

Ethno-Medicinal Practices among the Limbu Community in Limbuwan, Eastern Nepal

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Abstract

Limbuwan is the land inhabited and dominated by the indigenous Limbu people. The Limbu are very rich in ethno-medicinal knowledge and culture as well. The main objective of this work is to document the ethno-medicinal knowledge of the Limbu community with semistructured interviews and questionnaire methods. A total of 225 species, in 191 genera and 92 families, in terms of life form, 100 herb species, 48 tree species, 46 shrub species and 25 climber species were documented as medicinal plants in Limbuwan. Among these, 52 species are used for the treatment of gastrointestinal disorders, 40 species for cut-wound-burn (CWB). The ethnomedicinal treatments are performed by Limbu healers (Phedangma) who have immense knowledge of ethno-medicine. Among the various categories, 112 species for oral administration, 92 species in extract form and root part of 67 species are used in Limbu community. This study found that the Limbu community uses more plants than other ethnic communities. Despite the efficacy of the indigenous knowledge it is gradually eroding day by day in the name of civilization.

Index terms— community, limbu healer, medicinal plants, indigenous.

1 Introduction

The Limbu ethnic community belongs to the Kirati group of the Tibeto-Burman family. They are often wrongly believed to be an offshoot of the Mongol by those who misinterpreted some Western scholars' use of the term 'Mangol' or 'Mangoloid' to refer to the Limbu's complexion. Their home land or the land of origin used to be called Pallo Kirat (far Kirat) in the past, but now it is known by the name Limbuwan, which means 'Limbu land' in the Persian language. The Limbu are culturally very rich. They have their own cultural dances and songs. The Limbu are also rich in literature. They use a script called the Sirijunga script nomenclatured after its inventor Sirijunga. Their religion is called the Kirat religion.

The Limbu people reside near jungles and streams in the hills of Limbuwan because their lifestyle is overwhelmingly dependent on natural resources. Their territorial land covers mainly Sankhuwasabha, Tehrathum, Dhankuta, Taplejung, Panchthar and Ilam districts of Nepal, but a large number of the Limbu people also live outside Limbuwan, viz. Sikkim, Darjeeling and some part of the North East region of India.

The Limbu enjoyed a special system of land ownership called Kipat since time immemorial. They also had the right to local governance under the leadership of a village head man called Subba.

Limbuwan was thus governed by different Subbas and was autonomous or semi-autonomous until a few decades ago. When the Land Reform Act was enforced in the Limbuwan area in 1965, the Limbus lost their power to land and local governance forever. Limbu communities have immense knowledge on ethnomedicine and a rich cultural, and food heritage (Bista, 1967; Subba, 1999a; Subba, 1999b). The Limbus have excellent traditional knowledge base (Rai et al., 2004) and extraordinary innovativeness. They have been using hundreds of plants for the treatment of diseases (Siwakoti, 1998), ranging from diarrhea, constipation to fracture. Phedangma, Shamba and Yeba-Yema are their sacred specialists (Limbu shamans). They have rich knowledge of diseases,

their identification, and application of herbal medicines for their cure. This knowledge is valuable not only to those who depend on it in their daily lives, but also to modern industry and agriculture. Many widely used products, such as plant-based medicines and cosmetics, are derived from traditional knowledge. Traditional knowledge can make a significant contribution to sustainable development. Most indigenous and local communities are situated in areas where the vast majority of the world's plant genetic resources are found. Their skills and techniques provide valuable information to the global community and a useful model for biodiversity policies. Furthermore, as on-site communities with extensive knowledge of local environments, indigenous and local communities are most directly involved in conservation and sustainable use.

Ethno-medicine is a set of empirical local practices on the basis of indigenous knowledge of a social group often transmitted orally from generation to generation. Ethno-medicinal knowledge on plant resources has been constantly diminishing because of changing perception of the local people, increasing influence of global commercialization and socioeconomic transformation (Gadgil et al 1993; Kunwar and Adhikari 2005). Due to the lack of scientific harvesting, proper management techniques and lack of conservation awareness, the number of ethno-medicinal plants is decreasing (Kunwar and Duwadee 2003). All the people of Nepal have no access to allopathic medicine and health centre because of illiteracy, poverty and unavailability. Thus, about 80% of the population in Nepal relies on traditional medicine (Manandhar, 2002).

