# Documentation of Indigenous Knowledge, Skill and Practices of Kirata Nationalities with Special Focus on Biological Resources

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## EXECUTIVE SUMMARY

Nepal is an independent, individual, sovereign, secular, inclusive and federal democratic republican state. It has a cultural mosaic comprising different caste and ethnic groups. As the national census 2001, it has 37.2 percent indigenous nationalities belonging to 59 different groups. They are all deprived in political participation and are marginalized from decision-making process, and economically, educationally fallen far behind than non indigenous peoples. They have depended mainly on biological resources for livelihood purposes since time immemorial and possess incredible indigenous knowledge (IK), skill and practices system. But the information regarding IK, skill and practice of different indigenous nationalities system is very scanty. The objectives of this research project were to explore and document the existing IK, skill and practices of Kirat Nationalities associated with biological resources, and formulate recommendation for reorganization of such things to NGOs, INGOs, Development Partners and Nepal Government Agencies.

Nepal, a signatory of the Convention on Biological Diversity (CBD), is committed to the conservation of biological diversity, sustainable use of natural resources and institutionalization of equitable sharing of benefits arising out of the biological resources and IK linked to the use of the biological resources. Protection of IK associated with biological resources is, therefore, necessary to exercise provisions and obligations of CBD. It is important to document different indigenous nationalities' IK for enhancing benefit sharing efforts as well as for protecting them from erosion and misappropriation. Documentation of IK associated with biological resources is also essential for Nepal the country is a member of World Trade Organization (WTO).

Kirat Nationality is one of the Indigenous Nationalities of Nepal. On the basis of Kirat Religion followers, they are classified as core and peripheral Kirat groups. Limbu, Yakha and Rai are considered as core Kirat group because 79.5 percent (in average) populaces of this group follow the Kirat Religion. Sunuwar is also regarded as core Kirat but only 17.4 percent of them are Kirat Religion follower. Among the Kirat, Rai Nationality is the largest group, which comprise 2.79 percent of the state population, and is the tenth largest group. B. H. Hodgson was the first scholar who wrote a basic word list of Yakha but the recognition of this group was remained unknown until 2001. Now the population of Yakha is recorded 17,003 in number, which comprise 0.07 percent (66th position of the state population). Before 2001, they were regarded as Rai and partly Limbu also. Kirat shamans treat different ailments in traditional way. Occasionally, they also use biological resources.

In Nepal, during *Kirat* and early *Lichchavi* period, there was no sign of discrimination. It was the *Lichhchavi* rulers (200- 879 AD) who for the first time in the history introduced Hinduism. They were the Hindus and promoted the Hindu religion by constructing many temples. They adopted *Sanskrit* as the official language and promoted sculpture system. When the *Mallas* superseded Lichchavi dynasty, they made every attempt to promote Hinduism. With the help of *Brahman* priests, the *Malla* rulers introduced *Varna* system and stratified people on the basis of caste structure. They assumed that enforcement of caste hierarchy would promote social cum political stability. They expected lower caste group and non-Hindu communities gradually adopt the rituals and ideology of high caste Hindu. Furthermore, Jayasthiti Malla (1360-95) started promoting social reform activities on the threshold of Hindu doctrines. He invited 5 Brahmins from India by requesting them to make the rules as they wished. There after, he formulated a religious code named *Manav Naya Shastra* in 1380 AD, which is the oldest law of the world, where various discriminative laws had been included.

After Malla period, Shah King governed the country by also *Brahman* orthodoxy. They promoted *Chhetris* as rulers and Brahman as lawgivers. Prime Minister Junaga Bahadur Rana promulgated the *Muluki Ain* (National Code) of Nepal in 1854. It restructured Nepali Society into four caste hierarchy, including IPs. They were *Tagadhari* (Sacred thread wearing or Twice-born), *Matawali* (Liquor drinking), *Pani nachalne choi chhito halnu naparne* (Water unacceptable but no purification required, if touched or Touchable Low Castes), and *Pani nachlne choi chito halnu parne* (Water unacceptable and purification required, if touched or Untouchable Low Castes). That legal provision was abolished in 1963. After the People's movement-I of 1990, new constitution was promulgated. The 1990 Constitution also had enclosed some provisions that represented cultural discrimination, particularly with reference to language. Nepali, as the 'national language' as the only official one and other indigenous languages were downgraded. Again people's movement II took place in 2006. After movement, new Interim Constitution (IC) has been made. The new IC 2007 (with its fifth amendment) is little better than the 1990 Constitution.

Key informant interview, Jungle walk, Questionnaire survey, Observation Schedule and Specimen Identification were chosen to obtain primary data. Moreover, prior to the 'real' field work, few informal meetings and interviews were carried out with some key people and potential key informants in Kathmandu and Dharan basically to explore baseline information regarding the research project. The collected specimens were brought to Kathmandu for identification confirmation and deposited for its voucher specimens at KATH. The Project aim was qualitative analysis however data were numerically coded. Sum of the different categorical variable values were presented quantitatively. By using Statistical Package for Social Sciences (SPSS) and Microsoft excel data were coded, summarized, presented and analyzed. The field research was carried out from October 2006 to early 2008. Total of six VDCs as its project area was selected from Sankhuwasabha (4 VDCs), Taplejung (1 VDC) and Bhojpur (1 VDC) districts. These six VDCs covered 272 square kilometers (approximately). In Sankhuwasabha, concentration was given mainly in Tamaphok VDC where Yakha is densely populated and also because of culturally and linguistically traditional Yakha's existence. It is heartland of Yakha for its culture and identity.

A total of 198 plant (mainly wild) and 14 animal species were documented as used in the treatment of different ailments. From the literature analysis, 26 plant species were noticed as new medicinal plant for Nepal. Among them, 4 plant species are additional species for Nepal Flora (New to Nepal). Plant species were found to be used mainly in 18 different problems such as gastric, jaundice, pneumonia, gastrointestinal, women related etc. Similarly, a total of 130 wild plant species were documented as used for edible fruit, curry, species and other various livelihood purposes. Food and beverage related other various items were also recorded. Kirat shamans were found actively participating as practitioners. Apart from the shamans, few Kirat personnel were also found as herbalists. They were using such knowledge practices from the time immemorial. But such knowledge, skill, practices are rapidly lessening. There is urgent need of documentation of such knowledge, practices. Nepal Government needs to make Access of Benefit Sharing laws from which Indigenous Peoples (IPs) could get benefit from their knowledge and knowledge associated biological resources. India, Bangladesh and many other countries have already made such laws and IPs, and those countries are already gaining benefits.

## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ABS | Access of Benefit Sharing |
| BR | Biodiversity Registration |
| BS | Bikram Sambat |
| CA | Constitution Assembly |
| CBD | Convention on Biological Diversity |
| CBS | Central Bureau of Statistics |
| CNAS | Centre for Nepal Asia Studies |
| Dr | Doctor |
| FAO | Food and Agriculture Organization |
| GATT | General Agreement on Tariffs and Trade |
| GPS | Global Positioning System |
| IGC | Inter Governmental Committee |
| IK | Indigenous Knowledge |
| ILO | International Labor Organisaton |
| IPs | Indigenous Peoples |
| IPRs | Intellectual Property Rights |
| ITPGRFA | International Treaty on Plant Genetic Resources for Food and Agriculture |
| IUCN | World Conservation Union |
| JEP | Janajatis Empowerment Project |
| KATH | National Herbarium & Plant Laboratories, Godavary, Lalitpur, Nepal |
| MoFSC | Ministry Forests and Soil Conservation |
| NDC | National Development Council |
| NEFIN | Nepal Federation of Indigenous Nationalities |
| NFDIN | National Foundation For Development of Indigenous Nationalities |
| NGIIP | National Geographic Information Infrastructure Program, Kathmandu |
| NP | Ninth Plan |
| NPC | National Planning Commission |
| PGCTU | Post Graduate Campus Tribhuvan University |
| PIC | Prior Informed Consent |
| PPVFR | Protection of Plant Variety and Farmers' Right |
| Prof. | Professor |
| RBRs | Research Benefit Rights |
| TBGRI | Tropical Botanical Gardens Research Institute |
| TK | Traditional Knowledge |
| TP | Tenth Plan |
| TRIPs | Trade Related Intellectual Property Rights |
| TYIP | Three Year Interim Plan |
| UNCED | United Nations Educational, Scientific and Cultural Organization |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| VDC | Village Development Committee |
| WCED | World Commission on Environment and Development |
| WIPO | World Intellectual Property Organization |

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# CHAPTER 1

## INTRODUCTION

Nepal is a cultural mosaic state comprising different caste and ethnic groups belonging to mainly the Tibeto-Burman and Indo-Aryan linguistic families, which is indicative of the waves of migrations that have occurred for over 2000 years from the north and south, respectively (Pradhan & Shrestha, 2005: 1): the Tibeto-Burman or Mongoloid group that migrated especially from the north and east and by Caucasoid (Aryan) group that migrated from the south and west. It has been said that Nepal is a nation forged in migration (Gellner, 2007). The migration of various groups took place again and again over long periods. According to the Interim Constitution of Nepal 2007, Nepal is an independent, individual, sovereign, secular, inclusive and federal democratic republican state[4], and it has 103 caste and ethnic groups.

Except the Caucasoid groups of Nepal, all groups are deprived in political participation and are marginalized from decision-making process, and do not have access to or control over production resources. Thus, they are economically and educationally fallen far behind than Caucasoid group. But they possess remarkable Indigenous Knowledge (IK), Skill and Practices regarding the use of Biological Resources. They have been using IK, Skill and Practices from the time immemorial.

With the advancement in medicinal and biotechnology, the application of IK has been decreasing and dependency of ethnic people on modern medicine has increased. On the other hand, like other parts of the world, the pharmaceutical industries have been continously exploring new medicineal plant species and its associated traditional medicinal knowledge of the ethnic communities. It can be guessed IK of the Indigenous Peoples (IPs) have been widely used by the pharmaceutical industries 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 eroson as well as misappropration.

Nevertheless, the concept of documentation of IK is not a new practice in Nepal. There is proof of documentation of the importance and uses of various plants and animals for different purposes in the communities over generations. For example, many ethnobotanical and ethnocultural studies depict valuable knowledge regarding different plants, animals, birds and reptiles. However, the process has neither been institutionaliszed nor is there any legal mechanism to protect the ownership rights of the holders of such informations (Anonymous, 2005a: 3). In order to fill this gap, the Ministry of Forests and Soil Conservation (MoFSC) of Nepal has taken the initiative for documenting and registering the biological resources and its associated IK but the government has not built yet any act related to this.

In a literal sense, documentation refers to an act or instance of authenticating with documents. It is essentially a process of ensuring conformity to historical facts (Paudel, 2004: 211). The need and importance of the documentation may be summarized as follows (Anonymous, 2005b: 2-3):

[4]Amended by the Fourth Amendment (Article No 4).

- IK holders are gradually losing their indigenous practices due to urbanization, mass migration from rural to urban areas, modern agricultural practices, destruction of forests and natural habitats,.
- The IK holder's are at risk due to misappropriation of the biological resources and associated IK. There is an urgent need to formally recognize the rights of the indigenous communities in order to equitablly share the benefits between knowledge holders and users of the IK;
- The distribution of biological resources of Nepal is extended beyond its political boundary. Consequently, the knowledge associated is also distributed to a wider range beyond the political boundary;
- Nepal has cultural shares with its neighbouring countries. Several of its classical documents explaining the importance of varied biological resources are also prevalent in these countries; and
- Documentation of genetic resources is also necessitated by the fact that Nepal has entered in to the WTO and it has obligations to document the genetic resources of the country.

**1.1 IK**

IK has become recognized worldwide not only because of its intrinsic value but also because it has a potential instrumental value to science and conservation (Kunwar and Bussmann, 2008). Here, the term IK implies any knowledge produced by and or distinctive to a particular culture group or any loosely defined group of resource users in a given area. Such knowledge is usually produced informally by only people actually practicing a skill or working directly with a resource, as opposed to paid knowledge professionals such as scientists. According to Purcell (1998: 260), IK is 'the body of historically constituted (emic) knowledge instrumental in the long-term adaptation of human groups to the biophysical environment'. It is the knowledge which is rooted and embedded in (indigenous to) the rurally located and socio-economically underprivileged groups within Third World societies.

According to World Intellectual Property Organization (WIPO) (2005: 4), IK is often referred to as Traditional Knowledge (TK) and 'encompasses the content or substance of traditional know-how, innovations, information, practices, skills and learning of TK Systems such as traditional agricultural, environmental or medicinal knowledge'. Such knowledge, developed from experience gained over time and adapted to the local culture and environment, has always played – and still plays – an important role in the daily lives of the majority of people globally and is considered to be an essential part of cultural identities. It is very important to the food security and health of millions of people in the developing, and even developed countries. Moreover, such knowledge of the IPs or ethnic people, which must be honored by the world like knowledge developed after long research. Therefore, this knowledge must have rights like new knowledge gained by Research Company that patents its outcomes. For this, such knowledge must have to be documented through Biodiversity Registration (BR). Similarly, every country has to make the law concerning BR for such knowledge preservation and they should have to follow and respect the Convention on Biological Diversity (CBD) objectives for IPs or ethnic groups' welfare.

**1.1.1 Possession of IK**

On the basis of possession, IK may as categorized in individual knowledge, distributed knowledge and communal knowledge.

**Individual Knowledge:** In some cases, individuals produce traditional medical knowledge without any interface with the community or outsiders. In such cases, the knowledge is held by individuals (individual knowledge). For instance, some individual traditional healers continuously improve or innovate on existing body of knowledge through sustained observation and experimentation.

**Distributed Knowledge**: In other cases, knowledge is in the possession of some but not all members of a group (distributed knowledge). In such cases, the knowledge is asymmetrically distributed among individuals within a group, even though such individuals may not be aware that others in and outside the community share the same knowledge. Individual and distributed knowledge are often interconnected in that sometimes healers compare notes and share remedies across quite wide geographic areas.

**Communal Knowledge**: Certain medical knowledge may be available to virtually all members of a group (communal knowledge). In such a case, the knowledge is freely available to its members although it may concentrate among the old members of the society. In every community, for example, there are plants, which are well known to have some medicinal properties.

### 1.1.2 Discourse of IK

During 1970-1980s, a number of anthropologists turned their attention to exploring IK (Purcell, 1998: 265). The studies were concentrated on how IK and institutions could contribute to more culturally appropriate, sustainable development. Much of the path-breaking works centered on issues of immediate concern for survival (Guillet, 1987; Kurin, 1983; Meehan, 1980; Warren, 1993; Purcell, 1998: 265).

There are two strands to the evolution of the IK perspective that have remained largely independent, one academic and the other development- focused (Sillitoe, 1998: 224; Howes, 1980). As cited by Sillitoe (1998: 223), the academic issues were in two broad areas: ethno-science and human ecology. In development, it has emerged over the past decade or two, also from two broad approaches: farming systems and participatory development. The first signifies the behavioral study of ethnic groups in response to their survival knowledge while the other points out the knowledge conservation and documentation with the approach of benefit sharing that comes from utilizing knowledge and its resources.

### 1.1.3 IK verses TK

Generally, the concepts of IK are used synonymous to TK. However, these two words exhibit some sort of sense similarity; are distinctively different. The term ‘indigenous’ refers to the point of origin, the source of initiative. It may incorporate the elements and processes from outside the world, provided the initiative for its incorporation is local, while TK may not be of local origins, as their adoption my have been imposed from outside. As regards the TK, local communities have always generated specific knowledge, which has been used for shorter/longer periods and informally passed from generation to generation or from group to group. This tradition can be defined as the knowledge, innovations and practices of indigenous people and local communities.

TK is usually collective knowledge. Sometimes, due to parallel development or due to the exchange of knowledge, communities with similar ecosystems, culture or problems can have the same or similar TK which, in turn, is or is not, expressed in a similar fashion. For those indigenous or local communities that did not have a written tradition, TK takes the form of stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language, culinary recipes and agricultural practices, including the development of plant species and animal breeds. It is therefore extremely difficult to determine with accuracy which communities are the rightful owners of certain knowledge, or the relationship between TK and different communities.

***Box-1:*** **Why Patents cannot protect traditional knowledge**

The reason why the patent system does not work for traditional knowledge holders, particularly in the Asia-Pacific region, is because of the followings**:**

1. It is impossible to identify individual inventors due to the collective nature of traditional knowledge
2. Traditional Knowledge often cannot be attributed to a particular geographical location.
3. Ownership of varieties of plants is alien to many social and cultural beliefs.
4. The required criteria of 'novelty' and 'inventive step' are not always possible particularly in cases where the traditional knowledge has been in existence over a long period of time.
5. The cost of applying for a patent and pursuing patent infringement cases are extremely high for the individual and the developing countries.

Source: GRAIN & Kalpavriksh (2002)

Leidwein (2006: 254) argues that TK has no agreed international definition, in the course of extensive international discussions, however a common meaning of the term has gradually emerged. This common meaning has been casted into various working definitions by multilateral discussions on Tradition knowledge protection in the European Union (ibid.: 255). As defined by WIPO, the term TK refers to the content or substance of knowledge that is the result of intellectual activity and insight in a traditional context, and includes the know-how, skills, innovations, practices and learning that form part of TK systems, and knowledge that is embodied in the traditional lifestyle of a community or people, or is contained knowledge systems passed between generations. It is not limited to any specific technical field, and may include agricultural, environmental and medicinal knowledge, and knowledge associated with genetic resources.

It is important to note that TK does not mean that this knowledge must be old. Recently established knowledge that is based on existing knowledge can also be TK. Moreover, TK can be held either by one person, many people or everyone belonging to the local people or an indigenous community. Indeed, the number of persons holding the knowledge does not affect the extent to which this knowledge is distinct and new to the outside world.

### 1.1.4 IK and Bioprospecting

The knowledge either indigenous or traditional accumulated for centuries by ethnic communities about their habitat is increasingly being used for commercial purposes in fields such as pharmacy and agriculture. Technological developments based on IK have resulted in remarkable improvements in the supply of food crops and health-related breakthroughs, among other uses

(Johnson, 1992). Transnational corporations or multiple corporation and research laboratories use such knowledge obtained from the analysis of plants and other biological samples provided by ethnic communities, or from the observation of their traditional practices. These substances are studied, developed, reproduced, made the object of property rights and eventually released in the market, while the communities that provided such knowledge don't receive any compensation for its use. IK and knowledge based on biological as well as genetic resources are also registered for their own benefit. They always try to portray such knowledge as they invented or discovered it.

***Box-2:*** **Examples of Patents Provided to Misappropriation**

**The Turmeric Case:** Turmeric is a plant of the ginger family yielding saffron-colored rhizomes. It has been used as a dye, medicine and flavoring since 600 B.C. In 1280, Marco Polo described Turmeric as 'a vegetable with the properties of saffron, yet it is not really saffron.' Turmeric has been used medicinally throughout Asia to treat stomach and liver ailments. It is also used externally to heal sores and as cosmetic.

In 1995, two Indian nationals at the University of Mississippi Medical Center were granted a U.S. patent on 'use of turmeric in wound healing.' The Indian Council of Scientific and Industrial Research (CSIR) requested the U.S. Patent and Trademark Office (USPTO) to re-examine the patent.

The CSIR argued that turmeric has been used for thousands of years for healing wounds and rashes and therefore its medicinal use was not novel. Their claim was supported by documentary evidence of TK, including and ancient Sanskrit text and a paper published in 1953 in the Journal of the Indian Medical Association. The USPTO upheld the CSIR's objections and revoked the patent in August 2002.

That's why, such transnational corporations have been accused of exploiting IK about plants to produce new drugs without giving due recognition or any economic benefits to the people who have developed and carried this information since time immemorial (Posey and Dutfield, 1996). Neighboring country India is one of such examples. Many useful plants products of the subcontinent such as *nim*[5] (*Azadirachta indica* A. Juss.), *basmati* rice (*Oryza sativa* L.) and *turmeric*[6] (*Curcuma domestica* Valeton) were patented in Europe and US (See *box 1 below*). But later India claimed its patent rights and won the cases with strong official documents such as ancient Sanskrit writings, *urdu sayaris* where the uses of the *nim, basmati rice* and *turmeric* are well explained.

### 1.1.5 IK: Creators, Holders and Benefits

IPs and ethnic groups are IK creators and holders. Now such knowledge regarding healing properties of certain plants has been the source of many modern medicines. IK thus has been

[5] European Patent No. 436257 was granted by the European Patent Office on 1September 1994.

[6] U.S. Patent No 5401504 was granted for the use of turmeric powder as a wound healing agent on 28 March 1995.

***Box-3*: Examples of Patents Provided to Misappropriation**

**The Turmeric Case:** Turmeric is a plant of the ginger family yielding saffron-colored rhizomes. It has been used as a dye, medicine and flavoring since 600 B.C. In 1280, Marco Polo described Turmeric as 'a vegetable with the properties of saffron, yet it is not really saffron.' Turmeric has been used medicinally throughout Asia to treat stomach and liver ailments. It is also used externally to heal sores and as cosmetic.

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translated into commercial benefits by providing leads for development of useful products and processes. The valuable leads provided by such knowledge save time, money and investment of the modern biotech industry in research and product development. The question that now needs to be addressed is whether a share of benefits should build up to 'creators' and 'holders' of IK and if so, how.

### 1.1.6 Recognition of IK and Its Protection

Recognition and Protection of the IK is a recent phenomenon in the international community. In 1981, the WIPO and the United Nations Educational, Scientific and Cultural Organization (UNESCO) adopted a Model Law on Folklore. The concept of farmers' rights was introduced in 1989 by the Food and Agriculture Organization (FAO) into its International Undertaking on Plant Genetic Resources, and in 1992 the CBD highlighted the need to promote and preserve IK.

European Union and some of its member states have already set legal or pragmatic measures for the documentation and protection of biological and genetic resources and associated IK, especially in the field of agriculture and food production (Leidwein, 2006: 251). These measures respond to multilateral obligations and to the needs of farming communities in Europe. Some of these measures already fulfill criteria and technical standards elaborated in the Intergovernmental Committee (IGC) on Intellectual Property (IP) and Genetic Resources, IK and Folklore of the WIPO.

## 1.2 IK Practice in Prehistoric Period

Plants have been one of the most important sources of food and medicine since the dawn of human civilization. Archaeological evidence of 60,000 year-old Neanderthal burial grounds in Shanidar, Iraq, pointed to the use of plants like Marshmallow, Yarrow and Groundsel, which are still used in contemporary folk medicine (Lietava, 1992; cited in Kunwar & Bussmann, 2008). Evidence for the medicinal use of *Papaver somniferum* L[7]., the opium poppy dates back 8000

[7] *Papaver somniferum* L. has been grown since ancient times for its oil-rich seeds and the opium, which is exuded from its incised seed capsules.

years (Stockwell, 1989). But Adhikari *et al.* (2003) argued that the Vedic concept of treatment from which *Ayurveda* came into existence, is the oldest system and the basis for origin of different systems of treatment. *Ayurveda* is derived from two Sanskrit words: *ayur*, life, and *veda*, the science. The use of medicinal plants was first mentioned in the *Rigveda* (4500-1600 B.C.). The *Ayurveda* (2500-600 B.C.), is considered the earliest source on the medicinal plants in which the properties of drugs and their uses are given in detail. Ayurvedic medicine is based on plants, animals' products, and minerals. It is estimated that Ayurvedic medicine came into Nepal as early as 879 A.D.

### 1.3 Exploration of IK in Nepal

In Malla regime, a *vaidyakhana* (Ayurvedic pharmacy) was started at Hanuman Dhoka palace square in Kathmandu to prepare medicine. Although there was lack of adequate facilities to refine plants and a shortage of skilled labor, preventing large-scale operation, some medicines were prepared on limited scales. The *vaidya* (traditional medicinal practitioners) of Kathmandu followed the Ayurvedic system, and their skill in preparing medicines from plants and their art of diagnosis were handed down from their ancestors.

During the Rana autocracy, the role of the *vaidya* or *kabiraj* was important in the palaces. The *vaidyakhana* of Hanuman Dhoka was moved, and Ayurvedic medicines were made available only to Rana rulers and their families, ending the tradition of a public dispensary. The new location of *vaidyakhana* was in the enormous and newly built personal palace of Prime Minister Chandra Shamsher, called Singha Durbar, which was completed in 1904. Since then, this pharmacy has been known as Singha Durbar Vaidyakhana and it has served as the national centre for the development of herbal medicines. After the dawn of democracy, the King Tribhuvan declared the availability of Ayurvedic medicines for the general public, and in 1961, it began distributing Ayurvedic medicines free of charge to people through centers located in each district of Nepal.

**Medicinal Plant Related Institutes:** At first, a chemist, Prof. Khadananda Sharma carried out a research regarding importance or role of medicinal plants in Nepal and in 1930; he submitted a report to the government on this subject. As a result, the Vanaspati Goswara (botany section) was established at Tebahal, Kathmandu where trading of crude herbal drugs was used to be a prime activity. In 1937, this office was moved to Pakanajol, Kathmandu, and renamed Vanaspati Phant (Botany Department). Later, a small herbal farm was established at the foot of Shivapuri Hills north of Kathmandu. In 1960, the Vanaspati Phant was converted into a Department under the Ministry of Forests. This department was responsible for the formulation and implementation of government policies on research, collection, cultivation and sale of Nepalese medicinal plants. To achieve these objectives, five sections were set up: the Royal Botanical Garden, Royal Drugs Research Laboratory, Botanical Survey and Herbarium, Herbal Farms, and Herbal Trading Center.

In 1960, National Herbarium and Plant Laboratories[8] was established at Godavari, Lalitpur district for purpose of gardening of various plant species, including medicinal plants. The Royal Drug Research Laboratory, started in 1964, was concerned with the search on the utilization of herbal plants, development of technology, testing, standardization, and quality control of drugs.

[8] Initially it was named Royal Botanical Garden

The Herbal Farms were located in different ecological zones to develop technology for cultivation, utilization, and processing of medicinal plants. Vegetation surveys and taxonomic research in different parts of Nepal were conducted by the Botanical Survey and Herbarium. At the same time, the first ethnobotanical information about useful plants, including medicinal ones, was being recorded. Statistical data on exported herbs started to be recorded by the Herbal Trading Center, where prevailing procedures for trading medicinal plants were also studied, providing useful information for business men and the collectors.

**Research on Medicinal Plants:** Nepal Himalaya, with globally significant and biologically diverse ecosystems produces a wide range of unique and valuable medicinal plants. It is expected the country is the home of more than 7000 higher plant species. Of the total species, 10 percent is said to be (and is cited everywhere) medicinal and aromatic. In this regards, M. L. Banerji's work is pioneer; in 1955, he published a paper on medicinal and food value plants of eastern Nepal. In that paper, 13 plant species was described out of which 5 species were of medicinal value and 4 species were noted for their food value. Five years later, Singh (1960) reported 20 species of food plants, which were sold by villagers in Kathmandu markets. Similarly, Pandey (1964) presented a paper on Nepalese medicinal plants at a symposium in China, where he mentioned some drug plants used by local people in Nepal.

Later, Bhatt (1970) wrote a book, mentioning more than 60 medicinal plant species and few species of wild edible plants; and in the same year, Department of Medicinal Plants of Government of Nepal published 'The Medicinal Plants of Nepal' which dealt with 393 medicinal plants that were used in traditional as well as Ayurvedic medicine systems and many of them were also included in the pharmacopoeias of different countries. Later on, the list of medicinal plants occurring in Nepal was extended to over 1600 species. Recently, Baral and Kurmi (2006: ii & iii) have made and account of some 1700 plant species of medicinal uses comprising weeds, cultivated, exotic and naturalized, and also indigenous and endemic taxa.

About 60 % of the world population and 60-90 % population of developing countries rely on traditional medicine. It is estimated that 80 % Nepalese populace use traditional medicine. Similarly, populace of India, Pakistan, Sri Lanka, Bangladesh, Burma and Indonesia use the traditional medicines 80 %, 65 %, 90 %, 85 %, 60 % and 45 %, respectively (Shinwari *et al.*, 2000)

**Research on Ethno Medicinal Plant:** Curing different ailments, not from health post and nursing home services, is directly related to ethnobiological knowledge. Ethnobiology is the combination of ethnobotany and ethnozoological study. In the context of Nepal, the ethnobiological study or research is more or less in the stage of void; whereas ethnobotanical research is accounted in Nepal. The first study of a particular community was conducted by Toba (1975) on study on ethnobotany and village economy followed by Sacherer (1979) on plants used by the Sherpa community of Rolwaling near the northern border with Tibet. Thereafter after, Ratna Pustak Bhandar published a pioneer book regarding medicinal plants of Nepal (Manandhar, 1980), which mentioned for the first time 50 species of medicinal plants that were export commodities from Nepal. Coburn (1984) reported about 100 species of herbal drugs from Gurung community, of which about 50% were named scientifically and the rest in Nepali or Gurung. Since then, documentation of plant uses as medicinal and food values of different ethnic

groups are continuously being carried out (Toffin & Wiart 1985; Manandhar 1986, 1990, 1991, 1998; Shrestha 1988; Bhattrai 1989; Muller-Boker 1993; Dangol & Gurung 1991,1999; Chaudhary 1997; Nepal 1997; Siwakoti *et al.* 1997 & 2005; Siwakoti & Siwakoti 1998, 2000; Khan 1998; Basnet *et al.* 1998; Dahal 1999; Joshi *et al.* 1999*;* Rai 2003).

### 1.4 Rationale

1. Indigenous Nationalities and Ethnic Groups are using Biological Resource from the time immemorial;
2. But such Knowledge, Skill and Practices are vanishing day by day because such nowledge and Skill holders are few in numbers and new generation are not taking interest to learn it;
3. Scientifically, very little such knowledge has been documented; and
4. Nepal Government has not given priority to protect Indigenous Knowledge.

### 1.5 Statement of Problems

1. Indigenous Knowledge of the Indigenous Nationalities is vanishing;
2. Existing Indigenous Knowledge has not been recognized and documented officially; and
3. Nepal Government has not made the Access to Genetic Resources Act till to date.

### 1.6 Objectives of the Study

Having saying the statement of problems, this research project had the following three objectives:

1. Explore the existing Indigenous Knowledge, Skill and Practices of *Kirat* Nationalities associated with Biological Resources;
2. Document the Indigenous Knowledge, Practice and Skill of *Kirat* Nationalities; and,
3. Make recommendations for reorganization and documentation of Indigenous Knowledge, skills and practices associated with biological resources for registration and patent rights to *Kirat* institutions, NGOs, INGOs, and development and government agencies for reorganization and documentation of the Indigenous Knowledge, skills and practices associated with biological resources for biodiversity registration and patent rights.

### 1.7 Research questions

1. What are the existing indigenous knowledge, skill and practices of the *Kirat* Nationalities-Yakha, Limbu and Rai?
2. What are the biological resources being used by the Yakha, Limbu and Rai Nationalities?
3. What are the government policies, strategies and guidelines concerning indigenous knowledge? And what it should be?

# CHAPTER 2

## INDIGENOUS PEOPLES

Indigenous and Tribal Peoples Convention 1989 (No. 169) has laid down a broad framework for regulating the relationship between the State and IPs in a number of domains. This Convention replaced the Indigenous and Tribal Population Convention, 1957 (No. 107), the former Internatioal Labor Organisation (ILO) Convention on the subject, which remains in force in countries such as Bangladesh, India, Malawi, Pakistan and Syrian Arab Republic that has not yet ratified the Convention No 169. According to the Convention, IPs are broadly defined as 'People in independent countries who are regarded as indigenous on account of their descent from the population which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonization or the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions'. As stated by Asian Development Bank's policy on Indigenous people and poverty reduction programs, 'Indigenous people are regarded as those with a social or cultural identity distinct from the dominant or mainstream society, which makes them vulnerable to being disadvantaged in the processes of development' (cited in Plant, 2002: 7). But generally accepted definition of IPs is those who identify themselves as indigenous and who were the first inhabitants of a territory before any colonization took place.

The Indigenous and Tribal Peoples are about 5 percent of the total world's population. But about 70 percent of the world's Indigenous and Tribal Peoples live in Asia and the Pacific. In India, it is estimated that there are about 400 Scheduled Tribes totaling 60 million people, known also as *adivasi*[9], who are connected in the central and north eastern parts of the country. In Philippines it is estimated that IPs total between 12 and 15 million people, representing around 20 percent of the total population. In Sri Lanka, the *Wannyalaetto* constitute only 1 percent of the national populace. Nepal is a rich in IPs. According to the census 2001, total population of Nepal is 23,151,423. The indigenous nationalities constitute 37.2% of the total population, while the Indigenous People are claimed to be 42 percent of the population.

