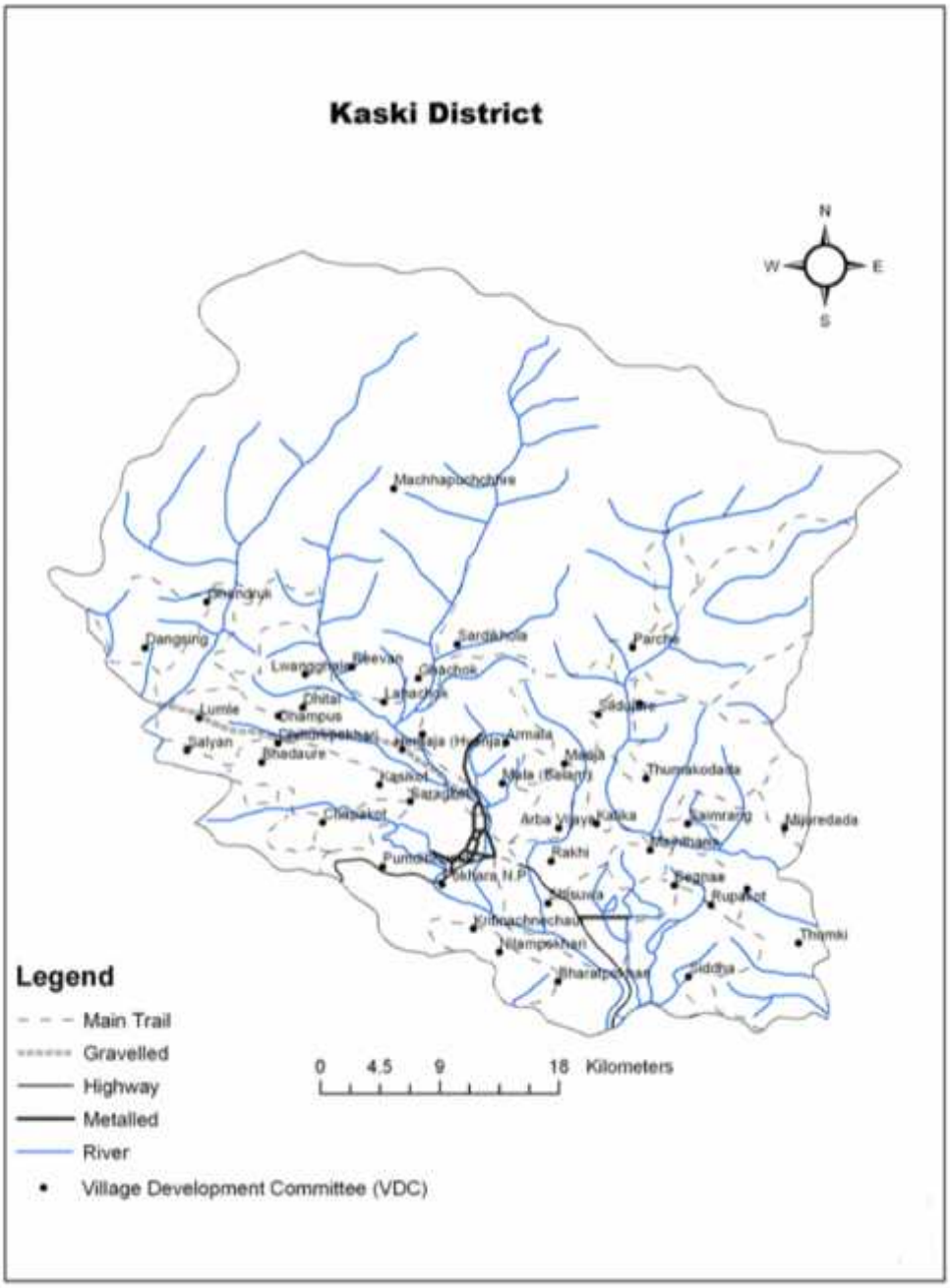

Figure No. 3 Map of Kaski district

Figure No. 4 Map of ★ Tangbe village

Figure No. 5 Map of ● Study area in Pokhara (Study area)

3.2 Floral and Faunal Diversity

Pokhara is not just a place for the mountains; it is rich for its natural vegetation and forest type too. Hills like Sarankot, Kaundada etc boast wide variety of forest plant and trees. These dense forests are also a dwelling place for different wild creatures.

There is exclusively great floral and faunal diversity in Pokhara Valley due to the prevalence of wide range of climatic and topographical variations. The forest of Pokhara Valley can be grouped under five types as follows: Evergreen Coniferous Forest-7%, MixedForest-34%, Monsoon Forest-33% Grassland - 12% Riverine Forest-14%.

Important flora of this area are: *Pinus roxburghii* (Chirpine), *Castanopsis indica* (Katus), *Shorea robusta* (Sal), *Artemesia vulgaris* (Titepati), *Lantana camera* (Banmara), *Bidens pilosa* (Kuro), *Bombax ceiba* (Simal).

Several medicinal plants are also recorded in the Pokhara valley. They are *Emblica officinalis* (Amala), *Azidarachtaindica* (Neem), *Butea monosperma* (Palans), *Datura stramonium* (Dhaturo).

Nearly 35 species of mammals are found in Pokhara valley. Some of them are *Panthera pardus* (Common leopard), *Muntiacus muntjak* (Barking Deer), *Macaca assamensis* (Assamese monkey), *Lutra lutra* (Common otter). Some of the bird species includes *Bubulcus ibis* (Cattle egret), *Apus affinis* (House swift), *and Corvus splendens* (House crow) etc are found.

Mustang district also comprises varied flora and fauna having medicinal value. Important flora comprises of *Saussurea graminifolia*, *Arnebia benthamii*, *Brassica rapa* (Salgam), *Oxytropis sps*, *Rhododendron arboretum* (Gurans), *Shorea robusta* (Sal) *Malus domestica* (Apple), *Salix alba* (Bains), *Pashia sp* .(Aru) *Juniperus indica* (Dhupi)

Important fauna comprises of *Capra hircus* (Chyangra), *Bos grunniens* (Yak), *Gyps himalayensis* (Vulture), *Equus kiang* (Donkey), *Equus hemionus kiang* (Horse), Canis *aureus* (Jackal).

3.3 Geography and Climate

Kaski district falls on the Western Development Region in Gandaki Zone. No, other place do mountains rise quickly. In this area, within 30km, the elevation rises from 1,000m to over 7,500m.

Climate is of Sub-tropical type, due to elevation temperature are moderate. Summer temperature average between 25-35 ^{0}C and winter temperature between 2-15^0 C. Due to the sharp rise in altitude, area of Pokhara has high ppt that is 4,000 mm/year. The weather Station at Pokhara shows that mean monthly minimum temperature varies from 7.44^{0}C to 22.31^{0}C, whereas mean monthly maximum temperature varies from 20.13^{0}C to 30.91^{0}C (Pokhara Weather Station 2000-2009; Fig 2.). The maximum mean monthly rainfall is in August, i.e. 941.8 mm and the minimum is for the month of January at 20.09 mm (Pokhara Weather Station 2000-2009; Fig 4).

Mustang district is the place from where Tangbe have been migrated having Jomsom as its headquarter. The climate is largely arid with annual ppt in the range of 250-400 mm due to its position in the rain shadow of the Annapurna massif and the Dhaulagiri range towards the South. The weather station at Mustang shows that mean monthly minimum temperature varies from -7.78^{0}C to 9.33^{0}C, whereas mean monthly maximum temperature varies from 4.41^{0}C to 20^{0}C (Mustang Weather Station 1986-2005; Fig 1). From 1986 to 2005 the data of some year (1992, 1995- 2002, 2005) were not available at the Hydrology and Metrology Department, Kathmandu. The maximum mean monthly rainfall is in July, i.e. 37.51mm and the mean monthly minimum temperature is in April, i.e. 0 mm (Mustang Weather Station, 1991-2000; Fig 3). The data after 2000 were not available.

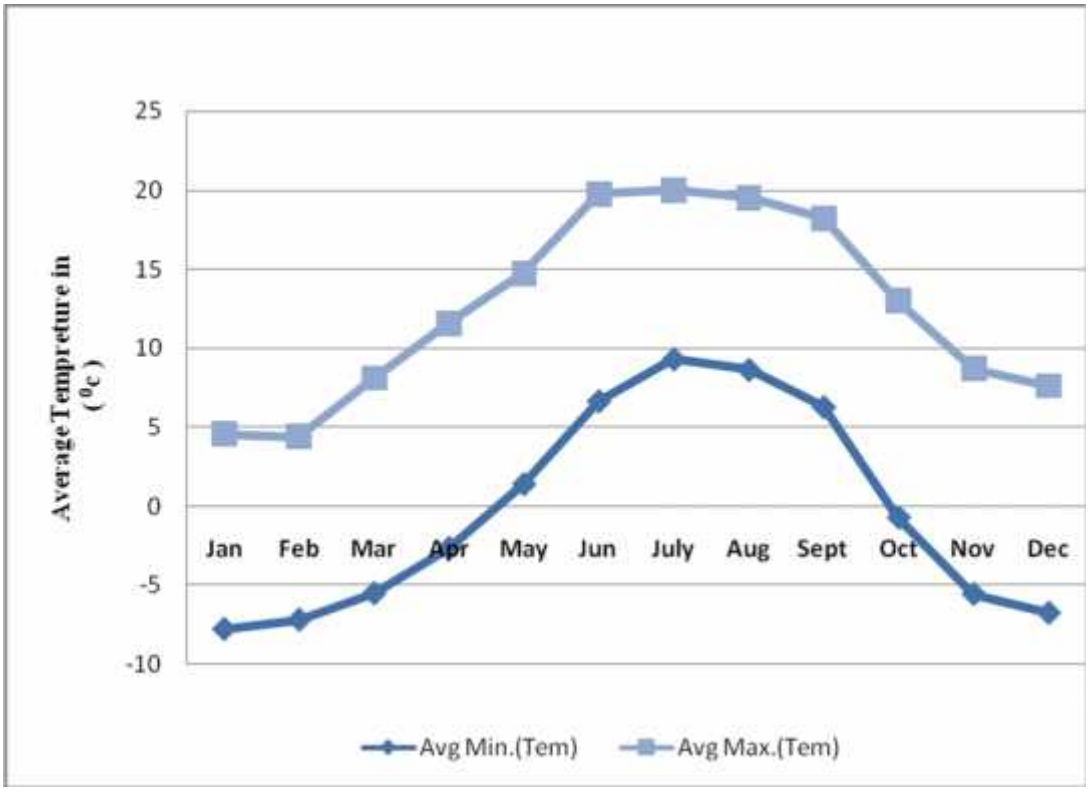

Figure No. 6 Line diagram showing mean monthly temperature of Mustang district.

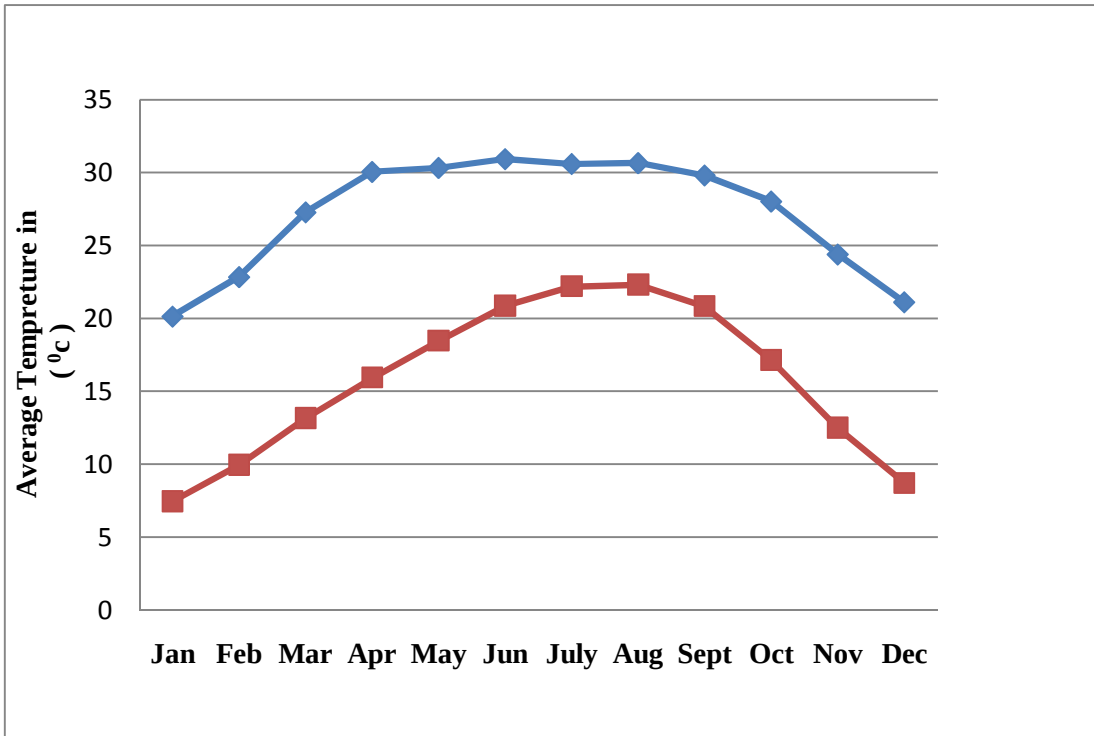

Figure No. 7 Line diagram showing mean monthly temperature of Pokhara.

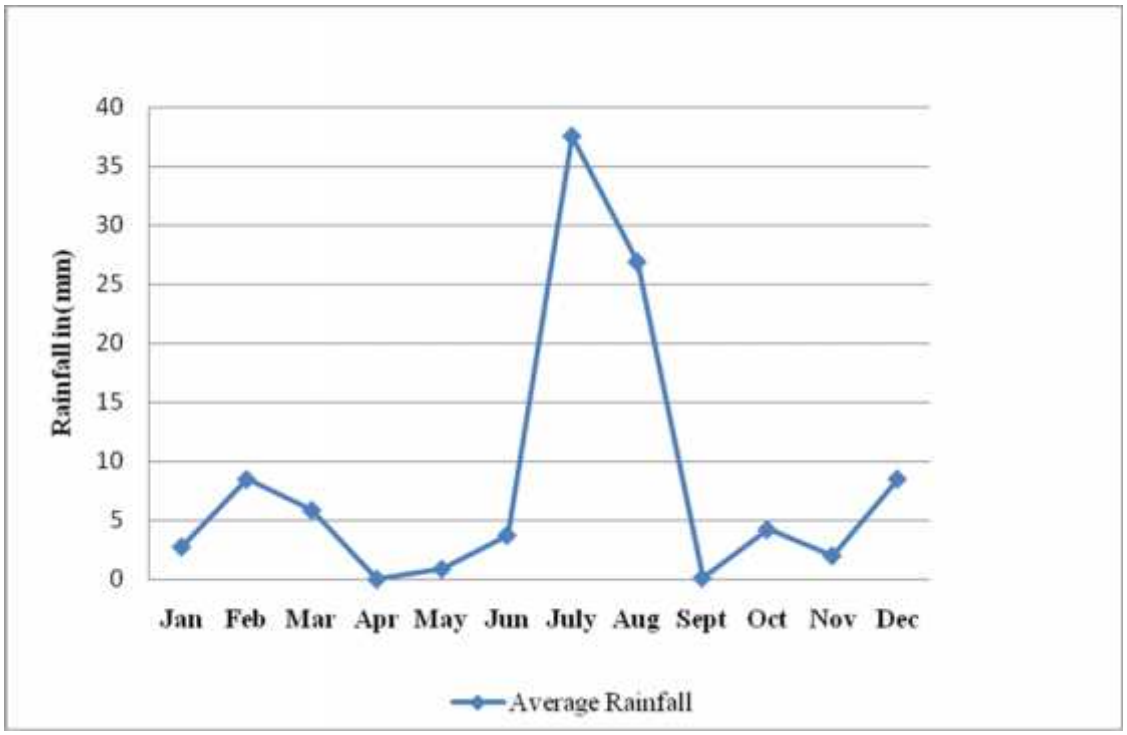

Figure No. 8 Line diagram showing mean monthly rainfall of Mustang district.

