

An assessment of biodiversity in Panch Pokhari of Sindhupalchok District of Central Nepal Emphasizing Conservation Needs

**A Project Report (Final) Submitted to Rufford Small Grants Foundation,
The United Kingdom**

Investigators

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Mr. Bhaiya Khanal - Investigator, Zoologist
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Acronyms and Abbreviations

A	Alpine
AS	Alpine Scrub
BPP	Biodiversity Project Profile
C	Common; Central
CITES	Conservation for International Trade of Endangered species of Fauna and Flora
CL	Crop Land
Cl	Climber
E	East
FC	Fairly common
F	Forest
GL	Grazed Land
Govt.	Government
GS	Goat Shed
H	Herbs
IUCN	International Union of Conservation of Nature
MC	Most common
MP	Moist place
MS	Moist slope
N	Nepali name
NG	Nepal Government
NPC	National Planning Commission
O	Occasion
OL	Open land
OP	Open place
P	Pasture
R	Rare, Rock
Sh.	Shrub
Shr.	Shrubberies
S. N.	Serial Number
SPTDMC	Sindhupalchok Panch Pokhari Tourism Development and Management Committee
T	Tamang name; Tree
TS	Trail side
W	West
WCL	Waste crop land
Wcl	Woody climber

WL	Waste Land
WP	Waste Place
CO ₂	Carbon dioxide
ca.	close to; about
e.g.	for example
m	metre
sp.	Species
ssp.	subspecies
var.	varieties
*	added in the previous report

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1. INTRODUCTION

1.1. Background

Panch Pokhari, a part of the Langtang National Park to its east, lies at 27° 36' to 28 ° 13' N and 85 ° 2' to 86 ° 06' E. (Fig.1). Being enriched with highly valued biodiversity, interesting terrains and mind blowing peaks, this area is still beyond the reach to prosperous tourism besides having incomplete documentation of the valuable natural history existing here. The area lying between 2135 to 4300 m displays good pasture land influenced mainly with the cold and chill climate of the Himalaya. The heavy snow of winter is melted in summer eventually into the cold water of the Panch Pokhari Lakes (Five ponds). The heavy snow fall which occurs here almost for six months annually controls healthy growth of the vegetations in this part. When snow melts in May, the livestock grazers transfer their livestock to the high altitude meadows for grazing purpose; they stay there till October before the start of the cold and harsh weather characteristics of the Himalayan climatic type.

This district encompasses many of the accessible and remote villages where literacy rate is still under minimum level. Poverty has become the main obstacle to many of those who wish to peruse higher education in Kathmandu or abroad, so they have to divert themselves fully to other professional activities like farming, business or others. Many youths of this district also go abroad mainly in the countries like UAE, Malaysia, Saudi Arabia, Qatar etc for temporary employment purpose.

Nepal displays complex terrains and varied elevations at lowland to the higher Himalayas. The area above 3000 m is represented by 25 percent of the total land mass of the country. For the last decades, the population increase has impacted seriously on forest and forest resources of the country. According to Majupuria and Kumar (1998), the loss of habitat, overgrazing and poaching have caused a serious decline of many of the wild animal species. Corbet and Hill (1992) write that the boundary between the Indo-Malayan and Palaearctic regions is the tree line at about 3000 m. The faunal elements above tree line have Palaearctic affinities. The Himalayan sub region is mainly confined to the mid hill



Source: Karki and Thapa (2001)

Fig.1. Map showing the location of Panch Pokhari

areas. This is a transitional sub region with various Palaearctic faunal elements descending into the forest below 3000 m.

Nepal occupies a linking position at the cross roads of diverse faunal elements on the basis of faunal distribution. Swan and Leviton (1962) mention that the fauna of the west zone of the Himalayas has similarities with those species found in western China. They mention in greater detail that the Indo-Chinese Fauna becomes greatly reduced on the eastern frontier of Nepal. However, it is continued westward through Nepal mainly in isolated forest areas which exist between 914.4 m and 2133.6 m.

Heinen and Kattel (1992) mention that several of the Himalayan parks are large by Asian Standards, most have substantial portions of their land cover is permanent ice and snow (e.g, 30 percent of Langtang including Panch Pokhari). The manage zones in which some grazing and wood collections are permitted in several Himalayan parks mean that the effectively conserved area is subsequently smaller than the map area Tourism provides the single largest source of foreign exchange for the country's development plan, and the largest source of employment besides agriculture for Nepali nationals. Tourism is the major sources of income

for the residents of Langtang and could be for the peoples of Panch Pokhari areas if promotional activities are increased here effectively under the Government's managed way of planning and policies.

1.2. Agriculture

The higher areas display poor agricultural products. Potato is the main cash crop and has gained wide market even to Kathmandu city. Other common vegetables grown in this village include soybeans, beans and tomatoes which grow mainly during rainy season. Cereal crops like wheat and maize grow well up to the Botang village (1600 m). They also harvest wild edible mushrooms for their food but use their own traditional system to distinguish a poisonous mushroom from a non poisonous one. Among fruits, apple and berries grow well. The good quality apple which has just been initiated to grow here has a wide market up to the Kathmandu and adjoining cities.

Our two phases of study has shown that the inhabitants of the Botang and Dukhan villages (nearby villages of Panch Pokhari) are still not much familiar to adapt scientific agricultural practices mainly to grow green vegetables, peas, cabbages and others. The soil of these villages is fertile and can significantly be positive to raise their economy if trained properly to grow seasonal vegetables and fruits in these villages. This can also aid to tourism promotional activities in this place. After 2200 m of elevations no villages or human settlements can be found except some Goths (shades for livestock) where livestock grazers grow some green vegetables around their living places.

About 1000 individuals of cows and 121 buffaloes are reared in nearby villages of Panch Pokhari. Domesticated Yaks can also be seen at Nasim (3500 m). The conflict between the wild animals and grazers is a serious problem in this part. The villager's main complain is about the aggressiveness of the wild beasts like bears and leopards which are the main predators of their livestock usually during rainy season period.

The stored grains like maize, barley, millet, etc are grounded up into flour by the use of the locally made water turbine. About two such turbines were noticed at different places between Botang and Dukhan villages. This is basically established in that part of the stream where water current is noticeably high.

1.3. Small Business

The small or domestic business is very poorly developed in this region. They usually prepare some personal items mainly with soft bamboos. Such items include varieties of attractive baskets and important storing stuffs. Few women at Yarsa village (1700 m) weave woollen clothes and carpets using traditional typed weaving machines made up of wooden materials.

Some village peoples are also engaged with the trade of forest products like lichens used mainly for making dyes and other stuffs. This was noticed at Tipeni (way to Dhap) where tons of such lichens were made ready to be dispatched. At higher elevation of Panch Pokhari, the local people collect various medicinal herbs for trading purpose. *Cordicep sinensis*, a well known highly prized medically valued herb is collected widely in this part during May and June. This is the symbiotic product of fungus and caterpillar of a moth called *Hepialus chinensis*. The moth dies after the fungus grows upon it. This is called *Yarsa Gumba* in Nepali. This has been said to be of high aphrodisiac value and has greater market demand as well.

1.4. Religious Festivals

Janai Purnima Festival: This festival is observed in the mid of August annually when devotees from countrywide reach to Panch Pokhari to take their holy bath which is said to carry significant mythological belief. About two thousand peoples are estimated visiting this place annually.

Dasahara: This festival is observed in March/ April and lasts for a month. During this time, many devotees visit to Panch Pokhari Lake to worship god Shiva and to take holy bath there. They also pay visit to a locality at Chitre where a small fountain of sour water (water with high rate of basic elements) is located. They believe, this water may cure their contaminated diseases if drunk once in their life span. Thousands of peoples visit this place annually. According to an estimation of the village peoples, the 2008 festival of Janai Purnima brought about 5000 peoples to take their holy bath at Panch Pokhari lakes.

1.5. Objectives

This study program has the following objectives

- a. To document the existing biodiversity in Panch Pokhari and adjoining areas.

- b. To assess the local /national status of every observed species of biodiversity found in this part.
- c. To study the prospects of promoting ecotourism in this part.
- d. To make people's participation in conservation through conservation education program.

2. METHODOLOGY

2.1. Field trips

A systematic study was done in two different seasons (First and Final Phases) which was initiated from Melamchi (1000 m) to Panch Pokhari Lake (4300 m). This study which was divided into two different phases which lasted for 15 days each in the field (total one month in two phases). The whole area of Panch Pokhari towards Melamchi side was (south-eastern side) extensively explored by the team which included well known botanists and zoologists of the country. Each spot mentioned in Figure 2 was investigated very thoroughly and its result is incorporated in this report.

Kathmandu -----^{Bus}----- Melamchi
 Melamchi (1000 m) to Gupha Danda (1200 m)
 Gupha Danda to Dhap (1300 m)
 Dhap to Botang (1600 m)
 Botang to Chitre (3000 m)
 Chitre and associated areas (3000 m to 3400 m)
 Chitre to Nasim (3500 -3800 m)
 Nasim and associated areas (3900 m)
 Nasim Pati to Panch Pokhari (4300 m)
 Panch Pokhari to Nasim Pati
 Nasim Pati to Chitre
 Chitre to Dukhan (2200 m)
 Dukhan to Botang
 Botang to Dhap
 Dhap to Melamchi
 Melamchi -----^{Bus}----- Kathmandu

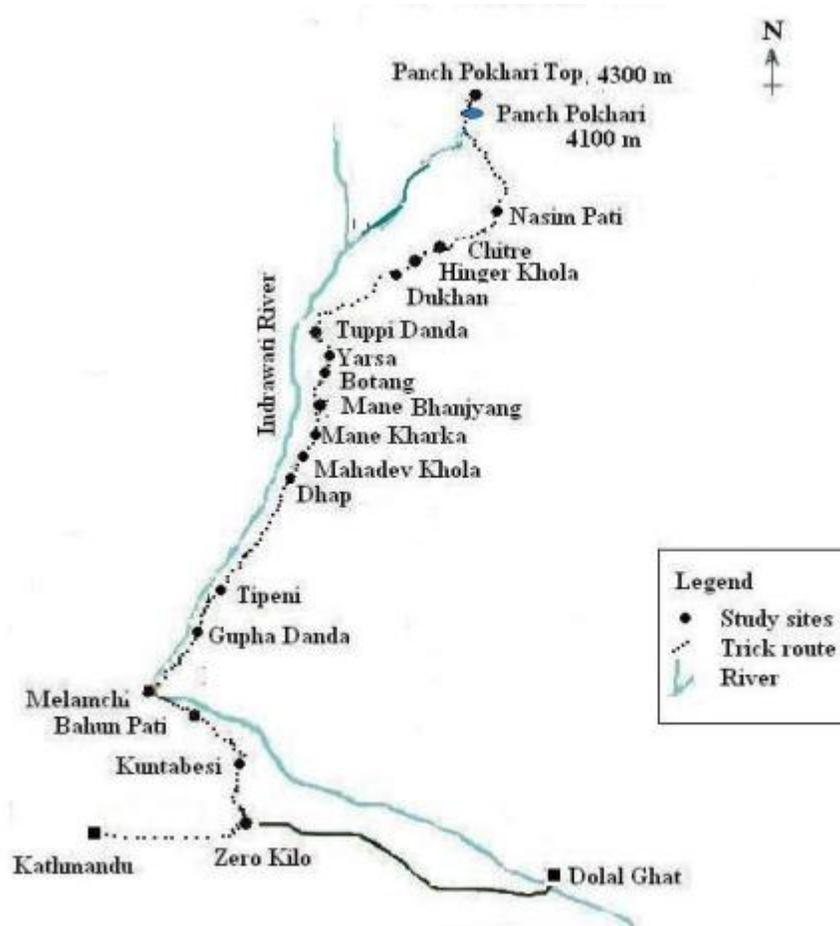


Fig.2. Study Route to Panch Pokhari and Peripheral Areas

The significant components of the biodiversity were recorded with photographs. The unidentifiable invertebrate specimens in the field were collected and the process of identification was completed at Tribuvan University of Kathmandu. Other components of the biodiversity were studied with the help of the field guides. The lichens and bryophyte specimens were collected using pocket knife and placed safely into the paper packets. The hand lens with magnifying power (5X-20X) is used for field identification. Various relevant literatures viz. Chopra (1975), Eddy (1988, 1990, 1996), Gangulee (1969-1980), Kashyap

(1972), Smith (1996), Sharma (1995), Baniya (1996), Awasthi (1991), etc are consulted for identification.

Several Angiosperm, Gymnosperm and Pteridophytic plants were collected as voucher specimens with the record of their important field characters. Attempts were made to identify these plants in the field by using personal expertise and literatures (Polunin and Stainton, 1984; Stainton, 1988) and Press *et al*, 2000.

Field observation and interaction with local peoples were made to know about species abundance, local names (especially Tamang names) and local uses of the plants.

Those species of butterflies which were not readily identifiable in the field were collected with the help of butterfly net. Relevant literatures (Smith, 1989, Khanal and Smith, 1997) were consulted for identification. Binocular was used to study the bird species and field guide (Fleming *et al*, 1976) was used for their identification. The mammals were identified in the field with the help of relevant book of Prater (1965).

The first phase of the field study was initiated in April 26 to May 10 and the second or final phase was conducted in the last week of September to October, 2008.

2.2. Significance of this Study

Nepal Government's plan to promote tourism in this place though can be helpful to uplift the financial status of many of the rural people, may still leave equal impact upon the forest resources of this place. So this study to document the existing biodiversity of Panch Pokhari and peripheral areas has been felt essential before any damages can occur here.

Conservation Education is believed to bring about conservation awareness among the local peoples. Once baseline data is completely documented, the future follow up can be made easy by monitoring the degree of habitat alteration from the period of baseline study (this work). If any impact is found in future, the village communities and government organizations will be reported to add effectiveness in their conservation policies.

Our main target is to develop this place an excellent conservation and tourism flourishing area of the country. The effectiveness in conservation action and favourable tourism scheme in this

place may raise the socio-economy of the local inhabitants besides generating a ransome of revenues to the Nepalese Government.

2.3. Current Study and Future Plan

One of the main aspects of this study was to conduct a detail biodiversity survey and promote tourism in Panch Pokhari and adjacent regions (4200 m). The species diversity both of floral and faunal components has been found increased in the final phase of study which was held in September/October as it was little warm and humid compared to drought April when the first phase was completed. The biodiversity survey was accompanied with the study of the prevailing deforestation, habitat alteration and status categorization of every biological species observed in the field.

The second or final phase of the field study also included a two days of Conservation Education program implemented basically to the inhabitants of this part. This study also included the biodiversity documentation and status categorization of every added species during this phase. The local inhabitants were found completely unaware of the conservation values of the existing biodiversity of their area.

2.4. Poaching

No check points of the Department of National Parks or Forest Division are established here so far. The roaming poachers in this part generally kill musk deers especially for the musk pods. They also kill bears at the Larke Khola area especially for liver, biles and other parts. They hunt deer illegally for meat and skin. Red Panda has also been noticed killed by the poachers for its beautiful fur. They use various local and traditional traps and guns for this purpose.

2.5. Tourism

The pilgrimage tourism has retained a sacred destination at Panch Pokhari region. About 2-3 thousands of people visit Panch Pokhari especially to take their holy baths and worship lord Shiva (*Pers.comm.* Hira lama). This takes place usually in March/April and the end of August every year.

The flow of international tourists is very insignificant in this region. This is mainly due to uncomfortable trekking routes, lack of suitable accommodation and unavailability of pertinent food items for visiting tourists. Trained guides and good camping sites are the next problems in this part. The hidden natural and cultural diversity which are still unknown among the circles of national and international tourists is the next cause for its less popularity. Countable tourists visiting this place usually come under package tour program, so all the required food stuffs and camping equipments are taken with them for the entire trip period.

Due to scenic beauty, incredible landscape, diverse cultural and natural diversity, Panch Pokhari can be expected to attract many tourists of different interests. This all need good management especially the required physical facilities, camping areas, and trained guides. Many other interesting spots like Bhairab Kund, a popular high altitude lake is also located in this region at 4300 m. The next beautiful lake called Suraj Kund lies at the junction of Sindhupalchok, Nuwakot and Rasuwa districts.

2.6. Local Efforts

Of the main activities of the local peoples to promote tourism in this place has been aided by the formation of the Sindhupalchok Panch Pokhari Tourism Development and Management Committee (SPTDMC) which is a non profit and non-Governmental organization based at Chautara, the headquarter of this district. This was established as a joint venture of the youths and tourism professionals of Sindhupalchok in 2000. This organization aims to support to self-reliant and sustainable development through tourism in this region.