### 2.1 Indigenous Nationalities of Nepal

The ethnic groups of Nepal were also referred as *adivasi janajati*. The term *adivasi janajati* is made up of two words *adivasi* and *janajati*. The former word indicates the groups of people who have been living here time before the arrival of Caucasoid[10] group. The English translation of the word *janajati* is nationalities. *Janajati* or Nationalities are referred as those people living here since time immemorial.

Nepal Janajati Mahasangh was established in 1992. Soon after the formation of the Mahasang, it defined the term *janajati* as the indigenous communities or IPs (Shakya, 2007: 164). The United Nations declared the year 1993 as the year of IPs and later the decade of IPs. The Mahasangh noticed the UN declaration and sought to establish linkage with the UN action. In order to fit with the UN terminology the name of Nepal Janajati Mahasangh was renamed as Nepal Adivasi

[9] The term *adivasi*, which means ' beginning' or ' of earliest times'.
[10] There are four racial groups in Nepal, viz. Mongoloid, Caucasoid, Dravidian and Proto-Australoid.

Janajati Mahasangh (Nepal Federation of Indigenous Nationalities-NEFIN[11]). On the other hand, *adivasi janajati* became the phrase jointly used to mean the movements of indigenous nationalities (*ibid*: 163). Now the people belonging to Mongolian, Dravidian and Proto-Austroloid groups are referred as Indigenous Nationalities in Nepal.

***Box-4:*** **Situation of Indigenous Peoples in Nepal**

As the national census 2001, the state has 37.2 percent indigenous nationalities of the total population. There are 59 groups belonging to indigenous nationalities. Again, 59 indigenous nationalities comprise of minor populated groups like Bankariya, Kusunda, Chhierotan[12], Kushabadiya, Raute, Surel and other groups having more than million populations, for example, Magar, Tharu, Tamang, etc. Most of them are economically, socially, educationally and politically weak. This is due to the government's century's long deprivation policies.

It was the *Lichchhavi* rulers who for the first time in the Nepalese history introduced Hinduism in the state system. When the *Mallas* superseded the *Lichchhavi* dynasty, they made every attempt to promote Hinduism. With the help of *Brahmin* priests, the *Malla* rulers introduced *Varna* system in Nepali society and stratified people on the basis of caste structures.

Prithvi Narayan Shah (1723-1775), governed the state also by Brahman orthody. Shah Kings promoted *Chhetris* as rulers and *Brahmins* as astrologers and lawgivers. Prime Minister Junga Bahadur Rana promulgated the *Muluki Ain* (National Code) of Nepal in 1854. That legal provision was abolished in 1963. This became one of the guiding principalities of social discrimination which institutionalized social oppression. Similarly, the state used one culture, one language and one state policy as other tools to suppress indigenous nationalities. As a result, IPs is marginalized in political, economic, social, cultural and educational sectors. That's why, IPs have lost their culture, language and land, and are at the verge of extinction due to Hindu culture, and socio-political domination and now many IPs are in confusion as some of them have adopted Hindu rites while some retain the traditional cultures. Consequently, they have fallen far behind as in the government employee. During 2001 and 2002, Bhrahmans / Chhetri, Newar and *adivasi/janjati* were 87.0 per cent, 8.7 percent and 0.5 per cent, respectively as gazetted third class officers (Yadav, 2007:114).

Now elected government has been formed after the Peoples' Movement II, the marginalized groups, including IPs, are still excluded from the main decision making process. Yadav argues (2007: 116) Brahmans and Chhetri are going to excessively dominate the civil service for at least next 30 to 35 years in the country unless a major restructuring in civil service is done. This is due to deprivation of education opportunities systems because a large number of IPs and ethnic group students aged populace are still far behind in contest to Brahman and Chhetri. So, they are not in a position to compete with the high caste individuals enjoying state protection.

Since February 7, 2002, 59 ethnic groups are recognized as Indigenous Nationalities of Nepal; and they refer to those ethnic groups that have their own distinct language, different cultures, and historical territories they existed prior to the formation of modern Nation-State by the new comers. As Caucasoid, they don't belong to Hindu Varna and caste hierarchy. The census sets the total indigenous nationalities population is 8.4 million, constituting 37.2 percent of the total population.

[11] Among 59 Indigenous Naitonalities, 54 are affiliated with NEFIN (Kusunda, Raute, Bankaria, Free and Chierottan are not affiliated)

[12] According to NEFIN, Nowdays this Nationality does not exist (also free Nationality)

**Table 1: Categories of Indigenous Nationalities of Nepal**

| SN | Name | SN | Name | SN | Name |
|---|---|---|---|---|---|
| | | | **A. Endangered Group** | | |
| 1 | Kusunda | 2 | Bankariya | 3 | Raute |
| 4 | Surel | 5 | Hayu | 6 | Raji |
| 7 | Kisan | 8 | Lepcha | 9 | Meche |
| 10 | Kusbadiya | | | | |
| | | | **B. Highly Marginalized** | | |
| 11 | Majhi | 12 | Siya | 13 | Lohmi (Shingsawa) |
| 14 | Thudam | 15 | Dhanuk | 16 | Chepang |
| 17 | Satar (Santhal) | 18 | Jhangar (Urau) | 19 | Thami |
| 20 | Bote | 21 | Danuwar | 22 | Baramu |
| | | | **C. Marginalized Group** | | |
| 23 | Sunuwar | 24 | Tharu | 25 | Tamang |
| 26 | Bhujel | 27 | Kumal | 28 | Rajbansi |
| 29 | Gangai | 30 | Dhimal | 31 | Bhote |
| 32 | Darai | 33 | Tajpuria | 34 | Pahari |
| 35 | Topkegola | 36 | Dolpo | 37 | Free |
| 38 | Mugali | 39 | Larke | 40 | Lohpa (Lhopa) |
| 41 | Dura | 42 | Walung | | |
| | | | **D. Disadvantaged Group** | | |
| 43 | Chhairotan | 44 | Tangbe | 45 | Tingaule Thakali |
| 46 | Baragaule | 47 | Marphali Thakali | 48 | Gurung |
| 49 | Magar | 50 | Rai | 51 | Limbu |
| 52 | Sherpa | 53 | Yakha | 54 | Chhantyal |
| 55 | Jirel | 56 | Byansi (Sauka) | 57 | Yolmo |
| | | | **E. Advantaged Group** | | |
| 58 | Newar | 59 | Thakali | | |

Source: National Foundation for Development of Indigenous Nationalities Act 2001.

On the basis of geography, these Indigenous Nationalities are grouped in to 4 categories namely Mountain, Hill, Inner Tarai and Tarai Nationalities (Table 3). Further more, NEFIN has used some indicators to Indigenous Nationalities such as literacy rate, housing unit, land holding, education, population size to categorize these Indigenous Nationalities and has made five groups, which are given in Table 1.

The Kirati, who were once the dominant political and cultural force in Nepal and ruled over the Kathmandu Valley in the time of Buddha, are generally believed to have been the progenitors of various presently Tibeto-Burman peoples (Davids & van. Driem, 1985: 117). Although Kirati

influence was once wide-spread in central Nepal, most present day, they live in eastern Nepal. Rai, Limbu, Yakha and Sunuwar have common racial and linguistic origins as well as a body of oral tradition which show traces of common ancestry and identities. Now, geographically, these four nationalities belong to Hill Nationalities. Furthermore, on the basis of literacy rate, housing unit, land holding status and economic assets, they belong to Disadvantaged and Marginalized Groups.

According to the 2001 census, total population of *Kirat* was 4.86 percent (Rai 2.79 per cent, Limbu 1.58 per cent, Sunuwar 0.42 percent and Yakha 0.07 per cent). These four indigenous nationalities are main followers of *Kirat* religion and known as core *Kirat* Nationalities. There are other such 12 Indigenous Nationalities which are known as peripheral *Kirat* Nationalities (Table 2). *Kirat* religion is a form of animistic traditions, a belief that all objects (tree, stones, the wind, etc.) have souls.

**Table 2: Kirat Religion Followers as the census 1991 and 2001**

| SN | *Janajati* | 2001 | 1991 | SN | *Janajati* | 2001 | 1991 |
|---|---|---|---|---|---|---|---|
| 1 | Limbu | 86.3 | 51.53 | 9 | Magar | 00.2 | 0.16 |
| 2 | Rai | 70.9 | 30.13 | 10 | Sherpa | 0.2 | 0.03 |
| 4 | Yakha | 81.4 | - | 11 | Chepang | 0.2 | 0.06 |
| 3 | Sunuwar | 17.4 | 2.49 | 12 | Raji | 0.2 | 0.06 |
| 5 | Thami | 14.6 | 0.03 | 13 | Tamang | 0.1 | 0.03 |
| 6 | Lepcha | 01.1 | 0.25 | 14 | Gurung | 0.1 | 0.08 |
| 7 | Majhi | 00.9 | 0.21 | 15 | Kumal | 0.1 | 0.06 |
| 8 | Bote | 00.6 | 00.9 | 16 | Danuwar | 0.1 | 0.09 |

Source: CBS Population Census, 2001

## 2.2 National Plan and Indigenous Peoples

National Planning Commission (NPC) is the apex body for formulating development plans of the country under the directives of the National Development Council (NDC). Though, the country embarked on periodic planning as early as 1956; however until 1996, Nepal Government had no plans, policies and programs for IPs and tribal peoples of Nepal. A National Committee for Development of Nationalities was established in 1996 and the Nepalese planners introduced Indigenous people and ethnic Groups in Development Programs in the Ninth Plan (Bhattachan, 2005: 45). The programs included
in the plan were launched with the objectives of eliminating existing social disparities by improving their socio-economic condition, raising overall cultural status of the nation by undertaking research works on their cultural heritages and also to conserve them, enhance their capability through empowering them economically, socially and communally and

**Table 3: Indigenous Nationalities of Nepal According to Geographical Distribution**.

| | | | | | |
|---|---|---|---|---|---|
| **Mountain** | | | | | |
| 1 | Bara Gaunle | 7 | Lhomi(Shingsawa | 13 | Thakali |
| 2 | Bhote | 8 | Lhopa | 14 | Thudam |
| 3 | Byansi | 9 | Marphali Thakali | 15 | Tingaunle Thakali |
| 4 | Chhairotan[13] | 10 | Mugali | 16 | Topkegola |
| 5 | Dolpo | 11 | Siya | 17 | Sherpa |
| 6 | Larke | 12 | Tangbe | 18 | Walung |
| **Hill** | | | | | |
| 1 | Bankaria | 9 | Hayu | 17 | Newar |
| 2 | Baramo | 10 | Yolmo | 18 | Pahari |
| 3 | Bhujel | 11 | Jirel | 19 | Rai |
| 4 | Chepang | 12 | Kushbadia | 20 | Sunuwar |
| 5 | Chhantyal | 13 | Kusunda | 21 | Surel |
| 6 | Dura | 14 | Lepcha | 22 | Tamang |
| 7 | Free[14] | 15 | Limbu | 23 | Thami |
| 8 | Gurung | 16 | Magar | 24 | Yakha |
| **Inner Tarai** | | | | | |
| 1 | Bote | 4 | Kumal | 7 | Raute |
| 2 | Danuwar | 5 | Majhi | | |
| 3 | Darai | 6 | Raji | | |
| **Tarai** | | | | | |
| 1 | Dhanuk | 4 | Jhangad/Urau | 7 | Rajbanshi/Koch |
| 2 | Dhimal | 5 | Kisan | 8 | Satar/Santhal |
| 3 | Gangai | 6 | Meche | 9 | Tajpuri |
| 10 | Tharu | | | | |

Source: National Foundation for Development of Indigenous Nationalities Act 2001.

lastly, involving them in the nation building task through ensuring their access to resources by promoting knowledge and skill along with the modernization of their traditional occupations (Anonymous, 2002: 571).

During the **Ninth Plan (NP)**, government had conducted few notable works among the IPs, such as awareness programs was raised in the field of education, health, legal matter, sanitation and environment, culture, women awareness and ethnic groups identification. The primary leveled course books in the ethnic languages/dialects of Bantawa Rai, Kulung Rai, Limbu, Tharu, Tamang, Baramu, Magar, Gurung were written and informal classes were run using those books (ibid.: 571). Though other various programs were also conducted, IPs as a whole could not be benefited as envisioned from these programs. There were several drawbacks of the conducted programs. Mainly, the program planners were unclear for strengthening the IPs capacity because there were no national concept on skill, knowledge, technology and capacity of IPs and ethnic groups.

[13] As saying the official personnel of Nepal Federation of Indigenous Nationalities, Chhairotan and Free Indigenous Nationalities don't exist or have not found after 2001( extinct ?or mistakenly included in the census 2001).

In the **Tenth Plan**[15] (TP), consultation with IPs was done in order to formulate the plan and programs. Main goal of the plan was to provide development opportunities by empowering disadvantaged groups, like the IPs who were not involved in the development process. The plan had incorporated the following strategies and working policies for IPs and ethnic groups.

**Strategies**

1. Assist to create an egalitarian society by making all-round development of indigenous people and ethnic groups through the programs related to social, educational, economic and cultural development as well as uplift IPs and ethnic groups.
2. Protect and promote the language, scripts, culture/literature, art, history of IPs and ethnic groups.
3. Protect and promote traditional skill, technology and specialization knowledge and assist to utilize them in commercial groups.
4. IPs and ethnic groups will be made partners in the mainstream of overall development by fostering good relationship, goodwill and respect among the various IPs, ethnic groups, caste and communities.

**Working Policies:**

**All -round development egalitarian society (Related to strategy 1**)

- Arrangement will be made to implement the on-going target programs of IPs and ethnic groups, making necessary structural and institutional reforms effective.
- Priority will be given to persons of highly backward and endangered IPs and ethnic groups for admission in technical and non-technical subjects under higher education. Similarly, the scholarship program will be extended for the children of that community in schools and it will be made effective.
- Priority will be given to establish schools and health posts for that community and areas to increase their access to education and health care system.
- In order to make active participation in the development activities, awareness among economically backward IPs/ethnic communities in the matter of education, health, economic and social will be increased. The employment and profession oriented programs will be implemented with the intention of minimizing economic and social imbalance existing between the IPs/ethnic groups and the advanced ethnic communities.
- Women of IPs/ethnic groups will be empowered by extending women development programs.
- The capacity of women of IPs/ethnic groups will be empowered by extending women development programs.
- The capacity of women of IPs/ethnic groups will be developed by providing legal protection of their traditional development friendly rights.
- Mandatory arrangement will be made to analyze the status of IPs/ethnic groups of the district at the time of formulation of district plan by the local institutions particularly District Development Committee.

**Conservation of cultural heritage (Related to strategy 2)**

[15] Tenth Plan period 2002-2007

- Steps will be taken to establish model village or museums to enable the identification of multi-lingual, multi-religious, multi--culture of the country.

**Traditional skills and specialization (Related to strategy 3)**

- IPs and ethnic groups will be made partners in the process of national development through conducting research, conservation and promotion of diverse culture, language, knowledge and skills inherent in them.
- The National Academy for Development of Indigenous Nationalities Act, 2058 BS with the objectives of protecting the rights of indigenous people and ethnic groups as well as protection and conservation of their culture, language and diverse knowledge has been promulgated. The Academy will be established and strengthened.

**Mainstreaming (Related to strategy 4)**

- IPs and ethnic groups will be empowered through decentralization, local community development, human resources development and mobilization, efforts of poverty alleviation and lingual and cultural institutions.
- The programs of various agencies of Nepal Government will be targeted to those groups and to those areas where majority of IPs and ethnic groups reside. Special arrangements will be made for monitoring and evaluation of investment programs launched by the non-government organizations to uplift IPs and ethnic groups.

Duration of the plan period, NEFIN carried out an Janajati Empowerment Project (JEP), which helped highly marginalized and endangered groups to raise their capacity and the means of livelihood to some extent (Anonymous, 2007: 120); however, on the whole IPs and ethnic groups obtained very little of worth, as mentioned in the Tenth Plan for the following main reasons:

- Even though there were targeted programs, they couldn't be implemented due to lack of adequate resource allocation.
- There was no practice of properly addressing the interest and needs of IPs and ethnic groups leading lackluster or undistinguished performance.
- As there was no positive discrimination and the laws favoring reservation for IPs and ethnic groups to access the services and facilities as prescribed.
- Due to countrywide political instability, armed conflict, absence of elective local government institution, priority issues of IPs and ethnic group's remained unattended.
- There was no proper module for databases and no tradition of keeping important information regarding IPs and ethnic groups; their issues, therefore, went unnoticed for priority actions.
- Appropriate programs and budget resources to deal with the education, health reform and preservation of languages and cultural heritage of endangered, marginalized and the highly marginalized and disadvantaged groups were lacking.
- There was no clear-cut policy directed to progressively identify the valued traditional skill, technical knowledge, language and inherent capabilities of IPs and ethnic groups.

Now **Three Year Interim Plan** (TYIP) (2007/08-2009/10) is operating. This Interim Plan is elaborated and appreciable than the Tenth Plan for IPs and ethnic groups' perspective. In the Tenth Plan IPs and ethnic groups related subject matter were mainly carried on in chapter 29, entitled *IPs and ethnic groups* but in TYIP, IPs and ethnic groups related subject matters have

been mentioned especially in chapter 8 (Gender Mainstreaming and Inclusion), and also in chapter 9 (Agriculture) and chapter 12 (Forest and Soil Conservation). The TYIP has incorporated the following strategies, Policy and Working Policies and Major programs for IPs and ethnic groups (Anonymous, 2007: 122-124).

**Strategies**

1. Reform of existing state structure, laws and policies which present hindrances to the promotion of interests of *Adivasi Janajati* or frame new ones as appropriate.
2. Work towards enhancing the traditional and indigenous organizations for empowerment to gradually enable them to participate in the development process.
3. Programs targeted to *Adivasi Janajati* needs would be carried out to minimize poverty of endangered, highly marginalized and disadvantaged groups.
4. Physical infrastructure will be built as quickly as possible in areas where *Adivasi Janajati* live in majority to improve their conditions of life.
5. Human resources of *Adivasi Janajati* will be gradually developed by improving their social conditions by applying the principle of positive discrimination.
6. Languages, religions and cultures of *Adivasi Janajati,* which exist as national heritage, will be preserved and promoted by developing a National Culture Policy.

**Policy and Working Policies**

- In education, a tri-lingual policy will be formulated and implemented, and multi-lingual education will be promoted
- Measures will be taken for ensuring proportional representation of indigenous women.
- *Adivasi Janajati* will be organized and strengthened.
- Capability of indigenous and traditional institutions will be enhanced and integrated in development partnership.
- For the benefit of endangered, highly marginalized, marginalized and disadvantaged groups, specifically targeted programs will be taken up.
- Marginalized and disadvantaged *Adivasi Janajati* will be encouraged to open industry, trade and banking businesses by following the principle of positive discrimination.
- Appropriate measures to increase access to natural resources like water, land, forest and mines of *Adivasi Janajati* will be taken.
- It will be made mandatory for local level agencies to allocate budget resource to promote economic and cultural values of *Adivasi Janajati.*
- Local agencies will be mobilized to build physical infrastructure in the *Adivasi Janajati* concentrated localities. In their localities of remote areas, important infrastructures like foot trail/road, electricity and effective communication links will be developed.
- To raise the education standard of *Adivasi Janajati*, compulsory and free education with incentives up to secondary level will be arranged.
- For the human resource development of *Adivasi Janajati*, seats in higher education including higher technical education will be reserved by applying the principle of positive discrimination.
- There will be health post/centers in the localities of *Adivasi Janajati* to provide health services. To increase their awareness about the values of good health, sanitation and environment protection, information and communication materials will be published in their native languages for distribution.

- There will be a master plan ready for the preservation and promotion of languages and cultures of *Adivasi Janajati* and that will be carried progressively.
- Measures to use traditionally written forms of mother languages as medium of instructions and government business transactions will be taken. Such measures will also include the use of mother languages for the statement in course of proceedings of courts of justice.

**State Machinery and Policies**

- Policies and laws related to the *Adivasi Janajati* will be reviewed, reformed and/or new ones made.
- A tri-lingual medium including Nepali as a link language and English as international language, mother languages of *Adivasi Janjati will* be the medium of instructions. A policy to this end will be formulated and applied.
- A policy of giving priority to the indigenous women and men in employment opportunities available in the government/nongovernmental sectors and in their programs will be worked out.
- Existing laws and policies that contradict with the provision of the International Labor Organization Convention No. 169 will be identified and so amended.
- Necessary steps will be taken to guarantee the rights of the *Adivasi Janjati* as per the United Nations Declaration on the Rights of *Adivasi Janjati.*
- Appropriate measures will be taken to increase the access of *Adivasi Janjati* to the natural resources like water, land, forest and mines of Adivasi Janajati will be taken. In the conservation and promotion works of natural resources, local *Adivasi Janjati* will be given priority.
- Policies and rules will be formulated as appropriate to the development of occupation and skills of *Adivasi Janjati*, and for providing loans on easy terms.
- Necessary initiatives to provide teacher posts for *Adivasi Janjati* who are proficient in Nepali as well as in their own mother languages will be taken.
- Appropriate law will be formed to admit traditionally written form of indigenous language for the regional and local level government transactions, and to entitle *Adivasi Janjati* to receive allegation form and to submit statement to the court of justice in their mother languages will be enacted.
- Necessary steps will be taken to admit mother language for taking qualifying examinations for the posts of non-gazetted level.

## 2.3 Indigenous People and Interim Constitution 2007

The Interim Constitution (IC) 2007 is the fundamental law of Nepal. It was publicized on 15 January 2007. Since then several amendments have been done to the IC 2007. On 13 July 2008, the Constitution Assembly (CA) passed its Fifth Amendment. In the article **154,** IPs and ethnic groups' related matter has been incorporated under miscellaneous heading of chapter 22. This article is related to the Formation of Commission to safeguard and promote the rights and interest of different sectors of the country including women, Dalits, IPs and ethnic groups (*Adivasi Janajati)*, Madeshi, disabled, laborers or farmers. This article says 'the provisions for the formation, function, duties and powers of such commission shall be determined by the law'. The article 35 (18) of chapter 4 has also described 'the state shall pursue a policy regarding TK, skill and practice existing in the country by identifying and protecting them'.

Nepal's caste system is a part of the caste system of the Indian sub-continent that originated thousands of years ago. Action Aid, Nepal's study findings on caste based discrimination, including untouchability, in Nepal. Altogether 205 existing practices of caste-based discrimination were identified in the eight sample sites[16]. The article number 33 (n) of the Interim Constitutes is related to discriminative laws, which states to repeal all discriminatory laws.

[16] A report entitled *Caste Based Discrimination in Nepal*, prepared for Indian Institute of Dalit Studies , Delhi and International Dalit Solidarity Network, Copenhagen, by Krishna B. Bhattachan and Yasso Kranti Bhattachan

# CHAPTER 3

## LITERATURE REVIEWS ON CONVENTIONS, TREATIES, LAWS, AGREEMENTS REGARDING IK AND ON SOCIAL EXCLUSION

### 3.1 International Instruments

IK has been globally recognized to be of great value for the conservation and sustainable use of biological diversity, whose contribution for meeting the medicinal requirements of Indigenous and local communities and also in food, fiber etc. has been well documented. Such knowledge and practices have also benefited other communities outside the local domain. Multinational Corporations engaged in the plant breeding, manufacturing pharmaceutical and biotechnology have used the IK for the purpose of maximum profits. There is a significant cultural variation between Indigenous or traditional communities and so-called modern communities in the way they view this subject matter. While IK in traditional communities is mostly in public domain, i.e., freely accessible, the modern community, however, which has not made any significant contribution for the preservation of such knowledge, have been using them for their own benefits and patent them for obtaining proprietary rights. This act directly affects the notion of private property over these knowledge systems. (Anonymus, 2005a: 5)

Realizing the immense contribution of local communities throughout the world for maintaining IK for various useful purposes and need to prevent their misappropriation, the international community has been propelled to make and explicit reference to this issue during United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992, and has made international instrument for achieving rights for Indigenous Peoples.

***Box-5:*** **Legal Problems in Indigenous Nationalities Issues in Nepal**

On the basis of impact of the provisions of prevailing Nepalese laws on Indigenous Nationalities, the following problems and issues have been identifies:

- Discriminatory laws and decisions;
- Exclusion of Indigenous Nationalities in judicial administration;
- Double standard between Indigenous Nationalities and non-Indigenous Nationalities on legislation and in practice;
- Preferential treatment given to Khas Hindus and to issues related to their identities in laws, policies and in practice at the cost of negatively affecting the non-Hindus;
- Absence of full recognition of the human rights and fundamental freedoms of Indigenous Nationalities;
- Lack of access to justice for Indigenous Nationalities;
- Absence of the right to fair hearing given that Khas-Nepali is the language of official use.

Source: Limbu (2005: 47)

#### 3.1.1 Convention on Biological Diversity

In Earth Summit in Rio de Janeiro in 1992, the CBD was opened for signature at the UNCED. Nepal Government signed on CBD on 12 June 1992, ratified on 15th September 1993, and became a party to the convention on 21st February 1994 (Anonymous, 2006: iv). MoFSC serves as the national focal point to this convention. In accordance with the Article 26 of the CBD, in

2006, Nepal Government published 'Nepal Third National Report to the Convention on Biological Diversity'.

Internationally, the CBD entered into force by December 1993, which is the first attempt of the international community to provide a legal framework for conservation and sustainable use of the genetic resources in addition to addressing concerns of equity. The convention is also intended to promote the services to the communities involved in creation and conservation of biological resources, in the form of adequate reward and compensation and as an incentive to continue conservation.

***Box -6:*** **Equitable Sharing Benefits**

The convention endorses rights of local people, which harbor those biological diversity in article 8(j). This article is related to the provision, on the respect, preservation and maintenance of knowledge, innovation and practice of indigenous and local communities. The article assures the equitable sharing of benefits to the local communities that come from utilization of indigenous or local knowledge. The article 8(j) mentions that subjected to national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and promote their wider application with the approval and involvement of the holders of such knowledge, innovation and practices and encourage the equitable sharing to the benefits arising from the utilization of such knowledge, innovation and practices.

But now it has been one of the hard-negotiated international treaties, which has addressed the issues of IPs and biodiversity, where the local communities are recognized as developer and protector of tremendous knowledge related with conservation and use of biological diversity. The CBD has also recognized rights of those nation and communities who have been protecting that biological diversity. At present, a total of 191 countries have signed on it. The international society for ethnobiology identified a code of conduct addressing these issues as early as in 1988. Thereafter, with the advent of the CBD in 1992 came the recognition of the need to respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying the traditional lifestyles relevant for the conservation and sustainable use of biological diversity.

Perhaps the best evidence of the Conventions' comprehensiveness is found in article 1, which outlines the convention's objectives (Burhenne-Guilmin & Glowka, 1994: 16). The objectives of the convention are firstly the conservation of biodiversity at the genetic, species and ecosystem levels and secondly the sustainable use of its components. Third and most important one is the fair and equitable sharing of benefits derived from the uses of genetic resources and by appropriate transfer of technologies, taking into account all rights over those resources and to technologies, and by appropriate funding. The second and the third objectives are the recognition of the indigenous knowledge or traditional knowledge importance by the international community to establish their rights on it.

***Box -7:*** **Access of Benefit Sharing Law**

The Bonn Guidelines, adopted in April 2002, provide voluntary guidance for the CBD's contracting Parties regarding their obligation on Access to Genetic Resources and Fair and Equitable Sharing of

the Benefits arising out of the resource utilization (Laird *et al*. 2003: 13). These Guidelines provide operational guidance for 'users and providers' of genetic resources, to assist governments drafting national laws, and to guide government, communities, companies, researchers and other involved in Access to Benefit Sharing (ABS)agreements. The Guidelines recognize the need of flexibility of application, that each country is a provider and user of genetic resources, and that the Guidelines may be used in the development of national ABS strategies.

The convention also has recognized rights of the countries in its article 3 entitled ' Principle'. According with the treaty and the principles of international law, the states have the sovereign right to exploit their own resources pursuant to their own environmental policies and responsibilities to ensure that activities within their jurisdiction or control do not cause damage to the environment of the other states o areas beyond the limits of national directions.

### 3.1.2 ILO Convention No. 169 (Concerning Indigenous and Tribal Peoples in Independent countries)

ILO Convention 169 is the only binding international legal instrument for protecting the rights of Indigenous and Tribal Peoples. The instrument was adopted on 7 June 1989 by an overwhelming majority at the 76th Governing Body of the ILO. The Convention is based on the principle that Indigenous Peoples have the right to control their own development and institution concerning them, on the principle of recognizing their distinct identities as Indigenous Peoples.

According to Article 1, this Convention applies to:

- Those Tribal peoples in independent countries whose social, cultural and economic conditions distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations;
- Peoples in independent countries who are regarded as indigenous on account of their descent from the populations which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonization or the establishment of present State boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions.
- Self-identification as indigenous or tribal shall be regarded as a fundamental criterion for determining the groups to which the provisions of this Convention apply.

As stated in Article 23, handicrafts, rural and community-based industries, and subsistence economy and traditional activities of the peoples concerned, such as hunting, fishing, trapping and gathering, shall be recognized as important factors in the maintenance of their cultures and in their economic self-reliance and development. Governments shall, with the participation of these peoples and whenever appropriate, ensure that these activities are strengthened and promoted.

Upon the request of the peoples concerned, appropriate technical and financial assistance shall be provided wherever possible, taking into account the traditional technologies and cultural characteristics of these peoples, as well as the importance of sustainable and equitable development.

As stated in Article 38, the Convention shall be binding only upon those Members of the International Labor Organization whose ratifications have been registered with the Director-General. It shall come into force twelve months after the date on which the ratifications of two Members have been registered with the Director-General. Thereafter, this Convention shall come into force for any Member twelve months after the date on which its ratification has been registered.

As stated in Article 39, a member which has ratified this Convention may denounce it after the expiration of ten years from the date on which the Convention first comes into force, by an act communicated to the Director-General of the International Labor Office for registration. Such denunciation shall not take effect until one year after the date on which it is registered.

Each Member which has ratified this Convention and which does not, within the year following the expiration of the period of ten years mentioned in the preceding paragraph, exercise the right of denunciation provided for in this Article, will be bound for another period of ten years and, thereafter, may denounce this Convention at the expiration of each period of ten years under the terms provided for in this Article.

Former Nepal Government parliament member, Mr. Bijaya Subba nominated a conventional proposal 'sankalpa prastav' in the parliament regarding ILO Convention No. 169 on 12 August 2006. He was supported by former parliament members Mr. Romi Gauchan (Mustang), Mr. Prakash Bahadur Gurung (Kaski-3) and Mr. Nawa Raj Subedi (Pyuthan-2). Nepal Government ratified that convention on 22 August 2007 and the ratification step is equivalent to the *Nepal Treaty Act 1990*. The ratification was registered to the Director General Office of ILO on 14 September 2007.

### 3.1.3 International Day and Decade of Indigenous People

The United Nations General Assembly on 23 December 1994 designated 9 August to be observed as the 'International Day of the World's Indigenous People' every year during the International Decade of the World's Indigenous Peoples. The date marks the day of the first meeting in 1982 of the Working Group of Indigenous Populations of the sub commission on Prevention of Discrimination and Protection of Minorities of the Commission on Human Rights. Objectives of this day are:

- Celebrate the diversity and richness of different Indigenous cultures in the world;
- Strengthen international cooperation regarding Indigenous peoples;
- Draw States' attention to the severe cultural, economic, social, legal and environmental problems affecting Indigenous communities;
- Promote actions in support of Indigenous Peoples to ensure respect of their fundamental rights.

In late 1993, following a recommendation by the World Conference on Human Rights, the General Assembly proclaimed the International Decade of the World's Indigenous People (1995-2004). Later, the General Assembly decided that the theme of the Decade would be 'Indigenous People: Partnership in Action'. The goal of the Decade is to foster international cooperation to help and solve problems faced by indigenous peoples in such areas as human rights, culture, the

environment, development, education and health. On 22 December 2004, the General Assembly of UN adopted a Resolution (A/RES/59/174) for a Second International Decade, which commenced on 1 January 2005. The second decade has the following five objectives:

- Promoting non-discrimination and inclusion of indigenous peoples in the design, implementation and evaluation of international, regional and national processes regarding laws, policies, resources, programs and projects;
- Promoting full and effective participation of indigenous peoples in decisions which directly or indirectly affect their lifestyles, traditional lands and territories, their cultural integrity as indigenous peoples with collective rights or any other aspect of their lives, considering the principle of free, prior and informed consent;
- Redefining development policies that depart from a vision of equity and that are culturally appropriate, including respect for the cultural and linguistic diversity of indigenous peoples;
- Adopting targeted policies, programs, projects and budgets for the development of indigenous peoples, including concrete benchmarks, and particular emphasis on indigenous women, children and youth;
- Developing strong monitoring mechanisms and enhancing accountability at the international, regional and particularly the national level, regarding the implementation of legal policy and operational frameworks for the protection of indigenous peoples and the improvement of their lives.

