

CHAPTER ONE

INTRODUCTION

1.1 Background

1.1.1 Tourism

Today, tourism has become an important activity for mankind due to the demand for leisure time and recreation. Tourism, being a wide-ranging activity can be defined as the relationship between leisure travel and recreational activities. Tourism is a multidisciplinary activity; it not only consists of leisure activities it is rather extended to the research, trade, education, medicine, sports, agriculture, forests etc. According to WTO, tourism is one of the most important economic, social, cultural and political phenomena of the 20th century (Nepal, 2002).

Tourism is one of the fastest growing industries as well as the major source of foreign exchange earning and employment for many developing countries and nowadays it is increasingly focusing on natural environment. Tourism activity in an area offers the economic development and increase in other related social and environmental activities. Besides the mass tourism the well managed small tourism activities like rural tourism can also be helpful for the poor people in rural communities.

Tourism is one of the largest industries in the world economy today and it is one of the top five exports for 83% of countries and the main source of foreign currency for at least 38% of countries. The WTO predicts that by the year 2010 international tourism will contribute 11.6% to the global gross domestic product (Wood, 2002).

1.1.2 Tourism trends in Nepal

Nepal is a land of scenery with some of the world's best trails on earth. The scenic beauty of Nepal is complemented by the richness of flora and fauna. Nepal has an unequal ecological and natural environmental variations ranging from the high mountains to lowland Terai, for exploring richness in biological and cultural diversity.

Tourism is a good option for uplifting the economic condition of a developing country like Nepal. Ageless traditions, festivals and shrine like everlasting mountains make Nepal a living museum, a tourist's paradise (Nepal Traveler, 2005). The natural landscapes of Nepal, majestic mountains, rivers, glacial lakes, forests and wild animals are major resources for its tourism industry (Nepal, 2002). There are very few comparable somewhere else in the world where one finds such a great physical, cultural and biological diversity within such a small area as in Nepal. It is this unique diversity, which has attracted people around the globe to Nepal.

Tourism, in context of Nepal, has been recognized as the second major potential industry in the country. The development of the tourism is playing a key factor in the economic development and environmental conservation of Nepal. In 2003, total foreign currency earning from tourism was 190 million US dollar, which has given contribution of 2.6% of GDP to country (MOCTCA, 2004).

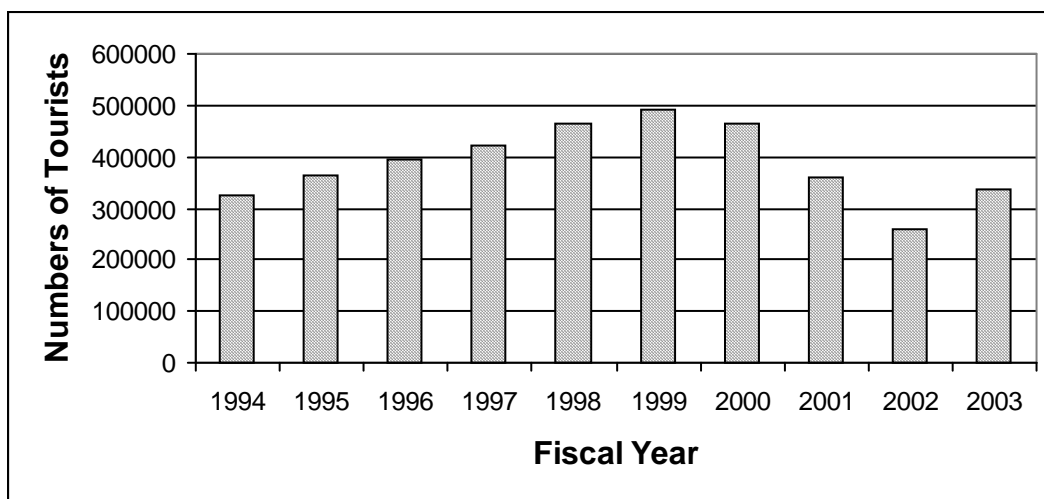


Fig. 1.1: Tourist Arrivals in Nepal (1994-2003)

Source: MOCTCA, 2003/4

In Nepal the door for tourism was opened since 1953. Tourists come to Nepal for the purpose of trekking, mountaineering and pleasure holidays. Out of the total tourist arrivals 70% of them visit the protected areas. Today, the nature of tourists has changed to visit those areas where the nature is unspoiled.

In Nepal, mountain tourism constitutes between 20-25% of total volume of tourism and provides a significant income source for numerous people living in and around popular mountain destinations such as Everest and Annapurna regions (Nepal, 1999). In recent years the nature of tourism has changed towards nature tourism.

Majority of the tourist visit Nepal with the purpose of holiday pleasure, mountaineering and trekking and visit of pilgrimage etc. Of the total arrivals in 2002, 21.5% visited Nepal for trek and mountaineering (MOTCA, 2003) and in 2003 only 19.4% came for the purpose of trekking. (MOTCA, 2004)

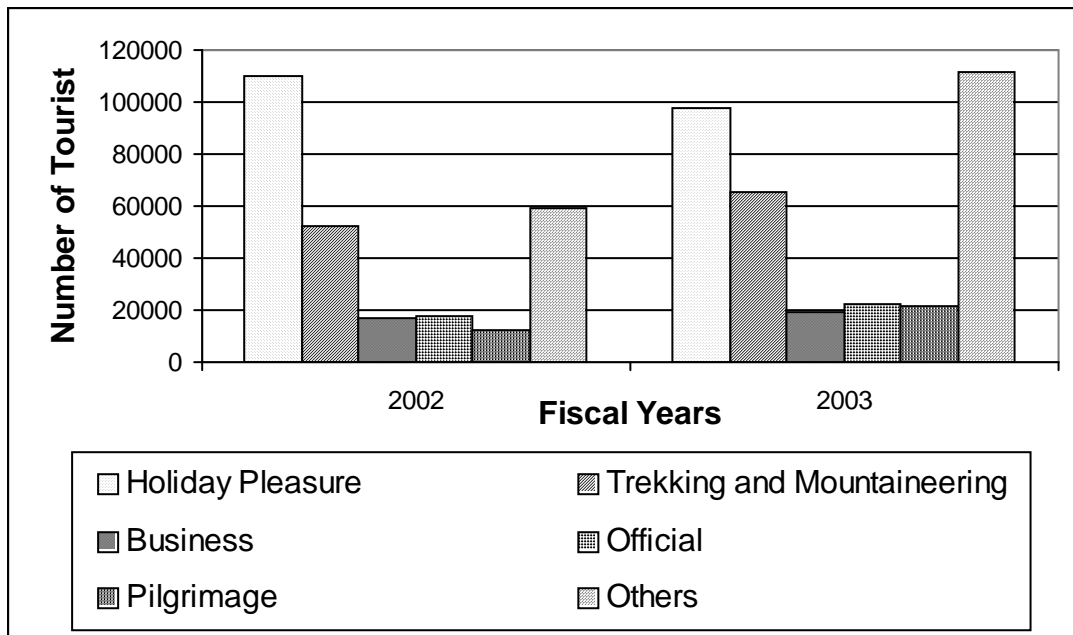


Fig. 1.2: Purpose of Visit of Tourist in Nepal

Source: MOCTCA, 2003/04

1.1.3 Ecotourism

Ecotourism, sometimes also called as nature tourism is a travel of natural attractions that contributes to the conservation, respects the integrity of local communities, ethnic groups and enhances the tourists understanding of natural attractions, its conservation and local community (Wood, 2002). The IUCN defines eco-tourism as environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature to promote conservation, has low negative visitor impact and provides for beneficially active socio-economic involvement of local populations (Ceballos-Lascurain, 1996). According to international ecotourism society (1991), ecotourism is responsible travel to natural areas that conserves the environment and sustains the well being of local people.

There are various fields incorporated in ecotourism. Among them trekking, hiking, bird watching, nature photography, wild safaris, camping, mountain

climbing, fishing, canoeing and botanical as well as the zoological studies are the most favorable aspects of ecotourism. (Jha, 1999)

The concept of ecotourism was developed since around 19th century but the popularity of ecotourism concept is considerably increasing only in recent years. During the mid 20th century, after Second World War, the activity of mass tourism started. Some of the groups at that time were concerned about the environment and those groups are considered as pioneer of ecotourism concept (Ceballos-Lascurain, 1996)

Around the globe ecotourism is quickly becoming one of the most popular forms of vacationing and comprises about 50% of the total tourist worldwide annually and the growth rate is in increasing trend. The United Nation had declared the year 2002 as the year of ecotourism (WTO, 2002).

1.1.4 Ecotourism in Nepal

Tourism in Nepal is in one or the other way related with nature and natural areas. Some estimations in various areas have shown that majority of the country's tourism market is linked with nature tourism or ecotourism. Hence, ecotourism is of crucial importance to the nation. The varied blend of natural resources and towering mountains in country helped to put Nepal among the top ten-ecotourism destinations in the world.

In Nepal, mostly the tourism concentration involves in the urban areas. Besides it, mostly tourism activities are engaged traveling to the undisturbed natural and remote rural areas of the country. The activities in such areas offer the tourists to get the opportunity to learn and experience varied socio-cultural and environmental situation. (Joshi, 2004)

Nepal is rich in different cultures and tribe. The indigenous knowledge of people about their natural environment and traditional lifestyle can be integrated through ecotourism practice to attract tourist and helps in

strengthening their cultural identity and indigenous knowledge (Chaudhary, 1998).

The nature of most of the tourism activity being practiced in Nepal makes nature tourism or ecotourism. Thus, ecotourism in context of Nepal can be defined as "Visitation to the natural areas especially the protected areas and their buffer zone with the purpose to gain knowledge regarding natural resources, watching wildlife, adventure and research and also give contribution in conservation and welfare of local communities", (MOPE, 2004).