This organization envisions on sustainable development and management of rural tourism supporting human resource development, providing economic opportunities, empowerment of the local peoples that are the basic requirements for community development.

This organization assists in different sectors such as health, education, eco-tourism, social mobilisation and social empowerment. Besides the natural beauty, innumerable historical monuments, pilgrim sites and both the tangible and intangible tourism products do prevail in the district. Because of all these tourism products, it can proudly be said that tourism has high potential in the district. Some parts of the districts that fall within Helambu region are very popular for tourism activities as Langtang - Helambu area is ranked third tourism destination of Nepal. Some of the well known and highly possible tourism sites within the district are

Helambu area, Tatopani, Ama Yangri, Bhoté Koshi, Panch Pokhari, Duganagadi, etc. The district is highly potential both for the domestic and international tourism.

Women of Botang are doing appreciable effort to develop their beautiful village as an excellent example of tourism and conservation. They actively are engaged to teach others to conserve forest resources found in their area. Their knowledge on forest resources is very low so the proposed conservation education in our final phase of field study can be expected to familiarize them with the value of forest and its valuable resources. There are only 3 girls in this village who have passed 10th grade of schooling so far (*pers.com*, Heera Lama).

2.7. Basic Requirements needed for the Promotion of Eco-Tourism

1. Accommodations (Inn)
2. Restaurants at every station.
3. Good Camping sites at every stop.
4. Regular water supply system
5. Trained trekking guides.
6. Easy porter availability.
7. Solar system/ alternative energy resources
8. Development in agriculture, cash crops, grains etc.
9. Good stores where various stuffs are available to buy.
10. Improvement of trekking trails.
11. Specified garbage dumping places.
12. Supply of Kerosene/ LP gas so to leave least impact upon forest resources.
13. Training to village peoples in cooking inter-continental food items.
14. Instructions to be posted at various places not to leave any impact upon forest resources.
15. Informative brochures of the area
16. Police posts should be established at different places for security.
17. Management to show traditional dances and culture of Tamangs
who are the major tribes of this part?

2.8. Problems for Tourism Promotion

There are many constraints that challenge to flourish tourism in Panch Pokhari which still can be improved if Nepal Government brings a long-term management policy to sustainable tourism in this place. This area which is under the initial stage of tourism has much to do specially with its infra-structure development and community's participation which is an utmost requirement.

Physical facilities like good accommodation and food choices for visiting tourists at every stops leading to Panch Pokhari are the prime requirements which has been experienced in this study.

Selected peoples from the local communities should be encouraged so to make them able as local guides. This can be achieved with supervised trainings. Access to obtain porters is not so easy so the local peoples should be prioritized and trained in this business. The condition of camp sites need improvement especially near water sources likewise trails to the main destination. Conservation education has been felt essential which helps to bring about community's participation in conservation campaign. This place is significantly valued which provides shelters to unique, valuable and interesting floral and faunal components of various status levels.

This study under two phases of study was conducted at the Melamchi to Panch Pokhari line provided significant clues to improve for its betterment and effectiveness for tourism and conservation aspects respectively. The next study planned at Helambu to Panch Pokhari route will explore out various factors for healthy tourism and existing biodiversity and its conservation which has least explored data available so far.

3. RESULTS

3. 1. FLORA

A list of flora reported both in the first and second phases of study is provided in tabulated form (Annex I - IV).

3. 1.1. Lichens

Lichens are formed basically by the combination of the fungal partner which lives symbiotically with an algal one. About 352 species of lichens have been reported in Nepal so far. These were collected at various areas of east Nepal (Sharma, 1999).

The lichen diversity is very rich at the elevations of 1500-3500 m, where trees like Pine, *Quercus*, *Rhododendron*, *Cedrus*, *Cupressus*, *Picea*, *Juglans*, etc are prevalent. Lichens prefer to grow on the barks of these trees. The rough barks provide better foothold for the growth of various lichen species. Bioclimatic condition plays an important role in producing fruiting bodies in the lichens which is evidently found in the lichens of the sub alpine region (Sharma, 1999).

A total of twenty-two species of Lichens under 15 genera and 9 families are recorded in Panch Pokhari region (Annex I, which includes both the first and second phases of collection). The lichen *Peltigera leucophlebia* (Nyl.) Gyeln. of Peltigeraceae is a new record to the country.

3. 1.2. Bryophytes

Bryophytes are non vascular plants and are considered to be the pioneer colonizer in terrestrial habitats from an aquatic environment. They are the simplest and the most primitive land plants as they do not have a well developed conductive tissue system. In form they are often dorso-ventrally flattened green plants basically differentiated into stem and leaves. They share a lack of lignified tissues and true roots, and anchor to their substrate by means of non-chlorophyllose filamentous branches called rhizoids. Leafy gametophytes are differentiated into stems and leaves. Moss gametophytes are either erect or extensively branched prostrate plants that consist

of an axis commonly called a stem bearing spirally arranged leaves. Antheridia and archegonia are the male and female gametes produced on the gametophytic generation. When the antherozoid from antheridium fuses with the egg formed within the archegonium, a called zygote is formed. The zygote is the first cell of the sporophytic generation. The sporophyte after reduction division produces spores and spore after germination give new gametophytic plants. Bryophytes are more common in humid areas and usually show microclimatic niches on rocks, trees and vicinity of small shady springs. The three main taxonomic groups of bryophytes have been recognized as hornworts, liverworts and mosses.

Nepal represents 1150 species of Bryofloral species (Pradhan and Joshi, 2007a), of which Panch Pokhari and peripheral areas are expected to represent more than 150 species. In the first phase of study, a greater diversity of this plant was noticed in the temperate to sub alpine regions mainly at 3000-4200 m of elevation.

More than 500 specimens were collected during the first and second phases of our field study. These were divided taxonomically into 77 species under 47 genera and 33 families. Of them five species are new records for the country.

The second phase study was made at the end of September to October. This season with optimum temperature condition was found fruitful to bring distinct sporophytic generations in many of the bryofloral species.

An overall list of bryofloral species recorded in the first and second phases are provided in Annex II.

3.1.3. Pteridophytes

Exotic fern species form an important part of the existing floral holding of Nepal. Their present is seen in the lowest plane to the highest elevation of 4550 m in the Himalayas. These green plants have ability to manufacture their own food with the help of CO₂ and water in presence of sun light, a process commonly called Photosynthesis. In Nepal, it came into light in 1825 with the work of David Don who compiled all the plants of Nepal collected by Buchanan Hamilton and Nathaniel Wallich. D. Don included 83 species of Nepalese ferns in his book *Prodromus Florae Nepalensis*. At present more than 500 species of ferns and fern allies are represented in Nepal (Gurung, 1999). The flora of Langtang and Cross Section Vegetation

Survey, Central Nepal (NG, 1976) included 75 species of ferns under 40 genera and 13 families.

Ferns occupy an intermediate position between the bryophytes and higher plants. They are vascular plants bearing no seeds. They vary from simple floating form (*Azolla* sp.) to large tree like structure (*Cyathea* sp.) and can be seen all the year round. Their fruiting start mainly in September to October. The tiny spores are formed in the sori under surface of the leaf which germinate to produce new plants. Many of the species of ferns are economically important and carry immense food value, medicinal uses, green manure, ornament and construction work

The first and second phase collection brings a list of 21 species of ferns categorized into 12 genera and 10 families. Its collection was made at 1200 to 4000 meter of elevation. An overall list of fern species recorded in the first and second phases are provided in Annex III.

3.1.4. Higher Plants

The sub tropical vegetation occurs at 1000 to 2000 m of elevations basically at the lower belt of the Himalayas. A patch of oak forest (*Quercus lanata*) was observed near Botang village which was conserved by the local peoples to enhance the beauty of the village. A lower temperate Oak- Rhododendron forest constituted by *Quercus lanata* and *Rhododendron arboreum* were noticed below the Dukhan (2200 m) at the dry rocky slope of Hingar Khola, the moist area in this place is dominated by *Alnus nepalensis* associated with *Lyonia ovalifolia*, *Rubus ellipticus*, *Oxyspora paniculata*, etc.

The temperate vegetation normally occurs at 2000 to 3000 m. The temperate vegetation was noticed widely above and around Dukhan (2800 m) settlement. The common tree species from Dukhan to Chitre Khola (3000 m) are *Rhododendron arboreum*, several species of laurels, *Symplocos ramosissima*, *Ilex dipyrena*, *Quercus semecarpifolia*, *Pyrus pashia*, *Berberis aristata*, etc. The ground floor is covered by *Duchesnea indica*, *Fragaria nubicola*, *Hemigraphis heterophylla*, *Trifolium repens*, *Poa* ssp., etc.

The sub alpine zone lies at the main Himalayan range between 3000 to 4000 m. The floral diversity above Deurali to Nasim (3500-3800m) is absolutely the sub alpine type. The dense forest of Rhododendron (*R. campanulatum*) is quite dominant in the area associated with some stands of *Abies spectabilis*, *Betula utilis*, *Juniperus recurva*, etc. Some colorful herbs (*Primula*

irregularis, *Anemone obtusiloba*, *Corydalis juncea*, *Hemiphragma heterophyllum*, *Potentilla* sp., *Viola* spp.) are commonly observed.

The alpine zone lies above 4000 m of elevation. The area between Lauribina (4000 m) to Panch Pokhari (4200 m) is covered with lustrous green meadows interspersed by rocky slopes. *Rhododendron lepidotum*, *R. anthopogon*, *R. setosum*, *Juniperus recurva* and *J. indica* can be seen in alpine meadow which is covered by a number of dried herbs belonging to Poaceae, Cyperaceae, Rosaceae, Primulaceae, Ranunculaceae, Gentianaceae, Papaveraceae, Campanulaceae, Saxifragaceae, Scrophulariaceae and Asteraceae. A moss like tufts of minute plants, *Arenaria polytrichoides* occurred along the meadow.

More than 110 species of flowering plants have been recorded in this study conducted in two different phases held in April and September / October, 2008. The second or final phase of study held in September-October added 134 species more in the previous list, so a total of 244 species has been given in the Annex IV.

3. 2. Fauna

3.2.1. Butterflies

Nepal encompasses integration of the various biodiversity components, of them Butterfly is the one which has the representation of more than 650 species so far.

Diverse faunal components are sheltered around Panch Pokhari area. Butterfly diversity is very rich in this part. Oriental components are more common up to 3000 m where prominent species of butterflies like *Précis almanac*, *P. lemonias*, *P. iphita*, *Zizeeria maha*, *Achillides polycctor*, *Atrophaneura polyeuctes* and *Metaporia agathon* are prevalent. Himalayan species found at 3000 m to 4300 m in this region are *Pieris brassicae*, *Vanessa indica*, *Issoria issaea*, *Danaus chryssipus* etc.

April is little earlier for good diversity of insects and butterflies. The actual season for butterflies in higher elevation starts from the end of May. *Parnassius hardwickei* which occurs only at higher elevation was not observed in this study though it has a continuous generation year round except the month of February (Smith 1989). Rest of *Parnassius* species found in Nepal Himalayas have a single generation so they appear till the end of October only.

The Himalayan region is very rich in insect fauna but very little work has been done on this aspect. The subtropical to upper temperate climates starting from Dhap (1300 m) to Panch Pokhari (4000-4200 m) has varied climate and different vegetation types. This provides various preferable habitats for many insect species. Their habitat preferences are also varied, some insects prefer forested and shady areas and some on moist dead logs (Stag Beetles) and some prefer bushes and open areas. All the required habitats are perfectly met in the areas stretching from Dhap to Panch Pohari climates. Nasim (3800-3900 m) to Chitre (3000-3100 m), then decrease in species richness was noticed. This region still needs detail exploration so to bring out a complete list.

3.2.2. Amphibians

Very little information was obtained on Amphibians of Panch Pokhary and adjoining areas. Species of amphibians like *Bufo melanostictus* was found very common especially in Dhap (1300 m) and Botang areas (1500-1600 m). The streams at Botang also provided *Rhacophorus maximus* which is also called the tree frog. This species was not common only 4 specimens were recorded.

According to Shrestha (1982), the high altitude amphibians of Nepal are famous for their large number of geographically vicarious taxa- its sticky caecilian, web footed salamander, spade footed toad, tree frogs etc. He also adds that these interesting forms are disappearing gradually from the native thickets due effects of pesticides, pollution, deforestation, draining of swamps and wetlands.

The lower villages to Botang specially Dhaap and adjoining Timbu areas, the local hunters kill frogs in large number. Especially Rhacophorid frogs and hylids are hunted for commercial purposes. According the traditional belief, dried hyla or rhacophorous extracts can cure typhoid and high fever.

3.2.3. Reptiles

The month of April is earlier for reptilian species. Only one species of lizard was observed during the entire trip period. This species is still under identification process. The distribution of reptiles in midland region especially in the northern part is scarce. According to Shrestha (1982), some lowland species also share their habitats in midland regions. Tifeny (1200 m), a

small village which is on the way to Panch Pokhary displayed interesting reptilian species like Hill Skink (*Mapuya carinata*) and above Mane Kharka (1500 m) near Bptang village represented common skink (*Lygosoma indicus*) this was fairly distributed species in this region.

According to Shrestha (1982) an interesting lizard species like *Japalura tricainata* was reported at lamgtang Khola which lies west to Panch Pokhary region. Species like *Leiolopisma himalayanum* and *L. sikkimense* have also been reported from this region.

The reptilian life is very scarce in the Himalayan zone. This zone normally represents those species which are found in midland regions. The snake diversity is very low in this part. Few species which has wide distributional features in most of the climatic types were recorded in this study programme.

3.2.4. Birds

Bird's life is very diverse in this region. Various preferred habitats for birds can be found here. Monal and Blood Pheasants were noticed at 3800 m above Nasim. Birds like finches were common at higher elevation; the most common was the Flower Pecker. Himalayan cuckoos and Large Hawked Cuckoos were frequently observed birds at higher elevation around 3800 m of Nasim area.

At Chitre (3000 m) and Nasim (3500 m), a beautiful bird called Himalayan Tree Pie was commonly observed. Other common birds noticed here are Yellow Billed Chough, Chuckor Partridge, Scaly Breasted Wren Babbler, Himalayan Cuckoo, Large Hawk Cuckoo, Beautiful Rose Finch, Common Rose Finch etc.

Inskip (1988) has recommended for the protection for several wooded areas in the hills of Nepal that have a high avian diversity. The climate change has also started to leave its impact upon many of the wetland areas of Nepal. This in turn are becoming non favourable for many of the migratory birds which visit this country during winter months for breeding. Of the total 669 species of birds found in the nation Spiny Babbler (*Turdoides nepalensis*) is the only species which is endemic to this country. The increasing deforestation and habitat loss are the next factors causing many residential birds escape from their original site. Of the total records in Nepal, 226 species are included in National red Data Book mainly breeding species. In Nepal about 142 species are found to be the migrant species and few species are summer

visitors which come from the tropical regions of Indian subcontinent for breeding in the forests of Nepal.

According to Fleming (1982), the unique feature, in the avian distribution has been stressed is the sub speciation. In general, birds found in the east are darker than the west. The common Kalij Pheasant (*Lophura leucomelana*) has a white crest and rump in west, a black crest and a white rump in the central and a black crest and a white rump in eastern regions of Nepal. This pattern is also noted in other birds like Redheaded Laughing Thrush (*Garrulax erythrocephalum*), Nepal Parrot bill (*Paradoxornis nipalensis*) and Leaf Warbler (*Phylloscopus pulcher*). This indicates interesting avian zoogeography of Nepal. The Himalayan vegetation often grows dwarfed in form and bird species diminish as the elevation is added.

The Langtang National Park which also includes Panch Pokhari has accommodated One hundred and sixty bird species (Majupuria and Kumar 1998).

3.2.5. Mammals

Mammalian species carrying high conservation significances are found in this region. Red panda (*Ailurus fulgens*) occur at Chitre (3000 m). This animal prefers moist temperate forests feeding on bamboo shoots, leaves and fruits. Its altitudinal range is 2200 to 4899 m in the Himalayas. Considering legal status, it comes under protected list of Nepal Government, vulnerable under IUCN list, CITES I and endangered under National red Data Book.

The Cat Bear or Red Panda (*Ailurus fulgens*) which is found next to Nasem and Chitre Villages generally above 2000 m has stumpy muzzle, short hairy soled legs and bright chest nut colored body and ringed tail with face and lower lips white. This is protected species by law and is also included under Appendix I of CITES. The local peoples of this area are still not familiar about the status and protection of this animal in its natural settings. The conservation education program which was introduced in this phase can be expected effective to bring awareness and their participation in conservation.

Similarly, the mammals occurring around temperate and sub alpine parts are the Langur Monkey, Assamese Monkey, Pika, Civet Cat, porcupine etc. A total of 30 species of mammals have been reported in Langtang National park including Panch Pokhari areas.

