

Ethnoecology of natural environment in trans-himalayan region of west Nepal

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The present study was conducted during a period of two years from 2001 to 2003 in trans-Himalayan region from Mustang to Dolpa region of west Nepal. The indigenous people were found to be rich in ethnoecological knowledge regarding environment and plant resources. The locals categorised six types of ecological land patterns such as *Nakri* (forest land), *Penhri* or *pangri* or *Thakri* or *dakri* (land pattern), *Sim* (marshy place or wetland), *Lung* (agricultural land) and *Khangri* (Snowy land). The people also had the knowledge of plants in population level and species level and had their own way of classifying them on the basis of different criteria like presence or absence of flower, habit, habitat, morphology, etc.

Key Words: Ethnobotany; Indigenous knowledge; Folk nomenclature; Folk classification

The indigenous people in different parts of Nepal Himalayas have been utilizing physical and natural environment in various ways since the time immemorial. The indigenous people in a particular geographical area have perceived environmental component at the landscapes level, species level and population level in different ways and categorised and delimited these components according to their specific local systems and terms.

Ethnoecology, the applied field of ethnobotany, is a study of local knowledge with respect to surrounding environmental components. A broad definition given by Toledo (1987) and modified by Patton (1993) defined ethnoecology as 'the study of all the knowledge, strategies, attitudes and skills that permit rural cultures to produce and reproduce the material conditions of their social existence through an appropriate management of natural resources.' Today in different parts of the world, participatory ethnoecological researches, have been directed towards the conservation and management of biological diversity. (Aumeeruddy, 1998 cited in Ghimire *et al.*, 2001). The present paper highlights ethnoecological knowledge of indigenous people living in *trans*-Himalayan region regarding the nomenclature of physical and biological environment.

Materials and methods

Study site

The study area lies in between 28°45'-29°45'N latitude to 82°20'-83°45'E longitude covering part of upper

Mustang and upper Dolpa in *trans*-Himalayan zone. The site is represented by its richness in alpine and arid flora with its phytogeographic uniqueness. Areas are almost treeless and virgin, pristine with arid *trans*-Himalayan ecosystem (Snellgrove, 1961; Ghimire *et al.*, 2001; Rokaya, 2002; Shrestha, 2004), located at the rain-shadow zone beyond the high mountain ridges formed by Mt. Dhaulagiri, Annapurna and Kanjiroba massif, which forms barrier to most of the monsoon precipitation that comes from south-east (Hagen 1960). The climate is similar to Tibetan Plateau with higher solar radiation and extremely low precipitation, and it ranges from cool and humid to arctic and cold desert types (Carpenter and Klein, 1995; Sherpa, 1992; Yosida, 2002). Annual rainfall drops 250-500mm along the Tibetan borderland in western Nepal because of rain shadow and distance from the Bay of Bengal (Manandhar, 2002; Rokaya, 2002; Shrestha, 2004). The population is of Tibetan origin hence follow Tibetan culture, social, and religious systems (McVeigh, 1994; Bista, 2000; Rokaya, 2002) and speak Tibetan language. Religions include Bon and Buddhism. Bon is the ancient religion prevailed in Tibet prior to Buddhism (cited in Ghimire *et al.*, 1999).

Data collection

The fieldwork was conducted in the study area at two different periods during October 2001-July 2003. Participatory methods such as Rapid Rural Appraisal (RRA), Participatory Rural Appraisal (PRA),

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participant observation, focus group discussion and key informant interviews (Martin, 1995; Rastogi et al., 1998; Cunningham, 2001) were employed. The participatory assessment was done in parallel way by conducting through a group discussion with the people from different localities asking different questions related to identification of plants, their use, distribution, habitat, vernacular name or local name, to folk taxonomy and nomenclature.