The concept of ecotourism is new to Nepal. Now, the popularity of this concept is increasing day-by-day so, National Tourism Board (NTB) has put forwarded national ecotourism strategy. NTB has emphasized certain areas to promote ecotourism in the country. Annapurna, Manang, Jomsom, Sagarmatha region and Langtang are the prime sites for ecotourism in Nepal (NTB, 2001).

Nepal exhibits immense natural beauty. So, properly managed ecotourism practice may change status of the society. For the development of ecotourism in Nepal different strategies are implemented which has emphasis on expanding the existing spectrum of ecotourism products and services aiming for a wide range of high quality products from village tourism to world-class wildlife and premier adventure products. (NTB, 2001)

1.2 Impacts of Ecotourism

Tourism is a double-edged activity, which contributes a positive impact if proper management is done but at the same time uncontrolled or improper management can be the major cause of the environmental degradation and loss of local identity and traditional cultures (CI, 2003).

Undoubtedly, on one hand tourism is boon for the economy of country; on the other hand it will also have a lasting impact on the natural environment (Joshi, 2004). The impacts on natural environment, positive or negative, largely

depend on the management of this sector. A symbiotic relationship between tourism and environment may be established when both of them are well organized.

Each area has a certain level of carrying capacity. Negative impacts from tourism occur when the level of visitor use is greater than the environments ability to cope with this use within the acceptable limits of change (Sharma, 1995).

People living in and around the park area have to adjust to the existing environmental conditions and they are unaware of the limitations of natural environment. Changes occur in the attitude towards the human needs with time. These changes disrupt the natural environment's status. As change in the behavior of human needs with the changing modern technologies irreversibly alter the natural environment.

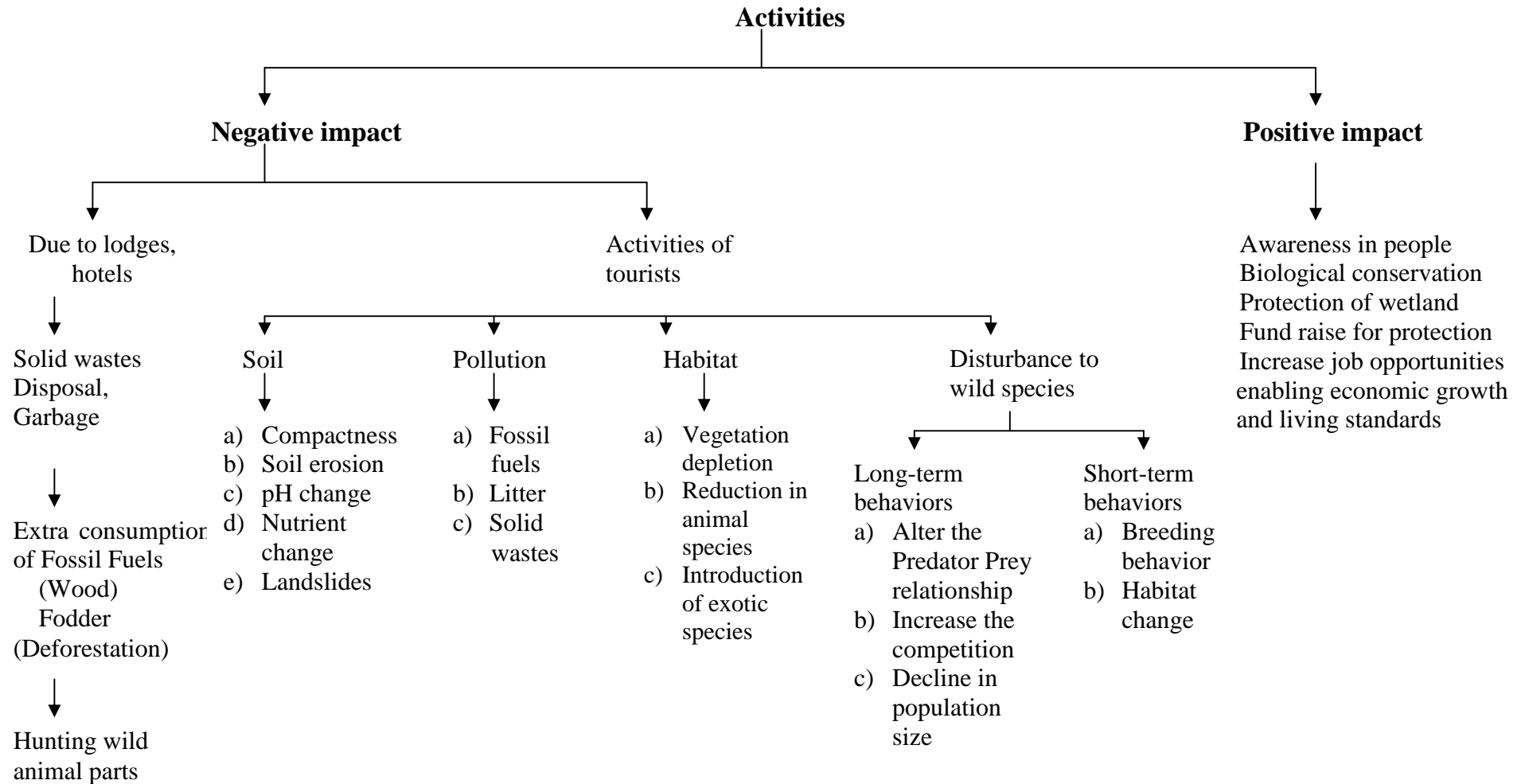
Although tourism has its share of negative environmental consequences, it also has some positive influences on natural resources (ADB, 2001). The financial contributions and revenues from the tourism activity can be invested to protection and management of the local area and a park. Tourism activity also generates employment for the local people, which help to increase the status of local people (Shrestha, 2002). The revenues generated from tourism activity can significantly contribute to protection, conservation and restoration of biological diversity, sustainable use of natural resources and community development. The locals living in and around the park can get compensation for damage by wild animals to their agricultural field. The revenue from the entry fee and taxes may be utilized for the upholding of natural environment and to lift the status of the local people (Satyal, 1988).

The negative impacts of tourism occur due to overcrowding, misuse of the natural resources and the construction of infrastructures. The negative impact may be categorized in two parts.

- a) Direct impact: by the presence of tourists
- b) Indirect impact: by building of infrastructures

Use of the natural resources, both renewable and non-renewable in the prerequisite of tourist facilities is one of the most significant direct impacts of tourism to the surrounding area (Weaver, 1998). Change in the land use system and deforestation are other severe causes in degradation of natural resources.

Fig. 1.3: Diagrammatic Representation of the Tourism Impacts



Present study site is Dhunche-Gosainkunda trek route in Langtang National Park, which is famous for its pilgrimage sites, trekking routes and indigenous tribal culture, yet unaffected by the impurities of modern world. Every year thousands of devotees visit Gosainkunda Lake. The Langtang National Park is also famous for trekking route hence many tourists come here for trekking purpose. The park also fulfills the trekking tourist needs by offering a wide area and varied altitudinal range and could be an ecotourism's spot.

1.3 Study Objectives

The main objectives of the study are: -

- 1) To study the impacts of tourism on flora, fauna and the environment of Dhunche-Gosainkunda trek route in Langtang National Park.
- 2) To analyze socio-economic and cultural impacts of tourism.
- 3) To recommend mitigation measures for sustainable tourism

1.4 Justification of the Study

Tourism activity is changing rapidly as nature heritage and recreational destinations become more important and are forced to meet tougher environmental requirements. This presents a challenge for government to develop new approaches for the tourism market. Successful ecotourism must benefit local populations economically and culturally to give them incentives to protect the natural resources which create the natural attraction. The goal of ecotourism is to play an important role in the development of nation. Country like Nepal may be the hotspot for ecotourism for its natural beauty and cultural heritage.

Nepal is gifted with immense natural and cultural heritage; hence we should focus on the development of the tourism that enhances the development of the country.

Most of the tourism activities in Nepal are concentrated in protected areas. Langtang National Park being one of the nearest National Parks in Nepal until now unaffected by the mass tourism could be developed the prominent hotspot for ecotourism.

The study of ecotourism in Langtang National Park (Dhunche-Gosainkunda area) is helpful to explore the natural and cultural heritage. This study will also focus on present status of environmental, cultural and economical impacts of tourism on study area and also the approaches towards the conservation of the natural environment.

1.5 Limitation of the Study

The study area is easily accessible, yet there are some limitations during the study period. The limitations are as follows.

- a) The increasing concern of tourists towards security condition.
- b) Literature on socio-economic aspects of ecotourism is available, however literature on ecotourism focusing its impact on natural environment is lacking.

CHAPTER TWO

LITERATURE REVIEW

In recent years the nature of tourism has changed from mass tourism towards nature tourism. People are becoming less interested in positive vacations and instead want to travel to new destinations, including exotic and natural places (Bhatta, 2000). The tourists want to visit such areas, which are unspoiled and untouched by natural degradations. Tourists want to change in their everyday way of life and wish to get special experiences, which are available in particular, places and ecotourism can be agent of change of mass tourism (Wall, 1997).

2.1 Mountain Tourism

Nepal, (2002) insists that the mountain ecotourism promotes responsible tourist behavior, conservation of important wildlife habitats and ecosystems and appreciation of the tourists towards local cultures and traditional lifestyles in provision to increase the livelihood status of people living in such communities.

Mountain ecotourism in Nepal can be a key factor in the focal concern for improvement of people's quality of life through sustainable development initiatives in economic development and environmental conservation. (Nepal, 2002)

Although, ecotourism has positive impacts, the aspect of ecotourism has negative cost too, if the adverse environmental activities are done and also with the lack of proper management. Mountain environments are fragile; hence, if unchecked the areas that tourists visit are prone of degradations and may be littered with waste and stripped of plant and animal life. (Cruz, 1999)

2.2 Relationship between Environment and Tourism

The relationship between nature tourism and conservation may be mutually beneficial. However, unless the requirement of safeguarding the environment is met, ecotourism is in danger of being a self-destructive process, destroying the very resources upon which it is based. (Cater and Lowmen, 1994)

The efforts in ecotourism not always bring the benefit for local people and environment. At its worst activity, ecotourism is environmentally destructive, economically exploitive and culturally insensitive. There is increase in demand of local resources with the arrival of the tourists in the natural areas. To provide the required demands, there is need of additional modern infrastructures, which in turn produce large waste and pollution and enhance further degradation of fragile ecosystem (Lindsay, 2003).

