

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Ethno biology is the study of the interrelationships as well as interdependency between a particular ethnic group and the existence of bioresearches in the given region. (Singh, 1997), and medico-ethno biology signifies the study of those beliefs and practices relating to diseases, which are products of indigenous cultural development and are not explicitly derived from the conceptual framework of modern medicine (Thapa, 2008). Medical anthropology is the study of human health and disease, health care systems, and biocultural adaptation (McElroy, 1996).

Ethnomedicine, the healing traditions found in every culture, has been practiced and has been contributing to human health for longer than three thousand years. It existed before the arrival of modern medicine. The World Health Organisation (WHO) has described traditional medicine as one of the surest means to achieve total health care coverage of the world's population (Rukangira, 2003). The WHO has estimated that 80% of the world population relies upon plant based traditional medicine for their health care (Joshi and Joshi, 2005). Medicinal plants discovered by the traditional societies are proving to be an important source of potentially therapeutic drugs (Cox & Baltic, 1994).

Exploration of medicine based on traditional indigenous knowledge of ethnic groups is a subject of interest to the scientific community. The WHO has listed over 21000 plants around the globe with medicinal uses (Chapagain, 2004), and 40% of the world drugs are synthesized from wild derivatives (Joshi and Joshi, 2005).

As indigenous knowledge is developed by the experience of more than one generation and is a result of day to day interaction with nature, it is environmentally sustainable and locally appropriate for sustainable management of the environment, such ethnomedical practices can make important contributions to future health care, (Ember and Ember, 2004).

According to CBS 2001, there are more than 61 ethnic groups in Nepal (representing 43% of total population) among which Tharus are second largest (after Magars) in the country and are the largest and oldest ethnic groups residing in the Southern part of the Nepal terai lowland constituting about 6.8% of the total population. Tharus being a forest dwelling tribe are still found living close to the heavily forested regions (Bista, 1996). Traditionally they have had a very close bond with the forest and are regarded as son of forest (Bhatt, 1977) and

have a vast indigenous knowledge on the medicinal values of biota. Plants are their main source of remedy for the various diseases. Several Vaidhya and Dharmi-Jhakri¹ of this community use various plants to remove the diseases since the time immemorial. Hundreds and thousands of traditional healers Amchis are engaged in herbal medical practices, (Manandhar, 1985).

But proper documentation and analysis of such knowledge is lacking and also due to rapid industrialization, urbanization and at the same time modernization in the people's way of life such indigenous knowledge is in the urge of extinction. Simultaneously biodiversity is also declining due to habitat destruction and over harvesting. So there is urgency for a systematic documentation and exploration of such medico-ethno biological knowledge among the ethnic groups. So that wealth of information hidden among the tribal may be applied on biomedical sciences to meet the ever increasing requirements of main kind for health care.

1.2 Objectives of the Study

The general objective of this research is to study and document traditional knowledge on medicinal plants associated with the indigenous knowledge of Tharu people in the study area. The specific objective are:-

- ❖ To identify and record traditionally important medicinal plants for the treatment of both human and livestock ailments
- ❖ To document the indigenous knowledge of the Tharu people on the use of medicinal plants in the study site

1.3 Justification of the Study

The far western lowland terai, especially the area in and around the Suklaphanta wildlife reserve is unique in term of its rich biodiversity and typical Tharu culture. Tharus being the largest and oldest ethnic group (tribe) residing in the terai, they have a vast knowledge about the medicinal plants developed by the experience of more than one generation and day to day interaction with nature. But this knowledge is in the verge of extinction due to modernization in the people's way of life as such knowledge is limited only to oral folklore.

Thus this type of research acts as a bridge between the traditional knowledge in medicinal plants and their wider application in modern medicine.

Also industrialization and urbanization and rapid population growth have resulted habitat destruction, and over and unsustainable harvesting is leading to the loss of biodiversity, losing its medicinal values as well. Thus this type of research would encourage the ethnic people to feel sense of legitimacy in their indigenous knowledge and belief systems and contribute to the biodiversity conservation.

These are the reasons that attracted to commence the present study.

CHAPTER II

LITERATURE REVIEW

2.1 Medical Anthropology and Ethnomedicine

Medical anthropology is a branch of anthropology that studies all aspects of health-related phenomena (health, illness, and health care); considers cultural systems as well as the effects of local and worldwide social and political environments. It is the systematized and synthesized area of specialization of interest of anthropologists in health (Ember and Ember 2004). It is among the most popular areas of anthropological specialization today and focuses on what people do when they fall ill. Much of the work done by anthropologist is concerned with understanding and responding to pressing health issues and problems around the world.

Medical anthropology is the study of human health and disease, health care systems, and biocultural adaptation. The discipline draws upon the four fields of anthropology to analyze and compare the health of regional populations and of ethnic and cultural enclaves, both prehistoric and contemporary. Collaboration among paleopathologists, human biologists, ethnologists, and linguists has created a field that is autonomous from any single sub discipline, with strong potential for integration of physical and Cultural anthropology. The field is also highly interdisciplinary, linking anthropology to sociology, economics, and geography, as well as to medicine, nursing, public health, and other health professions.

Tracing back to history of medical anthropology William Caudill (1953) (cited in Ember and Ember, 2004) was the first to identify the field, followed by review articles by Steven Polgar (1962) and by Norman Scotch (1963) (cited in Ember and Ember, 2004). Academics, applied scientists, and clinicians enthusiastically worked in the 1960s to organize the emerging social science in medicine movement at national meetings of the American Anthropological Association (AAA) and the Society for Applied Anthropology (SfAA). Caudill, Polgar, and Scotch were among the most active, as were Hazel Weidman, Arthur Rubel, Dorothea Leighton, Clifford Barnett, Marvin Opler, Marion Pearsall, Donald Kennedy, Benjamin Paul, and Charles Leslie (cited in Ember and Ember, 2004).

The Group for Medical Anthropology (GMA), established in 1967 with Weidman as chair, affiliated with the SFAA in 1969. As the Society for Medical Anthropology (SMA), the organization became a formal section of the AAA in 1972, with Dorothea Leighton, a psychiatrist-anthropologist, serving as its first president. Membership grew from 657 in 1972 to 1,523 in 1993, including a few hundred Canadian and other international members,

primarily Europeans. Next to North America, Great Britain has the largest number of medical anthropologists. Most of them are concerned more with political economy and clinical issues than with biocultural perspectives. Increasing numbers of medical anthropologists work in Australia, Latin America, the Philippines, and India.

Ethnomedicine, a branch of medical anthropology, is the health related beliefs, knowledge and practices of a particular cultural group. All cultures have ethnomedical systems: institutionalized practices for addressing health maladies. The folk or ethnomedical sector involves a variety of forms of cultural healing. The folk sector often incorporates both spiritual and secular influences in the same practice, with their practitioners emphasizing the power of faith and belief as central to mechanisms of their effectiveness and also claiming that their procedures are scientifically based. Folk practices overlap with popular religious practices such as prayer, where the intervention of deity is considered to be all that is necessary for cure (Winkelman 2009) (cited in Ember and Ember, 2004).

The World Health Organization defines traditional medicine as “health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose or prevent illness or maintain wellbeing” (WHO, 2003; WHO, 2006). This definition is incredibly broad and includes a variety of different practices originating in countries all over the world. Commonly used therapeutic techniques for traditional medicine include herbal medicines, acupuncture/acupressure, manual therapies, spiritual therapies and exercises (WHO, 2002).

By definition, ethnomedicine is context specific. What works successfully in one location or for one community may not for another. The defeat is to extract from the knowledge that applies in a particular context, the more general aspects that can be applied elsewhere. Experience and case studies show that this is possible, but at the same time, that it necessitates a careful approach (Hens, 2006).

Traditional knowledge systems have started to disappear with the passage of time due to insufficiency of written documents and relatively low income in these traditions. However, due to the lesser side effects of medicinal plants with respect to allopathic medicine, medicinal plants regained a wide appreciation (Ahmad *et al.*, 2009).

In modern time study on ethno biology came into existence with the formation of “Society of Ethno biology”, which held its first conference organized by Steve Weber, Steve Emslie in April 7-8, 1978 at Prescott College, USA.

All societies have also developed traditions regarding the use of local plants as an essential aspect of health maintenance and disease treatment. These traditions are both widespread; where virtually everyone knows some plants, and professional, where common bodies of empirical knowledge developed through clinical experience are learned regarding plant use. Medicinal use of plants has been existed in Hindu culture since time immemorial. All the four Vedas namely Rig-Veda, Yajur-Veda, Sama-Veda and Atharva-Veda contain the medicinal knowledge. In particular the Atharva-Veda (2000BC-1500BC) deals largely with the principle of Aryurveda “the science of life”, which combined herbal medicine, dietetics, body work, psychology and spiritually to serve itself a consolidated therapeutic systems, (Joshi and Joshi, 2005).

Medicinal plants are significant to both developing and developed countries. Estimates indicate that over 75% of the world’s rural people rely on traditional herbal medicine. About half of the world medicinal plant compounds are still obtained or derived from plants. Many of the most important drugs of the recent times were first isolated from plants including the curare alkaloids; penicillin and other antibiotics, antihypertensive alkaloids like reserpine,; and both cortisone and contraceptive steroids that are derivatives of diosgenin (Hamann, 1991).

There exist several works being carried out on the ethno-medicinal knowledge on plants, worldwide. A brief literature search of plants used for ethno medicinal practices is presented here.

2.2 Medico-ethno Biological Studies Globally

Rukangira (2003), found that traditional medicine is the most widely used medical system in Africa. This traditional medicinal practice is not only popular and accepted but is an only system available. Western medicine is costly and often inaccessible. Despite these importances, Rukangira has found one of the major challenges in the use of traditional medicine is the proof requirement that the active components contained in medicinal plants are useful, safe and effective. This is required to assure the medical field and the public regarding the use of medicinal plants as drug alternatives. The proofs of pharmacology activity that are available at present are mostly based on empirical experience. The scientific proof then becomes the most important thing, in order to eliminate the concern of using medicinal plants as drugs for alternative treatment. But unfortunately, most African countries are not able to conduct research or provide scientific proof of pharmacology. Reasons he reported for the lack of research data involved policy problems and also the research

methodology for evaluating traditional medicine. As the characteristics and application of traditional medicine is quite different from western medicine, how to evaluate traditional medicine and what kinds of academic research approaches and methods may be used to evaluate the safety and efficacy of traditional medicine are new challenges which have emerged in recent years.

Amsalu (2010), in his ethnobotanical study has recorded One-hundred thirty-six medicinal plants belonging to 123 genera and 68 families used by the ethnic people of study area. Of the collected medicinal plants, 75 species, 55.15 % were for human ailments and 25 species, 18.38 % were used against livestock diseases (including cattle, equines, sheep, bees and poultry). Thirty-two (23.53 %) species were used to treat both livestock and human ailments, and four species, 2.94 % were applied for others (fish, cattle /fish and insect repellents). Among all these 136 medicinal plants 57 species (41.9%) were herbs, 44 species (32.35 %) were shrubs, 25 species (18.38 %) were trees and 10 species, (7.35 %) were climbers. He has reported that 72.68% of medicinal plants were cited to be used in fresh form in remedy preparations, few medicinal plants (24.74 %) in dried form and the rest very few medicinal plants (2.56 %) were reported to be used as dried and fresh forms. The most widely used plant part for the preparations of remedy were leaves, which account for (56 cases, 34.78 %) followed by roots (29, 18.01 %) and fruits (17, 10.56 %). Resins, latex, stems, barks, tuber, flower, seeds were also used. The medicinal plant parts are processed in various forms crushing and harmonizing in water and/or other solvents and additives, powdering and boiling. Other forms were decoction, chewing and taking the solution, chewing and spitting and smoking and inhaling.

Kamble *et al.* (2009), in their study on the plants used in traditional medicine by 'Bhilla' tribe of Maharashtra recorded 127 species of flowering plants and ferns being used as medicine in health care treatment. The common diseases cured by medicinal plants in the community the authors recorded were stomachache, cough, cold, fever, rheumatism/arthritis, snake bite, scorpion bite, contraceptives, acidity/ulcer, menstrual complaints, dysentery, abortifacient, wounds, lactation in women, piles, diabetes, burns, bone fracture etc. but in that community the authors have found an inappropriate way of treatment. The patients do not get the treatment in time and there was not any standardized dose for the traditional medicine and were given by random approximation. They recommended that a proper and authentic treatment system should be made and there should be a clinical record for every treatment.

Betti (2004), conducted an ethno botanical study of medicinal plants among the Baka pygmies in the Dja Biosphere Reserve, Cameroon. Pygmies are well known in literature as

the great healers, who know much about forest products. The large majority of medicines used by the Baka Pygmies are of plant origins. The direct use of animal products is limited to the treatment of some specific ailments. Among the total 37 Baka households surveyed the author collected 102 plant species. A total of 1037 citations were recorded for 22 ailments and other health problems. Some prescriptions are made of two or three plant species mixed together. The ailments found to be prevailing in the baka community were Haemorrhoids, Amoebic dysentery, Diarrhoea, Intestinal helminthiasis, Toothache, Female genital system: obstetrics and gynaecology, Lactation failure, Gonorrhoea, Sexual dysfunction, Lumbago, Malaria, Scabies, Bronchite, Cough, Tuberculosis, Abscess, Hernia, Snake bite, Anaemia, "Child-cross", Headache, Jaundice and wounds. Among all these cough has the highest citations.