Among the notable mammals occurring below Panch Pokhari areas is Himalayan Tahr, *Hemitragus jemlahicus* (H.Smith) which like wild goats select the most inaccessible ground for shelter and usually do not occur above tree-line. They prefer precipitous terrains of towering cliffs, rock, dense scrublands and forests in higher elevations. It generally occurs at 2500 – 4400 m of elevations. It is under susceptible status of the National Red data Book.

The Himalayan Musk Deer (*Moschus chrysogaster*) which is found above Nasim to Panch Pokhari areas generally prefers temperate, sub alpine and alpine zones in birch-rhododendron and scrub and coniferous forests. Basically it occurs above 3000 m of elevation. Considering its legal status, it is a protected animal by the Government of Nepal. Its IUCN status is Endangered and comes under the Appendix I of CITES.

The Himalayan Black Bear (*Selenarctos thibetanus*) which is found in this region has smoother coat and black claws and is typically a black creature with V shaped breast mark which may be white, yellow or buff. It prefers steep forests and can be seen around Chitre to Naseem areas on the way to Panch Pokhari. In winter they come down to lower areas around 1525 m. This bear has been reported at 1000 m to 4000 m of elevations and comes under vulnerable status of IUCN.

The Common Leopard (*Panthers pardus*) which is found in many places en route prefers all types of habitats. It is distributed vertically at 300 m to 2800 m of elevations. It has been placed as Susceptible Status under the National Red Data Book. *Prionailurus bengalensis* (Leopard Cat) is a forest species of Felid. It generally occurs at 300 to 3000 m of elevations and is under the protected list of Nepal Government, CITES Appendix II and vulnerable of IUCN category.

The Indian porcupine (*Hystrix indica*) which occurs at Botang and Dokhan villages, enroute to Panch Pokhari, prefers rocky hill sides and can be found both in open and forest areas. Their hair is modified into powerful spines which is their defensive equipment. They are the pests of cultivated crops.

4. CONSERVATION ISSUES

The forest is the major source for timber, firewood, fodder, and grazing land used by the local communities. To fulfil their daily requirements they haphazardly cut down forest trees, for example, the subalpine species of *Abies spectabilis* is heavily cut for the construction houses and cattle sheds in the village, several young trees are also cut for firewood, and a large amount of fire wood is utilized for cooking and warming during winter cold. It was also observed that some patches of forests were cleared up by setting fire so to convert it into the pasture land. During May to mid June the pasture lands of the upper temperate and sub-alpine regions are heavily grazed whereas the alpine meadows are grazed particularly in late June to August.

Nepal's biodiversity conservation initiatives have taken place against the background of a number of needs and international commitments. The main initiative to date for protecting Nepal's biodiversity is the National Parks and Wildlife Conservation Act of 1973. Important areas for wildlife conservation were designated as protected areas, which covers about 14 % of the country's surface area. Although effective policy has been introduced for conservation still the loss of biodiversity is continuous (BPP, 1995).

Being located remotely, this area is receiving heavy impact from livestock grazers who visit here annually in summer and stay till the onset of winter in October. This study reported a high poaching rate in this place, so many of the fauna and flora existing here are remaining under threat category. Nothing can be said about the magnitude of impact until this proposed study is completed.

Loss and alteration of habitat is considered to be the greatest indirect threat to the existing biodiversity in the country. As a result of encroachment made by agriculture, the forests which are the abode of wildlife are badly getting depleted (Majupuria and Kumar, 1998).

The Department of Forest of Nepalese Government has brought out status of forest in Nepal up to the mid of 90's. Forty-two percent of the country's land has still retained its greeneries as tree areas, grass and scrublands. The area covered by the trees is only 5518 thousand hectares i.e. 37 percent out of the total land areas. The distribution of forest according to the geographical region is high Himalaya region 30 %, high mountain region 30 %, mid mountain region 33 %, Chure region 26 % and Terai region 8 %.

Deforestation is the major threat to conservation of forest resources in developing countries like Nepal. (Basnet, 1992). Environmental deterioration such as loss of biotic diversity, soil erosion, land slides, and flooding are the direct consequences of deforestation (Eckholm, 1975). Globally subsistence economy and the increasing demand for energy are the main driving forces for deforestation (Lonly, 1982; Haas, 1983).

Over 90 percent of the total population live in rural areas. More than 90 percent of Nepal's energy depends on the combustion of biomass (Donovan 1981, NPC 1991). Deforestation and subsequent environmental degradation stem from the demand for energy (Eckholm 1975) which is increasing to meet the needs of fast growing population (2.6 %) of the country.

Nepal's natural resources and significant biodiversity is at the brim of crisis. Over the last two decades more than half a million hectares of forests have been destroyed, particularly in the lowland regions which has caused a huge loss of biodiversity. The main causes of habitat loss are the increasing number of population and their basic demands for forest products and expansion of agricultural lands. The major and critical threat to biodiversity is mainly due to the habitat loss. Other factors related to the threats are over-exploitation of plants and animals, uncontrolled forest fire, over grazing by livestock, illegal hunting and poaching of wild animals (BPP 1995). Social and political forces also have contributed to the loss of biodiversity.

4.1. Conservation Education programme

The current problem of habitat destruction by increasing human encroachment has made us think seriously to educate peoples on environmental problems. This program on conservation education and publicity scheme to involve participation of local peoples has been managed in this final phase program. This has been introduced to make the people aware of the value of natural environment of their region. This program carries major theme of public awareness in the protection of environment and environmental measures are essential to acquaint the people with national requirements and problems. It has also been realized that the people's participation in forest protection and forest production should be enforced effectively.

Conservation education programme has been included as a significant aspect of this work. A high achievement of this programme has been made with an active participation of gatherings (about 101 peoples) at Shree Botang Devi School in Botang village, the nearby village of Panch Pokhari area. This education programme was launched for two days at the end of our final phase of study (October, 2009). The informative education provided them was based

mainly upon values of flora and fauna which was the outcome of our two phases of studies. They were also provided with the knowledge on biodiversity conservation and its role in promoting tourism in their region which covered all the potential areas from Dhap (1300 m) to the main destination of Panch Pokhari (4100 m). Their commitment for active participation to conserve biodiversity and to adapt sustainable policy was indeed very appreciable. Their highly positive response and motivation in conservation made us more energetic.

Besides the local villagers, the participation of the school teachers and students and their commitment to conservation and tourism promotion in their areas was indeed appreciable and encouraging.

Henning (1993) in context to Nepal has written very eloquently about environmental education as “This educational process deals with human inter-relationships with the environment. It utilizes an interdisciplinary, problem solving approach with values and value clarification. Environmental education is basically concerned with the process of knowledge, understanding attitudes, values, skills and commitment for environmental problems and consideration. The need for environmental education is continuous because each new generation needs to learn conservation for itself.”

This program of the conservation education was properly designed and was based mainly upon the needs of the local inhabitants. The expertises of this study team made their high efforts to make this programme effective and successful. The following topics were covered by the concerning expertises.

Name of Resource person	Topic covered
Nirmala Pradhan	Significant values of Lower Plants Their sustainable use and conservation.
Bhaiya Khanal	Rare endangered fauna and Conservation Issues.
Dr. Mohan Siwakoti	Higher plants of Panch Pokhary area.
Sandesh Bhattarai	Medicinal, fodder and higher plant Groups, their economy value and

Conservation.

Binod Thapa

Interviews to local with questionnaires

Geeta Thapa

Moderator of the programme.

Relevant questionnaires to villagers provided valuable inputs to our work and to recommend to tourism promotion in this area.

4.2. Evaluation of the Questionnaires

Relevant questions were asked to the local peoples and participants about tourism prospects and conservation issues in the Panch Pokhari and adjacent areas. Peoples were seen very interested to answer every question and fill out the questionnaires provided to them.

About sixty participants out of 100 shared the same answer about the possibility of enhancing tourism in their area. They also replied that wild animals mainly leopards attack their livestock when they transfer them temporarily in higher elevations for grazing. They can do nothing and are bound up with the rules and regulations of Wildlife Act. According to them, they loose many livestock due to leopard attack annually.

Many of them mentioned that Himalayan bear is one of the main pest of their crops. It also attacks villagers very frequently. Likewise, porcupines and rodents are also the main predators of their crops.

All the consulted villagers mentioned their interest to participate in conservation campaign and do their best to promote tourism in their area if they are supported by the government or any other agencies. The women of this area have formed Women's Group which is actively participating in village development programmes. They are equally interested in the conservation of forest resources, wild life and to promote tourism in their areas including Panch Pokhari. These women recently have planted trees in a mountain slope at Botang Village which is en route to Panch Pokhari Lake. They also have planned to develop the economy of village peoples through horticulture and agriculture processes. They have planted apple plants and orange in their village which can be helpful to increase the socio- financial condition and also could help to their community economically.

Many types of medicinal herbs are found in the forested areas at Chitre (3000 m) and Nasim (3800 m). Around Panch Pokhary lake, *Crodycep sinensis* can also be found which is a highly

prized medicinal herb used for different diseases including aphrodisiac use. This has been said to clean tooth and makes tooth strong and healthy. Likewise, *Achyranthus* is the next herb of this area used widely for tooth brushing. Some significant herbs used in their traditional medicines are *Ageratum*, *Anaphalis*, *Berberis*, *Centella*, *Justicia*, *Phyllanthus*, *Justicia* species, etc According to villagers; they need proper trainings to conserve valuable herbs of their area. They also have mentioned to run conservation education programme in school level and to villagers frequently.

4.3. QUESTIONNAIRE

BOTANG-PANCH POKHARI October, 2009

Name:

Address:

Age:

Sex:

Profession:

1. Number of Community and Government run forests of your area?
2. What types of wild animals are found in your nearby forests?
3. Do they harm village peoples?
4. What type of harm they do?
5. Does hunting or poaching frequently occur in your area?
6. Average number of tourists visiting Panch Pokhary annually?
7. What kind of infrastructure should be developed to enhance tourism in your region?
8. Do you need any training for that if so what kind of training is?
9. What is the main income of the local inhabitants?

10. How do you manage year long house hold requirements?
11. What kind of medicinal herbs are found in this region?
12. How do you harvest and utilize these herbs?
13. Where do you go for harvesting these herbs?
14. Do you have any knowledge about resources conservation and sustainable value?
15. Your Comments (if any):

5. DISCUSSION AND CONCLUSION

Among the collected lichens species, nine species are found common, nine are fairly common and four species like *Cetralia braunsiana*, *Heteroderma diedemata*, *Ramalina calicariss* and *Umbelicaria indiare* have been assessed rare in status. The lichen *Peltigera leucophlebia* (Nyl.) Gyeln. of the family Peltigeriaceae though common has been recorded as new to the country.

Among the bryophytes, the rare species recorded in this study includes *Asterella mussuriensis*, *Riccardia multifida*, *Jungermannia hyalina*, *Heteroscyphus coliatius*, *Metzgeria conjugata*, *Cepahlozeia* and *Calypogeia* species and among the Musci *Philonotis thwaitesii*, *Pohloa elongata*, *Fissidens grandiflorans*, *Bryum cellulare*, *Hyophila involuta*, etc. are rare. Species like *Ctenidium capillifolium*, *Plagiomnium cordatum*, *Barbula cylindrica*, *Pogonatum microphyllum* and *Pogonatum submacrophyllum* are new records to the country. The species *Folioceros assamicus* which was recorded in Teari for the first time also occurs here (Pradhan and Joshi, 2007b). It was also recorded at the Mahadev Khola, 1300 m on the way to Panch Pokhari. Among other sites in this study Tangu Khola, Chitre, Chhare Kharka and Hinger Khola, Gupha Danda, Mahadev Khola and Nasim are noted potential for bryofloral diversity.

About twenty one species of ferns were recorded in the first and second (final) phases of this study. The common species in this route are *Diplazium esculentum*, *Adiantum capillus-veneri*, *Onychium japonicum* and *Selaginella subdiaphana*. *Nephrolepis cordifolii* is the most common species recorded from Melamchi to Chetre. Likewise, the rare species noted here are *Botrychium lunaria*, *Botrychium virginianum* and *Lygodium japonicum*.

This region has remarkable display of floral species. The diversity was found rich at lower elevations compared to highland regions. The areas lying between Dukhan (2800 m) to Chitre (3000-35000 m) have good representation of forest growth. Among the vegetations found here *Abies spectabilis* and *Rhododendrn* spp hold dominancy in this part. *Primula* spp, a beautiful herb has been found wide spread specially in the highland meadows.

Among the recorded 244 species, six species belong to the group Gymnospermae. Of the total species 123 species are herbs, 32 species are shrubs and rest 29 species are trees.

Faunal diversity in this region is remarkable with the records of many rare and interesting species. The outcome of the two phase of study includes 86 species of butterflies, 20 species of other insects, four species of amphibians, 10 species of reptiles and 26 species of mammals. Species of mammals reported in this study like Musk Deer and Red Panda carry high conservation value and are protected by CITES Appendix I. These are the protected species by Nepal Government and also are included in National Red Data Book. Leopard Cat, Himalayan Bear, Spotted Leopard and Himalayan Tahr are also the CITES listed and protected species found in this region. *Ochotona roylei* (Royale's Pika) is the only species observed in this route. Its density has been found heavy around Chitre area (3000-32000 m).

This place still has many significant needs to flourish healthy tourism which can uplift the socio-economy of the local inhabitants of Tifeny to the Panch Pokhari areas. The main attractions for tourists in this region are the unique nature, existing biodiversity, awesome beauty of Panch Pokhari lakes and Tamang culture. The basic requirements to promote tourism in this part include good camping sites, good hotels and lodges, inter-continental and native food items, good trail, good source of water supply, trained guides, porters, information on existing biodiversity and alternative routes. It is also required to make survey and document existing biodiversity besides tourism prospect from other routes which lead to Panch Pokhari region. Our next study will explore out possible route to Panch Pokhari from Helambu side. This study will also document all the components of integrated biodiversity found in Helambu to Panch Pokhari region.

The conservation education programme has been experienced a basic need in this region. Though a part of the Langtang National Park, the peoples residing nearby villages of Panch Pokhari are still unaware of the protected animals like Red panda, Musk deers etc. They need good information and knowledge about sustainable uses of the forest resources and significant values of flora and fauna found in their areas. Considering this fact, our second phase of study

also included a programme of conservation education and was found very successful with active participation of more than 100 peoples. This programme was organized at Shri Botang Devi Primary School located in Botang Village. The participants were seen very much interested and made many queries which they wanted to know very curiously. They demanded this kind of programmes very frequently in their and nearby villages. The school teachers were also interested and made request to us to run such type of programmes in their school as well.

During field study in both the phases, no sign of poaching or huntings were observed. Tamangs who are the major tribes are mostly the followers of Buddhism so they are strictly bound up with the religion and do not kill any animals either wild or domesticated. Likewise, they worship forest believing Goddess (Ban Devi) lives in forest so the forest needs respect and conservation. The water of Panch Pokhari Lake as per Hindu and Buddhist's beliefs is very sacred so no body are supposed to pollute it.