### 3.1.4 International Treaty on Plant Genetic Resources

The International Treaty on Plant and Genetic Resources for Food and Agriculture (ITPGRFA) was approved by the UN Food and Agriculture Organization (FAO) Conference held on 3 November 2001. The Treaty came into force on 29 June 2004. This legally-binding Treaty covers all plant genetic resources relevant for food and agriculture, and is also related to the objectives of the CBD.

The objectives of ITPGRFA are the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of benefits derived from their use, in harmony with the Convention on Biological Diversity, for sustainable agriculture and food security. Through the Treaty, countries agree to establish an efficient, effective and transparent Multilateral System to facilitate access to plant genetic resources for food and agriculture, and to share the benefits in a fair and equitable way. The Multilateral System applies to over 64 major crops and forages. The Governing Body of the Treaty, which will be composed of the countries that have ratified it, will set out the conditions for access and benefit-sharing in a "Material Transfer Agreement".

Resources may be obtained from the Multilateral System for utilization and conservation in research, breeding and training. When a commercial product is developed using these resources, the Treaty provides for payment of an equitable share of the resulting monetary benefits, if this product may not be used without restriction by others for further research and breeding. If others may use it, payment is voluntary. The Treaty provides for sharing the benefits of using plant genetic resources for food and agriculture through information-exchange, access to and the transfer of technology, and capacity-building. It also foresees a funding strategy to mobilize funds for activities, plans and programs that help, above all, small farmers in developing

countries. This funding strategy also includes the share of the monetary benefits paid under the Multilateral System.

The Treaty recognizes the enormous contribution that farmers and their communities have made and continue to make to the conservation and development of plant genetic resources. This is the basis for Farmers' Rights, which include the protection of traditional knowledge, and the rights to participate equitably in benefit-sharing and in national decision-making about plant genetic resources. It gives governments the responsibility for implementing these rights.

### 3.1.5 TRIPs Agreement

Intellectual property rights (IPRs) are the rights given to persons over the creations of their minds. IPRs is concerned with Trade Related Aspects and used in the joint term as the Trade Related Aspects of Intellectual Property Rights (TRIPs). The TRIPs Agreements[17] is an International Agreement administered by the World Trade Organization (WTO) that sets down minimum standards for many forms of intellectual property regulation. It was negotiated at the end of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994. Now TRIPs is an integral part of the WTO.

The standards set out in the Agreement must be available to all of the WTO member countries, either by enactment of new legislation or by amendment of existing national laws. The Standards thus enacted and enforced must be provided on the basis of Most-Favored

***Box – 8:*** **Who benefits from the Treaty and how?**

All benefit, in many ways:

- Farmers and their communities, through Farmers' Rights;
- Consumers, because of a greater variety of foods, and of agriculture products, as well as increased food security;
- The scientific community, through access to the plant genetic resources crucial for research and plant breeding;
- International Agricultural Research Centers, whose collections the Treaty puts on a safe and long-term legal footing;
- Both the public and private sectors, which are assured access to a wide range of genetic diversity for agricultural development; and
- The environment, and future generations, because the Treaty will help conserve the genetic diversity necessary to face unpredictable environmental changes, and future human needs.

Nation and National Treatment (Article 3 & 4). Its interpretation with regard to the protection of IP outlines that each member nation of the WTO must accord to the nationalities of its own nation. Furthermore, any privilege or immunity (as regards the protection of IP) granted to any one nation of its nationalities must be granted to all the nation states and their nationals. Therefore, discrimination between the nationalities of one and the national of other Members is forbidden.

[17] Its inclusion was the culmination of a program of intense lobbying by the United States, supported by the European Union, Japan and other developed nations.

The TRIPs Agreement incorporates and extends to all the WTO Members substantive obligations of the main WIPO conventions, the Berne and Paris Conventions on copyright and industrial property, respectively[18]. It goes beyond these three conventions in setting standards on categories of IPRs where they were lacking (e.g., patents) and setting discipline relating to the enforcement of IPRs. One of the major achievements of the TRIPs Agreement is incorporation of an effective dispute settlement mechanism[19].

The Agreement requires that the Members provide within their national laws effective procedures and remedies for the enforcement of rights to the holders of those rights. TRIPs Agreement is the most contentious agreement within the WTO and patent is the murkiest area.[20]

**Table 4: Conflicting IPR Provisions of TRIPs Agreement and CBD**

| CBD Provisions | TRIPs Conditions | Contradictions |
|---|---|---|
| Nation states have sovereign public rights over their biological resources. | Biological resources should be subject to private intellectual property rights. | National sovereignty implies that countries have the rights to prohibit IPRs on life forms (biological resources). TRIPs overlooks these rights by requiring the provision of IPRs on micro-organisms, non-biological and microbiological process, as well as patents and/or suit generis protection on plant varieties. |
| The use of exploitation of biological resources must give rise to equitably shared benefits. | Patent must be provided for all fields of technology, therefore the use or exploitation of biological resources must be protected by IPR. There is no mechanism for sharing benefits between a patent holder is one country and the donor of material in another country from which the invention is derived. | CBD gives developing countries a legal basis to demand a share of benefits. TRIPs negate that legal authority. |
| The use or exploitation of traditional knowledge, innovations and practices relevant to the use of biodiversity must give rise to equitable shared benefits. | Patent must be provided for all fields of technology, therefore the use or exploitation of biological resources must be protected by IPR. There is no mechanism for sharing benefits between a patent holder is one country and the donor of material in another country from which the invention/resource is derived. | CBD gives developing countries a legal basis to demand a share of benefits. TRIPs negate that legal authority. |
| Access to biological resources requires the prior informed consent of the country of origin. It also require the | There is no provision requiring prior informed consent for access to biological resources, which may subsequently protected by IPR. | CBD now gives states legal authority to diminish the incidence of biopiracy by requiring prior informed consent. TRIPs ignore this authority and thus promote biopiracy. |

[18] Due to this TRIPs Agreement is often referred to as Berne, Paris plus Agreement.

[19] As cited in the report of IUCN Nepal (February 2005) regarding Legal and Policy Review for Documentation and Registration of Tradtional Knowledge in Nepal.

[20] CUTS (1997), TRIPs Biotechnology & Global Competition, Research Report, 9709. Consumer Unity and Trust Society, Jaipur.

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| 'approval and involvement' of local communities. | | |
| States should be responsible for the conservation and sustainable use of biodiversity as a common concern of humankind taking into account all rights over biological resources. | The safeguarding of public health and nutrition, and the public interest in general, shall be subject to the private interest of IPR holders as reflected in the provisions of the TRIPs Agreement. | CBD places the public interest and common good over private property and vested interest. TRIPs do the exact opposite. |

Source: Anonymous (2005a: 11)

### 3.2 Role of International Institutes

The issue of IK has been addressed by in several international institutions. Among them, United Nations' Environmental Program (UNEP)/CBD, WIPO, United Nations Concerence on Trade and Development (UNCTAD) and WTO are important. WIPO and UNEP undertook joint case studies on the role of IPRs in benefit sharing from the use of IK and associated biological resources, and FAO and CBD Secretariat regularly cooperate on issues of common interest in agriculture.

**United Nations Environment Program** is UN agency to coordinate international measures for environmental protection. Its main centre is at Nairobi, Kenya. UNEP is working in implantation of article 8(j) of CBD. In June 1999, the Inter-Session Meeting on the Operation of the Convention explored options for access and benefit sharing mechanisms. In this context, relationship between IPRs, the TRIPs Agreement and the CBD were studied. The meeting recognized the need to enjure mutual supportiveness between the TRIPs Agreement and the CBD and recommended that to Conference of the Parties (COP)-5 transmit its finding on Article 8 (j) to the WTO and WIPO. It also recommended to COP-5 to invite the WTO to acknowledge relevant provisions of the CBD and to make into account that the objectives of the TRIPs Agreement and the CBD are interrelated.

A panel of experts on access and benefit sharing was set up and held its first meeting in 1999 focusing on mutually agreed terms and contractual approaches to IPRs and the relationship between the TRIPs Agreement and the CBD were discussed under Item 23 of the provisional Agenda - Access to Genetic Resources- at COP-5 in Nairobi, 15-26 May 2000. The COP adopted a decision on access to genetic resources containing three sections:

a. Access and benefit sharing arrangements;
b. Relationship between IPRs and the TRIPs Agreements; and
c. *Ex-situ* collections acquired prior to the CBD's entry into force and not addressed by the FAO Commission on Genetic Resources for Food and Agriculture.

**WIPO** is a specialized agency of the United Nations. It is dedicated to developing a balanced and accessible international IP system, which rewards creativity, stimulates innovation and contributes to economic development while safeguarding the public interest.

WIPO was established by the WIPO Convention in 1967 with a mandate from its Member States to promote the protection of IP throughout the world through cooperation among states and in collaboration with other international organizations. Its headquarters are in Geneva, Switzerland. WIPO's vision is that IP is an important tool for the economic, social and cultural development of all countries. This shapes its mission to promote the effective use and protection of IP worldwide. Strategic goals are set out in a four yearly Medium Term Plan and refined in the biennial Program and Budget document.

Since 1998, WIPO has undertaken a program that explore emerging IP issues. As cited by Walker (2002), the program of WIPO for 2000/2001, among others, covered protection of IP, innovations and creativity - including commissioning a study on customary law and regulatory systems that apply to the protection of informal knowledge; commissioning a feasibility study on the use of IP law or practice to protect informal knowledge; and organizing an annual Round Table on the protection of IK for the holders of such knowledge.

**Food and Agriculture Organization (FAO)** is an autonomous agency within United Nations System which was founded in October 1945 with a mandate to raise levels of nutrition and standards of living, to improve agricultural productivity, and to better the condition of rural populations. The protection of IK/TK was also raised by FAO in relation to the definition and implementation of the concept of Farmers' Right introduced during the revision of the International Undertaking on Plant Genetic Resources for Food and Agriculture, which began in 1994.

After seven years negotiations, the FAO Conference (through Resolution 3/2001) adopted the ITPGRFA in November 2001 which relates more or less with Article 8 (j) of the CBD but it is narrower in the sense that it would not apply, for instance, to knowledge relating to medicinal or industrial uses of plant genetic resources. Under this approach, the issue of protection of IK/TK may be circumscribed to knowledge incorporated in farmers' varieties (land races) and certain associated knowledge (e.g., specific cultivation practices).

**United Nations Conference on Trade and Development (UNCTAD)** was held in Geneva in 1964 to address the growing concerns of developing countries in international trade. A meeting was held entitled 'Expert Meeting on System and National Experiences for Protecting IK or TK Innovations and Practices' from 30 October to 1 November 2000. Over 250 people from 80 countries participated, including representatives of government, indigenous groups, NGOs, Inter-Government Organizations, academia, private companies, and international agencies and 50 papers on country experience were presented.

UNCTAD's Commission on Trade in Goods and Services took up the meeting's outcome, which reflected the diversity of views of experts, in February 2001, and Commodities, which negotiated agreed recommendations to government, to the international community, and to the UNCTAD. The above 'Expert Meeting...Practices' did the recommendations to governments that included awareness program for protection of IK or TK, to support the innovation potential of local and indigenous communities, to facilitate the documentation of IK or TK and to promote the commercialization of IK or TK based products.

**World Trade Organization** is the only global international organization dealing with the rules of trade between nations. At its heart are the WTO agreements, negotiated and signed by the bulk of the world's trading nations and ratified in their parliaments. The goal is to help producers of goods and services, exporters, and importers conduct their business.

According to the WTO rules, only Member States and accredited observes are only allowed to participate in the WTO deliberations, local and indigenous communities (who are indeed the key stakeholders in the process) may only influence them through their respective governments.

The Council of TRIPs of the WTO is an important forum for the discussion of IPRs, biodiversity and the TK issues, particularly in the context of the review of the article 27.3(b). However, the CBD Secretariat has not yet been given permanent observer status to the Council of TRIPs (Anonymous, 2005a: 21). Various countries have made submissions about the review of Article 27.3 (b), which in some cases includes suggestions related to IK or TK. The relationship between the TRIPs Agreement and the CBD has been addressed by the Secretariat of The WTO. Further, as per the mandate provided by the Doha Ministerial Declaration, the TRIPs Council also conducted some work on this issue.

### 3.3 Legislation Review

India and many other countries have made the national legislation regarding the IK and benefit sharing. To some extent, the experience of these countries or from their legislation, it would be feasible for a country like Nepal to adopt the idea contained while designing its own legislation.

**The Biological Diversity Act of India 2002:** Indian Government passed the Biological Diversity Act of India in December 2002 after a series of discussion with various stakeholders. The act is very strict in terms of allowing access to the foreigners to the genetic resources and associated indigenous knowledge practices. As per Article 3 (1) of the Act, foreigners or non-resident Indians, legal or natural, ' shall not without previous approval of the National Biodiversity Authority obtain any biological resources occurring in India or knowledge associated thereto for research or for commercial utilization or for bio-survey and bio-utilization.' This is based on the principle of national sovereignty over biological resources and associated IK, as enshrined in the CBD.

The article 4 of the Act empowers the National Biodiversity Authority, on behalf of the Central Government to take any measures necessary to oppose the grant of IPRs in any country outside India on any biological resources obtained from India or knowledge with such biological resources is derived from India.

However, realizing the potential of using commercialization of these resources and knowledge for the benefit of the local communities, the Act does not prohibit exploitation of these resources for commercial purposes. As per Article 19 (1) person intending to obtain any biological resources occurring in India or knowledge associated thereto for research or for commercial utilization or for bio-survey and bio-utilization or transfer the results of any research relating to biological resources occurring in, or obtained from, India, shall make application in such forms and payment of such fees as may be prescribed, to the National Biodiversity Authority.

**Protection of Plant Variety And Farmers' Right Act 2001:** The Protection of Plant Varieties and Farmers' Right (PPVFR) Act was passed by the Indian Government in 2001. After India became signatory to the TRIPs Agreement in 1994, a legislation was required to be formulated (Brahmi, *et al*. 2004: 392). Article 27.3 (b) of this agreement requires the member countries to provide for protection of plant varieties either by a patent or by an effective *sui generis* system.

Plant Genetic Resources (PGRs) are the foundation for the development of a food and nutritionally secure society. Previously PGRs were treated as the 'heritage of mankind' and were shared freely among nations, till the concerns for conservation of biological diversity were raised by the CBD. The PPVFR Act of India is so far a progressive legislation on the protection of the farmers' rights, IK, skills and practices. This legislation combines the spirit of the two international instruments mentioned above, namely CBD and ITPGRFA (Anonymous, 2005a: 24).

The major components of the legislation in relation to IK are the mandatory requirement to reveal the source (origin) of the genetic resources; provision for rewarding farmers for the contributions made by them in development and conservation of genetic resources and associated IK; and provision of unencumbered rights to farmers to save and exchange seeds, which is a part of their traditional practices. Sharing of benefits accruing to a breeder from a variety developed from indigenously derived plant genetic resources has also been provided in section 26 (1). The authority may invite claims of benefit sharing of any variety registered under the Act, and shall determine the quantum of such award after ascertaining the extent and nature of the benefit claim, after providing an opportunity to he heard, to both the plant breeder and the claimer.

### 3.4 Indigenous Knowledge Approach on Sustainability

**Sustainability Framework**: The concept of 'sustainability' has been associated with a wide range of human activities related to the use of resources, including natural, human and financial, implying long-term continuity and ability to carry on with these activities indefinitely (Marinova & Raven, 2006: 588). Sustainability is not outside of economic theorizing; however, it gives value to genetic and biological resources, and indigenous knowledge for what it represents, for how it is constructed and conserved (ibids.: 592). Since the mid-1970s, however, the term became laden with value judgments about justice in the distribution and use of resources. This was started by the World Council of Churches during its 1975 Assembly in Nairobi (Cobb, 1992), followed by the publication of Our Common Future (or the Brundtland[21] Report) by the World Commission on Environment and Development (WCED) in 1987, the 1992 United Nations' Earth Summit in Rio de Janeiro (which adopted Agenda 21), and continued through the adoption of the Millennium Development Goals by the United Nations' General Assembly in 2000 and the 2002 World Summit in Johannesburg.

Indigenous sustainability, in particular, as a new movement in the field of sustainability (Kinnane, 2002), is concerned with addressing the disadvantages experienced by indigenous people in all aspects of society. Under the sustainability framework, there is also a role for customary law in recognizing value and giving value to indigenous knowledge (Marinova & Raven, 2006: 592). A new intellectual property protection should allow for maintaining the

[21] According to Brundtland Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

social, political, cultural and physical environment where indigenous knowledge is created. According to McGrath *et al.* (2005), 'indigenous people, whose spiritual practices connect with country and have the potential to provide a foundational ethic for sustainability generally have much to offer the Eurocentric rationalists who have separated themselves from ecological cycles between the earth, air and water and are thus disconnected from the spiritual self '. This ' offering' comes with certain obligation established through customary law that is also recognized through Western legal regimes. Examples of latter is fiduciary, the legal term used to describe the relationships between a person who occupies a particular position of trust, power or responsibility with respect to the rights, property or interests of another trustee or the community (Wikipedia, 2005). Such relationships of trust are essential in partnerships, which are important mechanisms for achieving a more sustainable development and way of living; which would be an important effort for the Nepalese indigenous people, if it is followed.

**The Current Patent Law Approach:** The issue of patent (as a subset of the protection of intellectual property) awards the patentee ' the rights to exclude other from making, using, offering for sale, or selling the invention throughout the territory covered by the patent law (Marinova & Raven, 2006: 593). Although the exact role of a patent is the 'right to exclude', in reality patents have a twofold role: first, they recognize ingenuity; and second, they allow for monopoly over economic benefits (ibid.: 593). These two functions are potentially equally applicable to indigenous knowledge that is, it results from ingenuity and creativity, and should generate economic benefits of indigenous people.

**Benefit-Sharing Approach:** In India, Multinational Corporation or other if use the Indigenous knowledge to manufacture, compensation is to be paid to the village or local communities for their contribution in the evolution of any variety registered under the Indian Act. The provision for benefit-sharing is included in the Act for the farmers and communities (Gopalakrishnan, 2002: 734). According to the Act, the Authority is duty-bound to invite applications for the award of benefit-sharing after issuing a registration certificate for a new variety. Interested persons must apply to the Authority in the prescribed form with the fee for claming benefit for the breeder of a variety registered under the Act. After giving an opportunity to the breeder and applicant to establish their respective claims the Authority, if satisfied with the claim, will decide the amount of benefit-sharing and direct it to be deposited to the Gene Fund. In Nepal, there is no such compensation system for the contribution of the variety invention.

**Research Benefit Rights:** The concept of research benefit rights (RBRs) has been put forward looking for a way to integrate compensation and authorization as the center of a research process, not under the principles of any enterprise solely looking for commercial benefits. Based on ethical norms and rights authorized by indigenous people, RBR's demand compensation for benefits derived from a non-commercial process, such as research.

RBRs seek to promote strategies that are ethically and contractually achievable, so that indigenous groups may enjoy a fair participation in the monetary and non-monetary benefits of research they have allowed in their communities; may have access and control over the research findings; may be recognized as the legitimate owners of their knowledge; and may have the option to participate in all of the processes.

The practice of RBRs would require an ethical and contractual base with at least two elements;

the development of ethical principles adhered to by research-financing organization, and empowerment of indigenous people to negotiate bilateral arrangements or contracts between themselves and external agents. This has been the experience with a community of Imbabura, in Equador.

**Rights over traditional resources:** In 1990 the Global Coalition for Cultural Biodiversity established a working group on intellectual property to facilitate indigenous communities, scientific organizations and environmental groups jointly proposed a strategy for using vernacular knowledge that involved local communities in conservation and development initiatives (Posey & Dutfield, 1996). The Coalition pointed to the difficulty brought about by the variety of legal, scientific, and political terms that were hard to translate to ethnic groups and local communities. It coined the term 'Rights over traditional resources', where the term ' traditional' refers to practices, beliefs, customs, and cultural heritages of indigenous and local groups living in close association to the land. The term ' resources' is used in a wide sense, to encompass knowledge and technology, spiritual and aesthetic qualities, and tangible and intangible resources needed to fully ensure their lifestyle for present and future generations. Finally, the term ' rights' refers to the inalienable guarantees of human existence and of collective entities needed to maintain their own dignity, and that of their predecessors and offspring. This term (or even better, this process) fits well among international agreements as a basis for a *sui generis* protection system, given the kind of knowledge contributed by indigenous communities.

**Actors and relationship in the exchange of knowledge:** Many different agents intervene in the exchange of traditional knowledge. These agents may be classified according to the cultural domain where they act.

**i. Ethnic community domain:** In most communities *Shamans* are in charge of cultivating and enforcing the protection of traditional knowledge. This gives them a special status over the other members of the group in the social order; they try to keep such knowledge secret.

**ii. The community is also an actor:** For centuries, communities have accumulated knowledge related to their habitat, and implemented decisions related to its management through a collective process. This knowledge includes several aspects: (a) actual or potential use of plants, animals, soils or minerals; (b) species preparation and processing; (c) magisterial formulations with several ingredients; (d) harvesting methods, plants selection; (e) environment protection, through resource protection and conservation method (Bravo, 1996).

**iii. National Society domain :** Some *national states* have developed rules to control the access to communities' knowledge and have defined regulations about its use. Other states have done little or nothing to recognize and protect collective rights of indigenous communities. This has been at the origin of many conflicts between national states and communities for decades. The level of conflict has grown as indigenous political organizations developed a notion of territoriality, for example some Amazonian national states have become more reluctant to acknowledge that rights, saying that only the nation-state can possess a territory (Smith & Wray, 1995: 228).

**iv. International domain :** *Transnational corporations* and *research laboratories* use traditional knowledge obtained from plant and biological samples, or from the observations of traditional, indigenous practices (Zerda-Samiento & Forero-Pineda, 2002: 102). They study them, develop

them, in some cases claim proprietary rights, and market products derived from this knowledge. Communities contributing to the new knowledge seldom receive any compensation.
Borders between enterprises and academic and scientific researchers have become unclear, especially in the field of pharmaceuticals (Zerda-Samiento & Forero-Pineda, 2002: 103). Collaboration schemes between pharmaceutical corporations and university laboratories often minimize differences in their interests and practices (Tarzian *et al.* 2000). Nonetheless, there are also cases in which university researchers do their work independently from businesses and seek to establish scientific status within a Mertonian ethic. In some cases, researchers have also promoted compensation and acknowledgement of communities that generated and developed that knowledge (Tarzian *et al.* 2000).

**3.5 Social Exclusion**

According to Beall and Piron (2005: 9), social exclusion is a process and a state that prevents individuals or groups from full participation in social, economic and political life and from asserting their rights. It derives from exclusionary relationships based on power. Now social exclusion is a concept commonly used in development, particularly following the World Social Summit in Copenhagen in 1995 (ibid.: 8).Thereafter a number of multilateral development agencies, notably the World Bank and the International Labor Organization, adopted social exclusion as a multidimensional framework.

At first, social exclusion became the subject of debate in France during the 1960s (Hillary, 1994: 532); first to describe various categories of people such as the mentally and physically disabled, the aged, abused children, single parents, marginal, asocial persons and so on comprising 10 percent of the French population, who were excluded from the employment based social security system (Pradhan, 2006: iv); and subsequently it gained popularity in the 1980s. In Britain, the social exclusion became a major aspect of British social policy during the election of the first Blair government (Levitas, 2005). Later, this issue also gained much ground at the European Union level (Silver and Miller, 2003). But initially both in France and in Britain, scholars have criticized the concept of social exclusion.
Though the social exclusion became the subject of debate in Europe, it was used to refer to various types of social disadvantage, related to the new social problems arising from economic crises and crises of the welfare state - long term unemployment, ghettoisation, and fundamental change in family life (Cannan, 1997; cited in de Haan, 1998: 11). Now in the early 21st century, social exclusion has become something of a trope around which is pegged justifications for various reforms (O'Brien & Penna, 2007), and the notion of social exclusion has found its way into the word list of all major global governance institutions. As argued by Toit (2004: 987) the concept of social exclusion has become increasingly dominant in European and United Kingdom debates about poverty. Moreover, he argues that there are serious problems with the idea that the use of this concept can be extended to the general analysis of poverty, especially in developing societies; and it has become the concept that social exclusion is more sensitive analysis in between livelihood dynamics and the broader discursive, social and spatial formation of power.

Indeed, the concept of social exclusion can take different meanings (Silver, 1994; Levitas, 2005), and it has the potential advantage of emphasizing social problems that do not fall under the traditional concept of poverty. For example, this concept stresses the logic of 'cumulative disadvantage' that affects the most deprived segments of the population (Silver and Miller,

2003). More precisely, de Haan (1998: 10) defines social exclusion as 'the process through which individuals or groups are wholly or partially excluded from full participation in the society within which they live'. According to Hillary (1994), social exclusion is polygenic having multiple meaning. Aasland and Flotten (2000) argue that the concept of social exclusion is no more unambiguous than the concept of poverty. They contend that when the concepts was first employed in France in the 1970s, it took into account people unable to adjust to mainstream society and in the following years the concept was frequently redefined and more groups were included, such as school dropouts, unemployed youths and immigrants. Aasland and Flotten attribute the problems attached to the concept of social exclusion arising out of the increasingly varied meaning attached to it in France and its spread to other countries with their own interpretations of the concept. Besides, they argue that the concept is vague and is employed to describe a multiple of situations and processes, which is often loaded with economic, social, cultural and political connotations.

The social exclusion concept focuses on the multi-dimensional character of deprivation. It concerns on the processes, mechanisms and institutions that exclude people. People become excluded in different ways in different spheres such as social, political, cultural and economic spheres. In this regards, de Haan (1998: 13) emphasizes the analysis of power relations, agency, culture and social identity in addition to resource allocation mechanism while understanding the social exclusion. Similarly, Francis (2000) locates the strength of social exclusion as a concept in its attempt to capture the multifaceted character of social deprivation, especially its institutional and cultural aspects. As cited in O'Reilly (2005: 81) this conception of social exclusion has been labeled as multidimensional concept of exclusion.

Even though, the concept of the social exclusion originated in France, Hillary (1994) point outs that the distinctive French Republican conception challenges the Republican ideology, and the adoption of exclusion discourse in other national contexts imparted meanings to the term more properly considered within other paradigms of social disadvantage. For example, liberal reconstructions of exclusion concentrate on various forms of discrimination, isolation, and the cross-cutting or cumulative personal characteristics of excluded individuals which are often generalized into the idea of 'underclass'. Due to this, Hillary puts forth the threefold typology of the multiple meanings of exclusion distinguished by different theoretical perspectives, political ideologies and national discourses.

**Three Paradigms of Social Exclusions**

Three paradigms of social exclusions (three meaning of social exclusion) are: solidarity (dominant in France), specialization (dominant in US) and monopoly (dominant in Britain and many North European Countries).

In the solidarity paradigm (derived from French Republican thought), exclusion is defined as the rupture of social bond between the individual (or group) and society that is cultural, moral rather than economically interested (Pradhan, 2006: iv). This is the notion of social solidarity and order. The 'social' order is conceived as external, moral, and normative, rather than grounded in individual, group, or class interests. In this tradition, the poor, unemployed and minorities are defined as outsiders (de Haan, 1998: 13). Furthermore de Haan argues, National solidarity is the political rights and duties of citizens.

In 'specialization' paradigm, exclusion is considered a consequence of specialization: of social differentiation, the economic division of labour, and the separation of spheres(Hillary, 1994: 542). It assumes that individuals differ, giving rise to specialization in the market and in social groups. According to liberal-individualistic theories, individuals are able to move across boundaries of social differentiation and economic divisions of labour. The liberal tradition emphasizes the contractual exchange of rights and obligations and the separations of spheres in social life. Here, exclusion occurs when individuals are denied free movement and exchange between spheres, when rules inappropriate to a given sphere are enforced or when groups' boundaries obstruct individual freedom to participate in social exchange.

'Monopoly' paradigm is the exclusion as a consequence of the formation of group *monopoly* (Hillary, 1994: 543). It views the social order as coercive, imposed through a set of hierarchical power relations. In this paradigm, exclusion arises from the interplay of class, status and political power and serves the interest of the included, and excluded are simultaneously outsiders and dominated exclusion is combated through citizenship, and the extension of equal membership and full participation in the community to outsiders.

### 3.6 Social Exclusion Discourse in Nepal

During the *Kirat* and early *Lichchhavi* periods, there was no sign of hierarchy of people (Pyakurel, 2007). It was the *Lichchhavi* rulers who for the first time in the Nepalese history introduced Hinduism in the state system. They were the Hindus and promoted the Hindu religion by constructing many temples. They made *Sanskrit* the official language and literary language of Nepal and promoted it in the field of architecture and sculpture too.

When the *Mallas* superseded the *Lichchhavi* dynasty, they made every attempt to promote Hinduism (ibid.: 2007). With the help of *Brahmin* priests, the *Malla* rulers introduced *Varna* system in Nepali society and stratified people on the basis of caste structures. They assumed, enforcement of caste hierarchy was supposed to instigate social cum political stability. They expected lower caste groups and non-Hindu communities gradually adopt the rituals and ideology of high caste Hindus.

Furthermore, Jayasthiti Malla (1360-95) started promoting social reform activities on the threshold of Hindu doctrines. He invited 5 Brahmins from Varanasi, India by requesting them to make the rules as they wished (Vishwakarma, 2007: 129). There after, he formulated a religious code named Manav Naya Shastra in 1380 AD (1436 BS) where various discriminative laws were included.

The political unification of Nepal under the Shah Kings set the stage for the imposition of and an orthodox Hindu social order (Sharma, 2008: 1). Similarly, during the Rana regime, similar Hinduistic patterns were applied in the governance system. The responsibility of social control was given to the royal priests. Prime Minister Jung Bahadur Rana promulgated the *Muluki Ain* (National Code) of Nepal in 1854. It restructured Nepali Society into four caste hierarchy. They are *Tagadhari* (Sacred thread wearing or Twice-born), *Matawali* (Liquor drinking), *Pani nachalne choi chhito halnu naparne* (Water unacceptable but no purification required, if touched or Touchable Low Castes), and *Pani nachlne choi chito halnu parne* (Water unacceptable and

purification required, if touched or Untouchable Low Castes). That legal provision was abolished in 1963.

After the People's movement-I of 1990, new constitution was promulgated. The Constitution 1990 had also enclosed some provisions that represented cultural discrimination, particularly with reference to language. Nepali, as the 'national language' and the only official one and other indigenous languages were downgraded. The imposition of spurious parity between a noun (*rastra*) and an adjective (*rastriya*) was exposed by Article 18.2 whereby teaching in non-Nepali languages was restricted only to the primary level, and the Supreme Court decision of 1998 invalidated the use of *Maithili* and *Newari* languages in local administration (Gurung, 2005). Again people's second movement took place in 2006. After people's second movement, new Interim Constitution has been made. The new IC 2007 (with its fifth amendment) also failed to address the social inclusion issues of different groups.

Now IPs, Madhesi, Women, Dalits, Muslim communities are excluded groups, they have consistently been excluded from mainstream development historically. According to the social exclusion definition, populace with disability, street or orphaned children and children from displaced/conflict affected families and people of remote regions especially of Karnali region also fall within the excluded groups. Restricted access to resources, services and opportunities, disempowerment, cultural and ritual debasement, discrimination and marginalization on the basis of caste, ethnicity, culture, language, religious affiliation, territorial/geographical origin/remoteness and gender, and capacity constraints are some the major forms of exclusion that different social groups are facing in Nepal (Subba, 2008: 4).

Long back, Gaige (1975) had argued with reference to the tarai region that Nepal had been geographically united; however, the state had not been able to accommodate the aspirations and culture of the tarai in the national framework. He (1975: 195) had then stated that integration of tarai in the national framework by force is not a viable option, but a more realistic approach would be to draw the plains' people into the national structure through participation in the nation's political life, through encouragement of the voluntary acceptance of national political and cultures values.

Now, Nepal has become one of the least developed countries in the world, where majority of people live in poverty, illiteracy, poor health, which is leading people to frustration, and more specifically to conflicting situation. The indigenous peoples' knowledge, skills, and cultural heritage, which could be useful for development, are neglected and as a result the IPs are now facing identity crises. Discriminatory policies deprived the IPs customary rights on natural and biological resources. Natural resources like forest resources began to deplete rapidly since the IPs lost control. IPs youths, with no other option, are compelled to migrate to foreign countries in search of employment, where they are exploited.