The main objective of this study was documentation and analysis of ethno-medicinal knowledge of the Limbu people of Limbuwan area and its vicinity.

2 a) Study Area

The research work was conducted in the Limbuwan area of Eastern Nepal. Limbuwan is an area of 14619 km² of the eastern part of the Nepal Himalaya, comprising Taplejung, Panchthar, Ilam, Jhapa, Tehrathum, Dhankuta, Sunsari, Morang districts and some parts of Sankhuwasabha District. Its geographic co-ordinate is 87° 12' 36" E to 88° 06' 51" E and 26° 22' 12" N to 27° 04' 46" N. Limbuwan borders the Arun and Koshi Rivers in the West, the Kanchenjunga Himalaya and Tibet of China in the north, the Mechi river in the east, and Bihar and West Bengal province of India in the south (Figure ??). The area is predominantly inhabited by indigenous Limbu people since time immemorial. Limbuwan falls under the southern aspect of the Himalaya range and humid climate which is suitable for luxuriant vegetation with diverse biodiversity. It is important to note that Limbuwan lies between the third highest peak of the world (Kanchenjunga: 8586 m) and the lowest point of the country (Kechana: 70 m).

3 II.

4 Materials and Methods

The primary data were obtained on site through participant observations, semi-structured interviews (Key Informant and Focus Group), and questionnaires.

The secondary data were obtained from District Development Committee, different literature such as those from Central Bureau of Statistics, WHO, National Reports on CBD, ANSAB, IUCN, and various national and international journals dealing with ethno-medicine, biodiversity, traditional knowledge, and sustainable utilization of natural resources.

Fieldwork was carried out four times from January 2009 to December 2011. We used the methods from ethnobotany (Martin, 1995) and ethnography (Spradley, 1979). Prior informed consent was obtained orally from each informant. Information was collected through open-ended and semi-structured interviews in which topic guides, questionnaires, drawings, photographs and living plant materials were used as auxiliary resources. A participant observation technique was also applied. Identified specimens in the field were noted down. Unidentified specimens were collected and herbarium made. The plant herbaria were identified in National Herbarium House, Godawari, Nepal. Twenty key informants (Limbu people) were selected by consultation with knowledgeable persons of the study area and interviewed on issues relating to ethnomedicine (using a combination of semi-structured questionnaires and free-listing technique). Data were recorded in fieldwork books and, when possible, the interviews were also recorded on voice recorder.

5 III.

6 Results and Discussion

A total of 225 species of medicinal plants were documented from the Limbuwan area. These were distributed among 191 genera and 92 families (Appendix). The species in the Appendix are arranged alphabetically by family and by genus. For each species, the common name(s), Limbu name, medicinal applications, used parts, mode of preparation, mode of administration and habit of medicinal plants are mentioned.

Numerous Limbu plant families contain a large number of species with reputed medicinal properties (Appendix). Families with the largest number of species are the following: Fabaceae (14 species), Cucurbitaceae (11 species), Asteraceae (10 species), Lamiaceae, Poaceae, Rosaceae, (8 species), and Zingiberaceae, Euphorbiaceae and Moraceae (7 species) (Appendix). The majority of Limbu medicinal species are herbs (100 species),

trees (48 species) and shrubs (46 species) (Figure ??). The most frequently used plant parts in the preparation of herbal remedies were roots (67 species), bark (40 species) and leaf (30 species) (Figure ??).

The most frequently elicited modes of preparation were extract (plant part smashed, crushed, or chopped and juice extracted: 92 species), paste (plant parts smashed, crushed and made paste: 63 species), soup (plant parts boiled: 14 species) and raw (plant part directly used without processing: 14 species) (Figure ??).

There were numerous ethno-medicinal plants used for the treatment of around 48 disorders in the Limbu community. Gastrointestinal treatment had the highest frequency of ethno-medicinal use (52 species). Cuts, burns and some other wounds were treated with 40 species and osteological disorders with 30 species. All the 48 disorders, regrouped into 15 on the basis of nature and physiology of disorders are given in Figure ??.