6. Graphic Representation of Biodiversity of Melamchi to Panch Pokhari, Central Nepal

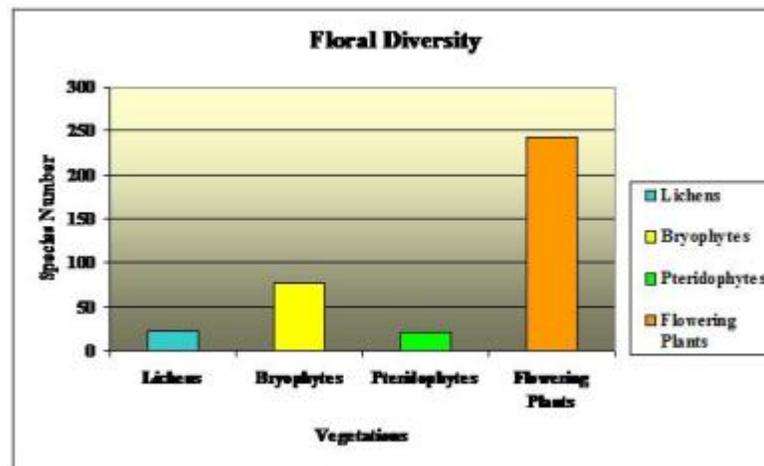


Fig.3. Floral Diversity of Pannch Pokhari areas

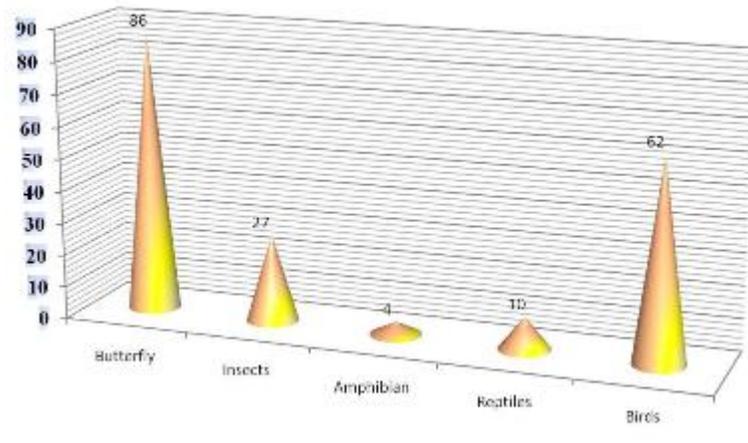


Fig. 4. Faunal Diversity in Melamchi to Panch Pokhari (4300 m)

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Floral Diversity

Annex 1

Lichens

S. N.	Latin names	Families	Locality	Elevation m.	Status	Remarks
1	<i>Azolla imbricate</i> (Roxb.) Nakai	Salviniaceae	Mane Bhanjyang	1500 m	C	Use in green manure
2	<i>Cetralia crispa</i> Nyl.	Parmeliaceae	Chitre-Daurali	3000-3500	FC	
3	<i>Cetralia braunsiana</i> (Mule. Arg.) Club. & Club.	Parmeliaceae	Nasim Pati	3800	R	
4	* <i>Cetrariastrum nepalensis</i> (Tayl.) Hale	Parmeliaceae	Yarsa	1600	C	
5	<i>Coccocarpia crony</i> (Tuck.) Vain.	Coccocarpiaceae	Botang	1600	C	
6	<i>Coliema rugosum</i> Kremp.	Collemataceae	Botang-Dukhan	2100	FC	
7	* <i>Evernia esorediosa</i>	Collemataceae	Mane Bhanjyang	1600	C	
8	<i>Heterodermia diedemata</i> (Tayl.) Awas	Physciaceae	Dukhan	1800	R	
9	<i>Heterodermia incana</i> (Stirt.) Awas.	Physciaceae	Tangu Khola	2200-2400	C	
10	<i>Leptogium javanicum</i> Mont.	Collemataceae	Dukhan	2200	FC	
11	* <i>Nephrolepis cordifolia</i>	Collemataceae	Melamchi- Chitre	1300-3000	FC	Medicinal uses
12	<i>Nephroma helveticum</i> Ach.	Peltigeraceae	Way to Dukhan	1800	FC	
13	<i>Parmelia adducta</i> Nyl	Parmeliaceae	Dukhan-	2000	FC	
14	* <i>Parmelia dilatata</i> Vain.	Parmeliaceae	Botang-Dukhan	1600-2000	C	Use in dye
15	* <i>Parmelia nepalensis</i> Tayl.	Parmeliaceae	Dukhan-Nasim Pati	2100-4000	FC	Use in spices and incense
16	* <i>Parmelia tectorum</i> Nyl.	Parmeliaceae	Nasim Pati	3500	FC	
17	* <i>Parmelia wallichiana</i> Tayl.	Parmeliaceae	Chitre- Tangu	2100-2450	FC	
18	<i>Peltigera leucophlebia</i> (Nyl.) Gyeln.	Peltigeraceae	Mane Bhanjyang	1560	C; New	On rock
19	* <i>Ramalina calicariss</i> L	Usneaceae	Daurali	3500	R	
20	* <i>Umbilicaria indica</i> Frey.	Umbilicariaceae	Dhap	1400	R	Used in dye
21	* <i>Usnia aciculifera</i> Vain	Usneaceae	Nasim Pati	3800	C	
22	* <i>Usnia pectinata</i> Tayl.	Usneaceae	Nasim Pati – Panch Pokhari	3500-4100	C	

Annex 2.

Bryophytes

S. N.	Families	Latin names	Localities	Status	Habitat
1	Amblystegiaceae	<i>*Calliegon cordifolium</i> (Hedw.) Kindb.	Chitre Khola, 3000 m	FC	Boulder stone
2	Anthocerotaceae	<i>Anthoceros punctatus</i> L.	Tangu Khola , 3500 m	R	Rock cliffs.
3	Anthocerotaceae	<i>*Anthoceros longii</i>	Mane Kharka, 1450 m	C	Mountain slope
4	Anthocerotaceae	<i>*Folioceros assamicus</i> D.C. Bhardwaj	Mahadev Khola, 1300 m	R	Soil
5	Anuraceae	<i>*Riccardia multifida</i>	Mahadev Khola, 1300 m; Par Dhungo, 2800 m	R	Rocks; soil
6	Aytoniaceae	<i>*Asterella mussuriensis</i> (Kashyap) Verd.	Sigale, 1250 m	R	Soil
7	Aytoniaceae	<i>Asterella wallichiana</i> (Lehm. & Linderb.) Grolle	Dhap, 1350 m	C	brick walls and rocks
8	Aytoniaceae	<i>Plagiochasma appendiculatum</i> Lehm. & Linderb	Dhap-Botang, 1300-1700 m	C	Soil; stone walls
9	Aytoniaceae	<i>*Plagiochasma pterospermum</i>	Kadamba, 1550 m	C	Rock
10	Aytoniaceae	<i>Reboulia hemispherica</i> (L.) Raddi	Tangu, 2800 m; Chitre, 3000 m; Dinger Khola, 2700 m	FC	Large patch on boulder stone
11	Bartramiaceae	<i>*Bartramia</i> sp.	Chitre, 3000 m	FC	Soil
12	Bartramiaceae	<i>*Philonotis Fontana</i> .	Yarsa, 1650 m	FC	Rock
13	Bartramiaceae	<i>*Philonotis thwaitesii</i> Mitt.	Gupha Danda, 1850 m	R	Rock
14	Brachytheciaceae	<i>*Bryhnia decurvans</i> (Mitt.) Dix.	Chitre Khola, 2800 m	FC	Soil
15	Bryaceae	<i>Bryum argenteum</i> Hedw.	Botang, 1600 m; Dukhan 2350 m; Gupha Danda, 1350 m	C	Rocks, brick walls
16	Bryaceae	<i>*Bryum capillare</i> Hedw.	Mane Bhanjyang, 1600 m	FC	Exposed rock
17	Bryaceae	<i>*Bryum cellulare</i> Hook.	Chitre, 3100 m	R	Soil
18	Bryaceae	<i>*Bryum dichotomum</i> Hedw.	Panch Pokhari, 4000 m	R	Exposed rock
19	Bryaceae	<i>Pohloa elongata</i> Hedw.	Nasim Pati, 3800-3900 m	R	Bark
20	Bryaceae	<i>Pohlia leucostoma</i> (Bosch et Lac.) Fleisch.	Dhaap-Dukhan, 1300-2300 m	C	Epiphytic , tree trunk
21	Bryaceae	<i>Rhodobryum giganteum</i> (Schwaegr.) Par.	Nasim, 3650 m	C	Soil
22	Calymperaceae	<i>*Syrhopodon gardneri</i> (Hook.) Schwaegr.	Bhotang - Yarsa , 1650 m	C	Boulder stone
23	Cephaloziaceae	<i>*Cephalozia</i> sp.	Par Dhungo, 2850 m	R	Soil
24	Calyptozeliaceae	<i>*Calypogeia</i> sp		R	Soil
25	Conocephalaceae	<i>Conocephalum conicum</i> (L.) Underw.	Chitre, 3000 m; Dinger Khola, 2600 m	MC	Moist soil
26	Dicranaceae	<i>Dicranum himalayanum</i> Mitt.	Par Dhungo, 2850 m	FC	Soil

27	Dicranaceae	<i>*Trematodon longicollis</i> Michx.	Botang – Mane Bhanjyang, 1600-1650 m	FC	Soil
28	Entodontaceae	<i>*Entodon rubicundus</i> (Mitt.) A. Jaeger	Gupha Danda, 1400 m	FC	Forest floor
29	Fissidentaceae	<i>Fissidens grandiflorus</i> Brid.	Maur Khola, 2100 m; Tangu, 2800 m	R	Soil covered rocks
30	Fissidentaceae	<i>Fissidens taxifolius</i> Hedw.	Dukhan-Chitre, 2000-2900 m	C	Rocks
31	Frullaniaceae	<i>Frullania muscicola</i> Steph.	Botang, 1600 m	R	Soil; boulder stones
32	Funariaceae	<i>Funaria hygrometrica</i> Hedw.	Dhap, 1300; Botang, 1600 m; Nasim, 3800 m; Daurali 3000 m	MC	Soil; rocks
33	Geocalycaceae	<i>Heteroscyphus</i> sp.	Hinger Khola, 3000 m	FC	Soil
34	Geocalycaceae	<i>*Heteroscyphus argutus</i> (Reinw. et al) Schiffn.	Ramburbesi – Melamchi 1300 m	FC	Rock
35	Geocalycaceae	<i>*Heteroscyphus coliatius</i> (Hook.) Schiffn.	Hinger Khola, 3000 m	R	Rock cliffs
36	Hypnaceae	<i>*Ctenidium capillifolium</i> (Mitt.) Broth.	Gupha Danda, 1250 m	FC, New	Root bark
37	Hypnaceae	<i>Hypnum macrogunum</i> Besch.	Gupha Danda, 1250 m	C	Rock
38	Hypnaceae	<i>Hypnum pleumaforme</i> W. Wilson	Chhar Kharka, 2800 m; Nasim Pati, 4000 m; Mahadev Khola, 1200 m	C	Soil; root barks
39	Hypnaceae	<i>*Isopterygium albiscens</i> (Hook.) A. Jaeger	Rambur Besi- Melamchi, 1200 m; Mane Kharka, 1300 m	C	Rock
40	Hypnaceae	<i>*Taxiphyllum taxirameum</i> (Mitt.) Fleisch.	Chitre Chowk, 2700 m	FC	Rocks
41	Jungermanniaceae	<i>Jungermannia atrovirens</i> Dumort.	Par Dhungo, 2800 m; Gupha Danda, 1400 m; Melamchi, 1250 m	FC	Rock
42	Jungermanniaceae	<i>*Jungermannia hyalina</i> Lyell	Top Kharka, 3500 m	R	Stone steps
43	Jungermanniaceae	<i>*Jungermannia</i> sp.	Gupha Danda, 1400 m; Par Dhungo, 2800 m	C	Soil; rocks
44	Jungermanniaceae	<i>*Jungermannia tetragona</i> Lindenb.	Rambur Besi, 1200 m; Gupha Danda, 1300 m; Melamchi, 1200 m	C	Soil
45	Leucobryaceae	<i>Leucobryum</i> sp.	Top Kharka, 3550 m	R	Stones edge
46	Leucobryaceae	<i>Octoblepharum albidum</i> Hedw.	Mahadev Khola, 1200 m	FC	Rotten log
47	Lophoziaceae	<i>*Lophozia</i> sp.	Par Dhungo, 2800 m	R	
48	Marchantiaceae	<i>Marchantia emarginata</i> Reinw. et al.	Dukhan, 2000 m; Dinger Khola, 1200 m	C	On the edge of brick wall
49	Marchantiaceae	<i>Marchantia paleacea</i> Bertol.	Gupha Danda, 1300 m	FC	Mountain slopes
50	Marchantiaceae	<i>Marchantia polymorpha</i> L.	Botang-Dukhan, 1300-1900 m	FC	Soil
51	Metzgeriaceae	<i>Metzgeria conjugata</i> Lindb.	Marj – Shong, 2050 m	R	Soil
52	Metzgeriaceae	<i>*Metzgeria leptoneura</i>	Par Dhungo, 2800 m	R	Soil

		Sproce				
53	Mniaceae	* <i>Mnium laevinerve</i> Card.	Dinger Khola, 2600 m	R		Rock cliffs
54	Mniaceae	* <i>Mnium lycopodioides</i> Schwaegr.	Chitre, 3000 m	C		Epiphyte
55	Mniaceae	<i>Mnium punctatum</i> , Hedw.	Nasim, 3800 m; Par Dhungo, 2800 m	R		Epiphyte, Root bark
56	Pelliaceae	* <i>Pellia epiphylla</i> (L.) Corda	Hinger Khola, 2800 m	R		Rock
57	Plagiochilaceae	<i>Plagiochila denticulata</i> Mitt.	Nasim, 3800 m	C		Epiphyte, Root bark
58	Plagiochilaceae	* <i>Plagiochila cuspidata</i> Steph..	Par Dhungo, 2800 m; Nasim, 3800 m	FC		Epiphyte, Root bark
59	Plagiomniaceae	* <i>Plagiomnium cordatum</i> Kop. & Norris	Chitre, 3100 m	R, New		Epiphyte
60	Plagiomniaceae	* <i>Plagiomnium cuspidatum</i> (Hedw.) T. Kop.	Dinger Khola, 2600 m	R		Rock cliffs
61	Plagiomniaceae	* <i>Plagiomnium succulenteum</i>	Sigale, 1250 m	FC		Stream bank; rock
62	Pottiaceae	<i>Barbula constricta</i> Mitt. .	Dukhan , 2800 m	R		Rocks
63	Pottiaceae	* <i>Barbula cylindrica</i> (Tayl.) Schimp.	Chitre, 3100 m	R; New		Soil
64	Pottiaceae	<i>Hyophila involuta</i> (Hook.) A. Jaeger	Thumli, 1750 m	R		Soil covered rocks
65	Polytrichaceae	* <i>Pogonatum aloides</i> (Hedw.) P. Beauv.	Thumli, 1700 m	FC		Rocks
66	Polytrichaceae	* <i>Pogonatum junghunianum</i> (Dizy & Molken) Dizy & Molken var. <i>sikkimensis</i> Ren. & Card.	Gupha Danda, 1300 m	FC		Rock; soil
67	Polytrichaceae	<i>Pogonatum microphyllum</i> Dozy & Molken	Dukhan, 2900 M; Chitre 3000 m; Nasim Pati, 3800 m	MC; New		Soil; mountain slopes
68	Polytrichaceae	* <i>Pogonatum microstomum</i> (R. Br.) Brid.	Dinger Khola, 2800 m	FC		Rock
69	Polytrichaceae	* <i>Pogonatum submacrophyllumi</i> Hedw.	Tangu Khola, 2500 m	FC; New		Mountain slopes
70		<i>Polytrichum commune</i> Hedw.	Dukhan -Chitre, 2000-2800 m	FC;		Soil
71	Polytrichaceae	* <i>Polytrichum urnigerum</i> Hedw.	Dukhan, 2600 m	FC		Dry rock
72	Sphagnaceae	<i>Sphagnum cuspidatum</i> C Muell.	Tangu Khola, 2100 m; Kharka-Chitre, 3000 m	C		Rocks
73	Targioniaceae	* <i>Cyathodium tuberosum</i> Kashyap	Rambur Besi ,1300 m ; Melamchi 1300 m	FC		Stone wall; Concrete wall
74	Targioniaceae	* <i>Targionia hypophylla</i> L.	Dhap, 1300 m	FC		Stone wall

75	Thuidaceae	<i>Haplocladium angustifolium</i> (Hampe & C. Muell.) Broth.	Gupha Danda, 1300 m	FC	Rock
77	Wiesnerellaceae	* <i>Dumortiera hirsuta</i> (Sw.) Nees	Khalte Khola, 1350 m	FC	Rock cliffs