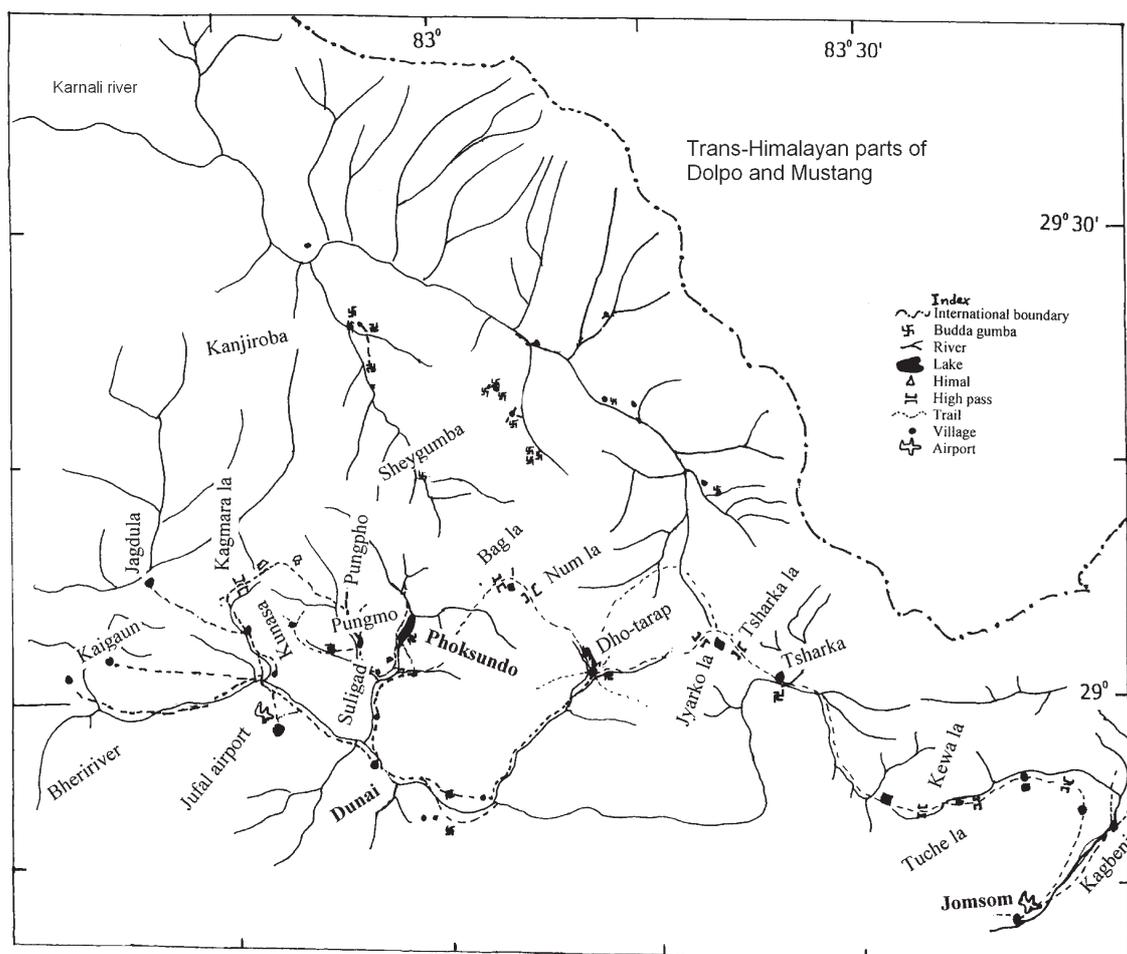
Results and discussion

The people of the study area were found to be exceptionally rich in their indigenous knowledge regarding the environmental factors, resources, and conservation and management aspects. They have their own terms for the level of categorization of land resources and for entire world of plants, which are cited below:

Indigenous knowledge at landscape level: There are various types of ecological zones differentiated by local people in different kinds of geographical

settings. The major six land use categories based on local perception are as follows:

- Nakri** (forest land): It is differentiated into *singhna* (forest), *na* (shrubby land), *singdong* (forest with only large trees).
- Penbri** or **pangri**: It is differentiated into four categories - *pang* (grassland), *degba* (big flat land), *thang* (a big field), *ya* (high alpine grass land).
- Thakri** or **dakri**: It has four different sub-categories as: *dza* or *dak* (rocky land), *ghyapa* (land full of gravel and coarse stones), *yama* (a place with slippery stones) and *chyanb* (highly rocky slope).
- Sim** (marshy place or wet land): It is differentiated into different sub-categories as: *tsangdam* (a river bank), *lungba* (a river between two hills), *nab jok* (marshy land) and *ya tsangdam* (moist place of high mountain or Himal).
- Lung** (agricultural land): It is differentiated into two sub-categories - *zbing* or *zingga* (crop cultivated land) and *lujing* (homestead land).
- Khangri** (Snowy land): It is also differentiated into two sub-categories which are *dza* (permanent



Map of the study area (source: Snellgroove, 1992)

Map: The Map showing routes taken by researchers in *Trans-Himalayan Parts of Dolpo and Mustang*

snow melting zone) and *ghya* (a place above the snow line).

Different forests and shrub lands are named according to different landmarks erected by the people for religious purposes. For example, the two Juniper forest patches in Kalang named as Lang-rok forest and Gyao-chu forest, the three patches of shrub lands and nine pastures in Dho-Tarap area are named in accordance to the prominent landmarks, such as *gombas* (monastery), *laptasai*, *mani* or *madong* and *chortens* (stupas), etc. The pastures that are highly important resources for the survival of local livestock and other biotic agents are of two major types: summer pastures and winter pastures. Among the eight pastures present in Dho-Tarap valley of Dolpo, the one named as Lang pasture is the only winter pasture. The summer pastures are Shulak Pasture, Mirobo pasture, Sorbo pasture, Pen pasture, Shorbu pasture, Traye pasture, Numala pasture that were named on the basis of landmarks.

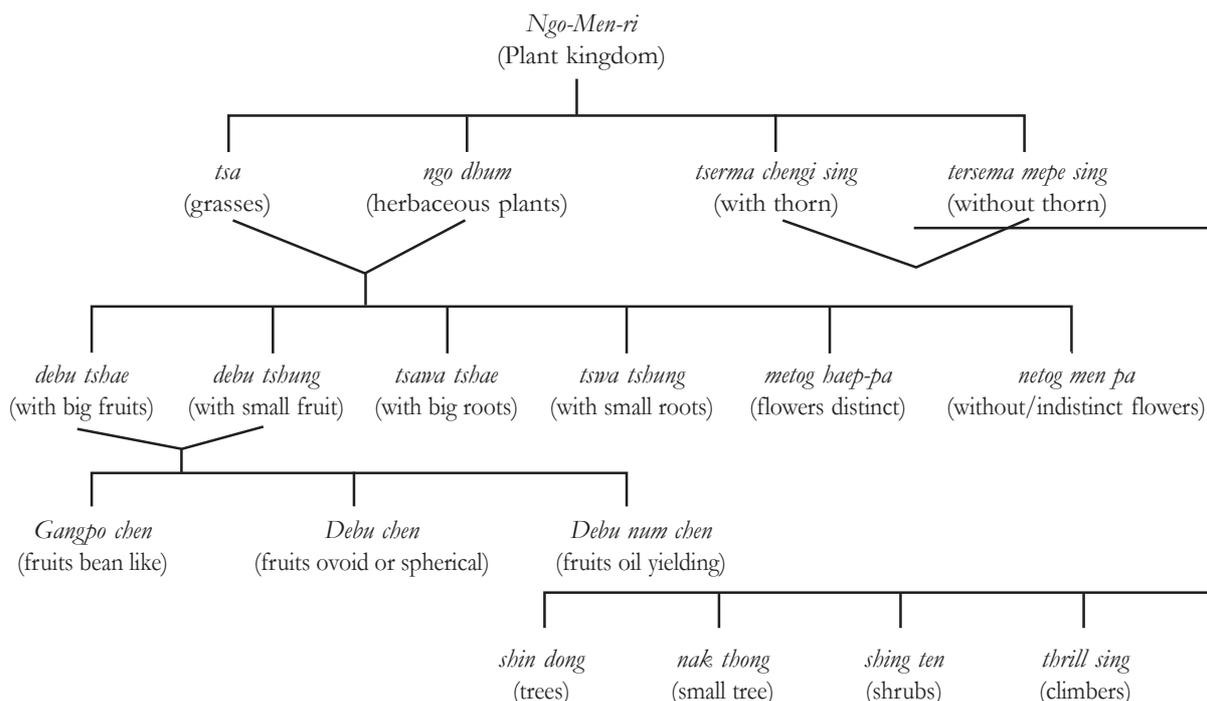
Indigenous knowledge at plant population level:

On the basis of plant population assessment, the local people defined population size as thick (*thukpo*), thin (*tapo*) and moderate (*dingba*) with respect to plant distribution patterns. For the specific distribution pattern, the terms used before the thin, thick and moderate patterns are everywhere (*sane yongjok*), somewhere (*sane dingba*), and few places (*sane nyungnyung*).

Indigenous knowledge at species level: The people of the study area are knowledgeable regarding biological component such as plants. Their folk classification was on the based on various criteria such as presence or absence of flowers, habit, habitat etc. These are described below:

- a) **On the basis of flowers:** The whole plant kingdom or the plant world is called as *ngo-men-ri*. The flower bearing plants are named as *metog bharyap* (angiosperms) and non-flowering plants are called as *metog menpa* (mostly includes cryptogams). The higher plants are called as trees (*sing dong*), shrubs (*singten*), herbs (*ngodum*) and *thrilsing* (climbers).
- b) **On the basis of habitat:** The whole plant kingdom (*ngbo-men-ri*) has been divided into different categories on the basis of the habitat of the plants: *tsbu ruk* (aquatic), *thangla haepa* (terrestrial plants), *sing bal* (epiphytic plants), *dbotak* (plants growing on the stones).
- c) **On the basis of the habit or structure:** This classification system of plants is more comprehensive and gives the detail account of the whole plant kingdom, *ngo-men-ri* (Fig 1). It is differentiated into two sub categories as *ngo dhum* (herbaceous plants) and *sing* (woody plants). The *ngo dhum* is further differentiated into *tsa* (grasses) and *ngodhum* (herbs). The herbs on the basis of size of fruits, roots, and flowers are differentiated into various categories such as *debu tshae* (plants

The categories of plants defined by local people and amchis of trans-Himalayan zone of west Nepal



with big fruits), *debu tshung* (plants with small fruits), *tsawa tshae* (plants with big roots), *tsawa tshung* (plants with small roots), *metog haep-pa* (plants with distinct flowers), and *metog menpa* (plants with small or indistinct flowers). On the basis of the structure and the property of fruits the plants are further differentiated into *gang po chen* (plants with bean like fruits), *debu chen* (plants with ovoid or spherical fruits), *debu num chen* (plants with oil yielding fruits). The woody plants (*sing*) are differentiated into *tserma chengi sing* (thorn bearing plants) and *tserma mepe sing* (plants without thorns). They are further differentiated as *sing dong* (trees), *na jok* (small trees), *singten* (shrubs) and *thrilsing* (climbers).

The folk system of nomenclature: The folk system of nomenclature of plants is based on the particular characteristics such as use, life forms, habitat, morphology, properties of plants etc.

a) Nomenclature based on plant habit: Many plant names refer to plant habit or life form categories such as trees (*sing*), grass or grass like (*tsa*), small plants (*tsungba*), thorny (*tser* or *tserma*), etc. For example *thesing* (*Pinus wallichiana*), *tsa awa* (*Carex* sp.), *tsa* (*Juncus* sp.), *jiptsi tshungba* (*Lamium tuberosum*), *thang na sing* (*Abies spectabilis*), *chang tser* (*Morina polyphylla*).