The plants used by the Baka were compared with the plants used in other parts of Africa, mostly in the following seven countries of central Africa belong to the same Guinean-Congolian Forest area. Betti found similarities in plant uses by Baka and other tribals in all those African countries. A total of 51 plants frequently used by the Baka females (mothers) are also used in other regions of Cameroon and/or in other African countries for similar ailments. Also it is noted that some specialized healers suggested the significance preparing standardized prescriptions, to avoid toxicity accidents.

Joana *et al.* (2003), in their ethnobotanical study of medicinal and aromatic plants in the Natural Park of "Serra de São Mamede" (Portugal) conducted informal interviews with 45 informants and recorded 150 plants which have medicinal and aromatic uses. They recorded 136 plants with medicinal uses. The most frequently claimed medicinal uses were for skin and subcutaneous tissue, for the digestive system, for high temperature (as an antipyretic), for pain (as an analgesic) and for the cardiovascular system. Fourteen toxic plants were also mentioned, 10 of which were also claimed to be medicinal. The most cited parts of plants were the aerial part (56 species) and leaves (51 species). Twenty different and well-defined preparation and application processes were mentioned, 10 for internal administration (infusion, tea/decoction, enema, gargling, inhalation, ingestion, ingestion after boiling, liquor, maceration, syrup) and 10 for external administration (direct application, cataplasm, indirect cataplasm—when the plant material is wrapped in a cloth and then applied over the skin, baths/washing after boiling, decoction in olive oil, vapors from plant boiling directed to genital region, melting and direct application—in seeds which are melted, and their oil placed on the affected area, water and alcohol maceration, ointment). Decoction was the main process of preparation, being used in nearly 58% of the reported useful plants. Most plants

used as aromatic or condiment also have medicinal uses, this confirms the fact that food and medicinal plant uses are closely related and can be relevant to the development of functional foods, pharmafoods or nutraceuticals

Sankaranarayanan *et al.* (2010), in their Ethnobotanical study of medicinal plants used by traditional users in Villupuram district of Tamil Nadu, India revealed that the local people there were using 46 species of medicinally important plants belonging to 20 families. These medicinally important plants were categorized in to five types: 14 herbs, 9 shrubs, 7 climbers, 1 small tree and 3 large trees. The most medicinally important plant species were observed in Malvaceae, Fabaceae and Acanthaceae family which are commonly occurring medicinally important plants used to treat various diseases like cold, fever, cough, diarrhea, dysentery, skin diseases, toothache, indigestion, worm infestations, jaundice, liver diseases and as an antidote for poison and in wound healing. Their findings were constant with the other general observation being reported earlier in relation to medicinal plant studies by the Indian Traditional System of Medicine. Different types of preparation made from medicinally important plants included decoction, juice, powder, paste, oil and whole plant extract. Some plants were even used in more than one form of preparations. Majority of the plant preparation were in the form of decoction obtained from the roots, seeds, stem, leaves and flowers. The leaves and roots are the two major plant parts which are frequently used for the treatment of diseases by the local people of Villupuram. External applications prepared from medicinal plants are used to cure many diseases like skin diseases, wounds, rheumatism, poisonous bites and dandruff. Oral consumption involves curing fever, cold, cough, diarrhea, jaundice and indigestion. The local people of the Villupuram prescribed the medicinally important plants either as single or as in combination with several plants to cure suffering of the people from illness. The local people preferred preparing medicines by combining several plant parts, since the combination rapidly cures the diseases and also enhances the immunity power of the patients. For example, coconut oil is combined with some medicinally important plant leaves like *W. tinctoria*, *C. alata*, *H. rosa-sinensis* and *C. inophyllum* for treatment of skin diseases. Medicinal preparations attained from either a part of a plant or the whole plant. In Villupuram, the traditional medicinal system is very efficient, supportive and successful in treating jaundice, female sterility and rheumatism.

Fassil (2003), has focused his attention on gaining insight into the local distribution of traditional health knowledge and the uses of various medicinal plants among ordinary men and women in rural communities, who constitute the vast majority of Ethiopia's population. He has recorded eighty plants with specific medicinal uses and has found that in general

traditional knowledge about medicinal plants and its application are very much taken for granted by both man and women and such traditional knowledge and practices constitute a routine aspects of daily life and deeply ingrained in the socio-cultural and economic fabric of these rural societies which clearly demonstrates the sheer scope and significance (actual and potential) of local traditional knowledge. He has reported that there are considerable gender and age differences in the type and extent of traditional health knowledge. For example, middle-aged and older women and men generally appear to have a greater breadth of medicinal plant knowledge. In addition, men more often demonstrated knowledge of plants primarily procured from the wild, whereas women generally showed greater familiarity with the therapeutic uses of weedy and semi-domesticated plants found around the homestead. He reported that most ailments are diagnosed and treated at the household level. Very few informants reported seeking professional traditional help on a regular basis. He also found some challenges to the traditional medicinal practices. There he did not find any treatment for malaria which was new to that community. He also reported lack of sanitation in using medicinal plants.

Yirga (2010), recorded twenty-five medicinal plants being used as a cure for 18 ailments. Most (64%) of the traditional medicinal plants were found in cultivation. Most of the traditional medicinal plants were used in fresh form (64%) while 36% in dried form. The inhabitants rely on medicinal plants for various purposes such as forage, medicine, firewood, spice, construction and food. The most commonly used plant parts for herbal preparations were leaves (52%) and seeds (24%). The administration routes were oral (20%), dermal (48%), nasal (16%), oral or dermal (8%), chewing (4%) and through the ear (4%). Some (44%) of the remedies are mixed with water, butter, honey, *Citrus limonum* and *Allium sativum* while the remaining do not have any ingredients added. His findings revealed that there were some impacts to the medicinal plants like drought, grazing, soil erosion and urbanization and agricultural expansion indicating current threats for medicinal plants in the study area. The effort to conserve medicinal plants in the district was observed to be very poor. However indigenous practices contributed to the sustained use, management and conservation of medicinal and multiple-use indigenous trees. It was reported that some traditional healers transfer their indigenous knowledge while others kept the knowledge with them for the sake of secrecy. Derogatory attitudes towards the traditional medicine practitioners had forced healers to keep their knowledge and practices to themselves. Moreover, it is an income generation activities for the healers. He found the indigenous

knowledge associated with the conservation and use of medicinal plants being disappearing and hence recommended for documentation.

Acharya *et al.* (2006), in their study on Ethno-Medicinal Plants Used by Bantar of Bhaudaha, Morang, Nepal found that Bantar still have conserved their ancestral knowledge about the medicinal practices of the plants. Among 98 species reported to be ethno medicinally important, 86 species belonging to 81 genera of 41 families are used for human diseases and 20 species belonging to 20 genera of 15 families are used for domestic animals, and 8 species being common for both. They reported all the plant parts like leaves, roots, flowers, fruits and barks being use as medicine which were applied along with some rituals and mantras. They also found similar uses of medicinal plants with tribe of near vicinity. It was also found that the use of traditional medicine was not for to save their ethnicity but due to poor economic conditions and lack of modern health facilities.

Rijal (2008), has recorded 219 plant parts from 115 species (belonging 55 families) in use among Chepang for medicinal uses. Of them 29 are trees, 36 shrubs, 25 herbs, 21 climbers, 3 ferns and one fungus (mushroom). Of the plants in use among Chepangs, 75 species had 118 different new medicinal uses for Nepal and 18 of them were not reported in any previous documents from Nepal as medicinal plants. Number of plant used to treat fever was highest (17 species) followed by wound, diarrhea and indigestion (14 to each). Of these 115 species, 107 are wild, 7 cultivated and 1 both wild as well as cultivated. Responding question regarding faith on traditional healers, all respondent (except few youth) expressed their faith. Plant parts use indicated that the root/rhizome had the highest use (45) followed by bark (39), fruit (32) and leaf (32). In some plants more than one part are used to cure various illnesses. Of these, 7 species were found cultivated, 107 species were collected from the wild and 1 species was found both in wild as well as planted. Chepangs were found to depend on the traditional medicines not only due to their faith but due to lack of modern health facilities. However they have belief that holy spirits live in plants, animals, rivers and mountains. According to their beliefs, disease and natural disasters are caused by disrespect of the spirits. Due to such belief they have faith on *Pande* or *Phal* or *Janne* (traditional faith healers) and for preference to go to them to treat illness through spiritual practices.

2.3 Studies Related to Medico-ethno Biological Knowledge of Tharus Outside Nepal

Prakash (2011), in his study on uses of some threatened and potential ethnomedicinal plants among the tribal of Uttar Pradesh and Utrkhand in India has recorded twelve plant species used by tharus for curing different diseases. He has focused his study on the conservation

status of plants. All medicinal plants he has reported are threatened and vulnerable. All these plant species he has recorded were used in curing diseases like cold, cough, bronchitis, antidote for snake bite, sexual strength and vigor, tumor, cancer, rheumatism, abortion, paralysis, diabetes, anti-inflammatory, fever influenza etc. the forms of medication were decoction, root extract, warmed paste, fruit powder, seed oil. Some plants were found being used in mixture with other plant extracts.

The resurgence of interest in green medicine he found in the Tharu community these was due to many reasons such as the number of diseases and disorders are increasing day by day and prices spent on medicines are also increasing. Even some diseases like asthma, cancer, diabetes, epilepsy, filaria, jaundice, rheumatism, gout and arthritis are still incurable in allopathic systems of medicine.

Kumar *et al.* (2012), in their study on Traditional uses of medicinal plants for dermatological healthcare management practices by the Tharu tribal community of Uttar Pradesh, India have reported 92 medicinal plants for preparing 113 crude drugs. The dermatological healthcare problems managed in their study area were cut and wounds, ringworm, leprosy, eczema, scabies, leucoderma, boils, carbuncles, pimples, skin blemishes, spots, eruption, and burns etc. They concluded that dermatological healthcare management practice in the study area depends largely on wildy growing medicinal plant species which need further research as well as managements.

Sharma *et al.* (2011), investigated medicinal plants used for primary health care by Tharu tribe of Udham Singh Nagar, Uttarakhand, India. They recorded 53 plant species covering herbs, shrubs, trees, climbers belonging to 52 genera and 34 families. These plants were used to treat different ailments such as fever, gastritis problems, diarrhea, cold and cough,, asthma, boils, cuts, jaundice, abdominal pain, body ache, earache, cholera etc. the form of medication they reported in the area were decoction, paste, powder, infusion, juice, latex, extracts etc. almost all the plant parts including roots, leaves, flowers, fruits, barks, whole plants etc. were found to be used. Fresh forms of plants were found to be used in majority of cases however in some cases plant parts were found to be preserved for future consumption.

Kumar *et al.* (2006), in their study on ethnomedicinal knowledge among Tharu tribe of Devipatan division, Uttar Pradesh, India fount Tharu tribe endowed with vast knowledge of medicinal plants have strong believes in supernatural power of plants in the treatment or prevention of various ailments. They have documented 31 plants belonging to 25 families having medicinal values. Some of these plant species were cultivated by the tribe and some were found growing in the wild conditions. The tribal were found depending predominantly

on those plants which were used to prevent abortion and miscarriages, achieve easy delivery, cure conjunctivitis, eye inflammation, fever, malaria, jaundice, gastritis, cold and cough, toothache, hydrocoel, antidote for snake and scorpion bite and induce sleep and sexual power.. The forms of medication were similar to other tribes like paste, decoction, raw etc. The Tharu tribes of that area were found to have superstitious believes on some plants which instead of preparing medicine were tied on the body to cure various ailments. For example roots of chota kamal plant are tied on waist of pregnant women to prevent abortion, tender twigs of sihoor are worn around neck to cue chronic conjunctivitis and inflammatory eyes, chopped stem pieces of bantulsi are worn around neck to cure respiratory problems, stem bark of planch is tied on arm to cure hydrocoel etc.

2.4 Medico-Ethno Biological Studies on Tharus in Nepal

Eight volumes of 'Bir Nighantu' compiled by Pandit Kashi Nath Devkota are considered as earliest record of Nepalese literature on the use of medicinal plants (Chapagain, 2004). But a systematic documentation of Medico-ethno botanical studies intensified after the establishment of Department of medicinal plants (Joshi and Joshi, 2005). The book entitled medicinal plants accounted 571 species of medicinal plants with their uses in Nepal (Thapa, 2001). The publication of a paper on medicinal and food plants by Benerjei in 1995 also contributed to the beginning of ethno botanical studies in Nepal (Chapagain2004).

A number of medico ethnobotanical studies have been carried out in Nepal on the Tharu tribe residing in different parts of terai region.