Analysis of 2001 population census data for poverty mapping reveals the level of disparity among social groups in the major occupation and household characteristics. The upper caste group constitutes 35.4 percent of total economically active population aged 10 years and above (Gurung, 2006a: 20).Their dominance is 62.2 percent in professional/technical, 58.3 percent in legislative/administrative and 53.6 percent in clerical occupation. As cited in Gurung (ibid. : 20),

the *Dalit* castes, with 11.9 percent of the total, economically active population, have involvement of only 1 to 4 percent in the above occupations.

The IPs with 37.2 % share in economically active population accounts for one-third in such occupation. The high castes dominate the state, as they represent 91.2 percent senior positions in politics and bureaucracy (ibid: 15). *Brahmin, Chhetri* and *Newar* are the rulers of the country, since they are in decision making position in the government administration and parliament (Bista, 1991). An ethnographic analysis of rural people's understanding of their position in a changing society is limited to contemporary expressions of identity (Caplan, 1991; cited in Pigg, 1995: 22). This self-characterization is often articulated in relation to powerful images of a historical village put forth in developmentalist ideology.

According to Nepal Living Standard Survey-II, the average capita income for all social groups is Rs.20, 689. The high caste (*Brahman* and *Chhetri*) has Rs.24, 399 average capita incomes. The *Janajati,* excluding *Newar,* comes next with a per capita income of Rs 15,630 but below the national average. The tarai middle caste and the *Dalit* rank third and fourth in average per capita income. The Muslim is ranked the last, worse off than the *Dalit*. As cited in Gurung (2006b:21), within all major groups, tarai sub-groups have lower income than their hill counterpart. In fact, the income level of tarai *Janajati* is lower than those of hill Dalit.

# CHAPTER 4

## RESEARCH METHODOLOGY

### 4.1 Selections of Key Informants

Discussion programs were held at different levels for the selection of the informants. Senior citizens, village elits, shamans (*Yeba* & *Yema*, *Samba*, *Phedangma*, *Magba* and *Bijuwa*)[22] and plant healears were invited for discussion. Personal contacts were also made with different stakeholders. As recommendated by them, lists of key informatants were prepared in each VDC for the contact during the field work (See Annex 13).

### 4.2 Selection of the Field Enumerators and Orientation Programs

For selection of the field enumerators, their academic, professional as well as social competence and working attitudes were given high priority. In each VDC, two-three field enumerators, both male and female were chosen. Two days orientation programs were conducted for the field enumerators at the field. The first day was scheduled to discuss on the questionnaire, specimens collecting and their preservation techniques, observation schedule and specimens card. The second day was scheduled for field training where the key informants also participated. They were assigned to fill the questionnaire in presence of key informants, and trained on sample of plant collection and their preservation methods. Specimen cards were filled up for each species. The plant collection was done by using advanced equipments especially global positioning systems (GPS) to record the exact location and the altitude of each specimen, and digital camera to take photos.

### 4.3 Literature Review and Secondary data

Relevant documents on Indigenous Knowledge and associated Biological Resources related International Conventions, Treaties or Agreements, national plan and policies, Acts or Bills were reviewed. The review and analysis laid special emphasis on the Indian experiences of biodiversity and Traditional Knowledge Documentation. Cases from countries, which have set good examples on the global context, are also cited as per their relevance to Nepal. During the field work, different types of maps produced by the Survey Department, National Geographic Information Infrastructure Program (NGIIP), Kathmandu, Nepal were used. Latitude and Longitude of each VDC were calculated from Topographic maps. The literature related to Social Exclusion and Inclusion was also reviewed in order to capture the present scenario of Indigenous Peoples.

### 4.4 Primary Data Collection

Field work was carried out in Sankhuwasabha, Taplejung and Bhojpur districts (see section 4.6). Key informant interview, Jungle walk (for specimens collection), Questionnaire survey, Observation Schedule and Specimen Identification were the key methods, tools and technique for collecting primary data. Moreover, prior to the 'real' field work, few informal meetings and interviews were carried out with some key people and potential key informants in Kathmandu and Dharan to explore more on baseline information regarding the research project. The collected specimens were brought to Kathmandu for identification confirmation and to deposit

[22] Refer Glossary

for voucher specimens at KATH.

**Key Informant Interview :** Key informant interview with social and community leaders, traditional/faith healers, elderly people both male and female were conducted to explore more about the existing Indigenous Knowledge, Practice and Skills of Yakha, Rai and Limbu especially focused on their knowledge of traditional use of plants and animals.

**The Jungle Walk :** Jungle walk was frequently carried out with the key informants, who were rich in Indigenous or Traditional Knowledge use of plants and animals in different ailments and livelihood purposes. The information gathering and specimens collection were also done from adjoining areas of the project sites. The collection or Observation Schedule was mostly arranged during the flowering seasons of utmost plants.

**Questionnaire Survey :** Questionnaire survey was carried out in order to find out more about the Indigenous Knowledge, practice and skills with emphasis on natural resources- plants and animals. Designing a quality questionnaire was one of the most important and key steps of the research. For this, two sets of semi-closed questionnaires had been drafted and finalized after discussion with experts Prof. Dr. Ram Prasad Chaudhari, Prof. Dr. Krishna Kumar Shrestha and associate Prof. Dr. Mohan Siwakoti.

The first set of 4 paged questionnaires had been developed in the line to explore the knowledge of the traditional/faith/plant healers and biodiversity experts and skilled persons of the communities in terms of traditionally used animals and plants for medicinal purpose. Additionally, it also contained brief account of the plants' habit and habitat, ecological parameters such as location (altitude, longitude, latitude, and slope), microhabitat (associated plant community), status (rare, threatened, common, and endangered) and the medicinal properties. The second set of 2 paged questionnaires was designed to explore traditional practices other than the medication of the *Kirat* Nationalities (see annex 6).

**Specimen Identification :** Specimen Identification was done in several steps. For this, at first, twig with the healthy flower or fruit, was collected, dried and glued in the herbarium sheet (size 28 x 44 cm). Check list of unidentified specimens were prepared. After examining the characteristic features, specimens were compared with the standard literature, viz. *Flora of Mustang, Nepal*; *Flora of British & India; Flora of China; Flora of India; Flora of Bhutan* and other accessory literature. These specimens were finally tallied with the voucher specimens[23] for identification confirmation, deposited at National Herbarium and Plant Laboratory, Godavari, Lalitpur (KATH); and herbarium section of Tribhuvan University, Kirtipur (TUCH). Dr Keshab Raj Rajbhandari was mainly consulted for specimen's identificcation confirmation. Photos of the specimens (taken form different aspects, especially flower), which were different or typical or confusing were sent outside the country for further confirmation of identification. The faunal specimens were preserved in formalin when they were collected and identification work was done with the help of standard literature and tallied with the voucher specimens deposited in Post Graduate Campus Tribhuvan University (PGC TU).

[23] The plants collected and identified specimens from various parts of Nepal have been deposited in different botanical or herbarium institutes; these specimens are referred as voucher specimens.

### 4.5 Data Analysis, Editing and Processing

This Project aim was qualitative analysis however data were numerically coded. Sum of the different categorical variable values were presented quantitatively. By using Microsoft excel and Statistical Package for Social Sciences (SPSS) data were coded, summarized, presented and analyzed.

**Data recording :** Data recording were done by the following steps

- Questionnaire to tabulation,
- Specimens identification to tabulation, and
- Observation schedule (plants parts used where, when, how, who etc) to tabulation

**Data Management and Processing, Using SPSS :**

- Coding of qualitative variables including multiple responses,
- Shorting data by alphabetical order of the plants and animals,
- Aggregating data set over the labels of categorical variables,
- Making frequency tables of different categorical variables,
- Data analyzed by using frequency tables and descriptive measures,
- Different categorical data were summarized using cross-tabulation and bar diagrams and pie charts

### 4.6 Selection of Project Area

Total of six VDCs, one from Bhojpur, four from Sankhuwasabha and one from Taplejung district were selected as the research sites (see table 5 below for details). According to map produced by the Survey Department, National Geographic Information Infrastructure Programme (NGIIP), Kathmandu, the total project area is spreaded over 272 Sq Km approximately. The project area was taken from three different localities. Two localities were very close and lying in the row of vertical direction. The third locality was isolated from first and the second. The first locality was Tamaphok, Madimulkharka, Mawadin and Nundhaki. This locality was chosen mainly for Yakha because Tamaphok is densely Yakha populated. According to Russell (1997: 332), culturally and linguistically traditional Yakha exists only in Tamaphok and it is the heartland of Yakha culture and identity.

Remaining three VDCs of the first locality was unique in the sense that three communities (Yakha, Limbu & Rai) was lived together. Usually they live in separate territory. The second locality was Phakumba. It was chosen for Limbu concentrated in Maiwa Khola. Maiwa Khola is supposed as origin place for many Limbu myths. Phakumba is just north to Sangu of Taplejung. Sangu is connected with Nundhaki. The third locality was Sindrang of Bhojpur which was chosen for Rai. Densities of the population of the three nationalities (Rai, Limbu and Yakha) were also taken as the main criteria for selection. These three nationalities have been living in those areas from time immemorial.

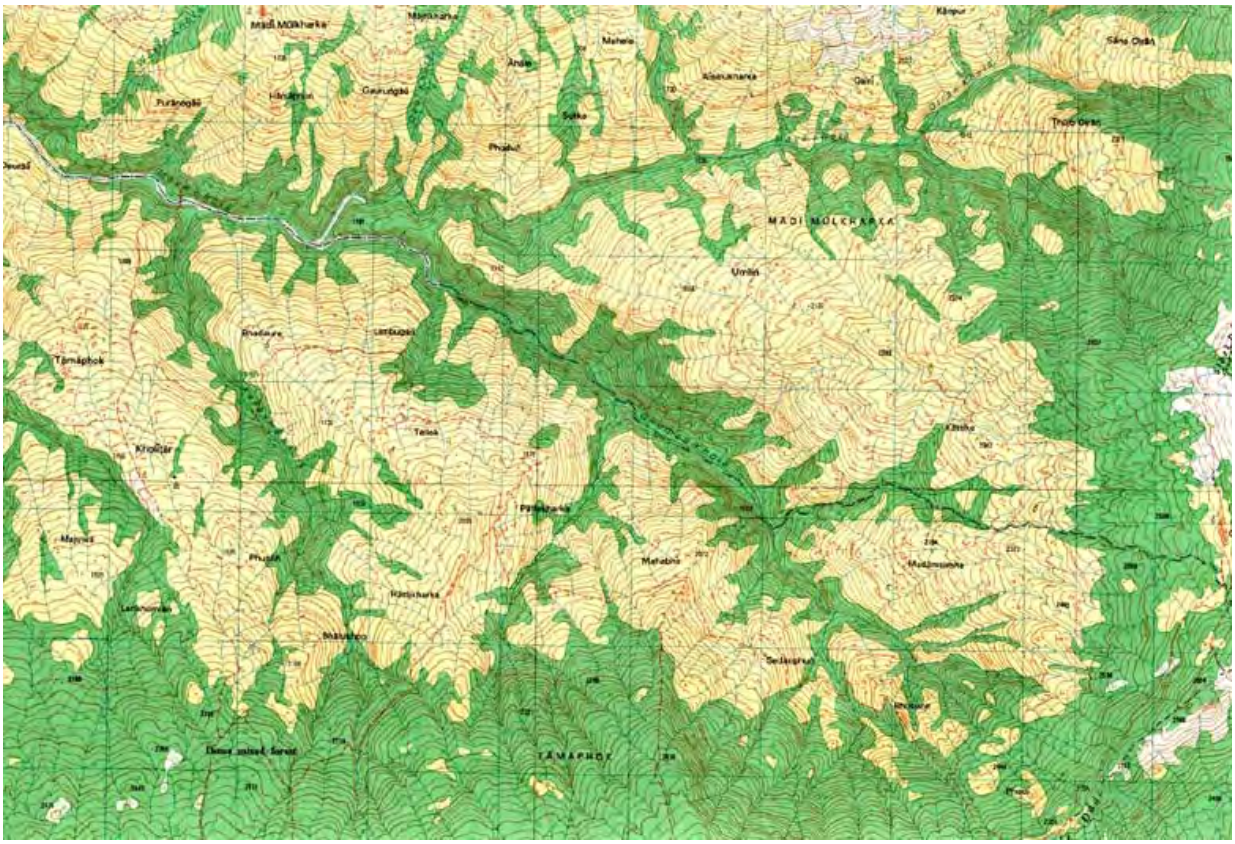



**Figure 1: Tamaphok VDC**

Source: NGIIP, Kathmandu

### 4.6.1 Tamaphok

Tamaphok is situated (27°7.87' - 27°14.5' N & 87°20.36' - 87°28.33' E) in the south east of the Sankhuwasabha district. It is almost north faced and rectangular shaped VDC. In winter, vehicles reach at the VDC from Dharan. The bus stop, Mudesansare is a small market village, in southern border of the VDC, 13 Km far from Bashantapur and 101 Km from Dharan. The VDC is densely Yakha populated. Ward number five has more than 95 percent Yakha populace. In the VDC, there is 21.03 percent Yakha populace while Limbu and Rai are 1.45 and 3.5 percent respectively.

In the east, Tamaphok is adjoined with Ambung, Jirkhimti and Solma of Tehrathum district and in south with Bashantapur (Tehrathum), Marekatare and Dandagaun of Dhankuta district. The west boundary is Mamling and Aankhibuin of Sankhuwasabha while northern border is demarcated by Ghumsa Khola and Maya Khola. Ghumsa Khola originates from the border of Madimulkharka and Tamaphok. It flows along entire one third length of northern border of the VDC; thereafter it mixes with Maya Khola. As mentioned in NGIIP, the area of the VDC is 62 Sq Km approximately, which is by area second largest VDC of the project area.

### 4.6.2 Madimulkharka

Madimulkharka is situated (27°12.77' - 27°15.69' N & 87°20.98' - 87°28.21' E) in between Tamaphok and Mawadin. In the east, it is adjoined with Morahang and Ambung of Tehrathum and in west with Madi Rambeni and Mamling. This VDC is almost south faced. Ward numbers 8 and 9 are large while wards 2 and 4 have comparatively high Yakha populace. Altogether 12.7 percent population of the VDC is Yakha, and 0.8 and 6.7 % of Limbu and Rai, respectively. Bhalu Khola originates near the border of Morahang. This river is also termed as Oirang Khola and Maya Khola. The area of the VDC is 48 Sq Km approximately.


**Figure 2: Mawadin VDC**

Source: NGIIP, Kathmandu

### 4.6.3 Mawadin

Mawadin is situated (27°15.13' - 27°18.11' N & 87°22.69' - 87°29.70' E) in between Madimulkharka and Nundhaki. In the east, it is adjoined with Shrijung of Tehrathum while in the west it is connected with Madi Rambeni and in North West with Siddhakali. The VDC is bounded by three rivers. In west, Mawadin and Madi Rambeni is separated from Bagha Khola. Similarly, the North West Siddhakali and Mawadin are separated from Piluwa Khola. The northeast Nundhaki is separated from Niduwa Khola. In the south boarder, there are three hills, Junkeri Danda, Bhuwan Danda and Lampokhari Danda.

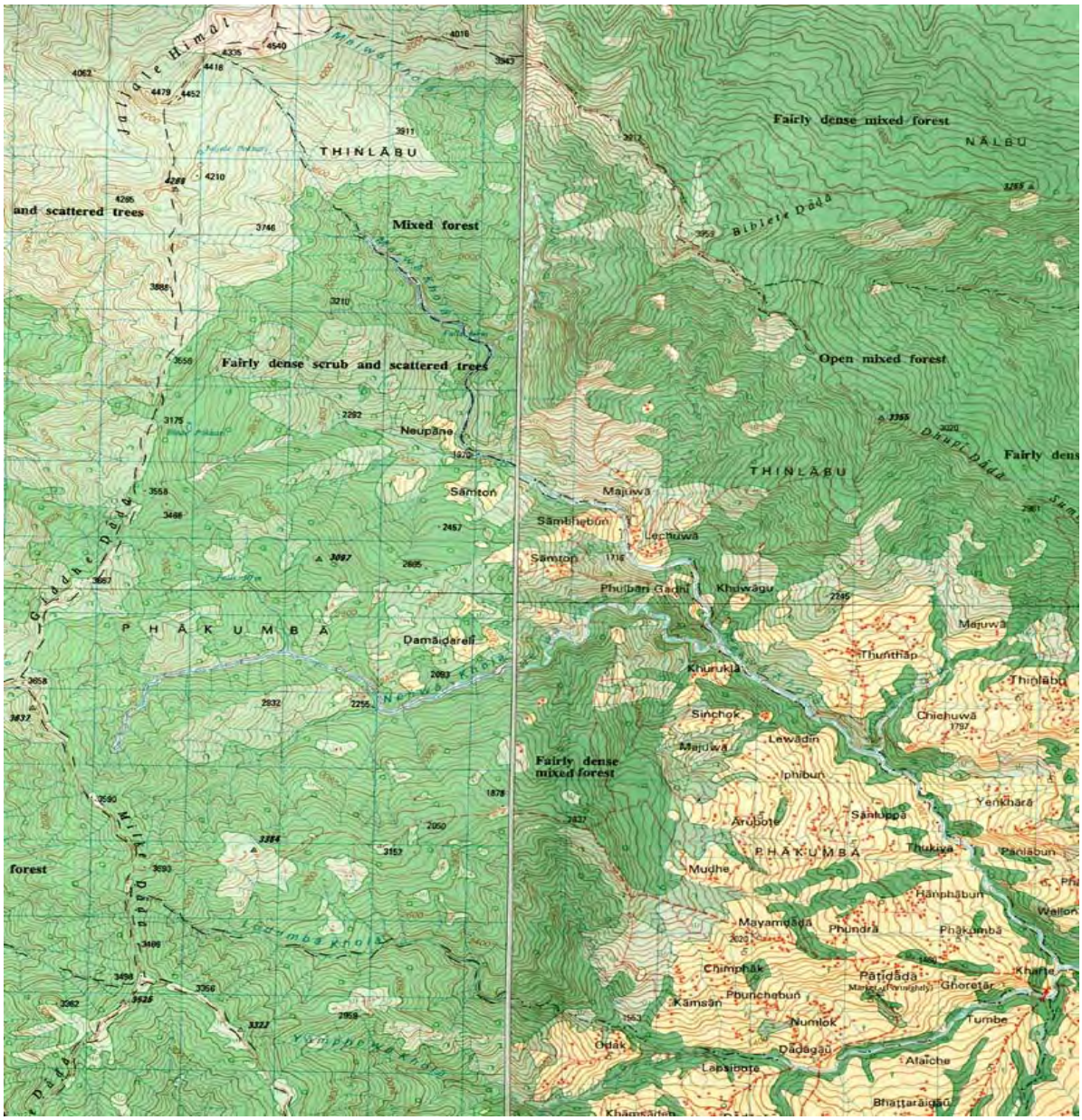



**Figure 3: Phakumba VDC**

Source: NGIIP, Kathmandu

Thirty eight point four % Limbu inhabit in the VDC. Similarly, 3.0 and 8.9 percent Yakha and Rai also inhabit. The area of the VDC is 37 Sq Km approximately.

### 4.6.4 Nundhaki

Nundhaki is situated (27°16.26' - 27°22.20' N & 87°4.04' - 87°5.95' E) in between Mawadin, Shrijung (Tehrathum), Sangu VDC (Taplejung), Siddhapokhari and Siddhakali (Sankhuwasabha). The famous river, Piluwa Khola originates from northern part of the VDC and joins with Tupuwa Khola at the southwest corner. Tupuwa Khola is located in the southwest border. Yakha populace is totally absent while Limbu and Rai occupy 21.7 and 5.08 % respectively. The area of the VDC is 51 Sq Km approximately.

### 4.6.5 Phakumba

Phakumba is nearly triangular in shape and situated (27°21.69' - 27°28.88' N & 87°27.03' - 87°33.83'E) in southwest corner of Taplejung district. The VDC is surrounded by Thinlabu from east but border is Maiwa Khola. The west border is connected with Sabhapokhari, Jaljala and Siddhapokhari. The northern area of the VDC is constricted and it is connected again with Thinlabu and Sabhapokhari. The southern border is

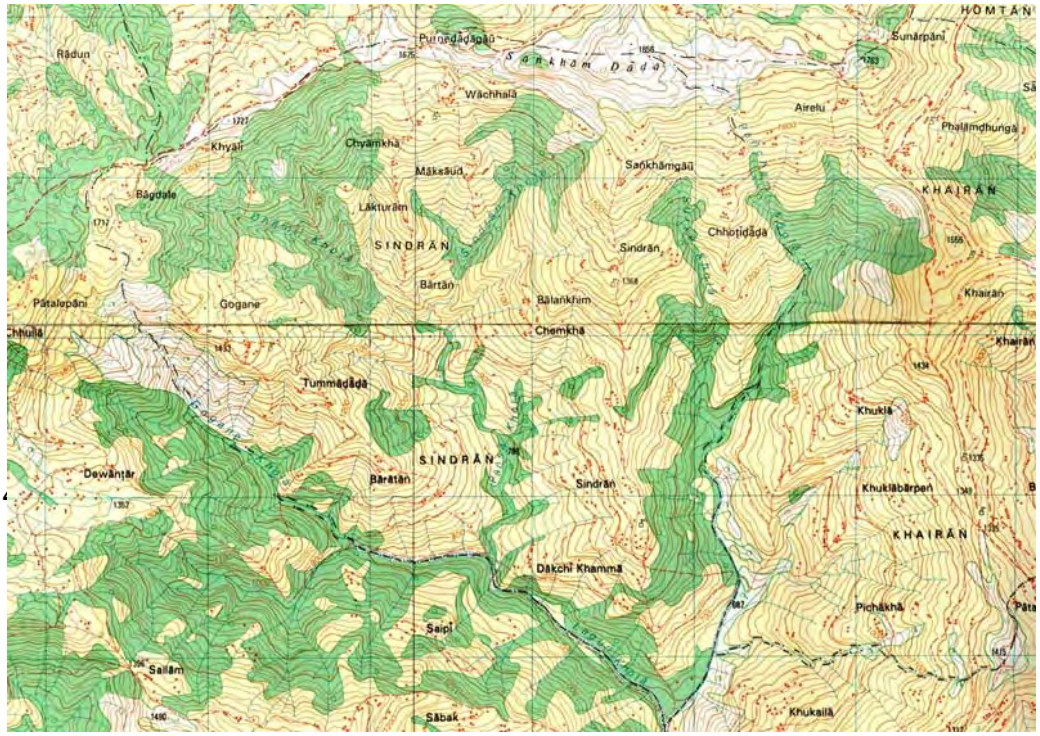



**Figure 4.4: Sindrang VDC**

Source: NGIIP, Kathmandu

demarcated by Lodumba Khola. The Lodumba Khola is termed as Odak when a river, Yamphewa from Sangu mixes in it. Two third part of the VDC is covered by ward number 6. Limbu population comprises 58 % of the total population. As Nundhaki, there is no Yakha but 1.9 percent Rai population. The area of the VDC is 66 Sq Km approximately and is the largest VDC of the project area.

### 4.6.5 Sindrang

Sindrang is small VDC of Bhojpur district. It is triangular in shape and situated (26°58.64' - 27°0.99' N & 87°3.83' - 87°6.4' E) in southeast of the district. More than 80 percent of east is adjoined with Khairang and about 15 percent area is connected with Paltlepani. The north boundary is Ranibas while west and south is connected with Dewantar. The ward number 3 is long and covers 95 percent by length of its east border. According to the census 2001, 93 % of the total VDC population is Rai alone. This is a typical VDC among the study site, in the sense,

that are there only Rai, no Yakha and Limbu. The area of the VDC is 8 Sq Km approximately and is the smallest VDC of the project area.

**Table 5: Population of Yakha, Limbu and Rai in the project sites (with area of VDCs)**

| SN | District | VDC | | | Yakha | | Limbu | | Rai | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Name | Area Sq. Km | Total Pop. | Pop | % | Pop | % | Pop | % |
| 1 | Sankhuwasabha | Tamaphok | 62 | 7069 | 1504 | 21.03 | 103 | 1.45 | 246 | 3.5 |
| 2 | " | Madimulkharka | 48 | 6850 | 871 | 12.7 | 57 | 0.8 | 457 | 6.7 |
| 3 | " | Mawadin | 37 | 3783 | 113 | 3.0 | 1453 | 38.4 | 336 | 8.9 |
| 4 | " | Nundhaki | 51 | 2910 | -- | -- | 1101 | 21.7 | 148 | 5.08 |
| 5 | Taplejung | Phakumba | 66 | 4144 | -- | -- | 2406 | 58.0 | 79 | 1.9 |
| 6 | Bhojpur | Sindrang | 8 | 1389 | -- | -- | 88 | 2.0 | 1296 | 93.3 |
| | | **Total** | 272 | **26145** | **3724** | | **5208** | | **2562** | |

Source: National census 2001

# CHAPTER 5

## RESEARCH FINDINGS

The overall research findings have been grouped in three folds: general findings, specific findings and the remarks. General findings include both literature analysis and field's finding. Specific findings include only those findings which obtained from the field, which is the main finding of the research. Remarks are based on mainly literature analysis.

### 5.1 General Findings on Kirat

Kirat is one of the ancient natives of Nepal. This supports from the inscription of Degutale temple in Hanumandhoka palace, Kathmandu (Bajracharya, 1996: 374-76 [Orig. 1973]. A long stone slab, forming a part of the platform of palace complex bears an inscription in five lines, where a word Kirat is present in the form of rock-edicts (Singh, 1990: 402). Lichchhavi king Ansu Varma made this inscription in early 7th century (Subba, 1998: 15 [Orig. 1995]). As in the ancient literature 'Yajurveda', the term Kirat was used to indicate the people who were different than wild non-Aryan tribes. They used to live in the mountains, particularly the Himalayas and in the North-eastern areas of India, who were Mongoloid in origin (Chatterji, 1998: 26-27 [Orig. 1951]). As cited by Singh (1990: 96), the word 'Kirat' has also been possibly derived from Cirata or Cireta or Cirayita - a very bitter plant [*Swertia chirayita* (Roxb. ex Fleming) H. Karst.] for non-Aryans, grown in the lower regions of the Himalayas, which was obtained from the Kirat by Aryans and used for medicinal purposes.

According to ancient history of Nepal, the very first ruler of Nepal, were Gopala dynasty (cow herders). They were overthrown by Mahispalas (buffalo herders). Mahispalas were succeeded by Kirat. According to *Gopala Raja Vamsawali* of 14th century AD, the Kirati from the area between the Sunkosi and Tamakosi, did three successive attacks and finally gained control of the Kathmandu valley. The first Kirat king was Yalambar (Yellung or Yellamba or Yalamba). He reigned for about thirteen years. During this period, he extended the frontiers of his kingdom from Tista of Bhutan to Trisuli in the west. Pavi (Paivi or Pambi or Yanchihang), Skandhara (Dushkhan or Yalan or Skandhahang), Balamba or Balambhang, Hriti (Hritti or Hritihang or Humatihang) were the 2nd, 3rd and 4th, 5th and 6th Kirat kings, respectively (Singh, 1990: 396).

Jitedasti was the 7th Kirat king. The Buddhist tradition records that during the reign of 7$^{t}$h Kirat king Jitadasti (in the 6th century BC), Gautam Buddha visited Kathmandu valley and expounded 1300 teachings. According to Mahabharat literature, king Jitedasti after being persuaded by Arjun went to Kuruksetra, took part in the war of Mahabharat on behalf of the Pandavas against the Kauravas and lost his life (Wright, 2007: 109 & 110 [Orig. 1877]. During the reign of the 14th Kirat king Stungko or Thumko, king Ashok, the Mauryan king of Pataliputra, also visited Kathmandu valley. He was a great believer of Buddhism. He visited all the holly places in Nepal and in commemoration of his visit; he built Buddhist monuments in Nepal. His Buddhist stupa of Patan is a famous one (Singh, 1990: 398).

During Kirat ruling period, they used to shift their capital from one place to another as the changing situation. One of their famous capitals was at Gokarna (Singh, 1990: 363; Chatterji, 1998: 66 [Orig. 1951]). There are debate on the number of the Kirat kings, who ruled over the Kathmandu valley, varies from twenty nine to thirty two. Gasti was the last Kirat king. His father Patuka built new palace at Sankha Mula Tirtha (a distance 4 kos to the south) due to repeated

attack at Gokarna by Somabansi Rajput (Wright, 2007: 112 [Orig. 1877]). In about 225 BC or third century BC, after ruling five or six centuries, Gasti was defeated by Lichchhavis. Though Kirat were defeated, their dynasty did not disappear completely, but their popularity, of course, was on the wane. Kirat were attempting to regain power repeatedly up to 3rd century AD but they received blow after blow from the Licchavis, and their position became gradually weak. Singh (1990: 411) argued that the Kirat were finally dethroned by the Abhira Gupta rulers in the 7th century AD. But in the east Nepal, the Kirat state was existed up to 1773 AD. The last Kirat ruler was Buddhi Karna Ray, whose domain consisted of parts of Mechi, Koshi and Sagarmatha Zone.

One section of the ancient *Kirat* is geographically, racially and linguistically represented by the modern *Kirat* in the east Nepal. They are generally identified with Sunuwar (Mukhiya), Rai (Khambu), Yakha (Jimi) and Limbu (Yakthumba). In the past, Sunuwar used to live in the Sunkoshi riverside, while Rai in between Sunkoshi and Arun river. Yakha used to live in the east of Arun river, whose identity was imbedded with Rai. As cited by Das (2008: 22 [Orig. 1899]), the aboriginal people who used to dwelt in between Arun and Tambar river from the time immemorial were designated by the name of Limbu, though they called themselves by the name of Yakthumba.

As the national census 2001, total population of *Kirat* was 4.86 percent (Rai 2.79 %, Limbu 1.58 %, Sunuwar 0.42 % and Yakha 0.07 %). These four indigenous peoples or nationalities are main followers of *Kirat* religion and known as core[24] Kirati group. There are other such 12 Indigenous Nationalities (Hayu, Thami, Dhimal etc.), who are also Kirat Religion follower but their least number only follow the Kirat religion, and known as peripheral[25] Kirat group.

**The Inspiring Spirit :** In general, Kirat people believe the inspiration of God's spirit in human body. When a person is inspired by the good spirit of God, he or she will be senseless for a while and when the sense returns, her or she will begins to speck oracles ( Chemjong, 2003: 23 [Orig. 1948]). Further more, Chemjong argued that he or she prophecies the good or bad results of a sickness or of projects of any man or woman who consults him/her, and after then he or she recites all the Mundhums of the past days in his/her oracles. These oracles encourage people to do good work for the benefits of the others. They give good advice to people who believe it and direct them how to proceed to good path. They instruct people to use medicine for the recovery of sickness. When the God's spirit goes away from his or her body, he or she will fall asleep for a while, but cannot remember what they had said before.

[24] Out of total population Limbu 86.3 %, Yakha 81.4 %, Rai 70.9 % and Sunuwar 17.4 % are Kirat Religion followers

[25] 29.10 % of Hayu (total population 1,821), 14.6 % of Thami (total population 22,999), 7.64 % Dhimal (total population 19,537) including 12 Mongoloid communities are Kirat Religion followers and they are called as peripheral Kirat group.

**Figure 5: Statue of the first Kirat King, Yalambar (Tamaphok VDC, Sankhuwasabha)**

### 5.1.1 Yakha or Jimi

There is a very well-known story concerning the derivation of the Yakha term. According to story, the term Yakha is derived from the word *yaksha*, meaning small shelter in agricultural area where workers take rest and do have breakfast during the working seasons. As this, long ago, there were two brothers; one went away from the home for a long period. Meantime, all forgot him and when he returned, there was nowhere for him to stay. In response to the question 'where should I live?' his brother replied go to stay in the *yaksha*. There after, the offspring of him and his brother were used to be said Yakha and Limbu respectively. Now Yakha are culturally and linguistically, closer to the Limbu than the Rai, but distinct from both of them (Russell, 1997: 329). But a large number population of the Yakha still use to say themselves Rai (Maden *et al.* 2007). Most of the Yakha people residing in Kharang, Baneshwar, Jaljala, Siddhakali and Siddhapokhari VDCs of Sankhuwasabha district, use to say themselves Rai because their surname is written Rai in their official documents such as in school certificates, citizenship and in land related papers.