b) Nomenclature based on habitat: Plants are also named on the basis of the specific habitat as *pang* (meadows), *drak* (rocky mountain cliff), *nak* (forest), *tshu* (water), etc. For example, the plant name *tshu bahal* (*Spirogyra* sp.) is given as the plant grows in the water (*tshu*) and looks like wool (*bahal*). The name *tshu tsa* is given for the aquatic grass. The term *pang* stands for grassland and *thong* for straight in habit, thus the plant growing straight in grass land is called as *pang a thogn* (= *pang a tung*), for example *Androsace strigillosa*. Likewise the name *thsuma tsi* or *chumatsi* (*Oxyria digyna*) has been derived for the plant being aquatic (*tshu*) and growing in mass or in groups of many (*tsi*). The term *drak* refers to the layer or the accumulated rot. The term *chudrak* refers to a layer of small plants accumulated in the water; *dhodrak* for the layer of the plants on the rock and appearing as if it is a layer of rot; and *sing drak* refers to a rot like plants on the trees. The plant name *kangla metog* (*Saussurea* sp.) is derived from different words as 'kang' meaning snowy place, 'la' meaning sloppy land and 'metog' meaning flower. Thus *kang la metog* means a flower in the sloppy and the snowy place. Likewise, the name *pang ram* (*Bistorta* sp.) has been

derived from two words 'pang' meaning grassland and 'rabae' meaning looking in dense population. So, *pang ram* means the plant appearing to be dense in the grassland area.

c) Nomenclature based on plant morphology:

The system is based on the structure of plant in reference to colour and the special appearances. For example, 'japo' means cock and 'tsi tsi' means the comb and the plant with the flower resembling to the cock's comb is named as *japo tsi tsi* (*Coleus barbatus*). The different species of *Pedicularis* are named with the prefix 'lugru' meaning sheep's horn as the flowers has the coiled beak similar to horn of the sheep. The name *kyiche karmo* (*Gentiana robusta*) has been derived as *Kyi* - dog, *che* - tongue and *karmo* - white as the leaves of the plant are similar to the tongue of dog with the white flowers. *Sang dril serpo* (*Primula sikkimensis*) has been derived from different words as *sang* - bell, *dril* - to ring and *serpo* - yellow for the plant with the yellow flower in the shape of ringing bell. The suffixes *karmo* (white), *serpo* (yellow), *ngon po* (blue or violet), *marbo* (red) are used with reference to the colour of the flower. For example, *balu marbo* (*Rhododendron lepidotum* - red flowered *Rhododendron*), *balu ngon po* (*Rhododendron nivale* - dark red flowered *Rhododendron*), *lugru serpo* (*Pedicularis klozschii* - yellow flowered *Pedicularis*), etc.

d) Nomenclature based on plant use: The use of the plant is also a basis of naming plant. Terms representing specific utilities of plants like *m-n* (medicine), *dbuk tsa* (poison), *poe* (scent or incense), etc. are given as suffixes or prefixes to name specific plants. For example, *sila poe* (*Jurinea dolomiaea*) has derived from two words *sila* (meaning the avoidance of the bad smell) and *poe* (meaning scent or incense). Thus the plant name *sila poe* stands for the scent used to avoid the bad smell. *M-ntsa* (medicinal grass) and *dbuk tsa* (poisonous grass) are also named according to the use of the plants.

e) Nomenclature based on plant property: The plants are also named based on their property. For example bitter is locally called *tike* (= *tig*) or *kha*. The plants with such taste are *tikta* (*Swertia* sp.), *Bashakha* (*Lagotis kunawurensis*), *gyatig* (*Androsace strigillosa*, *Swertia ciliata*), *zintik* (*Ajuga lupulina*). Plants with acrid taste are known as *tsa*, for example *chetsa* (*Ranunculus* sp.), and *chumtsa* (*Rheum* sp.), etc. The name *pang poe* (*Nardostachys grandiflora*) is given for the scented plant (*poe*) in the grassland (*pang*).