In the Limbu community, Limbu healers (Phedangma), who are the ethno-medicine practitioners, also recite some magical words called "mantra" (in Nepali) during the treatment. It is considered that the use of the mantra increases the healing power of the herbal medicine and the treatment becomes more effective.

The most frequently used modes of administration of medicinal preparations were oral (112 species) and topical (62 species) (Figure ??). Oral and topical modes of administration were preferred because

The plants described herein have tremendous ethno-medicinal significance. Their use in ethnomedicine has evolved largely by hit and trial process and some of these have very well stood the test of time. However, most of these plants are yet to be experimentally verified for their medicinal value. That is, the antibiotic-, bioactive-, and other properties of herbal medicine used by ethnic people needs to be tested. In other parts of the world, pharmaceutical industries have been continuously exploring new medicinal plant species and the associated traditional medicinal knowledge of the ethnic communities there. It can be surmised that many pharmaceutical industries may still be exploiting the IK (Indigenous knowledge) of the IPs (Indigenous Peoples) without any equitable benefit sharing mechanism. But such uses and practices are poorly documented. It is therefore important to document such uses and practices not only for enhancing conservation efforts but also for protecting IK erosion as well as misappropriation.

Limbu communities in the study area were found to be knowledgeable regarding the use of plants for various illnesses and ailments. A total of 225 species of ethno-medicinal plants of the Limbu community is reported in this work while the number of Limbu ethnomedicinal plants in the past reports are far below, e.g. 119 species (Limbu, 2008), 99 species (Maden et al, 2007) and 76 species (Siwakoti, 1998). The level of the Limbu cultural knowledge (as measured by the number of species interactions) may be compared to other ethnic groups living in similar environments in Nepal. For example, ethno-medicinal plants were reported to be of 119 species in the Newar community (Balami, 2004), 85 species in Magar (Magar, 2012), 85 species in Rai and 105 species in Yakkha (Maden et al, 2007). This shows that the Limbu community has far greater knowledge on ethno-medicinal practices as compared to other ethnic communities in Nepal. It must be noted that the Rai, Limbu and Yakkha communities are much closer to each other in term of kinship and settlement, as a result of which they share their indigenous knowledge and practices and some medicinal plants are common to them all.

7 IV.

8 Treatment Process

In order to treat people, Limbu priests and shamans have developed various treatment methodologies depending on the nature of diseases and illness. These treatment processes have been developed through long time efforts which involved hit and trial practices and are now considered approved. They use different parts of plant in various forms, i.e. paste, extraction, decoction and raw, for treatment.

Stomachache -A few respondents said that they used the fruit part of chimphing (*Heracleum wallichii*,). Most of the respondents said that they resorted to dhami-jhankri (witch-doctor). The knowledge gap in the treatment of stomachache is explicable because stomachache results from various reasons and no single medication is applicable to all cases. Under such circumstances, the trial-and-error method used by the natives cannot be expected to produce the results that can be easily generalized.

Fever -Most informants said that they use the infusion of chiraito (*Swertia chirayita*). This treatment is effective against headache also. This finding suggests that there exists a void in the transmission/dissemination of traditional knowledge. People seemed to relate persistent bitterness of plants to cure fever. This plant contains several bitter compounds like ophelic acid, chiratin (glucoside), amarogentin (glucoside), and swerchirin as the active component ??Anon, 2002). In Nepal, this plant (unprocessed) is used for the treatment of fever and malaria ??Anon, 2006).

Fracture -A number of items were named by the respondents for the treatment of fracture, viz. bark of mahuwa /mauwa (*Engelhardia spicata*), honey, eggs, milk, mistletoe or hadchoor (Dental problem (Toothache) - All the interviewees named clove oil and the oil of timur (*Zanthoxylum armatum*) as the most effective medicine. Other options included the latex from saruwa kadam (*Jatropha curcas*), extracts from the rhizome of kaalo unyu (*Tectaria macrodonta*), pire jhaar (*Spilanthes acmella*), tulasi (*Osimum sanctum*), and guava bark. Some informants mentioned of tantrik (one who castes spells) treatment also. Traditionally, it is believed that toothache is due to worms and the latter can be removed by a combination of tantrik method and herbal medication.