Boo (1990) and Wall (1994) conclude that tourism induced negative impacts are inevitable, as tourism occurs in special places having limited ability to withstand pressure.

The success of tourism not always brings the positive impact but may lead to the degradation of the natural environment by depleting the natural resources thus reducing the site attraction. The Sagarmatha National Park in Nepal vividly illustrates that the local environmental conditions have deteriorated as a result of tourism. (Nepal, 1997)

Solid waste problems are caused by the introduction of plastic materials and changing consumption pattern. The tourism industry produces large quantities of waste products. The trekkers and mountaineers use the non-biodegradable materials and the lack of the solid waste disposal systems; cause health problems to local people besides decreasing the aesthetic value of the area. (NEPAP, 1993)

Bhattarai, (1985) mentioned that a related solid waste problem is the litter often left behind by tourists. He further mentioned that the Mount Everest Trek route

is so littered that people started calling it the 'garbage trail' and the base camp is derogatorily referred to as 'the highest garbage dump in the world'.

Most of the trekking activities take place in natural places which lack proper sanitation. In such areas where toilet facilities are nonexistent the human wastes is becoming a problem (Boo, 1990)

The crowding of human populations on a particular area may change the behavior of wild animals. Although many animal species are directly affected by outdoor recreational activities, many more are affected by alteration of their habitats. Yonzon, (1989) carried out a study at Syabru and Langtang village associated with a study of ecology and conservation of Red Panda. The study revealed the excessive grazing problem, vegetation loss due to trampling and compaction of soil because of the frequent movement of livestock especially the yaks. The study also found out that these activities of domestic livestock has largely destroyed the habitat of Red pandas in the area.

The lack of sustainable grazing management in park area causes the deterioration of the existing natural resources. Overgrazing in the Langtang area has resulted in increased soil erosion, landslides and cessation of plant succession (Shrestha, 1998).

Sapkota, (2002) studied that increasing population in Helambu region in Langtang National Park is destroying the nature gradually by activities like overgrazing and collection of the fuel wood more than their need in lack of knowledge about these natural assets.

Williams, 2004 studied the status of red panda in Jamuna and Mabu villages of Ilam district of Eastern Nepal. The study points the change in land use pattern towards market-driven policy in these VDCs and the harvesting of bamboo and excessive grazing causes the decline in population and habitat of red panda. The study also revealed that the dogs are also predator of these precious animals.

Koirala, (2001) studied on the impacts of tourism on plants, animals and environment of Modi Khola valley. He found that the demand of fuel wood for tourist is more than that of local people. The study found that demand of fuel wood of a single tourist is nearly equal to the requirement of family having six members.

The cheese factories established in Langtang National Park has encouraged the local people to maintain large herds of Chauri. The presence of these bulk herds of Chauris, their herders and dogs has led to the death of many red pandas (Yonzon and Hunter, 1991).

In developing countries like Nepal ignoring the dependence of local people on park resources for their subsistence needs and emphasizing law enforcement can aggravate conflicts between indigenous people and park authorities (Sharma, 1991).

2.3 Relationship between Tourism and Trail

Trail impact by tourism includes a variety of problems including loss of vegetation cover, soil loss and compaction. The type and the amount of used area indeed is the main important factor that influence trail degradation. (Marion, 1994)

2.4 Relationship between Socio-Economic Condition and Tourism

Increase in the tourist related activities have many advantages such as improvement of facilities to the visitors. However, the local residents are also almost equally benefited due to improved infrastructures and general living conditions. (Shrestha, 2002)

Ecotourism activity in an area is supposed to be supportive tool for lifting the living status of the local residents. The lack in management policy of the authorities deprives the locals from enjoying such benefits. Bookbinder et al, (1998) carried out a study in villages near Royal Chitwan National Park to study the economic impact of ecotourism on local people. The study reveals that the economic impact of ecotourism on local people is minimal i.e. about 6% of the total population were directly or indirectly earning from ecotourism.

2.5 Relationship between Culture and Tourism

Gurung, (1995) elaborates that many local traditions and habits come under the influence of western tourists as such generations-old traditions and cultures have been impacted in many areas.

Western visitors consider that tourism development has enhanced the material quality of life of the local communities, but also has resulted in loss of traditional value and social disruption (Robinson, 1992). Dixit, (1989) elaborates that tourism activity causes the erosion of traditional values and culture and Sherpa et al. (1989) indicated that the physiological impact of tourism on local cultures has created a situation in which feeling of cultural pride and self-respect is giving way to sense of insecurity and inferiority.

Changes in people's behavior dress and lifestyle, family and social structure values and expectations, the decline in local support for local traditions and institutions, people's preference for tourist related jobs over education, pollution of sacred place and changes in traditional architecture are generally

cited as instances negative impact of tourisms on culture (Banskota and Sharma 1998).

Sometimes, carefully planned ecotourism practice has the potential to contribute to cultural preservation. There are several good examples where it has contributed to conservation of unique cultures, for instance the Sherpa culture in high Himalayan region and the Gurung cultures in middle and high hills (Weaver, 2001).

Tourist activities have influenced on dress patterns, food habits, family structure, religion, community language and daily pattern of life. (Puntenney, 1990)

CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1 Research Design

In this study research design was followed by the descriptive analysis because all these objectives in nature need the collection of qualitative and quantitative analysis.

3.2 Literature Review

Relevant literatures were thoroughly reviewed in order to collect secondary information regarding impact of tourism including other relevant study of the study area.

3.3 Nature of Data and Data Collection

To fulfill the objectives of study, both primary and secondary data were collected.

3.3.1 Collection of Primary Data

Primary data was collected through field survey of the study area. Qualitative information was gathered by interviewing the local people, tourists, porters and hotel/lodge owners. The study area and trails were visited and observed during various seasons within the study period. Field visit was done three times in the study period. A preliminary field survey was carried out during the first week of October 2002.

Field survey and data collection was made from Oct. 2002 to July 2003 of during which period data on impacts of eco-tourism in study area was collected.

The quantitative information was gathered from random questionnaire survey of tourists, local peoples, lodge owners, porters. The structured questionnaire used was developed on the basis of the needs of the study, with the help of available secondary data.

3.3.2 Collection of Secondary Data

The secondary data was collected from various literatures, books, and other official sources. Relevant articles and literatures were also accessed from the different sites of internet.

3.4 Data Analysis

The collected data are presented in appropriate table and charts. They are categorized and analyzed according to the objectives of the study.

1) Correlation coefficient:-

The responses from 12 statements from 114 (78 for local residents and 36 for local trekkers) sets of questionnaire were analyzed by rating scale (Gupta, 1999). Correlation coefficient between the view of local trekkers and the local residents were calculated by the formula,

$$r(x,y) = \frac{Cov(X,Y)}{\sqrt{t_x t_y}}$$

Where $Cov(X, Y) = \text{Co-variance between } X \text{ \& } Y = \frac{1 \sum (X - \bar{X})(Y - \bar{Y})}{n}$

$$t_x = \text{Standard deviation of } X = \frac{1 \sum (X - \bar{X})^2}{n}$$

$$t_y = \text{Standard deviation of } Y = \frac{1 \sum (Y - \bar{Y})^2}{n}$$

2) Testing of hypothesis:-

Hypothesis was tested by using t-test to show the significance of the view between local trekkers and local residents at 95% limit of confidence where the value of |t| was calculated by

$$|t| = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \text{ with } (n-2) \text{ d.f}$$

Where r= correlation coefficient

n= number of items taken for analysis.

All value of correlation and t-test were calculated by using SPSS computer software.

CHAPTER FOUR

STUDY AREA

4.1 Location

Langtang National Park is situated in Central Himalayas of Nepal. The park is located between latitudes 28°.00-28°.20'N and longitudes 85°.15'- 86°.00E. The park, filled with immense natural resources, is one of the most unspoiled national parks of Nepal. With increasing concern of the scientists and visitors to this region, the Government of Nepal gazette the park in 1976 under the National Parks and Wildlife Act 1973, to conserve its unique flora and fauna. The park has an area of 1710 sq. km. and extends over parts of Nuwakot (6%), Rasuwa (56%), and Sindhupalchowk (38%) districts. An area of 420 sq. km. in and around the park was declared as buffer zone in the year 1998 by the government. Langtang National Park encloses the catchments of two major river systems one draining west into the Trisuli River and the other east to the Sunkosi River.

The park is important from tourism and scientific point of view because of its richness in biodiversity of both flora and fauna. There are 45 indigenous village settlements inside the national park. A total of 28 VDCs fall inside the national park and there is a population of 50,000 in and around the park.

Table No. 4.1: Biodiversity of Langtang National Park

S.N.	Type	No. of Species
1	Mammals	46
2	Birds	345
3	Butterfly	58
4	Spider	10
5	Herpetofauna	11
6	Pisces	30

Source: HMG/LNP, 2001

4.1.1 Land use pattern in Langtang National Park

The National Park offers a wide variation in topography and covers about 31% of dense forest area with wide range of floral and faunal diversity. The land above the 4,500 m is snow covered. Table 4.1 shows the distribution of land use type.