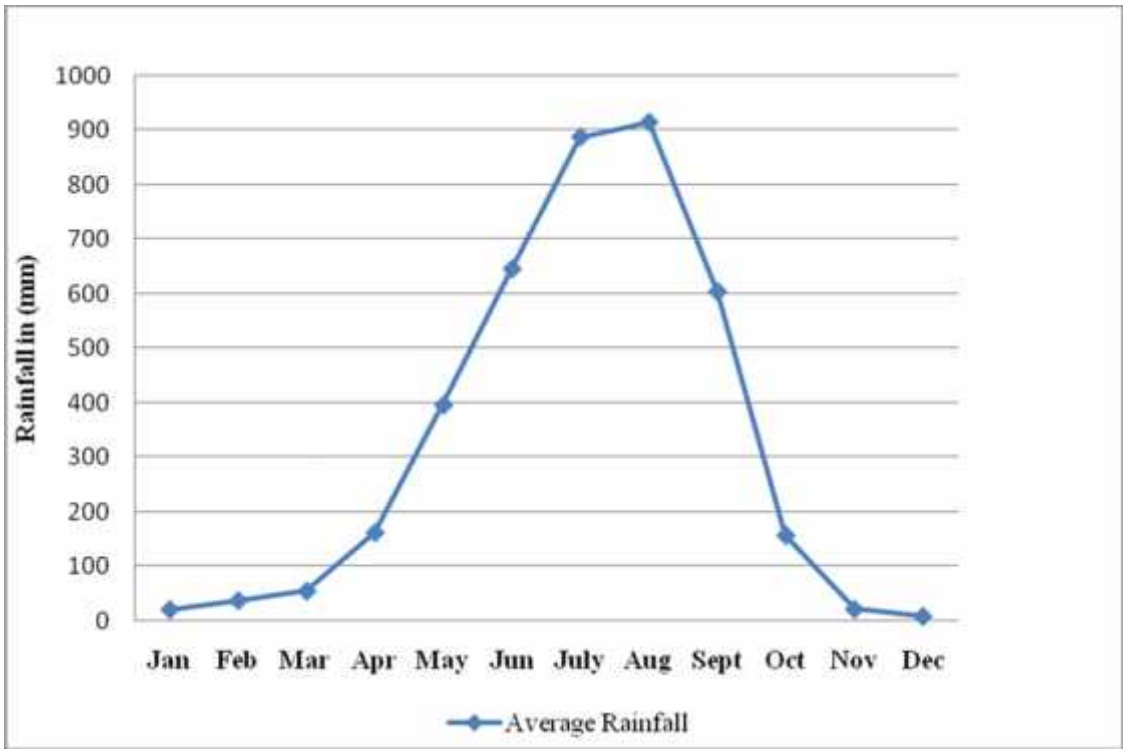

Figure No. 9 Line diagram showing mean monthly rainfall of Pokhara.

Chapter IV

4. MATERIALS AND METHODS

4.1 Selection of Site

Study is mainly focused on the migratory Tangbetons from Tangbe village in Mustang district to Kaski district, Pokhara. Majority of the population of Tangbetons live in the Pokhara. Those migrated people are utilizing modern health facilities, but also some of them are even utilizing their own traditional use of medicine. Some of them who are utilizing the modern health facilities now, utilized the traditional health care system before.

No previous medico-ethnobiological researches are carried out by any researchers on the Tangbetons. So due to my access to those areas study has been done in this area.

4.2 Nature and Sources of Data

For any research work there are different source for the collection of data. So the data collected were of two types.

A. Primary Data Collection

The data that are carried out by the researcher are known as Primary data, and were collected by using following ways:

i. Questionnaire

Simple, short questions were prepared (Questionnaire is tabulated as an ANNEX of this study), so that the respondents answers could meet the objective of the study. Even though the question was made in English, but while asking was translated to Nepali so that they may feel easy to answer the questions.

ii. Interview with key informants

Key informants of the related subject including local people like elder people, knowledgeable and traditional healers like Amchis were interviewed and their information were noted. Mainly the Amchis were the people who gave the key

information about medicine and that was the valuable content of the research, other information was given by the local people.

iii. Field visit and observation

To get the information from the Tangbetons field visit was done during September/October of 2010 and January/February, March/April of 2011. As it was not necessary to collect the data annually or seasonally so the field visit was done during the Lohsar of Tangbetons. During the study period field visit was done 15 to 20 times to extract the information from the Tangbetons people and Amchi. Field visit was done mainly during the evening. Sometimes data were collected in the morning and day time aswell.

iv. Photography and sample collection

As the study is of the migratory Tangbetons of Mustang district so samples collected were not so many. However plant species were identified from the Godawari, Kathmandu. Animals of Mustang were identified according to the Amchis whereas the animals of Pokhara valley were identified by the Tangbetons living in those areas. Plants and animals were taxonomically classified. Photographs of the interviewers were collected.

v. Secondary Data

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

Chapter V

5. RESULT

5.1 Ethnography of the Tangbetons

Tangbetons are mainly the inhabitants of Tangbe Village of Mustang district, Dhawlagiri Zone, i.e. Western Nepal. The Tangbetons have been described as indigenous people of Nepal, residing in Barhagaun area of Mustang. Tangbe Village is in Chhusang Village Development Committee. Actual population of Tangbetons is not recorded in any of the Census in Nepal.

Tangbetons are mainly found in the Western Region of Nepal. They live in hilly and mountain areas of Western Nepal. Manang, Mustang, Jomsom, Pokhara, Kathmandu, U.S. Majority of them are found to live in Pokhara as they migrated from their original habitat. In Pokhara they have their own Tangbe Samaj Sewa Sangh; Head Office; Parsyang, Pokhara-05, Kaski, Nepal.

5.1.1 Origin

Mustang was once an independent kingdom, although closely tied by language and culture to Tibet. From the 15th Century, its strategic location granted Mustang control over the trade between the Himalayas and India. At the end of the 18th Century the kingdom was annexed by Nepal. However the monarchy ceased to exist as the Kingdom of Lo in Upper (Northern) Mustang, with its capital at Lo Manthang on October 7, 2008, by the order of Government of Nepal. Mustang is also known as the 'Tibet outside the Tibetan Border', Marullo, Clara (1995).

Tangbetons came from the village of Tangbe, which is a part of Bahra Gaunle (12 Villages) Confederation in Mustang district, in Chhusang Village Development Committee. But according to Oral History, they have come to Tangbe from Bhurcho of Manang District. They are the indigenous people residing in Barhagaun of Mustang.

5.1.2 Physical Features

The Tangbetons look like Mongoloid in appearance. They are also called as 'Bhote'. They are like light black or dark brown in complexion, but some are white as well. Normally they have thick skin. Females are more beautiful than males. Females

lives more than male. Hair colour appears to be black. Eyes are small and lips are thick. Teeth are good in structure. Facial hair is scarce. Nose is flat and thick especially of the males. Female do not pierce their nose, so do not wear nose ring. They are of normal height i.e. medium to small. They resemble 'Lhoba' in physical appearance and are influenced by Tibetan Culture.

5.1.3 Language

Migratory Tangbetons are much influenced by the Nepali Language as they live in Pokhara. But as they are the original inhabitants of Mustang district, people living there use their own Language. They have the unique Language known as 'Serke'.

Here are some noted terms of their language.

a) Personal language

Tangbe	Nepali	English
Ngha	Ma	I
Nhi	Hami	We
Jha	Timi	You
Chu	Uu/Uni	He/She

b) Time Pronounce

Pila	Hijo	Yesterday
Timi	Aja	Today
Napche	Bholi	Tomorrow

c) Some Verbs

Langmo laba	Bolnu	to talk
Nyo	Janu	to go
Nazi	Dukhaunu	to hurt
Chabara	Khanu	to eat

d) Number Counting

Ghi	Yek	One
Nhi	Dui	Two
Som	Tin	Three
Chee	Char	Four
Nha	Panch	Five
Dhu	Cha	Six
Niss	Sat	Seven
Bray	Aath	Eight
Ku	Naun	Nine
Chu	Dus	Ten
Bhra	Ek saya	Hundred
Pongra	Ek hajar	Thousand
Pon gra chu	Dushajar	Ten thousand
Lakh	Ek lakh	One lakh

e) Ethnobiological terms

Animals

Taa	Baag	Tiger
Hya	Chauri	Yak
Ramo	Chyangra	Wild Goat
Memo	Gai	Cow
Fo	Mirga	Deer
Jyake	Giddha	Vulture

Plants

Nho	Lasun	Garlic
Nanam	Tori	Mustard

Lhau	Mula	Raddish
Mrhasin	Dhan	Rice
Gyakhe	Phapar	Buckwheat

5.1.4 Dress and Ornaments

Each ethnic group has its own type of custom. Each group has its own unique dress and ornaments. So Tangbetons also have their own unique dress and ornaments. Males wear bakkhu and doch, Females wear cholo, segen (jama), kiti, phiki, patuka and shawl. But casually migratory Tangbetons, both males and females wear t-shirts and pants, Females are rarely seen wearing kurtha surwal, only during festivals they are seen wearing their own dress. Some aged people wear their own unique dress even in Pokhara. But in Mustang they wear their own dress.

For ornaments they wear aunthi (ring of fingers), golden bangles. They do not wear nose ring as they do not pierce the nose. In neck they wear golden chain, or necklace, even they wear the garland made of muga as well.

5.1.5 Population

Population of Tangbetons has not been described in the Census of Nepal. So it was difficult to get the exact number of population of Tangbetons. There are about 32 households in Tangbe Village, about 100 families in Pokhara, around 25 families in Jomsom, around 20 families in Kathmandu and around 50 individual in the United States. In Pokhara there are about 100 households' having 5 people each in average.

5.1.6 Septs of Clans

Each and every ethnic group has their Septs (thar). Tangbetons also have 18 sub septs under Tangbetons. Among 18 different sub septs only 4 are known and others are not categorized among Tangbetons. Those are Lepa Harewa, Neppa Chhiring Nhina, Tashi Khikyab and Lapeu. These septs are categorized according to their ancestors' name. Lepa Harewa is the sub septs having maximum number of the Tangbetons, Lapeu subset is categorized as the Priest.

5.1.7 Education

As the research is about migratory Tangbetons, most of them in Pokhara are educated. Most of them are above S.L.C pass. About all teen aged Tangbetons are

educated. Most of the educated are quite sharp minded. Some are engineers, doctors, lecturers, business men etc.

The schools and colleges were searched for the record of Tangbe students studying there. But it was hard for me to find the exact information which may be due to the fact that they do not write their own surname as Tangbetons. Some write Lama and some Gurung. On the occasion of Lohsar of Tangbetons, during the study period most Tangbetons were found using the Surname Gurung. So it was difficult to know exactly how many have completed S.L.C, Intermediate, Bachelor, and Masters' and so on.

But also somehow the information were collected that the Tangbetons are studying in Kumudini Homes, Peace Zone, Mt. Everest, Saint Mary's, Global, Little Step, Sagaramatha Higher Secondary School, and Luxmi Higher Secondary School.

5.1.8 Economy

Traditionally Tangbetons were salt traders. After the decline in this trade many years ago, most of them started to be engaged in farming and other vocations. Due to insufficient technology as well due to arid climate and so having barren land it is not possible to grow many crops. But also in the village of Tangbetons i.e. in Tangbe village principal crops are *Hordeum vulgare* (Uva), *Fagophyrum esculentum* (Buck Wheat), *Allium wallichii* (Jimbu) and *Brassica compestris* (Tori).

But in Pokhara it is not noticed that they are engaged in agriculture and farming. They buy all the necessary things from the market. Majority of them have big fancy shops in Pokhara, such as in Mahendra pool, Prithvi chowk, Chipledhunga, New road and Srijana chowk. Most of them are engaged in business. Some work in Pokhara Cable, Annapurna FM, some have boring water supply center, plastic factory etc. On average all are rich.

5.1.9 Tangbetons Religion and Tradition

Most of the Tangbetons are Buddhist. They follow Buddhism. It seems contradictory as Buddha was the lover of peace and avoided sacrificing the animals, but Tangbetons feast and festivals are incomplete without meat.

According to their tradition the second son should become 'Dhawa', Lama (religious devotee Buddhist). The second daughter is 'Jhuma' (Buddhist Nun). The marriage system is polyandrous by tradition. But such marriages are not in practice in these days.

After 63 years of age the Tangbetons need not to be involved more in social work, i.e. they are not forced to do the work as others, now the age limit for this system is 57 yrs and this ceremony is known as 'Tharchyang' which means retirement of the life. They perform Puja of the old age as Hindus perform this kind of ceremony at the age of 84. By this system it seems that the Tangbetons don't live longer as the Brahmins and others line.

5.1.10. Culture and Festivals:

Lohsar is the main festival of Tangbetons. It is also their new year. It is different than other Lohsar like Gurungs. The Lohsar of Gurung exactly falls on 15th Paush, December 29 or 30 but of Tangbetons is after 15th Paush up to 25th, after December 29 or 30 to January 8 or 9.

Shifting in the newly built house has also a system. They call the Lamas to perform function like Puja and only family live in the new house. On the full moon day the Tangbe ride on horse and go to Muktinath and have a feast there which is called 'Yartong'. There is another festival in this community which is played with bows and arrows is called 'Dhachyang' and also called the 'Taro Hanne'. Tangbetons rarely celebrate the festivals of Hindus like Dashain, Tihar etc. They do not put tika. They also celebrate Chaite dashain.

5.1.11 Life Cycle Rites

5.1.11.1 Birth Rites

There is no special ritual like of the Brahmin and others in this caste. Newly born babies are named by the Lamas with chanting Mantras and reciting religious book. There is no fixed day or the period for naming the child, it can be conducted in about 2, 3 months after the birth. There is no culture to keep the woman separate from others, not to be touched by the rest members during the time of giving birth to a newly born baby.

The special meal given to the mother is ghee and the chickens as much as possible. Sheep, Chyangra meat is also given to the mother. To see the newly born baby for the first time they don't need to offer any gift, money etc.

Tangbetons have 12 classes i.e 'Lho' (Bargas) according to their animal calendar. Each year is of different class. It repeats after 12 years. All the babies who are born in the same year have the same class and the next year the other, respectively. The starting of this class is from the day according to the lunar calendar. The 12 classes are: rat, cow, tiger, rabbit, dragon, snake, horse, sheep, monkey, bird, dog and pig.

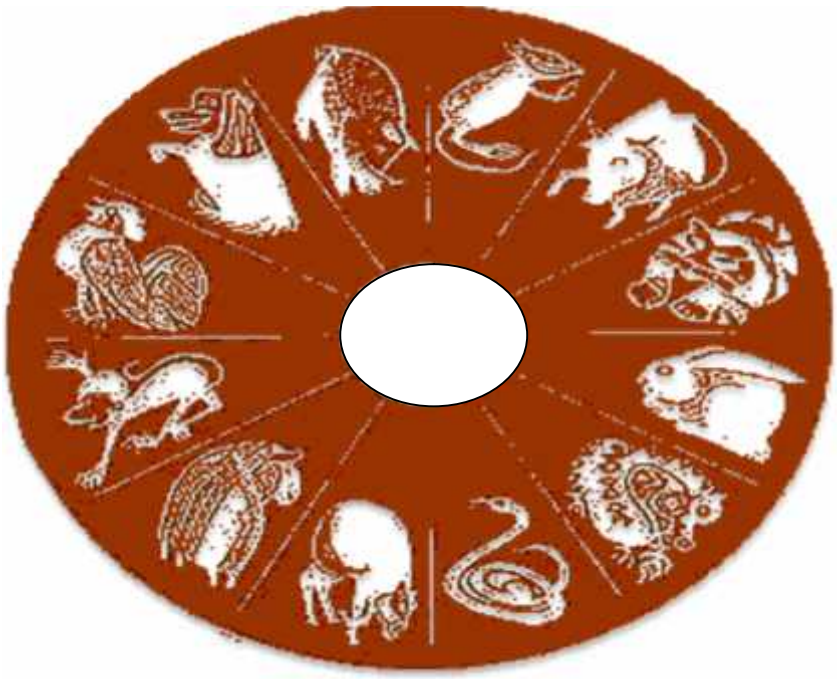

Fig. No. 10. Animal calendar according to 12 different classes.