B. H. Hodgson was the very first scholar, in 1857 he wrote a basic word list of Yakha and in a paper published following year, he argued for the group to be recognized, with the neighboring Limbu, as belonging to the Kirat group. There after, different scholars such as Northey and Morris (1927: 215-6; 239fn), Morris (1936: 85; 114-5) and Bista (1967: 32, 38) mentioned Yakha as an ethnic group. A German linguist Alfonse Weidert was the first scholar to have conducted any sort of in-depth study of the Yakha, concentrated in the middle hills of the Koshi Zone of east Nepal, but he was shot dead in a bar in Bangkok in 1988 and after his death all his field notes were lost. Later Russell (1992) carried out a detail social anthropological study of Yakha. He (1997: 327) argued, Yakha as an ethnic group had never been identified on Nepalese or Indian censuses, makes quantification difficult, and even today their identity was imbedded

with Rai and Limbu. As stated by Wolf (1982), Yakha were those people who are without history.

Nowadays, Yakha are living in a single large cluster of 13 contiguous VDCs from south-east Shankhuwasabha to north Dhankuta. There is also one small cluster of Yakha in south-east Dhankuta which covers 6 VDCs. Before the census 2001, their population was used to be counted partly as Rai and partly as Limbu, and in the census 2001, their total population was 17,003. Sankhuwasabha district is densely Yakha populated district; which accounts 41.18 % of the total Yakha population. Dhankuta, with 29.25 % of the total Yakha population, has the second highest Yakha concentration in Nepal followed by Ilam (7.57 %). As cited in Kongren and Kongren (2007: 110), the origin place of Yakha is five *maghiya* and ten *maghiya*, which is called as *Yaksalain*. They have been given the titles 'Dewan', 'Jimindar' and 'Majhiya'.

As stated by Russell (1997), Tamaphok of Sankhuwasabha district is important for Yakha Nationality because culturally and linguistically traditional Yakha only exists there. Typical Yakha populace was found there who were rich in Indigenous Knowledge regarding the use of biodiversity for different ailments treatment and livelihood purposes.

Significant number of Yakha shamans was found within that VDC. Mr Dharku Lal Linkha is well known *chhamba* (Yakha pronounces *samba* as *chhamba*) of that VDC. He uses medicinal plants to treat different ailments. Mr Kul Bahadur Linkha is well known *phedangma* of that VDC. He has good knowledge and practice of medicinal plants and animal for different ailments treatment. Mr Jaya Bhadra Koyonwa (*Maha Guru*) is a senior shaman of Tamaphok. He has good practice in using medicinal plants but now he has almost left it. He is also one of the *chhambas.* There was no single *yeba* & *yema* and *mangba*.

**Yakha Shamans:** In Yakha, there is four kinds of shamans and they are very similar with Limbu shaman category because all Yakha shamans are descendant of Limbu shamans; only different in pronunciations, such as *muntum, chhamba* and *mananba* to *mundhum, samba* and *mangba* respectively. They use entirely Limbu *mundhum.* In Tamaphok, there is a renowned shaman, Mr Dharku Lal Linkha, who, is known as *chhamba*. At present, in Yakha territory, there is no one *yeba* and *yema*. Yakha people usually used to say *bijuwa* or *dhami* to *chhamba* and *mananba.* But Russell argues (1992: 166) that *chhamba, bijuwa; jhankri* and *dhami* are equivalent to the Limbu word *phedangma* and *yeba.* He also argues (*ibid*: 167) that Yakha shaman's rank is a derivative of different traditions, the *bijuwa* from Rai, and *chhamba* from the Limbu. As cited by Kongren and Kongren (2007), *chamwa, manhanwa, phetanwa* are the Yakha shaman.

But according to Russell (1992: 16), a *mananba/manhanwa* doesn't play a plate and may have been synonymous with the Limbu *phedangma*. This is interesting because in Limbu shamanism, *mangba* is associated with the performance of rituals to deal with spirits (the

**Figure 6: Yakha Shaman and Herbalist Mr. Kul Bahadur Linkha**

**Figure 7: Yakha Informant Mr. Om Bahadur Koyonwa**

result of 'bad death') and in Yakha there is no specific role of the *mananba/manhanwa*, he only plays the role of a priest, a position open only to men and inherited down through the father's line. The *chhamba* is also slightly different than Limbu case, he is an only spiritual healer (*ibid*: 168).

### 5.1.2 Limbu or Yakthumba

Historical documents reveal that the term Limbu was used by king Prithvi Narayan Shah (1721-1774 AD) in 1774 AD. The land of Limbu is known as Limbuwan, which is used to say as *pallo* Kirat 'Far Kirat', which is one of the three Kirat lands. The Limbuwan lies between the Arun river in the west, the border with Sikkim and West North Bengal states of India in the east, the northern parts plains of Morang, Sunsari and Jhapa in the south and the border with Tibet, China in the north, almost covering an area of 11,655 sq. km. (Subba, 1998: 1 [Orig. 1995]).

There is controversy of the origin of the term Limbu and Limbuwan. Most of the Limbu argue that the term Limbu is derived from the combination of *li* 'bow', *a-bu* ' he shoots' and *ban* 'country'. Thus *Limbuwan* means 'the country won by bow and arrow' and Limbu means 'archer'. According to a myth (Mabuhang, 2006: 1; as cited in Tumbahang, 2007: 32), a Kirat*i* virgin girl, Mujikna Khewana conceived after contact with air and gave birth to Susuwalilim Yakthunghang and later Lilim was modified as Limbu. Vansittart (1906: 100) quotes Sarat Chundra Das as saying, 'The country between the Arun and Tamor is called Limbuwan by the Nepali natives, and the aboriginal people, who have resided there from time immemorial, are

designated by the name of Limbu, though they call themselves by the name of Yakthungba (refer male) and Yakthungma (refer female), though there is no exact meaning of these words.

Campbell (1840: 31) says that the term *Limbu* is a Gorkha conception of the autonym *Ekthoomba*. But in 1832 BS, the very first time, Gurkha King, P. N. Shah addressed them as the Limbu, giving the land tenure administrative authority, *lal mohar*[26]. Now it can be guessed that Limbu is not a native term but an exonym used to designate them. Driem (1987: xix) says that the term *Limbu* is a Nepali ethnonym and therefore, the Limbu homeland in eastern Nepal is known in Nepali as *Limbuwan*. Tumbahang (2007: 32) argues that from linguistic point of view, it sounds like a native word because in Limbu there are lots of words which contain such phoneme sequences as *limba* 'sweet', *limde* 'it tasted sweet' , *libu* 'he curled it', *labu* 'he burnt it' etc. Moreover, it does not sound a Nepali word as it does not mean anything in it. Despite such evidences, contemporary Limbus still believe that it is an exonym used by outsiders for them

Since then, the area from the eastern bank of the great river Arun and extending from it to Sikkim is referred as Limbuwan area. Previously, this area was divided into ten sectors, viz, Tamarkhola, Mewakhola, Miawakhola, Phedap, Panchthar, Chhatthar, Athrai, Yangrok or Yangrup and Chaubisia. These places were ruled over by ten Limbu chieftains and consequently, the area is collectively called as 'ten lands of the Limbus.' These areas are now under Koshi and Mechi zones. Limbu language is called *yakthung pan* or *yakthungba pan* in the mother-tongue and *Limbu bhasa* in the Nepali language. This belongs to Kirati subgroup of *Bodic* group of Tibeto-Burman sub-family of Sino-Tibetan family of languages (Tumbahang, 2007: 40), and they are a relatively unified group, possessing only four distinct dialects.

The Limbus, in particular, was amongst the last peoples to lose their independent status during the consolidation of the Nepalese state under king Prithvi Narayan Shah and his successors. At the beginning of the eighteenth century after independent Limbu kingdoms in eastern Nepal had finally been subjugated, the Limbus, who had developed their own literary tradition in an indigenous *Devanagari* -based Limbu script, were viewed by the government as a threat to a united Nepal (Davids & van Driem, 1985: 119). The use of the Limbu alphabet was banned and the possession of Limbu writing out-lawed. Nowadays, that *Devanagari* -based Limbu script is known as the *sirijonga.* The inventor of this script was Shirijunga Dewangsi[27]**.**

Later government divided the Limbu into two groups[28], the *sampriti* and the *niti*: the former were those who had surrendered to government power and cultural traditions, while the latter maintained their own traditions. The government authorities naturally favoured the *sampritis*, killing the *niti* Limbus or forcing them to flee their lands. As a result, much of the *niti* population migrated towards Sikkim and Bhutan.

The Limbus identity was particularly strong because Nepalese governmental authorities have come to governmentally control all former tribal lands except those of Limbus, who have

[26] Conferment of power sealed with the red seal upon the Limbus to rule certain area.

[27] The Limbu Saint Shirijunga Dewangsi was born in 1704 in Taplejung district. He was shot to death by the Tibetan Lamas or Tachhang Lamas of Pemayontse monastery in 1741 near village of Martam in Western Sikkim.

[28]See also Dhungel's (VS 2062: 60-62) similar article originally written in Nepali entitled 'Limbuka 'Sampriti' ra 'niti' samuha: Gorkha shasanko den' for a clearer picture of historical savagery of the past by conquerors.

retained their ancestral land rights (Caplan, 1970; as cited in Davids & van Driem, 1985: 121). These land rights are determined through the Limbu kinship system. The autochthonous Limbu *kipat-system* of land tenure was still operative in *Limbuwan* in 1975 alongside the governmental *raikar* system (Jones & Jones, 1976; Bista, 1980).

The Limbu is the most numerous group and now they have been living in one single cluster of 119 contiguous VDCs from Taplejung, Tehrathum, Panchthar, Ilam, Dhankuta, to northern Morang and Jhapa. They are territorially more contiguous than any other group in Nepal (Sharma, 2008: 29). They are the largest group in the three districts (Taplejung, Panchthar and Tehrathum), but have majority in none. They make up 41.7, 40.3 and 35.4 %, respectively of the district population in these three districts. They form over 10 % of the district population in a total of five districts (including Ilam and Dhankuta). These five districts account for 67.2 % of the total Limbu population. Panchthar, with 22.7 % of the total Limbu population, has the highest concentration of Limbu in Nepal followed by Taplejung (15.7 %), Ilam (11.3 %) and Tehrathum (11.1 %). Here, again, the strong migration flow is evident in Jhapa and Morang, which harbor 10.5 % of the total Limbu population.

**Limbu Shamans:** Generally four different kinds of shamans are recognized in Limbu communities. They are: i. *Yeba* & *Yema*, *ii*. *Samba*, iii. *Phedangma*, and *iv*. *Mangba*. The differences are often difficult for a non Limbu to understand, just as it would be difficult for a Limbu to understand the religious differences between a 'preacher', a 'priest', a 'reverend', a ' minister' in the society (Anonymous, 1996: 31 [Orig. 1976]). Sometimes the distinctions are minute and unimportant. All perform at weddings, funerals, wakes, harvest rites and periodic rituals for the welfare of households. Which

one will be called upon is a matter of individual choice and availability. In short, all serve as 'priests' in that they are capable of performing Limbu rituals. As Caplan (2000: 106 [Orig. 1970]), the *phedangma* officiates at the important Limbu *rites de passage* at the time of birth, marriage and death. He is also required to conduct the worship of domestic deities and is one of a variety of specialists who may be called upon to treat illness.

The difference are more pronounced when it come to the diagnosis and cure of diseases and the prevention of misfortunes and other calamities that have supernatural causes (Anonymous, 1996: 31 [Orig. 1976]). For example, the *yeba* and *yema* are specialists in diseases which are thought to have their origin in the spirit, Nahen- the spirit of envy and jealousy. Many Limbu feel they are more effective in controlling the evil actions of witches, such as the witches desire to such blood, which the yeba drinks on the Nahen[29] ceremony. Frequently, they are referred to as witches, in Nepali *boksa/boksi.* The only distinction made between a *yeba* and *yema* is in terms of sex - the *yeba* is male while the *yema* is female (ibid: 31).

[29] The personification of jealousy who instigates acts of witchcraft.

**Figure 8: Limbu Informant Mr Sanchbir Faben**

The *samba* is the first ritual minister in the myths of origin (Sagant, 1996: 439). He is a specialist in the oral literature and mythology of the Limbu, collectively called the *mundhum* (Anonymous, 1996: 31 [Orig. 1976]). Many believe his power is in the 'word', so to speak, and in his ability to recite the proper myth or *mantra* that is needed in pacifying any angry spirit, god or goddess. A good *samba* should know the entire *mundhum* by heart, which as most Limbu will point out, may take lifetime of study. Nevertheless, the *samba* should make this his goal as a shaman.

The *phedangma* does not seem to have a specialized function, as *yeba*, *yema* and *samba;* but he is a 'jack-of-all-trades' shaman. He is capable of performing the *Nahangma* ritual for the welfare of the head of the household. The *mangba* is a specialist in dealing with the spirits of people who have died by violence, known as *sogha* in Limbu terms, women who died in childbirth, *sugut* and stillbirths, *susik*. The *mangba* was initially only in Rai Communities.

Generally, in Limbu communities the shamans are ranked just as the children of the family are ranked. They are referred to (using Nepali terms) as *jetha* (oldest), *maila* (second oldest), *Saila* (second oldest) and *kanchha* (youngest). The *phedangma* is the *jetha*, the *Samba* is *Maila*, the *yeba* and *yema* is *saila* and *mangba* is the youngest, *kanchha*.

According to myth, the first shaman was the *phedangma* (Anonymous, 1996: 32 [Orig. 1976]). He had two names: Sing-dong-ding Pekwaling and Segephungwa. The first *phedangma* descended from the sky. He was sent by Tagera Ning-waphuma, the creator god, who is identified on earth as *Yuma Sammang*, the 'Grandmother Spirit'. He appeared in the rays of the sun and descended to the earth where he landed in a great body of water, a lake identified as the

God, Warokma, or the spirit of the waterplaces, lakes, streams, and waterfalls. He landed in a red part of the lake and swam ashore where he wandered on the earth, learning the *mundhum*, which details the creation of the universe, the origins of men and animals, and the first customs and laws. After learning the *mundhum*, he became a *samba*, the shaman who is today identified as mythological specialists. In the course of his learning, he was also given the powers to diagnose disease and cure the sick, through divination, sacrifice, and rituals to the gods and spirits of nature.

In contrast, the first *yeba* appeared in the green void of darkness (Anonymous, 1996: 33 [Orig. 1976]). His name was Pokthimba (related to a bird species). The first *yeba* was taught the *mundhum* of the Nahen, the spirit of envy and jealousy, and given the powers to cure men who suffer from her attacks. His origin and power are unequivocally identified with the evil in nature. He is considered to be the most powerful of shamans. His tutelary deity is Yejuli, the spirit of witchcraft, and both *yeba* and *yema* are sometimes referred to as witches. Because of his powers of evil, many Limbu are of the opinion that he should not perform ceremony (*puja*) to the other gods and goddesses of the Limbu pantheon; if they are used it is said that it would bring harm to those who witnessed the performance. The *mangba* is believed originally to have been a Rai shaman, and their role is close with the forces that aid the *yeba* and *yema*- the forces of darkness and evil. He is also sometimes referred to as a witch because of his powers over the spirits of those who die by violence.

More frequently, the Nepali term *dhami*, and less frequently, *bijuwa* or *dewari*, are used in identifying non Limbu shamans. The term *jhankri* is used in referring to Tamang or Bhotia shamans, who, with certain exceptions, assume the full dress costume of the feather headdress, bells, and skirt. According to anonymous (1996: 52 [Orig. 1976]), *yeba* and *yema* might be linked to the *jhankri* tradition, while the *phedangma* and *samba* have borrowed heavily from the more Hinduized *dhami*.

The difference between Limbu shamans are also defined in their respective costumes and shamanic equipments. Both *yeba* and *yema* wear a costume consisting of a skirt (*jama*), feather headdress (*wasang*), cowrie shell bandoliers (*uplak*) and garlands of acorn seeds, beads of *Elaecarpous sphericus* (*rudraksa*), bells, and the like. They frequently wear leather or canvas belt on which are strung a series of bells. They don't use the traditional shamanic drum, but instead during a state of trance or possession they beat a brass plate (*thal*).

The *phedangma* and *samba* don't wear the feather headdress and cowrie shell bandoliers. On very rare occasions, they wear the shaman's skirt. The key instrument in the ritual activities of the *phedangma* and *samba* is the two-headed drum, the *dhyanro* and both wear garlands of *Elaecarpous sphericus* (Botanical Name) beads and bells in curing ceremonies. But all shamans use the drum or the brass plant in life-cycle rituals, i.e., birth, marriage, and death- or harvest rituals. The *mangba* uses both the drum and the brass plate, but does not wear the feather headdress, skirt or cowrie shell bandolier. Significant number of Limbu shamans was found in Phakumba VDC of Taplejung district. Mr Makar Dhoj Shrengchongbang, Mr Nar Dhoj Phago (Phago Jetha), Mr Mohan Wanem, Mr Naule Kanchha were popular *yeba* of that VDC. They were found to be roaming in surrounding VDCs for ritual tradition too. Mr Sanch Bir Phaben is one of the popular *samba*s of Phakumba.

**Figure 9: Rai Shaman and Herbalist**

**Mr. Tara Ram Rai**

**Figure 10: An old Yakha Woman**

In addition to ritual tradition, he uses medicinal plants to treat different ailments. He knows most of the medicinal plants of his surrounding areas and has collected also high altitude plants. He has small box where he keeps different parts of medicinal plants which he uses for treatment. In the treatment, he uses his *mantra*, too. There were more than half dozen *phedangma* but there was no one *yema* and *mangba.*

### 5.1.3 Rai or Khambu

Rai is the fifth largest Indigenous Nationalities of Nepal. In 1952-54, there were a total of 236,049 Rai speakers, of which 221,089 were in the eastern hills region, where they formed 12.9 % of the population. Now as the census 2001, their total population number is 635,151 and constitutes 2.79 % of the total population of country. Rai perhaps, include a number of tribes, who speak closely related, although mutually unintelligible languages belonging to the Tibeto-Burman family. Now 22 different Rai languages have been registered as the national languages.

Rai inhabiting area is known as Khambuwan or *majh* Kirat. It is located in between Dhudh Koshi and Arun River. Nowadays, most of Rai prefer to introduce themselves as Khambu. In Kulung Rai community, there is a saying regarding the Khambu, according to this (McDougal, 1979: 3), long ago, there were three brothers, namely Khambuho, Menho and Meratup and once they separated, each taking his respective followers, and set out independently, as they penetrated different river valleys, such as the Sun Koshi, Dudh Koshi and Arun River. Most of the Rais are the descendents of Khambuho; but some, such as the Chamling and Sampang clans are thought to be descendents of Meratup and others descendents of Menho.

Perhaps, there is no contradiction in the origin of the word Rai. Concerning the land, it is royal commission and an honorific title given to the headmen of *majh* Kirat by the Gorkha Kingdom for acting as intermediaries between state and people. During the Gorkha Kingdom expansion period, there was no administrative machinery to directly rule the newly conquered territories, so temporarily such official tittles were created to rule over them. The Limbu headmen of the *pallo* Kirat, were given the same honorific title but different word, Subba. There was no difference between the Rai and Subba authority except the land territory and the royalty. Subba used to manage a bit large area than the Rai and consequently he had to pay more money as the royalty. In adjoining areas between *majh* Kirat and *pallo* Kirat the title Rai was also applied to a member of the Limbu village council (Regmi, 1978: 864).

Today, Rai are most numerous group and now they have been living in one major cluster that cover 130 contiguous VDCs in Solukhumbu, Okhaldhunga, Khotang, Bhojpur, Sankhuwasabha, Udaypur, Dhankuta, Sunsari and Morang districts; and there are also three small clusters of numerous Rai presence: 11 VDCs in Ilam-Panchthar, 10 VDCs in southern Ilam, and six in Ilam-Morang (Sharma, 2008: 29). However, they are densely populated only in five contiguous districts of Solukhumbu, Khotang, Bhojpur, Sankhuwasabha and Dhankuta and also in Ilam but don't form the majority in anywhere.

They comprise over 30 % of the district population in three districts (Solukhumbu, Khotang and Bhojpur), cover 20 % of the district population in six districts (adding Ilam, Dhankuta and Sankhuwasabha), and over 10 % of the district population in nine districts (further adding Udaypur, Panchthar and Okhaldhunga). These nine districts account for 67.7 % of the total Rai Population. Khotang and Bhojpur alone harbor a fourth of the total Rai population. Sunsari and Morang in the terai have 7 and 6.8 % of the total Rai population, indicating strong Rai migration to these districts. As stated in the religious epic, the *Rigveda*, they came to Nepal from Kangra (India) in 1200 B.C. when they were chased by the Aryans (Baral, 1997, cited in Manandhar, 2002: 34).

**Rai Shamans:** Rai also has different categories of shamans such as *noksung* and *mangpa.* But they usually say *bijuwa* to indicate them, or and *bijuwa* is widely used term.

Mr Tara Ram Rai is well known *bijuwa* of Sindrang VDC of Bhojpur district. He is very genuine person for the knowledge and use of medicinal plants. He has planted several medicinal wild plants in his kitchen garden. *Phlomis bracteosa* is a kind of herbaceous plant which is planted in his kitchen garden. That plant is documented as a new record of medicinal valued plant for Nepal. According to him, the flower of this plant is used to treat the gland tuberculosis like ailments.

### 5.1.4 Sunuwar[30]

Sunuwar is also known as Mukhias. The term Sunuwar[31] is said to be derived from Sunkoshi River. People residing on either side of Sunkoshi River are said to Sunuwar. According to national census 2001, their total population was 95,254. Out of their total population, they inhabited in Dhanusha (19.66 %), Ramechhap (9.30 %), Bara (8.76 %), Mahotari (7.77 %), Sindhuli (7.46 %), Rautahat (6.86 %), Okhaldhunga (5.86 %), Ilam (3.78 %), Udayapur (2.34

[30] In the project areas, due to lack of proper Sunuwar populated villages, documentation of indienous knowledge of this community was not done.

[31] According to Shafer (1953), the Sunuwars who are a Sino-Tibetan tribe, belonging to the Bodic group.

%), Dolakha (2.29 %), Panchthar (2.08 %) districts (Gurung *et. al*, 2006: 80-81), and their distribution has been recorded in 70 districts (*ibid*.: 16).

In Sunuwar Nationality, male shaman is called as *puimbo* and female shaman *ngiami*. Priest is called as *naso*. In general, puimbo and ngiami is never hereditary, although the cases of shamans who don't belong to a specific lineage are rare. But the position of *naso* is always hereditary. Usually puimbo and ngiami prefer to perform their rites during night. The *puimbo* wears a kind of long female garment (*jama*) and a turban in which he has inserted porcupine needles. The *puimbo* or *ngiami* must banish the wandering souls of those who have died a violent death such as suicide, child birth and accidents (Fournier, 1974: 156).

The *naso* operates and sacrifices during the day-time and a *naso* must choose his successor from among his male offspring; his choice usually falls on the son or grandson whom he considers to be the most intelligent and most able to perform religious functions. During the period of initiation the pupil *naso* is trained to memorize a great variety of propitiatory formulae or chants by mnemotechnique repetitions. When he is about six or seven years old, the future *naso* accompanies his father to different rituals in order to familiarize himself with the different sequences which he must re-enact in private under the guidance of his *guru*. He must also learn by heart all the myths and traditions of his own culture which he gleans from village elders who might know them. If his father dies before he has completed his training, the young pupil finds himself obliged to ask the village community to contribute to the expenses of completing instruction as the future conductor of village rituals. The *naso* inherits the sacrificial bow and arrows on the death of his father in return for which he must carry out certain funerary rites.

The equipment of the *naso* is very simple. When he is officiating, he wears his ordinary everyday dress in clean, white material ornamented with one or two necklaces of blue and red stones, interspersed with a few seeds of *riththa* (*Sapindus mukerossi* Gaertn.) and *gandemala* (Fruit of *Coix lacryma-jobi* Linn.). On his head he sports a large white cotton turban (*pheta*) which he has received from the person asking for the rituals. At his right side, he carries a small bag decorated with yellow tassels and cowries. When he is officiating at a ceremony, he is seated on a musk deer skin or on a blanket if there is one available or otherwise on a paddy mat. In front of him is placed a red copper vessel containing a branch of *hope* [*Thysanolaena maxima* (Roxb.) Kunz. ] which is used as a holy-water sprinkler, and an censer (*dhupauro*) containing burning ashes and juniper resin.

**Indigenous Knowledge Holders :** Though, the study areas are not beyond the primary health post center, large populaces of Kirat Nationalities were found depended on medicinal plants for their health problem. In each VDC, there was at least 1-2 herbalist, who had remarkable skill on the use of such plants. Shamans were also found as

**Table 6: Role of naso and puimbo in a dual system of symbolic classification**

| SN | *Naso* | *Puimbo* or *Ngiami* |
|---|---|---|
| 1 | Male | Male or female |
| 2 | Hereditary | Non-hereditary |
| 3 | Right[32] | Left |
| 4 | Sacrifice | Trance |

[32] When *naso* and *puimbo* both operates together, the former sits on the right and later sits on the left

| | | |
|---|---|---|
| 5 | Day-time | Night-time |
| 6 | Ordinary male dress | Specific female dress |
| 7 | Life cycle | Death cycle |
| 8 | Living | Spirit |
| 9 | Normal death | Abnormal death |

*Source: Fournier (1974: 156)*

herbalist. They are, in general, IK practitioners. These herbalists and shamans, who were basically individual knowledge holders and didn't want to share their knowledge.

Apart from these incredible herbalists and shamans, few villagers were also found more or less knowledgeable on the use of certain medicinal plants. They knew at least 10 medicinal plants use but they didn't have practices in their daily life as herbalists and shamans. Similarly, some common medicinal plants and their use were known virtually by most of the community members, although it may concentrate among the old members of the communities. Besides medicinal plants, zoological species were also recorded as used in treatment of different ailments by them. They are using these varieties of biodiversity resources for different ailments treatment and for edible as well as other livelihood purposes from time immemorial and such skill and practices have been transferred from generation to generation without any written forms.

### 5.2 Specific Findings-I

From October 2006 to early 2008, intensive field works were carried out, a total of 198 plant species were documented as used for treatment of different ailment by Yakha, Limbu and Rai Nationalities (see Annex 9). Similarly, 14 animal species were also found to be used for different ailment's treatment (Annex 2). From the literature analysis, 26 plant species were noticed as new medicinal plant species for Nepal (see Annex 11). Scientific names of recorded plants and animals are arranged in alphabetical order followed by family, local name, Kirat names i.e. Yakha, Limbu and Rai names (if available). In each problem, medicine preparation method, dose and duration is mentioned.

Life forms of each species (shrub, herb, tree, climber, mushroom, ferns, birds, insects, etc) are also given. Parts of plants and animals that are used, preparation method including tentative amount, dose per day and duration are explained so that any one could make and use the resources if he or she could recognize the resources. Among new record , 4 plant species are additional new species for Nepal which belong to family Cucurbitaceae.

Plant species were found to be used mainly in 18 different problems such as gastric, injury, jaundice, parasites, pneumonia, skin problem etc (see Annex 1). Furthermore, injury, ENT, gastrointestinal, women related problems are termed for different allied problems. For example, in injury the terms like body pain, heart pain, chest pain, toothache, pyorrhea, headache, bruise, sprain, abscesses, cut wound, wound, burned, fractured, dog bite, snake are incorporated. In general, root, fruit and leaf of medicinal plants were found widely used for various ailments treatment. In general, root was also found to be used through combination in leaf, bark or stem or other. Similarly, leaf was found to be used in the same way. Total frequency distribution of the parts of plants that were used in diverse ailments is given in the Table 7.

**Figure 11: Root tumor 'Rajgante' - Medicinal Plant**

**Table 7: Frequency distribution of the parts of plants used for diverse ailments**

| Part(s) of plants used | | Frequency | % | Valid % |
|---|---|---|---|---|
| Valid | root | 41 | 20.7 | 20.7 |
| | leaf | 24 | 12.1 | 12.1 |
| | bark | 12 | 6.1 | 6.1 |
| | stem | 4 | 2.0 | 2.0 |
| | rhizome | 12 | 6.1 | 6.1 |
| | fruit | 26 | 13.1 | 13.1 |
| | shoot | 6 | 3.0 | 3.0 |
| | entire | 12 | 6.1 | 6.1 |
| | others | 12 | 6.1 | 6.1 |
| | Root + leaf | 6 | 3.0 | 3.0 |
| | root + bark | 2 | 1.0 | 1.0 |
| | root + stem | 1 | .5 | .5 |
| | root + shoot | 2 | 1.0 | 1.0 |
| | root + others | 5 | 2.5 | 2.5 |
| | root + leaf + stem | 2 | 1.0 | 1.0 |
| | root + leaf + shoot | 4 | 2.0 | 2.0 |
| | root + leaf + fruit | 1 | .5 | .5 |
| | root + bark + shoot | 3 | 1.5 | 1.5 |
| | leaf + bark | 1 | .5 | .5 |
| | leaf + stem | 4 | 2.0 | 2.0 |

| | | | | |
|---|---|---|---|---|
| | leaf + fruit | 3 | 1.5 | 1.5 |
| | leaf + shoot | 7 | 3.5 | 3.5 |
| | leaf + entire | 2 | 1.0 | 1.0 |
| | leaf + stem + fruit | 1 | .5 | .5 |
| | bark + stem | 1 | .5 | .5 |
| | bark + fruit | 3 | 1.5 | 1.5 |
| | Fruits + others | 1 | .5 | .5 |
| | **Total** | **198** | **100.0** | **100.0** |

Source: The Research Field Survey, 2006-2008

As per Table 7, among 198 plant species, root of 41 species were found to be used, which constitutes 20.7 % of the total species. Fruit and leaf were found to be used 13.1 and 12.1 % respectively.

The medicinal plants concerning injury treatments were found maximum in number. Most of the plant healers easily treat bone fracture and other cases of injuries (see Table 8). For example, Yakha, Limbu and Rai use 25.3, 21.5 and 15.2 percent plant species respectively in injury and wound cases.

**Table 8: Frequency of table of different plants used for single problem**

| | | Plants used for single problem | | |
|---|---|---|---|---|
| | **Problems** | **Frequency** | **%** | **Valid %** |
| Valid | 1. injury, wounds | 40 | 20.2 | 33.1 |
| | 2. gastric | 16 | 8.1 | 13.2 |
| | 3. asthma | ? | ? | ? |
| | 4. jaundice | 5 | 2.5 | 4.1 |
| | 5. parasites | 4 | 2.0 | 3.3 |
| | 6. pneumonia | 10 | 5.1 | 8.3 |
| | 7. skin problem | 6 | 3.0 | 5.0 |
| | 8. ENT | 8 | 4.0 | 6.6 |
| | 9. tuberculosis | 2 | 1.0 | 1.7 |
| | 10. urinary | 2 | 1.0 | 1.7 |
| | 11. vomit | 3 | 1.5 | 2.5 |
| | 12. gastrointestinal | 11 | 5.6 | 9.1 |
| | 13. women related | 6 | 3.0 | 5.0 |
| | 14. cough cold | 1 | .5 | .8 |
| | 15. veterinary | 2 | 1.0 | 1.7 |
| | 16. fever | 3 | 1.5 | 2.5 |
| | 17. pressure | 1 | .5 | .8 |
| | 18. stone | 1 | .5 | .8 |
| | Total | 121 | 61.1 | 100.0 |
| Missing | System | 77 | 38.9 | |

| | | |
|---|---|---|
| **Total** | **198** | **100.0** |

Source: The Research Field Survey, 2006-2008

As per Table 8 Altogether 20.2 % plant species were found to be used in injury and wound cases. Plants were also found widely used in gastric problems. Sixteen species, i.e. 8.1 % plant species were recorded to be used in gastric problem. The third case in which the huge number of plant species used was in gastrointestinal. Diarrhea, dysentery, digestive, indigestion, abdominal troubles have been included within the term gastrointestinal. Concerning gastrointestinal problem, 11 plant species i.e. 5.6 % of the total collected species were found to be used.

Pneumonia was found as well known ailment among the Kirat Nationalities and it is also known as *santipat*. For the treatment of this problem, 10 plant species were found to be used. Similarly, six plant species which covers 3 % of the total plant species were found to be used in the woman problems such as irregular menses, over bleeding during menses, delaying placenta fall after delivery etc. The different ailments and number of plants used to treat them are given in the **Table 8**.

Among the listed 18 types of ailments (**Table 8**), 121 plant species were recorded to treat only a few ailments. For example, 16 plant species were recorded as used in gastric problems only which constitute 8.1 % of the 121 species. Similarly, 40 plant species were recorded as used in injury plus wound problem that constitute 20.2 %.