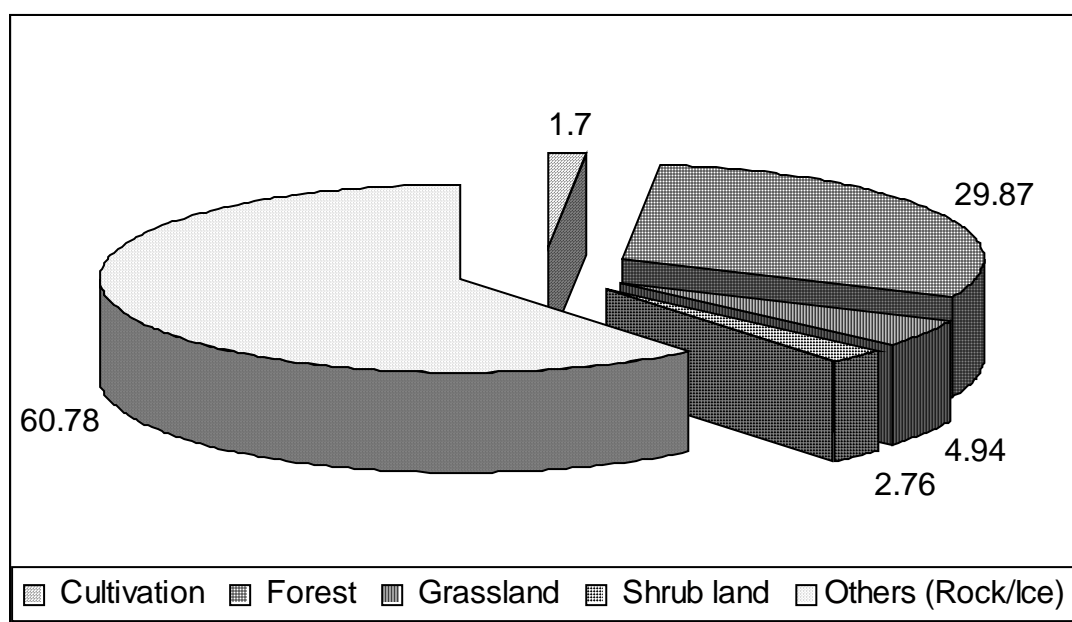


Fig. 4.1: Land use Pattern within L.N.P.

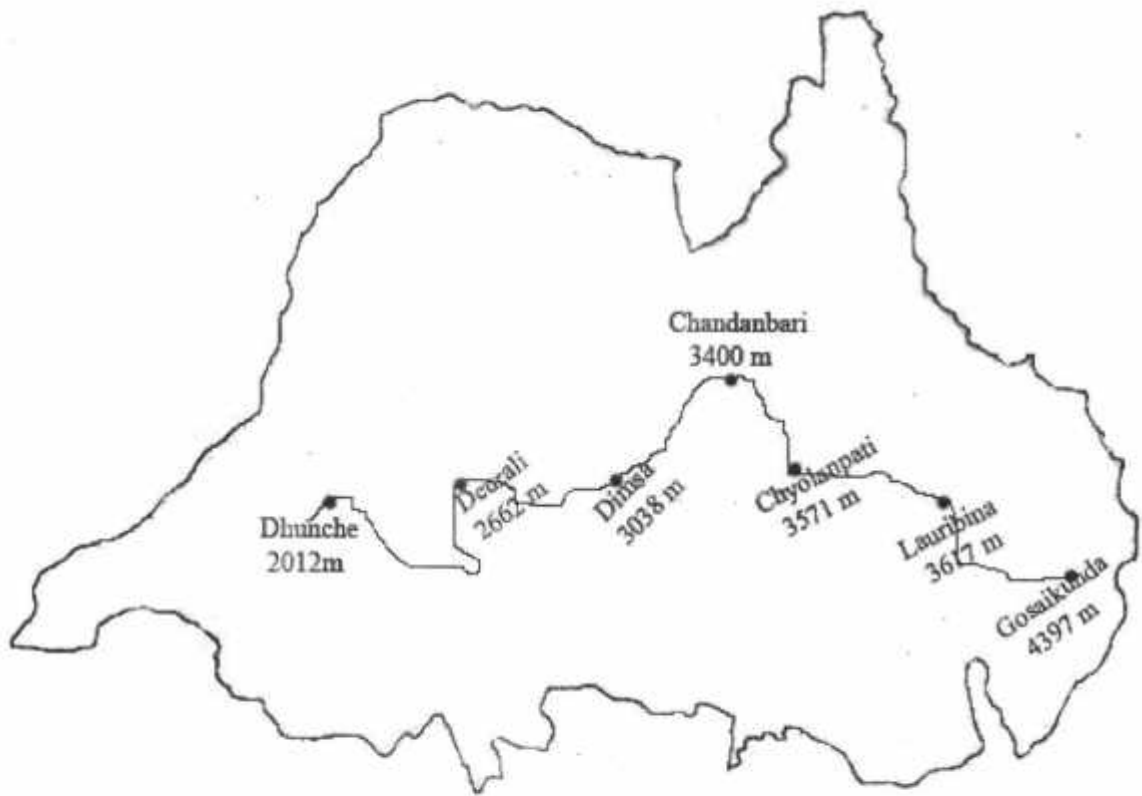
Source: HMG/LNP, 2001

4.2 Dhunche-Gosainkunda trek route

This trek route is one of the top trekking destinations in Langtang National Park and the elevation ranges from 2000 to 4500m. Within a short range and different altitudinal variation the study area flourishes various flora and fauna.

4.2.1 Climate

Some of the best examples of graded climatic conditions in the Central Himalayas are found in Dhunche–Gosainkunda trek route. The climatic condition of this region ranges from subtropical to arctic. The wet Micro-thermal climate is characteristic of altitude between 2,000m and 3,000m. Here



Trekking Route and Altitude from Dhunche to Gosaikunda

Fig. no. 4.2.

the mean annual temperature is between 10°C and 15°C and mean annual precipitation is above 2,000mm. Only 40 to 120 days in a year are frost free above the altitude of 2,500m here there is a snow period of around 200 days.

Alpine humid climate occurs between 3,000m to 4,500m. Mean annual temperature lies between 3°C to 10°C. Mean annual precipitation ranges from 1,000mm to 1,500mm. Cool summer and severe winters characterize this zone. At the altitude of 4,000m, frost-free days are very short (20 to 40 days). The period of snowfall in a year is only for about 90 days. (CDG, 1997)

5.2.2 Forest and Floral Diversity

The complex topography of the area furnishes a wide variety of forest types. The forest type ranges from tropical, sub-tropical, temperate, and sub-alpine to alpine. These forest types flourish more than 3000 species of vegetations.

Oaks, chir pine, blue pine, maple, fir, blue pine, juniper, hemlock, spruce and various species of rhododendron make up the main forest species. The important floras of the park are *Pinus roxburghii* and *Larix nepalensis*. Different types of Rhododendron forests such as *R. campanalutum*; *R. barbatum* etc. is the assets of this park. Nepalese larch (*Larix nepalensis*) is endemic to this park. *R. cowanianum* and *R. lowndesii* and *Picea smithiana* are also endemic to this park

Around 75 species of medicinal plants are recorded from Langtang National Park (Shrestha et al., 2002). Among them 21 are endemic to this region. *Crotalaria kanaii* is endemic to this region. Medicinal plants, *Amaranthus spinosus*, *Dymaria diandra*, *Gaultheria fragmatissima* have high medicinal value

The pattern of forest distribution in the park according to park management plan is as follows (HMG/LNP, 2001).

A) Subtropical zone (1000-2000m):

This region comprises the hydrophilic, mesophytic and xerophytic forest types. This zone mainly consists of *Schima wallichii*, *Castanopsis indica* (katus). This zone is characterized by shrubs and small trees such as *Berberis asiatica* (chutro) and *Rubus ellipticus* (Ainsalu). *Eupatorium adenophorum* and *Artemisia vulgaris* are the common herbs found in this region. *Pinus roxburghii* occur in the rocky terrain.

B) Temperate zone (2000-3000m):

The lower altitude 2000-2600m comprises *Quercus lamellose* forest. Due to the low temperature *Q. lantana*, *R. arboreum*, *Lyonia ovalifolia*, *P. wallinichii* are found. Above 2600-3000m comprises *Q. semicarpifolia*, *Tsuga dumosa* are dominant species. *Pinus excelsa* is often found associated with the drier habitat of this zone.

C) Sub-alpine zone (3000-4000m):

The zone between 3000-3600m represents the coniferous forest. Hemlock (*Tsuga dumosa*), silver fir (*Abies spectabilis*), *R. lepidotum*, and *R. barbatum*, Birch (*Betula utilis*) are found here. Above 3600m *R. campanulatum* and *Allium wallichii* are found.

D) Alpine zone (4000-5500m):

4000-4500 include the shrubs such as *R. anthopogon*, *Juniper indica* etc. The upper alpine zone includes alpine meadows.

4.3.2 Faunal Diversity

The complex topography and geology of this area provides a suitable habitat for a wide range of wildlife. About 46 species of mammals, 345 species of birds several reptiles and a number of amphibians have been recorded from this

national park. This study area is well known for its population of red panda (*Ailurus fulgens*), Himalayan black bear (*Selenarctos thibetanus*), snow leopard (*Panthera uncia*), Himalayan tahr (*Hemitragus jemlahicus*) wild dog (*Cuon alpinus*), ghoral, wild boar (*Sus scrofa*) Himalayan musk deer (*Moschus chrysogaster*), rhesus monkey (*Rhesus macaque*), common langur (*Semnopithecus entellus*), are also some important mammal fauna of the study area.

4.3 Major Tourist Sites

4.3.1 Gosainkunda

Gosainkunda lies in Syabru VDC, bedded in the southern slopes of Jugal Himal at altitude of 4,397m. Gosainkunda area encloses several high altitude lakes (108 lakes) *Surya Kunda, Bhairav Kunda, Sarasawati Kunda, Dudh Kunda* etc. which have a significant importance in Hindu mythology.