Epistaxis (nosebleed) -This condition occurs occasionally and there are several reasons for leading to this condition. Minor irritation and rupture of small veins of the septum of the nose are the main reasons. These

veins may rupture spontaneously, or the rupture may be caused by a cough or sneeze that raises the blood. We have attempted to present responses to the use of different plants or their parts for the treatment of diseases. They are as follows:

pressure inside the veins of the nose. People drop extracts from dubo (*Cynodon dactylon*) or titepati (*Artemisia indica*) into the nostrils for stopping the nosebleed. It is common to plug the nostrils with rolled leaves of titepati to clot the blood. Some informants mentioned that they rub soot from the mud (or stone) tripod of traditional firewood stove on the forehead. The details of reactions that may/may not take place when plant extracts are administered are a subject of further study (except that they have proven antiseptic property) but the use of soot appears to have a psychological role.

Scabies -Scabies is a contagious skin disease caused by itch mite (*Sarcoptes scabiei*). The disease is characterized by intense itching. To counteract this itching, people resort to different herbal medicines. People use the juice squeezed from titepati (*Artemisia indica*), bojho (*Acorus calamus*), or angeri (*Lyonia ovalifolia*) shoots. Angeri is a very potent medicine but it gives an intense burning sensation. For the sensitive ones, treatment with angeri can be very agonizing and therefore care must be taken during its administration.

According to some people, angeri is simply an absolute medicine for scabies. Modern treatments of scabies involve topical application of lotions containing permethrin and lindane. Burns -Many natives have heard about the use of ghiu kumari (*Aloe vera*), and some of them use it. Babari (*Ocimum basilicum*) juice, harro (*Terminalia chebula*) oil, ghoda khori (*Lyonia ovalifolia*) oil and saruwa kadam (*Jatropha curcas*) sap are also used. As to *Aloe vera*, the use of it is also prevalent in other regions of Nepal and it appears that the practice is not indigenous to the study site. These medicines may have chemicals the topical application of which may lessen the pain or hasten the healing but this needs further study to validate it. Jaundice -Jaundice results from various conditions, but all of them stem from the health of the liver. The patients are encouraged to drink black sugarcane juice and eat a lot of papaya. This is justifiable because the liver is weak, and easily assimilable forms of foods are needed under these conditions. The 'functional ingredients' found in these foods may well play complex and synergistic role in speeding up the recovery. Besides diet regimen, they also administer the juice of amarlata (*Cuscuta reflexa*) and aqueous extracts of ban ghiraula (*Trichosanthes cucumerina*) as modest doses.

Amarlata is a yellow-colored epiphytic plant that finds an important place in ayurveda. It is used in bilious disorders (Chopra, 1986), protracted fever, and also as a purgative (Chopra, 1986; Manandhar, 2002). The use of this plant in the treatment of jaundice may have relation to the sensory property of this plant, namely its golden color. Recently, Ali (2004) has carried out a very extensive study on the components of amarlata, in which 26 components were isolated. The author has also discussed the anticancer properties of some of these components.

According to Chadha (1976), the root of ban ghiraula is used as a cure for bronchitis, headache, and boils. Both the root and fruit are considered cathartic. Leaves are used in biliousness.

Dysentery -The natives use pakhandbhed (*Bergenia ciliata*), lalchan or belchanda (*Hibiscus sabdariffa*), guava barks/leaves, and rhizomes of kaalo unyu / kaalo nigure (*Tectaria macrodonta*). The oral administration of the above-mentioned herbs may have actions similar to antibiotics that are used to combat dysentery. Lalchan can be eaten as such but the rhizomes of kaalo nigure are first rubbed on a stone with some water and the slurry that results is taken orally.

Among other things, belchanda contains gossypetin, hibiscin, anthocyanins, pectic substances, vitamin C and many other organic acids.

Recent researches show that guava contains more than 20 identified components. Its leaves contain -selinene, guajavarin, quercetin (and a number of flavonoids), to name but a few. Reports validate that guava leaf and bark extracts can be effective against hypertension and diarrhea (Belemtougri, 2006).

