

# **Wetland and Biodiversity Conservation:**

**A Case Study of Maipokhari Ilam**

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Acceptance Certificate

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction

Nepal is a small land locked country lies between India and China. As it is stretches from plain Terai to snowcap Himalayas. So that it is very rich in biological diversity and freshwater resources. There are more than 10 rivers flowing from north and south originating from Himalayas and passing to India. Besides, there are various types of wetlands like floodplains of the rivers, oxbow lakes, swamps, marshes, reservoirs, ponds and paddy fields. According to Bishnu B. Bhandari 2006, more than 163 such wetlands sites are recorded in Nepal.

Ilam district, situated at the hill region of Eastern Development Region is famous for commercial agriculture such as tea and cardamom farming. Many types of wetlands are found in Ilam. Wetland ecosystem, biodiversity and cultural and spiritual values have neither been studied, nor explored. Wetlands of Ilam are important habitats for many flora and fauna. Forest and wetlands are highly exploited and no one knows the extent of their damage. Ilam is covered with dense forest but now it is slowly decreasing day by day.

Ilam has a numerous types of wetlands such as lakes, rivers, rivulets, strems, hill marshes, bogs, rice fields etc. the four sacred rivers named Mai, Jogmai, Puwamai and Deumai and its tributaries make the place good for human settlement, farming and biodiversity. Besides there are some lakes such as Mai Pokhari, Hans Pokhari, Kal Pokhari, Uttare Pokhari which have high values of cultural, spiritual and biodiversity. Among them Mai Pokhari is one of the most important wetland of Ilam.

Maipokhari is the most popular sacred sire, which has nine different edges of religious and cultural significance. Different ethnic groups have their own traditions, practices, spiritual beliefs, values and understanding about its sacredness.

Due to the location of Pokhari at high altitude, lots of medicinal plants, herbs, wild fruits and berry are found and it also serves as the habitats for birds,



reptiles, amphibians, salamander and others mammals. It is religiously prohibited to hunt and collect wildlife from around Pokhari. Lotus is the natural beauty of Pokhari.

By the biological and cultural values, we can say that wetlands and people are closely linked. People's activities often affect wetlands and also people are benefited from the use values of wetlands. In this way people's life is influencing by use values and misuses. But there is no study and exploration about wetlands ecosystem, biodiversity, cultural and spiritual values. So there is needed to study about wetlands and their cultural values which people have gained.

## **1.2 Statement of the Research Problem**

Wetlands are a valuable area for biodiversity in both flora and fauna. Due to the availability of distinct natural environment, food and shelter, it is considered as the appropriate residential area for animals and plants. Wetlands are the kidneys of landscape which were important mainly for water filtration, sedimentation and ground water recharge. But there is a lack of social study and research regarding this issue. Maipokhari wetland is one of them.

In contest of Maipokhari, neither there is any river blocked nor any glacial lakes have provided water. About 90 hectares of forest around the lakes is the permanent sources of water. If this is deforested, not only the lakes goes dry but also the shelter of the rare animals and plants like *Himalayan newt*, *Sphagnum moss*, *Pani Gohoro* get disappeared. Similarly, the life and occupations of the community near by the wetlands area turns difficult in the scarcity of water who are depended in Maipokhari (Shrestha 2062).

This area is important not only with biodiversity but also from the religious and cultural perspectives. Religious faith and beliefs as well as cultural values and norms are playing an important role in conservation of this area. Bishnu B. Bhandari (2006) writes that putting culture into perspective in his editor's note in *Wetlands and Culture* that as has been said elsewhere that wetlands are rich naturally as well as culturally but despite this reality; their

management has been bias toward natural resources. So, our wetland culture also can play an important role in publicizing the importance of culture in the management of wetlands. Maipokhari is the place where various ethnic groups are settled. So is their opinion towards Holly Lake. Due to geographical disadvantages and lack of information no concrete study and research has been carried out yet. Therefore, this study has tried to uplift the issues to conserve the biodiversity of wetland area through the research on the relation between community and wetlands.

Local community is using wetlands and its resources by following their own traditional knowledge as practiced by their previous generations. There is no institutional and individual research operated in order to explore and promote that kind of local knowledge. Although this study area is enlisted in Ramsar convention, the government has not stepped towards conservation of this area. Similarly, NGO/INGOs related to the environmental sectors have also not **achieved fruitful work** in wetland and biodiversity conservation in local level.

However, some technical aspects of wetlands and its biodiversity already been explored. Never the less the social aspects of the issue have not yet been explored. At present some of the questions which need to be answered are:

- How are socio-economic conditions of the people influenced by the wetlands?
- What does wetland mean to community?
- How is important for wetlands and biodiversity conservation for community?
- How does community influence wetlands and biodiversity conservation?
- What is the relationship between wetlands and community?

In order to meet the answers to these questions I had collected information from the study by applying various ethnographic tools techniques.

On the basis of these informations I was argued that local community may be the alternative means for the biodiversity conservation in mid hills of Nepal.

### **1.3 Objectives of the Study**

The General Objective:

The general objective of the study is to study the interrelationship between the wetlands and the local community.

The Specific Objective:

The specific objectives of this study are:

- To assess the socio-economic conditions of local people.
- To assess the interrelationship between community and wetland.
- To assess the perception and attitude of local people towards conservation of wetlands and biodiversity.
- To explore the cultural practices and influences in conservation of wetlands and its biodiversity.

### **1.4 Rationale of the Study**

There are some previous studies done on biodiversity from anthropological perspective. Although, this study will attempt to provide ethnographic approach to this study that might be useful for development, management and conservation of the freshwater resources for conserving biodiversity in the future.

This study might be helpful in tracing out the present condition of wetlands and biodiversity and its conservation, from the information gathered in Maipokhari Ramsar catchments area. The suggestions provided through this study are supposed to be helpful for those who are involved in wetlands and biodiversity conservation and management, both at public and private sectors. The purpose of this study is to provide some findings of how local people and traditional institutions play the role in wetlands and biodiversity conservation in the local level and its relation with people.

### **1.6 Theoretical Perspective**

Anthropologists argue that cultural differences could influence the way people perceive, assign value, and use the natural resources around them (Sponsel and Natadecha-Sponsel 1993). Conservation of biodiversity also requires cultural diversity. Biological and cultural diversity go together and therefore the diverse cultural traditions should be part of strategy for conserving and enhancing biodiversity (Chhetri, 1997). Success in conserving biodiversity will depend on success in understanding. Now, cultural factors affect the destruction and preservation of biodiversity; how cultural changes occur and how the sort of cultural change that promotes biodiversity can be encouraged (Engel 1993).

Conservation schemes should enhance the livelihood security of local communities *inter alia* through recognition of their customary rights over natural resources. The success of conservational efforts is critically dependent upon their ability to strengthen the technical, organizational and managerial capabilities of rural communities and organizations (Ghai, 1993). In each community, religious practices, rituals, social organizations and institutions are the cultural resources and those cultural resources are directly instrumental to conserve the natural biodiversity which can play an important role in the conservation of biodiversity.

## Chapter 2

### LITERATURE REVIEW

Various scientific studies have been done in the field of biodiversity applying various methods and approaches in different time periods. There is no single that could dominate all others. All these studies emerged with some specific features however they aren't free from drawbacks.

The Ramsar convention on wetlands has defined wetlands as “area of marsh, fen, peat land or wastes, whether natural or artificial, permanent or temporary. With water that is static or flowing, fresh, brakish or salt, including areas of marine water, the depth of which at low tide does not exceed sic meters”. The definition also incorporates riparian and coastal zones adjacent to the wetlands (Bhandari, et al. 2003).

In the Nepalese context wetlands defines as “natural or artificially created areas, such as swamp, marsh, riverine, floodplain, lake, water storage area and agricultural land precipitation that may be permanent or temporary, static or flowing, and freshwater or saline”(Nepal's National wetlands policy 2003).

Likewise the Nepal Biodiversity Strategy (2002) notes that wetlands are “sites distinguished by the presence of water which often have unique soils” that differ from the definition of wetlands, the strategy clearly identifies “permanently flowing rivers to seasonal stream” as examples of wetlands(IUCN2004).

Wetlands are so important because they are the main sources of freshwater and biomass production, which are essential for the survival of living being in the earth. Biologically, wetlands are also known as kidneys of landscape; biological supermarket; laboratory for education and research; integrated parts of people's lifestyles and sources, sink and transporter of nutrients. Culturally, their richness can be compared to treasure, trove such as the sources of supernatural power; refuge for spiritual exploration; source of folklore; dance and art; place for pilgrimage etc (Bhandari 2006).

Biological diversity is the variety and variability of plant, animal and microorganism species on our planet. The number of species is estimated to be between 5 and 50 million, of which only 1.4 million have been identified. Of the 1.4million which have been identified 248000 are higher plants, 9000 are bird species and 400 are mammals (Shrestha and Gupta 1993).

Nepal is rich in biological diversity due to its varied climate and altitudinal range with in distance. Although it covers only 0.001% of world surface, it includes 4.2% of world's mammal's species, 8.5% of world's bird species, 4.25% of world's butterflies species and 204 kinds of world flowering plant species.(shakya1995) Likewise in comparison, China is 70 times bigger than Nepal but in flowering species it is only 5 times bigger (shrestha2009).

Nepal's wetlands support significant species diversity and populations of globally threatened fauna. According to 2003 IUCN red list, 123globally threatened fauna species occur in Nepal, of which 42 species (34 percent) are found either in freshwater biomass or are significantly dependent on wetlands. Seventeen of 20 endemic vertebrates in Nepal are wetlands dependent ... in term of wetlands flora, it is believed that 25 percent of the country's estimated 7000 vascular plant species are wholly or partly wetland dependent. The Nepal biodiversity strategy (2002) notes that there are several endemic plants of Nepal - including 246 angiosperm species, 39 lichens, 30 bryophytes, 16 fungi, eight species of pteridophytes and three species of algae. Twenty six of the 246 angiosperm species are wetlands dependent, occurring in lakes, marshes and river/stream banks. Nepal's wetlands also hold several species of wild cultivars and wild relatives of cultivated crops, including four species of wild rice and two species of wild rice relatives (IUCN2004).

The National Wetlands Policy of Nepal simply covers and addresses wide array of issues which are indeed crucial for conservation and sustainable use of wetlands as well as sharing of the benefits arising from the utilization of wetlands resources. But, the major challenge between different government agencies and other organization involved for conservation of wetlands, is how

to ensure effective management and co-ordinate them to ensure effective implementation of the policy (Belbase and Thapa2009).

Biodiversity in Nepal has been degraded due to multiple factor such as population growth, poverty, misconception, anthropocentrism, cultural transitions, economic and policy implementations (Soule 1991).

Biodiversity is the total variety of life on the earth. Scientists can only guess how many millions of species exist on the planet where a major part of tropical forest, land, wetlands, ponds etc are still little explored. Biodiversity is complex beyond understanding and valuable beyond measures (Chaudary 1998).

The stated contributions of biodiversity to human beings have directly interlinked these natural resources to social, cultural and economic dimensions of human society. Hence, biodiversity which we see in our surroundings is actually a product of the interaction of both the social and biophysical systems. Recognizing the relationship, Shenghi (1996) has given the definition of biodiversity as “Biodiversity can be defined as fundamental natural resource on which humans are dependent for their livelihood and socio-economic development from ancient to present times, and extending to future generations.”

Most of the threats to biodiversity are linked to pressure or human population on biological resources. Because wetlands are very productive habitats most of the population of human kind is concentrated around them and most people depend directly and indirectly the biological resources of wetlands. Imagine a world without wetlands, no rivers, no lakes, no marshes, no mangroves, no swamp forest, and no shallow marine areas. How would the present human population survive? How much larger would the resource use pressure be on non-wetland biological resources? How would this the world’s biological diversity? This the major issue in wetlands biodiversity conservation (Gadgil 1993).

Adaptation strategies for integrated water resource management require reducing water requirements by different sectors by adopting appropriate tools

and techniques and economic instruments; recycling of wastewater should be emphasized. Water saving techniques will be required for agriculture, industry and the domestic sector to ensure that the needs of wetlands are met. At the same time, wetland management should adapt to the conditions of a changing climate so that wetland ecosystem services are less affected. Currently, our understanding of approaches and methods of wetland management is extremely poor, particularly in the Eastern Himalayan region. Hence, the importance of education and awareness, as well as capacity building at all levels should be recognized; currently, these are at their lowest ebb in the context of wetlands (Gopal, Shilpakar and Sharma 2010).

The involvement of the community is ensured only when conservation and management of biological resources are integrated with the development of the local community. The development activities inside the Reserve should always be sympathetic and sensitive to local culture as well as social norms and values. In order to reduce heavy pressure of humans and livestock on the natural resources inside Reserve, the concepts of a buffer zone and resource area should be brought into practice in consultation with the local community (Bhandari Feb 1994).