About 30,000 devotees come yearly to worship Lord Shiva and take bath during *Janai Purnima*, which falls in the month of July/August. The devotees also visit this sacred place during *Dashara*, another important festival that falls in month of April/May.

4.3.2 Mountain Peaks

A wide range of eye catching Mountain peaks Langtang Lirung (7,245), Ganesh Himal (7,408m), Langtang Himal (6,905m), and Dorje Lakpa (6,983m) steal the heart of every trekker visiting the site. The mountains are ever covered with snow and the reflection of sunlight during sunrise and sunset offers a magnificent view of the area.

4.3.3 Cave and Water Falls

In Dhunche a cave *Ghale Durbar Gupha* is located. Numerous waterfalls of various sizes adorn the different trekking routes.

4.4 Cultural Resources

The area is culturally rich and provides a unique fusion of different ethnic groups. Tamangs are the dominant groups in the region. The Tamangs are Buddhist by religion. Tamangs, Sherpas, Gurungs go to *Ghyang (Monastery)* to worship Lord Buddha. *Loshar* is the main festival of Tamangs that falls in month of February-March. Immediately after *Loshar* they celebrate *Manichhopa* festival. The people celebrate *Saaywa naach* and *Rodi*. The Tamangs and Sherpas make *Mane* (cemetery) after the death of the family member. A number of other ethnic groups like Brahmin, Newar, and Sarki live at lower altitudes. They are mostly of the Hindu faith. They go to temples to worship gods and goddesses. They celebrate festivals like *Dashain, Tihar and Naag Panchami*.

The dress patterns of the Tamangs demonstrate their richness in culture and interrelated with the environmental situation of the area. The male usually wears *Bhoto, Daura Suruwal, West coat, Coat* and *Patuka*. The females wear self-woven dresses *Bakhhu, Patuka (a long belt), Shyama, Angdu and Docha*.

CHAPTER FIVE

RESULTS

5.1 Tourism in Dhunche- Gosainkunda Route

Dhunche-Gosainkunda route in Langtang National Park is one of the main tourist destination and trekking areas of Nepal. The natural beauty of the trail is the major attractions for the tourists. Dhunche-Gosainkunda trek route is one of few places in Nepal, where the combination of spectacular scenery, exotic cultures and varied biological diversity exists and it is among the least crowded trekking destinations in Nepal.

The mountain peaks of the Langtang and Ganesh Himal ranges and the large number of glaciers are the other natural assets. The Dhunche-Gosainkunda area provides a unique fusion of Tamang and Tibetan culture. Gosainkunda (a high altitude lake), 'heart of Langtang National Park' is a religiously and nationally important center of pilgrimage and attracts a large number of pilgrims annually.

5.2 Tourism Trend

The number of tourist that visited the area in 2003 was 3,119, which is 0.92% of the total tourist that visited this country that year. According to the DDC, average length of stay of trekkers visiting this trekking route is about 11 days (DDC, 2003). The total revenue from tourism in the area in 2058/59 (2003) is Rs.94, 57,104.56. From the study it was found that the tourist visiting the area has decreased regularly. Out of total tourist that visited Nepal in 2002, 52,225 came for purpose of trekking and mountaineering. Among them 9.17% visited Langtang National Park which is third after 64.6% visited Annapurna region and 23.6% in Everest region.

Of the total trekkers who visited this site 87% have the second destinations mostly the Helambu region, Langtang valley and Kyangin area.

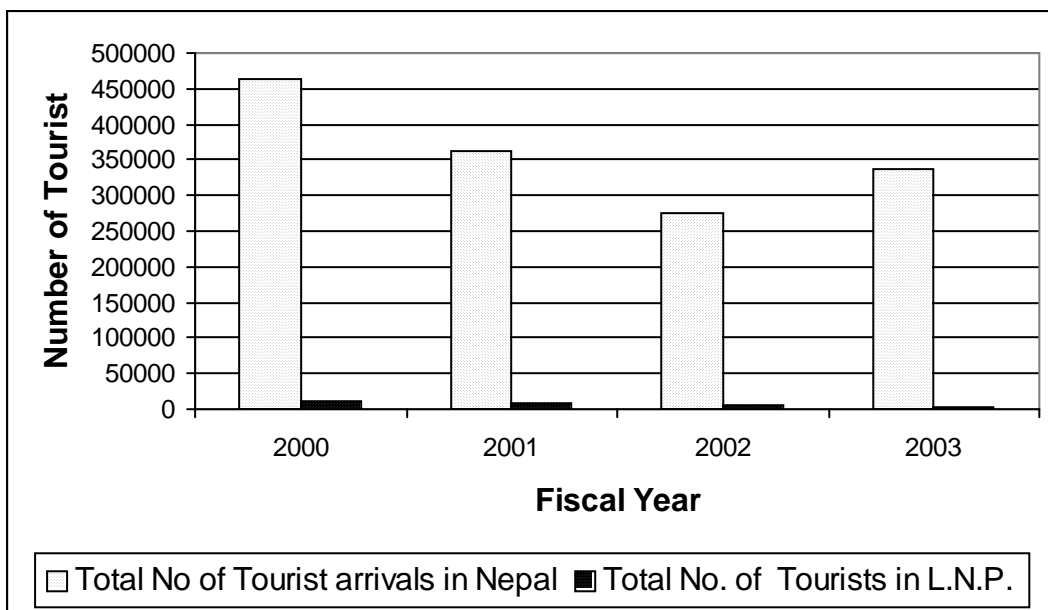


Fig. 5.1: Comparison between Tourist Arrival in Nepal and L.N.P.

Source: DDC, 2003

The park generates a considerable amount of revenue yearly. The revenue includes the entry fee from tourists. It shares 0.83% of total revenue collection of all the national parks in Nepal. Table 5.2 shows the revenue generated by park for five years.

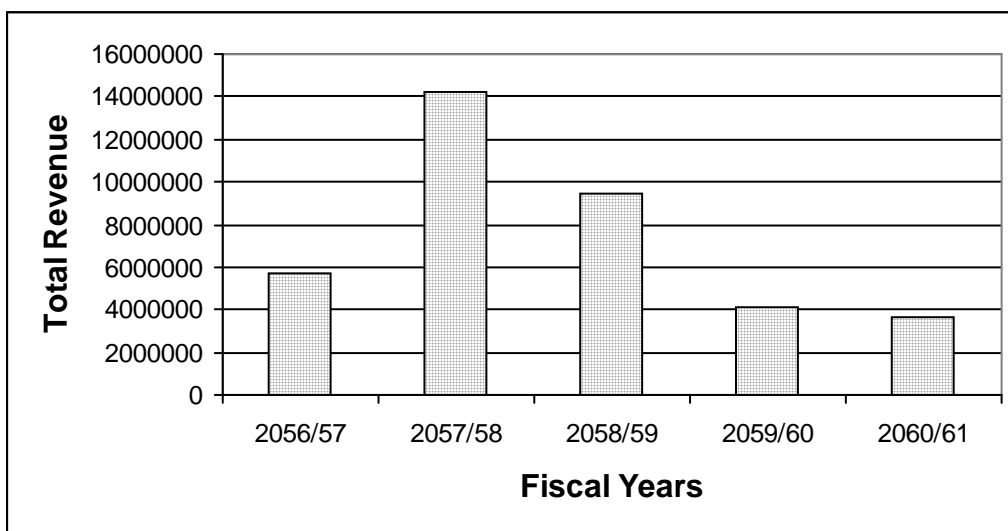


Fig. 5.2: Total Revenue Generation in Langtang National Park

Source: DDC, 2003

5.3 Tourists Experience

Some of the tourists visiting the area described it as ‘Amazing! The scenery of Gosainkunda’, (Jacquet a French national) and ‘More natural site compared to Annapurna region’ (Silvestre a French national). The tourists come here not only enjoy the panoramic beauty of this site yet they are aware of the natural degradation of the area. They raise concern over the excessive use of the fossil fuel.

Among the respondents (n=36) 58% were individual trekkers and 42% were group trekkers. Around 52.77% of the tourists are attracted to this site for its trekking and mountaineering, 19.44% are attracted by the natural beauty and wilderness of ecosystem, 8.33% are attracted by unique ethnicity and culture and 13.88% visit for research and study and 5.55% for official visit.

Table no 5.1: Purpose of Tourist Arrivals

S. N.	Purpose	No of Respondents	Percentage
1.	Trekking & mountaineering	19	52.77
2.	Natural beauty & wilderness of ecosystem	7	19.44
3.	Official	2	5.55
4.	Research/study	5	13.88
5.	Unique ethnicity and culture	3	8.33
	Total	36	100.00

Source: Field Survey 2003/04

5.4 Tourism infrastructures

The tourists come here with purpose to experience the splendid natural beauty of the area. The tourists come here expect the basic facilities of tourism. The accommodation facilities, communication, transportation and tourist information centre are the prime tourism infrastructures available at Langtang National Park.

5.4.1 Accommodation

After the tourism started in Langtang National Park in 1979, the Gosainkunda trek route became the prime destination of this region. There was increase in the number of hotels, lodges and teashops with the increase in flow of tourists. The concentration of hotels and lodges with various standards is seen especially in Dhunche. There are altogether 37 hotels and lodges in study area of which 24 is in Dhunche and there are also 23 teashops.

5.4.2 Communication

The communication facilities in this area are very poor. Telephone (STD, ISD) and fax are the only tools of communication in this region and can be utilized in Dhunche where it is distributed in limited area only. Local phones are distributed in Chandanbari, Lauribina and Gosainkunda area. The modern communication technologies like e-mail and Internet services are out of reach of the local people and tourists alike.

5.4.3 Transportation

The park is connected to Kathmandu by land through 125 km Kathmandu – Trishuli - Dhunche road and 32 km. by air. The road from Kathmandu to Trishuli is blacktopped and is in fairly good condition. From Trishuli to the park, the road is graveled and in very poor condition. During the rainy season landslides block the road for around 2-4 months and cuts off the area from rest of the country. It takes about 8 hours to reach Dhunche from Kathmandu by

bus. Local buses are the only mode of transportation. It takes about 3-4 days from Dhunche to reach Gosainkunda.