According to their culture if the girl is of tiger class and the boy is of monkey class are considered to be bad or not good enough with luck etc. So they don't want to be of those classes. The cow class is considered to be the best class. Tangbetons culture and tradition is more similar to Japanese culture.

The girl and the boy can be involved in social work when they are of 19 years.

5.1.11.2 Wedding Rites

Talking about marriage practices, arrange marriage is most in the practice. The boy himself does not go to ask the girls hand. The boy having both father and mother go

for the process, instead of sindoor the bride is offered with ghee. They take 2 wooden pots full of ghee and fermented rice (chhyang) to purpose for marriage and if the girl's parents accept the gift the relation is sure. They fix the date of marriage and this time also only the parents and other relatives go to the girl's house. As their custom they play the musical instruments for requesting to bring out the bride from inside the home. Then the bride comes out of the room with a basket full of gifts as dowry. This is the gift like money, jewelry etc. to their daughter only. In their custom they should not give anything to the bridegroom and to the family members of him. The gift is carried by the girl herself. In the brides home nothing is given to eat to the members of the wedding party. The bride is welcomed with the rituals performed by the Lamas in the bridegroom's home. They don't use red tika, but they sprinkle the girl with *Hordeum vulgare* (Uva) by the Lama and the girl enters the boy's house. There is no tradition of respecting to their elders like in other caste. The next 2 days the relatives and the neighbors of the bridegroom are given feast including meat and chhyang.

The special dress for this ceremony is bakhhu, chhirki cap for the bridegroom and cholo, segen, fiki, patuki for the bride with other jewelery for the bride. The gift like clothes and jewelry offered by the boy, the girl only wears after reaching the boy's house.

Son and daughter of brother and sister can be married. The system of polygamy was high in the ancient times, but nowadays it is rare. No more intercaste marriage is seen and if it is hardly accepted. But it is seen that they have been married with some Newar, Japanese and Americans.

The distribution of property of the father is not fair among the sons. The eldest son only is the heir of the property where as others are deprived of this right if they want to be separated from the family. Those who want to be separated they are given with bowl and they leave the family. So that it is seen that they are migrated to the cities and to foreign countries.

5.1.11.3 Death Rites

When there is death of Tangbetons there is a very strange and different system of types of rituals than others. The dead body is taken to nearby river or stream and cut into many pieces by a fixed man appointed for this function. The pieces are scattered then

with the help of sankha eagle and fish are called to eat the pieces. These are called by Lamas. It is believed that if the eagles come and eat the flesh the man had done the good deeds and go to the heaven if not then he had committed the sins and go to the hell. There is another strange tradition about the death. If the field of the dead one is full of mature barley *Hordeum vulgare* (Uva) the body is taken to the top side of it and if the field is barren the body is taken to the bottom side of it. If the dead one is below 13yrs then it is burnt instead of cutting into pieces. There is no system of burning the dead body like Hindus, but migratory Tangbetons burn up the dead body. Only the men go to funeral procession not the women.

A puja is performed after 3 days and goes up to 21 days. The puja after 3 days is called Chyaksumba in which puja is performed by Lamas and 108 lamps are lighted. A dummy of the dead person is made and everyday it is fed with meals for 21 days. There is no culture of sitting separate, cutting the hair, wearing the white dress and avoiding the salt during this period, but most of them don't eat meat .The wife don't wear ornaments. On the 21st day there is a special puja function. They feed their relatives and others. Then only they collect the remaining like bones of the dead body and burn as the last ritual of death.

There is again another function in the name of the dead one on the 49th day. Lighting the 108 lamps on the Gumba by Lamas and giving the feast. This function is known as Kucho.

The last function or the remembrance of the dead is after one year. There is the programme of lighting lamps and the Lamas chant (recite) mantras and the relatives are given feast again in Gumbas or at home.

5.2 Medico- ethnobiology

Plants and animals are widely used throughout the world as the medicine, because most of the medicine is made from the different parts of plant and animal species. Mainly the people in the rural area where there are not modern health facilities use the plant and animal parts as medicine for their health care. Medicinal knowledge about the plant and animal parts are passed for further through personal experience and oral tradition.

There are many studies done for medico-ethnobiology and those studies have revealed about the use of medicinal plants and animals in Nepal. The present study is a detailed ethnomedical survey that was carried out in Pokhara Sub-metropolitan City. This present study /research adds the knowledge about the ethnomedical biology, and will be helpful to document importance medicinal plants of Nepal, that are often used by the Tangbetons communities for primary health care. Medico ethnobiology is sub-divided into medico-ethnozoology and medico-ethnobotany.

5.2.1 Medico-ethnozoology

Ethnozoology is the study of the relationship between human culture and animals in human environment. This interdisciplinary subject blends anthropological, cognitive and linguistic perspectives with scientific approaches to describing and interpreting people's knowledge and use of animals. Its broader focus is on how animals are perceived, used and managed in human societies, including their use for food, medicine and personal adornment, as well as their use in divination and ritual.

Each and every part of the animals is used as medicine for treatment of disease from ancient times. Tangbetons people are also using some of the animal parts for curing their diseases. As they are Buddhist they do not harm or kill the animal. So, they only use the part of the animal that is dead. But some of the Tangbetons usually use the medicine given by ‘Amchis’ (traditional healers).

From the research it was found that the medicine was prepared by using 13 different body parts. Body parts used for medicine are:

- Horn (Ra)
- Bone (Ruba)
- Meat (Sha)
- Blood (Tak)
- Gall Bladder (Thipa)
- Fat (Tsel)

- Brain (Lepa)
- Skin (Pakpa)
- Nail (Sermo)
- Urine (Chongpa)
- Stool (Shang)
- Hair (Sa)
- Whole Body (Lue/Su)

They use different animal species including vertebrates and invertebrates. Research concluded that there are altogether animal species, both wild and domesticated belonging to order and families that have been used for the remedy of different diseases by using Tangbetons traditional knowledge.

The list of animal species used in the traditional cure of disease by migratory Tangbetons people of the study area is shown below with their order family and habit.

Table1. List of animals used for folklore medicine by the migratory Tangbetons of the study area.

S.N	Order	Family	Latin Name	English Name	Nepali Name/Local Name	Habit/Habitat
1	Artiodactyla	Bovidae	*Bos grunniens*	Yak	Chauri/Hya	Domesticated/M
2	Artiodactyla	Bovidae	*Capra hircus*	Chyangra	Chyangra/Ramo	Wild/M
3	Artiodactyla	Bovidae	*Capra hircus*	Goat	Bakhra/Khasi	Domesticated/P
4	Artiodactyla	Bovidae	*Bos indicus*	Cow	Gai/Mhemo	Domesticated/P
5	Artiodactyla	Bovidae	*Ovis ammon*	Sheep	Bhenda/Ghyu	Domestic

			hodgsoni			ated/M
6	Artiodactyla	Cervidae	*Moschus chrisogaster*	Deer	Mirga/Fo	Wild/M
7	Carnivora	Canidae	*Canis aureus*	Jackal	Syal/Syala	Wild/M
8	Carnivora	Felidae	*Panthera tigris*	Tiger	Bagh/Taa	Wild/N
9	Columbiformes	Columbidae	*Columba livia*	Pigeon	Parewa/Dokhen	Domesticated/M
10	Falconiformes	Accipitridae	*Gyps himalayaensis*	Vulture	Giddha/Jyake	Wild/M
11	Hymenoptera	Apidae	*Apis laboriosa*	Honey bee	Mauri	Domesticated/P
12	Blattaria	Blattidae	*Peripaneta Americana*	Cockroach	Sanglekira	Domesticated/
13	Perissodactyla	Equidae	*Equss hemionus kiang*	Horse	Ghoda/Ta	Domesticated/M
14	Perissodactyla	Equidae	*Equus kiang*	Donkey	Gadha/Bumbu	Domesticated/M
15	Perrisodactyla	Rhinocrotidae	*Rhinoceros unicornis*	Rhino	Gainda	Wild/N
16	Primates	Hominidae	*Homo sapiens*	Human	Manche/Mhi	Domesticated/N
17	Rodentia	Muridae	*Apodemus gurkha*	Mouse	Musa/Nami	Domesticated/M

5.2.2 Diversity of Animal Species

From the findings among 17 animal species recorded for the folk medicine by the migratory Tangbetons were 13 species of mammals, 2 species of aves and 2 species of

invertebrates, on the basis of habit 11 were domesticated and 6 were wild, the 17 animal species identify were of 9 order and 12 families.

5.2.3 Diseases/Ailments Treated

The 17 recorded animal species from the study area have been found to be used for the treatment of 22 different diseases and disorders by the Tangbetons using their own traditional knowledge. The list of diseases along with the animal species is shown in the table below.

Table2. List of diseases with the animal species used.

S.No	Name of Disease	Name of Animal Used
1	Diarrhoea	*Equus kiang* (Donkey) *Bos grunniens (Yak)* *Panthera tigris* (Tiger) *Moschus chrisogaster* (Deer)
2	Fever	*Bos grunniens (Yak)*
3	Gives energy and heat to the body	*Panthera tigris* (Tiger) *Bos grunniens (Yak)* *Gyps himalayaensis* (Vulture) *Capra hircus* (Goat)
4	Joint Pain	*Moschus chrisogaster* (Deer) *Equus kiang* (Donkey) *Bos indicus* (Cow)
5	Rheumatism	*Ovis ammon hodgsoni* (Sheep), *Canis aureus* (Jackal)
6	Menstrual Imbalance/Over Bleeding	*Moschus chrisogaster* (Deer)
7	Sinusistis (Pinas)	*Moschus chrisogaster* (Deer)
8	Thyroidism	*Gyps himalayaensis* (Vulture)
9	Energy to the newly delivered women	*Capra hircus* (Chyangra), *Capra hircus* (Khasi)
10	Arthritis	*Canis aureus* (Jackal)
11	Gives energy and gives	*Bos grunniens (Yak)*

	heat to the body	*Gyps himalayaensis* (Vulture) *Capra hircus* (Goat)
12	Water deposition in different parts of the body as in Muscles or in Joints.	*Equus kiang* (Donkey) *Bos indicus* (Cow)
13	Pain on the Limbs	*Capra hircus* (Goat)
14	Abscess (Take out pus from the body)	*Apodemus gurkha* (Mouse) *Columba livia* (Pigeon)
15	Makhya (Naevus)	*Rhinoceros unicornis* (Rhino)
16	Eye Pain, Conjunctivitis	*Homo sapiens* (Human)
17	Swelling	*Bos indicus* (Cow)
18	Due to indigestion or due to blood itself the stomach becomes hard so as the baby inside and to cure such disease/ Stiffening of the stomach (Pet saro hune athawa sunnine)	*Equss hemionus kiang* (Horse)
19	Common Cold, Cough	*Apis laboriosa* (Honey Bee)
20	Body Pain, Leg pain	*Capra hircus* (Goat), *Panthera tigris* (Tiger)
21	Indigestion	*Bos grunniens* (Yak)
22	Severe pain as like Appendicits	*Periplaneta Americana* (Cockroach)

5.2.4 Parts or Organs of Animals Used

On the basis of the research, it was found that different parts or organs of animals were used for various medicinal purposes. Widely used organs among the people under research area were meat. The other organs included were horn, bone, meat, blood, gallbladder, fat, brain, skin, nail, urine, stool, whole body.

5.2.5 Routes of Administration

Medical use or administration includes oral absorption which is internal medication. Some are used by applying on the injured parts that is known as external medication. Most of the process of treatment was done orally.

5.2.6 Detailed Study of the Animal Species

The different species that are used by the people of the study area during research are described primarily based on the information collected during the field survey. The descriptions of the animal species are given in alphabetical order of family of the animal species.

1. Accipitridae

Gyps himalayaensis ‘Vulture’

Type: Aves

Organs Used: Meat

Forms of medication: Cooked

Medicinal Use: Cure thyroidism and gives heat to the body. Intestinal meat is good for diarrhea.

2. Apidae

Apis laboriosa 'Mauri'

Type: Insect

Products Used: Wax, Honey

Forms of medication: Raw, Diluted Drug

Medicinal Use: 1-2 tea spoon of honey mixed with zinger good during cough, common cold. 1 spoon mixed with mild hot water and *Citrus aurantifolia* is good for body shape.

3. Blattidae

Periplaneta americana ‘Sanglekira’

Type: Insecta

Product Used: Meat

Fors of Medication: Whole body

Medicinal Use: It helps to cure severe pain as like Appendicitis.

4. Bovidae

a) *Bos grunniens* 'Yak'

Type: Mammal

i) Organs Used: Horn

Forms of medication: Powder

Mode of Use: Horn is chopped in thin pieces then washed with water. Pieces are put in clay pot making air tight then pot is kept within an ignited fire. Then the final product powder is swallowed with water. It is used 3 times a day.

Medicinal Use: It helps to heat the body and good for digestion.

ii) Organs Used: Meat, muscle

Forms of Medication: Cooked

Medicinal Use: It helps to provide energy to the body as it heats the body.

iii) Organs Used: Blood

Forms of Medication: Raw or Cooked

Medicinal Use: Prevent Diarrhoea and fever.

b) *Capra hircus* 'Chyangra'

Type: Mammal

Products Used: Meat

Forms of medication: Cooked, Dry

Medicinal Use: It gives strength to the newly delivered women. Dry meat is also used as food.

c) *Capra hircus* ‘Khasi’

Type: Mammal

Products Used: Meat, Feet

Forms of medication: Cooked/Soup

Medicinal Use: Bones containing meat are cooked to prepare soup. Soup is taken to cure pain on the limbs and heat the body.

d) *Bos indicus* ‘Cow’

Type: Mammal

Organ Used: Urine

Forms of medication: Raw

Medicinal Use: It is applied in joints during joint pain and swelling. It helps to cure water deposition inside the joints.

e) *Ovis ammon hodgsoni* 'Sheep'

Type: Mammal

Organ Used: Brain

Forms of medication: Meat, Cooked

Medicinal Use: Meat is cooked and eaten it is known to cure Rheumatism.

5. Canidae

Canis aureus 'Sayal'

Type: Mammal

Organ Used: Meat

Forms of medication: Cooked, Liquor

Medicinal Use: Meat is cooked properly and taken regularly. It helps to cure Rheumatism and Arthritis.

6. Cervidae

Moschus chrisogaster 'Deer'

Type: Mammal

i) Organ Used: Meat

Forms of medication: Cooked

Medicinal Use: It helps to cure over bleeding during menstruation that helps to cure menstrual imbalance.

ii) Organ Used: Fat

Forms of Medication: Ghee

Medicinal Use: It helps to cure Sinusistis.

7. Columbidae

Columba livia 'Pigeon'

Type: Aves

Part Used: Stool

Forms of medication: Dried, Powder

Mode of Use: Stool is kept in the metal vessel then is kept within an ignited fire. Then the final product powder is swallowed with water. It is used 3 times a day.

Medicinal Use: It helps to cure Abscess.