The importance of integrating local people /community participation in biodiversity conservation is not well recognized. However, there is still a need to strengthen effort to ensure that processes for such integrations are developed and implemented. While enactment of legislation is a step towards that direction, formulation of guidelines and methodologies to promote such participation is essential to achieve the desired end. The latter refers to the details on the nature, scope, and ways of participation, effectiveness in achieving the goals, obstacles to participation and the impacts upon other actors responsible for biodiversity conservation. These will then set in motion concerned efforts to effectively reach out to more people/communities to participate in conservation under the biodiversity convention regime (Amando S. Tolentino 1994).



In recent years, several factors such as decay in the traditional value systems (weakening community solidarity, individual interests overtaking group interest etc), diversity in the socio-cultural composition of the village due to high rate of in and out migration are affecting the sense of group solidarity in the village. Provision of more power and authority to modern local administration on one hand and the conflicting intra political party interests and policies at the local level are weakening the sense of group solidarity and unanimity in community decisions including villages level policies and programmes on wetland management. Growing population, unemployment and poverty are putting much pressure on the traditional wetland management system in the villages. Feeling of trees for commercial use, encroachment of pastures, grass conservation, and public spaces, reclamation of ponds and swamps for other uses, filling up of the natural drains and rain gullies for personal use are some of the negative trends affecting the sustenance of the wetland and human relationship in the villages. The excessive use of chemical fertilizers and pesticides too is harming the natural ecology of the area. It is high time for the researchers to do serious research along with recommendation on the Tharu-wetland relationship so as to explore the methods and ways for the revival and strengthening of the traditional wisdom and skills for the wetland conservation for sustenance in this part of Asia (Rajaure 2008).

It is indeed clear that women possess extensive knowledge of the environment and are thus, key actors in the management of biodiversity. Moreover, in Nepal biodiversity is the theme under which numerous projects and activities are undertaken, both at the community and policy levels, by NGOs and governments. Indeed, there is a significant amount of rhetorical support to participatory development as well as gender concerns, but much of it is not actualized at community levels. On closer inspection, there is little evidence to suggest that planners, agriculturists, foresters and community development workers are aware of how to proceed with plans to involve women in the decision-making process, both at the grassroots and institutional levels (Gurung 1997).

Several approaches to the cultural/human dimension of conservation have emerged with the increasing awareness and interest in indigenous natural resource management. These approaches range from the idealistic and romantic view of indigenous peoples and their knowledge and attitudes to nature, to the role of various disciplines in designing conservation strategies (Muchena and Vanek 1995).

Nepal is a country, full of various kinds of biodiversity manifests human relationship with wetlands in many ways. The visible human relationship are being minimized day by day. Yet in countryside, we can still observe how for generations people from different geographical, ethnic and cultural backgrounds have been maintaining strong and close relationships with wetlands. Several communities have developed their own socio-economic and cultural traditions based on their close relationship with wetlands on their neighborhood (Rajaure 2006).

Nepal is rich in respect of both flora and fauna diversity despite its small area. It can be attributed to an incredible variation in altitude and also unique geographic position in the world. Nepal is centrally located in the Himalaya. This has been regarded as a narrow extension of the Sino-Japanese floristic region and is surrounded by other five floristic regions. As a result, Nepal has become a common platform for meeting of the floristic elements from all these surrounding regions (BPP 1995, Shakya 1995). Out of eight biogeographical realms of the world, the Palearctic and Indo-Malayan realms and three Phytogeographic units are also identified more than 114 ecosystems and seven bioclimatic (See Dobremez, 1972 BPP 1995).

The Convention of Biological Diversity (1993) recognizes that states have sovereign rights over their biological resources. And also articles 8(j) of the convention also recognizes the knowledge, innovations and practices of indigenous and local communities and specifically encourage (s) the equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices. However, national legislations have no more implementation of the agreement. So, indigenous and local people receive only a minuscule

proportion of the profits generated from the sale of bioprospecting products that embody their knowledge and resources (Krishna B. Ghimire and Michel Pimbert 1993).

The literature on wetlands show that the definitions of wetlands falls in two camps: - ecologists and conservationists camps. The ecologist looks at wetlands as an ecosystem giving some kind of ecological and social characteristics. To them it is an eco-tone between terrestrial and aquatic communities. The conservationist views it as a composite of a wide range of habitats and attributes including ifs multiple uses and functions. The former is narrow and latter is broad and inclusive in scope (Bhandari 2009).

Nepal also stressed the importance of culture in the management and wise use of wetlands as criterion for site designation as discussed in the meeting, the Cultural Working Group discussed changing cultural landscapes, noted the loss traditional activities and emphasized incorporating cultural aspects into wetland management, while respecting social specificity of culture (Karki 2006).

The religious beliefs and cultural performances are the main factors that led to Hindus and Buddhists to visit the lakes of confluence of rivers and observe some rites and rituals according to their traditions. Besides, the cultural performances such as songs and dances, the worshipping of their respective deities are also embedded in their cultural beliefs. In this regards people from the priest to the shaman, from lower to the higher caste groups etc. visit the wetlands sites for earning merits not only in the world but also for the next world too(Sharma 2007).

Wetlands are the source of cultural and religious inspiration for indigenous people and attraction of international tourists. This generates business and employment to the communities that increases the values of wetlands ecosystem and generates funds for conservation through tourism revenue and tax (Magma Narbu Sherpa 2009).

Many locally available wetland resources can provide a significant source of income if sustainable methods of utilization are known. However due

to a lack of existing indigenous knowledge of wetlands resource use as a means of securing alternative and sustainable source of income to support livelihoods (I Thapa and B R Dahal).

There are strong pragmatic and political grounds for paying detailed attention to the impact of biodiversity erosion and conservation upon human welfare, particularly in cases where conservation efforts may affect local people directly. The pragmatic grounds are that coerced and enforced conservation tends to fail in the long run. The political grounds are that others considerations- such as the abuse of human rights and the accentuation of inequalities- are related to environmental degradation and so conservation efforts must be seen to address these issues too, and not exacerbate them (Blaikie and Jeanrenaud 1993).

Different ethnic groups have different cultural and spiritual beliefs and customs towards wetlands biodiversity. Traditions, customary practices, lore, norms and values are the bio-cultural and spiritual heritages and identities of the community. However, bio-cultural and spiritual heritages of the community are rapidly vanishing (Rai 2006).

Hindu religion has its stronghold in our culture, and there are many festivals, rites, and rituals. The religious scripture has given its importance to water because it is one of the five elements of *panchatatwa*. Most of the human rites and rituals from birth to death are carried out in the place where there is water (Poudyal 2006).

The rivers of the earth are therefore seen as being necessary to creation and as having a heavenly origin. They are brought to earth by the heroic act of god who defeats demon, which had hoarded the waters and kept them from fertilizing and nourishing the earth in the forms of rivers (Rig-Veda 7-49).

Buddhists principles offer potential solution for dealing with the problems behind environmental destruction, including the greed which causes people to use wetlands of economic gain and the poverty which forces villagers to expand into the wetlands or misuse its resources. The ecological monks believe that people and the wetland can co-exist if people are aware of their

responsibility to protect it and its resources carefully. As respected leaders in Thai society, monks are playing a crucial role in preserving the natural environment. The villagers also performed a ceremony requesting the local tutelary spirit to help them protect the wetlands and its wildlife (ibid).

New and innovative approaches need to be applied to wetlands management. Also there should be increased financial investment in wetlands management. Wetlands provide many benefits- environmental, economic and social. Yet there is limited assessment of these multiple values. Consequently, they are often not reflected in national decision making processes. Wetlands provide critical ecosystem services which are undervalued by many public and private intuitions and markets, but which need to be reflected in national accounts and the markets place (Poudel 2009).

From the Anthropological points of view, the conservation of wetland and its biodiversity is an important issue. Wetland and is related to human societies in term of social, cultural, economic and religious values. Wetland is rich in flora and fauna which are in supporting human existence and contributing to human welfare. But it is not only the reason to conserve wetlands. There are other non-anthropocentric reasons for wetlands conservation. Inskipp (1992) summarized five reasons for maintaining biodiversity viz., ethical reasons, Maintaining Ecosystems, Material and Economic benefits to people, Maintaining Evolutionary process and Aesthetics. In the human societies, each and every section of the societies perceives different values of biodiversity which then may determine their variety of interests and different meanings of biodiversity conservation among them.

All the above mention literature shows that local people have their own traditions and customs in management and conservation practices. Traditional institutions and indigenous knowledge possessed by the local people is the basis of traditional system of natural resources management and conservation. But such activities of local people have been deteriorating with modernization. Younger generation is no longer interested with traditional institutions and indigenous knowledge by which their ancestors maintained their fragile

environment. So marriage between traditional and modern technique is essential for the proper management of such kinds of natural resources.

They have further emphasized that cultural and spiritual beliefs, norms and values can be used in wetlands and biodiversity conservation. But such cultural practices are not being used in conservation and proper management of natural resources. They further highlight the importance of traditional institutions and indigenous knowledge for conservation and management activities. People of different part of Nepal have been practicing various traditional institutions adopting with local environment. But, very limited studies have been conducted in this aspect.

So in this study, I had attempted to analyze the importance of cultural values, local people's participation and role of community in conservation of wetlands and its biodiversity.

## **RESEARCH METHODOLOGY**

### **3 Research methods**

#### **3.1 Rationale of the Selection of the Study**

This research has conducted in Maipokhari Ramsar catchments area which is situated in the top land of Sulubung and Maipokhari VDCs. I have selected this area because of my own interest that the place where I want to get new experience in my study and ethnographic knowledge.

Maipokhari is that place which is full of religious and cultural significance. Different ethnic groups have their own traditions, practices, spiritual beliefs, values and understanding about its scarceness and also it is full of flora and fauna diversity. So I am interested for the study in this area.

#### **3.2 Nature and Sources of the Data**

Both primary and secondary sources of information are used for study. The primary data were collected through participant observation, interview, questionnaire and focus group discussion. Then secondary data were gathered from Sulubung and Maipokhari VDCs, District Development Committee (DDC), District Plant Office, Tourism Promotion Center Ilam (TPC) and Maipokhari Religious Forest Group (MRFG) and library, as well as published articles and books.

#### **3.3 Design, Size and Selection of Sample**

The study area is homogenous. Non probability sampling was used to collect data and information. Therefore, the study primarily is based on purposive sampling process. The total population of study area is 493 where male is 265 and female is 228. The researcher takes census survey 21% of total population based on age, sex, status, caste and education. The total number of respondent is 103. The household survey was done in the entire universe.

### **3.4 Techniques of Data Collection**

The required data is collected using following techniques:

#### **3.4.1 Participant Observation**

Participation observation was carried out number of times. During field visit, observation was made about the present conditions of wetlands and biodiversity and its interrelationship with community. Photographs of the area were taken to illustrate later. Important observed information was noted for study.

#### **3.4.2 Key Informant Interview**

The key informant interview was applied to obtain information from the knowledgeable persons of the community (teachers, government officers, older persons, political leaders) who knows the Maipokhari historical, political, cultural etc and provides the information in detail about their knowledge and experience in conservation of wetlands and its biodiversity.

#### **3.4.3 Focus Group Discussion**

The focus group discussion was done in order to obtain general information about people's perceptions towards conservation of wetlands and biodiversity. Group discussion was conducted in each ethnic community on the relevant issues. The size of group discussion is 6 people for each group.

#### **3.4.4 Interview Schedule**

A set of interview schedule was used as a tool to collect primary data in order to achieve the research objectives. It mainly inquired about age, sex, ethnicity, education, family size, marital status, income, expenditure, attitude and perception towards conservation of wetlands and biodiversity, and practices and influences in conservation of wetlands and biodiversity etc. Different categories of respondents were used for the conservation threats analysis and perception of people accurately. The interview schedule was



prepared in English and then translated into Nepali before the respondents were asked in the study area.

### **3.4.5 Secondary Data Collection**

Secondary data were collected from official records of VDCs, District Development Committee, Maipokhari Religious Forest Group, District Forest and Soil Conservation Office, District Plant Office and other related publications.

### **3.5 Data Analysis**

After the data collection, data was analyzed by using simple statistical tools and techniques. This was possible at three stages viz. reading the field descriptive notes and identifying the relevant themes/concepts; including relevant materials under relevant themes (separating them as appropriate); and developing generalizations.

### **3.6 Limitations of the Study**

The limitations of the study are as follows:-

- a. This study was covered only the Maipokhari Ramsar catchment area defined by the *Maipokhari Chetra Bikasko guru Yojana* which is situated in top land of Sulubung and Maipokhari VDCs.
- b. This study was conducted for the completion of the partial fulfillment of master degree of anthropology. So, it is not feasible for a detailed research due to the constraint of time and resources.
- c. This study has adopted more anthropological research tools and methods.