Annex 3

Pteridophytes

S. N.	Families	Latin Names	Locality	Status	Habitat
1	Athyriaceae	* <i>Diplazium esculentum</i> (Retz.) Sw.	Gupha Danda, 1300 m	C	Mountain slope
2	Equisetaceae	* <i>Equisetum debile</i> Roxb. ex Vaucher	Dhap - Botang, 2100 - 2500 m	FC	Rocks
3	Equisetaceae	<i>Equisetum diffusum</i> D.Don.	Dhap, 1300 m; Botang 1600 m	C	Terrestrial, on open path
4	Gleicheniaceae	<i>Gleichenia glauca</i> (Thunb.) Hook	Dhap- Tupi Danda, 1300-2500 m	C	Mountain slopes,
5	Gleicheniaceae	* <i>Gleichenia gigantea</i> Wall. ex Hook. et Bauer	Gupha Danda, 1300 m	FC	Mountain slopes,
6	Lycopodiaceae	<i>Lycopodium clavatum</i> L.	Dhap (1300 m); Botang, 1600 m	C	Terrestrial on sandy slopes
7	Lycopodiaceae	* <i>Lycopodium serratum</i> Thunb.	Duthan, 2800 m	FC	Rocks
8	Oleandraceae	<i>Nephrolepis cordifolia</i> (L.) Presl	Gupha Danda, 1300 m; Melamchi, 1250 m; Tipeni, 1250 m; Thumli, 1700 m; Chetre, 3000 m	MC	Mountain slopes, dry rocks, tree trunks
9	Ophioglossaceae	<i>Botrychium lunaria</i> (L.) Sw.	Dukhan, 2500 m; Chitre, 3000 m	R	Terrestrial mountain slopes
10	Ophioglossaceae	<i>Botrychium virginianum</i> (L.) Sw	Chitre-Panch Pokhari, 3000-4000 m	R	Mountain slopes
11	Parkeriaceae	* <i>Adiantum capillus-veneris</i> Linn.	Dhap- Bhotang, 1300-1600 m	C	Mountain slopes pickle
12	Parkeriaceae	<i>Adiantum philippine</i> L.	Dhap – Botang, 1300 - 1600 m	C	Old stone walls
13	Parkeriaceae	<i>Adiantum caudatum</i> L.	Melamchi, 1200 m	FC	Mountain slope
14	Parkeriaceae	* <i>Onychium japonicum</i> (Thunb) Kunze	Gupha Danda, 1300 m	C	Mountain slope
15	Pteridaceae	* <i>Cheilanthes anceps</i> Blanford	Dhap- Botang, 1300 - 1600 m	C	
16	Pteridaceae	<i>Cheilanthes formosana</i> Hayata	Dhap, 1350 m; Thumli 1800 m	C	On stone wall
17	Pteridaceae	<i>Pteris dactylina</i> Hook.	Chitre-Nasim, 2800-3650 m	C	Mountain slopes
18	Pteridaceae	* <i>Pteris vittata</i> Linn.	Dhap, 1350 m; Botang 1660 m	C	Mountain slopes
19	Schizaeaceae	<i>Lygodium japonicum</i>	Chitre, 3000 m	R	Climbing on

		(Thunb.) Sw.			open places
20	Selaginellaceae	<i>Selaginella monospora</i> Spring	Thumli, 1780 m	FC	On mossy rocks
21	Selaginellaceae	* <i>Selaginella subdiaphana</i> Wall.	Dhap, 1400 m; Botang, 1700 m	C	Forest floor

Annex IV

Higher Plants (Angiosperm & Gymnosperm)

S. N	Latin names/families	Local name	Habit/ Habitat	Status	Distribution	Remarks
1	<i>Abies spectabilis</i> (D. Don) Mirb. (Pinaceae)	Kald (T)	T/F	C	Nepal (WC, 2400-4400 m); Tangu - Nasim, 2800-4000 m.	Gov. protection, Timber
2	<i>Acer campbellii</i> Hook. f. & Thoms. (Aceraceae)	Yali (T)	T/F	C	Nepal (WCE, 2100-3600 m); Tangu -Maur Khola, 2100- 3600 m	Fuelwood
3	<i>Acer oblongum</i> Wall. ex DC. (Aceraceae)	Yali (T)	T/F	O	Maur Khola, 1200-2100 m	Fuelwood
4	<i>Acer pectinatum</i> Wall. ex Pax (Aceraceae)	Yali (T)	T/F	O	Nepal (WCE); Maur Khola, 2700-3800 m	Fuelwood
5	<i>Achyranthus aspera</i> L. (Acanthaceae)	Dathiwan (N)	H/TS	C	Nepal (WCE, 100-2900); Melamchi-Botang, 1000-1600 m	Medicinal
6	<i>Acogonum campanulatum</i> (Hook. f.) Hara (Polygonaceae)	Rapreghans (N)	H/MP	O	Nepal (CE, 2100-4000); Deurali, 2200-3400 m	
7	<i>Aconitum species</i> (Ranunculaceae)		H/P	O	Nasim, 3800 m	
8	<i>Aconogonum molle</i> (D. Don) Hara (Polygonaceae)	Thotne (N)	H/MP	O	Nepal (CE, 120-2400 m); Maur Khola, 2500 m	Pickle
9	<i>Agava cantula</i> Roxb. (Agavaceae)	Pat (T)	Sh/MP	O	Nepal (WE, 2000 m); Dukhan, 2800 m	
10	<i>Ageratina adenophora</i> (L.) King & Robinson (Asteraceae)	Banmara (N)	H/MP	C	Dukhan, 2800 m	

11	<i>Ageratum conyzoides</i> L. (Asteraceae)	Gane (N)	H/CL	C	Nepal (WCE, 200-2000 m); Dukhan , 2800 m	Medicinal
12	<i>Ainsliaea aptera</i> DC. (Asteraceae)		H/F	C	Nepal (WE, 1600-3500 m); Maurgoth, 3500 m	
13	<i>Aletris pauciflora</i> (Klotz.) Hand.-Mazz. (Liliaceae)		H/A	O	Nepal (WCE, 2500-4900 m); Tam-Kharka, 3000m	
14	<i>Alnus nepalensis</i> D. Don (Betulaceae)	Utis (N), Kaymasin (T)	T/MP	C	Nepal (WCE, 500-2600 m); Hingar Khola 3000 m	Fuel wood
15	<i>Anaphalis busua</i> (Buch.- Ham. ex D. Don) DC. (Asteraceae)	Buki phool (N), Teptep (T)	H/MP	C	Nepal (WCE, 1500-2900 m); Chitre,3000 m	
16	<i>Anaphalis triplinervis</i> (Sims) Clark. (Asteraceae)	Teptep (T)	H/MP/ GL	C	Nepal (WCE, 3400-5500 m); Chitre, 3000 m	Medicinal
17	<i>Anaphalis contorta</i> (D. Don) Hook. f. (Asteraceae)	Buki phool (N), Teptep (T)	H/GL	C	Nepal (WCE, 1700-4500 m); Deurali, 3500 m	
18	<i>Anemone obtusiloba</i> D. Don (Ranunculaceae)		H/GL	C	Nepal (WCE, 2300-4200 m); Tangu, 3000 m)	
19	<i>Arenaria polytrichoides</i> Edgew. ex Edgew. & Hook. f. (Caryophyllaceae)		H/A	C	Nasim, 3900 m	
20	<i>Arisaema</i> sp. (Araceae)	Sarpakomakai (N)	H/MP	O	Melamchi-Botang, 1000-1600 m	
21	<i>Artemisia dubia</i> Wall. ex Besser (Asteraceae)	Titepati (N), Chhenten (T)	Sh/W/C L	C	Nepal (WCE, 1200-3400 m); Dukhan, 2800 m	
22	<i>Arthraxon lancifolius</i> (Trin.) Hochst. (Gramineae)		H/TS	C	Nepal (CE, 900-1800 m); Melamchi-Botang, 1000-1600 m	Fodder
23	<i>Arundina</i> sp. (Gramineae)	Nigalo (N)	S/F	C	Deurali, 3500 m	Constructio n materials
24	<i>Asparagus racemosus</i> Willd. (Asparagaceae)	Kurilo (N)	H/F	O	Nepal (CE, 600-2100 m); Melamchi –Botang, 1000-1600 m	Medicinal
25	<i>Aster</i> sp. (Asteraceae)		H/MP	C	Chitre Khola, 2900 m	
26	<i>Aster</i> sp. (Asteraceae)		Sh/OP	O	Chitre, 3000 m	

27	<i>Barleria cristata</i> L. (Acanthaceae)	Bherekuro	Sh/TS	C	Nepal (WCE, 200-2000m); Melamchi-Botang (1000-1600 m)	
28	<i>Begonia picta</i> Sm. (Begoniaceae)	Magarkace (N)	H/MP	O	Nepal (WCE, 600-2800 m); Melamchi-Botang, 1000-1600 m	
29	<i>Berberis aristata</i> DC. (Berberidaceae)	Kerpa (T)	Sh/F	C	Nepal (WCE, 1800-3500 m); Chitre, 3000 m	Medicinal
30	<i>Berberis asiatica</i> Roxb. ex DC. (Berberidaceae)	Cutro (N)	Sh/TS	C	Nepal (WCE, 1200-2500 m); Melamchi-Botang , 1000-1600 m	
31	<i>Berberis hookeri</i> Lem. (Berberidaceae)	Kerpa (T)	Sh/F	O	Nepal (CE, 2500-3500 m); Chitre, 3000 m	
32	<i>Berberis mucrifolia</i> Ahrendt (Berberidaceae)	Kerpa (T)	Sh/ Shr	C	Nepal (WCE, 2500-4500 m); Nasim, 3850 m	
33	<i>Betula utilis</i> D. Don (Betulaceae)	Bhojpatra (N)	T/F	O	Nepal (WCE, 2700-4300 m); Tam Kharka, 2700 m	Fuelwood
34	<i>Bidens pilosa</i> L. (Asteraceae)	Kalokuro (N)	H/TS	C	Nepal (WCE, 700-2100); Melamchi-Botang, 1000-1600 m	Invasive Alien species
35	<i>Bistortia affinis</i> (D. Don) Greene (Polygonaceae)		H/OP	O	Nepal (WCE, 3500-4800 m); Nasim, 3500-3850 m	Medicinal
36	<i>Bistortia amplexicaulis</i> (D. Don) Greene (Polygonaceae)	Raktaryauo (N)	H/MP	O	Nepal (WCE, 2100-4800 m); Deurali, 3500 m	
37	<i>Bistortia vacciniifolia</i> (Wall. ex Meisn.) Greene (Polygonaceae)	Pulungejhar (N)	H/OP	O	Nepal (WCE, 3000-4500 m); Tamkhaka, 3000-4500 m	
38	<i>Boehmeria platyphylla</i> D. Don (Urticaceae)	Gargalo (N)	Sh/MP	O	Nepal (WCE, 800-2700 m); Hingar Khola, 3000 m	Medicinal
39	<i>Boenninghausenia albiflora</i> (Hook.) Rchb. ex Meisn. (Rutaceae)		H/TS	O	Nepal (WCE 600-3300 m); Nasim , 3800 m	
40	<i>Caltha palustris</i> L. (Ranunculaceae)		H/OP	O	Nepal (WE, 2900-3600 m); Maur Khola, 2400 m	
41	<i>Campanula pallida</i> Wall. (Campanulaceae)		H/OP	C	Nepal (WCE, 1000-4500 m); Chitre, 3000 m	
42	<i>Capsella bursa-pastoris</i> (L.) Medik. (Brassicaceae)	Camsure jhar (N)	H/OP	O	Nepal (WCE, 1800-4500 m); Chitre, 3000 m	

43	<i>Carex cruciata</i> Wahlenb. (Cyperaceae)		H/ F	C	Nepal (CE, 1500-3400 m); Chitre, 3000 m	Fodder
44	<i>Carex</i> sp. (Cyperaceae)		H/F	C	Maur Khola, 2500 m	
45	<i>Cassia occidentalis</i> (Fabaceae)		H/OP	O	Nepal (WCE, 200-1400 m); Melamchi-Botang, 1000-1600 m	
46	<i>Cassiope fastigiata</i> (Wall.) D. Don (Ericaceae)		Sh/A	C	Nepal (WCE, 2800-5000 m); Pamch Pokhari, 4100 m	
47	<i>Centella asiatica</i> (L.) Urb. (Apiaceae)	Ghodtapre (N)	H/MP	C	Nepal (WCE, 500-2100 m); Melamchi-Botang, 1000-1600 m	Medicinal
48	<i>Cerastium fontanum</i> var. <i>angustifolium</i> (Franch.) Hara (Caryophyllaceae)		H/P	O	Nepal (WCE, 2200-5000 m); Deurali, 2200 m	
49	<i>Cerastium glomeratum</i> Thuill. (Caryophyllaceae)		H/P	O	Nepal (WC, 1500-3800 m); Chitre, 3000 m	
50	<i>Chenopodium album</i> L. (Chenopodiaceae)	Bathe (N)	H/CL/ WP	C	Nepal (WC, 2000-4000 m); Chitre, 3000 m	Vegetable
51	<i>Choerospondias axillaris</i> (Roxb.) Burtt. & Hill (Anacardiaceae)	Lapsi (N), Kalong (T)	T/CL	C	Nepal (E, 1200-1500 m); Botang 1550 m	Fruit edible
52	<i>Cirsium wallichii</i> DC. (Asteraceae)		H/OP	C	Nepal (C, 2200m); Botang – Yarsa, 1800 m	Medicinal
53	<i>Cissampelos pariera</i> L. (Menispermaceae)	Batulepati (N)	H/CL	O	Nepal (WCE, 150-2200 m); Melamchi-Botang, 1000-1600 m	Medicinal
54	<i>Clematis montana</i> Buch.- Ham. ex DC. (Ranunculaceae)		WCI/ F	C	Nepal (WCE, 1600-4000); Chitre, 3000 m	
55	<i>Clinopodium umbrosum</i> (M. Bieb.) K. Koch (Lamiaceae)		H/CL/ WP	C	Nepal (WCE, 180-3200 m); Chitre, 3100 m	Medicinal
56	<i>Coelogyne corymbosa</i> Lindl. (Orchidaceae)		H/F	O	Nepal (CE, 2200-2800 m); Dukhan Gufa, 2800 m	
57	<i>Commelina</i> sp. (Commelinaceae)		H/TS	C	Melamchi-Botang, 1000-1600 m	Fodder
58	<i>Conyza bonariensis</i> (L.) Cronquist (Asteraceae)		H/W//C L	C	Nepal (WC, 1400-2800 m); Dukhan, 2800 m	
59	<i>Corallodiscus lanuginose</i>		H/MP	C	Nepal (WCE, 1000-3400 m);	

	(Wall. ex DC.) Burtt (Gesneriaceae)				Chitre Khola, 2900 m	
60	<i>Corydalis juncea</i> Wall. (Papaveraceae)		H/OP	C	Nepal (CE, 2500-5100 m), Mayu Kkhola, 2500 m	
61	<i>Corydalis</i> sp. (Papaveraceae)		H/F	O	Mayur Khola, 2500 m	
62	<i>Cotoneaster microphyllus</i> Wall. ex Lindl. (Rosaceae)		Sh/ R	C	China, Nepal (WCE, 2000- 5400 m), Deurali, 3500 m	
63	<i>Crassocephalum crepidioides</i> (Benth.) Moore (Asteraceae)	Anikalejhar (N)	H/CL	C	Nepal (CE, 400-2000 m); Dukhan, 2800 m	
64	<i>Crotalaria alata</i> Buch.- Ham. ex D. Don (Fabaceae)	Chinchine (N)	H/OP	O	Nepal (WCE, 300-1400 m); Melamchi-Botang, 1000-1600 m	
65	<i>Crotalaria albida</i> Heyne ex Roth (Fabaceae)	Bhediphul (N)	H/OP	O	Nepal (WCE, 450-2200 m); Melamchi-Botang, 1000-1600 m	
66	<i>Cynodon dactylon</i> (L.) Pers. (Gramineae)	Dubo (N)	H/OP	C	Nepal (WCE, 100-3000 m); Chitre, 3000 m	Fodder
67	<i>Cynoglossum zeylanicum</i> (Vahl ex Hornem.) Thunb. ex ehm. (Boraginaceae)	Kanikekuro (N)	H/CL	C	Nepal (WCE, 1200-4100 m); Chitre, 3100 m	
68	<i>Cyperus iria</i> L. (Cyperaceae)	Thulomothe (N)	H/MP	C	Nepal (WCE, 200-1800 m); Melamchi-Botang, 1100-1600 m	
69	<i>Cyperus</i> sp. (Cyperaceae)	Mothe (N)	H/MP	C	Melamchi-Botang, 1100-1600 m	
70	<i>Daphne bholua</i> Buch.- Ham. ex D. Don (Thymelaeaceae)	Chibu (T)	Sh/F	C	Nepal (CE, 200-2900 m); Deurali 3500 m	
71	<i>Delphinium</i> sp. (Ranunculaceae)		H/A	O	Nasim, 3800 m	
72	<i>Descurainia sophia</i> (L.) Webb ex Prantl (Brassicaceae)		H/OP	O	Nepal (WC, 2200 – 4100 m), Melamchi to Bothang , 1000- 1600 m	
73	<i>Desmodium elegans</i> DC. (Fabaceae)	Bakhregans (N)	Sh/F	C	Nepal (WC, 1200-3000 m), Melamchi to Bothang, 1000- 1600 m	
74	<i>Desmodium laxiflorum</i> DC. (Fabaceae)		Sh/F	C	Nepal (WCE, 600-1000 m), Melamchi- Bothang, 1000- 1600 m	