Some of the plant species were recorded as to be used for diverse ailments treatment. Forty three species were found to be used in the treatment of two different ailments. For example, Yakha Nationality use the spore of *Calvatia gigantea* (Batsch.: Pers.) Lloyd[33], a kind of mushroom, for treatment of cut wound and ear inflection. Limbu Nationality use *Achyranthes aspera*, locally known as *ulte jhar*, for curing pneumonia and remove placenta quickly after delivery. Rai Nationality use *Cyperus rotundus* L., a kind of herb, which is locally known as *mothe*, to cure gastric and ulcer. Similarly, 24 plant species were found to be used in the treatment of three different ailments. *Gonostegia hirta* **(**Blume) Miq., a herb known as *chiple jhar*, was used to treat fracture, cough and colds, and dandruff by Yakha Nationality. *Rubus ellipticus* Sm., known as *ainselu*, was used to treat in vomiting, pneumonia and urine infection by Limbu Nationality. A few plants were found to be used in more than three ailments. The frequency of such plants which were used in two, three or more is given in the Tables 8, 9 and 10 respectively. Furthermore, the problems as mentioned in **Table 8**, is given under remarks title.

[33] In 1998, *Calvatia gigantea* (Batsch.: Pers.) Lloyd was reported as new record for Nepal by Dr M.K. Adhikari from Kathmandu valley but its medicinal value has not been reported yet.

**Figure 12: Calvatea gigantea**

## Table 9: Frequency table of the different plants used for 2 problems

| Plants used for 2 problems Frequency | | | | | |
|---|---|---|---|---|---|
| **Problem number** | | | **%** | **Valid %** | **Remarks** |
| Valid | 19. problems 1& 2 | 4 | 2.0 | 9.3 | 1. gastric<br>2. injury, wounds<br>3. asthma<br>4. jaundice<br>5. parasites<br>6. pneumonia<br>7. skin problem<br>8. ENT<br>9. tuberculosis<br>10. urinary<br>11. vomit<br>12. gastrointestinal<br>13. women related<br>14. cough cold<br>15. veterinary<br>16. fever<br>17. pressure<br>18. stone |
| | 20. problems 1& 5 | 2 | 1.0 | 4.7 | |
| | 21. problems 1& 6 | 1 | .5 | 2.3 | |
| | 22. problems 1&7 | 1 | .5 | 2.3 | |
| | 23. problems 1& 12 | 3 | 1.5 | 7.0 | |
| | 24. problems 1&14 | 4 | 2.0 | 9.3 | |
| | 25. problems 2&4 | 1 | .5 | 2.3 | |
| | 26. problems 2& 7 | 2 | 1.0 | 4.7 | |
| | 27. problems 2&8 | 3 | 1.5 | 7.0 | |
| | 28. problems 2&10 | 1 | .5 | 2.3 | |
| | 29. problems 2 &11 | 1 | .5 | 2.3 | |
| | 30. problems 2&12 | 2 | 1.0 | 4.7 | |
| | 31. problems 2&13 | 2 | 1.0 | 4.7 | |
| | 32. problems 2&14 | 3 | 1.5 | 7.0 | |
| | 33. problems 3 &10 | 1 | .5 | 2.3 | |
| | 36. problems 5 &12 | 1 | .5 | 2.3 | |
| | 37. problems 5 &13 | 1 | .5 | 2.3 | |
| | 38. problems 5 &16 | 1 | .5 | 2.3 | |

| | | | | |
|---|---|---|---|---|
| | 39. problems 6 & 8 | 2 | 1.0 | 4.7 |
| | 40. problems 6 & 16 | 1 | .5 | 2.3 |
| | 41. problems 7 & 8 | 1 | .5 | 2.3 |
| | 43. problems 7 & 12 | 1 | .5 | 2.3 |
| | 44. problems 8 & 10 | 1 | .5 | 2.3 |
| | 45. problems 8 &12 | 1 | .5 | 2.3 |
| | 46. problems 10 &13 | 1 | .5 | 2.3 |
| | 47. problems 14 &16 | 1 | .5 | 2.3 |
| | Total | 43 | 21.7 | 100.0 |
| Missing | System | 155 | 78.3 | |
| **Total** | | | **100.0** | |

Source: The Research Field Survey, 2006-2008

As per Table 9, 43 plant species were recorded as used for the treatment of two ailments. For example, 4 species were recorded as used for gastric and injury plus wound cases, which constitute 9.3 % of the 198 plant species and 2 % of 43 plant species. Two plant species were found used for gastric and parasites, which constitute 4.7 % of 198 plant species and 1.0 % of 43 species.

**Table 10: Frequency table of the different plants used for 3 problems**

**Plants used for three problems**

| **Problem number** | | **Frequency** | **%** | **Valid %** | **Remark** |
|---|---|---|---|---|---|
| Valid | 48. problems 1, 2, 4 | 1 | .5 | 4.2 | 1. gastric<br>2. injury, wounds<br>3. Asthma<br>4. jaundice<br>5. parasites<br>6. pneumonia<br>7. skin problem<br>8. ENT<br>9. tuberculosis<br>10. urinary<br>11. vomit<br>12. gastrointestinal<br><br>13. women related<br>14. cough cold<br>15. veterinary<br>16. fever<br>17. pressure<br>18. stone |
| | 49. problems 1, 2, 5 | 2 | 1.0 | 8.3 | |
| | 50. problems 1, 2, 13 | 2 | 1.0 | 8.3 | |
| | 51. problems 1, 2, 14 | 1 | .5 | 4.2 | |
| | 52. problems 1, 5, 12 | 3 | 1.5 | 12.5 | |
| | 53. problems 1, 6, 13 | 1 | .5 | 4.2 | |
| | 54. problems 1, 8, 12 | 1 | .5 | 4.2 | |
| | 55. problems 1,11, 12 | 1 | .5 | 4.2 | |
| | 56. problems 1,12, 13 | 1 | .5 | 4.2 | |
| | 57. problems 1,12, 16 | 1 | .5 | 4.2 | |
| | 58. problems 2,6,12 | 1 | .5 | 4.2 | |
| | 59. problems 2,7,14 | 1 | .5 | 4.2 | |
| | 60. problems 2,7,16 | 1 | .5 | 4.2 | |
| | 61. problems 2, 8, 14 | 1 | .5 | 4.2 | |
| | 62. problems 2, 11, 12 | 1 | .5 | 4.2 | |
| | 63. problems 2, 13, 16 | 1 | .5 | 4.2 | |
| | 64. problems 2, 14, 16 | 2 | 1.0 | 8.3 | |
| | 65. problems 8,12, 14 | 1 | .5 | 4.2 | |
| | 66. problems 8,12, 16 | 1 | .5 | 4.2 | |
| | Total | 24 | 12.1 | 100.0 | |
| Missing | System | 174 | 87.9 | | |

| | | | |
|---|---|---|---|
| **Total** | **198** | **100.0** | |

Source: The Research Field Survey, 2006-2008

As per Table 10, 24 plant species were recorded as used for the treatment of three different ailments. Among them, one species (as tabulated first) were recorded as used in gastric, injury plus wound and jaundice, which constitutes 4.2 % of 198 plant species and 0.5 % of 24 plant species. Similarly, second species (as tabulated) were recorded as used in gastric, injury plus wound and parasites, that constitute 8.3 % of the 198 plant species and 1.0 % of the 24 plant species. As frequency occurred in the table, 3 plant species were recorded as used for gastric, parasites and gastrointestinal problems (problem 1,5 & 12 as tabulated)

**Table 11: Frequency table of the different plants used for 4 or more problems**

| | | plants | | | |
|---|---|---|---|---|---|
| **Problem numbers** | | **Frequency** | **%** | **Valid %** | **Remark** |
| Valid | 67. problems 1,2,6,14 | 1 | .5 | 10.0 | 1 gastric<br>2. injury, wounds<br>3. Asthma<br>4. jaundice<br>5. parasites<br>6. pneumonia<br>7. skin problem<br>8. ENT<br>9. tuberculosis<br>10. urinary<br>11. vomit<br>12. gastrointestinal<br>13. women related<br>14. cough cold<br>15. veterinary<br>16. fever<br>17. pressure<br>18. stone |
| | 68. problems 1,2,6,16 | 1 | .5 | 10.0 | |
| | 69. problems 1,2,8,12 | 1 | .5 | 10.0 | |
| | 70. problems 1,2,10,11 | 1 | .5 | 10.0 | |
| | 71. problems 1,2,12,16 | 1 | .5 | 10.0 | |
| | 72. problems 1,5,14,17 | 1 | .5 | 10.0 | |
| | 73. problems 2,3,5,17 | 1 | .5 | 10.0 | |
| | 74. problems 6,12,13,16 | 1 | .5 | 10.0 | |
| | 75. problems 1,4,6,14,16,17 | 1 | .5 | 10.0 | |
| | 77. problems 1,6,7,8,12,16 | 1 | .5 | 10.0 | |
| | Total | 10 | 5.1 | 100.0 | |
| Missing | System | 188 | 94.9 | | |
| **Total** | | **198** | **100.0** | | |

Source: The Research Field Survey, 2006-2008

As per Table 11, 10 plant species were recorded as used for the treatment of 4 or more ailments.Medicinal plants have been further grouped in their respective divisions such as Fungi, Lichens, Ferns and Angiosperms. Furthermore, these plants belong to different life forms such as tree, shrub, herb, climber or other forms (thallose- not differentiated into root, shoot and leaf). Here, all these documented plants have been tabulated according to their respective groups and the life forms (see Table 12). The maximum numbers of herb, shrub and climber species were found to be used by Yakha Nationality (see Chart 1. Bar diagram). While maximum number of tree and other species were found to be used by Limbu Nationality.

In addition to plant species, 14 animal species were found to be used for 6 different ailments treatment. These animals have been also grouped as insects, fishes, reptiles, amphibia, birds, mollusk and mammals.

The Kirat Nationalities have been surviving in a rural life adjacent to forest. They are also using forest plants as an important part in their life and derive food, fodder, fuel, etc. from the forest. The intimacy of Kirat Nationalities with forest and plants, a large number of plants were found to be used in edible and livelihood purposes. A total of 130 wild plant species were found to be used as edible fruit, curry, spice and other various livelihood related purposes.

**Table 12: Frequency table showing the distribution of the plants used for diverse ailments as their life form and the group**

| Belonging group or divisions | Frequency | % | Plant life form | Frequency | % |
|---|---|---|---|---|---|
| Fungi | 5 | 2.5 | herb | 69 | 34.8 |
| Lichens | 1 | 0.5 | shrub | 49 | 24.7 |
| Ferns | 9 | 4.5 | climber | 20 | 10.1 |
| Angiosperms -monocots | 27 | 13.6 | tree | 46 | 23.2 |
| Angiosperms -dicots | 156 | 78.8 | other | 14 | 7.1 |
| **Total** | **198** | **100.0** | **Total** | **198** | **100.0** |

Source: The Research Field Survey, 2006-2008

As per Table 12, 183 species of angiosperms (27 monocots and 156 dicots species) which constitute 92.40 % (13.6 % monocots and 78.80 % dicots species) were recorded as used for the treatment of different ailments by Yakha, Limbu and Rai Nationalities. Similarly 9 ferns (4.5 %), 5 fungi (2.5 %) and 1 lichen (0.5 %) species were recorded for the same purpose.

**Table 13: Frequency table of the plants used for edible and livelihood purposes as their life forms and the groups (divisions)**

| Plant belonging group (divisions) | | | Plant life-form (Habits) | | |
|---|---|---|---|---|---|
| | Frequency | % | | Frequency | % |
| Fungi | 3 | 2.3 | herb | 31 | 23.8 |
| Lichens | 1 | 0.8 | shrub | 38 | 29.2 |
| Ferns | 6 | 4.6 | climber | 18 | 13.8 |
| Angiosperms/monocots | 21 | 16.2 | tree | 33 | 25.4 |
| Angiosperms/dicots | 99 | 76.2 | other | 10 | 7.7 |
| **Total** | **130** | **100.0** | **Total** | **130** | **100.0** |

Source: The Research Field Survey, 2006-2008

As per Table 13, 130 species of angiosperms (21 monocots and 99 dicots species), which constitute 92.40 % (16.2 % and 76.2 %) were recorded as used for edible and livelihood purposes by Yakha, Limbu and Rai Nationalities. Similarly, 6 ferns (4.6 %), 3 fungi (2.3 %) and 1 lichen (0.8 %) were recorded as used for the same purposes.

**Table 14: Frequency table of the plants used for edible and livelihood purposes**

| Edible Purpose | Frequency | % | Livelihood Purpose | Frequency | % |
|---|---|---|---|---|---|
| vegetable | 20 | 15.4 | dyes | 4 | 3.1 |
| pickle | 12 | 9.2 | washing | 2 | 1.5 |
| fruits | 8 | 6.2 | poison | 9 | 6.9 |
| oil | 2 | 1.5 | thread | 5 | 3.8 |
| beverages | 5 | 3.8 | yeastcake | 13 | 10.0 |
| spices | 2 | 1.5 | religious | 23 | 17.7 |
| sel-roti | 2 | 1.5 | decoration | 1 | .8 |
| veg. + pickle | 7 | 5.4 | fruit ripening | 1 | .8 |
| oils + bev. | 1 | .8 | pot and instruments | 4 | 3.1 |
| fruit+bev. | 3 | 2.3 | fuil + fuil-oils | 2 | 1.5 |
| veg. + fruits | 2 | 1.5 | gum + other | 2 | 1.5 |
| | | | diyes + poison | 1 | .8 |
| | | | religion+yeastcake | 1 | .8 |
| **Total** | **64** | **49.2** | **Total** | **68** | **52.3** |
| **Total** | **130** | **100.0** | **Total** | **130** | **100.0** |

Source: The Research Field Survey, 2006-2008

As per Table 14, edible and livelihood related plants were 64 and 68 species respectively. Among edibles, 20 species, which constitute 15.4 %, were found to be used as vegetable followed by pickle 12 species (9.2 %). In livelihood, 23 species, which constitutes 17.7 %, were found to be used as religious plants, followed by yeast cake (13.0 species or 10.0 %).

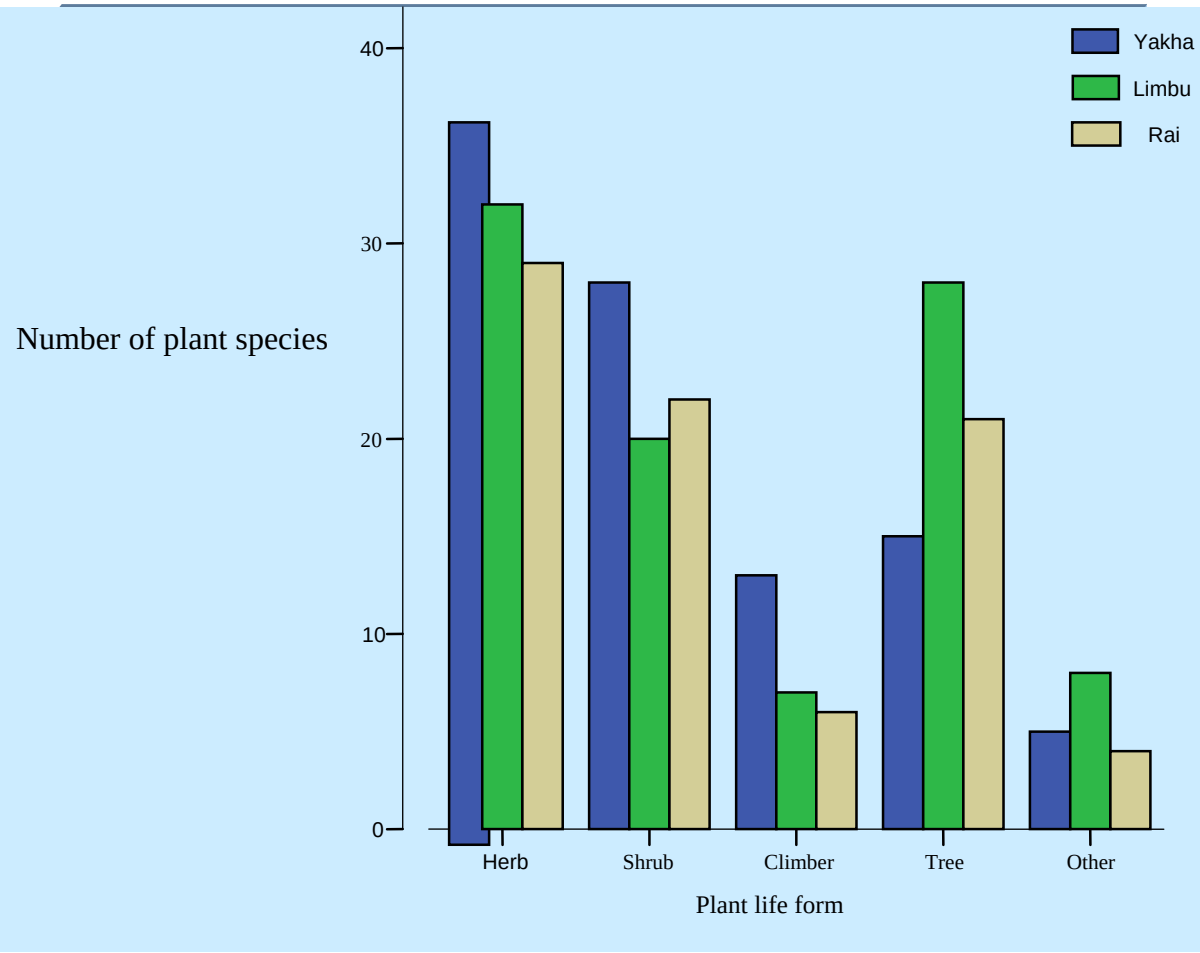



**Chart 1:** Distribution of plants as their life form used for diverse ailment by Yakha, Limbu and Rai.

As per Chart 1, Yakha Nationality use maximum number of herb, climber and other plant species for treatment of different ailments followed by Limbu and Rai Nationalities, respectively. Similarly, again Yakha Nationality use maximum number shrub and tree species for treatment of different ailments followed by Rai and Limbu Nationalities, respectively.

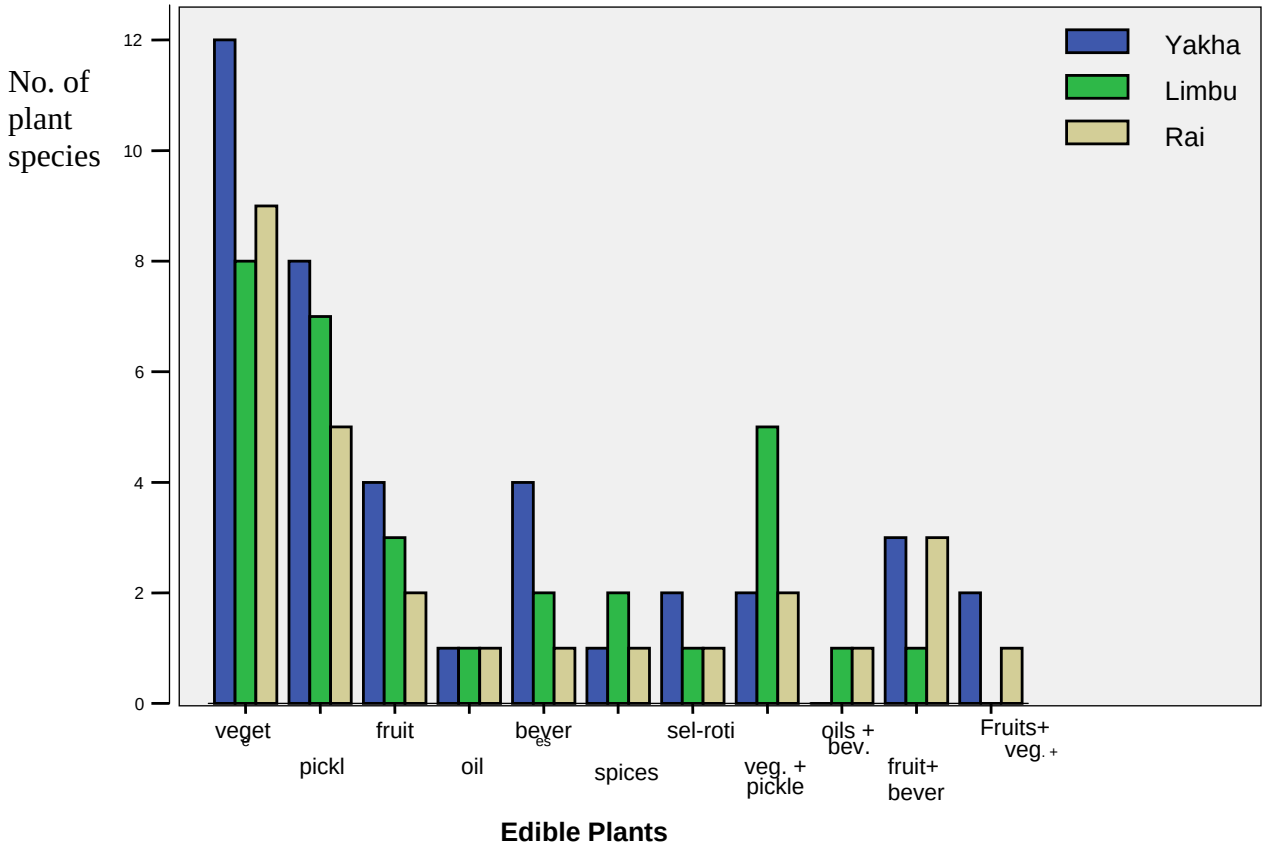



**Chart 2 :** Distribution of the plants used for edible purposes by Yakha, Limbu and Rai

As per Chart 2, Yakha Nationality use maximum number of plant species as vegetable, pickle, fruit, beverage, sel-roti, and fruit plus beverage. Limbu Nationlity use maximum number of plant species for vegetable plus pickle. Same number of plant species was found as used for oil by Yakha, Limbu and Rai Nationalities.

### 5.2.1 Yakha: Plants and Animals Used for Treatments of Different Ailments

Yakha Nationality is one of the small populace sizes among three studied Kirat Nationalities. They were found using more biodiversity resource for different ailments treatment. Altogether, 109 species (both plant and animal) were documented as used by Yakha Nationality for different ailments treatment (see Annex 3).

This project is the pioneer ethnobotanical research of Yakha because earlier no one has carried out such research in this Nationality. From the literature analysis, 20 species were recorded as new medicinal valued plants and animals for Nepal. *Rajgante,* is a kind of root tumor, found in the root of *kharane* (*Symplocos ramosissima*). This type of root tumor is formed due to infection of certain bacterial species. This bacterial specimen is also new record for Nepal.

### 5.2.2 Yakha: Plants Used for Edible and Livelihood Purposes

Edible and livelihood related plants were also consumed in higher number by Yakha than other two Kirat Nationalities. A total of 70 such species were documented (see Annex 4) from Sankhuwasabha district. A high number of plant species were found to be used by Yakha as vegetable, pickle, fruit, beverage and sel-roti (see Bar diagram of Chart 2).

### 5.2.3 Limbu: Plants and Animals Used for Treatment of Different Ailments

Limbu Nationality is the second largest group of Kirat Nationality. Siwakoti & Siwakoti, (1998) published a paper concerning ethnobotany of Limbu Nationality. The paper is based on the Limbu respondents of Pathri and Letang, Morang district. In the paper, altogether, 76 species of plants used as medicine by Limbu Nationality have been shortly described.

In the present research work, altogether 103 species (99 plant species and 4 animal species) have been documented as used by Limbu Nationality in different ailments treatment (see Annex 5). Among 198 plant species (used by Yakha, Limbu and Rai), 52 species were recorded as used only by Limbu Nationality which constitute 26.3 %. Similarly, 19 species were found to be used commonly by Yakha and Limbu. Again, 9 species were recorded as used commonly by Limbu and Rai. Furthermore, 15 species were recorded as used by Yakha, Limbu and Rai. These 103 plant species are almost different than listed by Siwakoti and Siwakoti (1998) because they collected the information only in the plain region while this research was carried out at the altitude from 1,200 to 2,500 meter and the occurrence of plant species varies according to altitudes. They have not reported a single new species that have been used by Limbu Nationality only. This research documents 10 species as new record of medicinal valued plants and animal for Nepal.

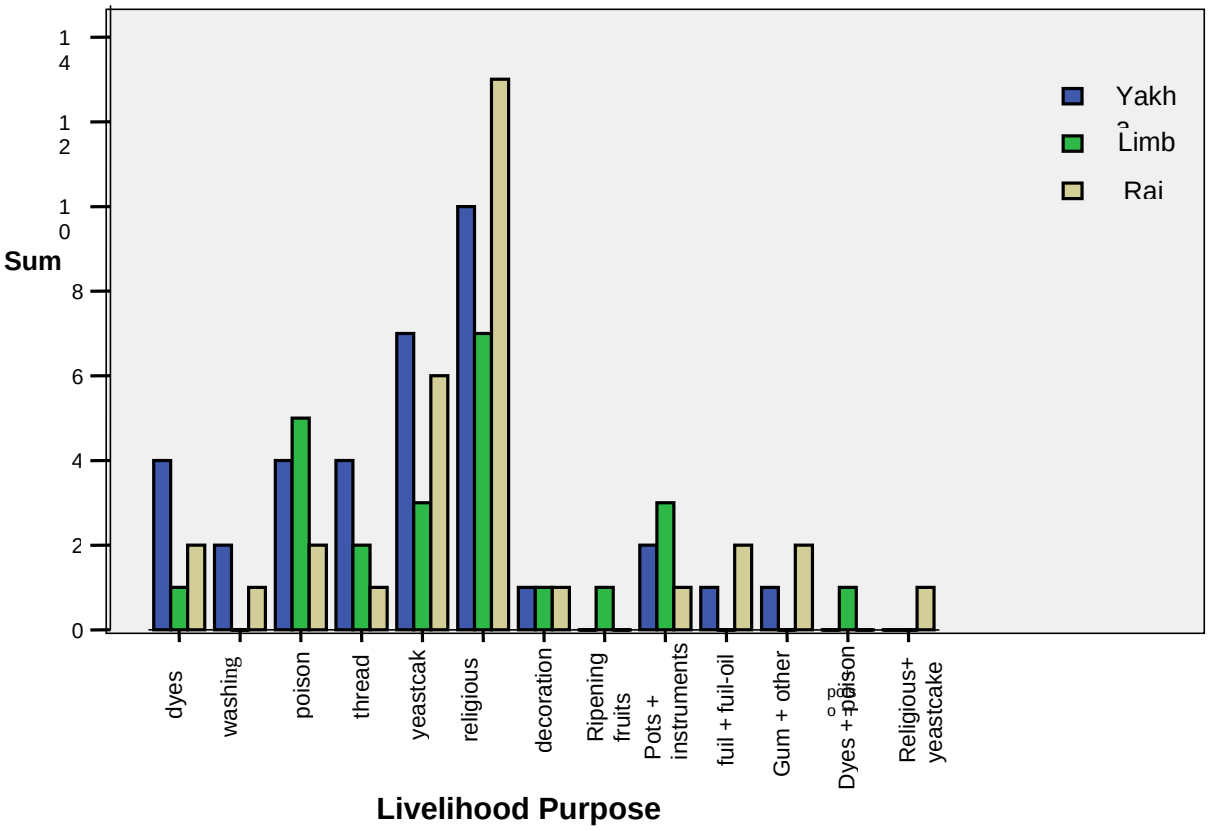



**Chart 3: Distribution of the plants used in livelihood purposes by Yakha, Limbu and Rai**

As per Chart 3, Rai Nationality use maximum number of plant species for religious purpose followed by Yakha and Limbu. Yakha Nationality use maximum number of plant species for dyes, threads and yeast cake. Limbu Nationality use utmost number of plant species for instrument. All these three Nationalities use same number of plant species for decoration.

### 5.2.4 Limbu: Plants Used for Edible and Livelihood Purposes

A total of 71 plant species were used by Limbu Nationality as edible fruits, curry, spice, thread or rope, religious and other various purposes (see Annex 6).As vegetable, less number of plant species were found to be used by Limbu than Yakha and Rai but Limbu were found using a high number of plant species as vegetable plus pickle (see Bar diagram 2).

### 5.2.5 Rai: Plants and Animals used for treatment of different ailments

Few ethnobotanical researches of Rai Nationality have been carried out by different researchers. Nepal (1999) carried out his master leveled dissertation work in ethnobotany of Rai and Sherpa Communities of Makalu-Barun Conservation Area, east Nepal. In the same year, Dahal (1999) published a paper regarding the ethnobotany of Aathpaharia Rai of Dhankuta district. He compiled ethnobotanical information about 25 plant species. Toba (1975: 7-240) published a total of 223 plant species used by Khaling Rai (one of the Rai languages spoken in Solu-Khumbu, Sagarmatha Zone) for medicine, edible and livelihood purposes (except the firewood related plants).

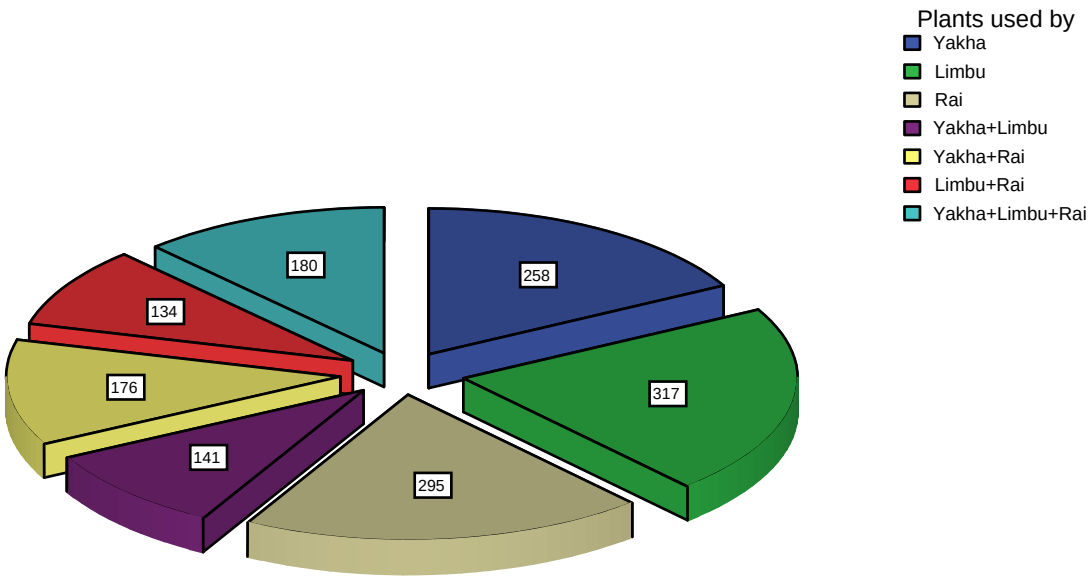
The present research has documented altogether 89 plant and animal species (85 plant species and 4 animal species) as used for different ailments treatment by Rai (Bantawa) Nationality (see Annex 7). Among 198 plant species (used by Yakha, Limbu and Rai), 39 plant species were used only by Rai Nationality. Eleven species have been recorded as new record of medicinal valued plants and animal for Nepal. *Hodgsonia macrocarpa* (Blume) Cogniaux, a large straggling climer, locally known as *ghyu fall* or wild pumpkins and in Rai language *Ngamsi* has been recorded from Sindrang VDC of Bhojpur district, which is a new species for Nepal.

### 5.2.6 Rai (Bantawa): Plants Used for Edible and Livelihood Purposes

Fifty two plant species were documented as used for edible and livelihood purposes by Rai Nationality of Sindrang VDC of Bhojpur district (see Annex 8). Maximum number of plant species used as religious was documented in Rai nationality (see Bar diagram 3).

## 5.3 Specific Findings- II (Cross Findings)

Some of the plant species were recorded as commonly used by Yakha, Limbu and Rai as tabulated in Table 15. Few species were used by only Yakha and Limbu, Yakha and Rai, Limbu and Rai, and Yakha, Limbu and Rai. Here, the tentative species are also shown by the Pie Chart 1.



As per Pie chart 1, Limbu Nationality use the maximum number of plant species for the treatment of ailments followed by Rai and Yakha, respectively. Similarly, Yakha plus Rai combinely use more plant species followed by Limbu plus Rai and Yakha plus Limbu, respectively. Just little more plant species were found used by Yakha plus Limbu plus Rai than Yakha plus Rai, respectively.