Aryal (2009), in his study on ethno botany of Tharus in Kapilbastu district found that the Tharus possess a very rich ethno botanical knowledge. They have been making use of a large number of plants species for various purposes such as medicine, fodder, firewood, timber, ceremonies, etc. He has recorded 71 plant species, to be of medicinal use among the Tharu of the study area. The plants were cultivated and no cultivated including 20 tree species, 5 shrubs, 40 herbs and 6 climbers. The author has reported that the Tharu of the study area though have access to modern health care facilities to certain extent, they do not prefer to use it readily. They prefer traditional ways of healthcare. There are a number of traditional healers called as *Guruwa* (in Tharu language) in the study area, who provide medical service readily at free of cost.

Guruwa, he reported are generally the elder members and are very knowledgeable and highly respected even among non-Tharu communities in the locality. They are the first person to

visit in any kind of illness. They refer any illness to be the act of ghosts and spirits. Ethnomedication, in most cases, involves certain rituals with spells of mantras along with the application of herbal medicines. The process Aryal described in his report is 'a ritual action, locally called as *Pati Baithma* is performed as the primary step in healing all sorts of ailments. In this, a small clay saucer is tied with thread at three points, then it is filled with mustard oil and a burning cotton wick is placed in it. Then the *Guruwa* moves the hanging saucer, to and fro, murmuring mantras at the same time. While doing this, he actually urges the spirits to keep calm and leave the ill person. After finishing this ritual, in most cases, *Guruwa* gives the patient something to intake or apply according to the ailment. It was observed that the people considered the rituals to be more important in healing than the herbal application that followed. Although such rituals seem to help the patient psychologically, certain ailments were found to be cured by conducting only rituals involving certain mantras.' Generally they have their own names for the plants and plant parts they use, which are different from the names used by other Tharu in the community. *Guruwa* refuse to mention such names to the public and use the general names while talking with others. They believe that the power to overcome *Bhutwa* decreases if the knowledge is disseminated to public. The knowledge of ethno medication is transferred from one generation to the next within the same family, normally from father to eldest son. During his investigation, Aryal found that the *Guruwa* he consulted were quite reserved and it took some time before they would be ready to cooperate. Even then they simply refused to let the mantras be recorded. But, they cooperated well for the documentation of the used of medicinal plant parts. From the discussion with traditional healers of the study area, large number of ailments was found to be treated using plant species. Among these ailments, both human and animal illnesses were reported. A single problem is treated by a number of plant species while a single plant species also treats a number of problems. The plants used were for liver problem, mud infection, indigestion, stomach problem, skin diseases, ear problems, respiratory problems, diarrhea, dysentery, body swelling, navel swelling, thorn lodged in nails, bone fracture, constipation, cough, cold, source of vitamin C, tonic, snake bite, diarrhea and dysentery, toothache and gum diseases, vomiting, delivery problems, appetite, impotency, weakness, sleeplessness, asthma, chronic cold, half headache, worms in animals, tongue swelling, infection and cuts, ear pain, tonic, appetite, over bleeding in menstruation, menorrhagia, leucorrhoea etc. The medicines prepared were in the form of paste, decoction, powder etc. Almost all plant parts were found to be used to cure human as well as livestock diseases.

Acharya *et al.* (2009), conducted ethno botanical study of medicinal used by tharu community of Parroha VDC, Rupendehi district collected information on 45 medicinal plants species belonging to 42 genera and 31 families. Out of total species used for medicinal value, majority were trees (42%) followed by herb (27%), shrub (18%) and climber (13%). The plant parts widely used for medicinal purposes in that tribal community included fruit, seed, leaf, root / rhizome, Stem/bark, whole plant and flower. Regarding different disease categories, they found that 26 medicinal plant species were used to treat gastro-intestinal problems (dysentery, diarrhea, gastric, abdominal pain, ulcer etc.), 17 species were used to treat headache and fever, eight species were used to treat respiratory tract related problems (cough/ cold and bronchial problem, asthma etc.), four species were used to cure dermatological problems (scabies, burns, swellings, and other skin related problems), two species for snake bite, and very less for ophthalmic and cuts and wounds. The diseases in that community were treated by elderly people in the community as in other Tharu community. The faith in the traditional medicine was due to lack of modern health facilities, poor economic conditions and in some cases disease not cured by modern medicine. The traditional knowledge was found to pass through generation to generation but the young generation in this community were found less interested in the traditional practice.

Gachhadar (2010), has made an effort in order to explore and document indigenous knowledge and practice of Tharu Community of Eastern Nepal. She has selected Morang, Sunsari and Saptari District of eastern Nepal and has reported Plants as their main source of remedy for the various diseases. During her investigation 136 medicinal plants belonging to 112 genera and 61 families including herbs, shrubs, trees and climbers were recorded which are used to treat 43 human diseases. The main medicinal plants of the study area are Neem, Kadam, Ultachirchiri, Dhatura, Bojho, Chhatyen, Dubo, Peeper, Gurujlatti, Tulsi etc. She found traditional healers (Dhami/ Ojha) still being highly respected and many people going to these healers for the primary treatment of diseases and disorders before going to the doctors or while they get weary from going to doctors. The healers help the diseased person by providing herbal medicines with which they are quite familiar. It has been reported that most of the plants are used for the treatment of dysentery and diarrhea, menstrual disorder, fever, cough, stomach pain, burn, cut and wounds and skin diseases. Menstrual disorder is the common disease seen among the Tharu women of eastern Nepal. She documented many disease cases where medicinal plants are effective than modern medicine. The different parts of plants used as medicines as per the respondent's response are whole plant (usually in

herbs), leaves, flowers, fruits, roots of herb, shrubs, trees, climbers, stem, root, root bark, resins, and latex, rhizome, tuber, bulb, tender, seed, petiole and latex. Her study showed that the Tharu people use different parts of the same plants for different diseases and mixture of several parts of same plants or different plants for different diseases. It is also found that in some case only one part of the plant has medicinal value. Usually the different parts of plants were made into paste, juice, powder, decoction and raw form. In most of the cases people use fresh plant as a medicine. Single plant or a part of the plants was also found to be taken as a whole. The doses of the medicine depends upon the form how it was used. The dose differs with different plants. It was also found that fresh plant was more effective than dry or old plant materials. The different medication forms were paste, juice, decoction, liquid, powder, smoke, ash and raw as reported in other researches.

Singh *et al.* (2011), carried out an study on Ethno Medicinal Plants Used by the Tharu Community of Rupendehi District, Western Nepal. They have reported 74 different plant species to cure different ailments such as diarrhea, dysentery, pain, respiratory diseases, jaundice, ear complaints etc. Almost all the plant parts like leaves, barks, fruits, seeds, roots, whole plants were being used in the community for treatment of prevailing diseases. The forms of medication they found to be prepared in the community were decoction, powder, juice, paste, latex, smoke etc.

2.5 Medico-ethno Biological Studies on Tharus in Kanchanpur District

Thapa (2001) in her ethno botanical study of the Tharus of Kanchanpur District has documented the traditional use of plants by Tharu for various purposes. She also included medicinal use of plants in her research and among all 131 plant species she found 107 plant species (50.71% of the total) medicinal plants being used traditionally to cure 33 types of ailments. Among all 107 plants being used as medicine she reported 45 tree species, 29 herbs, 17 shrubs, 5 pteridophytes, 1 gymnosperm and one climber. Her data showed that 38 types of diseases and disorder were treated by plants. Of all 107 medicinal plants 103 species (96.33%) were used for treatment of human disease and 4 species (3.66%) to cure cattle disease. Highest number (20 species i.e.18.34%) of plants was used in the treatment of pain. Similarly, 15 species (13.76%) were used for blisters; 13 species (11.92%) for cuts and wounds; 9 species (8.25%) as antidote against snake and scorpion bite, 8 species (7.33%) for cold and cough; 7 species (6.42%) were used to cure eye disease and fever. Likewise 6 species (5.50%) were used to cure swelling of different parts of body; 5 species (4.58%) were

used to cure dysentery and diarrhea and used as diuretic; 4 species (3.66%) each were used for other five types of diseases; 3 species (2.75%) each were used for other 6 types of diseases; 2 species (1.83%) each were used for other 5 types of diseases; and 1 species (0.91%) each was used for other 8 types of diseases. For curing the diseases the Tharu community was found to use all the plant parts like fruits, tuber, root, rhizome, leaf, flower, seed, young shoots, latex/resin, bark, whole plant and stem. The medicine preparation they made was in different form such as raw (warmed, roasted or taken with curd), paste, decoction, pickle, ash, smoke, buti. The paste was used for skin diseases; decoction for fever, cold headache etc, and pickle was used for stomach disorders.

CHAPTER III

METHODOLOGY

3.1 Selection of Study Site

The Tharus of Kanchanpur district of far western Nepal have been selected for this study. This district is situated along the western borders of the country, adjacent to India. There are a number of diverse ethnic groups in the area. Tharus who are one of the major ethnic minorities in Nepal are the oldest resident of far western terai even before Rana regime. Dangaura and Rana Tharus are the main Tharu group residing in that area. Since far western Nepal, until recently was far from Nepal's political center, the Tharus in this area became a subject of academic study only after Nepal opened to research. Thus only little can be known of the Tharus. Regarding their ethno biological knowledge only one research has been documented. But no study has been found done on the ethnomedicinal practices of Tharus inhabiting this area.

Since knowledge of utilization of medicinal plants is vast in Tharu community in other parts of the country, an essential need for the documentation of such knowledge of these ethnic groups was felt.

Also this area is easily accessible and the Tharus are familiar to the researcher

3.2 Description of Study Site

Kanchanpur district is situated between $28^{\circ} 32'$ and $29^{\circ} 08'$ north latitude and $80^{\circ} 03'$ and $80^{\circ} 33'$ east longitudes, and altitude ranged from 160m to 1528m from mean sea level. The total geographical area of the Kanchanpur district is 1, 61,741 hectare, of which about 88,200 hectare, area is under forest. The climate is sub-tropical monsoonal, the land is nearly level and productive. The soil is deep fertile, moist alluvial loam, conspicuous by free from boulders and gravel. The general appearance of the tract is gently sloping towards the south-east. The temperature of this area in the summer is maximum 43°C , average 27.4°C . Average rainfall for the whole of the terai is 1775 mm with 80% occurring between June-September.

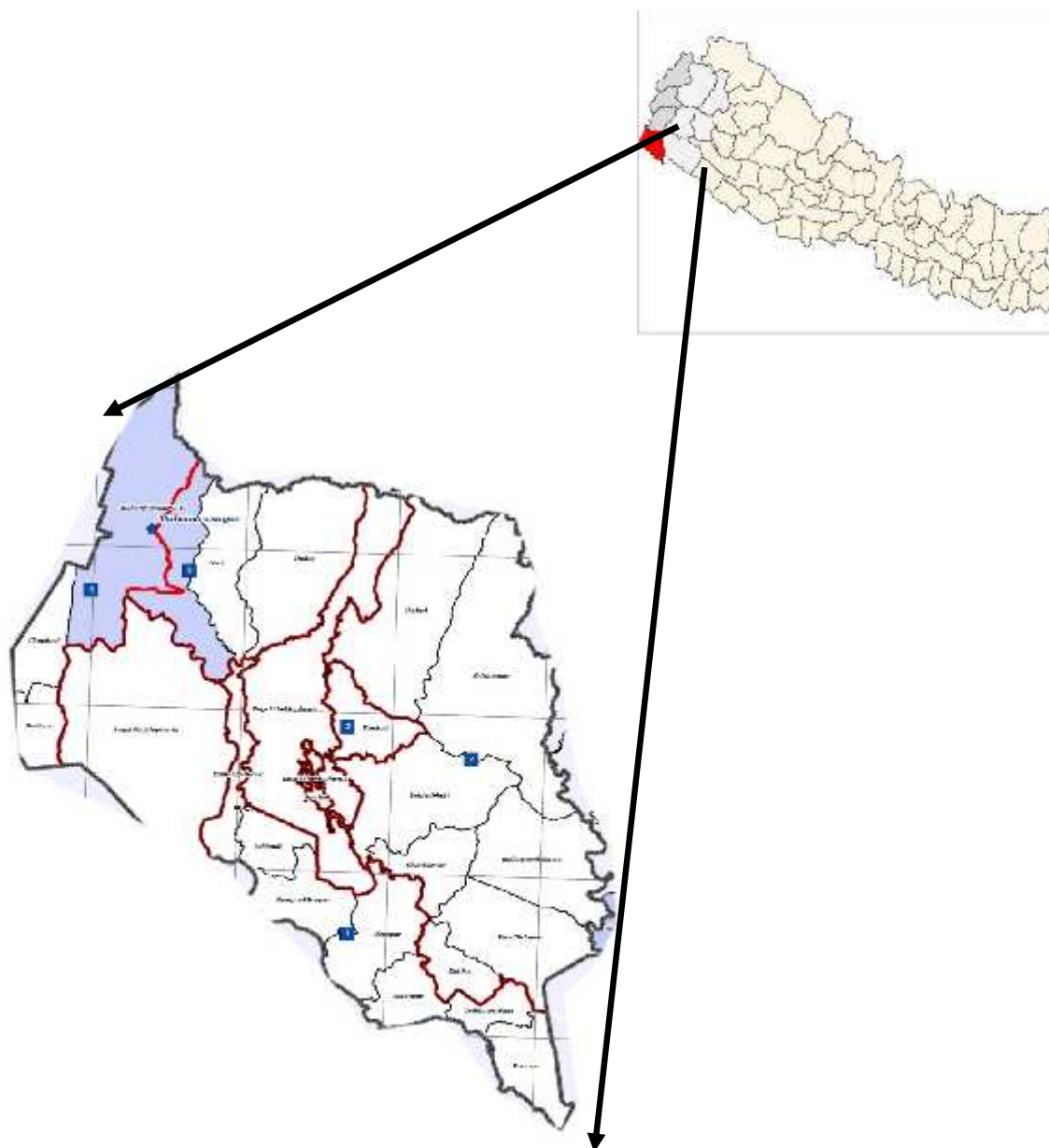


Fig 3.1: Map of Kanchanpur district showing study site

3.3 Methods of Data Collection

This study being focused to assess the ethno medicinal knowledge as well as the management practices, the methods employed in this research was exploratory as well as analytical. The data collected is more qualitative rather than quantitative. The methodology employed in order to fulfill the objectives of the present study is described below under different headings.