Tonsillitis -Tonsillitis, incorrectly called 'tonsil' by the natives, is the inflammation of tonsils of the mouth, caused by either bacteria or virus. The natives believe that chewing a corn seed is beneficial for tonsil. Abhijaalo (Limbu name: wana) (*Drymaria cordata*) can also be chewed to soothe the pain. These medicines most probably work by destroying/inhibiting the causative organisms, much like the antibiotics used in allopathic treatment. Ding et al (2005) have discussed the presence of 3 cyclic peptides and 4 flavone glucosides (drymareatin A, B, C, and D) in the abhijaalo plant. The plant is also used by the Chinese in the treatment of acute hepatitis (Ding et al., 2005).

Sinusitis -Sinusitis is a skull disease that occurs due to inflammation (caused by bacterial infection) of the membrane lining a sinus of the skull. A plant called haachhyun jhaar (*Dichrocephala integrifolia*) is very popular but this is not a permanent remedy. The plant induces sneezing, which temporarily relieves the condition. Some people also said that they administer the juice of ban ghiraula (*Trichosanthes cucumerina*) through the nostrils. Hot salt water was reported to stabilize the complication.

Boils/Abscess -In the survey, it was found that people deliberately made boils more septic by topically applying murcha (Yeast cake), etc. Sometimes, a kind of paste prepared from amliso (*Thysanolina maxima*) roots is also used. Bringing about septic condition fills the boils with pus and can be easily squeezed out.

Piles -A few people mentioned the use of harro (*Terminalia chebula*) for the treatment of piles. Since this Harro seeds are extensively as a medicine. The seed flesh is rich in tannin (mainly chebulagic acid, chebulinic acid, and corilagin). The fruit is credited with laxative, stomachic, tonic, and alterative properties. Snake bite -People use black bikhma (*Aconitum spicatum* syn bisma) as the primary aid. Biting garlic (*Allium wallichii*) and sucking poison out of blood from the wound is a very effective first aid. Garlic and bikhma may be effective

as an antitoxin (though not exactly like an anti-snake venom serum, ASVS). The tying of upstream part with a flexible cord is very logical as it delays the spread of toxin.

Bikhma contains five diterpene alkaloids: palmaticine, vakognavine, vakatisine, vakatisinine, and vakatidine. It can be externally used for rheumatism and cuts or wounds (Chadha, 1976). Aconitine is easily absorbed through skin and poisoning may occur through this route simply by picking the leaves. Therefore, care must be taken in identifying the correct plant.

Worms -Aqueous extracts of firewood ash is usually used to kill worms. Many people also use lemon juice. Some people use root extracts of siru (*Imperata cylindrica*), amliso (*Thysanolina maxima*), sallibisalli (*Equisetum* sp.), bhirgaule (*Coix lachrymajobi*), and ulte kuro (*Achyranthes aspera*). The roots are rubbed on a stone and the aqueous dispersion are orally administered. Some people mentioned using the fruit decoction of lapsi (*Choerospondias axillaris*). It is known that rhizomes of siru contain, inter alia, appreciable amounts of dimethylsulfoxopropionate and potassium.

Elsewhere, a siru extract is combined with other herbs to prepare liver cleansing medicines. It has antibacterial-, diuretic-, febrifuge-, and anthelmintic properties (Yeung, 1985; Manandhar, 2002).

Fresh wounds/Cuts -People topically apply extracts or juices of kaali jhaar (*Eupatorium odoratum*), titepati (*Artemisia indica*) and certain lichens. Some people also topically apply trichome of dhusure (*Colebrookea oppositifolia*). The above plants extracts obviously work as disinfectant. Some may also work as pain reliever. Some informants were found to use tender shoots of thaade unyu (*Thelypteris appendiculoides*) and rhizomes or leaves of chiple (*Pouzolzia hirta*).

Elsewhere, rhizomes of *Zingiber cassumunar* are used for curing nausea and headache. A small piece of rhizome may be chewed and swallowed or paste topically applied for the treatment of the same. The plant is believed to ward off evil spirits and repel snakes.

Muscle Sprain -Muscle sprain is treated by applying paste of chitu (*Plumbago zeylanica*) roots. Some people also use aankh (*Calotropis gigantea*) leaves. The leaves are baked on fire or under hot cinders and pressed over the sprain while still hot (the heat may sometimes become unbearable). The process is repeated for a number of times. People also said that they use ghoda khori (*Viburnum cylindricum*) oil and 'rifle oil' (whenever available) to, which they rub over the sprain. This massaging relieves one of pain and speeds up healing.