### **3.7 organization of the Study**

The dissertation consists of five chapters. The first chapter is the introduction chapter that consists of statement of the problem objectives of the study, rational of the study, and theoretical prospective. The second chapter

includes the review of literature that provides some information about wetland and biodiversity. The third chapter consists of research method applied to complete this dissertation. The further chapter provides the general profile of the study area that consists of physical setting, climate, population, composition, major occupation, educational status and agricultural and livestock income. The fifth chapter deals data presentation and analysis of the dissertation. In this chapter, socio-economic condition, and people relationships with wetland and biodiversity, overall perception and attitude toward the conservation of wetland and biodiversity and cultural practices and influence of community in wetland and biodiversity conservation were presented. And the last chapter or sixth chapter provides summary, conclusion and recommendation.

## CHAPTER 4

### Study Area Description

#### 4.1 An introduction of Ilam District

Ilam is a small hilly town with pristine landscapes of sloped tea gardens, thick natural forests, holy sites and unique culture which is situated in eastern development region, Mechi zone of Nepal. It stretches from Mahabharat range of 600 meters to 3636 meters from sea level with maximum temperature of 31°C to minimum 0°C. Geographically linked to Darjeeling in the east, Jhapa in the south, Morang and Dhankuta in the west and Panchtar in the north, is divided into 48 VDCs and 1 Municipality.

According to the population census 2001, the total population of Ilam was 2,82,822 (male 1,42,535 and female 1,40,287) residing in 55,619 households size of 5.1. The district has a population density of about 166 with around 94 percent of total population being rural. Ilam has higher literacy rate with average of 66.23 percent for both the sexes and 74.10 percent for male and 58.23 percent for female and their common mother tongue is Nepali.

#### 4.2 Brief Note on Case Study Site

##### 4.2.1 Introduction of Case Study Site

The Maipokhari wetland is located at an altitude of 2121 meters high and lies between the junctions of two VDCs named Sulubung and Maipokhari in northern part of Ilam District. It is surrounded by thick forest of chilaune-kattus (*Schima-Castanopsis*), Purbi Himali Phalat-kaulo (*Eastern Himalayan oak-laurel*), Japanese Juniper etc, stretches in area of 1.6 hectares with nine angular points which is declared Ramsar site. It has been identified a potential biodiversity corridor for precious mountain terrestrial and aquatic and rare biodiversity. It is a resting and breeding site for more than 300 birds, tree frog (*Polypedates maculstes*), and Himalayan warty newt, White-rumped Vulture, Leopard cat, 6 types of reptiles, 3 types of fish species, 14 types of mammals and more scarce plants like *Sphagnum nepalense* etc. International Center for Integrated Mountain Development (ICIMOD), The World Conservation Union

(IUCN) and The Conservation International defined Mai Pokhari watershed has been identified as a potential biodiversity corridor for long-term conservation of protected species of Kanchenjunga Transboundary.

Maipokhari wetland is the main habitat of a unique and endemic moss *Sphagnum nepalense* one of the high water holding capacitors, which prevents the evaporation of pond water supporting to maintain the cool and moist habitats necessary for a number of habitat sensitive rare species. In addition a number faunal species like Chheparo, Hariyo Chheparo (*Japalura variegata* - endemic of east Himalaya)- reptile; Tyang Paha (*Limnonetes nepalensis*)- endemic to Nepal and Khasre bhyaguto, Dhudaribyang, Khatkhyarri meghoba (*Bufo himalayanus*)-TYPE locality in Nepal)-amphibians deserve special significant at international level, have been reported from the wetland. It shelters large number of economically and ecologically valuable species. As such oak tree (*Quercus lamellosa*), Lali gurans (*Rhododendron arboreum*)- National flower, *R. dalhousiae*, *R. campanulatum*, Ghoge Champ (*Magnolia campbellii*), Seto Champ (*Michelia doltsopa*), Gogai Champ (*M. velutina*) are some of the tree species of the area with significant values.

#### **4.2.2 Climate**

The overall climate of the area is temperate humid. Annual maximum temperature is 18° c. and minimum temperature is 2° c. The annual rain fall in this area is more 3000 mm.

#### **4.2.3 Population Composition**

The total population of this selected study area of Maipokhari is 493. This population is grouped in 105 households own 1777 ropani land. The area consist 3 community forests. The forest with the area of around 10 hectores, where Maipokhari has been located, is under the ownership of maipokhari Religious Forest Group which is established in 2062 BS. The following table shows the population composition of the Maipokhari area.

**Table – 1**  
**Population Composition of Maipokhari Area**

<b>Caste</b>	<b>Household</b>	<b>Female</b>	<b>Male</b>	<b>Total</b>
Rai	31	52	64	116
Brahman/chhetri	24	55	62	117
Sherpa	17	47	46	93
Magar	10	24	35	59
Gurung	9	18	19	37
Sunuwar(mukhiya)	7	19	26	45
Tamang	3	6	7	13
Limbu	1	3	1	4
Damai(siwa)	1	4	5	9
<b>Total</b>	<b>103</b>	<b>228</b>	<b>265</b>	<b>493</b>

*Source: Maipokhari Kshetra Bikas Guru Yojana, 2009*

This table -1 shows there were 9 ethnic groups which include Rai, Bharaman/Chhetri, Sherpa, Magar, Sunuwar (Mukhiya), Gurung, Tamang, Limbu and Damai. Among these ethnic groups Bharamin/chhetri is highest; Limbu and Siwa are lowest in population. The difference in the number of households between Bharamin/Chhetri and Rai is 6 households whereas the difference of their population is just one. Likewise the average size of family member of Bharamin/Chhetri is 5 and 6.5 of the Rai caste.

#### **4.2.4 Major Occupation**

The primary (main) occupation of most of the households of this area has been agriculture but also some of them have other/alternative occupation. The occupational structure of household is presented in the following table.

**Table – 2**  
**Major Occupation of Households**

<b>S.N.</b>	<b>Primary Occupation</b>	<b>No of households</b>	<b>Precentage%</b>
1	Agriculture	62	60.20
2	Animal Husbandry	2	1.94
3	Business	36	34.95
4	Service	3	2.91
	Total	103	100

*Source: Maipokhari Kshetra Bikas Guru Yojana, 2009*

Above table-2 shows that, among 103 households, the primary occupation is agriculture occupied by 60.20% followed by 34.95% of business. This shows agriculture is the primary occupation of the study area. So, most of the people living in this area are depending on agriculture for their livelihood. Agriculture and animal husbandry is a traditional occupation of the people.

#### **4.2.5 Educational status of Maipokhari Area**

The field survey carry out the overall educational status of Maipokhari area. This data is taken from the field study which is conducted among 103 households. The given table shows the educational status of this area.

**Table -3**  
**Educational Status of Maipokhari Area**

<b>Caste</b>	<b>Total pop</b>	<b>Master</b>	<b>Diploma</b>	<b>CL</b>	<b>SLC</b>	<b>Illiterate</b>
<b>Rai</b>	116	0	0	5	3	7
<b>Bhramin/chhetri</b>	117	1	4	13	10	6
<b>Sherpa</b>	93	0	2	3	0	10
<b>Magar</b>	59	2	3	5	2	4
<b>Gurung</b>	37	0	0	2	3	1
<b>Sunuwar/mukhia</b>	45	0	0	0	15	0
<b>Tamang</b>	13	0	0	0	0	1
<b>Limbu</b>	4	0	0	0	0	0
<b>Damai(siwa)</b>	9	0	0	0	0	2
<b>Total</b>	<b>493</b>	<b>3</b>	<b>9</b>	<b>28</b>	<b>33</b>	<b>31</b>

*Source: Source: Maipokhari Kshetra Bikas Guru Yojana, 2009*

The given data shows that the literacy rate of this area is 93% and only the aged people are illiterate. Two people from Magar community and one from Bhramin community have completed their master's degree. The data present only nine people have bachelor degree, 28 in PCL level and 33 in SLC. The Sherpa community has a high in illiteracy. There is one secondary school, one primary; one Bedasram and one private primary level school are located in this area. This data shows the overall educational status of this area is very good. All children were sent school where boys and girls have equal rights for education.

#### **4.2.6 Agricultural production in Maipokhari area**

Agriculture is the major occupation in this area. Potato is the major crop which is the highest production. Mainly they produce cash crops like cardamom, potato, tea and herbal plant. They earn money by selling these

products in local market Deurali bazaar and Biblate bazaar. These markets are main market of this area. The following table shows the agricultural production of this area.

**Table-4**  
**Agricultural production in Maipokhari area**

Caste	Land (ropani)	Annual agricultural production ( in kg)						
		Maize	Potato	Carda mom	Tea	Herbal plant	Mille t	Ginge r
Rai	163	2740	4000	0	215	45	0	0
Bhramin/chetri	657	12500	15450	250	850	265	0	0
Sherpa	439	7200	7100	1125	575	55	0	0
Magar	210	2570	2400	215	85	230	0	0
Gurung	146	1230	1130	125	325	0	0	0
Sunuwar	162	1375	950	150	600	45	0	0
Tamang	0	0	0	0	0	0	0	0
Limbu	0	310	225	0	0	0	85	350
Damai(siwa)	0	113	35	25	120	0	0	0
<b>Total</b>	<b>1777</b>	<b>28038</b>	<b>35440</b>	<b>1890</b>	<b>2770</b>	<b>640</b>	<b>85</b>	<b>350</b>

Source: Maipokhari Kshetra Bikas Guru Yojana, 2009

This table presents Bramin/Chhetri of this area with the households of 21.94% occupies more area of land. They hold 36.02% of total land of this area. But Rai community with the households of 27.6% holds only 9.17% of total land. This shows Rai community has lower land holding capacity in proportion to the population. Potato is the highest product in quantity but cardamom comes top in terms of income. The gross income from agricultural production can not able to mange their annual expenditure. They managed their household activities generating income from different sources. Limbu and Siwa have a land with out tenure right. They were farming in leased land from the landlord of this area which is called *biyajmaraune* in local term. These families are fully depended on other occupation. Siwa works in his own tailoring shop



and manage his household activities. Limbu family depends on business in Deurali and one person of this family is meson.

#### **4.2.7 Livestock and its Income of Maipokhari Area.**

Due to the easy access of the forest and pasture, Livestock has become one of the occupation in this area. Although cattle rearing have not been the major source of income for the community, cows and buffaloes are kept to fulfill the dairy consumption. The Sunuwar in large number of cattle's whereas limbu and Siwa have no cattle. Livestock distribution pattern according to castes is tabulated on the following table:

**Table – 5**  
**Livestock and its Income of Maipokhari Area**

<b>Caste</b>	<b>Cow</b>	<b>Milk (in liter/year)</b>	<b>Buffalo</b>	<b>Milk (in liter/year)</b>
Rai	17	8800	2	1200
Brahman/chhetri	24	16300	5	3420
Sherpa	22	10250	5	3500
Magar	12	5500	1	0
Gurung	10	4200	0	0
Sunuwar(mukhiya)	15	6800	0	0
Tamang	1	1200	0	0
Limbu	0	0	0	0
Damai(siwa)	0	0	0	0
<b>Total</b>	<b>101</b>	<b>1138320</b>	<b>13</b>	<b>136320</b>

*Source: Maipokhari Kshetra Bikas Guru Yojana, 2009*

## CHAPTER 5

### DATA PRESENTATION AND ANALYSIS

#### 5.1 Social Aspects

This section of the study mainly highlights the social phenomena. Actually the social characteristics include sex, marriage, education etc.

##### 5.1.1 Population Composition/ethnicity

Population is the one of the important aspect of any research. It structures the socio-cultural and economic aspect of the country. The population composition is presented on the basis of ethnic distribution in the following table:

**Table-6**  
**Caste/Ethnicity Distribution of Respondents:**

S.N.	Ethnicity	No. of Respondents	Male	Female	Percentage
1	Rai	31	18	11	30
2	Br/Chr	24	15	8	23
3	Sherpa	17	7	10	16
4	Magar	10	4	6	10
5	Gurung	9	5	4	9
6	Sunuwar	7	4	3	7
7	Tamang	3	2	1	3
8	Limbu	1	1	0	1
9	Damai	1	1	0	1
	Total	103			100

*Field Survey 2009*

Above table-6 shows that 30% of the total respondent were from the Rai community followed by Bhramin/Chhhetri with 23%. This shows that the highest population of Rai can be found on the study area. The respondent from the Sherpa and Magar community were 16% and 10% respectively. 42% of the respondents are female. More number of male respondents is older people who were not engaged in any occupation.