75	<i>Dichroa febrifuga</i> Lour. (Hydrangeaceae)	Ganaunepat (N)	Sh/OP	O	Nepal (CE, 900-2400 m), Hinger Khola, 2980 m.	
76	<i>Dichrocephala integrifolia</i> (L. f.) Kuntz. (Asteraceae)		H/CL/ WP	C	Nepal (WCE, 800-3000 m); Dukhan, 2800 m	
77	<i>Digitaria</i> sp. (Gramineae)		H/MP	C	Hinger Khola, 2950 m	
78	<i>Dioscorea</i> sp. (Dioscoreaceae)		H/F	O	Hinger Khola, 2900 m	
79	<i>Drymaria cordata</i> (L.) Willd. ex R. & S. (Caryophyllaceae)	Abijalo (N)	H/CL	C	Nepal (WCE, 2200-4300 m); Chitre, 3000 m	
80	<i>Duchesnea indica</i> (Andrew.) Focke (Rosaceae)	Luven (T)	H/OP	C	Nepal (WCE, 1000-2900 m); Dukhan, 2800 m	Fruit edible
81	<i>Elaeagnus infundibularis</i> Momiya (Elaeagnaceae)		Scanden t/ F	C	Nepal (CE, 1500-2500 m); Maur Khola, 2500 m	Fruit edible
82	<i>Elscholtzia eriostachya</i> (Benth.) Benth. (Lamiaceae)		H/OP	C	Nepal (WCE 3000-4800 m); Nasim, 3800 m	
83	<i>Epilobium</i> sp. (Onagraceae)		H/MP	O	Maur Khola, 2500 m	
84	<i>Eragrostis nigra</i> Nees ex Steud. (Gramineae)	Kuro (N)	H/OP	C	Nepal (WCE, 900-3000 m); Melamchi-Bothang, 1000-1600 m	
85	<i>Eranthemum pulchellum</i> Andrews (Acanthaceae)		Sh/MP	C	Nepal (WCE, 200-1200 m); Melamchi to Bothang, 1000- 1600 m	
86	<i>Erigeron bellidioides</i> (Buch.-Ham. ex D. Don) Benth. ex C. B. Clark. (Asteraceae)		H/OP	C	Nepal (WCE, 1400-4300 m); Chitre, 3000 m, Melamchi - Bothang , 1000-1600 m	
87	<i>Euphorbia hirta</i> L. (Euphorbiaceae)	Dudhe (N)	H/ OP	C	Nepal (WCE, 150-1500 m); Melamchi – Bothang, 1000- 1600 m	
88	<i>Eurya acuminata</i> DC. (Theaceae)	Jhingani (N), Thangar (T)	T/F	C	Nepal (WCE, 1300-2500 m); Dukhan , 2500 m	
89	<i>Eurya cerasifolia</i> (D. Don) Kobuski (Theaceae)		T/F	O	Nepal (CE, 900-2300 m); Dukhan, 2800 m	
90	<i>Ficus auriculata</i> Lour. (Moraceae)	Nimaro (N)	T/CL	O	Nepal (C, 250-1700 m); Bhotang, 1550 m	Fruit edible
91	<i>Ficus neriifolia</i> Sm. (Moraceae)	Dudhilo (N)	T/CL	O	C. Nepal (C, 1800 m); Botang, 1600 m	Fodder

92	<i>Ficus semicordata</i> Buch.-Ham. ex Sm. (Moraceae)	Khanio(N)	T/CL	C	Nepal (WCE, 200-1700 m); Bhotang, 1500 m	Fruit edible
93	<i>Fimbristylis dichotoma</i> (L.) Vahl (Cyperaceae)	Panimothe (N)	H/MP	C	Nepal (CE, 100-1800 m), Melamchi-Bothang, 1000-1600 m	
94	<i>Floscopa scandens</i> Lour. (Commelinaceae)	Kane (N)	H/MP	C	Nepal (CE, 500-1800 m); Melamchi-Bothang , 1000- 1600 m	
95	<i>Fragaria nubicola</i> Lindl. ex Lacaíta (Rosaceae)	Bhuiainselu (N)	H/OP	O	Nepal (WCE, 1600-4000 m); Maur Khola, 2500 m	Fruit edible
96	<i>Fraxinus floribunda</i> Wall. (Oleaceae)	Lankure (N)	T/WL	O	Nepal (CE, 1200-2000 m); Chhimdi, 2700 m	
97	<i>Galinsoga parviflora</i> Cav. (Asteraceae)	Chitlangejhar (N)	H/CL	C	Nepal (WCE, 850-3000); Dukhan, 29000 m	
98	<i>Galium asperifolium</i> Wall. (Rubiaceae)		H/CL	C	Nepal (WCE, 1500-3000 m), Botang , 1600 m	
99	<i>Gaultheria fragrantissima</i> Wall. (Ericaceae)	Dhasingare (N), Chesum (T)	Sh/ F	C	Nepal (WCE, 1200-2600 m); Dukhan, 2800 m	Fruit edible
100	<i>Gaultheria trichophylla</i> Royle (Ericaceae)		Sh/F/A	C	Nepal (WCE, 2700-4500 m); Tangu, 2700 m	
101	<i>Gentiana capitata</i> Buch.-Ham. ex D. Don (Gentianaceae)		H/P	O	Nepal (WCE, 1500-4500 m); Chitre, 3000 m	
102	<i>Gentiana pedicellata</i> (D. Don) Griseb. (Gentianaceae)	Gyanjak (N)	H/P	O	Nepal (WCE, 750-3800 m); Chitre 3000 m	
103	<i>Girardinia diversifolia</i> (Link) Friis (Urticaceae)	Allo (N), Pollo (T)	H/MP	O	Nepal (1700-3000 m); Hingar Khola, 3000 m	
104	<i>Gnaphalium affine</i> D. Don (Asteraceae)	Bhukiphul (N)	H/CL/ WP	C	Nepal (600-3700 m); Chitre, 600-3700 m	
105	<i>Gonostegia</i> sp. (Urticaceae),		H/MP	O	Hingar Khola, 2900 m	
106	<i>Guizotia abyssinica</i> (L.f.) Csa. (Asteraceae)	Philinge (N)	H/OP	C	Nepal (WCE, 900-1900 m); Melamchi - Botang , 1000- 1600 m	
107	<i>Hemiphragma heterophylla</i> Wall. (Scrophulariaceae)	Nasjhar (N)	H/P	C	Nepal (WCE, 1800-3500 m); Tangu, 2900 m	
108	<i>Holboellia latifolia</i> Wall. (Lardizabalaceae)	Chhyamba (T)	Cl/F	O	Nepal (2000-4000 m); Chitre, 3000 m	Fruit edible

109	<i>Houttuynia cordata</i> Thunb. (Saururaceae)		H/CL	O	Nepal (CE, 1300-2500 m); Botang, 1600 m	
110	<i>Hypericum japonicum</i> Thunb. ex Murray (Guttiferae)	Kanikeghans (N)	H/CL	C	Nepal (WCE, 150-2600 m); Botang, 1600 m	
111	<i>Hypericum uralum</i> Buch.- Ham. ex D. Don (Guttiferae)	Khareto (N)	Sh/Shr	C	Nepal (WCE, 1200-3600 m); Chimdi 2600 m	
112	<i>Hypoxis aurea</i> Lour. (Hypoxidaceae)	Vansiru (N)	H/ Shr	O	Nepal (WCE, 1700-2900 m); Dukhan, 2800 m	
113	<i>Ilex dipyrrena</i> Wall. (Aquifoliaceae)	Setokhusru (N)	T/F	C	Nepal (2500-3000 m); Chitre 3000 m	
114	<i>Impatiens</i> sp. (Balsaminaceae)		H/MP	O	Dukhan, 2800 m	
115	<i>Juglans regia</i> L. (Juglandaceae)	Kadu (T), Okhar (N)	T/F/CP	O	Nepal (WCE, 1200-2100 m), Dukhan, 2800 m.	Under govt. legal protection
116	<i>Juncus</i> sp. (Juncaceae)		H/MP	C	Tam Khrka, 3500 m	
117	<i>Juniperus indica</i> Bertol. (Cupressaceae)	Mekhlisukpa (T)	Sh/AS	C	Nepal (WCE, 3700-4100 m); Nasim, 3850 m	Fuelwood
118	<i>Juniperus recurva</i> Buch.- Ham. ex D. Don (Cupressaceae)	Mekhlisukpa (T)	Sh/AS	C	Nepal (CE, 3300-4600 m); Nasim, 3800 m	
119	<i>Jurinea dolomiaea</i> Boiss. (Asteraceae)		H/AS	O	Nepal (WCE, 3200-4300 m); Panch Pokhari, 4300 m	
120	<i>Justicia adhatoda</i> L. (Acanthaceae)	Asuro (N)	Sh/F	C	Nepal (WCE, 500-1600 m), Melamchi to Bothang, 1000- 1600 m	Medicinal
121	<i>Justicia</i> sp. (Acanthaceae)		H/TS	O	Nasim, 3850 m	
122	<i>Kobresia</i> sp. (Cyperaceae)		H/P	O	Panch Pokhari, 4000 m, Melamchi to Botang, 1000- 1600 m	
123	<i>Koenigia</i> sp. (Polygonaceae)		H/P	O	Tamkhrka, 3000 m), Melamchi - Botang, 1000- 1600 m	
124	<i>Lecanthus peduncularis</i> (Royle) Wedd. (Urticaceae)	Kholejhar (N)	H/MP	O	Nepal (WCE, 1200-3200 m); Hangar Khola, 3900 m, Melamchi – Bothang, 1000- 1600 m	

125	<i>Lepisorus loriformis</i> (Wall.) (Polypodiaceae)	Rukunue (N)	H/ TT	O	Nepal (C, ca. 2300 m); Melamchi – Bothang, 1000-1600 m	
126	<i>Leucas cephalotes</i> (Roth) Spreng. (Lamiaceae)	Suparijhar (N)	H/MP	C	Nepal (WE, 150-2400 m); Melamchi – Botang, 1000-1600 m	
127	<i>Leucas lanata</i> Benth. (Lamiaceae)		H/MP	C	Nepal (WCE, 700-1100 m); Melamchi – Bothang, 1000-1600 m	
128	<i>Leucosceptum canum</i> Sm. (Lamiaceae)	Bhusure (N)	T/F	O	Nepal (WCE, 1000-2800 m); Chitre, 3000 m.	
129	<i>Lindenbergia indica</i> (L.) Vatke (Scrophulariaceae)		H/OP	O	Nepal (WCE, 300-2600 m), Melamchi-Botang, 1000-1600 m	
130	<i>Lindera</i> sp. (Scrophulariaceae)		T/F	O	Dukhan, 2800 m	
131	<i>Lindernia</i> sp. (Scrophulariaceae)		H/MP	O	Dukhan, 2800 m	
132	<i>Lobelia pyramidalis</i> Wall. (Campanulaceae)	Eklevir (N)	H/ Shr	O	Nepal (WC, 1100-2300 m); Dukhan, 2900 m	
133	<i>Lonicera acuminata</i> Wall. (Caprifoliaceae)		C/FC	O	Nepal (CE, 2100-3200 m); Dukhan 2800 m	
134	<i>Lyonia ovalifolia</i> (Wall.) Drude (Ericaceae)	Dumsang (T)	T/F	C	Nepal (WCE, 2700-3800 m); Chitre, 3300 m	Poisonous to cattle
135	<i>Lyonia villosa</i> (Hook. f.) Hand.-Mazz. (Ericaceae)	Dumsang (T)	T/F	O	Nepal (WCE, 2700-3800 m); Tangu, 3000 m	
136	<i>Mahonia napaulensis</i> DC. (Berberidaceae)	Mandrecukro (N)	Sh/F	O	Nepal (WCE, 2000-2900 m), Chitre, 2950 m	
137	<i>Mazus surculosus</i> D. Don (Scrophulariaceae)	Taprejhar (N)	H/OL, C L	C	Nepal (WE, 900-3000 m); Chitre (3000 m).	
138	<i>Meconopsis</i> sp. (Papaveraceae)		H/R	C	Nasim, 3800 m	
139	<i>Melastoma normale</i> D. Don (Melastomataceae)	Chuleshi (N)	H/MP	C	Nepal (CE, 900-1800 m), Melamchi-Botang, 1000-1600 m	
140	<i>Mentha</i> sp. (Lamiaceae)		H/TS	O	Mahadev Khola, 1300 m	
141	<i>Micromeria biflora</i> (Buch.-Ham. ex D. Don) Benth. (Lamiaceae)		HTS	O	Nepal (WC, 900-4000 m); Melamchi-Botang, 1000-1600 m	
142	<i>Mimulus</i> sp. (Scrophulariaceae)		H/TS	C	Mahadev Khola, 1450 m	

143	<i>Murdannia japonica</i> (Thunb.) Faden (Commelinaceae)	Nigaleghaba (N)	H/OL	O	Nepal (CE, 400-2000); Botang, 1600 m	
144	<i>Myrica esculenta</i> Buch.-Ham. ex D. Don (Myricaceae)	Kaphal (N), Karsa (T)	T/F	C	Nepal (WCE, 1200-2300 m), Hangar Khola, 3000 m	Fruit edible
145	<i>Neolitsea</i> sp. (Lauraceae)		T/F	O	Dukhan, 2800 m	
146	<i>Nepata</i> sp. (Lamiaceae)		H/OP	O	Mahadev Khola, 1450 m	
147	<i>Osbeckia stellata</i> Buch.-Ham. ex D. Don (Rosaceae)	Chulesi (N)	Sh/OP	C	Nepal (WCE, 1300-2600 m); Melamchi-Botang, 1000-1600 m	
148	<i>Oxalis corniculata</i> L. (Oxaladaceae)	Cariamilo (N)	H/MP/C L	C	Nepal (WCE, 300-2900 m); Dukhan, 2900 m	Medicinal
149	<i>Oxyspora paniculata</i> (D. Don) DC. (Melastomataceae)		Sh/ Shr	O	Nepal (CE, 1300-2000 m); Hingar Khola, 3000 m	
150	<i>Paris polyphylla</i> Smith (Liliaceae)	Satuwa (N)	H/F	O	Nepal (CE, 1800-3300 m); Maur Khola, 2600 m	Medicinal
151	<i>Parochetus communis</i> Buch.-Ham. ex D. Don (Fabaceae)	Janglibadamejhar (N)	H/Mp	O	Nepal (WCE, 900-4000 m); Maur Khola, 2600 m	
152	<i>Parthenium</i> sp. (Asteraceae)		H/OP	C	Dukhan, 2800 m	
153	<i>Pedicularis</i> sp. (Scrophulariaceae)		H/P	O	Nasim, 3800 m	
154	<i>Persea duthiei</i> (King ex Hook.f.) Kosterm. (Lauraceae)	Mahilokaulo (N)	T/F	O	Nepal (WCE, 1000-2900 m); Dukhan, 2900 m	
155	<i>Persicaria capitata</i> (Buch.-Ham. ex D. Don) Gross (Polygonaceae)	Raktanyaulejhar (N)	H/CL	C	Nepal (WCE, 600-2400 m); Dukhan (2400 m)	
156	<i>Persicaria chinensis</i> var. <i>ovalifolia</i> (Meisn.) H. Hara (Polygonaceae)	Bakhrehotne (N)	H/F	O	Nepal (WCE, 1200-2900 m); Chitre, 3000 m	
157	<i>Phyllanthus parvifolius</i> Buch.-Ham. ex D. Don (Euphorbiaceae)	Kareto (N)	S/F	O	Nepal (CE, 1100-2200 m); Botang, 1600 m.	
158	<i>Phyllanthus uranaria</i> L. (Euphorbiaceae)	Bhuiamala (N)	H/OP	C	Nepal (WCE, 760-1700 m), Botang, 1600 m.	Medicinal