5.4.4 Tourist Information Centre

Though tourism in this region has a long history, yet there is lack of the tourist information centre, which is a significant problem for tourists. Dhunche is the head quarter of the Langtang National Park, which also lacks appropriate information centre. Recently a tourist map has been placed at Dhunche with some basic information of trekking routes and medical and accommodation facilities. However, the tourists still have to face a lot of troubles, because of lack of information of facilities of the area, condition of the route and social and cultural features of the area they visit.

5.5 Tourism impacts

The social, environmental and cultural impacts of tourism in the area are quite evident. The impacts of tourism activity in study area on various sectors are given below.

5.5.1 Socio-economic Condition

5.5.1.1 Population Settlements

Dhunche-Gosainkunda route is one of the important trekking destinations in the nation. The population size in this area is increasing and the number of new houses is also increasing. During the past few years, tourism industry has been the chief source of income. This is helping the local people to increase their livelihood status and conservation of the area.

The total no of household and the population of the study area are tabulated as follows:

Table No.5.2: Population Settlement in Study Area

Name of VDC	Population			Total households
	Male	Female	Total	
Dhunche	1315	1015	2330	574
Syabru	1147	994	2141	484

Source: CBS, 2001

Mostly the people in this region depend on agriculture. The people living along the trail open hotels, lodges and teashops. Numerous households in the area have a family size of six or more. This area has a considerable population growth every year. So, the existing area has to hold the increasing no. of populations. In such conditions the people have encroached surrounding wild life habitats for agricultural land and settlements. These activities have caused the decrease in animal population.

5.5.1.2 Livelihood Status

The study area lies in mountainous region, the local people predominantly depend on agriculture and livestock herding. Majority of local people inside the study area depend on agriculture. The major cash crops in this region are rice, maize, millet, buckwheat and potato.

The cheese factory in Chandanbari established by Dairy Development Corporation collects milk from local people, so the local people in this region are encouraged to improve their economic condition by yak farming. After agriculture and livestock herding tourism is major source of income for people. The other income source is porterage, guide business and services.

The collection of medicinal plants for its high economic value is the other source of income for local people. This area lacks big industries. The Himalayan Spring Water Company, situated in Dhunche VDC, is the only large industry in the area.

The flow of domestic as well as foreign tourist increases during *Janai Purnima* and *Dashara mela*. So during this season local people, hotels and lodges get

opportunities for income generation. The collection and sale of the fuel wood is another source of income in this region.

Of the total respondents 22% are involved in the tourism i.e. hotel, lodges and teashops. Most (58%) are involved in agriculture and livestock herding. Around 12% adopts both the business and agriculture. Remaining 8% are engaged in other profession like service, tourist's guides and porter, painter carpenter.

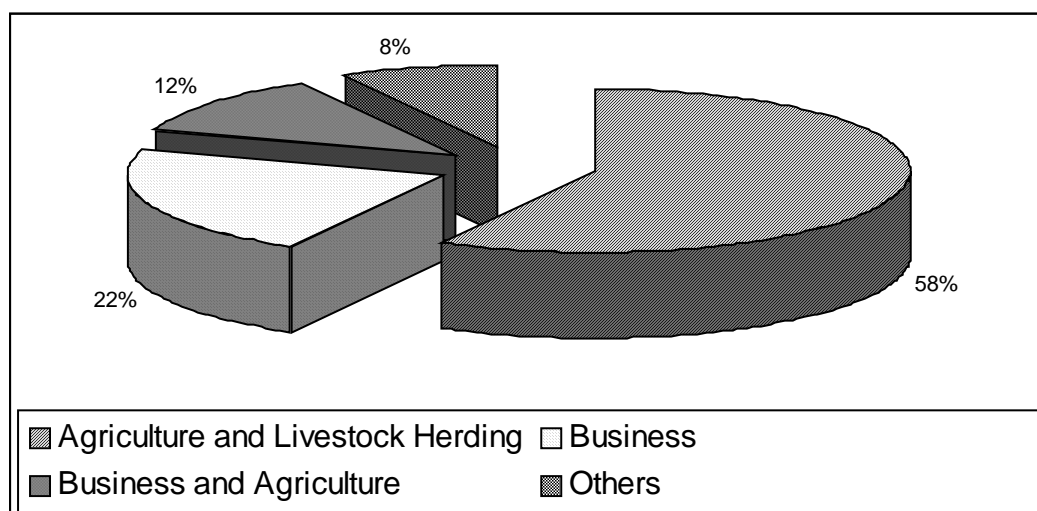


Fig. 5.3: Livelihood Status in Study Area

5.5.1.3 Local Products

The locals get income from the local products. The cheese and *Chhurpi* made from milk of Yak and Chauri are famous for this region. The cheese factory in Chandanbari produces Yak Cheese and *Chhurpies*, which are supplied to Katmandu. The DDC produces 18,000 kg. Yak cheese and 8,000 kg of *Chhurpi* annually. (Source: DDC, 2003)

This region is also known for its hand woven handicrafts like *Carpets, Bags and Radis* made from the wool of Yaks, Chauries, and sheep. They also make traditional dresses like *Bakhhu, Patuka* and sell to the local market and the tourists. By selling the local products they earn a good sum of money every year. The local people make *carrying baskets, mats, and ropes* from bamboo, which are sold in the local market. The cultivation of the *lokta* for paper production is another source of income.

5.5.1.4 Livestock Herding

Yaks, Chauris, and cattle are the main livestock. Sheep and horses are the other livestock. Poultry farming is popular, especially in the lower altitudes.

From the survey 83% of the household are found to be rearing at least one kind of livestock and 17% of the respondents were not rearing single livestock. From the data collected during survey 39% of the household were rearing buffalo. Of the total household 47% were rearing sheep and goat. Yaks and Chauris were being raised by 35% of the household and. 52% of the household was found rearing poultry.

Majority of the livestock are captive. The park authority has banned the captive animals to graze in the park area but the local people let their livestock free in nearby jungle, which has intense effect on the vegetation and the behavior of the wild animals.

5.6. Tourism Impacts on Environment

People living in and around the park area have to adjust to the existing environmental conditions and they are unaware of the limitations of natural environment. Changes occur in the attitude towards the human needs with time. These changes disrupt the natural environment's status. As change in the behavior of human needs with the changing modern technologies irreversibly alter the natural environment.

A set of 12 statements of 114 questionnaires were asked to the local people and the trekkers ranging from strongly agree to strongly disagree. A summary of data from the data survey is presented in table 5.3 and 5.4.

Both the positive and negative impacts on surrounding natural environment are discussed and analyzed by using response provided by the local residents and local trekkers.

A total of 78 respondents from local residents and 36 local trekkers were asked the prepared statement

Table 5.3

Response of local residents and local trekkers towards negative environmental impact

Table is included in Annex Portion

Table 5.4

Response of local residents and local trekkers towards positive environmental impact

Table is included in Annex Portion

5.6.1 Impacts upon Animal Population and Behavior

Frequent poaching activities are taking place in this region. Recently the unified command team in Syabru seized the skins and bones of different animal species worth 5 million rupees. Most of the local people here hesitate to answer about poaching activities in this area.

This park is well known for the suitable habitat for red pandas. Red pandas are shy animal and sensitive in nature and are the prime assets of this area and also a national heritage of the country. They are usually found in the habitat of elevation ranging from 2800 to 3600m. Chloyanpati and Chandanbari are the core habitat area of red panda.

During the grazing period there is practice of taking dogs along with the animals for safety. The presence of those dogs also affecting the activity of red pandas (**Interview with Warden of LNP**). In 2003, two red pandas were reported killed by the dogs.

Grazing practice in this area is widely practical. The captive animals were seen left free for grazing in nearby jungles during study period. They usually prefer food of bamboo species. The cutting of bamboo to make various goods also caused decrease in bamboo species. The movements of the Yak, Chauri have depressed the bamboo abundance by trampling which results the high mortality rate of red pandas.

Although the poaching of wild animals is totally banned in this region, the poachers kill the wild animals for purpose of meat, and other products. The poaching of the wild animals especially those listed, as endangered species is a real threat to the study area and park as well.

The security personels of the army base camp based in Dhunche are also involved in illegal hunting. During the interview some local respondents

indicate that they kill the wild animals like deer, wild pig and the other bird species which enter the camp to get the left over food materials.

The hunting of endangered species like musk deer for its musk, wild boar, ghoral and serow for meat purpose, leopard for skin, barking deer for its antler and meat, red panda for its furry skin and fascinating pelt is seen in this region. The pheasants are also trapped for its meat and to keep as pet. Table 5.5 shows the major fauna affected by illegal hunting.

Table No. 5.5: Major affected Animals by Human Activity in Study Area

Common name	Food purpose	Medicinal value	Cash income	Body parts used
Musk deer	+	+	+	Musk, skin
Barking deer	+	+	+	Antler, flesh, skin
Serow	+	-	-	-
Goral	+	-	-	-
Leopard	-	-	+	Skin
Black deer		+	+	Skin
Wild boar	+	-	+	-
Rhesus Monkey	-	-	+	-
Pheasants	+	-	+	-
Red panda	-	+	+	Skin, Anal gland
Birds	+	+	+	-

Source: Field survey, 2003

Besides the illegal trade of parts of large animals in this area the biopiracy of small animals is also a growing threat. Though the amount is little the incident of biopiracy especially of insects, beetle species is increasing. Lucanid beetles especially male of family Lucanidae is illegally collected from this area and exported especially to Japan to keep as pet, for fighting, and for ornamental purposes (*Source: Field survey, 2003*).