8. Equidae

a) *Equss hemionus kiang* 'Horse'

Type: Mammal

Organ Used: Nail

Forms of medication: Powder

Mode of Use: Nail is chopped in thin pieces then washed with water. Pieces are put in clay pot making air tight then pot is kept within an ignited fire. Then the final product powder is swallowed with water.

Medicinal Use: Powder form is swallowed with water. It helps to cure stiffening of the stomach due to Indigestion or due to blood itself.

b) *Equus kiang* 'Donkey'

Type: Mammal

i) Organ Used: Blood

Forms of medication: Cooked or Raw

Medicinal Use: It helps to cure joint pain.

ii) Organ Used: Tongue (Meat)

Forms of Medication: Cooked

Medicinal Use: It helps to prevent Diarrhoea.

iii) Organ Used: Nail (Toe)

Forms of Medication: Powder

Mode of Use: Nail is chopped in thin pieces then washed with water. Pieces are put in clay pot making air tight then pot is kept within an ignited fire. Then the final product powder is swallowed with water.

Medicinal Use: It helps to cure water deposition in the body.

9. Felidae

Panthera tigris 'Tiger'

Type: Mammal

Organ Used: Bones

Forms of medication: Powder

Mode of Use: Bone is chopped in thin pieces then washed with water. Pieces are put in clay pot making air tight then pot is kept within an ignited fire. Then the final product powder is swallowed with water.

Medicinal Use: Cure body pain and provide energy to human beings.

10. Hominidae

Homo sapiens ‘Human’

Type: Mammal

Organ Used: Urine

Forms of medication: Raw

Medicinal Use: During Conjunctivitis Urine is sprinkled in the eye which helps to cure it.

11. Muridae

Apodemus gurkha 'Mouse'

Type: Mammal

Organ Used: Skin

Forms of medication: Dried

Medicinal Use: Skin meat is eaten, it helps to cure Abscess.

12. Rhinocerotidae

Rhinoceros unicornis ‘Rhino’

Type: Mammal

Products Used: Skin, Meat

Forms of medication: Dried

Medicinal Use: Skin is dried in the sun and eaten. It helps to cure Naevus ‘Makhya’

5.2.7 Medico-ethnobotany

Plants have been of the medicinal value from ancient times. There are different medicinal plants species for their own local health care system by the people of the study area. It was found that they use 60 sps of medicinal plants belonging to 41 families and 57 genera for curing 61 different diseases using their own indigenous knowledge.

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

Table 3. List of medicinal plants used by the local migratory people of the study area

S.No	Family	Latin Name	Nepali//Local Name	Life Forms	Habitat
1	Acanthaceae	*Justicia Adhatoda*	Asuro	Shrub	P
2	Amaryllidaceae	*Allium sativum*	Lasun/Nho	Herb	P
3	Araceae	*Acorus calamus*	Bojho	Herb	P
4	Asteraceae	*Saussurea graminifolia*		Grass	M
5	Boraginaceae	*Arnebia benthamii*	Unknown/Dimok	Hairy Grass Plant	M
6	Cannabaceae	*Cannabis sativa*	Bhang	Tree	P
7	Combretaceae	*Terminalia bellirica*	Barro	Tree	M
8	Combretaceae	*Terminalia chebula*	Harro	Tree	M
9	Cruciferae	*Brassica compestris*	Tori/Nanam	Herb	M
10	Cruciferae	*Brassica juncea*	Rayo/Daf	Herb	P
11	Cruciferae	*Brassica rapa*	Salgam/Muli	Herb	M
12	Cruciferae	*Lepidium sativum*	Chamsur	Herb	P
13	Cruciferae	*Raphanus*	Mula/Lhau	Herb	P

		sativus			
14	Cucurbitaceae	*Leucartha*	Lauka	Climber	P
15	Cucurbitaceae	*Memordica charantia*	Karela	Climber	P
16	Cupressaceae	*Juniperus squamata*	Shuk	Shrub or small tree	M
17	Elaeocarpaceae	*Elaeocarpus nerefolia*	Rudraskhya	Tree	M
18	Ephedraceae	*Ephedra gerardiana*	Ephedra	Shrub	M
19	Ericaceae	*Rhododendron arboreum*	Gurans/pathamhendo	Tree	M
20	Euphorbiaceae	*Phyllanthus emblica*	Amala	Tree	P
21	Gentianaceae	*Swertia chirayita*	Ciraito	Herb	P
22	Gramineae	*Hordeum vulgare*	Uva/Karu	Herb	M
23	Gramineae	*Oryza sativa*	Dhan/Mrhasin	Herb	M
24	Gramineae	*Saccharum officinarum*	Ukhu	Shrub	P
25	Hypocreaceae	*Cordyceps sinensis*	Yarsagumba	Herb	M
26	Labiatae	*Ocimum sanctum*	Tulasipatra	Herb	P
27	Lamiaceae	*Dracocephalum tanguticum*	Not known/Ti yang ku	Grass	M
28	Lauraceae	*Cinnamomum tamala*	Tejpat	Small Tree	P
29	Lauraceae	*Dodecadonia grandiflora*	Nepali Dalchini	Small Tree	P

30	Leguminaceae	*Oxytropis sp.*	Tak sha	Shrub	M
31	Leguminosae	*Trigonella foenum*	Methi/Methi	Herb	P
32	Liliaceae	*Allium wallichi*	Jimbu/Jhumak	Herb	M
33	Liiaceae	*Aloe barbadensis*	Gheukumari	Shrub	P
34	Liliaceae	*Asparagus racemosus*	Kurilo/Asparagus	Herb	P
35	Mediaceae	*Azadirachta indica*	Nim	Tree	P
36	Moraceae	*Ficus bengalensis*	Bar	Tree	M
37	Moraceae	*Ficus religiosa*	Bhote Pipal	Tree	M
38	Myristicaceae	*Myristica fragrans*	Jaiphal	Tree	M
39	Orchidaceae	*Dactylorhiza hatagirea*	Panca angule	Herb	M
40	Palmae	*Areca catechu*	Supari	Tree	P
41	Papilionaceae	*Dolichus biflorus*	Gahat	Herb	P
42	Paranassiaceae	*Parnassia nubicola*	Nirmashi	Herb	M
43	Pedaliaceae	*Seasumum orientale*	Til/Samlha	Shrub	M
44	Plantaginaceae	*Plantago depressa*	Unknown/Tha ram	Shrub	M
45	Poaceae	*Pisum sativum*	Kerau	Climber	P
46	Polygonaceae	*Fagophyrum esculentum*	Phapar/Gyakhe	Herb	M
47	Punicaceae	*Punica granatum*	Anar	Tree	P

48	Rosaceae	*Prunus persica*	Aru	Tree	P
49	Rosaceae	*Rosa sericea*	Sewa'i metok	Shrub	M
50	Rutaceae	*Citrus aurantifolia*	Kagati	Tree	P
51	Rutaceae	*Zanthoxylum armatum*	Timur/Timur	Small Tree	P
52	Scrophulariaceae	*Picrorhiza scrophulariflora*	Kutki	Herb	M
53	Solanaceae	*Solanum surattense*	Kantakari	Herb	M
54	Umbelliferae	*Carum carvi*	Bhote Jira/Jiri	Herb	P
55	Umbelliferae	*Coriandrum sativum*	Dhaniya	Herb	P
56	Vitaceae	*Vitis vinifera*	Angur	Climber	P
57	Zingiberaceae	*Ammomum subulataum*	Alainchi	Tree	P
58	Zingiberaceae	*Curcuma longa*	Besar	Herb	P
59	Zingiberaceae	*Elettaria cardamomum*	Sukmel	Tree	P
60	Zingiberaceae	*Zingiber officinale*	Aduwa	Herb	P

5.2.8 Diversity of the Medicinal Plants

From the findings among 60 medicinal plants species recorded for the folk medicine by the migratory Tangbetons, 25 are herb, 4 are climber, 10 are shrub and 18 are tree.

5.2.9 Diseases/Ailments Treated

The different species of plants recorded for medicinal use have been found to be used for the treatment of 61different disease/ailments by the people using their indigenous

knowledge system. The list of diseases along with the plant species is shown in the table below.

Table 4. List of Diseases with the Plant Species used

S.N	Name of Disease	Name of Plants Used
1	Jaundice (Panhele rog)	Swertia sps (Tikta), *Saccharum officinarum* (Ukhu), *Memordica charantia* (Karela), *Swertia chirayita* (Chiraito), *Fagophyrum esculentum* (Bitter Buck wheat)
2	Swelling(Sunnine)	*Oxytropis sps, Arnebia benthamii*
3	Diarrhoea (Pakhala lageko) Dysentery (Mansi pareko) Stomach ache (Pet dukheko)	*Picrorhiza scrophulariflora* (Kutki), *Oryza sativa* (dhan), *Hordeum vulgare* (Uva), *Zingiber officinale* (Aduwa), *Terminalia chebula* (Harro), *Emblica officinalis* (Amala), *Terminalia belerica* (Barro), *Justicia adhatoda* (Asuro) Oxytropis sps, *Rosa sericea, Plantago depressa, Neopicrorhiza scrophulariflora* (Kutki), *Oryza sativa* (Dhan)
4	Intestinal worms(Juka pareko)	*Citrus aurantifolia* (Kagati)
5	Typhoid	*Neopicrorhiza scrophulariflora* (Kutki)
6	Indigestion(Khana napachne)	*Zingiber officinale* (Aduwa), *Amomum subulatum* (Alainchi), *Allium wallichii* (jimbu), *Juniperus squamata*, *Dracocephalum tanguticum, Raphanus sativus* (Mula), *Brassica rapa (Salgam,Mula)*
7	Fracture (Markeko,Bhacheko)	*Betula utillis* (Bhote pipal)
8	Nasal Bleeding	*Juniperus squamata*
9	Piles (Harsa)	*Hordeum vulgare* (Uva), (*Myristica fragrans*) Jaiphal

10	Fever (Joro aune)	*Parnassia nubicola* (Nirmashi), *Azadirachta indica* (Nim) Oxytropis sps, *Solanum surattense* (Kantakari), *Neopicrorhiza scrophulariflora* (Kutki), *Swertia chirayita* (Chiraito)
11	Chronic Fever, Blood Fever	*Arnebia benthamii*
12	Body pain (Jiu dukhne)	*Dactylorhiza hartagiera* (Panchaunle), *Zingiber officinale* (Aduwa), *Lepium sativum* (Chamsur)
13	Common cold (Ruga lagne)	*Allium wallichii* (jimbu), *Carum carvi* (Jira), *Citrus aurantifolia* (Kagati), *Ocimum sanctum* (Tulsipatra), *Acorus calamus* (Bojho), *Curcuma angustifolia* (Besar)
14	Cut Bleeding (Ragat bagne)	Oxytropis sps, *Ephedra gerardiana*
15	Burnt Area,Spots on the skin	*Aloe barbadensis* (Gheukmari)
16	Cough (Khoki lagne)	*Neopicrorhiza scrophulariflora* (Kutki), *Terminalia belerica* (Barro) *Azadirachta indica* (Nim), *Vitis vinifera* (Angur), *Ephedra gerardiana*, *Carum carvi* (Jira) *Allium wallichii* (jimbu), *Ocimum sanctum* (Tulsipatra), *Acorus calamus* (Bojho), *Curcuma angustifolia* (Besar)
17	Energy, Strength, Vitamin	*Asparagus racemosus (Kurilo), Cordyceps sinensis (Yarsagumba), Brassica compestris* (Tori), *Dactylorhiza hartagiera* (Panchaunle)
18	Gastric	*Capsicum annum* (Rato khursani), *Xanthoxylum armatum* (Timur), *Zingiber officinale* (Aduwa), *Terminalia chebula* (Harro), *Emblica officinalis* (Amala), *Cinnamomum zeylanicum (Dalchini) Allium*

		wallichii (jimbu), *Allium sativum (*Lasun) *Punica granatum* (Anar), *Sesamum orientale* (Til), *Raphanus sativus (*Mula), *Dracocephalum tanguticm*
19	Low Blood Pressure	*Punica granatum (*Anar),
20	High Blood Pressure	*Brassica compestris* (Tori), *Memordica balsamina* (Karela), *Aloe barbadensis* (Gheukmari)
21	Arthritis (Bath), Rheumatism	*Terminalia belerica* (Barro)
22	Newly Delivered Women	*Hordeum vulgare* (Uva),*Brassica compestris* (Tori)
23	Teeth Pain (Dant dukheko)	*Acorus calamus* (Bojho), *Seasumum orientale* (Til)
24	Blood and lymph disorder	*Juniperus squamata*
25	Ear Pain (Kan dukheko)	*Prunus persica* (Aru)
26	Throat Pain (Ghati dukheko)	*Acorus calamus* (Bojho), *Terminalia chebula* (Harro), *Terminalia belerica* (Barro), *Zingiber officinalae* (Aduwa)
27	Vomiting (Wak aune)	*Xanthoxylum armatum* (Timur),*Citrus aurantifolia* (Kagati), *Cinnamomum zeylanicum* (Dalchini) *Corriander Sativum* (Dhaniya), Oxytropis sps, *Plantago depressa*,
28	Wound and Cut Parts (Ghau, kateko dhaun)	*Curcuma angustifolia* (Besar), *Oxytropis* sps, *Sassurea graminifolia*
29	(Khana naruchne)	*Xanthoxylum armatum* (Timur)
30	Fish Bone Stuck in Throat (Ghatima kanda adkeko)	*Rodonderon arborerum* (Lali guras)
31	T.B, Lungs Problem	*Vitis vinifera* (Angur)
32	Mental Disorder (Manasik	*Areca catechu* (Supari), *Allium sativum*

	santulan bigreko)	(Lasun), *Solanum surattense* (Kantakari)
33	Eye Problem (Ankha dukhne)	*Sesamum orientale* (Til), *Solanum surattense* (Kantakari) *Allium wallichii* (jimbu), *Emblica officinalis* (Amala), *Brassica juncea* (Rayo)
34	Skin Problem (Chalako samasya)	*Zingiber officinale* (Aduwa),*Aloe barbadensis* (Gheukmari)
35	Food Poisoning	*Piper nigrum* (Marich) *Dactylorhiza hartagiera* (Panchaunle)
36	Legs Problem (Khutako samasya)	*Punica granutum* (Anar)
37	Haemoglobin Problem	*Punica granutum* (Anar)
38	Diabetes (Chini rog)	*Azadirachta indica* (Nim), *Swertia chirayita* (Chiraito), *Zingiber officinale* (Aduwa), *Hordeum vulgare* (Uva), Wheat
39	Purification of Blood (Ragat safa garchha)	*Terminalia chebula* (Harro),*Cannabis sativa (Bhang)*, *Justicia adhatoda* (Asuro), *Neopicrorhiza scrophulariflora* (Kutki), *Emblica officinalis* (Amala)
40	Leg, Hand Fracture (Khutta, Hat markeko)	*Ficus religiosa* (Bhote Pipal)
41	Kidney Problem (Mirgaulako samasya)	*Elettaria cardamomum* (Sukmel), *Areca catechu* (Supari), *Cinnamomum tamala* (Tejpat), *Cordyceos sinensis* (Yarsagomba), *Dracocephalum tanguticum*
42	Kidney Fever (Mirgaulako joro)	*Ephedra gerardiana, Saussurea graminifolia*
43	Itching Problem (Chilaune samasya)	*Cannabis sativa* (Bhang)
44	Menstruation problem	*Zingiber officinale* (Aduwa),*Pisum sativum* (Kerau)
45	Hand Pain, Joint Pain, Backache	*Terminalia belerica* (Barro) *Cannabis sativa* (Bhang), *Brassica compestris* (Tori)
46	Purify the Vocal Cord (Awaj	*Xanthoxylum armatum* (Timur)

	ramro banne)	
47	Poisoning	*Arnebia benthamii*
48	Sinusistis (Pinas)	*Zingiber officinale* (Aduwa), *Trogonella foenum* (Methi)
49	Water deposition inside the joints	*Elaeocarpus nerefolia* (Rudrakshya)
50	Kidney Stone	*Dolichos biflorus* (Gahat)
51	Corns(Kanda/khil)	*Brassica compestris* (Tori)
52	Constipation	*Oryza sativa* (Dhan)
53	Intestine Disorder, Swelling of Stomach, Liver Disease	*Rosa sericea*
54	Heart Disease	*Ephedra gerardiana*
55	Cancer Disease	*Allium sativum* (Lasun)
56	Disorder Sleep	*Allium sativum* (Lasun)
57	Dandruff	*Ficus bengalensis* (Bar)
58	Pneumonia	*Swertia chirayita* (Chiraito)
59	Headache	*Neopicrorhiza scrophulariflora* (Kutki)
60	Stone in Gall Bladder	*Swertia chirayita* (Chiraito)
61	Massage Cream	*Brassica compestris* (Tori)

5.2.10 Plants Parts Used

There were different types of plants used in the folk medicine by the people of the study area. Every plant part that was used as medicine was different. Parts of the plant were used in raw form or by cooking or through processing to extract important drugs. Seed and leaves were most widely used parts of the plant as medicine for treating different disease. Whole plant was also used as the medicine. Other parts used in the medicine were stem, root, fruit and bark.