**Table 15: Cross tabulation of the plants (as their life form) used in treatment of different ailments by Yakha Limbu and Rai (New record for Nepal)**

| | | Life form of the species | | | | | Total |
|---|---|---|---|---|---|---|---|
| **Used by the Nationality** | **Used for** | **Herb** | **Shrub** | **Climber** | **Ang. monocot** | **Ang diccot** | |
| Yakha | injury +fractured | 1 | 2 | 0 | 0 | 0 | 3 |
| | snake bite | 0 | 1 | 0 | 0 | 0 | 1 |
| | Pneumonia | 1 | 0 | 0 | 0 | 0 | 1 |
| | gastric + appetite loss | 1 | 1 | 0 | 0 | 0 | 2 |
| | headache | 0 | 0 | 0 | 1 | 0 | 1 |
| | jaundice | 0 | 0 | 1 | 0 | 0 | 1 |
| | wound, ear problem | 0 | 0 | 0 | 0 | 1 | 1 |
| | Pneumonia, eye problem | 0 | 0 | 1 | 0 | 0 | 1 |
| | headache, heart pain | 0 | 1 | 0 | 0 | 0 | 1 |
| | **Total** | **3** | **5** | **2** | **1** | **1** | **12** |
| Limbu | injury +fractured | 0 | 0 | 0 | | 1 | 1 |
| | wound | 0 | 0 | 1 | | 0 | 1 |
| | Pneumonia | 0 | 1 | 0 | | 0 | 1 |
| | fever | 1 | 1 | 0 | | 0 | 2 |
| | ear infection | 0 | 0 | 0 | | 1 | 1 |
| | wound, diarrhea | 1 | 0 | 0 | | 0 | 1 |
| | **Total** | **2** | **2** | **1** | | **2** | **7** |
| Rai | injury +fractured | | 0 | 1 | 0 | | 1 |
| | intestinal worms | | 1 | 0 | 0 | | 1 |
| | gastric + appetite loss | | 0 | 1 | 0 | | 1 |
| | gland tuberculosis | | 1 | 0 | 0 | | 1 |
| | diarrhea | | 0 | 0 | 1 | | 1 |
| | **Total** | | **2** | **2** | **1** | | **5** |
| Yakha + Limbu +Rai | wound, jaundice, appetite loss | | 1 | | | | 1 |
| | **Total** | | **1** | | | | **1** |
| **Total** | | | **10** | **5** | **2** | **3** | **25** |

Source: The Research Field Survey, 2006-2008

As per Table 15, medicinal plant species (new record) used for different ailments by Yakha, Limbu and Rai separately and commonly are given according to life forms. Among them, 12 plant species have been documented as medicinal valued for the first time those are used by Yakha Nationality only (see Annex 11). These plants are further grouped in their respective life forms such as herb, shrub, tree etc. As new record, Yakha use 3 herb, 5 shrub, 2 climber, 1 monocot and 1 dicot species. Similarly, Limbu Nationality use 2 herb, 2 shrub, 1 climber and 2 dicot species as the new medicinal record. Likewise, Rai Nationality use 2 herb, 2 shrub,

1 climber plant species as the new record. And, Yakha, Limbu and Rai Nationalities use 1 plant species as new record.

**Table 16: Cross Table showing animals of different groups used for healing purpose by Yakha, Limbu and Rai (New record for Nepal)**

| Used by | Used For | Belonging group or divisions | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | Amphibia | Reptiles | Fish | Insects | Birds | Mammals | |
| Yakha | injury + wound | 0 | 0 | | 1 | 0 | | 1 |
| | burn | 0 | 0 | | 0 | 1 | | 1 |
| | pox +measles | 2 | 0 | | 1 | 1 | | 4 |
| | pox+jaudice | 0 | 0 | | 1 | 0 | | 1 |
| | skin problem | 0 | 1 | | 0 | 0 | | 1 |
| | **Total** | **2** | **1** | | **3** | **2** | | **8** |
| Limbu | fever | | | 1 | | | | 1 |
| | **Total** | | | **1** | | | | **1** |
| Rai | bodypain +swelling | 1 | | | 0 | | 0 | 1 |
| | injury + wound | 0 | | | 1 | | 1 | 2 |
| | **Total** | **1** | | | **1** | | **1** | **3** |
| Yakha+Limbu | cough | 1 | | | | | | 1 |
| | Total | 1 | | | | | | 1 |
| Yakha+Limbu+Rai | asthma | | | | | | 1 | 1 |
| | **Total** | | | | | | **1** | **1** |
| | **Total** | **4** | **1** | **1** | **4** | **2** | **1** | **14** |

Source: The Research Field Survey, 2006-2008

As per Table 16, the animal species used by Yakha, Limbu and Rai separately and commonly for the treatment of different ailments are given with their belonging groups or divisions. For example, Yakha Nationality uses 1 insect species for the treatment of injury plus wound and one bird species for the treatment of burn. Limbu Nationality use 1 fish species for treatment of fever. Rai Nationality use 1 amphibian species for treatment of body pain and swelling. Similarly, again Rai Nationality use 1, 1 species of insect and mammal for injury plus wound treatment, respectively.

**Table 17: Cross Table showing the distribution of the organs of animals used for healing purpose of different problems by Yakha, Limbu and Rai (New record for Nepal)**

| Used by | Used for | Part(s) used | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | | Teeth | Skin | Egg | Spleen | Flesh+other | Entire | Hive | |
| Yakha | injury + wound | | 0 | 0 | | | 0 | 1 | 1 |
| | burn | | 0 | 1 | | | 0 | 0 | 1 |
| | pox +measles | | 0 | 1 | | | 3 | 0 | 4 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | pox+jaudice | | 0 | 0 | | | 1 | 0 | 1 |
| | skin problem | | 1 | 0 | | | 0 | 0 | 1 |
| | **Total** | | **1** | **2** | | | **4** | **1** | **8** |
| Limbu | fever | | | | | | 1 | | 1 |
| | **Total** | | | | | | **1** | | **1** |
| Rai | bodypain +swelling | 0 | | | | 1 | 0 | | 1 |
| | injury + wound | 1 | | | | 0 | 1 | | 2 |
| | **Total** | **1** | | | | **1** | **1** | | **3** |
| Yakha+Limbu | cough | | | | | | 1 | | 1 |
| | **Total** | | | | | | **1** | | **1** |
| Yakha+Limbu+Rai | asthma | | | | 1 | | | | 1 |
| | Total | | | | 1 | | | | 1 |
| | **Total** | **1** | | **2** | **1** | **1** | **7** | **1** | **14** |

Source: The Research Field Survey, 2006-2008

As per Table 17, different parts of animal are given as used for the treatments of different ailments by Yakha, Limbu and Rai separately and also commonly. For example, teeth, skin, egg, spleen, etc. were found to be used to cure injury and wound, burned, small pox, measles by Yakha. In the treatment of asthma, Yakha, Limbu and Rai use spleen of one animal species.

## Table 18: Cross tabulation of the parts of the different plants used (as their life form) by Yakha, Limbu and Rai for diverse ailments

| | | Plant life form | | | | | Total |
|---|---|---|---|---|---|---|---|
| **Plants used by** | **Part(s) of plants used** | **Herb** | **Shrub** | **Climber** | **Tree** | **Other** | |
| Yakha | root | 5 | 6 | 2 | 1 | 0 | 14 |
| | leaf | 2 | 0 | 1 | 0 | 1 | 4 |
| | bark | 0 | 1 | 0 | 1 | 0 | 2 |
| | stem | 0 | 1 | 1 | 0 | 0 | 2 |
| | rhizome | 2 | 1 | 0 | 0 | 0 | 3 |
| | fruit | 2 | 1 | 1 | 1 | 0 | 5 |
| | shoot | 1 | 1 | 1 | 0 | 0 | 3 |
| | entire | 2 | 0 | 0 | 0 | 1 | 3 |
| | others | 0 | 1 | 1 | 1 | 1 | 4 |
| | root+shoot | 1 | 0 | 0 | 0 | 0 | 1 |
| | root+others | 0 | 1 | 0 | 0 | 0 | 1 |
| | leaf+shoot | 1 | 1 | 1 | 0 | 0 | 3 |
| | **Total** | **16** | **14** | **8** | **4** | **3** | **45** |
| Limbu | root | 5 | 3 | 2 | 3 | 1 | 14 |
| | leaf | 5 | 1 | 0 | 2 | 2 | 10 |
| | bark | 0 | 0 | 0 | 4 | 0 | 4 |
| | rhizome | 0 | 0 | 0 | 0 | 1 | 1 |
| | fruit | 0 | 1 | 0 | 3 | 0 | 4 |
| | shoot | 0 | 0 | 0 | 1 | 0 | 1 |
| | entire | 1 | 1 | 0 | 0 | 2 | 4 |
| | others | 0 | 2 | 0 | 0 | 0 | 2 |
| | root+leaf | 3 | 1 | 0 | 0 | 0 | 4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | root+bark | 0 | 0 | 0 | 1 | 0 | 1 |
| | root+others | 2 | 0 | 0 | 0 | 0 | 2 |
| | root+bark+shoot | 1 | 0 | 0 | 0 | 0 | 1 |
| | leaf+bark | 0 | 0 | 0 | 1 | 0 | 1 |
| | leaf+stem | 0 | 0 | 1 | 0 | 0 | 1 |
| | leaf+fruit | 0 | 0 | 1 | 0 | 0 | 1 |
| | leaf+entire | 0 | 0 | 0 | 1 | 0 | 1 |
| | **Total** | **17** | **9** | **4** | **16** | **6** | **52** |
| Rai | root | 2 | 0 | 0 | 0 | 0 | 2 |
| | leaf | 1 | 2 | 0 | 1 | 1 | 5 |
| | bark | 0 | 0 | 0 | 2 | 0 | 2 |
| | stem | 0 | 0 | 0 | 2 | 0 | 2 |
| | rhizome | 3 | 0 | 0 | 0 | 0 | 3 |
| | fruit | 3 | 5 | 0 | 4 | 1 | 13 |
| | entire | 1 | 0 | 0 | 0 | 0 | 1 |
| | others | 2 | 1 | 0 | 0 | 0 | 3 |
| | root+bark | 0 | 0 | 1 | 0 | 0 | 1 |
| | root+shoot | 0 | 1 | 0 | 0 | 0 | 1 |
| | root+others | 0 | 1 | 1 | 0 | 0 | 2 |
| | root+bark+shoot | 0 | 0 | 1 | 0 | 0 | 1 |
| | leaf+shoot | 1 | 1 | 0 | 0 | 0 | 2 |
| | leaf+entire | 1 | 0 | 0 | 0 | 0 | 1 |
| | **Total** | **14** | **11** | **3** | **9** | **2** | **39** |
| Yakha+Limbu | root | 0 | 2 | 1 | 0 | 0 | 3 |
| | leaf | 2 | 0 | 0 | 1 | 0 | 3 |
| | bark | 0 | 0 | 0 | 1 | 0 | 1 |
| | rhizome | 1 | 0 | 0 | 0 | 0 | 1 |
| | fruit | 0 | 0 | 0 | 1 | 0 | 1 |
| | shoot | 0 | 0 | 0 | 1 | 0 | 1 |
| | entire | 1 | 0 | 0 | 0 | 0 | 1 |
| | others | 1 | 2 | 0 | 0 | 0 | 3 |
| | root+leaf | 0 | 0 | 0 | 0 | 1 | 1 |
| | root+stem | 1 | 0 | 0 | 0 | 0 | 1 |
| | root+leaf+ shoot | 1 | 0 | 0 | 0 | 0 | 1 |
| | root+leaf+fruit | 0 | 0 | 1 | 0 | 0 | 1 |
| | leaf+stem | 0 | 0 | 0 | 1 | 0 | 1 |
| | **Total** | **7** | **4** | **2** | **5** | **1** | **19** |
| Yakha+Rai | root | 3 | 2 | 0 | 0 | 0 | 5 |
| | leaf | 0 | 0 | 0 | 1 | 0 | 1 |
| | bark | 0 | 0 | 0 | 1 | 0 | 1 |
| | rhizome | 2 | 0 | 0 | 0 | 1 | 3 |
| | fruit | 0 | 0 | 1 | 2 | 0 | 3 |
| | rot+leaf+stem | 1 | 0 | 0 | 0 | 0 | 1 |
| | root+leaf+ shoot | 0 | 1 | 0 | 0 | 0 | 1 |
| | leaf+stem | 0 | 1 | 0 | 0 | 0 | 1 |
| | leaf+stem+fruit | 0 | 0 | 1 | 0 | 0 | 1 |
| | bark+fruit | 0 | 0 | 0 | 1 | 0 | 1 |
| | fruits+ others | 1 | 0 | 0 | 0 | 0 | 1 |
| | **Total** | **7** | **4** | **2** | **5** | **1** | **19** |
| Limbu+Rai | leaf | 0 | 0 | | 0 | 1 | 1 |
| | bark | 0 | 0 | | 2 | 0 | 2 |
| | root+leaf | 1 | 0 | | 0 | 0 | 1 |
| | leaf+stem | 0 | 0 | | 1 | 0 | 1 |
| | leaf+fruit | 0 | 0 | | 1 | 0 | 1 |
| | leaf+shoot | 0 | 1 | | 1 | 0 | 2 |
| | bark+fruit | 0 | 0 | | 1 | 0 | 1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Total** | **1** | **1** | | **6** | **1** | **9** |
| Yakha+Limbu+Rai | root | 2 | 1 | 0 | 0 | | 3 |
| | rhizome | 1 | 0 | 0 | 0 | | 1 |
| | shoot | 0 | 1 | 0 | 0 | | 1 |
| | entire | 3 | 0 | 0 | 0 | | 3 |
| | root+leaf+stem | 0 | 0 | 1 | 0 | | 1 |
| | root+leaf+ shoot | 0 | 2 | 0 | 0 | | 2 |
| | root+bark+shoot | 0 | 1 | 0 | 0 | | 1 |
| | leaf+fruit | 1 | 0 | 0 | 0 | | 1 |
| | bark+stem | 0 | 0 | 0 | 1 | | 1 |
| | bark+fruit | 0 | 1 | 0 | 0 | | 1 |
| | **Total** | **7** | **6** | **1** | **1** | | **15** |

Source: The Research Field Survey, 2006-2008

As per Table 18, 198 plant species are categorized mainly in two groups. In the first category, the plant species as used separately by Yakha, Limbu and Rai are given with life forms and used parts. For example, 45 plant species were recorded as used only by Yakha. Among them, roots of 14 plant species were recorded as used by Yakha in the ailments treatments (5 herbs, 6 shrubs, 2 climbers, 1 tree and 0 other). In the second category, plant species number that commonly used by Yakha, Limbu and Rai are given with the used parts. For example, Yakha, Limbu and Rai commonly used 15 different plants. These plants are further grouped according to their parts used.

## Table 19: Cross tabulation of the plants used for single problem as their life form by Yakha, Limbu and Rai

| | | **plant life form** | | | | | **Total** |
|---|---|---|---|---|---|---|---|
| **Plants used by** | **Plants used for single problem** | **Herb** | **Shrub** | **Climber** | **Tree** | **Other** | |
| Yakha | 1. gastric | 3 | 3 | 0 | 0 | 0 | 6 |
| | 2. injury, wounds | 4 | 5 | 2 | 2 | 2 | 15 |
| | 4. jaundice | 0 | 0 | 2 | 0 | 0 | 2 |
| | 6. pneumonia | 2 | 0 | 0 | 0 | 0 | 2 |
| | 7. skin problem | 0 | 1 | 0 | 1 | 0 | 2 |
| | 8. ENT | 1 | 0 | 0 | 0 | 0 | 1 |
| | 9. tuberculosis | 0 | 0 | 1 | 0 | 0 | 1 |
| | 12. gastrointestinal | 0 | 2 | 0 | 1 | 0 | 3 |
| | 14. cough cold | 1 | 0 | 0 | 0 | 0 | 1 |
| | 16. fever | 0 | 1 | 0 | 0 | 0 | 1 |
| | **Total** | **11** | **12** | **5** | **4** | | **34** |
| Limbu | 1. gastric | 2 | 1 | 1 | 0 | 0 | 4 |
| | 2. injury, wounds | 4 | 0 | 1 | 4 | 3 | 12 |
| | 4. jaundice | 0 | 0 | 0 | 1 | 0 | 1 |
| | 5. parasites | 1 | 0 | 0 | 1 | 0 | 2 |
| | 6. pneumonia | 1 | 3 | 0 | 1 | 0 | 5 |
| | 8. ENT | 1 | 0 | 0 | 1 | 1 | 3 |
| | 10. urinary | 0 | 1 | 0 | 0 | 0 | 1 |
| | 11. vomit | 1 | 0 | 0 | 2 | 0 | 3 |
| | 12. gastrointestinal | 3 | 1 | 0 | 1 | 1 | 6 |
| | 13. women related | 0 | 1 | 1 | 2 | 0 | 4 |
| | 16. fever | 0 | 1 | 0 | 0 | 0 | 1 |
| | **Total** | **13** | **8** | **3** | **13** | **5** | **42** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Rai | 1. gastric | 2 | 0 | 1 | 1 | 0 | 4 |
| | 2. injury, wounds | 5 | 1 | 1 | 1 | 1 | 9 |
| | 4. jaundice | 0 | 0 | 0 | 1 | 0 | 1 |
| | 5. parasites | 0 | 0 | 1 | 0 | 0 | 1 |
| | 6. pneumonia | 0 | 1 | 0 | 0 | 0 | 1 |
| | 7. skin problem | 1 | 2 | 0 | 0 | 0 | 3 |
| | 8. ENT | 1 | 0 | 0 | 1 | 1 | 3 |
| | 9. tuberculosis | 0 | 1 | 0 | 0 | 0 | 1 |
| | 10. urinary | 0 | 0 | 0 | 1 | 0 | 1 |
| | 12. gastrointestinal | 0 | 1 | 0 | 0 | 0 | 1 |
| | 13. women related | 0 | 1 | 0 | 1 | 0 | 2 |
| | 15. veterinary | 0 | 1 | 0 | 0 | 0 | 1 |
| | 16. fever | 1 | 0 | 0 | 0 | 0 | 1 |
| | 17. pressure | 1 | 0 | 0 | 0 | 0 | 1 |
| | 18. stone | 0 | 1 | 0 | 0 | 0 | 1 |
| | **Total** | **11** | **9** | **3** | **6** | **2** | **31** |
| Yakha+Limbu | 1. gastric | 1 | 0 | 0 | 0 | | 1 |
| | 6. pneumonia | 0 | 1 | 1 | 0 | | 2 |
| | 15. veterinary | 0 | 0 | 0 | 1 | | 1 |
| | **Total** | **1** | **1** | **1** | **1** | | **4** |
| Yakha+Rai | 1. gastric | 0 | 0 | 1 | | 0 | 1 |
| | 2. injury, wounds | 1 | 1 | 0 | | 0 | 2 |
| | 12. gastrointestinal | 0 | 0 | 0 | | 1 | 1 |
| | **Total** | **1** | **1** | **1** | | **1** | **4** |
| Limbu+Rai | 2. injury, wounds | | | | 0 | 1 | 1 |
| | 4. jaundice | | | | 1 | 0 | 1 |
| | 7. skin problem | | | | 1 | 0 | 1 |
| | **Total** | | | | **2** | **1** | **3** |
| Yakha+Limbu+Rai | 2. injury, wounds | 0 | 1 | | | | 1 |
| | 5. parasites | 1 | 0 | | | | 1 |
| | 8. ENT | 0 | 1 | | | | 1 |
| | **Total** | **1** | **2** | | | | **3** |

Source: The Research Field Survey, 2006-2008

As per Table 19, plant species are tabulated according to their single use and cross uses, and according to plant life forms. Thirty four plant species were recorded as used for the treatment of single ailment by Yakha. Among them, 3 herb and 3 shrubs species were documented as used to treat the gastric problem. Similarly, 42 plant species were recorded as used in the treatment of single ailment by Limbu. Again, 31 plant species were recorded as used in the treatment of single ailment by Rai. 4, 4, 3 and 3 plant species were recorded as used commonly in single ailment treatment by Yakha plus Limbu, Yakha plus Rai, Limbu plus Rai and Yakha plus Limbu plus Rai, respectively.

**Table 20: Cross-tabulation of the parts of different plants (as their life form) used for edible purpose**

| | | | | Edible Purpose | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Plant (habits)** | **life-form** | **Plant (Habits)** | **life-form** | **vegetable** | **pickle** | **fruits** | **oil** | **beverages** | **spices** | **sel-roti** | **veg. + pickle** | **oils + bev.** | **fruit+ bev.** | **veg.+ fruits** | **Total** |
| herb | | root | | 0 | 0 | 0 | | 1 | 0 | | 0 | | | | 1 |
| | | leaf | | 0 | 0 | 0 | | 0 | 1 | | 0 | | | | 1 |
| | | stem | | 0 | 0 | 0 | | 0 | 0 | | 1 | | | | 1 |
| | | rhizome | | 0 | 0 | 0 | | 1 | 0 | | 0 | | | | 1 |
| | | fruit | | 0 | 1 | 0 | | 2 | 0 | | 0 | | | | 3 |
| | | shoot | | 6 | 0 | 1 | | 0 | 0 | | 0 | | | | 7 |
| | | others | | 1 | 0 | 0 | | 0 | 0 | | 0 | | | | 1 |
| | | leaf +shoot | | 1 | 1 | 0 | | 0 | 0 | | 0 | | | | 2 |
| | | **Total** | | **8** | **2** | **1** | | **4** | **1** | | **1** | | | | **17** |
| shrub | | leaf | | 0 | 1 | 0 | | 0 | 1 | | | | 0 | | 2 |
| | | rhizome | | 0 | 1 | 0 | | 0 | 0 | | | | 0 | | 1 |
| | | fruit | | 0 | 0 | 2 | | 1 | 0 | | | | 3 | | 6 |
| | | shoot | | 4 | 1 | 0 | | 0 | 0 | | | | 0 | | 5 |
| | | entire | | 1 | 0 | 0 | | 0 | 0 | | | | 0 | | 1 |
| | | others | | 0 | 1 | 0 | | 0 | 0 | | | | 0 | | 1 |
| | | **Total** | | **5** | **4** | **2** | | **1** | **1** | | | | **3** | | **16** |
| climber | | root | | 2 | 0 | 0 | 0 | | | | 0 | | | 0 | 2 |
| | | fruit | | 0 | 2 | 1 | 1 | | | | 0 | | | 0 | 4 |
| | | shoot | | 0 | 1 | 0 | 0 | | | | 1 | | | 1 | 3 |
| | | **Total** | | **2** | **3** | **1** | **1** | | | | **1** | | | **1** | **9** |
| tree | | leaf | | 0 | 0 | 0 | 0 | | | 0 | 1 | 0 | | 0 | 1 |
| | | bark | | 0 | 0 | 0 | 0 | | | 1 | 0 | 0 | | 0 | 1 |
| | | stem | | 0 | 0 | 0 | 0 | | | 1 | 0 | 0 | | 0 | 1 |
| | | fruit | | 0 | 1 | 4 | 1 | | | 0 | 0 | 1 | | 0 | 7 |
| | | shoot | | 0 | 1 | 0 | 0 | | | 0 | 1 | 0 | | 0 | 2 |
| | | others | | 1 | 0 | 0 | 0 | | | 0 | 0 | 0 | | 1 | 2 |
| | | flower+shoot | | 0 | 0 | 0 | 0 | | | 0 | 1 | 0 | | 0 | 1 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **1** | **2** | **4** | **1** | **2** | **3** | **1** | **1** | **15** |
| other | leaf | 0 | 1 | | | | 1 | | | 2 |
| | entire | 2 | 0 | | | | 1 | | | 3 |
| | others | 2 | 0 | | | | 0 | | | 2 |
| | **Total** | **4** | **1** | | | | **2** | | | **7** |

Source: The Research Field Survey, 2006-2008

As per Table 20, 64 plant species were recorded as use for edible purpose. Among them, 17 herb, 16 shrub, 9 climber, 15 tree and 7 other species were recorded. Eight herb species were used for vegetable (shoot -6 species, other - 1 species, leaf plus shoot - 1 species). Two species were used for pickle (fruit - 1 species, leaf plus shoot-1 species).

## Table 21: Cross-tabulation of the parts of different plants (as their life form) used for livelihood purpose

| | | **Livelihood Purpose** | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Plant life-form** | **Parts of the plants used** | **dyes** | **washing** | **poison** | **thread** | **yeastcake** | **religious** | **decoration** | **Fruit- ripening** | **pots+ instruments** | **uil + fuil oils** | **gum + other** | **lyes + poison** | **eligion+ yeastcake** | **Total** |
| herb | leaf | | | | 2 | 0 | 2 | | | | 1 | | | 0 | 5 |
| | fruit | | | | 0 | 0 | 1 | | | | 0 | | | 0 | 1 |
| | entire | | | | 0 | 4 | 3 | | | | 0 | | | 1 | 8 |
| | **Total** | | | | **2** | **4** | **6** | | | | **1** | | | **1** | **14** |
| shrub | root | | | 0 | 0 | 1 | 0 | | 0 | 0 | 0 | 0 | | | 1 |
| | leaf | | | 1 | 0 | 0 | 1 | | 1 | 0 | 0 | 0 | | | 3 |
| | stem | | | 0 | 1 | 0 | 0 | | 0 | 2 | 0 | 0 | | | 3 |
| | rhizome | | | 1 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | | 1 |
| | fruit | | | 0 | 0 | 0 | 1 | | 0 | 0 | 1 | 1 | | | 3 |
| | shoot | | | 2 | 0 | 1 | 1 | | 0 | 0 | 0 | 0 | | | 4 |
| | entire | | | 0 | 0 | 4 | 2 | | 0 | 0 | 0 | 0 | | | 6 |
| | flower+shoot | | | 0 | 0 | 0 | 1 | | 0 | 0 | 0 | 0 | | | 1 |
| | bark + shoot | | | 0 | 1 | 0 | 0 | | 0 | 0 | 0 | 0 | | | 1 |
| | **Total** | | | **4** | **2** | **6** | **6** | | **1** | **2** | **1** | **1** | | | **23** |
| climber | leaf | 1 | | 0 | | 0 | 0 | | | | | 0 | | | 1 |
| | bark | 0 | | 1 | | 0 | 0 | | | | | 1 | | | 2 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | stem | 0 | | 0 | | 0 | 1 | | | 0 | 1 |
| | fruit | 0 | | 0 | | 0 | 1 | | | 0 | 1 |
| | entire | 1 | | 0 | | 3 | 0 | | | 0 | 4 |
| | **Total** | **2** | | **1** | | **3** | **2** | | | **1** | **9** |
| tree | bark | 1 | 1 | 2 | 1 | | 0 | | 0 | 0 | 5 |
| | stem | 0 | 0 | 0 | 0 | | 0 | | 2 | 0 | 2 |
| | fruit | 0 | 1 | 0 | 0 | | 1 | | 0 | 0 | 2 |
| | shoot | 0 | 0 | 1 | 0 | | 3 | | 0 | 0 | 4 |
| | entire | 0 | 0 | 0 | 0 | | 1 | | 0 | 0 | 1 |
| | others | 0 | 0 | 0 | 0 | | 2 | | 0 | 0 | 2 |
| | leaf +shoot | 1 | 0 | 0 | 0 | | 0 | | 0 | 0 | 1 |
| | bark + shoot | 0 | 0 | 1 | 0 | | 0 | | 0 | 1 | 2 |
| | **Total** | **2** | **2** | **4** | **1** | | **7** | | **2** | **1** | **19** |
| other | leaf | | | | | | 1 | 0 | | | 1 |
| | entire | | | | | | 1 | 1 | | | 2 |
| | **Total** | | | | | | **2** | **1** | | | **3** |

Source: The Research Field Survey, 2006-2008

As per Table 21, 68 plant species (14 herb, 23 shrub, 9 climber, 19 tree and 3 other species) were recorded as used for livelihood purpose by Yakha, Limbu and Rai Nationalities. Among them, leaves of 2 herb species were used for thread. Four herb species were used for the preparation of yeast cake. Six herb species were used for religious purpose. Fruit of 1 species was used for oil, and 1 herb species was used for religious plus yeast cake preparation.

**Figure 13: Insect - 'Rambheda'**

**Table 22: Cross-tabulation of Plants used for livelihood purpose as their life forms (habits) by yakha, Limbu and Rai**

| Plants Used by | Livelihood Purpose | Plant life-form (Habits) herb | shrub | climber | tree | other | Total |
|---|---|---|---|---|---|---|---|
| Yakha | dyes | 0 | 0 | 1 | 1 | | 2 |
| | washing | 0 | 0 | 0 | 1 | | 1 |
| | poison | 0 | 2 | 0 | 0 | | 2 |
| | thread | 0 | 2 | 0 | 0 | | 2 |
| | yeastcake | 0 | 2 | 2 | 0 | | 4 |
| | religious | 1 | 1 | 0 | 3 | | 5 |
| | **Total** | **1** | **7** | **3** | **5** | | **16** |
| Limbu | poison | 0 | 1 | 1 | 3 | | 5 |
| | yeastcake | 2 | 0 | 0 | 0 | | 2 |
| | religious | 3 | 1 | 0 | 0 | | 4 |
| | fruit ripening | 0 | 1 | 0 | 0 | | 1 |
| | pot and instrument | 0 | 1 | 0 | 0 | | 1 |
| | diyes + poison | 0 | 0 | 0 | 1 | | 1 |
| | **Total** | **5** | **4** | **1** | **4** | | **14** |
| Rai | thread | 1 | 0 | 0 | 0 | 0 | 1 |
| | yeastcake | 1 | 2 | 1 | 0 | 0 | 4 |
| | religious | 2 | 3 | 1 | 2 | 2 | 10 |
| | pot and instrument | 0 | 1 | 0 | 0 | 0 | 1 |
| | fuil + fuil-oils | 1 | 0 | 0 | 0 | 0 | 1 |
| | gum + other | 0 | 1 | 0 | 0 | 0 | 1 |
| | religion+yeastcake | 1 | 0 | 0 | 0 | 0 | 1 |
| | **Total** | **6** | **7** | **2** | **2** | **2** | **19** |
| Yakha + Limbu | washing | 0 | 0 | | 1 | | 1 |
| | poison | 0 | 1 | | 0 | | 1 |
| | thread | 1 | 0 | | 1 | | 2 |
| | yeastcake | 1 | 1 | | 0 | | 2 |
| | pot and instrument | 0 | 0 | | 2 | | 2 |
| | **Total** | **2** | **2** | | **4** | | **8** |
| Yakha + Rai | dyes | | 0 | 0 | 1 | | 1 |
| | poison | | 0 | 0 | 1 | | 1 |
| | yeastcake | | 1 | 0 | 0 | | 1 |
| | religious | | 0 | 1 | 1 | | 2 |
| | fuil + fuil-oils | | 1 | 0 | 0 | | 1 |
| | gum + other | | 0 | 1 | 0 | | 1 |
| | **Total** | | **2** | **2** | **3** | | **7** |
| Limbu + Rai | religious | | 1 | | | | 1 |
| | **Total** | | **1** | | | | **1** |
| Yakha+Limbu+ Rai | dyes | | | 1 | 0 | 0 | 1 |
| | religious | | | 0 | 1 | 0 | 1 |
| | decoration | | | 0 | 0 | 1 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| **Total** | **1** | **1** | **1** | **3** | |

Source: The Research Field Survey, 2006-2008

As per Table 22, again 68 plant species were used for livelihood purpose as their life forms for livelihood purpose by Yakha, Limbu and Rai Nationalities. Yakha Nationality use first one climber species (as tabulated) for dye preparation. Limbu Nationality use 1 shrub species for poison. Rai Nationality use 1 herb species for thread. Similarly, Yakha, Limbu and Rai use 16,14 and 19 plant species, respectively.