3.3.1 Reconnaissance Visit

Prior to the study different parts of Kanchanpur district inhabited by Tharus were visited for ethno botanical study. The study has been conducted in the 10 villages/settlements under two

VDCs and one municipality. The villages/settlements surveyed during the study period are Beldandi, Shankarpur (2 VDCs) and Baghphanta (Ward no 19 of Bhimdattanagar municipality). These sites are mainly inhabited by Tharus as the major ethnic group along with few hill migrants.

3.3.2 Sources of Data

3.3.2.1 Primary Data

Primary ethno botanical information was obtained from Tharu people during the field visit and household survey. The study has been carried out by interviewing the inhabitants in different villages of the study site. A total of 20 days were spent for the field work in the study area in the month of February 2012. The area was visited daily during the study period. Field observations were carried out with local people guidance and key informants. Interviews were conducted with 12 key informants (traditional healers) and local people of different households selected on a random basis to obtain information including the various data sets such as local names, ailments and diseases treated, therapeutic effects, parts of plants used, methods of preparation, methods of administration, doses, duration of the treatment etc. on ethnobotanical use of medicinal plants. During this period, traditional healers were randomly selected in each VDC and Ward. A standard questionnaire based form (Appendix) prepared earlier was filled with the help of the household members and key informants.

3.3.2.1.1 Focus Group Discussion

To gather primary information on plant resource use Focus Group Discussion was conducted in different villages along with close participation and cooperation of the local people. Focus group discussions (meetings) were organised among elderly and experienced villagers of different age groups and both sexes in each site to obtain knowledge on different medicinal plants species, along with location, growing condition, place of availability, state of collection, cultivation and its management status. People of different age groups and both sexes were asked about their knowledge on plant species.

3.3.2.1.2 Key Informants Interview

Short, brief and precise interview was made with *Guruwas*, *Bharra*, *Baidaya* and *Baidaniya* (traditional healers) regarding the medicinal plants used in the traditional healthcare systems of the tribe. Information on local names of the plants, their medicinal uses, methods of preparation, mode of administration, disease conditions, indigenous knowledge on medicinal

plants, and threats to plants, conservation and management of plants and related data were recorded. The reported medicinal plants were collected and their habit, habitat, local vernacular names etc. were noted down. Then the collected plant specimens were again placed in front of other local people to confirm their identity in terms of vernacular names, uses and other information.

3.3.2.2 Secondary Data

A brief review of the literature on ethnobotany was made to have a good knowledge about the subject matter and analysis of the previous works done on the field of ethnobotany. The review was especially focused on ethno botanical knowledge of different ethnic groups. The summaries of outcomes of some of these studies have been illustrated in Chapter II. A discrete framework for the study was designed with the help of various publications and previous researches in ethno botany. The secondary data was collected from different reports of Ethnobotanical studies done in different place available in central library of Tribhuvan University. Similarly various books, journal published by native and foreign institutions, newspapers and documents from internet have also been adequately consulted for relevant information. The Secondary information were also obtained from other sources in the study area which included numerous published as well as unpublished research reports, and articles.

3.4 Data Analysis and Interpretation

The ethnobotanical information of each field visit was thoroughly analyzed and the incomplete information were cross checked and reconfirmed in later visits. The information gathered from Tharus of different villages was compiled and a single set of ethnobotanical information was prepared. A comprehensive desk work involving comparison of collected information with the available publication of similar nature, tabulation etc were conducted for the preparation of this thesis.

3.5 Limitations of the Study

Since this study is carried out only in 10 villages and only 12 traditional healers were selected for the interview due to short time and financial problems. The results obtained from this study may not be applied to the large population of Tharus residing in the terai. Also due to political instability in the country and conflict between ethnic and non-ethnic people there were some difficulties in group discussion and interview. The information obtained here may have differences with Tharus of other places.

CHAPTER IV

ETHNOMEDICINAL KNOWLEDGE OF THARUS OF KANCHANPUR

Tharus of Kanchanpur were found to possess very rich ethnomedicinal knowledge. The Tharu people were found dependent upon agriculture supplemented by animal husbandry, which depend on forest for feed and fodder. They depend upon the forest resources around them, for a number of their daily requirements such as medicine, food, fodder, firewood, timber, ceremonial uses, house and agricultural implements construction etc. Their ethnomedicinal knowledge on medicinal plants was also found very vast. The tribal communities are living in vicinity of forest since several years and their medicine-men have inherited this good knowledge of ethnomedicine and local nature of flora with hidden value from their ancestors. The Tharus have a strong belief that the traditional medicines are very beneficial to both men and animals. Every Tharu village has at least one to two medicine men, known as '*Bharra*' or '*Baidaya*' or '*guruwa*'. They determine the knowledge of traditional medicinal plants from observation and results of trial and errors. They believe that if they convey this knowledge of traditional medicinal practice to everybody then, the healing power of medicine and mantras would be less effective. That is why they disclose this knowledge to their selected family member only.

4.1 Ethnomedicinal Plants Used to Treat Human and Livestock Ailments

In this study altogether 130 medicinal plant species belonging to 60 families were recorded, which were commonly used by Tharu tribes of Kanchanpur District to cure different human as well as livestock ailments. Among these 130 species of medicinal plants 125 (96.15%) species were used for human diseases, 2 (1.53 %) species were used for curing livestock disorders and 5 (3.84 %) species were used for human as well as livestock diseases (Fig. 4.1).

Most of the reported medicinal plants are used to treat human ailments. This showed that, the people of the study area are more knowledgeable and give great attention about human ailments as compared to livestock disease. Similar results were recorded by Thapa 2001, in the same area who recorded 107 medicinal plants of which 103 were for human ailments and 4 were for livestock diseases. The study also showed that most of the medicinal plants cure more than two ailments whereas, relatively some used only the treatment of one type of disease.

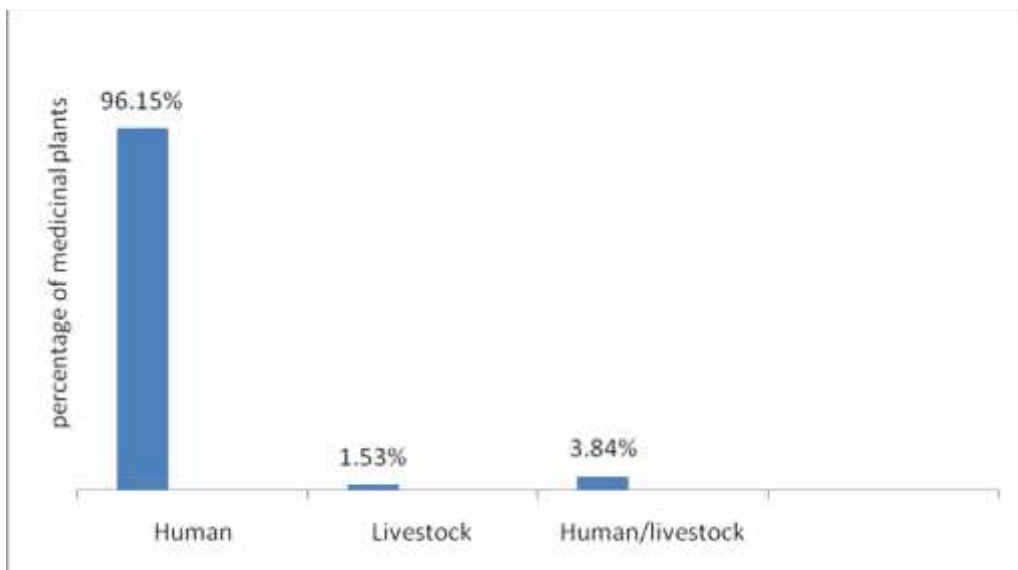


Fig. 4.1 Medicinal Plants Used to Treat Human and Animal Diseases in the Study Area

4.2 Habits and Availability of Medicinal Plants

The medicinal plants were found to be of different habit including herbs, shrubs, trees and climbers, both cultivated as well as wild. The cultivation was found done in their own agricultural fields and gardens while wild species were found being collected from the community forest and forest in the buffer zone of the Suklaphanta Wildlife Reserve.

4.3 Forms of Medication of Medicinal Plants

These medicinal plants were found being used in different forms. The forms of medicine preparation by indigenous people observed during study period are Paste, juice, powder, smelling, decoction, raw and buti. Paste is prepared by crushing fresh plant parts in a stone mortar and pastel. Juice is prepared by crushing fresh plant parts and pressing it to extract the liquid. Powder is the form where the plant parts are dried in open sunlight, then are crushed in dry mortar and pastel and made into fine powder. Decoction is a liquid preparation obtained by boiling plant parts in water and extracting drugs by stringing the preparation. Smelling is the form of medication where the plant part after crushing or burning is smelled with deep breath. The fresh or dried plant parts of the plants are taken in their natural form with no further processing in raw form and buti is that form of medication where plant parts singly or in mixture is tied in a long thread and it is worn as a necklace or arm or in the waste following pervaded traditional beliefs such as mantras and other rituals.

4.4 Belief of Tharu People in Traditional Medicine

It is observed in this study that the Tharus have a strong belief on traditional medicines and prefer to visit traditional healers for their health problems. The dependency of Tharu people found in traditional medicine is because they have been practicing this culture since time immemorial even before the modern allopathic medicine began. Tharu people also believe that traditional medicines are equally effective or in certain cases even more effective than widely accepted allopathic medicine. They have a strong faith on the efficacy of folk medicines. Also the costly allopathic medicines are beyond the reach of common people due to higher cost and there are no any well facilitated hospitals nearby in the area.

4.5 Plant Parts Used in Preparation of Remedies

The most widely used plant part for the preparations of remedy were leaves, which account for 40 cases, 30.76%, followed by roots, rhizomes and tubers which account for 31 cases, 23.84%, fruits accounting for 27 cases, 20.76%, whole plants and young shoots accounting for 16 cases, 12.30%, barks with 15 cases, 11.53%, flowers and seeds accounting for 12 cases, 9.23%, stem accounting for 6 cases, 4.61% and least used plant parts were latex and honey accounting for 3 cases, 2.30% (fig 4.2).

Different parts of same medicinal plants have been found to cure same as well as different diseases. For example fruit, leaf and whole plant of *Aegle marmelos* is used to cure same diseases like Deafness, constipation, dysentery, gastritis. Similarly bark, leaf and fruit of *Azadirchta indica* is uses in all skin disorders, dental care and fever. Similarly latex, root and leaf of *Calotropis gigantia* is used to expel spines. Similarly root leaf and fruit of *Ficus Semicordita* is used in the treatment of Cooling, gonorrhoea, jaundice.

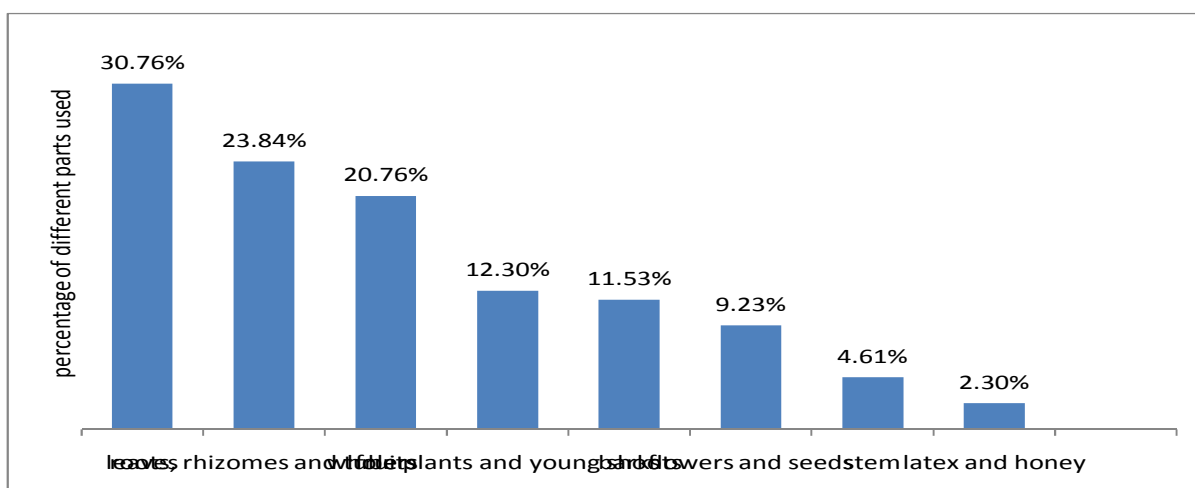


Fig. 4.2 Plant Part Used in Preparation of Remedies

The medicinal plants categorized on the basis of their parts used and disease cured are represented in the tables below and discussed accordingly.