5.2.11 Forms of Medication

Medication implies to the way how the plant parts was used in the form of medicine. Some of the parts were used in raw form, some in paste form, some in diluted juice form and some as powder. In the study area the process of preparation of medicine by Tangbetons was by mixing with other plants, grinding, crushing to powder form, boiling the parts to be used or whole plants to extract the medicine from them.

5.2.12 Routes of Administration

The medicine extracted from the plant was taken in different form. Some was inhaled, some was taken orally and some are used as massage cream.

5.2.13 Detailed Study of Medicinal Plants

Those plants that were of medicinal value were studied in details. The information that was collected during the study period was from the local people, Amchis and some other specialized persons. Mainly the information was obtained from interviews. The descriptions are given in alphabetical order of families of plant species.

1. Acanthaceae

Justicia adhatoda 'Asuro'

Habit: Shrub

Parts Used: Seed

Forms of Medication: Raw or Powder

Medicinal Use: Small amount of it helps to purify blood.

2. Amaryllidaceae

Allium sativum L. 'Lasun'

Habit: Herb

Parts Used: Bulb

Forms of Medication: Raw

Medicinal Use: Used alone with salt or with vegetables. It is mixed with *Xanthoxylum armatum* (timur) and salt and taken with hot water, cure gastritis. It also helps to control cancer disease and disorder sleep.

3. Araceae

Acorus calamus L. 'Bojho'

Habit: Herb

Parts Used: Root

Forms of Medication: Raw

Medicinal Use: Small Piece of root is taken for throat pain or during common cold.

4. Asteraceae

Saussurea graminifolia

Habit: Grass

Parts Used: Whole Parts

Forms of Medication: Wash and Dry

Medicinal Use: 1-3gm with other herbs. It is suitable for all kind of bile disorders, kidney fever and sores.

5. Boraginaceae

Arnebia benthamii

Type: Hairy Grass Plant

Parts Used: Root, Bark

Forms of medication: Dry

Medicinal Use: 1-3gm with other herbs. It is suitable for chronic fever, blood fever, and swelling and poisoning.

6. Cannabaceae

Cannabis sativa L. 'Bhang'

Habit: Tree

Parts Used: Seed

Forms of Medication: Seed is taken in raw form.

Medicinal Use: It helps to purify the blood.

7. Combretaceae

i) *Terminalia bellirica* Garetn. 'Barro'

Habit: Tree

Parts Used: Fruit

Forms of Medication: Raw

Medicinal Use: Fruit is taken directly for throat pain and cough.

Fruit is dried with fruit cover of *Terminalia chebula* (Harro) and *Embelica officinale* (Amala) then powder is made by grinding it. One full spoon is taken with hot water twice a day to cure gastritis and joint pain.

ii) *Terminalia chebula* 'Harro'

Habit: Tree

Parts Used: Fruit

Forms of Medication: Powder

Medicinal Use: The fruit is dried along with fruit of *Terminalia belerica* (Barro) and *Emblica officinale* (Amala) for few days then powder is made by grinding it. One full spoon is taken with hot water twice a day to cure gastritis. It also helps in purification of blood.

8. Cruciferae

i) *Brassica compestris* ‘Tori

Habit: Herb

Parts Used: Seed, whole plant

Forms of Medication: Oil, plant as vegetable

Medicinal Use: Raw seed is grinded to take out oil. The pure oil is put on the part where there is thorn on the body. After few days the thorn comes out from the body. Oil is also used as massage cream for backache and joint pain.

ii) *Brassica juncea* ‘Rayo’

Habit: Herb

Parts Used: Leaves

Forms of Medication: Raw or Cooked

Medicinal Use: Good for eye.

iii) *Brassica Rapa* ‘Salgam’

Habit: Herb

Parts Used: Root

Forms of Medication: Cooked

Medicinal Use: Digestion

iv) *Lepidium sativum* ‘Chamsur’

Habit: Herb

Parts Used: Whole plant

Forms of Medication: Raw, Dried

Medicinal Use: Whole plant except root is cooked and taken as vegetable to cure body pain. It gives heat to the body.

v) *Raphanus sativus* ‘Mula’

Habit: Herb

Parts Used: Leaf, Root

Forms of Medication: Raw or cooked

Medicinal Use: Raw is taken directly or in cooked form. It helps in digestion. And is good for gastritis.

9. Cucurbitaceae

i) *Lagenaria siceraria* ‘Lauka’

Habit: Climber

Parts Used: Fruit

Forms of Medication: Juice

Medicinal Use: Juice extracted from it is taken to cure High Blood Pressure.

ii) *Memordica balsamina* ‘Karela’

Habit: Climber

Parts Used: Fruit

Forms of Medication: Juice or taken as vegetable

Medicinal Use: to cure High Blood Pressure

10. Cupressaceae

Juniperus squamata

Habit: Shrub or small tree

Parts Used: Seed, Leaves

Forms of Medication: Uproot all parts, wash ingredients and dry out.

Medicinal Use: 2-3gm with other herbs. Seeds are useful for the ailments of leg, hands, lymph disorders, good for sleep, increase appetite. Leaves are useful for digestion, blood disorders and nasal bleeding.

11. Elaeocarpaceae

Elaeocarpus sphaericus 'Rudraskhya'

Habit: Small Tree

Parts Used: Seed, Powder

Forms of Medication: Seed is scrubbed and powder is made.

Medicinal Use: Powder is taken with the water, which helps to cure water deposition inside the joints.

12. Ephedraceae

Ephedra gerardiana

Habit: Shrub

Parts Used: Seeds and leaves

Forms of Medication: Wash and dry in Shadow.

Medicinal Use: 1-3gm with other herbs. It is suitable for excessive bleeding, kidney fever, cough, heart disease and blood pressure.

13. Ericaceae

Rhododendron arboreum Sm. 'Gurans'

Habit: Tree

Parts Used: Flower

Forms of Medication: Raw or juice

Medicinal Use: Raw flower or juice from it is taken to remove or dissolve fish bones stuck in throat.

14. Euphorbiaceae

Emblica officinalis 'Amala'

Habit: Tree

Parts Used: Fruit

Forms of Medication: Powder, Raw

Medicinal Use: The fruit is dried with the fruit of *Terminalia chebula* (Harro) and *Terminalia belerica* (Barro) and then grinded to make powder. One full spoon is taken with hot water twice a day to cure gastritis. It also helps in purification of blood. Raw form is also taken. It contains vitamin C and is too good for eye.

15. Gentianaceae

Swertia chirayita Roxb.ex fleming 'Ciraito'

Habit: Herb

Parts Used: Whole plant, Leaves

Forms of Medication: Juice

Medicinal Use: Whole plant is boiled in water then the juice is taken to cure fever and pneumonia. Leaves are washed and chewed for minimum 2 weeks. It helps to cure jaundice. It also helps to dissolve/take out stone from gall bladder.

16. Graminae

i) *Hordeum vulgare* 'Uva'

Habit: Herb

Parts Used: Seed

Forms of Medication: Seed, Powder, Wine

Medicinal Use: Seed is kept in the utensils then is grinded, the product is known as Satu. It gives strength and energy. Good for diabetes patient. Wine is made from the Uva, then is mixed with coffee and drunk. It helps to cure Diarrhoea.

ii) *Oryza sativa* ‘Dhan’

Habit: Herb

Parts Used: Grain

Forms of Medication: Old Grain is made porridge by mixing salt and water by cooking.

Medicinal Use: Cure diarrhoea.

iii) *Sacchrum officinale* ‘Ukhu’

Habit: Shrub

Parts Used: Stem

Forms of Medication: Raw or Juice

Medicinal Use: It is taken orally, it is good during Jaundice.

17. Hypocreaceae

Cordyceps sinensis ‘Yarsagumba’

Habit: Medicinal Herb

Parts Used: Whole plant

Forms of Medication: Raw or dried form

Medicinal Use: Plant is washed and dried. Then powder is made by grinding it. It is good to the kidney and gives strength to the body. It gives vitamin to the body.

18. Labiatae

Ocimum sanctum ‘Tulasipatra’

Habit: Herb

Parts Used: Leaves

Forms of Medication: Raw

Medicinal Use: Leaves are washed and chewed alone or with water. It is used for common cold and during cough.

19. Lamiaceae

Dracocephalum tanguticum

Type: Grass

Parts Used: Roots

Forms of medication: Dry

Medicinal Use: 1-3gm with other herbs. It is suitable for digestive disorder, wind disorder and kidney disease.

20. Lauraceae

i) *Cinnamomum tamala* 'Tejpat'

Habit: Small Tree

Parts Used: Leaves

Forms of Medication: Leaves are dried, Cooked with other vegetables.

Medicinal Use: It is good for the kidney.

ii) *Cinnamomum zeylanium* 'Dalchini'

Habit: Small Tree

Parts Used: Stem

Forms of Medication: Fresh or cooked

Medicinal Use: It can be eaten freshly or cooked with other food. It is good for gastritis.

21. Leguminosae

i) *Oxytropis* sps

Habit: Shrub

Parts Used: Leaves, Flower, Fruits

Forms of Medication: Uproot all parts, wash ingridents, dry in shade

Medicinal Use: 1-2gm with other herbs. It is suitable for the imbalances of wound, sore, fever, cut, poison, dysentery, vomiting.

ii) *Trigonella foenum* 'Methi'

Habit: Herb

Parts Used: Seed, grain

Forms of Medication: Wet seed

Medicinal Use: Methi is soaked in water for whole night and the next day it is taken. It is used to cure sinusitis.

22. Liliaceae

i) *Allium wallichii* 'Jimbu'

Habit: Herb

Parts Used: All Part

Forms of Medication: Dried

Medicinal Use: Jimbu mixed with salt, *Curcuma longa* (Turmeric), *Carum carvi* (jeera) and boil in water. Then the liquid is drunk. It helps to cure common cold, Cough, Gastric. It is good for digestion and is good for eye as well.

ii) *Aloe barbadensis* 'Gheukumari'

Habit: Shrub

Parts Used: Fleshy Leaves

Forms of Medication: Juice, Raw

Medicinal Use: The juice is extracted from the leaves is applied over the burnt area for its cure. It also helps to control high blood pressure. It is also taken in raw form. It also helps to cure spots on the skin.

iii) *Asparagus officinalis* ‘Kurilo’

Habit: Herb

Parts Used: Stem or whole plant

Forms of Medication: Cooked

Medicinal Use: It is valuable as it gives energy.

23. Mediaceae

Azadirachta indica ‘Nim’

Habit: Tree

Parts Used: Leaves

Forms of Medication: Raw

Medicinal Use: Leaves boiled in water then a glass is drunk for 2-3 days. It cures fever and cough.

24. Moraceae

i) *Ficus bengalensis* ‘Bar’

Habit: Tree

Parts Used: Seed

Forms of Medication: Powder

Medicinal Use: Seed is scrubbed and powder is made. The powder is mixed with oil or water and then paste is applied in the hair. It helps to cure dandruff.

ii) *Ficus religiosa* ‘Pipal’

Habit: Tree

Parts Used: Fruit, Seed

Forms of Medication: Powder

Medicinal Use: Bark of the tree is used during leg or hand facture, it acts as the immobilizer.

25. Myristicaceae

Myristia fragrans 'Jaiphal'

Habit: Tree

Parts Used: Seed

Forms of Medication: Powder

Medicinal Use: Powder is boiled with the wine made from Uva and then taken as medicine. It is use during Piles.

26. Orchidaceae

Dactylorhiza hatagirea D.Don 'Panch anule'

Habit: Terrestrial erect herb

Parts Used: Root

Forms of Medication: Dry form

Medicinal Use: The root is dried then grinded to make powder. It is used with hot water or mixed with milk and taken. It gives strength to the body. It acts as Vitamin to the body.

27. Palmae

Areca catechu L. Supari'

Habit: Tree

Parts Used: Fruit

Forms of Medication: Fruit

Medicinal Use: It is taken directly. The inner part of the fruit is eaten. It is good for kidney.

28. Papilionaceae

Dolichus biflorus 'Gahat'

Habit: Herb

Parts Used: Seed

Forms of Medication: Boiled Soup

Medicinal Use: It helps to remove Kidney Stone.

29. Paranassiaceae

Parnassia nubicola 'Nirmashi'

Habit: Herb

Parts Used: Seed

Forms of Medication: Powder

Medicinal Use: Seed is scrubbed and the powder taken out from it is cooked with water then eaten. It is good to cure fever.

30. Pedaliaceae

Seasumum orientale 'Til'

Habit: Shrub

Parts Used: Seed, Grain

Forms of Medication: Raw, Oil

Medicinal Use: Used in pickle. Oil is made by grinding *Seasumum orientale* (Til) and used in food. It helps in cure of gastritis, teeth problem, eyes problem.

31. Plantaginaceae

Plantago depressa

Habit: Shrub

Parts Used: Whole Part

Forms of Medication: Wash and Dry

Medicinal Use: 1-3gm with other herbs. It is suitable to stop vomiting, improve body heat and lymph fluid.

32. Poaceaea

Pisum sativum 'Kerau'

Habit: Climber

Parts Used: Flower

Forms of Medication: Raw

Medicinal Use: It helps in menstrual imbalance.

33. Polygonaceae

Fagophyrum esculentum 'Phapar'

Habit: Herb

Parts Used: Grain

Forms of Medication: Grain or flour

Medicinal Use: Bitter Buckwheat is used for making flour liquid. Jaundice is cured.

34. Punicaceae

Punica granatum 'Anar'

Habit: Tree

Parts Used: Fruit

Forms of Medication: Fruit, Juice

Medicinal Use: Eaten as raw or juice is prepared from it. It cures Gastric Problem. It balances hemoglobin. It helps to balance Blood Pressure.

35. Rosaceae

i) *Prunus persica* 'Aru'

Habit: Tree

Parts Used: Seed

Forms of Medication: Inner part of Seed

Medicinal Use: Inner part of the seed is used to make oil and put in ear for 3 days then ear pain is cured.

ii) *Rosa sericea* 'Gulab'

Habit: Shrub

Parts Used: Flowers, Fruit, Bark

Forms of Medication: Uproot all parts, wash ingredients and dry out.

Medicinal Use: 1-3gm with other herbs. It is suitable for imbalances of bile, swelling of stomach, intestine disorder, diarrhoea and liver disease.