Several uses of aankh have been mentioned in the Wealth of India (Chadha, 1976). The root bark contains -amyrin, -amyrin, taraxasterol, gigantol, giganteol, etc. The latex gives cardiac glycosides, calotropin, uscharin, calotoxin, colactin and uscharin.

The calotropin and calotropain component of the latex have anti-inflammatory and anthelmintic properties. Warmed leaves are bandaged to soothe swellings and sprains.

The traditional use of ghoda khori oil for rubbing against pain and backache has been mentioned by Chadha (1976) and (Widmann et al., 2003).

Rabies dog bite -The bark of the kaphal (*Myrica esculenta*) tree or the stinging nettle or 'sisnu' (*Urtica dioica*) root is ground into paste and applied over the affected area. A small amount of the paste is also administered orally. Some people mentioned the use of bikhma (*Aconitum spicatum*) and root extracts of kaali jhaar (*Eupatorium odoratum*).

According to Chadha (1976), the kaphal bark is astringent, carminative and antiseptic. A decoction of the bark is useful in asthma, diarrhea, fever, etc. The bark is rich in tannins. The fruit part is eaten. The active components of the botanicals mentioned above have been described earlier.

Sore throat -People eat corn seeds, pumpkin seeds, and laligurans (*Rhododendron arboreum*) flowers to relieve sore throat. *Rhododendron* has been shown to possess antiviral properties by ??ajbhandari et al (2007). *Rhododendron lepidotum* flower in particular is effective against fever, cough, cold and tonsillitis.

Rhododendron arboreum is used in the preparation of a kind of snuff. Tender leaves are stated to be used as a vegetable, and also applied to the forehead to relieve headache. Green leaves contain a glucoside called ericolin (Bhattarai et al, 2010). Eating flowers in large amounts causes intoxication. Petals can be used for the treatment of diarrhea and dysentery (Chadha, 1976). Constipation -In the sites where we conducted our research, constipation occurs only occasionally, in which case they suck the black coatings of the rajbrikhsa (*Cassia fistula*) seed. Since this rajbrikhsa treatment is popular among other people also, it is difficult to say when and from where the practice began. Some people mentioned indreni (*Trichosanthes tricuspidata*) roots, chewed in modest amounts, are very effective against constipation. A great deal of literatures is available on *Cassia fistula*. An extensive review by Baborun et al (2005) shows that this plant contains potent phenolic antioxidants such as anthraquinones, flavonoids and flavanol derivatives. Rajbrikhsa is used Rash due to allergy -The Limbu people believe in a very peculiar treatment method. 'Puwalo mala' (a type of beaded necklace) is rubbed against the rashes, which is later pressed with 'janto' (a hand operated attrition mill made from a pair of circular stone; used to pulverize grain seeds). Another very effective treatment is to rub phachyang (*Zingiber cassumunar*) over the affected area. This plant also supposedly wards off evil spirits.

Common cold -People drink in modest amounts the un-boiled aqueous extract of titepati. This medication is also helpful in pneumonia. Some people drink a lot of heavily-seasoned, hot chicken soup to drive away the cold. It is a general belief that fried (sizzled in a small amount of oil) raksu can also relieve cold. It is also common to chew ginger rhizomes (hot, baked under cinders) to counteract the irritation in throat and relieve the coughing. Albeit less commonly lasun (*Allium wallichii*) and gurans (*Rhododendron lepidotum*) are also eaten in modest

amounts to get relief from common cold. Diarrhea -In the study sites, immature banana and guava are considered beneficial to the treatment of diarrhea. Bark extracts of jamuna (*Syzygium cumini*), gayo (*Bridelia retusa*), and ambak (*Psidium guajava*); fruit extracts of totala (*Oroxylum indicum*) and tender bud extracts of ainselu (*Rubus ellipticus*) were also mentioned as having antidiarrheal properties. Although they are familiar as home-based electrolytic treatments such as 'nun-chini-pani' (salt-sugar-water) and 'jivan jal' against dehydration, as anyone knows, these are not their discoveries. People were found to believe that an immature banana owes its medicinal property to alkaline taste. Guava is supposed to cure diarrhea because of its profuse seeds (which help harden the stool!).