Table 4.1 Medicinal plants used for their leaves with their local name and disease cured

S. N	Local Name	Scientific Name	Family	Forms of medication	Used for (problems)
1	Bel	<i>Aegle marmelos</i>	Rutaceae	Paste, juice	Deafness, constipation, dysentery, gastritis
2	Lalgedi, ratigedi	<i>Abrus precatorius</i>	Leguminaceae	Juice, paste	stiff shoulder, leucoderma, purgative
3	Haldu	<i>Adina cardifolia</i>	Rubiaceae	Paste	Ringworm
4	Ghyu Kumari	<i>Aloe vera</i>	Liliaceae	Juice	constipation, burn and facial body ache
5	kurjo	<i>Artemisia annua</i>	Asteraceae	Juice	malaria, fever, diarrhea, diuretic, gastritis and milk production in cattle
6	Neem	<i>Azadirachta indica</i>	Meliaceae	Raw, decoction, juice	Typhoid, wound insecticide, fever, skin diseases, dental care, measles
7	Gane	<i>Ageratum conyzoides</i>	Compositae	Juice	Cuts and wounds
8		<i>Buddleja paniculata</i>	Loganiaceae	Juice	Diabetes, stomach swelling
9	Kat Bans	<i>Bambusa arundinaceae</i>	Gramineae	Juice	Jaundice, otitis (kan pakne)
10	Tanki	<i>Bauhinia purpurea</i>	Leguminaceae	Raw	Diarrhea, dysentery
11	Bhatar	<i>Clerodendrum viscosum</i>	Verbenaceae	Juice	Cuts and wounds
12	Dhursuli	<i>Colebrookea oppositifolia</i>	Labiatae	Juice	Cuts and Wounds
13	Lal mirch	<i>Capsicum frutescens</i>	Solanaceae	Juice	Eye disease, headache
14	Morphul	<i>Centranthera grandiflora</i>	Scrophulariaceae	Juice	Fever

15	Gurjon lahera	<i>Cissampelos pareira</i>	Menispermaceae	Paste	Jaundice
16	Kasonji	<i>Cassia tora</i>	Legumiosae	Paste/Powder	Rheumatic fever, burn
17	Ghar pidalu	<i>Colocasia esculenta</i>	Araceae	Paste, juice	Skin itching, styptic, urinal hemorrhage, laxative
18	Aank	<i>Calotropis gigantia</i>	Asclepiadaceae	Raw	Expel spines
19	Sisam	<i>Dalbergia sissoo</i>	Leguminasae	Decoction	Heatstroke (to cattle), diarrhea, swelling problem
20	Ban tambaku	<i>Elephantopus scaber</i>	Compositae	Paste	Rheumatic pain, body swelling
21	Anjir	<i>Ficus carica</i>	Moraceae	Paste	Ringworm
22	Gular	<i>Ficus racemosa</i>	Moraceae	Juice	Heat stroke
23	Timla	<i>Ficus roxburghi</i>	Moraceae	Juice	Medicine
24	Khanyo	<i>Ficus Semicordita</i>	Moraceae	Juice	Cooling, gonorrhoea, jaundice
25	Ban pidalu	<i>Gonatanthus pumilus</i>	Araceae	Paste	Boils, wounds
26	Mehndi	<i>Lawsonia inermis</i>	Lythraceae	Paste (mixed mustard oil)	Cuts and wounds
27	Lauka	<i>Lagenaria siceraria</i>	Cucurbitaceae	Juice	Burn
28	Pudina	<i>Mentha spicata</i>	Labiatae	Pickle, raw	Heat stroke, indigestion
29	Mentha	<i>Mentha longifolia</i>	Labiatae	Decoction	Fever
30	Karela	<i>Momordica charantia</i>	Cucurbitaceae	Juice, raw	Fever, Antihelminthic, piles, diabetic
31	Lajjawati	<i>Mimosa pudica</i>	<u>Fabaceae</u>	Paste,	Ringworm
32	Bakaino	<i>Melia azedarach</i>	Meliaceae	Raw	Antihelminthic (to cattle)
33	Tulsi	<i>Ocimum sanctum</i>	Labiateae	Raw, decoction	Cold and cough, gastritis, fever
34	Aaru	<i>Prunus persica</i>	Rosaceae	Paste	Blisters
35	Rudilo	<i>Pogostemon benghalensis</i>	Labiatae	Juice	Cuts and wounds
36	Rasbhari	<i>Physalis peruviana</i>	Solanaceae	Raw, pickle, paste	Eye disease / Night blindness, antidote
37	Jangli	<i>Sida acuta</i>	Malvaceae	Paste(mixed with	Blisters, eye disease and night

	methi, khareti			mustard oil)	blindness, fever, antidote
38	Baigun	<i>Solanum melongena</i>	Solanaceae	Paste	Blisters, skin itching
39	Guithel	<i>Trewia nudiflora</i>	Euphorbiaceae	Paste	Body ache
40	Arjun tree	<i>Terminalia arjuna</i>	Combretaceae	Paste	Burn

The medicinal plants used for their leaves as tabulated above are similar with that of other works done on Tharus of Kanchanpur as well as other parts. For example *Prunus persica* used for blisters, *Ageratum conyzoides* for cuts and wounds, *Ocimum sanctum* for cold and cough, gastritis and fever etc are similar with that reported by Thapa 2001, in same area. Similarly *Aegle marmelos* is found being used for gastrointestinal disorder, *Azadirchta indica* for skin diseases etc are similar to that reported by Gachhadar 2010, eastern Nepal. *Mentha spicata* has similar use in Tharu community of Rupendehi, in indigestion as reported by Acharya et al.

Table 4.2 Medicinal plants used for their roots, rhizome and tuber with their local name and disease cured

S.N	Local Name	Scientific Name	Family	Forms of medication	Used for (problems)
1	Apamarga, datiwan	<i>Achyranthes aspera</i>	Amaranthaceae	Paste, buti	Antihelminthic (to cattle), antidote, skin itching
2		<i>Abelmoschus crinitus</i>	Malvaceae	Paste	Diabetes
3	Sarifa, sitafal	<i>Annona squamata</i>	Annonaceae	Paste	Antilice, blisters
4	Lalgedi, ratigedi	<i>Abrus precatorius</i>	Leguminaceae	Juice, paste	sciatica, stiff, shoulder leucoderma , purgative
5	Bojho	<i>Acorus calamus</i>	Araceae	Raw, decoction	Anti-helminthes, cough and fever
6	Kurilo, sataur	<i>Asparagus racemosus</i>	Liliaceae	Decoction, raw	Diarrhea, diuretic, fever, Tonic, Gastritis, lactation and milk production for livestock.
7	Kat Bans	<i>Bambusa arundinaceae</i>	Gramineae	Juice	Jaundice, otitis (kan pakne)
8	Sagar gota	<i>Caesalpinia bonduc</i>	Fabaceae	Paste	Antihelminthic

9	Bhang, ganja	<i>Cannabis sativa</i>	Cannabaceae	Juice	Eye disease, night blindness
10	Bankariya	<i>Capparis zeylanica</i>	Cappariaceae	Juice	Gastritis, stomachache
11	Bun haledo	<i>Curcuma angustifolia</i>	Zingiberaceae	Roasted and Eaten, raw	Stomachache and body swelling
12	Ghar pidalu	<i>Colocasia esculenta</i>	Araceae	Paste, juice	Skin itching, urinal hemorrhage, laxative
13	Aank	<i>Calotropis gigantia</i>	Asclepiadaceae	Raw	Expel spines
14	Safed musli	<i>Chlorophytum arundinaceum</i>	Liliaceae	Decoction with milk	tonic, Aphrodisiac
15	Bhutkesh	<i>Equisetum debile</i>	Equisetaceae	Paste	Body ache
16	Ban tambaku	<i>Elephantopus scaber</i>	Compositae	Paste	Rheumatic pain, body swelling
17	Ghans	<i>Eleusine indica</i>	Gramineae	Paste	Talu Gadeko
18	Khanyo	<i>Ficus Semicordita</i>	Moraceae	Juice	Cooling, gonorrhea, jaundice
19	Ban pidalu	<i>Gonatanthus pumilus</i>	Araceae	Paste	Boils, wounds
20	Marod phal	<i>Helicteres isora</i>	Sterculiaceae	Paste	Blisters
21	Siru	<i>Imperata cylindrica</i>	Gramineae	Juice	Antihelminthic (to cattle), cuts and wounds
22	Khirro	<i>Jatropha corocus</i>	Euphorbiaceae	Juice	Antihelminthic, Anti-allergy
23	Hathikana	<i>Leea macrophylla</i>	Leeaceae	Decoction	Fever
24	Maida lakri	<i>Litsea glutinosa</i>	Lauraceae	Paste	Internal injuries
25	Kukurjhar	<i>Lygodium flexosum</i>	Lygodiaceae	Paste	Scabies
26	Kela	<i>Musa paradisiaca</i>	Musaceae	Juice, raw	Diuretic, diarrhea
27	Karela	<i>Momordica charantia</i>	Cucurbitaceae	Juice, raw	Fever, Antihelminthic, piles, diabetic
28	Ekpatiya	<i>Ophioglossum reticulatum</i>	Ophioglossaceae	Raw , paste	Diuretic, lactation, pneumonia
29	Khajur	<i>Phoenix sylvestris</i>	Palmae	Decoction	Gastritis
30	Sarpagandha	<i>Raulvofia serpentina</i>	Apocynaceae	Decoction	Reducing blood pressure, sedative
31	Adrak	<i>Zingiber officinale</i>	Zingiberaceae	Paste (with honey), decoction	Cough and cold

The medicinal plants utilized for their roots, rhizomes and tubers as tabulated above have some similar uses with Tharus of other parts and similar uses in earlier work done in the same area. For example *Achyranthes aspera*, *Caesalpinia bonduc* are reported for being used as antihelminthic, *Cannabis sativa* in eye diseases and night blindness by Thapa 2001. Similarly *Curcuma angustifolia* being found to be used in stomachache and body swelling but earlier study in same area by Thapa 2001 has reported its use in cuts and wounds. Some dissimilar uses of same plant part in Tharu community of eastern Nepal have been reported by Gachhadar, 2010. For example root of *Achyranthes aspera* is used in menstrual disorder, *Curcuma angustifolia* is used in gastritis and tonic, *Jatropha corocus* is being used as appetizer etc.

Table 4.3 Medicinal plants used for their fruits with their local name and disease cured

S.N	Local Name	Scientific Name	Family	Forms of medication	Used for (problems)
1	Bel	<i>Aegle marmelos</i>	Rutaceae	Paste, juice	Deafness, constipation, dysentery, gastritis
2	Neem	<i>Azadirchta indica</i>	Meliaceae	Raw, decoction, juice	Typhoid, wound insecticide, fever, skin diseases, dental care. Measles
3	Kubindo	<i>Benincasa hispida</i>	Cucurbitaceae	Raw	Jaundice
4	Rajbriksha	<i>Cassia fistula.</i>	Leguminosae	Juice	Constipation and Piles, dysentery, allergy
5	Bijapur	<i>Citrus medica</i>	Rutaceae	Juice	Constipation and Piles
6	Chidya ko bhuja	<i>Callicarpa macrophylla</i>	Verbenaceae	Raw	Diarrhea
7	Nimbuwa	<i>Citrus limon</i>	Rutaceae	Raw (warmed and applied)	Internal injuries
8	Papita	<i>Carica papaya</i>	Caricaceae	Raw, pickle	Jaundice, stomach swelling, antihelminthic
9	Jambira	<i>Citrus aurantifolia</i>	Rutaceae	Raw	Source of vitamin C
10	Bhorla	<i>Cordia vestita</i>	Ethretiaceae	Raw	Demulcent, exporant and astringent.
11	Timla	<i>Ficus roxburghi</i>	Moraceae	Juice	Medicine