Indigenous knowledge on the biology and life cycle stages of plants:

The local people were found knowledgeable in biology and life cycles of plants. The identification of plant during its life cycle is very important because its potency depends on the different stages of the life cycle. The stages in the cycle based on the local perception are *dheubu* (seeds), *khabui* (seedling), *dhurtsi* or *lomakae thuk* (juvenile stage), *thong bo kae thuk* (mature plant), *metog kae thuk* (flowering stage), *dhbu kae thuk* (fruiting stage). The plants that propagate through roots are called *chab nae kae du* and those through seeds are *thap tae kae du*.

The people generally identify plants on the basis of taste of different plant parts, types of the root structures and different life cycle stages. The most important account is taken that of structure, fragrance, colour and the taste of the flowers and the seeds. The people are well aware of the conductance and the storage of the sap in the plants, and use the different parts of the plants according to the perception of nutrients level in different plant parts. Thus, they use the various parts of the plants in different time of the year and at the various stages of the life cycle. For example people use seeds during December to January, shoots during February to April, flowers during May to August, and roots during September to November.

The land categorization system is comparable to the scientific classification of the ecosystems as terrestrial, aquatic and artificial ecosystems. Further these major categories are sub-categorized into smaller units. The classification is natural and is on the basis of the habitat of the plants that is similar to scientific classification of the ecosystems. The naming of the forest and the pastures are on the basis the presence of prominent landmarks and is similar to the other parts of Nepal (Ghimire *et al.* 2001; Lama *et al.*, 2001).

Folk nomenclature and classification system in some extent is comparable with the scientific classification system. However, the local classification of the plants is not so explicit so that there is lack of detail categorization of the plant up to specific level. Locally the plants have been classified as *metog bharyap* (flowering plants) and *metog menpa* (non-flowering plants) and it is similar to the phanerogams (flowering plants) and cryptogams (non-flowering plants) of scientific classification. The life form and the intermediate levels between the folk ranks and the scientific taxa are not sharp. The life form categories such as *tsa* (grass) and *ngodum* (herbs) have some correspondence to monocotyledons (or scientific family – Graminae and Cyperaceae) and the

herbaceous dicotyledons. The monocotyledons other than grass-like are grouped in *ngodum* (herbs). On the other hand *tserma chengi sing* (with thorns) and *tserma mepe sing* (with out thorns) or the plants with distinct flowers and the plants with indistinct flowers corresponds to angiosperms or gymnosperms. But the demarcation of this category is not distinct and prominent. In a systematic classification the family is a category comprising one of more genera or tribes of common phylogenetic origin and the plants have a common ancestor that have evolved into various species along and evolutionary process, but this sorts of criteria is not available in the local system of classification (Ghimire *et al.* 2001). However, the system of classification is so large that the plants could be identified up to generic level with the systematic identification.

The folk nomenclature of plants is similar to scientific nomenclature. In the folk nomenclature given name of the plant is based on different morphological and physical characteristics. The term representing these characteristics is given in the form or prefix or suffix. At the generic level and the varietal level the plants are named on the basis of different attributes as habit, habitat, morphology of the flowers, use, property of the plants, plant size, etc. The system of nomenclature is also in some places binomial. However, according to Ghimire *et al.* (2001) the correspondence between folk nomenclature and the scientific nomenclature exist in a large scale.

Regarding the life cycle in indigenous concept the various steps are well differentiated right from seed (*dhaebu*) to the fruiting plant (*dhaebu kaethuk*). Although the ethnoecological knowledge is rich, the identification of the plants is still not so scientific as the account of fragrance or the parts of the plants are taken into consideration. The level of perception on the potency of the plant based on nutrient concentration looks scientific because the local people use the plant parts according to the seasonal calendar.

Conclusion

The present study focussed on ethnoecological knowledge of indigenous people of *trans-himalayan* region of west Nepal showed good level of knowledge regarding natural environment at different levels. Indigenous people have differentiated the ecological zones on the basis of land use categories. It was further found that folk nomenclature system and folk classification of the plants were based on the different aspects such as presence or absence of

flowers, habitat, habit and morphological structure, use and property. In this modern world, it is important to document indigenous knowledge regarding natural resources in order to make effective strategies to conserve natural resources for the future generation.

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