### 5.1.2 Age Details

It deals with the distribution of respondents in following age groups of study area. The age composition of respondents is presented as follows:

**Table -7**  
**Age Composition of Respondents**

Age group	Number	Percent %
20-29	26	25
30-39	31	30
40-49	20	19
50-59	21	21
60+	5	5
Total	103	100

*Source: Field survey 2009*

Table-7 shows the age groups of respondents of study area. Among the total population 30-39 age groups occupies 30%, likewise, 20-29 age group occupies 25%, 40-49 and 50-59 age groups occupies 19% and 21% respectively and 60+ age group occupies 5%. The age between 20-29 in the community is most productive because they are involving in the different types of job like Agriculture, Animal Husbandry, Business and Services.

### 5.1.3 Family Type

Family is the major part and cell of the society which has important role in human life. Being a rural sector area it has also found the rural features. In this part of society it has been included its size and types as follows:

**Table -8**  
**Family Type of the Respondents:**

Type	Number	Percentage %
Nuclear Family	51	50
Joint Family	31	30
Extended Family	21	20
Total	103	100

*Source: Field survey 2009*

The above table-8 shows that 50% of families lived in nuclear family. 30% and 20% lived in joint and extended family respectively. Researcher found that traditional joint family system was breaking up. People preferred the nuclear family for the economic opportunities. In query of researcher ‘why the nuclear family is emerging?’ the respondents answer was ‘the self dependent economy’. Because of this mania of self dependent notion, the traditional society tie was replaced by modern values of nuclear family.

#### **5.1.4 Marital Status**

The marital status of respondents was identified and presented in the following tables:

**Table -9**  
**Distributions of Respondents by Marital Status**

Respondent Type	Number	Percentage %
Widow	8	7
Married	82	81
Unmarried	13	12
Total	103	100

*Source: Field survey 2009*

According to the data, 81% of the respondents are married. Widows are 7% and 12% respondents are unmarried. Researcher could not find the any

cases of the divorce and separateness in community. The old people are widows.

### 5.1.5 Educational Status of Respondent

The field survey carry out the overall educational status of respondents. This data is taken from the field study which is conducted among 103 households. The given table shows the educational status of the respondents:

**Table-10**  
**Educational Status of respondents**

S.N.	Level	No. of respondents	Percentage %
1	Master	3	2.5%
2	Diploma	6	5%
3	CL	19	18.5%
4	SLC	25	24.5%
5	Only Literate	29	28.5%
6	Illiterate	21	21%

*Field Survey 2009*

Above table-10 shows that 28.5% of my respondents are only literature followed by 24.5% of SLC pass respondents. 2.5% and 5% of respondents had completed masters and diploma level. Two Magar people and one Bhramin people have completed master's level education. Two people from Sherpa community, one from Chhetri and three people from Bhramin community have completed Diploma level education. All the Tamang, Limbu and Damai are illiterate. The most of only literate respondents are female, who were housewives. And the older people are also illiterate. All the school-age groups-children are admitted in school and they went school regularly.

### 5.2 Economic Aspects

This section of the study mainly highlights the economic status of the respondents. The economic characteristic includes occupation, income and expenditures etc.

### 5.2.1 Major occupation of respondent

The Primary occupation of most of the respondent has been agriculture but also some of them have other/alternative occupation. The occupational structure of the respondents is presented in the following table:

**Table-11**  
**Major Occupation of respondents**

S N	Primary occupation	No. of Respondent	Percentage %
1	Agriculture	65	64
2	Animal Husbandry	2	2
3	Business	21	20
5	Service	15	14
	<b>Total</b>	103	<b>100</b>

*Field Survey 2009*

Above table-11 shows that, among 103 respondents, the primary occupation is agriculture occupied by 64% followed by 20% of business. This shows agriculture is the primary occupation of the study area. So, most of the people living in this area are depending on agriculture for their livelihood. Cash crops like cardamom, tea and herbal plants are the major agricultural sources of income of the local people. Damai and Limbu are engaged in businesses and they have no land and house. Sherpa people are involved in hotel business.

Some educated people are involved in services in government and private services. They are also engaged in local level trade and industry but the percent is very low. Few people went outside the village for services e.g. police, military, civil servants and some went foreign employments. In this situation most of the families are headed by women.

### 5.2.2 Family Income of Respondents

The total income of the family is analyzed in the basis of monthly income. The income of family is categorized four different series and presented in following table in monthly schedule. The family income of respondents is as follows:

**Table-12**  
**Family Income of Respondents**

Income/month	No of Family	Percentage%
5000-8000	31	30
8000-11000	41	40
11000-14000	17	16
14000 above	14	14
Total	103	100

*Field Survey 2009*

The above table-12 shows that their family income per month 8000-11000 for 41 households and it carry 40%, another family income per month 5000-8000 for 31 households and its carry 30%, then family income per month 11000-14000 for 17 households and it carry 16% and above 14000 for 14 households and it carry 14%. The monthly income more than 11000 falls on Joint and Extended family. The study shows that collection from more family member had been high monthly income.

Food is essential for all to get energy to survive. Man does various works in order to get better food and income for family. Female are involved in households works and business. All the economically active people were employed in different sectors like agricultural works, business, services etc.

### **5.2.3 Family Expenditure of Respondents**

To locate level of the community in the social strata it is necessary to know the ways of expenditures of the people. Because the priority of education, family, health and advanced means of communication that indicates the highest level of the community. The following table shows the expenditure of the respondents:

**Table-13**  
**Expenditure Pattern of Respondents**

Items	No of Family	Percentage %
Food items	61	60
Household goods	21	20
Children 's Education	11	10
Health	10	10
Total	103	100

*Field Survey 2009*

Above table-13 shows that 60% of their income is spend on the food items. Due to the low productivity of maize, wheat, millet etc they are unable to survive through own products. So, all the family exports these corn from local market Biblate and Deurali. They have given high priority for the production of cash crops like cardamom, tea and herbal plants for the cash income. And remaining income spends on Household goods, children's education and health. They spend 20% for household goods, 10% for education and health respectively. They give the less priority on health and education.

### **5.3 Community and their Relation with Wetland**

It is a fact that wetlands deliver a wide range of critical and important services vital for human well-being is well-known. Wetland systems directly support millions of people and provide goods and services to the world outside the wetland. People use wetland as sources of fresh water and water transportation for agriculture, they catch wetland fish to eat, and direct use may also take the form of recreation, such as bird watching or sailing, or scientific study or tourist destination likewise.

All the local communities near by the wetland area have strong attachment with the wetlands for their daily livelihood. These communities depend on the wetland services in their day to day life. Wetland can act as the major source of water supply, flow regulation and water transportation for community. In case of Maipokhari wetland area people are benefited from



several aspects. Maipokhari has strong excess of water storage which may occurred during the heavy rainfall. It is a store house of rain water which keeps on the refreshing and renewing the available water resources by this area. In the area of mid hills it can be considered as milestone source of water for the community. Most of the people of this study area are benefited from this wetland. Among households of this area more than 25 households are fully depended on the water for their daily livelihood because they have no alternative source of water. People are using water for irrigation through the water cannels from the outlet of the Maipokhari where water is collected from the different other wetlands littering around the Maipokhari ponds. And women from the poorer families gather wild plants for food and medicines.

The wetland has been supporting and protecting a rich diversity of endemic plants and animals. These species and their genetic diversity help to maintain wetland processes such as water storage, sediment trapping and nutrient cycling which are the opportunities for formal and informal education and training to researchers and students from this community and outsiders. According to Tirtha Bahadur Shrestha 2009, wetlands are especially important for many migratory birds. The ecological and cultural values of Maipokhari attracted tourists from different places where they are spending money and times for entertainment and research that benefited the local communities.

Maipokhari has a cultural significant in both Hindus and Buddhists religions. People from Hindu community go there for their sacred bath mainly in *Janai Purnima* and *Haribodhini Ekadasi*. They worship Maipokhari as goddess Mai Bhagawati. Likewise, the people from the Buddhist community worship Maipokhari as a most sacred site where many spiritual Gurus visits and practiced their religious observation. A part from the two major religion doctrines, the folk belief practiced by indigenous people also emphasize on the importance of ponds. There is a strong belief that lake is considered as the form of god and goddess or spirituals powers in Rai, Limbus, Sherpas, Sunuwar etc.

#### **5.4 Flora and Fauna Diversity in Maipokhari Area**

The Maipokhari wetland area is rich in both flora and fauna diversity. It is a unique and rare instance of natural wetland in the middle mountain ecosystems of eastern Himalayas. It has sheltered habitats of for a number of rare, endemic, vulnerable and endangered floral and faunal species (Joshi, Sangam and Shrestha2007). The total number of flora and fauna diversity of Maipokhari is listed in annex 2.

#### **5.5 Perception of the Local People in Conservation of Wetlands and Biodiversity**

The interviewed local people of the study area were unaware of the term ‘wetland and biodiversity’. When, they were explained about direct and indirect uses of wetland and the variability of plants and animals species in this area, they conceptualized the term wetland and its biodiversity to their meaning. Nevertheless, they expressed their views and discussed about local effort to maintain high number of plants and animals species in this area. They further clarified that they required various wetland product from the wetlands area. This made them increase or maintain the diversity of plants and animals in the wetland area.

When the conservational work was done in Maipokhari wetland area by MRFG, the need and aspiration of local people were not taken into consideration. They participate in the program as just labour. Now, they have realized that the diversity of plants and animal were not able to survive if wetlands area had disappeared. They ranked their activities according to the importance of the species. In this work technical support is provided by the District Plant Office of Ilam. They made a code of conduct for the conservational activities with the involvement of local people/ government representatives and local stakeholders.

The chairman of the MRFG expressed his opinion that perception of local people is positive for the conservational activities and it will be converted

into a safe and well protected area within 25 years. However, based on the needs for varieties of plants and animals the community should have to do more. In response of query about the cause of protecting this area, people reacted that this creation would help them for their alternatives sources. The local people in the present study have mentioned that they would increase or maintain the species diversity in the wetlands area. They have been able to the knowledge that they could intervene in the wetlands area to increase the diversity of plants and species of wetlands through management operations. One respondent further emphasized that their activities are not only guided by use values but also by cultural and religious beliefs. He informed that religious belief of local people also played a critical role in conversational activities.

The local people’s perception towards conservation of wetland and biodiversity is positive. Most of the local people are conscious about value s and benefit of wetland and increased biodiversity. The perception of local people in conservation of wetlands and biodiversity is given in table below:

**Table -14**

**Perceptions in Conservation of Wetland and Biodiversity**

<b>Opinion of Respondent</b>	<b>No of Respondent</b>	<b>Percentage</b>
Very positive	73	70%
Positive	30	30%

*Source: field survey 2009*

The above table-14 shows perception of local people towards conservation of wetlands and biodiversity. 70% people were very positive in conservation because of their dependency with the wetlands resources. The people who are engaged in agriculture and business also seem very positive in conservation because their occupation is related in wetland services and beauty. In their view, this area is the touristic area. So, if Maipokhari got disappeared, no one visit there and their business can not run. Due to their needy purposes

people of Maipokhari carry positive attitude towards wetland and biodiversity and they were highly interested in such conservational activities.

### **5.6 Local practices in the past and at present**

In the queries of researcher about the local practices for the conservation of wetlands and biodiversity were responded which let know that this place has been getting no collective efforts in past and new management efforts at present. The viewpoint of pilgrimage has played a major role in conservation of wetlands and biodiversity in these days. It is taken as religious site where many pilgrims visit there as religio-cultural views but now people visit there not only for the cultural importance but also for the other purposes. A respondent named Dinesh Subedi said that local people have prior attention to Maipokhari for its cultural importance in the past. There is no institutional effort to conserve Maipokhari but when people came to know about the global importance, we were working in unity under the Maipokhari Religious Forest Group (MRFG) since April 2005. The growing sensitivity of local people towards conservation of wetlands and biodiversity is the positive factor for concern organizations. In the case of conservation of wetlands and biodiversity MRRG has developed its own rules and regulations through the mass meeting of local people to use and maintain wetland site. The most interesting case is that MRFG takes care of only pond and its vicinity.

Now, there are three forest groups which look after the pond and its surrounding forest. Nir Bahadur Subedi, a member of MRFG informed that when this area was designed to the Ramsar, they were unknown about the criteria of Ramsar and the activities are permitted and restricted in this area. So they didn't implement our plan in this area. This case shows that communities are sensitive regarding their activities in this area. On the basis of field observation, the researcher pointed out that most of the respondents expressed willingness to participate in the conservation of wetlands. Conservational attitude were strongly influenced by educational level and resource use. Educated people were more positive towards conservation than other people.