159	<i>Pieris formosa</i> (Wall.) D. Don (Ericaceae)	Prot (T)	T/F, Shr	C	Nepal (CE, 2000-3300 m); Tangu, 2800 m.	Toxic to cattle
160	<i>Pinus roxburghii</i> Sargent (Pinaceae)	Salla (N), Thangsing (T)	T/ Shr	O	Nepal (WCE, 1100-2100 m); Botang, 1600 m.	Fuelwood
161	<i>Pinus wallichiana</i> Jacks. (Pinaceae)	Gobresalla (N)	T/ Shr	O	Nepal (WCE, 1800-4100 m); Yarsa , 1700 m	Fuelwood
162	<i>Piptanthes nepalensis</i> (Hook.) D. Don (Fabaceae)		Sh/F	O	Nepal (WCE, 2200-3800 m); Deurali, 3500 m	
163	<i>Plantago erosa</i> Wall. (Plantaginaceae)	Ishabgol (N)	H/OP	C	(WCE, 900-4100 m); Chitre, 3000 m	Medicinal
164	<i>Plumbago zeylanica</i> L. (Plumbaginaceae)	Citu (N)			Nepal (WCE, 100-1300); Dhap, 1300 m	
165	<i>Poa annua</i> L. (Gramineae)		H/MP	C	Nepal (CE, 2300-3500 m); Maur Khola, 2300-3500 m	
166	<i>Poa</i> sp. (Gramineae)		H/MP	O	Hingar Khola, 2500 m	
167	<i>Potentilla argrophylla</i> Wall. ex Lehm. (Rosaceae)		H/P	C	Nepal (WCE, 3900-4600 m); Nasim, 3900 m	
168	<i>Potentilla josephiana</i> Ikeda & Ohba (Rosaceae)		H/P	C	Nepal (C, 2400-4150 m); Nasim, 3900 m	
169	<i>Pouzolzia zeylanica</i> (L.) Benn. & R. Br. (Urticaceae)	Nicasag (N)	H/MP	C	Nepal (WCE, 200-2400 m); Melamchi-Botang, 1000-1600 m	
170	<i>Pratia</i> sp. (Campanulaceae)		H/MP	O	Dukhan, 2800 m	
171	<i>Primula aureata</i> Fletcher (Primulaceae)		H/R	O	Nepal (C, 3100-3500 m); Chitre-Nasim, 3600-3850 m	Endemic
172	<i>Primula denticulata</i> Sm. (Primulaceae)		H/MP	O	Nepal (WCE, 1500-4900 m); Tangu, 2800 m	
173	<i>Primula gracilipes</i> Craib (Primulaceae)		H/MP	C	Nepal (CE, 3200-4100 m); Nasim (4000-4100 m).	
174	<i>Primula irregularis</i> Craib (Primulaceae)		H/MP	O	Nepal (WCE, 2800-3400 m); Tangu , 2800-3000 m	
175	<i>Primula sikkimensis</i> Hook. f. (Primulaceae)		H/OL	C	Nepal (WCE, 2900-4800 m); Nasim , 3800 m	
176	<i>Prinsepia utilis</i> Royle (Rosaceae)	Dhatelo (N)	Sh/ Shr	C	Nepal (WCE, 1500-2900 m); Dukhan, 2800 m	

177	<i>Prunus cerasoides</i> D. Don (Rosaceae)	Paiyu (N), Pyuru (T)	T/CL	C	Nepal (WCE, 1300-2400 m), Dukhan, 2800 m	Fruit edible
178	<i>Prunus cornuta</i> (Wall. ex Royle) Steud. (Rosaceae)	Lakhale (T)	T/F	C	Nepal (WE, 2100-3500 m); Tangu, 2800	
179	<i>Prunus rufa</i> Hook. f. (Rosaceae)		T/F	O	Nepal (WCE, 3000-3800 m); Tangu, 2800 m	
180	<i>Pycreus flavidus</i> (Retz.) T. Koyoma (Cyperaceae)		H/MP	C	Nepal (WCE, 200-3800 m); Melamchi-Botang, 1000-1600 m	
181	<i>Pycreus sanguinolentus</i> (Vahl) Nees ex C. B. Clarke (Cyperaceae)		H/MP	C	Nepal (CE, 800-2900 m), Melamchi - Bothang , 1000- 1600 m	
182	<i>Pyrus pashia</i> Buch.-Ham. ex D. Don (Rosaceae)	Mayal (N), Pana (T)	T/F	C	Nepal (750-2600 m); Dukhan 2800 m	Fruit edible
183	<i>Quercus lanata</i> Sm. (Fagaceae)	Banjh (N)	T/F	C	Nepal (WCE, 460-2600); Hingar Khola, 3000 m	
184	<i>Quercus semecarpifolia</i> Sm. (Fabaceae)	Karsu (N)	T/F	C	Nepal (WCE, 1700-3800 m); Chitre, 3000 m	
185	<i>Ranunculus</i> sp. (Ranunculaceae)		H/MP	O	Melamchi-Botang, 1000- 1600 m	
186	<i>Rheum australe</i> D. Don (Polygonaceae)	Padamchal (N)	H/R	O	Nepal (CE, 3200-4200 m); Deurali, 3550 m	Medicinal
187	<i>Rhododendron anthopogon</i> D. Don (Ericaceae)	Barlosukpa (T)	Sh/A/Sh	O	Nepal (WCE, 3300-5100 m); Panch Pokhari, 3300-5100 m	Medicinal
188	<i>Rhododendron arboreum</i> Sm. var <i>arboreum</i> (Ericaceae)	Paramindo (T)	T/F	C	Nepal (WCE, 1500-3300 m); Dukhan, 2900 m	
189	<i>Rhododendron arboreum</i> var. <i>album</i> Wall. (Fl white) (Ericaceae)	Gurans (N)	T/F	C	Nepal (CE, 2800-3600 m); Tangu, 2800m	
190	<i>Rhododendron barbatum</i> Wall ex G. Don (Ericaceae)	Gurans (N)	T/F	C	Nepal (WCE, 2700-3600 m); Tangu, 2800 m	
191	<i>Rhododendron campanulatum</i> D. Don (Ericaceae)	Chimal (T)	T/F & Shr	C	Nepal (1500-4100 m); Nasim . 3800-3900 m	

192	<i>Rhododendron lepidotum</i> Wall ex G. Don (Ericaceae)	Rasukpa (T)	Sh/ Shr	O	Nepal (WCE, 2100-4700 m); Nasim, 3900 m	
193	<i>Rhododendron setosum</i> D. Don (Ericaceae)	Jhusesunpati (N)	Sh/ Shr	O	Nepal (CE, 3700-5600 m); Panch Pokhari, 4100 m	
194	<i>Rhus succedanea</i> L. (Anacardiaceae)	Bhalayo (N)	T/F	O	Nepal (WCE, 1300-2400 m); Dukhan, 2800 m	
195	<i>Ribes griffithii</i> Hook. f. & Thoms. (Grossulariaceae)		Sh/F	O	Nepal (WCE, 2900-4000 m); Maur Khola, 2700-4000	
196	<i>Ribes takare</i> D. Don (Grossulariaceae)	Dhusurlo (N)	Sh/F	O	Nepal (WCE, 2200-3300 m); Maur Khola, 3300 m	
197	<i>Rosa sericea</i> Lindl. (Rosaceae)	Bhotegulaph (N)	Sh/F	O	Nepal (WCE, 2200-4600 m); Tangu, 2200 m	Fruit edible
198	<i>Rubia manjith</i> Roxb. ex Fleming (Rubiaceae)	Majitho (N)	Cl/F	O	Nepal (CE, 1200-2100 m); Dukhan, 2800 m	
199	<i>Rubus calycinus</i> Wall ex D. Don (Rosaceae)	Ainselu (N)	H/F	O	Nepal (CE, 2200-2800 m); Tangu, 2800 m	
200	<i>Rubus ellipticus</i> Sm. (Rosaceae)	Polang (T)	Sh/FS	C	Nepal (WCE, 1700-2300 m); Dukhan, 2800 m	Fruit edible
201	<i>Rubus rugosus</i> Sm. (Rosaceae)	Goruainselu (N)	S/F	O	Nepal (CE, 1500 m); Melamchi-Botang, 1000-1600 m	Fruit edible
202	<i>Rubus</i> sp. (Rosaceae)	Ainselu (N)	Sh/F	O	Chitre, 3000 m	Fruit edible
203	<i>Rumex nepalensis</i> Spreng. (Polygonaceae)	Hali (N)	H/GS	C	Nepal (WCE, 1200-4200 m); Chitre, 3000 m	Medicinal
204	<i>Sagina saginoides</i> (L.) Karst. (Caryophyllaceae)		H/TS	O	Nepal (WC, 2000-3600 m); Tangu, 28000 m	
205	<i>Salvia campanulata</i> Wall. ex Benth. (Lamiaceae)		H/TS	C	Nepal (CE, 2400-3800 m); Melamchi-Botang, 1000-1600 m	
206	<i>Salvia</i> sp. (Lamiaceae)		H/OP	O	Melamchi-Botang , 1000-1600 m	
207	<i>Sambucus adnata</i> Wall. ex DC. (Sambucaceae)	Motephul (N)	Sh/WP	C	Nepal (WCE, 2000-3700 m); Chitre, 3000 m	
208	<i>Sarcococca</i> sp. (Buxaceae)		Sh/F	O	Chitre, 3000 m	

209	<i>Saurauia nepaulensis</i> DC. (Saurauiaceae)	Gogan (N)	T/CL	O	Nepal (WCE, 750-2100 m); Dukhan, 2800 m	
210	<i>Schisandra grandiflora</i> (Wall.) Hook. f. & Thoms. (Schisandraceae)	Singato (N)	WCI/F	O	Nepal (WCE, 2100-3300 m); Chitre, 3100 m	
211	<i>Scutellaria scandens</i> Buch.-Ham. ex D. Don (Lamiaceae)	Kankame (N)	H/Shr	O	Nepal (WCE, 1200-2400 m); Dukhan, 2800 m	
212	<i>Senecio</i> sp. (Asteraceae)		H/F	O	Chitre, 3000 m	
213	<i>Setaria</i> sp. (Gramineae)		H/TS	O	Chitre, 3000 m	
214	<i>Skimmia laureola</i> (DC.) Sieb. & Zucc. ex Walp. (Rutaceae)	Cumlani (N)	Sh/F	O	Nepal (W, 2400-3000 m); Chitre, 3000 m	
215	<i>Solanum nigrum</i> L. (Solanaceae)	Jangalivihi (N)	H/OP	C	Nepal (WCE, 900-2900 m); Gupha Danda, 1300 m	Medicinal
216	<i>Solanum virginianum</i> L. (Solanaceae)	Thulovihini (N)	H/F	O	Nepal (WCE, 300-1600 m); Melamchi-Botang, 1000-1600 m	Medicinal
217	<i>Sonchus</i> sp. (Asteraceae)		H/CL	O	Chhimdi, 2000 m	
218	<i>Sorbus cuspidata</i> (Spach) Hedlund (Rosaceae)		T/F	O	Nepal (WCE, 2700-3700 m); Tangu, 2700-2800 m	
219	<i>Spergula arvensis</i> L. (Caryophyllaceae)	Jhayujhar (N)	H/TS	O	Nepal (WC, 900-1600 m); Melamchi-Botang, 1000-1600 m	
220	<i>Spilanthes clava</i> DC. (Asteraceae)	Marathi (N)	H/OP	C	Nepal (CE, 300-2300 m); Melamchi-Botang, 1000-1600 m	
221	<i>Sporobulus fertilis</i> (Steud.) Clayton (Gramineae)	Ghans (N)	H/GL	O	Nepal (WCE, 1000-2400 m); Chitre, 3000 m	
222	<i>Stellaria media</i> (L) Vill. (Caryophyllaceae)		H/MP	C	Nepal (WC, 1800-2700 m); Dukhan, 2800 m	
223	<i>Strobilanthes wallichii</i> Nees (Acanthaceae)		H/OP	O	Nepal (WCE, 2500-3500); Melamchi-Botang, 1000-1600 m	
224	<i>Swertia</i> sp. (Gentianaceae)		H/OL	O	Nepal (C, 1000-2500 m); Chitre Khola, 2900 m, Melamchi-Botang, 1000-1600 m	

225	<i>Symplocos ramosissima</i> Wall. ex G. Don (Symplocaceae)	Dabdabe (N)	T/F	O	Nepal (WCE, 1400-2600 m); Chitre, 2950 m, Melamchi – Botang, 1150 -1600 m	
226	<i>Taraxacum</i> sp. (Asteraceae)		H/GL	O	Nasim, 3800 m	
227	<i>Taxus baccata</i> ssp. <i>wallichiana</i> Zucc. (Taxaceae)	Lauthsalla (N)	T/F	O	Nepal (WCE, 2300-3400 m); Tangu, 2300-3400 m	Govt. legal protection
228	<i>Tetrastigma serrulatum</i> (Roxb.) Planch. (Vitaceae)	Panilahara (N)	WC/F	O	Nepal (WCE, 500-2400 m); Melamchi-Botang , 1000-1600 m	
229	<i>Thalictrum</i> sp. (Ranunculaceae)		Sh/F	O	Tangu, 2950 m	
230	<i>Trifolium repens</i> L. (Fabaceae)	Pyauli (N)	H/P	C	Nepal (C, 1500-2500 m); Tangu, 2800 m	
231	<i>Tsuga dumosa</i> (D. Don) Eichler (Pinaceae)	Thingesalla (N)	T/F	C	Nepal (WCE, 2100-3000 m); Tangu, 2850 m	Fuel wood
232	<i>Urena lobata</i> L. (Malvaceae)	Bherejhar (N)	H/F	C	Nepal (WCE, 200-1600 m); Melamchi-Botang, 1000-1600 m	
233	<i>Urtica dioica</i> L. (Urticaceae)	Pollo (T)	H/MP	C	Nepal (WC, 3000-4500m); Dukhan, 2800 m	Vegetable, Medicinal
234	<i>Urtica</i> sp. (Urticaceae)			C	Gupha Danda, 1300 m	
235	<i>Vaccinium nummularia</i> Hook. f. & Thomson ex C. B. Clarke (Ericaceae)		Sh/F P	C	Nepal (CE, 2400-4000 m); Nasim, 3800 m	
236	<i>Vernonia cinerea</i> (L.) Less. (Asteraceae)	Jhurjhure (N)	H/OP	C	Nepal (WCE, 100-2300 m); Melamchi-Botang, 1000-1600 m	
237	<i>Viburnum cotinifolium</i> D. Don (Sambucaceae)	Bakalpate (N)	T/F	C	Nepal (WC, 2100-3600 m); Maur Khola, 3440 m	Fruit edible
238	<i>Viburnum erubescens</i> Wall. ex DC. (Sambucaceae)	Sukrati (T)	Sh/F, Shr	C	Nepal (WCE, 1500-3000 m); Chitre, 3000 m	
239	<i>Viola hamiltoniana</i> D. Don (Violaceae)		H/MP	O	Nepal (CE, 3000-3300 m); Dukhan (2300 m)	
240	<i>Viola hookeri</i> Thomson ex Hook. f. & Thomson (Violaceae)		H/MP	O	Nepal (CE, 3000-3300 m); Tanga, 3300 m	
241	<i>Viola pilosa</i> Blume (Violaceae)		H/MP	C	Nepal (WCE, 1200-3000 m); Chitre, 3000 m	

242	<i>Vitex negundo</i> L. (Verbenaceae)	Simali (N)	T/OP	O	Nepal (WCE, 100-1200 m); Melamchi-Botang, 1000-1600 m	Medicinal
243	<i>Xanthium strumarium</i> L. (Asteraceae)	Kuro (N)	H/OP	C	Nepal (WCE, 100-2500 m); Melamchi-Botang, 1000-1550 m	Invasive Alien Species
244	<i>Zanthoxylum</i> sp. (Rutaceae)		T/F	O	Nepal (C, 1000-2500 m); Dukhan, 2500 m, Melamchi-Botang, 1000-1550 m	

Source: Field survey, April - May and September-October, 2008

Faunal Diversity

Annex V

Butterflies (First Phase, April, 2008)

S. N.	Family	Scientific Name	Altitude (m)	Status
1.	Lycaenidae	<i>Lampides boeticus</i>	2800 m	Common
2.		<i>Zizeeria maha</i>	1700 m	Common
3.	Nymphalidae	<i>Vanessa cardui</i>	3500 m	Moderately Common
4.	Nymphalidae	<i>Vanessa indica</i>	3200 m	Common
5.	Nymphalidae	<i>Issoria issaea</i>	3900 m	Uncommon
6.	Nymphalidae	<i>Argyneus hyperbius</i>	1700 m	Rare
7.	Nymphalidae	<i>Precis iphita</i>	1900 m	Common
8.	Nymphalidae	<i>Precis lemonias</i>	1600 m	Common
9.	Nymphalidae	<i>Precis almana</i>	1650 m	Common
10.	Nymphalidae	<i>Aglais cashmirensis</i>	3200 m	Common
11.	Papilionidae	<i>Menelaides helenus</i>	1400 m	Common
12.	Papilionidae	<i>Achillides polyctor</i>	1550 m	Common
13.	Papilionidae	<i>Atrophaneura alcinous</i>	1500 m	Rare
14.	Papilionidae	<i>Atrophaneura polyeuctes</i>	1300 m	Common
15.	Pieridae	<i>Pieris brassicae</i>	1300 – 3700 m	Common
16.	Pieridae	<i>Pieris indica</i>	1800 m	Common