12	Khanyo	<i>Ficus Semicordita</i>	Moraceae	Juice	Cooling, gonorrhoea, jaundice
13	Kela	<i>Musa paradisiaca</i>	Musaceae	Juice, raw	Diuretic, diarrhea
14	Rohini, sindure	<i>Mallotus philippensis</i>	Euphorbiaceae	Juice(mixed with mustard oil)	Ear infection, Antihelminthic, scabies, antidandruff
15	Karela	<i>Momordica charantia</i>	Cucurbitaceae	Juice, raw	Fever, Antihelminthic, piles, diabetic
16	Amla	<i>Phyllanthus emblica</i>	Euphorbiaceae	Paste (black pepper, Zinger Salt)	Cold and Cough
17	Pipla	<i>Piper longum</i>	Piperaceae	Raw (honey)	Cold and cough
18	Rasbhari	<i>Physalis peruviana</i>	Solanaceae	Raw, pickle, paste	Eye disease / Night blindness, antidote
19	Amrood	<i>Psidium gaurvaja</i>	Myratecae	Raw	Diarrhea
20	Anar	<i>Punica grantum</i>	Punicaceae	Raw, juice	Reducing blood pressure
21	Aamari	<i>Spondias pinnata</i>	Anacardiaceae	Raw	Cold and cough
22	Bhela	<i>Semecarpus anacardium</i>	Anacardiaceae	Paste	Skin itching
23	Khanthakari	<i>Solanum virginium</i>	Solanaceae	Raw	Common cold, headache, asthma and fever.
24	Bahera, barro	<i>Terminalia bellerica</i>	Combretaceae	Past (Harro Jawano, Piper)	Cold and cough, stomachache, heatstroke, indigestion, wounds
25	Harro	<i>Terminalia chebula</i>	Combretaceae	Paste (Barro)	Cold and cough, loss of appetite, heatstroke
26	Tooni	<i>Toona ciliata</i>	Meliaceae	Raw	Tonic
27	Afim	<i>Xeromphis ulignosa</i>	Rubiaceae	Paste	Blisters

The medicinal plants being used for their fruits as tabulated above have some similar and some dissimilar uses with other studies in tharus of same area as well as other parts. For example fruits of *Aegle marmelos*, *Azadirchta indica*, *Citrus medica*, *Carica papaya*, *Musa paradisiaca* etc. have been reported of similar use in earlier works by Thapa 2001. The fruits of same medicinal plants tabulated here have been reported to have some different use in

Tharu community of other places. For example *Aegle marmelos* is reported for being used differently in over heat, tension, menstrual disorder, chronic cold by tharus of Kapilbastu, Aryal 2009, in cholera by the tharus of Uddham Singh Nagar, India, in dysentery by the Tharus of Rupendehi etc. fruit of *Carica papaya* have same use in jaundice among Tharu community of all places. *Cassia fistula* is found being used similarly in constipation in Tharus of eastern Nepal but *Citrus* species are reported to be differently used in cold and cough in the same community by Gachhadar 2010.

Table 4.4 Medicinal plants used as whole plants and young shoots with their local name and disease cured

S.N	Local Name	Scientific Name	Family	Forms of medication	Used for (problems)
1	Hamsapadi	<i>Adiantum philippense</i>	Polypodiaceae	Paste	Mouth blisters
2	Bel	<i>Aegle marmelos</i>	Rutaceae	Paste, juice	Deafness, constipation, dysentery, gastritis
3	Jambu	<i>Allium strachegi</i>	Amarylsidaceae	Raw, fried	body massage, pectoral disease, piles
4	Ghortapkya, barhmi	<i>Centella asiatica</i>	Umbelliferae	Paste	Diuretic, heat stroke, headache
5	Bethuwa	<i>Chenopodium album</i>	Chenopodiaceae	Curry	Stomachache, laxative, Antihelminthic
6	Kaddu	<i>Cucurbita maxima</i>	Cucurbitaceae	Paste	Mumps
7	Bhringraaj	<i>Eclipta prostrata</i>	Compositae	Paste	Cuts and wounds
8	Dudhe jhar	<i>Euphorbia thymifolia</i>	Euphorbiaceae	LT	Medicine
9	Papda	<i>Fumaria indica</i>	Papavaraceae	Juice	Diuretic
10	Hazari phool	<i>Jagetes erecta</i>	Asteracea	Raw, juice	Astringent, carminative stomachic, blood purifier, fever, ulcer, piles and muscular pain.
11	Pudina	<i>Mentha arveusis</i>	Labiteae	Raw, pickle	Cold, fever, cough
12	Tulsi	<i>Ocimum sanctum</i>	Labiteae	Raw, decoction	Cold and cough, gastritis, fever
13	Amlola	<i>Oxalis corniculata</i>	Oxalidaceae	Juice	Headache
14	Bhangiri	<i>Perilla frutescens</i>	Lamiaceae	Juice, paste	Sedative, antispasmodic, antiseptic, antidote, headache and influenza.
15	Jangali baigun	<i>Solanum nigrum</i>	Solanaceae	Paste	Headache
16	Ashwa	<i>Withania somnifera</i>	Solanaceae	Juice,	Ulcer, bronchitis, burn, and

	gandha			decoction, paste	uterus problem.
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The medicinal plants being used as whole plants and young shoots as tabulated above have some similar and some dissimilar uses with other studies in Tharus of same area as well as other parts. For example *Adiantum philippense*, *Aegle marmelos*, *Centella asiatica* all are reported to have similar use in earlier study in the same area by Thapa 2001. But in the Tharu community of Kapilbastu same medicinal plants have different uses like *Mentha arvensis* has use in worms in animal, tongue swelling and infection and cuts. Similar use of *Ocimum sanctum* in cold and cough is reported in Tharus of eastern Nepal, different uses of *Centella asiatica* in skin disease, nerve tonic, and memory enhancer has been recorded in the Tharu community of Rupendehi by Acharya et al. 2009.

Table 4.5 Medicinal plants used for their barks with their local name and disease cured

S.N	Local Name	Scientific Name	Family	Forms of medication	Used for (problems)
1	khair	<i>Acacia catechu</i>	Leguminaceae	Juice	Aau (dysentery), bone fracture, internal injuries
2	kurjo	<i>Artemisia annua</i>	Asteraceae	Juice	malaria, fever, diarrhea, diuretic, gastritis and milk production in cattle
3	Neem	<i>Azadirchta indica</i>	Meliaceae	Raw, decoction, juice	Typhoid, wound insecticide, fever, skin diseases, dental care. Measles
4	Simal	<i>Bombax ceiba</i>	Bombacaceae	Juice	Measles, blister, stomachache
5	Tanki	<i>Bauhinia purpurea</i>	Leguminaceae	Raw	Diarrhea, dysentery
6	Kumbi	<i>Careya arborea</i>	Lecythideceae	Juice	Vomiting, blisters
7	Aaghai	<i>Dillenia pentagyna</i>	Dilleniaceae	Powder	Body swelling
8	Peepal	<i>Ficus religiosa</i>	Moraceae	Juice, paste	Diabetes, stomachache
9	Bargad	<i>Ficus benghalensis</i>	Moraceae	Decoction	Stomachache, fracture, jamuha rog
10	Dudhi	<i>Holarrhena pubescens</i>	Apocynaceae	Juice (mixed with Jwano and salt)	Asthma, diarrhea, gastric, body swelling, dysentery
11	Sehjan	<i>Moringa oleifera</i>	Moringaceae	Raw/Paste	Cuts and wounds, blood clotting
12	Aam	<i>Mangifera indica</i>	Anacardiaceae	Decoction	Indigestion, loss of appetite
13	Jamun	<i>Syzygium cumini</i>	Myrtaceae	Juice	Diarrhea, blood purifying
14	Mainphal	<i>Xeromphis spinosa</i>	Rubiaceae	Paste	Asthma, body swelling, headache, blisters

15	Bayer	<i>Zizyphus mauritiana</i>	Rhamanaceae	Juice, nodule	Dysentery
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The medicinal plants being used for their barks are tabulated above. These plants also have some similar and some different uses among the same community as reported in earlier studies, and among the Tharu community of other places. For example *Acacia catechu* being used in bone fracture *Azadirchta indica* in fever, *Bombax ceiba* in measles and blisters etc. Similar uses of *Acacia catechu* in sprain and swelling and different uses in jaundice have been reported among the Tharu community of Kapilbastu by Aryal 2009. *Ficus religiosa* and *Ficus benghalensis* have been reported to have different uses in skin diseases in the Tharu community of eastern Nepal. *Ficus benghalensis* also have different use in gynecological disorders in the Tharu community of Kapilbastu district.

Table 4.6 Medicinal plants used for flower and seed with their local name and disease cured

S.N	Local Name	Scientific Name	Family	Forms of medication	Used for (problems)
1	Lalgedi, ratigedi	<i>Abrus precatorius</i>	Leguminaceae	Juice, paste	sciatica, stiff, shoulder leucoderma, purgative
2	palaans	<i>Butea monosperma</i>	Leguminaceae	Paste	Diuretic
3	Lahi	<i>Brassica campestris</i>	Cruciferae	Raw	Eye disease / Night blindness
4	Tanki	<i>Bauhinia purpurea</i>	Leguminaceae	Raw	Diarrhea, dysentery
5	Koiralo, kachnaar	<i>Bauhinia verigata</i>	Leguminaceae	Boiled, pickled	Stomachache
6	Seto dubo	<i>Cynodon dactylon</i>	Poaceae	Powder, raw	Cuts and Wounds, ring worm, skin itching
7	Kasonji	<i>Cassia tora</i>	Legumiosae	Paste/Powder	Rheumatic fever, burn
8	Akash beli	<i>Cuscuta reflexa</i>	Convolvulaceae	Paste/Buti	Quick Delivery, Antihelminthic, bilious disorder and jaundice
9	Kantha jhad	<i>Leucas cephalotus</i>	Labiatae	Smoke	Jaundice, loss of appetite
10	Parijat	<i>Nictanthes arbortristis</i>	Aleaceae	Juice	Jaundice
11	Ander	<i>Ricinus communis</i>	Euphorbiaceae	Paste	Rheumatic pain
12	Jwano	<i>Trachyspermum ammi</i>	Umbelliferae	Juice	Asthma

The medicinal plants being used for their flowers are tabulated above. These medicinal plants have some same and some varying uses as reported in earlier research done by Thapa 2001. For example *Butea monosperma*, *Brassica campestris*, *Cynodon dactylon*, *Leucas cephalotus*, *Riccinus communis* etc. have similar medicinal uses but some medicinal plants have different uses in other Tharu communities in other places. For example *Trachyspermum ammi* is used in lactating and tonic in Tharu community of Kapilbastu (Aryal 2009), *Abrus precatorius* is used to treat fever, stomach disorders, eye disease, asthma and uterus problems in Tharus of Rupendehi (Acharya et al. 2009).

Table 4.7 Medicinal plants used for stem with their local name and disease cured

S.N	Local Name	Scientific Name	Family	Forms of medication	Used for (problems)
1	Akash beli	<i>Cuscuta reflexa</i>	Convolvulaceae	Paste/Buti	Quick Delivery, antihelminthic
2	Mothae		Cyperaceae	Raw	Antihelminthic to cattle
3	Guithel	<i>Discoria deltoidea</i>	Discoraceae	Paste	fracture, wound
4	Bijayasal	<i>Pterocarpus marsupium</i>	Leguminosae	Juice	Pneumonia, blood purifier, body ache, menstrual cycle
5	Ganna	<i>Saccharum officinarum</i>	Gramineae	Juice	Indigestion, loss of appetite
6	Bayer	<i>Zizyphus mauritiana</i>	Rhamanaceae	Juice, nodule	Dysentery

Those medicinal plants being used for their stem are tabulated in the above table. These have also some same and some different uses reported by other authors. These all plants have similar uses as reported by Thapa 2001. But *Cuscuta reflexa* has been reported to have different uses in bone fracture and body swelling among the Tharu community of Kapilbastu (Aryal 2009), vomiting *Cyperus rotundus* and constipation among the Tharus of eastern Nepal (Gachhadar 2010) and stomachache, headache, body ache and jaundice by the Tharus of Rupendehi (Acharya et al. 2009). *Pterocarpus marsupium* also has different uses in neurological problem by the Tharus of Rupendehi (Acharya et al. 2009), sprain and overheating by the Tharus of Kapilbastu (Aryal 2009), *Cyperus rotundus* is been reported to be used differently in indigestion, diarrhea, vomiting, cough bronchitis and fever by Tharus of Rupendehi (Acharya et al. 2009).

Table 4.8 Medicinal plants used for latex and honey with their local name and disease cured

S.N	Local Name	Scientific Name	Family	Forms of medication	Used for (problems)
1	Maha	<i>Apis nepalensis</i>	Apidae	Raw	Medicinal and Tonic
2	Aank	<i>Calotropis gigantea</i>	Asclepiadaceae	Raw	Expel spines
3	Khirro	<i>Jatropha corocus</i>	<i>Euphorbiaceae</i>	Juice	Antihelminthic, Anti-allergy

The plants tabulated above are those used for latex and honey. All these plants were not found reported in earlier works in the same area by Thapa 2001. But in Tharu community of other places their uses are recorded. For example *Calotropis gigantea* is used to treat body pains, boils and pimples by the Tharus of Rupendehi (Acharya et al. 2009), in menstrual disorder in Tharu community of eastern Nepal (Gachhadar 2010) and in stomach disorders, skin diseases, ear and respiratory problems by the Tharus of Kapilbastu (Aryal 2009).