36. Rutaceae

i) *Citrus aurantifolia* 'Kagati'

Habit: Small Tree

Parts Used: Fruit

Forms of Medication: Juice

Medicinal Use: Juice is mixed with hot water and salt then is drunk. It is good during Common Cold. It also helps to stop Vomiting.

ii) *Zanthoxylum armatum* 'Timur'

Habit: Small Tree

Parts Used: Fruit

Forms of Medication: Raw

Medicinal Use: Fruit is taken, chewed with salt and *Alium sativum* (Lasun) and inhaled with hot water. It helps to cure gastric pain. It also makes vocal cord good. It gives taste to the food.

37. Scrophulariaceae

Neopicrorhiza scrophulariflora 'Kutki'

Habit: Herb

Parts Used: Whole plant, Root

Forms of Medication: Paste, Juice

Medicinal Use: The juice extracted from root is taken for the cure of fever, cough, diarrhoea, typhoid and headache as well. It also helps in the purification of blood.

38. Solanaceae

Solanum surattense

Habit: Herb

Parts Used: Fruit

Forms of Medication: Raw or Powder

Medicinal Use: It is used for Mental Disorder, Fever and Eyes Problem.

39. Umbelliferae

i) *Carum carvi* 'Jira'

Habit: Herb

Parts Used: Seed

Forms of Medication: Raw or powder

Medicinal Use: Jira is mixed with *Allium wallichii* (Jimbu), *Curcuma longa* (Besar) and boiled in water then drunk. It is used to cure common cold and cough.

ii) *Coriandrum sativa* 'Dhaniya'

Habit: Herb

Parts Used: Seed

Forms of Medication: Raw or mixed with other ingredients

Medicinal Use: Seed mixed with *Xanthoxylum armatum* (Timur), Black salt then boiled in water. A glass is taken. It helps to cure vomiting.

40. Vitaceae

Vitis vinifera 'Angur'

Habit: Climber

Parts Used: Fruit

Forms of Medication: Fruit or Juice

Medicinal Use: Fruit or juice is taken directly. It helps to cure lungs and cough.

41. Zingiberaceae

i) *Ammomum subulataum* 'Alainchi'

Habit: Tree

Parts Used: Seeds

Forms of Medication: Powder or raw

Medicinal Use: Seeds are chewed during indigestion. Seeds are dried then powder is made by grinding it. Then powder is mixed with hot water and given to control vomiting.

ii) *Curcuma angustifolia* 'Besar'

Habit: Herb

Parts Used: Underground part, Rhizome

Forms of Medication: Powder

Medicinal Use: Root is dried then grinded to make powder. The powder is mixed with amilo (made from kagati) then paste is applied on the wound and cut parts then wrapped with clothes. So helps to cure in cut parts and wound. It is also used during common cold and cough, as it is mixed with Jimbu and salt and boiled.

iii) *Elettaria cardamomum* 'Sukmel'

Habit: Tree

Parts Used: Fruit

Forms of Medication: Raw or dried

Medicinal Use: It can be used with vegetables or can be eaten directly. It is good for kidney problem.

iv) *Zingiber officinale* 'Aduwa'

Habit: Herb

Parts Used: Rhizome

Forms of Medication: Paste

Medicinal Use: The paste made from ginger is taken with honey and is taken to cure cough and throat pain. It is also good for gastritis and diabetes. It is also good for menstrual imbalance.

Chapter VI

6. INDIGENOUS KNOWLEDGE SYSTEM

The kind of knowledge which is born inherent or innate to the heart and mind is called indigenous knowledge (Singh, 1995). Indigenous knowledge is different in different ethnic groups.

People of the study area were found to use their own knowledge in their different livelihood activities. There are different types of traditional ways to treat themselves.

6.1 Different Forms of Indigenous Knowledge System in Tangbetons

- When there is pain in eye due to some small insects inside or due to pricking, then the milk of the newly born baby mother is used to cure the pain in eye. The newly born child should be son.
- If there is continuous bleeding from the wound or cut part, the old web of spider is used or instead of it *Curcuma longa* (Turmeric) powder is used.
- During delivery if complication appears the ghee is chanted with some religious mantras to the pregnant women. That will be helpful for easy birth.
- Diarrhoea is cured by eating porridge made from old *Oryza sativa* (Rice) water and salt by cooking.
- Many years ago there was a belief that water should not be given to the person suffering from Diarrhoea.
- Newly delivered women should not eat the meat of *Bos grunniens* (Yak) as it gives more heat, so the meat of sheep and *Capra hircus* (changrya) is given.
- During Jaundice, porridge of bitter *Fagophyrum esculentum* (Buckwheat) or flour liquid of buckwheat is given.
- Teeth Pain- Is cured by heating the iron rod and put in the cavity. If there is swelling in chick, then *Acorus calamus* (Bojho) is used.
- Ear Pain- Inner part of the seed of the *Prunus persica* (peach) is used to make the oil, and then is put in the ear for 3 days.
- Arthritis- Cloth soaked with salty water is patted in hurt part.

- Fever- *Parnassia nubicola* (Nirmashi) seed is scrubbed and the small amount of powder is boiled with water then is eaten.
- Vomiting- Black salt, Nepal Peeper, *Coriandrum sativum* Seed is cooked or boiled with water then 1, 2 glasses is drunk.
- *Cordyceps sinensis* (Yarsagomba) - It is used for getting strength.
- *Dactylorhiza hatagirea* (Panchaunle) - When someone is believed to be suffered by Serpent, then it is scrubbed in mild hot water then is used.
- Pure ghee and fresh Simrik is used when someone is injured or fractured in leg. Simrik alone is also used for joint pain.
- Gall Bladder- They has perception that when Gall Bladder of Bear is eaten then all types of disease will be cured.
- *Hordeum vulgare* (Uva) - From Uva No.1 Beverage is made.
- If some part of the floor outside the house is painted with red clay, then it is the sign that something bad is happening inside the house.

6.2 Storage of Seeds and Food Grains

Mustang is cold region so food grains are not much destroyed by the pest. So there is not more way to store their food grains. But also *Hordeum vulgare* (Uva) is kept in the box made from the *Shorea robusta* (Sal). It is kept in the sac made from the wool of *Capra hircus* (Chyangra).But in Pokhara, migratory Tangbetons store the seed, grains in balti, sac etc.

6.3 Preparation of Indigenous drink 'Pa gheun' and'Pa jhi'

In the utensil *Hordeum vulgare* (Uva) is cooked with water, and then allowed to cool down. Marcha is made up of peeper and flour is added to the Barley then is knead and put in the bamboo basket. The basket is covered with the cotton cloth tightly as it should be warm after 2 to 3 days alcoholic smell comes from the basket, and then the mixture is taken out from the basket and kept in the ware (ghyampo). Needed amount is taken out from the earthen ware and mixed with small amount of water then is squeezed and the liquid is drunk. If it is hard some amount of water is added more than drunk. The liquid of 1st stage is hard then gradually goes on decreasing, 3rd stage liquid is mild and best then others. Fourth and fifth stage goes on decreasing its hardness. The alcoholic drink made by this method is called 'Pa gheun'.

For other method all the process is same but earthen ware is fit with the tap on the bottom. If the drink is needed for next day the water is added to the mixture on that day and allowed to leave for whole night. Next day the liquid is drawn from the tap and drunk. The alcoholic drink by this method is 'Pa Jhi'.

6.4 Preparation and Use of Materials from Locally Available Resources.

- Halo – It is used to plough the field. It is made from the wood of *Shorea robusta* (Sal).
- Panighatta – It is used as the tool to fetch water from the river. It is also made from the wood of *Shorea robusta* (Sal).
- Okhal and Dhiki – It is used to grind the mustard and oil is taken out from it. It is made from the wood of *Shorea robusta* (Sal). It is also used to grind the Uva, Maize etc. Raw food material like mustard, uva is ground and the husk is peeled out by using such tools.

Chapter - VII

7. DISCUSSION

Among many indigenous ethnic groups of Nepal Tangbetons is also one of them. Their population is not recorded yet so actual population is not found.

Tangbetons are mainly the inhabitants of Bahra Gaunle, Tangbe Village of Chhusang Village Development Committee, in Mustang district, Dhawlagiri Zone i.e. Western Nepal. Due to their migration towards the urban area the population is low in Mustang. Most of them are migrated towards Pokhara, Kaski district some are in Jomsom, Kathmandu and U. S.

Tangbetons are Mongoloid group and they are called as 'Bhote'. They are light black to dark brown in complexion, not fair but thick skin. They are of normal height medium to small. Nose is flat and thick. Females do not pierce their nose and are more beautiful than males. Teeth are good in structure. Facial hair is scarce. They resemble 'Lobha' in physical appearance and are influenced by Tibetan Culture.

They are the inhabitants of the Mustang district, and Mustang lies in mountainous region they can use and utilize the resources available in that area. They have some knowledge, skills and techniques on the traditional utilization of natural resources especially found in the local areas. Some of those who are migrated to the Pokhara are also using those natural resources of their place Mustang and also some of those of Pokhara.

As the work is the research about the migratory Tangbetons of Pokhara, so the resources that are available in both areas that they use are also included i.e. some area of Mustang district and some area of Kaski district. The use of the natural resources by the people is since time immemorial. Before urbanization at the stoneage the people fully depend on the natural resources for their livelihood.

As far as the human civilization started they came to know the use of Natural Resources. The local and migratory Tangbetons both carry the knowledge on the utilization of different plant and animal species for medicinal purpose at local level.

The present study shows that they make use of the 60 species of medicinal plants belonging to 41 families and 17 species of animals both wild and domesticated belonging to 9 order and 12 families for medicinal purpose. Plant species were used widely in comparison to the animal species.

The study and analysis of the data shows that the recorded 17 animal species from the study area used for the treatment of 22 different ailments by the migratory Tangbetons people of the area using their own traditional knowledge. Among 17 animal species recorded 13 species were mammal, 2 species were Aves and 2 species was invertebrate, insect. Each and every part of the organism has its medicinal value. Different parts or organs of the animal were used as the medicine. Organs or parts used as the medicine were horn, bone, meat, blood, gall bladder, Fat, brain, skin, nail, urine, stool and hair and in some cases whole body was utilized.

Meat of the different animal species was widely used. Meat was used to cure 12 medical remedies as pain on the limbs, rheumatism, over bleeding, menstural imbalance, arthritis, thyroidism, diarrhoea, abscess, makhya and also it provided energy, strength and heat to the body. A single species of *Bos grunniens* (Yak) was used for the treatment of diarrhoea, fever, indigestion and for providing energy and heat to the body. Two species were used for joint pain, 2 species for rheumatism, 2 species for diarrhoea, 1 sps for common cold and cough and 1 species for arthritis. Medicinal use or administration of animal's products and organs include oral absorption which is internal medication and applying is external medication. 15 remedies were administered orally i.e. internally and 2 remedies were applied, externally.

Animal species used for medicinal purposes were both domesticated and wild. Among 17 species 11 were domesticated and 6 were wild. Wild species were *Moschus chrisogaster* (Deer), *Capra hircus* (Chyangra), *Canis aureus* (Syal), *Panthera tigris* (Tiger), *Rhinoceros unicornis* (Rhino) and *Gyps himalayensis* (Vulture). Domesticated species were *Bos grunniens* (Yak), *Capra hircus* (Goat), *Bos indicus* Cow, *Ovis ammon hodgsoni* (Sheep), *Apis cerana* (Honey Bee), *Equus kiang* (Donkey), *Equus hemionus kiang* (Horse), *Homo sapiens* (Human), *Apodemus gurkha* (Mouse), *Columba livia* (Pigeon) and *Periplaneta americana* (Cockroach).

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 the meat of *Gyps bengalensis* is used to cure thyroidism in the present study, while the bone of the same species was used as cementing material in case of human bone fracture by Koirala (2004). *Apis cerana* is used to cure common cold and cough in the present study. Similarly Thapa (2008) has reported the same species for curing menstrual disorder. The same species was used by the Niroula (2009) for curing body pain. Meat of *Columba livia* was used to cure backache and cold cough by Koirala (2004), whereas stool of the same species is used to cure abscess in the present study. Similarly for the treatment of rheumatism cooked meat and alcohol of meat of *Canis aureus* is used in the present work or study which was also reported by Kaundinya (1997), Dhakal (2004), Koirala (2004), Pangeni (2005), Tamang (2009) and Niraula (2009), Dhami (2010) in their studies. Thakur (2004) reported the use of urine of this species in the treatment of insanity and epilepsy.

Similarly some of the animal species reported from the present study have been used for different medical purposes which differs from others study. For example *Capra hircus* have been used for curing the pain on the limbs and heat the body in the present study while the liver of the same species was reported to be used for night blindness by Dhakal (2004), blood of the same species have been used to cure menstrual disorder reported by Thapa (2008).

The study and analysis showed that 60 species of Medicinal plants were used for the treatment of 61 different diseases. Among 60 different medicinal plants 43 (71.66%) are Dicot and 17 (28.33%) are Monocot. On the basis of habit, 41.66% are herb, 30% are tree, 16.66% are shrub, 6.66% are climber and 5% are grass. The different parts of the plant used for the medicinal purpose include root, stem, seed, bark, rhizome, flower, fruit, stem and leaves and in some case whole plant was also used.

Widely used part was the seed which was used for different remedies like sinusistis, jaundice, purification of blood, back ache, joint pain, massage cream, nasal bleeding, digestion, water deposition inside the joints, cough, blood pressure, heart disease, kidney fever, diabetes, diarrhoea, dandruff, piles, fever, gastritis, teeth and eye problem, ear pain, common cold, vomiting etc., fruits of the plants were used to cure different diseases like mental disorder, kidney problem, cough, fever, eye problem, gastritis, common cold, diarrhoea, swelling of the stomach, dysentery, vomiting, purification of blood, throat pain etc. Similarly leaves of the medicinal plants was used

for the cure of ailments like fever, cough, dysentery, vomiting, common cold, pneumonia, jaundice, heart disease, blood pressure, stone in gall bladder, body pain etc. Bark of the medicinal plants was used to cure the leg fracture, chronic fever, poisoning, diarrhoea etc. Whole plant of medicinal value was used for treatment of kidney fever, body pain, bile disorder and common cold. Rhizome of the plant was used to cure cough, throat pain, diabetes, gastritis, cut, wound and common cold.

13 different species were used for respiratory tract infections, 12 different species were used for gastritis problem, 6 species of plants were used for body pain, 5 different species were used for the purification of the blood and 5 different species were used for blood pressure. Similarly 5 species each was used for diabetes, eye problem, kidney problem, jaundice and for getting strength; respectively, 9 different species was used for different kind of fever, 7 different species each was used for indigestion and vomiting; respectively, 2 different species each was used for sinusitis, food poisoning, skin problem, menstrual problem, teeth pain and piles; respectively, 1 different species each was used for the cure of typhoid, headache, fracture, ear pain, fish thorn striking on throat, tuberculosis, lungs problem, dandruff, constipation, kidney stone, gall bladder stone and to make the vocal cord good, for excessive bleeding, pneumonia, mental disorder, disorder sleep, cancer disease, water deposition inside the joints, swelling of stomach, intestine disorder, liver disease, nasal bleeding, blood disorder and improving body heat and lymph fluid; respectively . Different parts of medicinal plant species were used in different forms by the migratory Tangbetons. The different forms are juice, raw, paste, powder, cooked vegetable, oil etc.

For the preparation of powder, parts of the plant were dried then grinded with the mortar then used. For the preparation of decoction, parts required were boiled with liquid for some time and then juice extracted from it is used. For the preparation of paste, parts of plant were grinded with small amount of water if needed and applied over the infected area. In some case fruit, flower and seed were taken in the raw form. Among different forms of medication raw comprises of 43.33%, cooked form is 26.66%, dry form is 21.66%, powder form is 18.33%, Juice is 15%, oil is 5%, wet form is 1.66%. Medical administration includes oral administration. 52 medicinal plant species are taken orally as medicine, 4 medicinal plant species are taken as medicine by applying in the diseased area, 4 medicinal plant species are taken orally as well as by applying.