**Table 23: Cross tabulation of the plants (as their life form) used in healing different ailments by Yakha Limbu and Rai (newly identified for Nepal)**

| Used by the community | Used for | Life form of the species | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | Herb | Shrub | Climber | Ang. monocot | Ang dicot | |
| Yakha | injury +fractured | 1 | 2 | 0 | 0 | 0 | 3 |
| | snake bite | 0 | 1 | 0 | 0 | 0 | 1 |
| | Pneumonia | 1 | 0 | 0 | 0 | 0 | 1 |
| | gastric + appetite loss | 1 | 1 | 0 | 0 | 0 | 2 |
| | headache | 0 | 0 | 0 | 1 | 0 | 1 |
| | jaundice | 0 | 0 | 1 | 0 | 0 | 1 |
| | wound, ear problem | 0 | 0 | 0 | 0 | 1 | 1 |
| | Pneumonia, eye problem | 0 | 0 | 1 | 0 | 0 | 1 |
| | headache, heart pain | 0 | 1 | 0 | 0 | 0 | 1 |
| | **Total** | **3** | **5** | **2** | **1** | **1** | **12** |
| Limbu | injury +fractured | 0 | 0 | 0 | | 1 | 1 |
| | wound | 0 | 0 | 1 | | 0 | 1 |
| | Pneumonia | 0 | 1 | 0 | | 0 | 1 |
| | fever | 1 | 1 | 0 | | 0 | 2 |
| | ear infection | 0 | 0 | 0 | | 1 | 1 |
| | wound, diarrhea | 1 | 0 | 0 | | 0 | 1 |
| | **Total** | **2** | **2** | **1** | | **2** | **7** |
| Rai | injury +fractured | | 0 | 1 | 0 | | 1 |
| | intestinal worms | | 1 | 0 | 0 | | 1 |
| | gastric + appetite loss | | 0 | 1 | 0 | | 1 |
| | gland tuberculosis | | 1 | 0 | 0 | | 1 |
| | diarrhea | | 0 | 0 | 1 | | 2 |
| | **Total** | | **2** | **2** | **1** | | **6** |
| Yakha + Limbu +Rai | wound, jaundice, appetite loss | | 1 | | | | 1 |
| | **Total** | | **1** | | | | **1** |
| | **Total** | **5** | **10** | **5** | **2** | **3** | **25** |

Source: The Research Field Survey, 2006-2008

As per Table 23, 26 plant species were used as new medicinal record for Nepal.[34] Among them Yakha, Limbu and Rai use 12, 7 and 6 species, respectively. Yakha, Limbu and Rai use 1 such plant species.

**Figure 14: Mrs. Tanka Maya Limbu taking interview with the informant**

**Figure 15 Mrs Tanka Maya Limbu showing Lichens**

**Figure 16: Lichens in the old twig**

[34] 1 species is missing in tabulation

Some typical foods and beverage items developed and used by only the Kirat nationalities are as follows:

### 5.3.1 Yangben

*Yangben* is Yakha as well as Limbu term that refers to certain species of lichens[35] consumed as food by both Yakha and Limbu. In Nepali language, lichens are commonly called *jhyau*. This plant belongs to *Parmelia, Ramalina,* and *Usnea* species. *Yangben* are most likely never eaten alone as it is usually cooked / served as mixed curry with pork, egg and pork blood.

**Figure 17: Alchohol preparation from traditional method**

[35] Thallophytic plant, is made up of algae and fungi; few species of this group are edible.

- Preparation of raw *Yangben:* a) boil with ash solution for 1-2 hours. The product becomes grayish in color. b) wash, sun-dry on bamboo mate *mandro,* c) pack, and store. The dried *Yangben* is re-hydrated before cooking and or making mixed curry.
- Nutritional values of the lichen: Carbohydrates found in lichens are known to be less digestive in comparison to other sources of carbohydrates. Although lichens are flat, tasting acidic, they possess more calories than equal amounts of honey and cornflakes. Plentiful starch carbohydrate makes lichen useful for human food.
- Socio economic values: lichens have wide range of economic uses. Nepal exports huge amounts of lichens to India annually, 70% of which consists of *Parmelia* species and the rest *Usnea* species. Although *Yangben* are customarily taken as a delicacy, it can also be good source of income. *Yangben* collection can therefore be an important side job. Small amounts of processed *Yangben* are occasionally found in the market which is highly demanded by Yakha and Limbu.
- Collection and home processing of *Yangben* does not require full-time involvement as it can be collected during collection of fodder and firewood, and cowherds roaming the forest area with their cattle can voluntarily collect a sizeable amount of *Yangben*.

### 5.3.2 Kinema

*Kinema* is a term used for bacteria-fermented soybean. It is one of the popular foods of the eastern hills of Nepal especially valued by Yakha, Limbu and Rai. It is commonly used as curry and *achar*. *Kinema* has a peculiar smell which is the main characteristic but it can be a repellent for new users.

- Traditionally, following ingredients/materials are used while preparing *Kinema*: Soybean (black or white), banana leaf, Ash, Cooking vessels, *Okhli* (wooden mortar and pestle), and Bamboo basket (woven).
- *Kinema* is a value-added product. The price of dry *Kinema* at the local market is approximately NRs 300 per kg. Therefore, there is sufficient scope for *Kinema* trade.

### 5.3.3 Jand and tongba

*Jand i*s a generic term that refers to traditional alcoholic beverages made from grains like millet, rice, and wheat by using yeast cake. It has a very prominent place in Kirat culture. When it is distilled, it becomes or called *raksi.* In several aspects *raksi* is like whiskey.

- It is also used in several festive occasions, ritual ceremonies and rites, settling disputes and appeasing deities.
- Yeast cake is a starter cake made up of wild plants/*murcha* plants and starchy based flour. The cake serves the source of microorganism for the fermentation and has been reported to have a shelf life of about 1 year. The tradition of offering *jand* to guests is a unique way of showing hospitality.
- It is served in different forms and modes. Strained *jand* is prepared by leaching out the readily extractable contents from the mash with lukewarm water. A strainer made up of thin bamboo strips is normally used for straining the liquid portion. This form of beverage is drunk in deep aluminum mugs until satiated. The beverage is cloudy in appearance and has a very short life, of few hours.
- *Tongba:* It is another kind of *jand*. About half a pound of mass is transferred to a cylindrical bamboo or wooden container previously filled (about one-fourth) with hot water. The juice gradually and spontaneously gets extracted, and after about half an hour,

the extract is sucked by wooden/metal straw called *peepa*. The mass can be used again for 4-5 times.

Nutritional aspects of *jand*: It is generally believed (and sometimes manifested) that *jand* drinking in moderate quantity can indeed have a beneficial effect on health. When compared with other alcoholic beverages, however, *jand* has superior nutritional value. Unlike other beverages such as wine and beer, it contains large amount of starch, which contributes energy. It also contains other unrefined carbohydrates that have therapeutic value. *Jand* contains 5-9% alcohol; 0.8-1.1% acidity (as lactic acid); 1.6-2.5% reducing sugar (as glucose); 1.6 – 2.8% total sugar (as sucrose); 12-14% starch; 76-80% water; and traces of methanol, higher alcohols, esters, aldehydes and other flavor components (Subba *et al*., 2005).

**Scientific aspects of Yeast cake or *murcha***

Yeast cake is a source of microorganisms and it contains yeasts, molds and bacteria. Yeast cake is used for fermentation of starch in the cereals for alcohol making such as *Jand*. The white colonies that appear during the incubation are molds. Molds are highly aerobic organisms. They grow and work only under aerobic condition. This is why the millet mass is not directly transferred to *ghyampo*. These molds break down the complex starch into simple form, namely glucose. This glucose is utilized by yeasts for their own growth and also for alcohol production. Yeasts cannot themselves use starch and therefore must depend on molds. Yeasts produce alcohol under anaerobic condition, which is provided by sealing the millet mash in *ghyampo*. Bacteria that prevail in *jand* produce lactic acid during the course of fermentation. This acid imparts taste to *jand*. It also helps yeast to flourish and work by creating a mildly acidic environment. Thus, *jand* fermentation entails symbiotic action of different microorganisms in *murcha*.

- The quality of *jand* is very much variable. The variability depends on the quality of yeast cake, which in turn depends on the microorganisms. Villagers sometimes use charcoal to make good *jand.* The scientific logic behind adding charcoal can be that charcoal is a good absorber of odor and color. This is why good wines and whiskeys are aged in charred oak barrels.

### 5.3.4 Sargyangma

*Sargyangma* is one of the typical traditional Yakha and Limbu foods. It looks like sausage which is made up of pork intestine, internal parts, blood and fat, *Yangben*, rice grains (optional) and garlic, chilli, salt, onion, ginger (as per taste). It is usually prepared during special occasions like Dashain / tihar or whenever pig is slaughtered.

- Nutritional value of *Sargyangma* depends on the amount of the ingredients used. On average, a typical *Sargyangma* contains 61% moisture, 20% fat, 18% protein, 1% minerals and 0.0% carbohydrate (as cited in Subba *et al*., 2005).

### 5.3.5 Wamungchuruk or wachippa

*Wamungchuruk or Wachippa:* It is one of the traditional as well as special dishes of Yakha, Limbu and Rai. The term *Wamungchuruk* or *Wachippa* (In Yakha) refers to charred feathers of chicken. The dish is bitter in taste and usually taken with alcoholic beverages, it is also used as an appetizer. Some people associate the bitterness of *Wachippa* with its medicinal value.

- Charred feathers are prepared by flaming the chicken along with the fine feathers. During flaming, the fine feathers burn and curl up into black residue. This residue is dusted down on *mandro*, rubbed to break up the lumps, and used in the recipe.
- Nutritional value: it is rich in minerals, particularly calcium and phosphorus as it contains fine bones. A typical *Wachippa* contains 50% moisture, 28% protein, 15% fat, 7% ash and traces of carbohydrates.
- Traditional recipe of *wachippa:* requires following ingredients/materials - charred feathers, internal parts of chicken i.e. heart, liver, gizzard, intestine and chicken head, legs, wings, spices such as onion, garlic, ginger and salt and chilli (as per taste) and oil. Yakha use rice to reduce its bitter taste.
- *Wachippa* has not been produced in large amounts, nor it is sold in the market. However, it is sometimes available in local restaurants and hotels as a special dish.

## 5.4 Remarks

### 5.4.1 Draft Bill 2002: Access to Genetic Resources and Benefit Sharing & IUCN Traditional Knowledge Documentation

MoFSC prepared a draft of national legislation at first in 2002 regarding "Access to Genetic Resources and Benefit Sharing". Based on draft legislation, during 2003-2004, Ministry of Forest & Soil Conservation and World Conservation Union (IUCN Nepal) carried out an inventory work entitled "To Protect Biodiversity and Indigenous Rights through Documentation and Registration of Traditional Knowledge". This Documentation and Registration project process as well as the draft legislation 2002 was strongly criticized by NEFIN, stating that they were not consulted in the documentation process and also condemned to the draft legislation; it was said the draft legislation was incomplete.

### 5.4.2 Draft Bill 2006: Genetic Resources (Approach, Utility and Benefit Sharing)

Being the MoFSC as national focal point of the CBD, it again revised the former Draft Bill in 2006. The revised title is "Genetic Resources (Approach, Utility and Benefit Sharing) Draft Bill 2006" and is awaiting for approval. The Draft Bill 2006 has framed more closely to the objectives of CBD. The CBD has provided a legal framework for conservation and sustainable use of the genetic resources and furthermore, it is related to the provision, on the respect, preservation and maintenance of Indigenous Knowledge, Innovation and Practices. The Article 8 (j) of the CBD assures the equitable sharing of benefits to the local communities that come from the utilization of Indigenous Knowledge or local knowledge. The Article 5(1) of the Draft Bill 2006 states that the authority of the traditional knowledge would remain to the particular local communities. The Article 5(2) is related to third objective of CBD, which states, any genetic resources remained in ownership of any personnel, institutes or government agencies if that genetic resources' conservation and utility regarding traditional knowledge is based on any Indigenous Peoples or ethnic groups, then the priority should be given for that particular communities in resources approach, utility and benefit sharing.

**Figure 18: Ghyu phal' or 'Ban pharsi', *Hodgsonia macrocarpa***

***Box -9:*** **Draft Bill and Inventry of IUCN Nepal**

Nepal Government prepared a draft national legislation at first in 2002 regarding biodiversity and traditional knowledge documentation (access to genetic resources, right and benefit sharing). Based on the draft legislation, Ministry of Forest & Soil Conservation of Nepal and IUCN Nepal, and participation of Indigenous Nationalities Institution/Ethnic Institution, completed biodiversity related traditional knowledge documentation programs in 15 districts from three development regions (eastern, central and western). In the eastern regions, three districts viz. Jhapa (Santhal Indigenous Nationality Rajbansi Indigenous Nationality and Meche Indigenous Nationality), Morang (Dhimal Indigenous Nationality and Bantar or Sardar ethic group) and Sunsari (Jhangal or Urau Indigenous Nationality and Musahar ethnic group) were chosen. These districts are historical territory of indigenous peoples and programs were conducted there without consulting indigenous people (Sherpa, 2005: 1). Furthermore, as cited by Sherpa (2005), the draft legislation 2002 was itself incomplete, unfavorable to indigenous people; and on the other hand, that activities of registration and documentation program encouraged to biopiracy and violate indigenous peoples' customary right over their resources and knowledge. Indigenous voice was raised to stop collecting information, and the collected information should back to proper indigenous peoples till the draft legislation recognize indigenous peoples as well as confirm their participation in each step of decision making and should not even disclose the report to funding organization.

Article 27 of that Draft Bill contains a provision for Council formation at the central level for National Genetic Resource Authority. The Council registers the documented biological resources

and associated IK .It also deals the royalty with the commercial companies and distributes it to the three concerned partners as follows:

A. Resources owner if Nepal government-
    i. 50 % to Nepal Government
    ii. 30 % to National Council
    iii. 20 % to local community, individual or institute

If the Nepal Government is the owner of biodiversity and genetic resources, Nepal Government shall keep 50 % of the benefits obtained from it. National Council and Local Community will get 30 and 20 %, respectively.

B. Resource owner if Local community, individual or institute-
    i. 51 % to local community, individual or institute
    ii. 29 % to National Council
    iii. 20 % to Nepal Government

If the local community is the owner of biodiversity and genetic resources, such community shall keep 51 % of the benefits obtained from it and 29 % to National Council and 20 % to Nepal Government.

### 5.4.3 Biodiversity Registration

Indigenous knowledge has been transferred from generation to generation in oral form and such knowledge is losing ground day bay day. Biodiversity Registration (BR) is only the way to conserve indigenous technical knowledge through documentation. If the knowledge is utilized as in commercialize production, and then knowledge holder could get benefit by taking income %age as royalty. This is only possible when Nepal Government makes the Act or Laws regarding Genetic Resources as mentioned above in section **5.4.2.**

In BR, genetic resources parts such as leaf, root, bark, fruit or seed, and their uses in different ailments or livelihood are documented with the processing method. Apart from,

***Box-10:*** **The Kani Tribe: Knowledge Transfer & Benefit Sharing Example**

The Kani is one of the tribe groups of India who live in forests of the Agast-Hymalai hills of the Western Ghats. They have an extremely rich and unique Traditional Knowledge about the use of the resources, particularly the biological resources around them. In December 1987, a ethnobotanist team lead by Dr P. Pushpangadan were trekking through the tropical forest hills. That team was accompanied by a few Kani tribesmen as guides, who surprisingly remained energetic and agile. They occasionally would chew some small blackish fruits. One of them offered a few of these fruits to the team pointing out that if they ate those, they could go on trekking without tiredness. The members of the team chewed that blackish fruit. They found that the fruit was a strange variety because immediately they gained energy and felt no tiredness. The plant was belonging to cucurbitaceae family and they identified it as *Trichopus zeylanicus* ssp. *travancoricus*.

Detailed chemical and phamacological investigations showed that the leaf of the plant contained various glycolipids and some other non-steroidal compounds with profound adaptogenic and immmuno-enhancing properties (Mashelkar, 2001). The fruits showed mainly anti-fatigue properties. The Tropical Botanical Gardens Research Institute (TBGRI) was successful in developing a scientifically validated and standardized herbal drug, based on the tribal knowledge. The drug was

named as *Jeevani* and was released for commercial production in 1995 by Arya Vaidya Pharmacy. While transferring the technology for production of the drug to the pharmaceutical firm, TBGRI agreed to share the license fee and royalty with the tribal community on a fifty-fifty basis.

The prime concern of the tribals in the beginning was to evolve a viable mechanism for receiving such funds. With the help of TBGRI, some government officials and NGOs, the tribals formed a registered trust. About 60% of the Kani families of Kerela are members of this trust. From February 1999, the amount due to them has been transferred to this trust with an understanding that the interest accrued from this amount alone can be used for the welfare activities of the Kani tribe.

It is heartening to note that TGBRI has trained 25 tribal families to cultivate the plant around their dwellings in the forest. In the first year itself, each family earned about Rs. 8,000 on sale of leaves from cultivation of *T. zeylanicus* in half-hectare area. But unfortunately the forest department objected to the cultivation with the plea that the tribals might remove the plants from the natural population of the species in the forests and thereby make it endangered. This problem has now been resolved and the forest department has recently approved the cultivation of this plant

other various things related to genetic resources are incorporated. The documentation contains also the information of the communities, personnel or institutes, who have such knowledge and practices. Such documentation proves that that knowledge has existed in the communities, personnel or particular areas. Once such information is documented, commercial companies are not allowed to patent on the resources and technology, which are already documented. Thus the documentation stops possibilities of cheating of the biological resources and associated IK in it. Secondly it facilitates accessing benefit sharing from the user of the knowledge or the commercial companies, which use the knowledge of the IPs.

### 5.4.4 Patent Rights

Patent means any useful invention relating to a new method or process of manufacture, operation or publicity of any material or a combination of materials, or that made on the basis of a new theory or formula. On 30 August 1965, patent related Act was published in *Rajpatra,* Volume 15, No 14A (E), under the title *Patent Design and Trademark Act 1965 of Nepal*. This act was amended on 18 October 1987. Using this act, any particular indigenous knowledge practices can be applied for patent right and Indigenous Nationalities or Individual person or institutes could take enormous benefit from their knowledge practices. As regards the patent right, mainly the following matters are given in *Patent Design and Trademark Act 1965 of Nepal*.

### Acquisition of Patent Rights

The person obtaining right over the patent consequent to such transfer shall not operate or use it in any manner in his name or that of any person other than the patenteen himself unless he (the transferee) has the transfer effected under Section 9 of the act in the relevant Register maintained at the Department[36].

1. Any person desirous of obtaining right over any patent shall have such patents registered in his name under this act.

[36] Department means the department prescribed by Nepal Government by notification in the Nepal Rajapatra, and the Department of Industry unless so prescribed.

2. The patent registered in the name of any person under this Act shall not be copied by any other person or operated or used in his name during the period mentioned in Section 3 without the written permission of the patentee.

A plant, locally known as *chhasing*[37] in the Sherpa language and *bhotechiya* in Nepali in the Makalu-Barun National Park and its Buffer Zone region, is widely used in tea-beverage. Sherpa Indigenous Nationality use the following procedure in the preparation of *chhasing* (Chaudhary *et. al*. 2004

1. First, fresh leaves are collected in late winter.
2. The leaves are boiled with wood-ash for 15 minutes (about 1 kg of leaves mixed with 200g of wood ash in 1.5 liter of water).
3. The boiled leaves are allowed to cool, after which they are washed thoroughly in cold water to remove the ash and other foreign material.
4. After sun-drying for two days, the leaves are stored (for up to three years) in a dry place.
5. When *chhasing* is prepared for drinking, the dried leaves are boiled for 10-15 minutes with water, sugar, and milk and put in a long wooden vessel called *tolon* (a bamboo trunk about 1-1.5 meter tall and 15 centimeter in radius).
6. A small quantity of salt and *ghee* is added and the mixture is churned for 5 minutes with a loosely fitted piston.

Chaudhari *et al*. (2004) analyzed the leaf samples and found it free from a detectable amount of caffeine. Several elution peaks of *chhasing* matched unknown compounds in both the black and green tea, as well as one that was not present in either. The plant is seen very useful for beverage. It doesn't contain a detectable amount of caffeine, and also not other harmful chemicals because Sherpa Nationality is using that plant from the time immemorial. The growing of this tea-like beverage has provided self sufficiency to the local communities in the upper Arun river basin of the Makalu Barun region, east Nepal. It can be commercialized and Sherpa Nationality properly could get benefit from their *chhasing* practice (i.e. indigenous knowledge) and preparation method. But *chhasing* related resources and technology or knowledge practice should be registered in National Act. If that biodiversity related resource and knowledge is once registered or documented, then commercial companies couldn't patent that technology, and it will also facilitates accessing benefit sharing from the user of the knowledge or the commercial companies, which uses the knowledge of the Indigenous Nationalities.

The role of ash could be the removable of off-taste and smell giving compounds. As ash is alkaline by its nature, so boiling of *chhasing* leaves could be done using food grade alkaline compounds, viz., sodium bicarbonate (NaHCO3) could be more efficient in removing these unwanted components. As *chhasing* leaves contain compounds similar to those present in black and green tea, they might be polyphenol (both un-oxidized and oxidized). It has been known that polyphenols are anticarcinogenic agents; there detailed study could be very much conducive in exploring newer compounds that can be used to cure cancer. Chhasing leaves tea is being consumed by Bhote community quite often and they are very much healthier. It can be anticipated that chhasing leave tea might have tonic value; however, it calls for detailed study.

[37] The plant used to produce *Chhassing* is *Cleyera japonica* Thunb. var. *wallichiana* (DC) Sealy. This plant species belongs to the tea family (Theaceae).

Hence, the old knowledge can explore for new opportunity.The patent registered in the name of any person under this act may be transferred by him in any manner to any other person like movable property.

**Provided that:-**

The person obtaining right over the patent consequent to such transfer shall not operate or use it in any manner in his name or that of any person other than the patenteen himself unless he (the transferee) has the transfer effected under Section 9 of the act in the relevant Register maintained at the Department.

**Application for Acquiring Right Over Patent**

1. A person desirous of having any patent registered in his name shall submit to the Department an application according to the specimen form specified in Schedules 1(a), containing the particulars mentioned below, along with all available evidence in his possession:-

a. Namely address and occupation of the person inventing the patent. If the applicant himself is not the inventor, how and in what manner he acquired title thereto from the inventor.
b. Process of manufacturing, operating or using the patent.
c. The theory or formula if any on which the patent is based.

2. Along with the application mentioned in Sub-Section (1), e applicant shall also submit maps and drawings along with particulars, of the patent, as well as the fee specified in Schedule 3.

**Investigation by Department**

1. On receipt of application submitted under Section 4, the Department shall, on the advice also of experts if so considered necessary, conduct investigation or studies to ascertain whether the patent investigations in the application is a new invention or not, and whether it is useful to the general public or not, and thereafter decide whether or not to register such patent.
2. In case the Department feels that any patent should not be registered in the circumstances mentioned in Section 6, it shall give a notice to the applicant to the effect that the patent cannot be registered according to his or her application.
3. (Repealed on October 18, 1987).

**Circumstances in Which Patents Cannot Be Registered**

1. The Department shall not register any patent under this act in the following circumstances:-

a. In case the patent is already registered in the name of any other person, or
b. In case the applicant himself is not the inventor of the patent sought to be registered by him, nor has he acquired rights over it from the original inventor, or
c. In case the patent sought to be registered is likely to adversely effect the public health, conduct or morality or the national interest, or
d. In case (the registration of the patent) will constitute a contravention of existing Nepal law.

Provided that noting contained in Clause (a) shall be deemed to have prejudiced the transfer of the registration of any patent under the provisions of Section 9.

2. In the circumstances mentioned in Sub-Section (1), the department may cancel the registration of any patent which had been registered.

**Provided that:-**

The department shall, before canceling the registration of any patent, provide opportunity to the patentee to show cause, if any, why the registration of this patent should not be cancelled.

**Registration of Patent**

1. On receipt of applications filed under Section 4 for registration of any patents, the department shall, after completing necessary investigations under Section 5 issue a registration certificate according to the scotchman form indicated in Schedule 2 (a) to the applicant, except in the circumstances mentioned in Section 6.
2. For obtaining the certificate mentioned in Sub-Section (1), the applicant shall pay the registration fees specified in schedule 3 (1) (b) to the department.

**Registered Patents to Be Published**

1. Patents registered under this act, other than those which must be kept secret in the national interest, shall be published by the department in the Nepal Rajapatra for the information of the public.
2. In case anybody desires to see or copy the particulars, maps, or drawings of a patent published under Sub-Section (1), he may be allowed to do so after paying the fees prescribed by the department.
3. In case anyone has any objection to such a patent, he may file a complaint with the department within a period of 35 days from the date of seeing or copying the patent under Sub-Section 92).
4. In case any complaint is received under Sub-Section (3), the department shall take necessary action after conducting inquiries.

**Terms of Patent**

1. The title of the patentee to the patent shall be valid for a period of seven years from the date of prostration thereof under Section 7, except when it is renewed under Section 23 B.
2. Notwithstanding, anything contained in Sub-Section 91),in the case of patents registered before the commencement of this Section, the term fixed according to the provision in force at the time of registration thereof shall be valid, and after the expiry of that term, the patent must be renewed under Section 23B.

**Transfer of Registered Patent**

In case any patentee transfers any patent registered in his name after relinquishing his title there to the transferee shall submit an application to the department for removing the name of the transferee from the patent register and then registering his own name therein.

1. In case any person files an application under Sub-Section (1), the department shall send a notice to the sureness whose name is mentioned in the register directing him to file complaints with it within 15 days if he has any objection to the transfer of his patent according to the application submitted by the transferee. In case the patentee files complaints accordingly within this time-limit and it becomes necessary to determine which of the two parties has title to the patent, such transfer shall be stayed pending the judgment of a court on such dispute. In case no complaint is filed within this time-limit, the transfer is affected as requested in the application.
2. The person applying for transfer of patent under the provisions of this Section shall pay along with the application the prescribed amount as transfer fee to the department.

**Submission of Design or Model Of Patent To Government Archives**

The patentee shall submit to the National Archive also a copy of the design or model of the article manufactured according to the patent registered under this act.

**Punishment for Violation of Section 3**

In case any person commits or attempts to commit, or abets the commitment of any act in contravention of any provisions of Sub-Section (2) or the restrictive clause contained in Sub-Section (3) of Section 3, he will be punished with a fine not exceeding NRs 2000 as well as confiscation of all articles or goods connected with such offence on the order of the department.

# CHAPTER 6

## CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Conclusions

Kirat Nationalities were found to be rich in Indigenous Knowledge, Skill and Practices especially for use on Medicinal Plants and livelihood purposes. The key issues and or conclusions of the research are as follows:

#### 6.1.1 Indigenous Knowledge on the Verge of Extinction

A total of 198 different plant species were documented as used in the treatment of different ailments by Yakha, Limbu and Rai Nationalities. Similarly, 14 animal species were also recorded as used for the same purpose. Except the treatment of different ailments, a total of 128 plant species were also documented as used for edible and livelihood purposes by these nationalities. The above plant species, related to treatment, consist of 156 dicots, 27 monocots, 9 ferns and 5 fungi. Similarly, the plant species, related to edible and livelihood, consist of 99 dicots, 21 monocots, 6 ferns and 3 fungi. However, the number of such plant and animal species may reach more than 300 species for ailment and 200 for livelihood purposes.

Among three major Kirat Nationalities, Yakha were found closer with the biological resources. Altogether 109 species (both plants and animals) were found to be used by Yakha for treatment purpose. A total of 103 species (both plants and animals) were documented as used for treatment utility by Limbu Nationality. Similarly, 89 species (both plants and animals) were documented as used in the treatment by Rai Nationality. A total of 39 plant and animal species were found to be used for medicinal purpose for the first time in Nepal.

Especially Kirat shamans were found actively participating as medicinal practitioner. Apart from these shamans, a few Kirat personnel were also found as herbalists. Except, shamans and leading herbalists, few villagers were also noticed as remarkable knowledge, skill and practice holder on biological resources. They were using such knowledge, skill and practices from the time immemorial in unwritten form and such knowledge, skill and practices are being transferred from generation to generation. But the use of indigenous knowledge, skill and practices are decreasing day by day. Villagers' attention is emerging towards the hospital facilities for treatments because the hospital action is quick and visible soon than herbalist. On the other hand, herbalist themselves also wouldn't like to treat because they often don't get any fee or payment. Due to various reasons, indigenous knowledge, practices are enormously reducing and are on the verge of extinction.

#### 6.1.2 Indigenous Knowledge - Beyond Documented Government Policies

Before 1996, Nepal Government had no plans, policies and programs for IPs and tribal peoples of Nepal. A National Committee for Development of Nationalities was established in 1996 and Nepalese Planner introduced Indigenous People and ethnic group in Development Program in the Ninth Plan.

In the Tenth Plan, Consultation with IPs was done in order to formulate the plan and programs. The goal of this plan was to provide development opportunities by empowering disadvantaged

groups. In the chapter 29 of the Tenth Plan, **Traditional Skill and Specialization** of Indigenous People and ethnic group has been mentioned as 'IPs and ethnic groups will be made partner of process of national development through conducting research, conservation and promotion of diverse culture, language, knowledge and skill inherent in them'. Now TYIP has been operating. The TYIP is elaborated and appreciable document than TP of the country for IPs and ethnic groups' perspective.

### 6.1.3 Need of National Legal Provisions on Indigenous Knowledge

Though the TYIP is appreciable documents for IPs and ethnic groups, Nepal Government has not made legal provision for Access to Genetic Resources and Benefit Sharing Act till to date. In the present context, documentation of Indigenous Knowledge has become a felt need, especially when Nepal has formally acceded to the WTO. As mentioned in Chapter 8 (**Gender Mainstreaming and Inclusion**) of TYIP, under subheading **major programs, Article 9,** that laws related to IPs should be made as soon as possible, and have to give opportunities to the IPs gaining benefit from their IK, skill and practices.

## 6.2 Recommendations

In the line with the key issues and or conclusions mentioned above the research team have made some recommendations as follows:

### 6.2.1 Recommendation to IPs and Indigenous Institutes

Indigenous Knowledge could play an important role for the economic benefit of IPs living in the rural areas, and also would be important resource for the state. Nowadays, even IPs are neglecting to use and preserve such valuable knowledge and related biological resources. So, it is very essential to bring to light the importance of IK, skill, practices at local level. In this regards, Indigenous Peoples or Indigenous Institutes should know the issue of benefit sharing and they should be very careful and sensitive in any laws and proposed laws regarding IPs or IK. Likewise, nationwide, they have to involve also in awareness programs relating to sustainable use of biological resources associated to IK and in bioprospecting. Without active and positive involvement of IPs and Indigenous Institutes, IK and IK related biological resources couldn't be preserved.

**Prior Informed Consent:** The Convention on Biological Diversity established the moral if not the legal basis for requiring Prior Informed Consent (PIC) of local and Traditional Communities for access to and use of their indigenous knowledge, innovations and practices relating to biological resources. Furthermore, the Bonn Guidelines states that PIC of Indigenous and local communities and the approval and involvement of the holders of traditional knowledge, innovations and practices should be obtained. Therefore, PIC is the most important aspects of community participation in decision-making process. In this regards, the communities need to be not only informed but also be educated prior to authorizing the access to and utilization of genetic resources and the IK that they possess. Such provisions will then only protect the rights of IPs over their resources including IK. The IPs and Indigenous Institutes need to check in using and exploiting the local resources by any external agencies for any purposes.

### 6.2.2 Recommendation to INGOs and Development Supporters

Nepal Government signed on CBD on June 12, 1992 and ratified later on 15 September 1993, and became a party to the convention on 21st February 1994 (Anonymous, 2006: iv). The CBD is the first attempt of international community to provide a legal framework for conservation and sustainable use of the genetic resources in addition to addressing concerns equity. Though CBD entered into force 15 years ago, in Nepal the issue of benefit sharing has not been fully understood at different level. In this regards, INGOs have to bring the awareness programs for different stakeholders associated to IK, Skills and Practices and consequently have to start capacity building program for Biodiversity Registration.

INGOs also have to play the role of facilitator in different Government Agencies and Indigenous Institutes or IPs in building ABS law and its proper implementation. If Government Agencies are not aware and also not positive to make laws as anticipated in CBD, then INGOs and Donors have to appeal the government to make the national laws and implement them properly

### 6.2.3 Recommendation to Nepal Government

The overall existing policy and legal environment in the country are not adequate to explore and document or protect Indigenous Knowledge, Skills and Practices associated with biological resources of Indigenous Nationalities. Most of valuable Indigenous Knowledge, Skills and Practices of many indigenous nationalities have already vanished and many more are on the verge of extinction due to lack of proper identification, recognition and incentives to the owner of these knowledge and resources in the past.

To protect the Indigenous Knowledge, Skills and Practices, Nepal Government has to make the Access to Generic Resources Act and its affective implement immediately. The Interim Constitution of Nepal 2007 also supports this approach. The Article 35 (18) of the Constitution communicates that the state shall follow a special policy of identifying, protecting, skills and practices existing in the country. In this context, it needs to pass the Draft Bill *'Genetic Resources (Approach, Utility and Benefit Sharing Bill 2006*' as soon as possible from the parliament which has been remained pending since 2002. As mentioned in TYIP strategies (**Chapter 8, sub section 8.3, Article 7**), the state will reform of existing state structure, laws and policies which present hindrances to the promotion of interests of *Adibasi Janajatis* or frame new ones as appropriate.

Then after, Nepal Government should launch the BR program for every Indigenous Nationalities and ethnic groups on a national scale. Further more, the Government should have to work collaboratively with IPs and ethnic groups as partner in the process of national development through conducting research on indigenous knowledge and skills inherent in them.

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