## **5.7 Influences of the Community Practices on Wetlands and Biodiversity Conservation**

Human influence on biodiversity is remarkable. This research aims to explore the practices and influences of the community on wetland and biodiversity conservation within the sphere of community and national forest. There exists a MRFG as a formal social organization in this area. The Maipokhari Religious Forest Group (MRFG) is a group of people who have common interest in protecting and managing a wetland and forest area. The basic criterion to be identified as a group member is that one has to be using the resources from this area. Despite the caste differences, cultural and socio-economic diversity and existence of alternative sources of products, the MRFG is the strong social organization to manage wetland and forest on a sustainable base. The members of MRFG are not only from the Maipokhari catchments defined by Maipokhari Master Plan but also from Sulubung, Sumbek and Maipokhari VDCs.

They have amended rules regarding protection and participation, reorganized the committee, increased the women's representation in the committee and implemented the operation plan effectively. The MRFG seems to be developing as the stable and self-regulating institution. The main reason, they attributed was the institutionalization of the MRFG for the management, protection and utilization of the resources. Here institutional capacity covers following aspects:

- Feeling of ownership and their commitment towards conservation, management and utilization of resources.
- Adhering to the rules and regulations established by the community.
- Capable for decision making.

- Enhancement of participation of people from different caste /ethnic background as well as the women in conservational activities.
- Capacity to resolve conflicts.

The discussions with the members of MRFG focused on questions and issues which were to allow the researcher to assess their institutional capacity against the above mentioned points. This was found to be institutionally capable for management, conservation and utilization of religious forests.

In the context of biodiversity conservation, the major practices and influences of the community can be categorized into followings headings.

- Protection system
- Conservational activities
- Forest Management and Utilization of the products

### **5.7.1 Protection system**

Forest protection was found to be one of the most vital activities necessary for biodiversity conservation. The lack of protection system was considered to be a main cause of biodiversity loss in the past. This was expressed by all the respondents during my field visits. In addition they agreed that the present state of improved wetland and biodiversity conservation is a result of strict and effective protection system in this area. As such, an oak tree (*Quercus lamellosa*) and Japanese pine (*Cryptomeria japonica*) are the dominant component vegetation in this area. The local people cooperated by restricting cattle grazing and leaf litter and ground grass collection from the forest. All of their activities were guided by the religious and cultural values of Maipokhari. In course of this study, it is found that all the resources and income is used in conservation and management of wetland and biodiversity itself.

### **5.7.2 Conservation Activities**

All the activities of community in the past were guided by the religious norms and values of Maipokhari because they worshiped Maipokhari as a Goddess. So they do not want to pollute and destroy her. MRFG is the main local institution which is working there as a representative of local community based on Nepal Forest Act and National Wetland Policy 2003 and registered with district forest office of Ilam. But nowadays their activities are closed due to the unawareness of Ramsar Criteria.

### **5.7.3 Forest Management and Utilization of the Products**

Regarding biodiversity conservation, it is realized that management activities are important as the protection mechanism. Users justified that management would produce forest products according to their need and which will encourage them to take an active part in the protection of the religious forest. They mentioned management operations to include cleaning, weeding, pruning, singling, thinning and felling trees. Attributes of the management activities are as follows

- During the cleaning and weeding operations, weeds such as *Uniu*, *Ganaune Jhaar*, *Banmare* and thorny species etc are removed.
- Only dead, dying and diseased tree are removed.
- Care is taken so that no permanent gaps were created by removing the existing vegetation.
- If gap were created plantation was done immediately to cover them.

They had experienced that these operations would provide room for natural regeneration in the forest floor. They believed that if they polluted and destructed this area, God and Goddess will punish. This also seems to promote regeneration of diverse species in this area. They rather claimed that the forest and wetland condition had improved appreciably after hand over. When they were asked about the reasons behind this improvement, they said that it was the well management system.

However, from biodiversity conservation point of view, removal of undesirable plant species, dead and dying trees and leaf litter might have negative impact on biodiversity conservation. These practices certainly disturbed the associated flora and fauna, the part of biodiversity. In case of this area, they had felt responsibility for conserving the biodiversity unknowing. They have no knowledge about biodiversity and its importance. That is why the condition of this area has been improving in comparison to the past days. By this, it could be concluded that biodiversity conservation can be much ensured in this religious forest and wetland area.

### **5.8 Role of Religious Belief and Sacred Forest in Wetland Conservation**

In case of Maipokhari cultural values are institutionalize in the form of rules and regulations of MRFG. From the research it is found that the Maipokhari is not only imperative habitat for wetland biodiversity but also imperative for indigenous religio-cultural assert. It is regarded as one point of convergences for Mundhusim, Hinduism and Buddhism. Traditionally, the Mai is known as a powerful deity of relieving the children from children pox/ small pox as well. The pond is visited by a large number of devotees all the year. According to the local beliefs, Maipokhari site is one of comical places of Paruhang and Sumnima (Maha Deva and Parbati, the God and Goddess), the ancestors of Kirats people of eastern Nepal. Local legend reveals that Paruhang placed a curtain around the pond while Sumnima went on bathing in the clean water of a Maipokhari. Later on, the curtain changed into cloud in the site, which is now seen always beings engulfed with it. Due to religious faith they don't use the resources around the Maipokhari area because god and goddess saw their activities and will angry with them and punished him. Wetland sites and dependent species have significant recreational, cultural and spiritual/religious values that is supporting in conservational work.

Maipokhari have significant human use and values in term of religion as well as culture. Religious belief of people is playing key role for conservation and management of the resources in this area. During the field visit the



researcher found that the pond is respected as Mother-Goddess of water and it has fostered shrines, temples, hermitages and monasteries on the site as Mai-Religio-Culture. The Mai-Religio-Culture does not allow pollution in the wetlands; it demands natural atmosphere and inviolability. For instance, the district authorities introduced boating on the pond for tourism development, but it did not go for long due to strong complaint raised by Mai-Religio-Cultural people. They informed that Maipokhari is shifted from Siddi thumka, a place located at 12 km southwest of Ilam bazaar, due to the pollution created by the local people. In the way, the pond shifted again to Ghale Tara of Barbote VDCs, a place found on the way to Maipokhari and lastly shifted to the present site. This myth reveals that Mai Goddess already warned local people against the polluting the site. Otherwise, she might shift to another place. These both stories stress on purity and protection naturally.

### **5.9 Cultural Practices and Influence in Conservation**

Culture and wetlands have close contact in this world. They are interdependent and interconnected to each other. According to Bishnu Bahadur Bhandari (2006), cultural components are already integrated into the management of wetlands resources but never has there been any attempt to manage wetlands based on the concept or wetlands culture.

In time of research it found that cultural significance and values were the major reason for the conservation of biodiversity. It is religiously prohibited to hunt and collect wildlife and fisheries from around the pokhari. If anyone does this restricted work, he/she gets seriously ill or meets death. Different ethnic groups have their own traditions, practices, spiritual beliefs, values and understandings about its sacredness which is playing vital role in conservation of wetland and biodiversity.

They are more sensitive about its purity so they had made a code of conduct to save and clean this area. Traditional culture, spiritual beliefs and customary practices put prohibition on throwing litters, garbage, dirt, harmful and poisonous substances into this wetland area. All these activities are the

evidences of closeness to the wetland and biodiversity conservation. Each member of community has to follow the customary practices and rules to their strong cultural faith toward Goddess Maipokhari. These cultural values and practices have influenced the community to the wetland and biodiversity conservation. The cultural practices of local communities are presented as below:

### **5.9.1 Cultural Practices of Rai**

The Rai groups are believed to be “indigenous” people of Nepal, who live in eastern hills of Nepal. These people mainly depend on agriculture and have traditional life styles with a low socio-economic status. They have ancient oral tradition, languages, culture, customs and behaviours close with nature and biodiversity. They have a strong belief towards Maipokhari as the sacred origin of ancestor.

According to an old man of this community, their ancient cultural tradition, religious and spiritual world in which we have spiritual belief in our societies, the spirit of ancestors are hidden in Pokhari. During the worships, religious priests can see in his/her dream and even have communication with spirits and the priests. The respondent further explained that if the soul of a person goes to the Pokhari, then he gets ill. The religious priests will have message in dream or in during praying time and will deliver the some information to the public as to what should be done. The priest initiate dialogue, negotiate with, and pledge to deities votive offers for getting soul back then this person get well.

Rai community are the devotees of the nature. Their religious traditions are interrelated with stone, water, mountain and places. Due to the strong belief towards Maipokhari, they can not do any destructive and negative work in this area. This shows that cultural practices of Rai have also given a high value to Maipokhari wetlands area.

### **5.9.2 Cultural Practices of Magar**

Magar community is one of the groups under Kiritis. This community also has close relations with the Maipokhari. This community with its own typical language, culture and traditions has the unique relations with the wetlands too. The local resident Dhan Bhadur Magar says, “According to our traditions developed by ancestors, we come to Pokhari and worships for power, lyrics and melody”. After completing the worship, they return back to their home and then pray their ancestral god again for spiritual power. It is believed that the local goddess Maipokhari should be made happy in order to get kuldeveta happy.

*Maruni Naach* is one of the remarkable dances of Magar Community of this area. Maruni dance of Magar community is performed its traditional and spiritual lyrics and melody by praying Maipokhari, and by addressing the god and goddess appeared in the forms of forest, water, stone, tree, fire, air, soil and so on. It is believed that due to the sort of dance mother goddess would excuse all the mistakes. The dance is ended up by thanking the goddess for providing power, blessing, lyrics and melody by offering donation in the Pokhari. They also request the goddess to stay in the place for ever and beg excuse for the mistakes if any. It proves the close link between magar community and holi lake, Maipokhari. From this affiliation with Maipokhari and this community, we can reach in the conclusion that local community itself play a vital role in preserving wetlands and biodiversity through cultural beliefs and traditions.

### **5.9.3 Cultural Practices of Sunuwar**

The Sunuwar community, who have resided around Maipokhari wetlands area and mainly at Jaspire of Maipokhari and Sumbek VDCs has established an special relation with Maipokhari. They have praise worthy role in conserving the wetlands area of Maipokhari. Sunuwar is the indigenous groups with minority.

Their culture, tradition and customs are interlinked with nature. In starting of any religious ceremony, they worship Maipokhari as settlement of

ancestors. It is believed that if the holly area is made polluted and dirty, the ancestors get angry and curse them which invites pain and suffering, and the family get destroyed. Therefore they give emphasis on the sanitation and cleanliness of the holly area. According to the Udaya Bahadur Mukhiya, Sunuwar and Maipokhari deserve historical, cultural and traditional relationship. He further emphasizes that our historical facts, religious norms, events and native traditions are also directed to the purity of holly Lake Maipokhari. It is also our cultural duty.

In my field research I found that all the Sunuwar people were devoted for the conservation of wetlands and biodiversity. They told me that Maipokhari is identified by its own cultural values and religious faith along with its natural beauty and endemic plant and animal diversity. So, it is our prior duty to conserve it. For the conservation of Maipokhari they are ready to do anything.

#### **5. 9.4 Cultural Practices of Bhramin /Chhetris**

Almost Bhramin/Chhetri around this area are the followers of the Hindu religion. Most of the people are engaged in agriculture, trade and government service. They have also deep faith and devotion towards Maipokhari. They go for the sacred bath mainly in *Haribodhini Ekadashi* and *Janai Purnima*. Great fairs are held in *Haribodhini Ekadashi*. In *Janai Purnima* people come to change their Holly thread (Janai) and offer bath. According to local Dinesh Subedi, Maipokhari is not only of a cultural and religious importance but also a centre of biodiversity. He further added, while starting any good deed people worship Maipokhari as local Goddess. Similarly, cattle are believed to be well if the cow milk is offered to the goddess. They also sprinkle Maipokhari's water upon themselves with the hope of emancipation from sins, if any.

In the answer of one query, another local respondent Tanka Kumar Subedi responded that Kapila Nanda, a Hindu ascetic, arrived at the site from Shorga Dwari, Pyuthan of mid-western Nepal for the first time in 1915 and performed Holly activities. Later on, Baala Guru, an unmarried Hindu

preacher, who had offered on of his hands to the god, came for meditation and Ram Bir Gurung; a follower of Jashmani Pantha (A sect of Hindu religion)came up to stay here at Maipokhari site in 1954 respectively. Narayan Dil and his wife Nirmal Mai from Jashbire, Mai Pokhari VDC, Ilam began to stay here permanently since 1961 by constructing a hermitage. He further added that according to the mythology, the goddess will bless the child for childless and voice for the voiceless child.

### **5.10 Discussion**

The government of Nepal has initiated the move for the protection and management of wetlands. The government has approved the National Wetland Policy 2003 that aims to involve local people in the management of wetlands and conserve wetlands biodiversity with the wise use of wetlands resources (Poudel 2009).