The above results and discussions are based on the emic perspective. Pharmacological analysis to test the efficacy of plant-based treatments is very difficult. Pharmacological data, especially screenings for the bioactivity of phytochemicals, to determine the relative efficacies of medicinal plants appears logical but is rather involved.

The frequency at which a given illness occurs in a rural setting is rather difficult to assess because people tend to forget the episodes unless they are very important. Here, an attempt was made to determine the frequencies of the illnesses by counting the frequency of a particular word in the text. Based on this method, following results (Table 1) were obtained. The ranking of illness (1 = highest incidence, 7 = lowest incidence) in Table 1 is in general explicable. Agriculture in the hills is obviously very difficult. It involves a lot of physical work, often in jungles, among thorny bushes, and eerily steep slopes. In fact, there isn't a day without cuts and wounds. The higher incidence of fracture is justifiable for the same reason.

Other illnesses in the list relate mostly to lack of sanitation and faulty food habit. This in turn will lead to food insecurity, malnutrition and hence the vicious cycle. Improvement in the food habit and sanitation can have a significant effect in the lives of these people.

The survey data shows that some of the traditional methods of treatments have rather questionable or dubious status, the treatments used for piles, snake bite, jaundice, and rabies in particular. Incidences of diseases such as food poisoning, toothache, constipation, worms, etc., can be reduced by several simple and effective measures such as sanitation, personal hygiene, and improved eating habits.

V.

9 Conclusions

The mountain dwelling indigenous Limbu people have identified a total 225 species of ethnomedicinal plants for the treatment of around 48 disorders in their community. The problems they often face are gastrointestinal and Cut-Wound-Burn (CWB) in their daily life. Thus, for the resolution of frequent problems, the Limbu investigated more ethno-medicinal plants in this respect, i. e. 52 species for gastrointestinal and 40 species for Cut-Wound-Burn (CWB). Limbu healers (Phedangma), who have special knowledge about ethno-medicine, are ethno-medicine practitioners. They also recite some words "mantra" during the treatment. It is considered that such treatment process is more effective. They prefer to use high altitudinal medicinal plants, namely *Aconitum spicatum* (Bikhma), *Astilbe rivularis* (Budho Okhati), *Bergenia ciliate* (Pakhanveda), *Euodia fraxinifolia* (Siltimur), *Heracleum nepalense* (Chimphing), *Nardostachys grandiflora* (Jatamasi) and *Swertia chirayita* (Chiraito) because they consider that these medicinal plants have high efficacy in treatment. The ethno-medicinal knowledge in of the Limbu community is gradually eroding due to western modern pharmacology, easy access of modern medicines, and general disinterest among younger generations in particular. ()

10 VI.

11 References Références Referencias

12 H

13 Table and Appendix

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Figure 1:

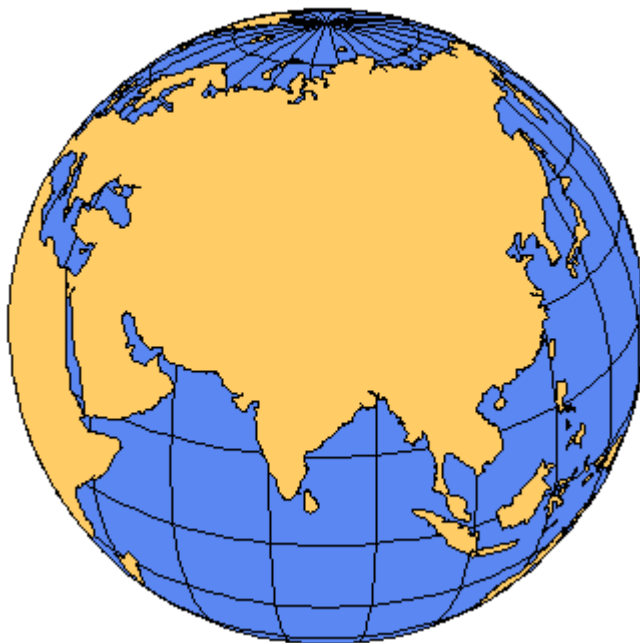


Figure 2:

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Illness

Figure 3: Table 1 :

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