The view of local people and the trekkers on wildlife population and behavior $r=0.498$ for wildlife population and $r=0.408$ for wildlife behavior change population. 44% of local trekkers and 53% of the local residents were agreed to the point that wildlife behavior has changed due to tourist activity while 30% of local residents and 30% of trekkers were against to the point ($t=1.96, p>0.05$ at 8df). Similarly 50% of the local residents and 52% of local trekkers were agreed to the statement that wildlife population has decreased due to tourist activity while 25% of total local residents and 27% of local trekkers were against to the statement ($t=2.69, p>0.05$ at 8df).

5.6.1.1 Major Wildlife Mobility in the Site

Wild boars, monkeys, deer and wild pigs are the frequent seen animals in the study site. Wild boars, monkeys and deer are the major crop destroyers in this region. These wild animals damage the crops severely which is a burden in such mountainous region. Most of the respondents agree that the wild boars are the major wild animals for cash crop damage followed by monkey and deer.

The conflict has increased between the communities and the park authorities as the locals don't get the benefit from park authorities. The locals don't get the incentives for the damage done by the wild animals in time. Crops and livestock depredation of the local people by the wild animals like wild boar, langurs etc also instigate the conflict between them.

In some areas the people inside the park replaces the park animals for high cash returns, which in turn increase the demand of fodder and grazing area.

Table No. 5.6: Major Wildlife Mobility in the Site

Wildlife	Always	Frequent	Sometime	Category
Wild boar	61	9	8	I
Monkey	48	20	7	II
Deer	41	19	18	III

Source: Field survey, 2003

5.6.2 Impact on Vegetation

Vegetation in this area frequently serves as an attraction for tourists. Tourists in this route usually use the same trail over again and again so, due to the trampling the ground level vegetation has affected and caused the loss in ground plant diversity.

Lodges and human settlements within the study area have practice to have grazing animals that is affecting the forests that cause damage to the natural environment. The people inside the park collect the fossil fuels like fuel wood, fodder from forest; some make the forest as pasture land which in turn has caused the deforestations.

5.6.2.1 Utilization of Fuel Wood

In total, about 90 percent households in and around the study area depends on park resources for wood and firewood. The collection of more wood than the need is another complex situation of this area. The local people use considerable amount of firewood for cooking and room heating purpose

The cheese factory situated in the highest elevation in Nepal is situated in Chandanbari (3254 masl), which is also dependent to the nearby jungle for firewood. The park has given authority to use 2,500cft of the fuel wood per year for DDC in Chandanbari. But they are using about 10,000cft of wood annually.

Average fuel wood consumption per household per month ranges from 20-40 *bhari*. Of the households surveyed 67.24% were found to be consuming 10-20 *bhari* of fuel wood, 12% of the households were found to be consuming 10-20 *bhari* per month and 21% of the household were found consuming more than 40 *bhari* of fuel wood per month.

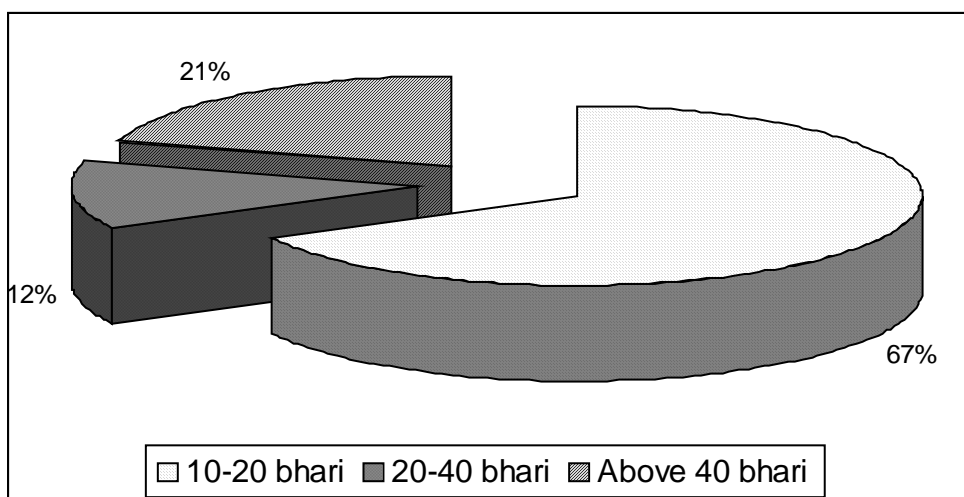


Fig. 5.4: Utilization of Fuel Wood by Local Residents in Study Area

**1 Bhari fuel wood = 40 Kg. dry weights*

**Source: Field survey, 2003*

Most of the lodges and hotels inside the study area use the alternative energy resources such as LPG, solar energy for electricity and warm water in recent years. Besides it the hotels, lodges and teashops were also found using a considerable amount of fuel wood to heat rooms and for cooking. The average use of dry wood during the winter season is about 70-80 kg per day per lodge.

Table 5.7 shows the amount of fuel wood consumption by hotels, lodges and teashops.

Table No. 5.7: Utilization of Fuel Wood in Hotels/Lodges/Teashops

S.N.	Place	Daily requirement of fuel wood/hotel/day	Total no of hotels/lodges/teashops	Total fuel wood consumption
1.	Dhunché	1 <i>bhari</i>	24	960 kg
2.	Ghattekholá	1 <i>bhari</i>	1	40 kg
3.	Deurali	1.5 <i>bhari</i>	1	60 kg
4.	Dimsa	1.5 <i>bhari</i>	1	60 kg
5.	Chandanbari	2.5 <i>bhari</i>	4	400 kg
6.	Chyolanpati	3 <i>bhari</i>	2	240 kg
7.	Lauribina	3.25 <i>bhari</i>	3	390 kg
8.	Gosáinkunda	4 <i>bhari</i>	4	640 kg
Total fuel consumption				2,790 kg

Average fuel wood consumption/hotel/day = 69.75 kg.

* 1 *Bhari* fuel wood = 40 Kg. dry weight

Source: Field survey, 2003

5.6.2.2 Major Forest Types Used For Fuel Wood

Castanopsis indica, *Betula utilis* and *Rhododendron* forest types are mainly destroyed by the local people for the purpose of fodder and fossil fuel. During Gosáinkunda mela the visitors use sticks to walk the trail. They usually use the nearby jungle for sticks. They excessively use the sticks of *Juniper* and *Rhododendron* species.

The Red Pandas are usually found in the habitat of elevation ranging from 2,800 to 3,600m. Chloyanpati and Chandanbari are the core habitat area for these animals. The forest depletion due to continuous consumption of forest products by local people and DDC in these areas has deteriorated the existing habitat of precious animal.

The Birch forest is the prime habitat of the musk deer. The use of birch forest for source of fuel wood is causing the habitat degradation on the study area.

To meet the need of the modern tourism facilities the cutting of the trees illegally is another severe threat of this region. The local inhabitants get timber from the nearby area of jungle. The locals generally use the forest resources to build their houses and furniture. Past few years the activity of tourism has increased and the number of new lodges has also increased. This has resulted in increased use of timber.

Perception of local people and the trekkers towards deforestations caused by tourism was found $r=0.846$. 47% of the local residents and 34% of the local trekker agreed that tourists are responsible for deforestations while 38% of the local people and 30% of local trekkers were against this statement ($t=2.02$, $p>0.05$ at 8df).

5.6.2.3 Fodder Collection

Most of the people in and around the study area raise livestock. They fulfill the requirements of their livestock by collecting fodder from the jungle. Those people living outside the park also used to collect the required fodder from the forest.

They extensively collect the fodder of *Betula utilis* for bedding purpose, which has high medicinal value. The average fodder collection ranges from 1-2 *bhari* per-day-per-households.

Among the respondents 76% of the household collect 1-2bhari of fodder to feed livestock and bedding purpose and 24% were found collecting 2-3 bhari of fodder.

The excessive fodder collection practice deteriorates the habitat of the animals like musk deer.

5.6.2.4 Use of Alternative Energy

The practices, fodder collection and fuel wood collection in this region are deteriorating the existing environment fast. In certain parts of the study area the use of alternative source of energy such as solar energy, L.P.G. and kerosene can be seen. These alternative sources of energy are of high cost hence not all local people can afford them, so, they rather prefer the fuel wood from nearby jungle. During study period the use of improved stoves were seen in the hotels and lodges. During the survey most of the local respondents against the use of alternative energy yet they are aware of the natural degradation of their natural environment.

The view of local people and local trekkers on view either tourism support the use of alternative energy, 29% of the local residents and 45% of the local trekkers agreed the statement and 36% local residents and 39% local trekkers were against the statement. $r= 0.643$, ($t=5.68$ at $p> 0.05$ at 8 df)

5.6.2.5 Illegal trade of medicinal plants

Various medicinal plants are found in this area. Though the collection of medicinal plants is strictly restricted in this region the local people collect these plants for its economic value and export it illegally. The collection of medicinal plants is unavoidable in this region. The people usually collect the plants like *Jatamasis (Nardostachyus grandiflora)*, *Aconitum spicatum (Bikh)*, *Picrorhiza kurroa*, *Swertia chiraita (Chiraito)*, *Rbeum australe (Padamchal)* *Yarsha gumba (Cordyceps sinensis)*, *Panchaule (Dactylorhiza hatigirea) etc.*

During the interview the local people and park authorities hesitate to agree the fact of illegal trade of medicinal plants in this region. Nepal Krishi Ban Pratisthan with the coordination of the Langtang National Park has given the authority for commercial production of Chiraito and Lokta to local people for their income generation and minimize the illegal trade of medicinal plants..

5.6.2.6 Impacts Due to Trampling

Tourists using the same trail over and over again trample the vegetation and soil, eventually causing damage that can lead to loss of biodiversity and other impacts. In the study area there can be seen the use of trails other than existing ones. This has caused the depletion of the ground vegetation of the area. From the questionnaire survey 40% of the local respondents 39% of the local trekkers were agreed to the statement that tourist are the causative agent of soil trampling while 31% of local residents and 32% of the local trekkers were against the statement i.e. $r=.846$ ($t=2.6$, $p>0.05$ at 8df).