By the legal provision, local people have legal right to conserve and use the wetlands resources. The legal provision fully authorizes them to manage, protect and utilize the wetlands so that they can meet their daily requirements of wetlands products and also maintain and improve the wetlands condition. However, the sustainable management of the wetland and biodiversity can not move forward in participatory management system. The management plan should be formulated in close consultation with wetland dependent communities as well as women, poor and socially excluded groups living around and about those wetlands (Belbase and Thapa 2008). This argument shows that there is strong gap in policy level and implement level.

## Summary, Conclusions and Way Forward

### 6.1 Summary

Nepal, small land locked country which lies between India and China, is very rich in biological diversity and freshwater resources. So many wetlands like floodplains of the river, ox-bow lakes, swamps, marshes etc are found here. In Ilam there are some lakes such as Mai Pokhari, Hans Pokhari, Kal Pokhari, Uttare Pokhari which have high values of cultural, spiritual and biodiversity. Among them Maipokhari is the one of the important wetlands. But there is no study about the wetlands and its biodiversity in social aspects. High value of cultural and religious traditions is interlinked with wetlands.

This study aims to understand socio-economic conditions of local people and practices and influences of community who are the main actors of wetland and biodiversity conservation, from the Anthropological perspective for conserving wetland and biodiversity in Maipokhari wetland area. This study focused on assesses the interrelationship between community and wetland; explore the perception and attitude towards conservation of wetlands and biodiversity. It also explores the cultural practices and influences in conservation of wetlands and its biodiversity. The study compiled information from Maipokhari wetland area from Ilam district. Both primary and secondary data were collected by using participatory techniques, questionnaire methods and revising available records and literature.

This study was focused only in Maipokhari area of Sulubung and Maipokhari VDCs. Overall literacy rate of this area is about 93% but also agriculture is the main occupation of these people. About 60.20% people are depending on agriculture for their livelihood. Cereal crops (maize, wheat, millet) and cash crops (cardamom, Potato and tea) are the main crops of this area. An animal husbandry and cereal crop is the traditional occupation of the people.

The socio-economic condition of local people is middle class level. Their social and cultural values are related in the Maipokhari wetlands area. The interrelationship between community and wetland were analyzed according to data gathered from the field by using the different methods and techniques. Wetland and community had a strong relationship in their daily life. The community was benefited from the wetland and its biodiversity in different ways and their activities had also attempted to conserve wetland and biodiversity.

The perception and attitude of the community towards wetland and biodiversity was analyzed for their interest and practice to favor conserved wetland and increased biodiversity. All the community members were found to be positive and highly interested in conservation of wetland and its biodiversity. They were working under the leadership of MRFG. MRFG is working by developing their own rules and regulations through the mass meeting of local people to use and maintain wetland site.

All the activities of MRFG, are guided by the cultural and religious values along with this, is focusing on the economic, social and environmental values. MRFG is the major actor of conservational work representing the local organizations. Cultural and religious values were playing a vital role for conservation of wetlands and its biodiversity in this area. The local people are interested to conserve Maipokhari in different ways to attract tourists, researchers and academicians. Thus we can say that economic, social and environmental values induce its sustainable conservation which lures tourist, researcher, student and specialists. As a result, they trace out the alternative economic resources. Different cultural practices of different ethnic groups have strong faith and worship towards Maipokhari. Their cultural and religious is interlinked with this wetlands area from the protection of their family and purity of Maipokhari.

## **6.2 Conclusion**

Maipokhari has very picturesque mixing with biological richness and cultural importance. The socio-economic situation of the area is good and ranks above average of many rural areas in Nepal. The people of the area are more interested in development and conservation of wetland and pristine beauty. The increasing trend of involving people at every step of conservation builds an environment for better ownership, responsibility and accountability. Maipokhari wetland area offers as high value of bio-assets with high potential place in terms of the natural, cultural and scenic attributes. Cultural and religious practices are the backbone of wetland and biodiversity conservation. All the religious practices are beneficial for the conservational activities in this area. Growing awareness of people indicates the positive factor for wetland and biodiversity conservation.

Economic factor is source of motivation factor for conservation. As their motive is guided by economic factor they would not destroy its cultural and religious significance. Established cultural and religious norms and values reinforce in its biodiversity conservation. From this we can say that cultural and religious insights are not only the way but also the means of conservation of wetland and biodiversity in this area. Finally, researcher concluded that the local community can play a role as an alternative means of wetlands and biodiversity conservation.

## **6.3 The Way Forward**

The wetland conservation program of Governments of Nepal does not encompass the objective of biodiversity conservation. However, there exists a high possibility within it, particularly in the Mid Hills regions of Nepal. After completing this thesis research, this researcher made up his mind suggest following way forward to policy makers, implementers and the users of wetland and biodiversity conservation program.



- There is urgent need to design and apply a methodology for rapidly estimating wetland and biodiversity condition in order to monitor the impacts of wetland and biodiversity conservation program.
- Existing local and traditional institutions, cultural and religious practices, which are functional in wetland and forest management system, must be incorporated in wetland and biodiversity conservation program instead of replacing them.
- Wetland conservation policy and forest conservation policy should be formulated with addressing common agenda because most of the wetlands areas are located with attachment to forest.
- The biological diversity of Maipokhari is locally, nationally and globally significant in both flora and fauna. So, this place should be declared as a live museum of wetland and biodiversity hotspot.
- Efforts should be made to develop trained and skilled manpower at local level in order to provide efficient knowledge of management and importance of wetland and biodiversity for well conservation of wetland and biodiversity.

## References cited

- Amando S. Tolentino, Jr. 1994 Necessary Legislation in Local People /Community Participation in Biodiversity Conservation, Seminar Paper, Ramsar Center Japan (148-153).
- Belbase, Narayan and L B Thapa 2008 Legislative and Policy Measures for Conservation of wetlands Opportunities and Challenges, Bishnu B. Bhandari, Seungh Oh suh and Sung- Hong Woo, Water Tower of Asia: *Experiences in Wetland Conservation in Nepal*, Nepal, IUCN-Nepal and Gyeongnam Ramsar Environmental Foundation South Korea (115-137).
- Bhandari, Bishnu B.1994 Wetland biodiversity in Nepal: A Case Study from Koshi Tappu Wildlife Reserve, Public Awareness of Biodiversity in Wetland in Asia *Experiences in Wetland Conservation in Nepal*, Nepal, IUCN-Nepal and Gyeongnam Ramsar Environmental Foundation South Korea (50-64).
- ... 2003 Community-based Educational Package, Bhandari, Bishnu B., Osamu Abe, *ET all*, Doing Education at Wetland Sites, IGES Japan (115-132).
- ... 2006 Wetlands: The Interface of Nature and Culture, Bhandari, Bishnu B., Wetlands and Culture; *The Proceedings of the Seminar on Cultural Aspects of Nepal's Wetlands*, Nepal, Forum for Ecosystem Management (6-12).
- ... 2009, Wise Use of Wetlands in Nepal, Mr R. Shakya, B. N. Oli ... (ed), Banko Jankari (Wetland Special Issue, Department of Forest Research and Survey of Nepal (10-17).

- Biodiversity Profiles Project, Nepal, 1995, *Biodiversity profile of Midhills Physiographic Zone*, Technical Publication No. 16, His Majesty's Government of Nepal / Governments of Netherlands.
- Blaikie, Piers and Sally Jeanrenaud, 1993, *Biodiversity and Human Welfare*, Compile of ANRM (189-195).
- Chaudary, R. P. 1998 *Biodiversity in Nepal (Status and Conservation)*, Sharanpur (U. p.), 1998, India and Tecpress (13-27).
- Chhetri, R. B. 1997 *Community Forestry and Biodiversity: A Review* (in press)
- Gadgil, M. 1993 *Biodiversity and Indian's degraded Lands*. *Ambio* 22(2-3): 167-172)
- Ghai, Dharma, 1993 *Environment, livelihood and Empowerment*, Dharma Ghai, Development and Empowerment, Oxford Blackwell Publishers America (1-10).
- Ghimire, Krishna B. and Michel Pimbert, 1993 *Social Change and Conservation: An Overview of Issues and Concepts*, Compile of ANRM (178-188).
- Gopal, Brij, Rajendra Shilpakar and Eklabya Sharma, 2010, *Function and Services of Wetlands in the Eastern Himalayas: Impacts of Climate Change-Technical Report 3*, ICIMOD and MacArther Foundation (1-18).
- Gurung, J. D. 1997 *Gender Dimension in Biodiversity Management in Nepal*, A Seminar Paper.

IUCN, 2004 A Review of the Status and Threats to Wetlands in Nepal (BLUE SERIES)

Inskipp, C., 1992; Biodiversity, Data Support for Education Sheet No. 25, WWF-UK Cited in *Biodiversity and Human Welfare*, Discussion Paper, United Nations Research Institute for Social Development (UNRISD), 1996.

Karki, Jhamak B. 2006 Sacred High Altitude Wetlands of Protected Areas, Bhandari, Bishnu B., *Wetlands and Culture: The Proceedings of the Seminar on Cultural Aspects of Nepal's Wetlands*, Nepal, Forum for Ecosystem Management (73-79).

Kerlinger, F. N., 1995 *Foundation of Behavioral Research*, 3rd edition, New Delhi.

Muchena, Olivia N. and Eric Vanek, 1995, *From Ecology through Economics to Ethno science: Changing Perceptions on Natural Resource Management*, *Compile of ANRM* (130-132).

Poudel, B.S. 2009, *Wetland Conservation in Nepal: Policies, Practices, Problems and Possibilities*, *Banko Jankari (Wetland Special Issue)*, Department of Forest Research and Survey of Nepal (5-8).

Poudyal, Dr Beena. 2006 *Wetlands in Hindu Religion and Culture*, Bhandari, Bishnu B., *Wetlands and Culture: The Proceedings of the Seminar on Cultural Aspects of Nepal's Wetlands*, Nepal, Forum for Ecosystem Management (41-45).

Rai, Kamal 2006 *Bio-cultural and Spiritual Values of Ilam's Wetlands*, Bhandari, Bishnu B., *Wetlands and Culture: The Proceedings of the*

*Seminar on Cultural Aspects of Nepal's Wetlands*, Nepal, Forum for Ecosystem Management (56-62)

Rajaure, D. P. 2006 Wetlands and Culture in Dang, Bhandari, Bishnu B., *Wetlands and Culture: The Proceedings of the Seminar on Cultural Aspects of Nepal's Wetlands*, Nepal, Forum for Ecosystem Management (18-22).

... 2008, Wetlands and Tharus of Nepal: Case Study of a Sustenance Relationship between Man and wetlands, Bishnu B. Bhandari, Seungh Oh Shuh and Sung-Hoon Woo, *Water Tower of Asia: Experiences in Wetland Conservation in Nepal*, Nepal, IUCN-Nepal and Gyeongnam Ramsar Environmental Foundation South Korea (54-58).

Sharma, Dilliram 2007, *Himalayan Wetlands: Religious and Cultural Values*, Bishnu B. Bhandari and Prof. Gea Jee Joo(ed.), *Himalayan Wetlands: Risks, Challenges and Opportunities* Nepal Wetland Society, IUCN, Pusan National University, Ramsar Wetlands Center Japan and Korea (65-70).

Sharma, Sunil kumar 1997, *A Sociological Study of Biodiversity Conservation: Perception, Attitude and Practices among Selected Forest User Group in Kabrepalanchok District*, Unpublished, Tribhuvan University Nepal (12-280).

Shengji, P., 1996, *Indigenous Knowledge of Mountain People and Conservation of Biodiversity in the Mountain Ecosystems in Environment and Biodiversity in the context of South –Asia*, Ecological Society (ECOS), Nepal.

- Sherpa, Mingma Narbu, 2008, Transboundary Wetland Management from Indigenous Perspective: Case Studies from Nepal and China, Bishnu B. Bhandari, Seungh Oh Shuh and Sung-Hoon Woo, Water Tower of Asia: *Experiences in Wetland Conservation in Nepal*, Nepal, IUCN-Nepal and Gyeongnam Ramsar Environmental Foundation South Korea (35-39).
- Shrestha, Tirtha B. 2009 Nepal: Nakhuleka Pataharu (in Nepali), Himal Books (113-179).
- Sponsel, Leslie E. and Poranee Natadecha-Sponsel, 1993 The Potential Contribution of Buddhism in Developing a Environmental Ethnic for The conservation of Biodiversity, Larence S. Hamilton (ed.), *Ethnics, Religion and Biodiversity: Relations Between Conservation and Cultural Values*. Cambridge: The White Horse press, PP (75-97).
- Thapa, I. and B R Dahal, 2009, Sustainable Wetland Management for Wildlife and People at Koshitappu Wild life Reserve, Mr R. Shakya, B. N. Oli ... (ed), Banko Jankari (Wetland Special Issue, Department of Forest Research and Survey of Nepal (36-39).