17.	Pieridae	<i>Pontia daplidice</i>	1630 m	Uncommon
18.	Pieridae	<i>Appias lycnida</i>	1630 m	Uncommon
19.	Pieridae	<i>Cepora nerissa</i>	1700 m	Uncommon
20.	Pieridae	<i>Metaporia agathon</i>	2200 m	Common
21.	Pieridae	<i>Eurema hecabe</i>	2000 m	Common
22.	Satyridae	<i>Ypthima newara</i>	1400 m	Uncommon
23.	Satyridae	<i>Mycalesis perseus</i>	1400 m	Common
24.	Hesperidae	<i>Pseudocoladenia dan</i>	1650 m	Common
25.	Hesperidae	<i>Tagiades litigiosa</i>	1600 m	Common
26.	Danaidae	<i>Danaus chryssipus</i>	1700 m	Common

Recorded in Final Phase (September/October, 2008)

27.	Papilionidae	<i>Pachiliopta aristolochae</i>	1300 m	Uncommon
28.		<i>Papilio alcinous</i>	1500 m	Rare
29.		<i>Papilio polyctor</i>	1450 m	Uncommon
30.		<i>Papilio helenus</i>	1300 m	Uncommon
31.		<i>Atrophaneura polyeuctes</i>	1500 m	Rare
32.		<i>Papilio memnon</i>	1230 m	Uncommon
33.		<i>Troides aeacus</i>	1620 m	Rare
34.		<i>Graphium cloanthus</i>	1100 m	Common
35.		<i>Graphium agamemnon</i>	1430 m	Rare
36.		<i>Atrophaneura latreillei</i>	1350 m	Rare
37.		<i>Papilio polytes</i>	1300 m	Common
38.		<i>Graphium sarpedon</i>	1350 m	Common
39.	Pieridae	<i>Eurema hecabe</i>	1200-1700 m	Common
40.		<i>Catopsilia pomana</i>	1200 m	Common
41.		<i>Pieris brassicae</i>	Upto 3000 m	Common
42.		<i>Delias belladona</i>	1443 m	Uncommon
43.		<i>Gonepteryx rhamni nipalensis</i>	1000 –2600 m	Common
44.	Nemeobiidae	<i>Zemeros flegyas</i>	1100 m	Common
45.		<i>Abisara fylla</i>	1130 m	Uncommon
46.	Nymphalidae	<i>Precis atlites</i>	1000 m	Common
47.		<i>Precis orithya</i>	1050 m	Common
48.		<i>Precis lemonias</i>	“	“
49.		<i>Precis almana</i>	1100-3100 m	Common
50.		<i>Hypolymnas bolina</i>	1000 m	Common

51.		<i>Neptis hylas</i>	900- 14000 m	Common
52.		<i>Phalantha phalanta</i>	2100-3900 m	Common
53.		<i>Vanessa indica</i>	2400-3800 m	Common
54.		<i>Neptis sps.</i>	1300 m	Rare
55.		<i>Cynitia lepidea</i>	1200 m	Uncommon
56.		<i>Pantoporia hordonia</i>	1460 m	Common
57.		<i>Polyura athamas</i>	1000 m	Rare
58.		<i>Aglais cashmirensis</i>	1299-3500 m	Common
59.		<i>Argyreus hyperbius</i>	3000 m	Common
60.		<i>Stibochiona nicea</i>	1000 m	Uncommon
61.		<i>Precis iphita</i>	900-1450 m	Common
62.		<i>Neptis ananta</i>	1400 m	Rare
63.				
64.	Satyidae	<i>Orsotrioena medus</i>	1100 m	Common
65.		<i>Melanitis leda</i>	1530 m	Uncommon
66.		<i>Mycalesis sp.</i>	1035 m	Uncommon
67.		<i>Aulocera saraswati</i>	1500 m	Uncommon
68.	Lycaenidae	<i>Catacryshops strabo</i>	1470 m	Rare
69.		<i>Freyeria trochilus</i>	1300 m	Uncommon
70.		<i>Zizeeria maha</i>	Many places upto 1460 m	Common
71.		<i>Celastrina pusp</i>	1540 m	Common
72.		<i>Celastrina sps</i>	1570 m	-----
73.		<i>Heliophorous epicle</i>	1443 m	Common
74..		<i>Heliophorous androcles</i>	1460 m	Uncommon
75.		<i>Spalgis epius</i>	1340 m	Uncommon
76.		<i>Curetis bulis</i>	1350 m	Rare
77.	Danaidae	<i>Euploea core</i>	1200 m	Common
78.		<i>Euploea mulciber</i>	1300 m	Common
79.		<i>Danaus aglea</i>	1470 m	Common
80.		<i>Danaus tytia</i>	1410 m	Rare
81.	Hesperiidae	<i>Tagiades litigiosa</i>	1500 m	Uncommon
82.		<i>Parnara sps</i>	1400 m	Uncommon
83.		<i>Caltorius tulsi</i>	1470 m	Common
84.		<i>Pelopidas mathiansis</i>	1460 m	Common

Other Insects

	Carabidae (Coleoptera)	<i>Paropisthius indicus</i>	2800 m	Uncommon
2.		<i>Calosoma maderae</i>	2800 m	Common
3.		<i>Carabus cavifrons</i>	1600 m	Uncommon

4.		<i>Trichotichnus sps/</i>	1600 m	Uncommon
5.		<i>Calomera sps.</i>	3000 m	Rare
6.	Scarabidae	<i>Scarabaeus sps.</i>	1600 m	Uncommon
7.		<i>Gymnopleurus sinnatus</i>	1500 m	Common
8.		<i>Oniticellus cinctus</i>	1500 m	Common
9.		<i>Onitis sps.</i>	1700 m	Uncommon
10.		<i>Carharsius molossus</i>	1700 m	Uncommon
11.		<i>Onthophagus sps.</i>	2000 m	Common
12.		<i>Anomola dorsalis</i>	2000 m	Common
13.		<i>Phyllophaga rugosa</i>	1700 m	Common
14.	Cerambycidae	<i>Lophosternus indicus</i>	1909 m	Rare
15.		<i>Haplocerambyx spinicornis</i>	1910 m	Rare
16.	Cicindelidae	<i>Cicindella dromicoides</i>	1910 m	Uncommon
17.	Carabidae	<i>Carabus nepalensis</i>	3042 m	Uncommon
18.	Coccinelidae	<i>Coccinella septopunctata</i>	2800 m	Common
19.	Meloidae	<i>Epicauta hirticornis</i>	1600 m	Rare
20.	Chrysomelidae	<i>Chrysomela chlorina</i>	2000 m	Common
21.		<i>Monolepta flavocincta</i>	1600 m	Common
22.	Dermaptera	<i>Labia sps.</i>	1800 m	Common
23.		<i>Irdex sps</i>	2000 m	Uncommon
24.	Orthoptera Mantidae	<i>Mantis religiosa</i>	1200 m	Uncommon
25.		<i>Phasmida sp.</i>	1400 m	Uncommon
26.	Diptera	Syrphid Fly	2500 m	Common
27.	Homoptera Aphidae	<i>Eriosoma sp.(Wooly Aphid)</i>	1100 m	Common

Amphibians

1.	Rhacophoridae	<i>Rhacophorous maximus</i>	1500 m	Uncommon
2.	Ranidae	<i>Rana tigrina</i>	1200- 1600 m	Common
3.		<i>Rana monticola</i>	1750 m	Rare
4.	Bufo	<i>Bufo melanostictus</i>	1200-1500 m	Common

Reptiles

1,	Agamidae	<i>Agama tuberculata</i>	1400 m	Uncommon
2.		<i>Calotes versicolor</i>	1800 m	Common
3.	Scincidae	<i>Lygosoma indicum</i>	1200-1800 m	Common
4.		<i>Leiopsima sps</i>	2100 m	Rare
5.	Colubridae	<i>Lycodon aulicus</i>	1800 m	Uncommon

6.		<i>Ptyas mucosa</i>	1400 m	Common
7.		<i>Amphispiza stolonata</i>	1500 m	Common
8.	Typhlopidae	<i>Typhlops braminus</i>	1430 m	Uncommon
9.	Liporidae	<i>Trimeresurus monticola</i>	1700 m	Uncommon
10.		<i>Teimeresurus albolabris</i>	1300 m	Uncommon

Annex VI

Birds

S.N.	Scientific Name	Common Name	Altitude	Local Status
1.	<i>Dendrocitta formosae</i>	Himalayan Tree Pie	2600 m	Uncommon
2.	<i>Milvus migrans</i>	Black Kite	3800 m	Common
3.	<i>Garrulax lineatus</i>	Streaked Laughing Thrush	3500 m	Uncommon
4.	<i>Lanius tephronotus</i>	Gray Backed Shrike	3200 m	Rare
5.	<i>Acridotheres tristis</i>	Common Myna	2200 m	Common
6.	<i>Cuculus sparverioides</i>	Large Hawk Cuckoo	2450 m	Common
7.	<i>Cuculus saturatus</i>	Himalayan Cuckoo	3000 m	Common
8.	<i>Pnoepyga albiventer</i>	Scaly Breasted Wren Babbler	3500 m	Moderately common
9.	<i>Gyps himalayansis</i>	Himalayn Griffon	3900 m	Rare
10.	<i>Garrulus glandarius</i>	Eurasian Jay	2200 m	Common
11.	<i>Pyrrhocorax graculus</i>	Yellow Billed Chough	3950 m	Common
12.	<i>Motacilla caspica</i>	Yellow Wagtail	2800 m	Rare
13.	<i>Motacilla alba</i>	Pied Wagtail	2600 m	Common
14.	<i>Alectoris graeca</i>	Chuckor Partridge	3200 m	Uncommon
15.	<i>Ithaginis cruentus</i>	Blood Pheasant	4000 m	Uncommon
16.	<i>Tragopan satyra</i>	Monal Pheasant	3000 m	Rare
17.	<i>Heterophasia capistrata</i>	Black Capped Sibia	2869 m	Uncommon
18.	<i>Phylloscopus inornatus</i>	Plain Leaf Warbler	2400 m	Common
19.	<i>Seicercus burkii</i>	Yellow Eyed Warbler	2200-3200	Common
20.	<i>Parus dichrous</i>	Crested Brown Tit	3500	Common
21.	<i>Carpodacus pulcherrimus</i>	Common Rose Finch	3500 m	Common
22.	<i>Carpodacus erythrinus</i>	Beautiful Rose Finch	3800 m	Common

ond Phase

S. N.	Scientific Name	Common Name	Altitude	Local Status
23.	<i>Lophophorous leucomelanous</i>	Kalij Pheasant	3000 m	Uncommon
24.	<i>Lophophorous impejanus</i>	Danfe Pheasant	3200 m	Uncommon
25.	<i>Megalaima asiatica</i>	Blue Throated barbet	1800 m	Common
26.	<i>Epupa epops</i>	Common hoopoe	3100 m	Common
27.	<i>Lanius tephronotus</i>	Gray backed Shrike	3510 m	Rare
28.	<i>Streptopelia chinensis</i>	Spotted Dove	2650 m	Common
29.	<i>Arborophila torqueola</i>	Hill Partridge	2300-2400 m	Common
30.	<i>Urocissa flavirostris</i>	Yellow Billed Blue Magpie	2700-3000 m	Common
31.	<i>Cuculus canorus</i>	Eurasian cuckoo	3200 m	Common
32.	<i>Collocalia brevirostris</i>	Himalayan Swiftlet	2800 m	Common
33.	<i>Trachymarpis melba</i>	Alpine Swift	3000 m	Uncommon
34.	<i>Columba livia</i>	Rock Pigeon	2700 m	Common
35.	<i>Columba leuconota</i>	Snow Pigeon	3500-3800 m	Common
36.	<i>Dicrurus macrocercus</i>	Black Drongo	1590 m	Common
37.	<i>Monticola solitarius</i>	Blue Rock Thrush	2500 m	Uncommon
38.	<i>Rhyacornis fuliginosus</i>	Plumbeous Redstart	1900-2800 m	Common
39.	<i>Enicurus scouleri</i>	Little Forktail	3100 m	Rare
40.	<i>Saxicola caprata</i>	Pied Bushchat	1600 m	Common
41.	<i>Parus ater</i>	Coal Tit	2800 m	Common
42.	<i>Parus major</i>	Great Tit	2200 m	Common
43.	<i>Parus dichrous</i>	Grey Crested Tit	2800 m	Common
44.	<i>Aegithalos niveogularis</i>	White Throated Tit	3400 m	Rare
45.	<i>Delichon nipalensis</i>	Nepal House Martin	1650 m	Common
46.	<i>Carpodacus rodopeplus</i>	Spotwinged Rose Finch	3400 m	Rare
47.	<i>Carpodacus rubicilla</i>	Great Rose Finch	3900 m	Rare
48.	<i>Melophus lathamii</i>	Crested Bunting	2230 m	Common
49.	<i>Emberiza pusilia</i>	Little Bunting	2700 m	Common
50.	<i>Haematospiza sipahi</i>	Scarlet Finch	2400 m	Rare
51.	<i>Carpodacus rubescens</i>	Blandford's Rose Finch	2900 m	Rare
52.	<i>Pycnonotus leucogenys</i>	White Cheeked Bulbul	2700 m	Common

53.	<i>Acrocephalus dumetorum</i>	Blyth's Reed Warbler	2400 m	Common
54.	<i>Garrulax variegatus</i>	Variiegated Laughing Thrush	3200 m	Uncommon
55.	<i>Dicaeum agile</i>	Thickbilled Flowerpecker	1500 m	Common
56.	<i>Aethopyga gouldiae</i>	Mrs.Gould's Sunbird	2900 m	Rare
57.	<i>Aethopyga ignicauda</i>	Firetailed Sunbird	2890 m	Common
58.	<i>Passer domesticus</i>	House Sparrow	1600 m	Common
59.	<i>Passer montanus</i>	Eurasian Tree Sparrow	1600-2500 m	Common
60.	<i>Anthus roseatus</i>	Rosy Pipit	3300 m	Common
61.	<i>Anthus sylvanus</i>	Upland Pipit	2100 m	Common
62.	<i>Prunella himalayana</i>	Altai Accentor	2950 m	Common

Annex VII

Mammals

S.N.	Family	Scientific Name	Common Name	Altitude	Status
1.	Cercopithecidae	<i>Macaca assamensis</i>	Assamese Monkey	2700 m	Rare
2.		<i>Macaca mulatta</i>	Rhesus Monkey	2200 m	Common
3.		<i>Presbytis entellus</i>	Langur Monkey	3000 m	Common
4.	Mustelidae	<i>Martes flavigula</i>	Yellow Throated Marten	2600 m	Uncommon
5.		<i>Mustela siberica</i>	Himalayan Weasel	3700 m	Rare
6.	Sciuridae	<i>Callosciurus pygerythrus</i>	Himalayan Squirrel	3100 m	Moderately Common
7.	Felidae	<i>Felis bengalensis</i>	Leopard Cat	2100 m	Rare
8.	Sciuridae	<i>Petaurista petaurista</i>	Flying Squirrel	2200 m	Rare
9.	Muridae	<i>Ratus ratus</i>	Field Rat	1800 m	Common
10.	Moschidae	<i>Moschus chrysogaster</i>	Himalayan Musk Deer	3900 m	Rare

11.		<i>Hystrix indica</i>	Indian Procupine	1800 m	Common
12.	Felidae	<i>Panthera pardus</i>	Common Leopard	2200 m	Common
13.	Ursidae	<i>Selenarctos thibetanus</i>	Himalayan Bear	3300 m	Common
14.	Suidae	<i>Sus scrofa</i>	Wild Boar	1900 m	Common
15.	Ailuridae	<i>Ailurus fulgens</i>	Red Panda	2800 m	Uncommon
16.	Muridae	<i>Talpa micrura</i>	Moles	2440 m	Common
17.	Bovidae	<i>Hemitragus tahr</i>	Himalayan tahr	3050 m	Common
18.	Ochotonidae	<i>Ochotona roylei</i>	Royale's Pika	2900 m -4000 m	Common
19.		<i>Ochotona macrotis</i>	Large Eared Pika	4000 m	Common
20.	Viverridae	<i>Pguma larvata</i>	Himalayan Civet Cat	1600 m	Uncommon

Additions II phase

21.	Micro- Chiroptera	<i>Pipistrellus caromandra</i>	Indian Pipistrelle	2600 m	Common
22.	Muridae	<i>Bandicota indica</i>	Bandicoot Rat	1800 m	Uncommon
23.		<i>Mus musculus</i>	House Mouse	1600 m	Common
24.		<i>Cannomys badius</i>	Bamboo Rat	2500 m	Uncommon
25.		<i>Niviventer eha</i>	Smoke-bellied Rat	2900 m	Rare
26.		<i>Alticola roylei</i>	Royal's Vole	2700 m	Common

Source: Field survey, May – October 2008