Most of the medicinal plants reported from the study area have multiple medicinal uses. *Terminalia belerica*, *Terminalia chebula*, *Seasumum orientale*, *Ephedra gerardiana*, *Zingiber officinale*, *Oxytropis sps*, *Swertia chirayita*, *Rosa sericea*, *Neopicrorhiza scrophulariflora*, *Plantago depressa*, *Allium wallichii* are some of the medicinal plants with multiple use. During medication either of the products was used. *Xanthoxylum armatum*, *Coriandrum sativum* and black salt is mixed in water and cooked, then 1, 2 glass of cooked water is drunk, it helps to control vomiting. Wine made from the *Hordeum vulgare* is mixed with the powder of *Myristia fragrans* then is cooked, it helps to cure piles. Coffee is mixed with the wine made from *Hordeum vulgare*, it helps to cure diarrhoea. The juice of *Zingiber officinale* is mixed with few spoon of honey from *Apis cerana* to cure throat pain and cough.

The different species of plants reported with their traditional medical therapy in the present research work are also supported by the findings of other researchers for different purpose, like *Aloe barbadensis* is used for the burn, high blood pressure and spots on the skin in the present study. Ghimire (1999) reported the same species for the cure of digestive disorder as well as diarrhoea and dysentery, Tamang (2003) use the same species for curing cough. Dhami (2010) reported the use of same species to treat boils.

Terminalia chebula is used for gastritis and purification of blood, Pangeni (2005) reported the same species for chronic ulcer wound, Koirala (2004) reported the use of same species for curing cough, Dhami (2010) also reported the same species for the treatment of rheumatism, arthritis, and pain.

Zingiber officinalae is used for throat pain, cough, gastritis and diabetes in the present study while the same species was used only to cure cough by Koirala (2004), Koirala (2004) and Tamang (2009) reported the same species to cure vomiting.

Zanthoxylum armatum is used for gastritis and to purify the vocal cord, the same species was used for abdominal pain and peptic ulcer by Pangeni (2005), Tamang (2009) reported the same species for rheumatic pain.

Prunus persicca is used during the ear pain in the present study whereas Koirala (2004) reported the same species as ointment in case of foot and mouth disease in

livestock. *Dolichus biflorus* (Gahat) is used for dissolving kidney stone in the body, whereas Tamang (2009) reported the same species to cure measles.

Ocimum sanctum is used during common cold and cough in the present study, Pangeni (2005) reported same species to cure the bronchial infection, Koirala (2004) reported the same species for ear pain and infection in the ear.

Cannabis sativa is used to purify the blood in the present study, Koirala (2004) reported the same species to treat the cattle for stomachache, and Dhami (2010) also reported the same species for the treatment of rheumatism, arthritis, pain.

Acorus calamus is used during common cold, throat pain, cough, teeth pain in the present study, Tamang (2009) reported the same species for treatment of Scabies. *Myristica fragrans* is used to cure piles in the present study, Dhakal (2004) reported the species to cure headache, and Pangeni (2005) reported the same species to relive cold.

Azadirachta indica is used during fever and cough in the present study, Pangeni (2005) reported the use of same species to kill the worms of stomach, Koirala (2004) reported the use of species to treat eczema, Koirala (2004) reported the use of same species to treat scabies.

Similarly the present findings for the use of *Lepidium sativum*, *Brassica compestris*, *Rhododendron arboreum*, *Ammomum subulatum*, *Saccharum officinarum*, *Allium sativum*, *Terminalia belerica*, *Acorus calamus*, *Dolichos biflorus*, *and Dactylorhiza hatagirea* were also supported by the findings of other researchers for similar use.

The Tangbetons people of the study area had two different kinds of religious person or they rely on Amchi and Lama for the treatment of different diseases as well as they rely upon the Lama for any ritual rites like death, birth, wedding, puja, festivals etc. The Tangbetons have only little knowledge about the traditional use of different plant and animals because they rely on the Amchi (medical authorized person) for their treatment. The migratory Tangbetons depend on the modern health facilities; however some of them depend on the Amchi. Tangbetons do not have their own Amchi they depend on the Tibetan Amchi as they are greatly influenced by the Tibetan culture. Amchi check or examine the patient in the early morning or in the evening. They rarely believe on jharphuk are done by Lamas.

Chapter VIII

8. CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion

From the research work, it showed that most of the Tangbetons hide their caste. They use their surname Gurung, Lama instead of Tangbetons. So the study of the Tangbetons from the educational point of view is complicated. More than 75%of the Tangbetons of the study area are educated, but due to the use of other surname in their caste exact number of the educated people was impossible to find.

Tangbetons do not have their own group of Amchi, so they depend on the Tibetan Amchi for treatment of diseases. Indigenous knowledge and traditional use in the utilization of different plant and animal species was found in those groups to cure various diseases as massage cream,diarrhoea, dandruff, piles, fever, gastritis, teeth and eye problem, ear pain, common cold, vomiting etc.

From the research work it was concluded that 17 medicinal animal species belonging to 9 order and 12 families were recorded for the treatment of 22 different diseases. Similarly 60 species of medicinal plants belonging to 41 families and 57 genera were used for the treatment of 61 different diseases. Different types of indigenous knowledge system was found during the research work such as for the storage of seeds and food grains, preparation of indigenous drink ;Pa gheun' and 'Pa jhi' and preparation and use of materials from locally available resources.

In comparison plant species were more than animal species. Most of them are Buddhist, so there were less animal species for medicinal purpose. It also seems contradictory because Buddhists are the lover of peace and avoid sacrificing the animals, but Tangbetons feasts and festivals are incomplete without meat. Ritual rites are done by the Lamas.Due to the modern health facilities in my study area Pokhara, most of them rely on modern health facilities, but also some were there who depend on the Amchis or traditional medicine system. The information about the medicinal plants and animals were from the elder people and Amchis. Youngsters were not seen interested in acquiring such knowledge and practices because modern health facilities are easily available in those areas.

The disease like diarrhoea, fever, joint pain, bleeding, vein cut, eye pain, common cold, and gastritis are cured through traditional medicinal therapy. Migrated Tangbetons are not seen so conscious in the conservation, protection and plantation of essential medicinal plants in the forest or in garden, but those of Mustang are somehow conscious for this purpose. The local people of Mustang and Amchis have contributed to the conservation as well as sustainable use of the medicinal plants and animal species by collecting the required parts of medicinal plants and protecting the remaining body of it. Different animals part as meat, blood, stomach and plants part as root, stem, fruit,seed etc. were found to cure different diseases. So it was concluded that different parts of plants and animal species were found to be used for the different diseases.

8.2 Recommendations

- Encouraging the youngsters to follow the traditional knowledge (knowledge that is practiced since past) for the treatment of disease by using various plants animal species.
- Increase frequency of research and investigation of indigenous knowledge system on biodiversity conservation and sustainable use of important medicinal plants.
- Motivating the Amchis to inherit their knowledge to the new generation, for the benefit of their community and mankind.
- Providing the awareness programme regarding Conservation, Management and Utilization of Medicinal plants in a sustainable way.
- Documentation and record of the diversified utilization of various plant and animal species.
- Encouraging the people to talk and discuss in the group about the knowledge they know about the medicinal plant and animal species.
- Discouraging to use the surname Gurung and encouraging them to write their own surname Tangbetons. So that they may have their own identity and they can proud.
- The government should recognize communities the indigenous knowledge present in the indigenous communities and encourage preserving it.

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LIST OF ANNEXES

Annex 1: Checklist

Checklist for the key informant interview for the preparation of traditional medicine and treatment

- Name:
- Gender:
- Locality:
- Literacy:
- Education:
- Occupation:
- How long it has been you are doing such treatment?
- Source or Inspiration of knowledge acquired.
- Common prevalent diseases in the society.
- Common diseases treated at home traditionally.
- Plant use for treating each disease and how? Detail information about the preparation of medicine from plant.

Preparation and Use of Medicine:

- Name of Disease
- Symptoms of Disease
- Name of Medicinal Plants/Parts of Animal Used
- Procedure of Preparing Medicine
- Process of Treatment along with required, Doses and Duration of intake
- Source of Medicinal Plants and Animals

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

- How is the use of traditional medicinal therapy working in the present context?
- Is there more influence of modern health facilities among the people?
- Is there any difficulty or barrier to pass such traditional knowledge to new generation?
- How curious are the youngsters to get and adopt such knowledge or they don't care about learning such knowledge?
- How is the belief of youngsters towards such traditional medicinal practice?

- What is the status of medicinal plants and animals, being used, are they rare or more?
- Are people facilitated with modern health facilities like hospital, health post and primary health care center?
- Is there any documentation done so far on the plant and animal species of medicinal values in your area, as well as their traditional knowledge?
- What are the risk you have noticed for raring such traditional medicinal practice and what is your opinion for the conservation of such knowledge?
- What are your expectations from the government and other organization in order to preserve such knowledge?
- What are the sources of medicinal plants and animals?
- How are the medicinal plants and animals collected?
- Are there any specific guidelines and techniques for harvesting and collection of medicinal plants?
- In which season medicinal plants are collected excessively?
- Are there any social or cultural rules, limiting harvesting to specific period? If yes, what are they and why so?
- Which parts of plants are excessively harvested?
- Are there any effort taken at local level towards conservation medicinal plants?
- Do you have taken any initiation for conserving medicinal plants?
- Your last words?
- Any suggestion for policy makers towards conservation of medicinal plants?

Annex 2: List of Tables

Table 5. Categorization of animal species used in folk medicine by the migratory Tangbetons of Pokhara valley.

S.N	Order	Family	Latin Name	Type	Nepali/Local Name	English Name	Organ Used	Medicinal Uses
1	Artiodactyla	Bovidae	*Bos grunniens*	Mammal	Chauri/Hya	Yak	Horn Meat Blood	Heat Body, Digestion Provides energy, Heat the body Diarrhoea, Fever
2	Artiodactyla	Bovidae	*Capra hircus*	Mammal	Chyangra/Ramo	Chyangra	Meat	Strength
3	Artiodactyla	Bovidae	*Capra hircus*	Mammal	Bakhra/Khasi	Goat	Meat	Pain on the Limbs, Heats the body
4	Artiodactyla	Bovidae	*Bos indicus*	Mammal	Gai/Memo	Cow	Urine	Joint pain, Swelling, Water Deposition inside the joints
5	Artiodactyla	Bovidae	*Ovis ammon hodgsoni*	Mammal	Bhenda/Ghyu	Sheep	Meat	Rheumatism
6	Artiodactyla	Cervidae	*Moschus chrisogaster*	Mammal	Mirga/Fo	Deer	Meat Fat	Over Bleeding, Menstrual Imbalance Sinusitis
7	Carnivora	Canidae	*Canis aureus*	Mammal	Syal/Syala	Jackal	Meat	Rheumatism Arthritis
8	Carnivora	Felidae	*Panthera tigris*	Mammal	Bagh/Taa	Tiger	Bone	Body pain, Energy
9	Columbiformes	Columbidae	*Columba livia*	Aves	Parewa/Dokhen	Pigeon	Stool	Abscess
10	Falconiformes	Accipitridae	*Gyps himalayaensis*	Aves	Giddha/jyake	Vulture	Meat	Thyroidism Heats the body, Good for Diarrhoea.
11	Hymenoptera	Apidae	*Apis cerana*	Insect	Mauri	Honey Bee	Honey	Cough, Common Cold
12	Blattaria	Blattidae	*Periplaneta americana*	Insect	Sangle kira	Cockroach	Whole body	Severe pain as like Appendicitis
13	Perissodactyla	Equidae	*Equus hemoionus kiang*	Mammal	Ghoda/Ta	Horse	Nail	Stiffening of the stomach
14	Perrisodactyla	Equidae	*Equus kiang*	Mammal	Gadha/Bumbu	Donkey	Blood Meat Nail	Joint pain Diarrhoea Water deposition in the body
15	Perrisodactyla	Rhinoceratidae	*Rhinoceros unicornis*	Mammal	Gainda	Rhino	Skin	Makhya
16	Primates	Hominidae	*Homo sapiens*	Mammal	Manche/Mhi	Human	Urine	Eye pain, Conjunctivitis
17	Rodentia	Muridae	*Apodemus gurkha*	Mammal	Musa/Nami	Mouse	Skin	Abscess

Table 6. Categorization of plant species used in folk medicine by the migratory Tangbetons of Pokhara valley.

S.N	Division	Family	Latin Name	Nep/Local Name	Life form	Parts Used	Forms of Medication	Medicinal Uses
1	Dicotyledon	Acanthaceae	*Justicia Adhatoda*	Asuro	Shrub	Seed	Raw or Powder	Purification of Blood
2	Monocotyledon	Amaryllidaceae	*Allium sativum*	Lasun/Nho	Herb	Bulb	Raw	Gastritis, Disorder Sleep Cancer Disease
3	Monocotyledon	Arecaceae	*Acorus calamus*	Bojho	Herb	Root	Raw	Throat Pain Common Cold
4	Dicotyledon	Asteraceae	*Saussurea graminifolia*		Grass	Whole part	Dry	Kidney Fever, Bile Disorder, Sores
5	Dicotyledon	Boraginaceae	*Arnebia benthamii*	Unknown/Dimok	Hairy Grass Plant	Root, Bark	Dry	Chronic fever, Swelling Poisoning
6	Dicotyledon	Cannabaceae	*Cannabis sativa*	Bhang	Tree	Seed	Raw, Cooked	Purify Blood
7	Dicotyledon	Combretaceae	*Terminalia bellirica*	Barro	Tree	Fruit	Raw	Throat pain, Cough
8	Dicotyledon	Combretaceae	*Terminalia chebula*	Harro	Tree	Fruit	Powder	Gastritis Purification of Blood
9	Dicotyledon	Cruciferae	*Brassica compestris*	Tori/Nanam	Herb	Seed,Leaves	Cooked, Oil	Back ache , Joint Pain, Massage Cream, Thorn
10	Dicotyledon	Cruciferae	*Brassica juncea*	Rayo/Daf	Herb	Leaves	Cooked	Digestion, Good for Eye
11	Dicotyledon	Cruciferae	*Brassica rapa*	Salgam/Muli	Herb	Root	Cooked	Digestion
12	Dicotyledon	Cruciferae	*Lepidium sativum*	Chamsur	Herb	Whole Plant	Cooked	Body Pain, Heat the body
13	Dicotyledon	Cruciferae	*Raphanus sativus*	Mula/Lhau	Herb	Leaves,Root	Raw or Cooked	Gastritis, Digestion
14	Dicotyledon	Cucurbitaceae	*Leucartha*	Lauka	Climber	Fruit	Juice	High Blood Pressure
15	Dicotyledon	Cucurbitaceae	*Memordica charantia*	Karela	Climber	Fruit	Juice or as Cooked Vegetable	High Blood Pressure
16	Monocotyledon	Cupressaceae	*Juniperus squamata*	Shuk	Shrub or small tree	Seed, Leaves	Dry	Nasal Bleeding, Digestion, Blood disorder
17	Dicotyledon	Elaeocarpaceae	*Elaeocarpus nerefolia*	Rudraskhya	Small Tree	Seed	Powder	Water Deposition inside the joints
18	Monocotyledon	Ephedraceae	*Ephedra gerardiana*		Shrub	Seed, Leaves	Dry	Kidney Fever, Cough, Heart Disease, Blood Pressure, Excessive Bleeding
19	Dicotyledon	Ericaceae	*Rhododendron arboretum*	Gurans/pathamhendo	Tree	Flower	Raw or Juice	Remove stuck thorn of Fish
20	Dicotyledon	Euphorbiaceae	*Emblica officinalis*	Amala	Tree	Fruit	Powder or Raw	Gastritis, Purification of