**Annex 1**  
**Questionnaire of Household Survey**

Name of household head:-

Name of the respondent:

Cluster:

Date of Interview:

Interview No:

Village /Ward:

***a. General information of the respondent***

a.1. Gender: - Male [  ] Female [  ]

a. 2. Caste/Ethnicity:

a. 3. Age (in year):

a. 4. Education

(  ) Illiterate (  ) Only literate (  ) <SLC (  ) >SLC

If other.....

a. 5. Native language: speak [  ] don't speak [  ]

a.5 marital status: (  ) Married (  ) Unmarried (  ) Widow

***b. Household information of respondent***

b.1 since when you have been living in this place?

.....

b. 2. Household size (No).....Male .....Female..... Children.....

b. 3. Family type

(  ) Nuclear (  ) Joint (  ) Extended

b. 4. Major occupation.....

b. 5. Land holdings (unit):.....

**c. Socio-Economic information**

c.1. Monthly income

Income/month	Tick in one
5000-8000	
8000-11000	
11000-14000	
14000 above	

c. 2. Annual Expenditure (Rs.)

Items	In Percentage
Food items	
Household goods	
Children 's Education	
Health	
Total	

c. 3. Do you earn money from tourism?  Yes  No

c. 4. If yes, can you give me detail about it?

**d. wetlands and Community**

d.1 Do you know what is wetland?

yes  No

d.2. Is it necessary to conserve the wetland and its biodiversity?

yes  No, if yes why is it necessary

d.3. Perception on the wetland and biodiversity?

Very positive  Positive  Negative  Very negative



d.4. can you tell me what kind of benefit is taking from wetlands?

d. 5 What are the major factors for wetlands and its biodiversity losses?

Cultural  Environment

Economic  Political

If other, specify .....

d. 7. Have you noticed any changes in the biodiversity (loss of local species) in recent time?

yes  No, if yes which local species are lost:

.....

d. 8. Is there any species in your locality which is causing the problem due to the loss of wetland?

yes  No, if yes name the species:

.....

.....

d.10. How can we preserve Maipokhari?

d. 11. What attempts you did to conserve Maipokhari?

***e. Local management practices in the conservation of wetlands***

e. 1. Are you involved in any institutions for conservation of wetland?

Yes  No

e. 2. If yes, which kinds of institution are you involved?

Traditional  community user group

If other, specify.....

e. 3. Which is the effective management practice for wetland and its biodiversity conservation?

( ) Traditional                      ( ) community user group

If other, specify.....

e. 4. Can you tell me why do you think a traditional/community management practice is better than other?

e.5. Can you give me information that you are working in conservation?

## Annex - 2

### *Focus Group Checklists*

1. What do you know about wetlands?
2. How is important for wetlands and biodiversity conservation for community?
3. is there any relationship between wetland and culture?
4. How does community influence wetlands and biodiversity conservation?
4. What is the relation between community and wetlands?
5. What are the main causes of biodiversity losses?
6. What is your opinion towards conservation of wetlands and its biodiversity?
8. What is your attitude towards conservation of Maipokhari wetlands?
9. What is your attitude towards conservation of Maipokhari wetlands?

### *Key Informants Checklists*

1. What do the wetlands mean to community?
2. What does the community understand about wetlands and biodiversity conservation?
3. What is the perception and attitude towards wetlands and biodiversity conservations?
4. What values does the community perceive about wetlands and its biodiversity for themselves?
5. Is there any change on wetland and biodiversity conservation patterns?
6. What sort of cultural connection lies between your community and Mai Pokhari?
7. What are the changes that you have been marking regarding Mai pokhari since the past ten years?
8. What can be the ways to be taken up to preserve wetland and biodiversity of this area?

### Annex 3

#### Nationally and globally significant flora of Mai Pokhari wetland area

Family	Genus	Species	Local Name	Nepal Government Protected	IUCN	CITES
MAGNOLIACEAE	<i>Magnolia</i>	<i>campbellii</i>	Ghoge Champ			II
MAGNOLIACEAE	<i>Michelia</i>	<i>doltsopa</i>	Seto Champ			II
MAGNOLIACEAE	<i>Michelia</i>	<i>velutina</i>	Gogai Champ			II
ORCHIDACEAE	<i>Calanthe</i>	<i>brevicornu</i>				II
ORCHIDACEAE	<i>Calanthe</i>	<i>plantaginea</i>				II
ORCHIDACEAE	<i>Cymbidium</i>	<i>iridioides</i>				II
ORCHIDACEAE	<i>Cymbidium</i>	<i>longifolium</i>				II
ORCHIDACEAE	<i>Dendrobium</i>	<i>aphyllum</i>				II
ORCHIDACEAE	<i>Dendrobium</i>	<i>longicornu</i>				II
ORCHIDACEAE	<i>Pleione</i>	<i>hookeriana</i>				II
ORCHIDACEAE	<i>Vandopsis</i>	<i>undulata</i>				II
PINACEAE	<i>Pinus</i>	<i>Wallichiana</i>	Salla		LC	II
TAXACEAE	<i>Taxus</i>	<i>baccata</i>	Loth Salla	Yes	DD	II

#### Nationally and globally significant fauna of Mai Pokhari wetland area

Group	Genus	Species	English name	Nepal Government Protected	IUCN	CITES
Bird	<i>Spilornis</i>	<i>cheela</i>	Crested Serpent Eagle		LC	II
Bird	<i>Falco</i>	<i>tinnunculus</i>	Common Kestrel		LC	II
Bird	<i>Leiothrix</i>	<i>lutea</i>	Red-billed Leiothrix		LC	II
Mammal	<i>Canis</i>	<i>aureus</i>	Golden Jackal		LC	III
Mammal	<i>Macaca</i>	<i>Mulatta</i>	Rhesus Macaque		NT	II
Mammal	<i>Felis</i>	<i>Chaus</i>	Jungle Cat		LC	II
Mammal	<i>Herpestes</i>	<i>edwardsii</i>	Common mongoose		LC	III

#### List of Non-flowering plants recorded in Mai Pokhari wetland area

Family	Genus	Species
SPHAGNACEAE	<i>Sphagnum</i>	<i>nepalense</i>
BOTRYCHIACEAE	<i>Botrychium</i>	<i>multifidum</i>
DAVALLIACEAE	<i>Leucostegia</i>	<i>immersa</i>
GLEICHNENIACEAE	<i>Gleichenia</i>	<i>gigantea</i>
LYCOPODIACEAE	<i>Lycopodiella</i>	<i>cernua</i>
LYCOPODIACEAE	<i>Lycopodium</i>	<i>japonicum</i>
POLYPODIACEAE	<i>Arthromeris</i>	<i>wallichiana</i>
POLYPODIACEAE	<i>Goniophlebium</i>	<i>argutum</i>
POLYPODIACEAE	<i>Lepisorus</i>	<i>loriformis</i>
POLYPODIACEAE	<i>Lepisorus</i>	<i>nudus</i>
PTERIDACEAE	<i>Pteris</i>	<i>biaurita</i>
PTERIDACEAE	<i>Pteris</i>	<i>wallichiana</i>

**List of flowering plants recorded in Mai Pokhari wetland area**

<b>Family</b>	<b>Genus</b>	<b>Species</b>
ACANTHACEAE	<i>Dicliptera</i>	<i>bupleuroides</i>
ACANTHACEAE	<i>Hypoestes</i>	<i>triflora</i>
ACANTHACEAE	<i>Justicia</i>	<i>procumbens</i>
ACANTHACEAE	<i>Thunbergia</i>	<i>coccinea</i>
ACERACEAE	<i>Acer</i>	<i>sikkimense</i>
AMARANTHACEAE	<i>Cyathula</i>	<i>capitata</i>
ANACARDIACEAE	<i>Dobinea</i>	<i>vulgaris</i>
ANACARDIACEAE	<i>Rhus</i>	<i>succedanea</i>
AQUIFOLIACEAE	<i>Ilex</i>	<i>diphyrena</i>
ARACEAE	<i>Arisaema</i>	<i>consanguineum</i>
ARACEAE	<i>Arisaema</i>	<i>costatum</i>
ARACEAE	<i>Arisaema</i>	<i>erubescens</i>
ARACEAE	<i>Arisaema</i>	<i>tortuosum</i>
ARALIACEAE	<i>Hedera</i>	<i>nepalensis</i>
ARALIACEAE	<i>Panax</i>	<i>pseudoginseng</i>
ARALIACEAE	<i>Schefflera</i>	<i>impressa</i>
ASCLEPIADACEAE	<i>Ceropegia</i>	<i>hookeri</i>
ASCLEPIADACEAE	<i>Ceropegia</i>	<i>pubescens</i>
BALANOPHORACEAE	<i>Balanophora</i>	<i>involucrata</i>
BALSAMINACEAE	<i>Impatiens</i>	<i>graciliflora</i>
BALSAMINACEAE	<i>Impatiens</i>	<i>racemosa</i>
BEGONIACEAE	<i>Begonia</i>	<i>megaptera</i>
BERBERIDACEAE	<i>Berberis</i>	<i>aristata</i>
BERBERIDACEAE	<i>Berberis</i>	<i>chitria</i>
BERBERIDACEAE	<i>Mahonia</i>	<i>napaulensis</i>
BETULACEAE	<i>Alnus</i>	<i>nepalensis</i>
BETULACEAE	<i>Betula</i>	<i>utilis</i>
CAMPANULACEAE	<i>Campanula</i>	<i>pallida</i>
CAMPANULACEAE	<i>Codonopsis</i>	<i>convolvulacea</i>
CAMPANULACEAE	<i>Codonopsis</i>	<i>viridis</i>
CAPRIFOLIACEAE	<i>Lonicera</i>	<i>glabrata</i>
CARYOPHYLLACEAE	<i>Drymaria</i>	<i>diandra</i>
COMMELINACEAE	<i>Amischophacelus</i>	<i>axillaris</i>
COMMELINACEAE	<i>Streptolirion</i>	<i>volubile</i>
COMPOSITAE	<i>Adenostemma</i>	<i>lavenia</i>
COMPOSITAE	<i>Ageratina</i>	<i>adenophora</i>
COMPOSITAE	<i>Ainsliaea</i>	<i>latifolia</i>
COMPOSITAE	<i>Anaphalis</i>	<i>contorta</i>
COMPOSITAE	<i>Anaphalis</i>	<i>margaritacea</i>
COMPOSITAE	<i>Artemisia</i>	<i>dubia</i>
COMPOSITAE	<i>Aster</i>	<i>tricephalus</i>
COMPOSITAE	<i>Bidens</i>	<i>bipinnata</i>
COMPOSITAE	<i>Conyza</i>	<i>stricta</i>
COMPOSITAE	<i>Erigeron</i>	<i>bellidioides</i>
COMPOSITAE	<i>Galinsoga</i>	<i>parviflora</i>