Furthermore comparing with other studies among Tharu communities of other places as well as other ethnic groups there are similarities as well as differences in the use of same medicinal plants.

The results of this study show slight difference with that of earlier study done by Thapa, 2001, who has recorded 107 medicinal plants used to cure different human as well as livestock ailments. This study though revealed the same medicinal plants and similar type of treatment processes in the Tharu community of Kanchanpur district as reported by Thapa, 2001, some more medicinal plants and also additional uses of some same medicinal have been found during this study. For example, *Acacia catechu* is reported to be used in bone fracture and internal injuries but this same species is also found to treat dysentery. Similarly, *Aegle marmelos* reported to be used in deafness and gastritis but it is also found to be used to treat dysentery and constipation. Additional use of *Aloe vera* is revealed in the treatment of constipation and in facial besides burn and body ache. *Asparagus racemosus* is reported to be used in cold and cough and lactation but it is also found being used in diarrhea, diuretic, fever, gastritis and milk production in cattles. *Azadirachtha indica* is recorded to be used in skin diseases, dental care, fever and measles but this study found its use in typhoid, wound and insecticide. *Cassia fistula* is recorded to be used in constipation and piles but this study found it being used in dysentery and allergy. *Chenopodium album* is recorded to be used in stomachache while its additional use as laxative and antihelminthic is revealed in this study. Similarly *Cuscuta reflexa* is reported to be used for quick delivery while this study revealed its additional uses in bilious disorder, jaundice and antihelminthic. *Musa paradisica* is

recorded as diuretic but its use is also found to treat diarrhea. Use of *Pterocarpus marsupium* is recorded in pneumonia and body ache but this study revealed its additional uses as blood purifier and in menstrual cycle. The additional uses of same medicinal plants than that of earlier study signify an increment in the traditional medicinal practices.

Comparing with other workers, it was found that many plants have similar uses with that of Tharus of different other places as well as other ethnic groups. For example out of 63 medicinal plants used by Tharu community of Bardia as reported by Shrestha (1989), many plant species were reported to have similar uses with that in Kanchanpur. Some plants species with similar medicinal use in Tharu community of Bardia and Kanchanpur are *Ageratum conyzoides* in cuts and wounds; *Cassia fistula* in piles and constipation; *Phyllanthus emblica* in cough and *Azadirchta indica* in fever and skin disease, *Cassia tora* is used in burns and rheumatic pain (fever) by both communities.

Some common plant species in Kanchanpur and Bardia were found to have different medicinal uses: for example; *Adina cordifolia* is used to control ringworm in Kanchanpur while the same plant is used in cuts and wounds by the Tharus of Bardia. *Aegle marmelos* is used to cure gastric problem and deafness by the Tharus of Kanchanpur whereas the same plant is used to cure fever by the Tharus of Bardia. *Bombax ceiba* is used to cure blisters, measles and stomachache in Kanchanpur while the same plant is used to cure cough, cuts and wounds by the Tharus of Bardia. Similarly *Butea monosperma* is used as diuretic by the Tharus of Kanchanpur whereas Tharus of Bardia use the same plant to cure tuberculosis. *Careya arborea* is used to cure blisters and vomiting by the Tharus of Kanchanpur whereas the Tharus of Bardia used the same plant in diarrhea. *Terminalia bellirica* is used to cure indigestion, cold, cough and stomachache by the Tharus of Kanchanpur in contrast to piles by the Tharus of Bardia. *Xeromphis spinosa* is used in body swelling, headache and asthma whereas the same plant is used to cure joint pain in Bardia.

Likewise comparing with 212 medicinal plants reported by Siwakoti and Verma (1996) from eastern Terai, 54 plants were used in Kanchanpur too with few similar and others for different medicinal purposes. For example, *Cissampelos pareira* is used in jaundice by the Tharus of Kanchanpur while it is used to cure fever, diarrhea and cough in eastern Terai of Nepal. *Acacia catechu* is used in bone fracture and dysentery by the Tharus of Kanchanpur while the same plant is used to cure cough and diarrhea in eastern terai. *Cassia fistula* is used in piles and constipation in Kanchanpur whereas it is used in rheumatic pain and as antidote by the people of eastern terai. *Mimosa pudica* is used in ringworm by the Tharus of Kanchanpur while it is used to cure piles and burns by the people of eastern terai. *Pterocarpus marsupium*

is used in stomachache, body ache, pneumonia and menstrual cycle by the Tharus of Kanchanpur while the same plant is used to cure diarrhea, toothache and diabetes by the people of eastern terai.

On the other hand plant species used for same medicinal purposes in both communities are *Fumaria indica* as diuretic, *Colebrookea oppositifolia* used in cuts and wound, *Pogostemon benghalensis* used in cuts and wounds by the Tharus of Kanchanpur as well as in eastern terai of Nepal. *Achyranthes aspera* is used as antihelminthic and as antidote at both places. Likewise, *Centella asiatica* is used in diuretic and heat stroke by the Tharus of Kanchanpur and by the people of eastern terai as well.

The Tharus of Kanchanpur widely use the bark and root of *Holarrhena pubescens* in asthma, diarrhea, dysentery, gastric and body swellings. This plant species is also found being used by Tharu community of Rupendehi in treatment of dysentery (Shing *et al.*), in treatment of stomachache and rheumatic pain by the Tharus of Chitwan (Muller-Booker, 1993).

Besides the above uses, *Holarrhena pubescens*, is also found being used differently in malarial fever by the Danuwars of Sindhuli District (Manandhar, 1990a); to cure scabies by the Chepangs of Makawanpur District (Manandhar, 1989a). It is also reported being used to cure fever and intestinal worms in eastern terai of Nepal (Siwakoti and Verma, 1996).

Moringa oleifera was found another popular and very effective medicinal plant, which is used in blood clotting and healing wounds in Kanchanpur. But this plant has been reported to have different uses in other tharu as well as other ethnic communities. For example used in scurvy by the Tharus of eastern Nepal (Gachhadar 2010), in cold and cough by the Tharus of Uddham Singh Nagar, India (Sharma *et al.*, 2011), in rheumatism by Bantar community of Morang (Acharya *et al.*), is used in dysentery and earache by the Mushhar tribes of Dhanusa district (Manandhar, 1986a); in stomachache and as abortifacient (Siwakoti and Verma, 1996) in eastern terai of Nepal.

Another well-known medicinal plant among Tharus of Kanchanpur is *Aegle marmelos*. The root of the plant is used to cure gastritis, constipation, dysentery and pulp of the fruit mixed with mustard oil is used to cure deafness due to old age or any accident. This plant species has been found in same by other communities like in stomach pain by Tharus of eastern Nepal (Gachhadar 2010), diarrhea, dysentery and vomiting by Tharus of Rupendehi (Singh *et al.* 2011, Acharya *et al.* 2009), for stomachache by the Tharus of Dang ((Acharya, 1996) and the people of eastern terai of Nepal (Siwakoti and Verma, 1996). However, the same plant is used for different purposes in some areas, such as in curing cholera by Tharus of Uddham

Singh Nagar, India (Sharma *et al.*, 2011), in over heat, tension, menstrual disorder and chronic cold in Tharus community of Kapilbastu (Aryal 2009). Similarly *Aegle marmelos* is used as laxative and to cure diarrhea and dysentery by the Limbus of Morang District (Siwakoti and Siwakoti, 1998).

The red powder of fruit of *Mallotus philippensis* is used to cure ear infection and as antidandruff, by the Tharus of Kanchanpur. Other medicinal uses of this plant is reported by several workers, as antihelminthic and in scabies by the Tharus of Dang (Acharya, 1996); to cure diarrhea and dysentery by Tharus of Rupendehi (Singh *et al.* 2011, Acharya *et al.* 2009), as oral contraceptive by the people of eastern terai of Nepal (Siwakoti and Verma, 1996); as antihelminthic by Tharus of Uddham singh nagar, India (Sharma *et al.*, 2011).

The seed of *Ricinus communis* is used in rheumatic pain by Tharus of Kanchanpur. Other medicinal uses of this plant has been reported by many authors as, used in boils by the Tharus of Dang- Deukhuri District (Manandhar, 1985); in headache at Dang (Acharya, 1996); to cure dysentery and as purgative by the people of eastern terai of Nepal (Siwakoti and Verma, 1996) and in skin burn, fever, asthma, bronchitis, dysentery, jaundice, liver complaints, piles, constipation, arthritis and leprosy by Tharus of Rupendehi (Singh *et al.*, 2011).

The Tharus of Kanchanpur have been found to widely use various weeds as medicine, which are growing abundantly without any care of cultivation. For example, *Achyranthes aspera* is used as antidote, antihelminthic and in weeping diseases of children in Kanchanpur. However other medicinal uses of this plant is recorded by many authors as used to facilitate delivery at Dang (Acharya, 1996); for boils and snakebite by the people of eastern terai (Siwakoti and Verma, 1996); the same plant is used to cure menstrual disorder by the Tharus of eastern Nepal (Gachhadar, 2010), to get relief from diarrhea, dysentery, toothache and gum diseases, vomiting, delivery problems, bone fracture and snake bite by the Tharu community of Kapilbastu district (Aryal, 2009). The juice of this plant is used by the Tharu community of Rupendehi to cure pneumonia, kidney stones and infections on urinary tract, powdered seeds are given to in bleeding piles and as brain tonic and leaf juice with common salt is used in stomach ache, piles and bronchitis (Singh *et al.*, 2011). The Tharus of Uddham Singh Nagar, India have been reported to use this same plant species in the treatment of boils (Sharma *et al.*, 2011), and in stomach disorder due to evil spirit by the Darai tribe of Chitwan District (Dangol and Gurung, 1999).

Similarly, *Leucas cephalotus* is another weed, which is used widely by Tharus of Kanchanpur to cure jaundice and as appetizer. The plant is used for different medicinal purposes as

described by several authors such as used in body pain by the people of eastern terai of Nepal (Siwakoti and Verma, 1996); in fresh wounds by the Mushhar tribes of Dhanusha District (Manandhar, 1986a); by Tharus of Chitwan District in treatment for ringworm (Dangol and Gurung, 1991); to treat jaundice at Kavreplanchowk District (Bhattarai 1990) and to treat urinary complaints of Tharus of Dang District (Manandhar, 1985).

Another widely used weed is *Eclipta prostrata*. In Kanchanpur, the paste of this plant is used to cure wounds between toes that are caused while walking barefoot during rainy season. Similar uses have been described by other authors such as by the Tharus Kapilbastu (Aryal, 2009), Tharus of Rupendehi (Singh *et al.* 2011) and Chitwan (Muller-Boker, 1993) and Darai of Chitwan (Dangol and Gurung, 1999). Other medicinal purposes of the same plant is reported by several workers as, it is used in headache by the Tharus of Dang (Manandhar, 1985); tharus of Rupendehi and Kapilbastu use the same plant in liver and spleen enlargement (Aryal, 2009 and Singh *et al.* 2011) and as an important ingredient in ayurvedic hair oil (Singh *et al.*, 2011) and in fever and urinary problems (Aryal, 2009) besides in wounds to treat cuts and wounds.

Another popular medicinal plant among Tharus of Kanchanpur is *Sida acuta*. The leaf of this plant is used to cure fever, as antidote, in blisters and to cure eye inflammation and night blindness. Several other findings were described by other authors such as used in fever and wounds by the people of eastern terai of Nepal (Siwakoti and Verma, 1996); in boils by the Tharus of Chitwan District (Dangol and Gurung, 1991).

Equisetum debile is widely used to cure body ache by the Tharus of Kanchanpur while the same or any other use of this plant is not found to be recorded in other studies.

It was found from the present study that there are several species of medicinal plants with multiple uses such as *Azadirachta indica*, *Buddleja paniculata*, *Curcuma angustifolia*, *Sida acuta*, *Terminalia chebula*, *Terminalia bellirica*, *Xeromphis spinosa*, *Pterocarpus marsupium* etc.

The Tharus of Kanchanpur use the leaf and stem of *Azadirachta indica* to cure skin diseases, fever, and measles and in dental care. Tharus of Rupendehi have been reported to have same medicinal uses if this plant in fever, skin diseases and dental and gum care (Singh *et al.*, 2011) and Tharus of eastern Nepal are also found using this plant for skin diseases (Gachhadar, 2010). Similar use in fever by the people of Pawannagar has also been found (Acharaya, 1986) and one different use as antiseptic by the people of eastern terai of Nepal has also been reported for this plant (Siwakoti and Verma, 1996).

Terminalia chebula is used as appetizer, in cuts, wounds and also in cough and cold by the Tharus of Kanchanpur. Similar uses of this plant species in cold and cough by Tharus of eastern Nepal (Gachhadar, 2010), by Tharus of Rupendehi (Singh *et al.*, 2011) has been reported. Many other workers reported different uses of the same plant as, it is used in dysentery and diarrhea at Dang District (Acharya, 1986) and Uddham Singh Nagar, India, in fever and eye disease and stomach disorder as an important constituent of triphala by tharus of Rupendehi besides cold and cough (Singh *et al.*, 2011 and Acharya *et al.*, 2009).