								blood, Good for eye
21	Dicotyledon	Gentianaceae	*Swertia chirayita*	Ciraito	Herb	Whole plant or Leaves	Juice	Fever, Pneumonia, Jaundice Stone on Gall Bladder
22	Monocotyledon	Gramineae	*Hordeum vulgare*	Uva/Karu	Herb	Seed	Powder,Wine	Diabetes, Diarrhoea
23	Monocotyledon	Gramineae	*Oryza sativa*	Dhan/Mrhasin	Herb	Seed, Grain	Cooked	Diarrhoea
24	Monocotyledon	Gramineae	*Saccharum officinarum*	Ukhu	Shrub	Stem	Juice	Jaundice
25	Dicotyledon	Hypocreaceae	*Cordyceps sinensis*	Yarsagumba	Herb	Whole Plant	Raw or Dried	Good to Kidney, Vitamin, Strength to the body.
26	Dicotyledon	Labiatae	*Ocimum sanctum*	Tulasipatra	Herb	Leaves	Raw	Common Cold, Cough
27	Dicotyledon	Lamiaceae	*Dracocephalum tanguticum*	Not known/Ti yang ku	Grass	Root	Dry	Digestive Disorder Wind disorder Kidney Disease
28	Dicotyledon	Lauraceae	*Cinnamomum tamala*	Tejpat	Small Tree	Leaves	Dried or Cooked	Good for Kidney
29	Dicotyledon	Lauraceae	*Dodecadonia grandiflora*	Nepali Dalchini	Small Tree	Stem	Raw or Cooked	Gastritis
30	Dicotyledon	Leguminaceae	*Oxytropis sp.*	Tak Sha	Shurb	Leaves,Flower,Fruits	Dry	Dysentry, Vomiting, Fever, Cut, Poison, Wound, Sore,
31	Dicotyledon	Leguminosae	*Trigonella foenum*	Methi	Herb	Seed,Grain	Wet	Sinusitis
32	Monocotyledon	Liliaceae	*Allium wallichii*	Jimbu	Herb	All part	Dried, Cooked	Common Cold, Gastric, Digestion, Good for eye, Cough
33	Monocotyledon	Liiaceae	*Aloe barbadensis*	Gheukumari	Shrub	All part except Root	Juice, Raw	Burnt Area, High Blood Pressure, Spots on the skin
34	Monocotyledon	Liliaceae	*Asparagus racemosus*	Kurilo	Herb	Stem	Cooked	Energetic
35	Dicotyledon	Mediaceae	*Azadirachta indica*	Nim	Tree	Leaves	Raw	Fever, Cough
36	Dicotyledon	Moraceae	*Ficus bengalensis*	Bar	Tree	Seed	Powder	Dandruff
37	Dicotyledon	Moraceae	*Betula utillis*	Bhote Pipal	Tree	Bark	Raw	Leg Fracture
38	Dicotyledon	Myristicaceae	*Myristica fragrans*	Jaiphal	Tree	Seed	Powder	Piles
39	Monocotyledon	Orchidaceae	*Dactylorhiza hatagirea*	Panca angule	Erect herb	Root	Dry	Strength, Vitamin
40	Monocotyledon	Palmae	*Areca catechu*	Supari	Tree	Fruit	Inner part of Fruit, Raw	Good for Kidney
41	Dicotyledon	Papilionaceae	*Dolichus biflorus*	Gahat	Herb	Seed	Cooked	Kidney stone
42	Dicotyledon	Paranassiaceae	*Parnassia nubicola*	Nirmashi	Herb	Seed,Grain	Powder	Fever
43	Dicotyledon	Pedaliaceae	*Seasumum orientale*	Til	Shrub	Seed,Grain	Raw,Oil	Gastritis, Teeth and Eye Problem
44	Dicotyledon	Plantaginaceae	*Plantago depressa*		Shurb	Whole Part	Dry	Vomiting, Good for lymph

								Fluid
45	Dicotyledon	Poaceae	*Pisum sativum*	Kerau	Climber	Flower	Raw	Cure Stomach pain during Menstruation
46	Dicotyledon	Polygonaceae	*Fagophyrum esculentum*	Phapar	Herb	Seed, Grain	Cooked	Jaundice
47	Dicotyledon	Punicaceae	*Punica granatum*	Anar	Tree	Fruit	Raw,Juice	Gastrict,Balances Haemoglobin and Pressure
48	Dicotyledon	Rosaceae	*Prunus persica*	Aru	Tree	Seed	Inner part of Seed, Oil	Ear Pain
49	Dicotyledon	Rosaceae	*Rosa sericea*		Shrub	flowers,Fruit ,Bark	Dry	Diarrhoea, Liver disease, Swelling of Stomach
50	Dicotyledon	Rutaceae	*Citrus aurantifolia*	Kagati	Small Tree	Fuit	Raw	Common Cold, Cough
51	Dicotyledon	Rutaceae	*Zanthoxylum armatum*	Timur	Small Tree	Fruit	Raw	Gastrict, Makes Vocal Cord Good
52	Dicotyledon	Scrophulariaceae	*Picrorhiza scrophulariflora*	Kutki	Herb	Whole Plant Root	Paste,Juice	Fever, Cough, Diarrhoea, Typhoid, Headache, Purification of Blood
53	Dicotyledon	Solanaceae	*Solanum surattense*	Kantakari	Herb	Fruit	Raw or Powder	Mental Disorder, Fever, Eyes Problem
54	Dicotyledon	Umbelliferae	*Carum carvi*	Jira/Jiri	Herb	Seed	Raw,Cooked	Common Cold Cough
55	Dicotyledon	Umbelliferae	*Coriandrum sativum*	Dhaniya	Herb	Seed	Raw, Cooked	Vomiting
56	Dicotyledon	Vitaceae	*Vitis vinifera*	Angur	Climber	Fruit	Raw or Juice	Cough, Good for Lungs
57	Monocotyledon	Zingiberaceae	*Amomum subulatum*	Alainchi	Tree	Seed	Raw	Indigestion, Vomiting
58	Monocotyledon	Zingiberaceae	*Curcuma longa*	Besar	Herb	Rhizome	Powder	Cut,Wound Parts,Common Cold, Cough
59	Monocotyledon	Zingiberaceae	*Elettaria cardamomum*	Sukmel	Tree	Fruit	Raw or Dried	Kidney Problem,
60	Monocotyledon	Zingiberaceae	*Zingiber officinale*	Aduwa	Herb	Rhizome	Paste or Powder	Throat Pain, Cough, Gastritis, Diabetes

Table 7. Minimum temperature in (^{0}C) of Mustang

Year	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
1986	-9.9	-8.8	-6.1	-2.8	0.5	7.1	9.1	8.2	6.1	-1.9	-5.5	-10.5
1987	-10.8	-9.5	-5	-3.2	-1.3	6.8	9.5	8.3	6.8	-1.3	-4.4	-8.4
1988	-10.1	-9.3	-8.5	-2.3	3.6	6.1	9.2	7.3	3.9	-1.4	-6.8	-8.7
1989	-12.3	-8.4	-4.7	-3.7	0.9	3.2	7	7.4	4.8	-1.5	-6.2	-9.6
1990	-8	-9.1	-7.4	-2.9	3.5	8.3	9.1	8.4	6.1	-1.3	-6.2	-8.8
1991	0	0	-0.7	-2.1	1.8	6.6	8.7	8.8	5.5	-3.2	-7	0
1993	0	0	-6.1	-1.4	2.6	7	8.2	9.9	7.1	0.3	-6.7	-11.7
1994	-10.7	-10.3	-6.8	-5.1	3.4	6.8	8.6	8.9	6.1	-1.3	-7	0
2003	-16	-16.5	-9.9	-2.9	-0.9	7.2	14	9.8	9.6	5.9	0	0
2005	0	0	0	0	0	7.6	9.9	9.6	7	-1.3	-5.8	-9.9
Total	**-77.8**	**-71.9**	**-55.2**	**-26.4**	**14.1**	**66.7**	**93.3**	**86.6**	**63**	**-7**	**-55.6**	**-67.6**
Average	-7.78	-7.19	-5.52	-2.64	1.41	6.67	9.33	8.66	6.3	-0.7	-5.56	-6.76

Table 8. Maximum Temperature in (^{0}C) of Mustang

Year	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
1986	4.4	5	7.9	12	14.5	19	18.8	18.9	17.2	12.2	10.9	3.6
1987	3.8	5.1	8.5	11.8	14.2	19.8	19.3	19.3	17.4	11.9	11.1	7.5
1988	7.5	7.8	8.3	14.8	16.6	18.5	18.9	19.1	18.5	13.5	9.1	35.6
1989	2.6	4.6	8.9	12.4	16.4	17.7	19	18.5	17.5	13.7	8.7	5.6
1990	10.5	5.3	6	13.1	17.3	20.9	18.8	19	17.8	11.9	9.8	7.5
1991	0	0	11.6	12.1	17.9	18.6	20.2	19.7	17.4	13.6	8.9	0
1993	0	0	6.8	12.1	16.7	19	20.5	19.5	18.1	14.1	11	9.2
1994	10.2	11.1	12.2	11.1	16.8	20.1	19.7	18.2	18.1	12.8	7	0
2003	6.8	5.2	10.8	16.2	16.7	21.1	22.9	21.7	19.6	12.4	0	0
2005	0	0	0	0	0	22.8	21.9	21.1	20.6	13.8	10.4	7.3
Total	**45.8**	**44.1**	**81**	**115.6**	**147.1**	**197.5**	**200**	**195**	**182.2**	**129.9**	**86.9**	**76.3**
Average	4.58	4.41	8.1	11.56	14.71	19.75	20	19.5	18.22	12.99	8.69	7.63

Table 9. Maximum temperature in (^{0}C) of Pokhara

Year	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
2000	20.5	20.6	26.1	30.2	29.7	30	30	29.5	28.7	27.9	23.9	20.6
2001	19.6	23.3	27.9	30.8	29.6	30.7	30.7	30.4	29.8	28.7	25.5	21.1
2002	20.1	23.4	27.1	29.2	29.8	31.4	30.2	30.3	29.7	28	24.6	20.9
2003	19.7	21.9	25.7	30.1	30.2	30.8	30.5	31.4	30.1	29	24.7	21.2
2004	19.8	23.4	29.3	28.9	30.6	31	29.9	31.4	29.4	27.3	23.5	21.1
2005	19.3	22.8	27.3	30.2	30.2	31.8	31	30.5	30.9	26.8	23.6	21
2006	21.4	25.5	27.3	29.2	30.4	30.5	31.3	31.2	29.8	28	24	21
2007	19.9	20.3	25.8	29.9	31.3	30.9	29.8	30.4	29.1	28.1	24.4	20.5
2008	19.1	21.4	27.5	29.8	30.4	30.5	31.1	30.5	30.1	28.4	25.4	22.3
2009	21.9	25.7	28.6	32	30.8	31.5	31.2	30.7	30.3	27.8	24.2	21.4
Total	**201.3**	**228.3**	**272.6**	**300.3**	**303**	**309.1**	**305.7**	**306.3**	**297.9**	**280**	**243.8**	**211.1**
Average	20.13	22.83	27.26	30.03	30.3	30.91	30.57	30.63	29.79	28	24.38	21.11

Table 10. Min Temperature in (^{0}C) of Pokhara

Year	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
2000	7.3	7.6	10.9	12.6	15.7	16.3	19.8	22.1	20.5	17.3	13.8	8.3
2001	7.5	10	12.3	15.4	19.2	21.6	22.5	22.2	20.8	17.8	13.2	8.8
2002	7.1	9.9	13.7	16.5	19.3	21.6	22.4	22.1	20.7	16.9	12.4	8.9
2003	6.9	9.6	12.8	16.9	17.6	21.1	22.1	22.5	21	17.6	13.3	8.3
2004	7.5	10.3	15.9	16.6	19.3	21	22.1	22.6	21.1	16.2	11.1	8.7
2005	7.8	9.7	13.8	15.2	17.6	21	22.3	22.2	21.5	16.9	11.8	7.2
2006	7.2	13.3	12.9	15.8	19.6	21.4	23.1	22.5	21.3	17.1	13.1	10
2007	7.1	10	12.9	16.8	19.6	21.8	22.5	22.6	21.1	18.4	12	7.6
2008	7.5	8.3	13.7	16	17.7	21.4	22.2	21.7	19.4	15.8	12	9.5
2009	8.5	10.7	12.6	17.4	19.1	21.4	22.9	22.6	21	17.2	12.2	9.7
Total	**74.4**	**99.4**	**131.5**	**159.2**	**184.7**	**208.6**	**221.9**	**223.1**	**208.4**	**171.2**	**124.9**	**87**
Average	7.44	9.94	13.15	15.92	18.47	20.86	22.19	22.31	20.84	17.12	12.49	8.7

Table 11. Rainfall in (mm) for Mustang

Year	Jan	Feb	May	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1991	0.0	0.0	0.7	0.0	2.1	0.0	23.4	48.0	0.0	0.0	4.7	0.0
1992	0.0	0.0	0.0	0.0	0.0	0.0	51.6	55.4	0.0	12.2	0.0	0.0
1993	0.0	0.0	27.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	4.4	3.2	2.1	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0
1995	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.0	0.0	12.5
1996	10.0	20.0	0.0	0.0	0.0	0.0	18.7	0.0	0.0	0.0	0.0	0.0
1997	0.0	0.0	0.0	0.0	0.0	0.0	23.7	0.0	0.0	5.6	11.1	72.3
1998	0.8	0.7	0.0	0.0	0.7	0.6	2.4	3.3	0.0	0.0	0.0	0.0
1999	12.1	45.1	0.0	0.0	0.8	11.5	88.3	83.5	0.9	0.2	3.0	0.0
2000	0.0	15.5	28.5	0.0	5.0	25.0	122.0	78.5	0.0	0.0	1.0	0.0
Total	**27.3**	**84.5**	**58.3**	**0.0**	**8.6**	**37.1**	**375.1**	**268.7**	**0.9**	**42.0**	**19.8**	**84.8**
Average	2.7	8.5	5.8	0.0	0.9	3.7	37.5	26.9	0.1	4.2	2.0	8.5

Table 12. Rainfall in (mm) for Pokhara

Year	Jan	Feb	May	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	10.6	13.3	51.5	199.5	682.9	875.7	1032.0	1192.4	572.7	136.0	18.4	0.0
2001	3.0	25.0	15.3	111.7	359.2	711.5	856.4	1521.9	716.1	115.3	77.1	0.0
2002	44.4	54.0	61.6	202.1	437.1	703.4	1815.1	693.3	335.4	114.0	23.5	0.0
2003	36.6	84.6	100.1	202.6	245.9	785.4	1291.8	586.0	935.0	17.2	16.9	42.1
2004	31.2	10.9	28.4	265.7	432.5	773.0	716.9	788.7	864.0	184.2	33.0	0.0
2005	58.0	11.7	85.0	104.6	309.5	282.2	548.8	924.5	313.5	325.7	3.6	0.0
2006	0.0	5.3	83.5	147.0	586.7	493.8	433.5	529.8	449.4	275.0	3.3	17.1
2007	0.0	159.5	59.2	220.8	307.8	616.1	931.4	676.1	1186.2	72.6	30.3	12.2
2008	17.1	1.6	29.3	113.6	332.8	604.3	487.4	1209.2	365.1	102.8	0.0	0.0
2009	0.0	0.0	25.3	45.6	260.2	609.3	762.7	1026.2	302.5	220.2	0.0	4.4
Total	**200.9**	**365.9**	**539.2**	**1613.2**	**3954.6**	**6454.7**	**8876.0**	**9148.1**	**6039.9**	**1563.0**	**206.1**	**75.8**
Average	20.1	36.6	53.9	161.3	395.5	645.5	887.6	914.8	604.0	156.3	20.6	7.6