Family	Genus	Species
COMPOSITAE	<i>Gnaphalium</i>	<i>affine</i>
COMPOSITAE	<i>Lactuca</i>	<i>glaucifolia</i>
COMPOSITAE	<i>Senecio</i>	<i>scandens</i>
COMPOSITAE	<i>Siegesbeckia</i>	<i>orientalis</i>
COMPOSITAE	<i>Spilanthes</i>	<i>calva</i>
CRUCIFERAE	<i>Pycnoplenthopsis</i>	<i>bhutanica</i>
CRUCIFERAE	<i>Rorippa</i>	<i>nasturtium-aquaticum</i>
CUCURBITACEAE	<i>Edgaria</i>	<i>darjeelingensis</i>
CYPERACEAE	<i>Bulbostylis</i>	<i>densa</i>
CYPERACEAE	<i>Carex</i>	<i>filicina</i>
CYPERACEAE	<i>Pycreus</i>	<i>sanguinolentus</i>
ERICACEAE	<i>Agapetes</i>	<i>incurvata</i>
ERICACEAE	<i>Agapetes</i>	<i>serpens</i>
ERICACEAE	<i>Gaultheria</i>	<i>nummularioides</i>
ERICACEAE	<i>Lyonia</i>	<i>ovalifolia</i>
ERICACEAE	<i>Rhododendron</i>	<i>arboreum</i>
ERICACEAE	<i>Rhododendron</i>	<i>campanulatum</i>
ERICACEAE	<i>Rhododendron</i>	<i>cinnabarinum</i>
ERICACEAE	<i>Rhododendron</i>	<i>dalhousiae</i>
ERICACEAE	<i>Rhododendron</i>	<i>triflorum</i>
ERICACEAE	<i>Vaccinium</i>	<i>gaultheriifolium</i>
ERICACEAE	<i>Vaccinium</i>	<i>retusum</i>
ERICACEAE	<i>Vaccinium</i>	<i>vacciniaceum</i>
EUPHORBIACEAE	<i>Baliospermum</i>	<i>corymbiferum</i>
EUPHORBIACEAE	<i>Macaranga</i>	<i>pustulata</i>
FAGACEAE	<i>Castanopsis</i>	<i>hystrix</i>
FAGACEAE	<i>Lithocarpus</i>	<i>pachyphylla</i>
FAGACEAE	<i>Quercus</i>	<i>glauca</i>
FAGACEAE	<i>Quercus</i>	<i>lamellosa</i>
GENTIANACEAE	<i>Gentiana</i>	<i>pedicellata</i>
GENTIANACEAE	<i>Swertia</i>	<i>angustifolia</i>
GENTIANACEAE	<i>Swertia</i>	<i>bimaculata</i>
GENTIANACEAE	<i>Swertia</i>	<i>chirayita</i>
GESNERIACEAE	<i>Didymocarpus</i>	<i>primulifolius</i>
GRAMINEAE	<i>Arthraxon</i>	<i>lancifolius</i>
GRAMINEAE	<i>Arundinaria</i>	<i>falcata</i>
GRAMINEAE	<i>Arundinaria</i>	<i>maling</i>
GRAMINEAE	<i>Bothriochloa</i>	<i>intermedia</i>
GRAMINEAE	<i>Capillipedium</i>	<i>assimile</i>
GRAMINEAE	<i>Cyrtococcum</i>	<i>accrescens</i>
GRAMINEAE	<i>Dactylis</i>	<i>Sps</i>
GRAMINEAE	<i>Eragrostis</i>	<i>nigra</i>
GRAMINEAE	<i>Erianthus</i>	<i>ravennae</i>
GRAMINEAE	<i>Imperata</i>	<i>cylindrica</i>
GRAMINEAE	<i>Microstegium</i>	<i>ciliatum</i>
GRAMINEAE	<i>Setaria</i>	<i>geniculata</i>
GRAMINEAE	<i>Sporobolus</i>	<i>fertilis</i>
GRAMINEAE	<i>Thysanolaena</i>	<i>maxima</i>

<b>Family</b>	<b>Genus</b>	<b>Species</b>
HAMAMELIDACEAE	<i>Exbucklandia</i>	<i>populnea</i>
HYDRANGEACEAE	<i>Dichroa</i>	<i>febrifuga</i>
HYDRANGEACEAE	<i>Hydrangea</i>	<i>robusta</i>
HYPERICACEAE	<i>Hypericum</i>	<i>choisianum</i>
HYPERICACEAE	<i>Hypericum</i>	<i>uralum</i>
JUNCACEAE	<i>Juncus</i>	<i>prismatocarpus</i>
LABIATAE	<i>Clinopodium</i>	<i>umbrosum</i>
LABIATAE	<i>Elsholtzia</i>	<i>flava</i>
LABIATAE	<i>Elsholtzia</i>	<i>strobilifera</i>
LABIATAE	<i>Leucosceptum</i>	<i>canum</i>
LABIATAE	<i>Melissa</i>	<i>axillaris</i>
LABIATAE	<i>Notochaete</i>	<i>hamosa</i>
LARDIZABALACEAE	<i>Holboellia</i>	<i>latifolia</i>
LAURACEAE	<i>Lindera</i>	<i>neesiana</i>
LAURACEAE	<i>Lindera</i>	<i>pulcherrima</i>
LAURACEAE	<i>Persea</i>	<i>clarkeana</i>
LEGUMINOSAE	<i>Erythrina</i>	<i>arborescens</i>
LEGUMINOSAE	<i>Parochetus</i>	<i>communis</i>
LEGUMINOSAE	<i>Piptanthus</i>	<i>nepalensis</i>
LILIACEAE	<i>Cardiocrinum</i>	<i>giganteum</i>
LILIACEAE	<i>Chlorophytum</i>	<i>nepalense</i>
LILIACEAE	<i>Hemerocallis</i>	<i>fulva</i>
LILIACEAE	<i>Lilium</i>	<i>wallichianum</i>
LILIACEAE	<i>Paris</i>	<i>polyphylla</i>
LILIACEAE	<i>Polygonatum</i>	<i>oppositifolium</i>
LILIACEAE	<i>Smilacina</i>	<i>oleracea</i>
LILIACEAE	<i>Smilax</i>	<i>lanceifolia</i>
LILIACEAE	<i>Smilax</i>	<i>menispermoidea</i>
LILIACEAE	<i>Smilax</i>	<i>rigida</i>
LOGANIACEAE	<i>Buddleja</i>	<i>asiatica</i>
LORANTHACEAE	<i>Scurrula</i>	<i>elata</i>
MAGNOLIACEAE	<i>Magnolia</i>	<i>campbellii</i>
MAGNOLIACEAE	<i>Michelia</i>	<i>doltsopa</i>
MAGNOLIACEAE	<i>Michelia</i>	<i>velutina</i>
MELASTOMATAACEAE	<i>Osbeckia</i>	<i>stellata</i>
MELASTOMATAACEAE	<i>Sarcopyramis</i>	<i>napalensis</i>
MORACEAE	<i>Ficus</i>	<i>neriifolia</i>
MYRSINACEAE	<i>Maesa</i>	<i>chisia</i>
NYMPHAEACEAE	<i>Nymphaea</i>	<i>stellata</i>
OLEACEAE	<i>Jasminum</i>	<i>dispermum</i>
ORCHIDACEAE	<i>Arundina</i>	<i>graminifolia</i>
ORCHIDACEAE	<i>Calanthe</i>	<i>brevicornu</i>
ORCHIDACEAE	<i>Calanthe</i>	<i>plantaginea</i>
ORCHIDACEAE	<i>Calanthe</i>	<i>tricarinata</i>
ORCHIDACEAE	<i>Coelogyne</i>	<i>corymbosa</i>
ORCHIDACEAE	<i>Coelogyne</i>	<i>crinata</i>
ORCHIDACEAE	<i>Cymbidium</i>	<i>iridioides</i>
ORCHIDACEAE	<i>Cymbidium</i>	<i>longifolium</i>

<b>Family</b>	<b>Genus</b>	<b>Species</b>
ORCHIDACEAE	<i>Dendrobium</i>	<i>aphyllum</i>
ORCHIDACEAE	<i>Dendrobium</i>	<i>longicornu</i>
ORCHIDACEAE	<i>Epigenium</i>	<i>rotundatum</i>
ORCHIDACEAE	<i>Eria</i>	<i>musicola</i>
ORCHIDACEAE	<i>Eulophia</i>	<i>herbacea</i>
ORCHIDACEAE	<i>Habenaria</i>	<i>pectinata</i>
ORCHIDACEAE	<i>Pleione</i>	<i>hookeriana</i>
ORCHIDACEAE	<i>Spiranthes</i>	<i>sinensis</i>
ORCHIDACEAE	<i>Vandopsis</i>	<i>undulata</i>
OXALIDACEAE	<i>Oxalis</i>	<i>corniculata</i>
PHYTOLACCACEAE	<i>Phytolacca</i>	<i>acinosa</i>
PINACEAE	<i>Pinus</i>	<i>roxburghii</i>
PINACEAE	<i>Pinus</i>	<i>wallichiana</i>
PLANTAGINACEAE	<i>Plantago</i>	<i>erosa</i>
PLANTAGINACEAE	<i>Plantago</i>	<i>major</i>
POLYGONACEAE	<i>Aconogonum</i>	<i>molle</i>
POLYGONACEAE	<i>Persicaria</i>	<i>chinensis</i>
POLYGONACEAE	<i>Persicaria</i>	<i>hydropiper</i>
POLYGONACEAE	<i>Persicaria</i>	<i>nepalensis</i>
POLYGONACEAE	<i>Persicaria</i>	<i>runcinata</i>
POLYGONACEAE	<i>Rumex</i>	<i>nepalensis</i>
RANUNCULACEAE	<i>Clematis</i>	<i>acuminata</i>
RANUNCULACEAE	<i>Clematis</i>	<i>buchananiana</i>
RANUNCULACEAE	<i>Ranunculus</i>	<i>hirtellus</i>
ROSACEAE	<i>Duchesnea</i>	<i>indica</i>
ROSACEAE	<i>Fragaria</i>	<i>nubicola</i>
ROSACEAE	<i>Potentilla</i>	<i>fulgens</i>
ROSACEAE	<i>Potentilla</i>	<i>kleiniana</i>
ROSACEAE	<i>Prunus</i>	<i>cerasoides</i>
ROSACEAE	<i>Rosa</i>	<i>sericea</i>
ROSACEAE	<i>Rubus</i>	<i>acuminatus</i>
ROSACEAE	<i>Rubus</i>	<i>biflorus</i>
ROSACEAE	<i>Rubus</i>	<i>calycinus</i>
ROSACEAE	<i>Rubus</i>	<i>ellipticus</i>
ROSACEAE	<i>Rubus</i>	<i>paniculatus</i>
ROSACEAE	<i>Rubus</i>	<i>rugosus</i>
ROSACEAE	<i>Rubus</i>	<i>treutleri</i>
ROSACEAE	<i>Spiraea</i>	<i>arcuata</i>
RUBIACEAE	<i>Galium</i>	<i>aparine</i>
RUBIACEAE	<i>Luculia</i>	<i>gratisissima</i>
RUBIACEAE	<i>Rubia</i>	<i>manjith</i>
RUTACEAE	<i>Euodia</i>	<i>fraxinifolia</i>
RUTACEAE	<i>Zanthoxylum</i>	<i>acanthopodium</i>
SAMBUCACEAE	<i>Viburnum</i>	<i>cylindricum</i>
SAMBUCACEAE	<i>Viburnum</i>	<i>erubescens</i>
SAURAUICEAE	<i>Saurauia</i>	<i>napaulensis</i>
SAXIFRAGACEAE	<i>Astilbe</i>	<i>rivularis</i>
SAXIFRAGACEAE	<i>Bergenia</i>	<i>ciliata</i>



<b>Family</b>	<b>Genus</b>	<b>Species</b>
SAXIFRAGACEAE	<i>Saxifraga</i>	<i>Sps</i>
SCHISANDRACEAE	<i>Schisandra</i>	<i>grandiflora</i>
SCROPHULARIACEAE	<i>Hemiphragma</i>	<i>heterophyllum</i>
SCROPHULARIACEAE	<i>Mimulus</i>	<i>nepalensis</i>
SCROPHULARIACEAE	<i>Torenia</i>	<i>cordifolia</i>
SOLANACEAE	<i>Cestrum</i>	<i>elegans</i>
SOLANACEAE	<i>Nicotiana</i>	<i>tabacum</i>
SYMPLOCACEAE	<i>Symplocos</i>	<i>ramosissima</i>
TAXACEAE	<i>Taxus</i>	<i>baccata</i>
TAXODIACEAE	<i>Cryptomeria</i>	<i>japonica</i>
THEACEAE	<i>Camellia</i>	<i>sinensis</i>
THEACEAE	<i>Eurya</i>	<i>cerasifolia</i>
THYMELAEACEAE	<i>Daphne</i>	<i>bholua</i>
THYMELAEACEAE	<i>Edgeworthia</i>	<i>gardneri</i>
UMBELLIFERAE	<i>Heracleum</i>	<i>nepalense</i>
UMBELLIFERAE	<i>Hydrocotyle</i>	<i>himalaica</i>
UMBELLIFERAE	<i>Oenanthe</i>	<i>thomsonii</i>
UMBELLIFERAE	<i>Selinum</i>	<i>wallichianum</i>
URTICACEAE	<i>Boehmeria</i>	<i>clidemioides</i>
URTICACEAE	<i>Chamabainia</i>	<i>cuspidata</i>
URTICACEAE	<i>Gonostegia</i>	<i>Hirta</i>
URTICACEAE	<i>Lecanthus</i>	<i>peduncularis</i>
URTICACEAE	<i>Urtica</i>	<i>dioica</i>
VALERIANACEAE	<i>Valeriana</i>	<i>hardwickii</i>
VIOLACEAE	<i>Viola</i>	<i>hamiltoniana</i>
VITACEAE	<i>Tetrastigma</i>	<i>serrulatum</i>
ZINGIBERACEAE	<i>Cautleya</i>	<i>gracilis</i>
ZINGIBERACEAE	<i>Roscoea</i>	<i>purpurea</i>

Available for download from: [http://www.ramsar.org/ris/key\\_ris\\_index.htm](http://www.ramsar.org/ris/key_ris_index.htm)

**Annex 3**  
**Some photos of Maipokhari**



**Maipokhari**



**Dense forest on the vicinity of Maipokhari**





**Small Pokhari near Maipokhari**



**Researcher in Field Visit**