Terminalia bellirica is another important plant used by Tharus of Kanchanpur to cure stomachache, indigestion, cough, cold, heat stroke and wounds between toes due to mud. Similar other uses of this plant are in gastritis by the Tharus of eastern Nepal (Gachhadar, 2010), in constipation (as an important constituent of triphala) by the Tharus of Rupendehi (Singh *et al.*, 2011 and Acharya *et al.*, 2009) and same use by the Tharus of Kapilbastu (Aryal, 2009). Several other worker reported different medicinal uses of the same plant such as, cough, cold, fever, diarrhea, bleeding from gums and eye disease by the Tharus of Rupendehi (Singh *et al.*, 2011 and Acharya *et al.*, 2009), used in cough by the Tharus of Kapilbastu (Aryal, 2009), it is used as antipyretic and in bronchitis at Dang District (Acharaya, 1996), to cure cough, cold and as an appetizer at Chitwan District by Tharus (Dangol and Gurung, 1991), to cure fever, headache and piles in eastern terai of Nepal (Siwakoti and Verma, 1996).

Another widely used plant species in Kanchanpur is *Cuscuta reflexa* being used for bilious disorder and jaundice, as an antihelminthic and for quick and easy delivery. Similar use of this plant in jaundice has been reported from Tharus of Rupendehi (Singh *et al.*, 2011 and Acharya *et al.*, 2009). Many different uses of this plant are to cure vomiting by the Tharus of eastern Nepal (Gachhadar, 2010), in the treatment of bone fracture and body swelling by the Tharus of Kapilbastu (Aryal, 2009), in ulcers, headache, stomachache and body pain by the Tharus of Rupendehi (Singh *et al.*, 2011 and Acharya *et al.*, 2009) and in tonsillitis and swelling by the Bantar people of Morang (Acharya *et al.*, 2006).

Phyllanthus emblica is also found to be in wide use by the Tharus of Kanchanpur in cold and cough. Several different medicinal uses of this plant have been reported in other ethnic communities, for example in dysentery, gastritis (as an important constituent of triphala), constipation, indigestion, diuretic, as appetizer, for cooling and as a source of vitamin C by the Tharus of Rupendehi (Singh *et al.*, 2011 and Acharya *et al.*, 2009), as hair tonic by the Tharus of eastern Nepal (Gachhadar, 2010), in curing diarrhea by the Tharus of Uddham

Singh Nagar, India (Sharma *et al.*, 2011) and in blood purification and mental disorder by the Bantar tribe of Morang.

Curcuma augustifolia is also one of the frequently and widely used plant species in Tharu community of Kanchanpur. This species is used to cure stomach ache and body swelling in that community. But this same plant has some different use in other Tharu communities. For example in the Tharu community of eastern Nepal this plant is used as tonic (Gachhadar, 2010) and among Tharus of Kapilbastu this plant is used in diarrhea and gastritis problems.

The comparisons made here for the similar and different uses of medicinal plants among the Tharu communities in different places of Nepal and India and also with other ethnic communities in Nepal signify that local people have a strong faith on the efficacy of traditional medicine and prefer to go to traditional healers to diagnose their problems.

This also reveals that one same plant is used to cure similar type of diseases in different Tharu as well as other ethnic communities. Some plants are found being used for curing similar type of ailments even in Tharu community of India. But in some cases same plant species is used to cure different ailments, even in the Tharu communities of different places. This fact signifies the ethnic diversity among the ethnic groups. Also it is clear that the traditional knowledge has been developed through experience of long interaction with nature and transferred through generations, the same ethnic community inhabiting in different natural ecosystems have developed some different practices regarding the uses of medicinal plants.

It has also been found during this study that the elders, who know more about medicinal plants and healing procedures do not share their knowledge to any person outside their community or even their own family. Since the young generation are no more interested in such practices the ethnic knowledge is been degenerating. The knowledgeable traditional healers might die without sharing their traditional knowledge to the young generation. Therefore, documentation of such knowledge is found inevitable to throw light in to the field of herbal research for the invention of modern drugs as well as to improve socio-economic condition of the tribal people.

4.6 Administration Routes and Dosage of Medications

The administration routes of medicines prepared from plant species, were oral, dermal, nasal, oral or dermal, chewing, and through the ear. This is inconsistent with the result of various ethnobotanical researchers elsewhere. The units of measurements to determine dosage are not standardized and were small mud cup, finger length and teaspoon. The quantity of plant part

used is measured by number of leaves, seeds and fruits, and length of root. There were variations in the unit of measurement, duration and time at which remedies are taken and prescribed by healers for the same kind of health problems. The measurements used to determine the dosages are not standardized and depend on the age, physical appearance of the patient, degree of the illness, diagnosis and experience of individual herbalists/or knowledgeable person. Children are given less than adults, such as, one fourth of a coffee cup whereas; an adult is given up to one glass depending on the type of illness and treatment.

These medicines are applied with some rituals and mantras which the healers refused to expose because they were found to believe that the power of healing is decreased and even the medication is not worthily if the mantras are told to outsiders. They only murmur those mantras while healing practices. A major problem observing during the study was that few of highly traditional skilled and knowledgeable persons are rigid to tell information. Nevertheless, farmers, students and other educated inhabitants are free to secrete out the information. This is because, first, it is a means of income generation and their livelihood depends on the income they get out of it. Second, they believe that the medicinal plant is less effective in treating a certain ailment if everybody knows it. On the other hand, most of the time knowledgeable persons were locally said to be a form of god. Because of the above mentioned difficulties, the traditional medicine practitioners had forced to keep their knowledge and practices in secret. They explained that their ancestors had gained this knowledge through dreams and has been disseminated through all the generations. If these knowledge are exposed to outsiders or even the members of same community who is not supposed to be told the efficacy of such medicines is finished and they are punished by their god and ancestors and something bad happens in their life. They transfer this knowledge to some selected members of their family. The selection of new healer is also guided by their dreams.

CHAPTER V

SUMMARY AND CONCLUSIONS

5.1 Summary

Ethnomedicine, the healing traditions found in every culture, has been practiced and has been contributing to human health for longer than three thousand years. It existed before the arrival of modern medicine. The World Health Organization defines traditional medicine as “health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose or prevent illness or maintain wellbeing” (WHO, 2003; WHO, 2006). The World Health Organization (WHO) has described traditional medicine as one of the surest means to achieve total health care coverage of the world’s population (Rukangira, 2003). The WHO has estimated that 80% of the world population relies upon plant based traditional medicine for their health care (Joshi and Joshi, 2005).

An Ethnobotanical study on medicinal plant was carried out among the Tharu community in Kanchanpur district of far western Nepal. This ethnic group has inhabited in this place since more than five decades and has developed its own interaction with nature including traditional medicinal practices. But this knowledge is in the verge of extinction due to modernization in the people’s way of life as such knowledge is limited only to oral folklore. Thus this type of research acts as a bridge between the traditional knowledge in medicinal biota and their wider application in modern medicine.

The objective of the study is to conduct ethnobotanical investigation in the area in order to identify and record traditionally important medicinal plants for the treatment of both human and livestock ailments and to document the indigenous knowledge of the people on the use of medicinal plants.

The study has been carried out in the month of February 2012 to get valuable information from the 10 villages/settlements under 2 VDCs and 1 municipality. The villages/settlements surveyed during the study period are Beldandi, Shankarpur (2 VDCs) and Baghpanta (Ward no 19 of Bhimdattanagar municipality). These sites are mainly inhabited by Tharus as the major ethnic group along with few hill migrants. A total of twenty days were spent in the field work and during this time twelve traditional healers as key informants and knowledgeable persons were interviewed. The ethnobotanical data were collected through interviewing local communities including key informants the *Guruwas*. Primary data were collected using guided field walk, group discussion, semi structured interview and participant

observation in the field. The inhabitants of the area have used the medicinal plants not only for medicinal value but also for various purposes and have for a long time been dependent on the surrounding plant resources for their food, shelter, fodders, for their animals, health care and other cultural purposes.

In total 130 species belonging to 60 families were recorded. Of these, 125 (96.15%) species were used for human diseases, 2 (1.53 %) species were used for curing livestock disorders and 5 (3.84 %) species were used for human as well as livestock diseases. The medicinal plants were found to be of different habit including herbs, shrubs, trees and climbers; both cultivated as well as wild. This study showed that preparation and administration of medicinal plants include several methods. The most frequently used plant parts for the preparations of remedy were leaves 40 cases, 30.76%, followed by roots, rhizomes and tubers 31 cases, 23.84%, fruits 27 cases, 20.76%, whole plants and young shoots 16 cases, 12.30%, barks with 15 cases, 11.53%, flowers and seeds 12 cases, 9.23%, stem 6 cases, 4.61% and least used plant parts were latex and honey 3 cases, 2.30%. These medicinal plant parts were processed in various forms and the major ones include Paste, juice, powder, smelling, decoction, raw and buti. The administration routes of medicines prepared from plant species, were oral, dermal, nasal, oral or dermal, chewing, and through the ear and the units of measurements to determine dosage are not standardized and were small mud cup, finger length and teaspoon with variations in duration and time at which remedies are taken and prescribed by healers for the same kind of health problems, the age, physical appearance of the patient, degree of the illness, diagnosis and experience of individual herbalists/or knowledgeable person. Children are given less than adults, depending on the type of illness and treatment. These medicines are applied with some rituals and mantras which the healers refused to expose because it is a means of income generation and their livelihood depends on the income they get out of it and they believe that the medicinal plant is less effective in treating a certain ailment if everybody knows it. They only murmur those mantras while healing practices.

5.2 Conclusions

In the present study, 130 plant species of medicinal importance were recorded and documented.

Most of these herbal medicines were harvested from natural stands followed by home garden. They are also found growing sporadically in natural forests, river and roadsides. They are the predominant sources of traditional medicine for traditional healers. Herbs and shrubs were

found to be the most dominant growth forms in the preparation of traditional remedies followed by shrubs, trees and climbers.

Like many other ethnic groups, Tharu community of Kanchanpur have traditional practices which they accumulated from generations to treat both human and livestock ailments. They use different parts of plants to prepare remedies (root, leaves, stem, bark, and other plants structure). The traditional medicinal practitioners have developed their own unique methods of diagnosis and treatment that are specific to their particular cultures. They also knew very well about the preparations, root of administrations and dosage about the traditional medicinal plants.

The result of the study showed that, traditional medicine is recognized and accepted by the community for its role in the maintenance of health and the treatment of diseases. This is due to lack of adequate communication, remoteness of the village and unavailability of modern health care facilities. Hence, the use of traditional medicine is attributed to its accessibility and affordability for the broad masses of rural people.

It has also been found during this study that the elders, who know more about medicinal plants and healing procedures do not share their knowledge to any person outside their community or even their own family. Since the young generation are no more interested in such practices the native's knowledge is been degenerating. The knowledgeable traditional healers might die without sharing their traditional knowledge to the young generation. Therefore, it has been concluded in this study that documentation of such knowledge is inevitable to throw light in to the field of herbal research for the invention of modern drugs as well as to improve socio-economic condition of the tribal people.

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APPENDIX

Semi-structured Questions Used for Discussion and Interview

I. General Information

1. Information on Respondents

-) Name.....
-) Age.....
-) Sex.....
-) Educational status.....
-) Any professional designation.....

2. What are the most common diseases of humans in your area?

3. What are the most common diseases of animals (livestock) in your area?

4. How do the local people prevent and control a given disease in the area?

II. Ethnobiological Data

5. Mention types of plants that are used to treat a given disease in the area and give their local names.

5.1. Plants used to treat only human diseases

5.2. Plants used to treat only livestock

5.3. Plants used to treat both human and livestock diseases

6. Do you use any animals to treat the diseases?

6.1 Mention types of animals that are used to treat a given disease.

6.2 Animals used to treat only human diseases.

6.3. Animals used to treat only livestock.

6.4. Animals used to treat both human and livestock diseases.

7. Where do the medicinal plants grow?

7.1. In natural habitat

7.2. In home garden

7.3. Both in the natural habitat and home garden

8. The habit of the plant: Tree, Shrub, Herb, Climber.

9. What are the most common habitats of the given plants?

10. Which part of each medicinal plant and animals listed is used?

a. Plants: Leaves, Roots, Barks, Stems, Flowers, Seeds Latexes or saps, Whole plants etc.

b. Animals: meat, blood, bones, specific organs etc.

11. What is the method of preparation of the medicine from medicinal plants and animals?
(Fresh, dried, crushed, powdered, used alone, mixed with water or others, decoction, boiling, infusion etc.).
12. Dosage: Does it vary among age groups, sex? If you say yes, why? If not, Why not?
13. Does the medicinal plant or animals have side effect? If you say yes, is there any means of
treatment for the side effect ?
14. Which members of the community use the medicinal plants and animals frequently?
15. Are the medicinal plants and animals marketable?
16. Are the medicinal plants and animals easily accessible and affordable? If not, why?
17. How is the knowledge of traditional medicine transferred from generation to
generation in the community?
18. Is there any interference between modern medicine and traditional medicine used in the
area?
19. To what extent the community depends on traditional medicine as compared
to modern medicine? Why?