5.7 Impacts on Water Quality and Sanitation

Water is one of the crucial natural resources. The rivers Trisuli and Bhotekoshi are major sources of drinking water in this region. The demand of fresh water increases with the increase in no. of tourist arrivals. The hotels, lodges and homes dispose the untreated effluents, household waste, and sewage directly to the water resources nearby. However the quality of water was not found to be degraded.

The toilet system in this area is very poor hence the local people living along the trekking trail especially in the high altitudes have the habit to toilet in nearby areas/ fields. The tourists during the trekking and camping also use the nearby areas for toilet and usually use the nearby water resources. More than 67% of the houses in study area don't have the facilities of toilet. Fig 5.5 shows the toilet facilities in study area.

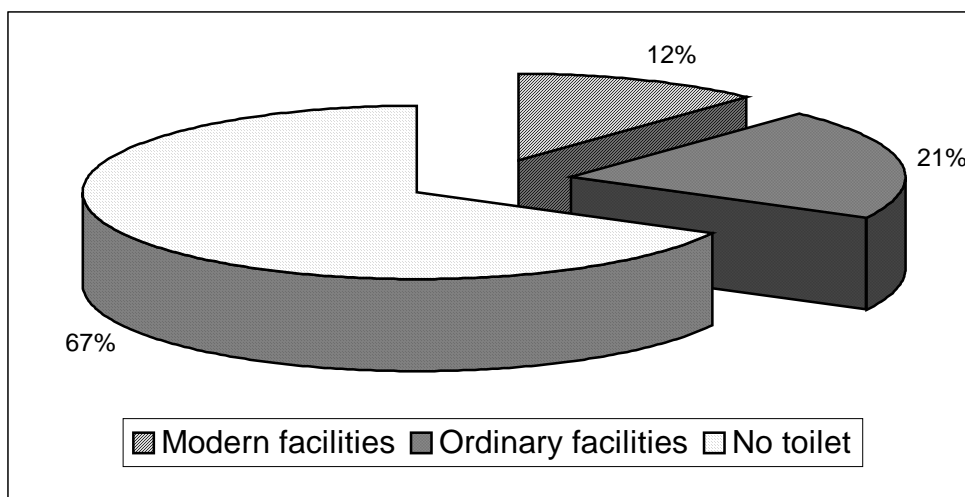


Fig. 5.5: Toilet Facilities

Source: Field Survey 2003/04

Local committees with local participations are formed here waste management in this area. Dhunche Bazar Sarsafai Samiti is established in Dhunche to collect wastes and raise awareness among the local residents for the use of toilets.

The quality of water hasn't found degraded. From the questionnaire both the local residents and local trekkers have the positive response ($r=0.5.42$). On survey 30% of local residents and 25% of local trekkers were agreed to the point that the sanitation and water quality has degraded due to tourist activity while 53% of local residents and 46% of the local trekkers were against the statement ($t=.4.49$, $p>0.05$ at 8df).

5.8 Solid Waste Management

The Dhunche-Gosainkunda route is the main transit to the Gosainkunda area. There is environmental pollution due to garbage and littering along trekking route and on campsites. This is mainly due to increased amount of non-biodegradable garbage littering, inappropriate disposal of human waste and contamination of water supplies along trekking routes and campsites. From the interview of respondents the trekkers make their first campsite in Chandanbari. These campsites are not well designed with respect to proper sanitation,

drainage; waste disposal and shelter thus are leading to environmental problems. During the Janai Purnima and Dashara festivals, the flow of devotees from Nepal and India to visit the Gosainkunda Lake, the sacred place for Hindus and Buddhist increases. During this season the flow of people increases such that the accommodation facilities provided by the hotels and lodges in this route are insufficient. Thus, the people depend on the temporary and permanent campsites along the trek route. The park authorities give permission for campsites only during mela. Some campsites are also seen built without the permission of the Langtang National Park authorities. These campsites are constructed without the proper management of sanitation, drainage, waste disposal which leads to environmental degradations of surrounding area. These devotees produce a considerable amount of solid wastes which pollute the surrounding area.

The tourists produce a large amount of solid waste which is deteriorating the trail and this sacred place. The non-biodegradable plastics (water bottles, noodles, chocolates wrappers), tin (juice, food) can be seen along the trekking trail, which reduces the aesthetic value of the area. These materials can be flown everywhere and increases the chance of consuming these materials by the local livestock and wild animals. The tourists generate more daily wastes.

The animals like horses, chauris are the only mode of transportation in this area. These animals' excreta can be easily traced along the route, which is polluting the route and decreasing the aesthetic value of the area as well.

On survey 37% of local residents and 43% of the local trekkers strongly agreed to the statement that tourism activity adds tourism disposal problem in the area. Similarly 44% of local residents and 35% of local trekkers were disagreed the statement. The correlation coefficient $r=0.905$ towards the view of solid waste management and there was no significance difference between the perception of the local residents and local trekkers ($t=2.10$, $p>0.05$ at 8df)

From another survey among tourists 52% of tourists were found burning out the biodegradable solid wastes and 48% manage them in pit.

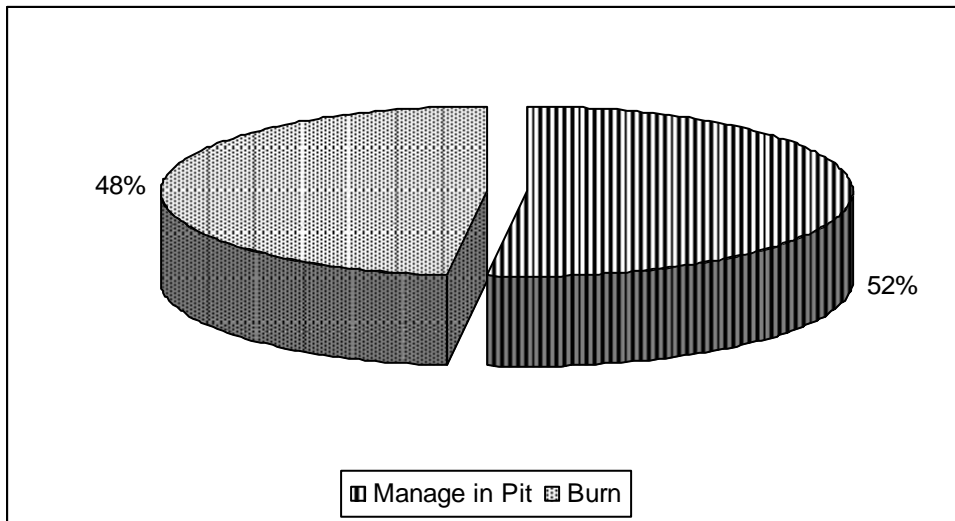


Fig.5.6: Biodegradable Solid Waste Management by Tourist

For non-biodegradable solid waste perception were 65% to carry together and 15% to burn it and 20% to manage in a pit.

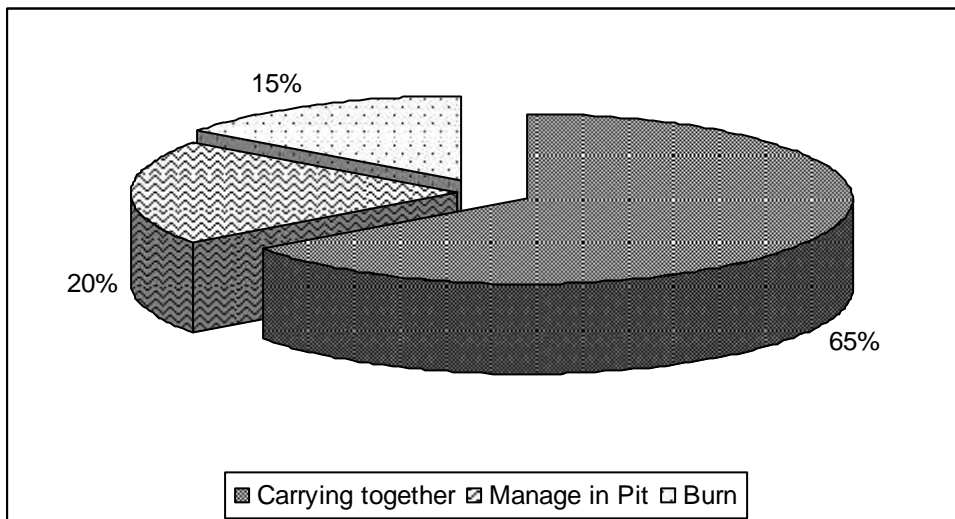


Fig.5.7: Non-biodegradable Solid Waste Management by Tourist

5.9 Local people on Conservation and tourism

There are various factors which are a threat to important wild animals including red pandas in this region. To save these creatures TRPAP have recently declared the Cholyanpati as the red panda eco-trail.

Perception of local people for conservation of natural vegetation was positive. Of the total respondents 93% were in favor of protection of natural environment and 7% were against the statement.

During the questionnaire about the involvement in the conservation activity in the area 47% were in favor of local participation. 23% were for participation of government and remaining 31% were in favor of all party involvement.

5.10 Tourism Activity Support for Conservation

The tourist and local people are two major parts of conservation in an area. Hence there should be a symbiotic relationship between them that enhance the development of an area. The development of tourism in an area should benefit the local communities inside the park.

TRPAP along with UNDP, SNV, DFID are working together to enhance the tourism activity area in this area and also to raise environmental conservation awareness to the local people.

In the field survey, 59% of local residents and 43% of local trekkers agreed for the statement that tourism supports the local people while 14% of local residents and 14% of the local trekkers were against this statement $r=0.713$ ($t=2.08$, $p>0.05$ at 8df). Of the local residents 30% and 41% of the local trekker believed that the tourism supports the wildlife conservation while 36% of the local residents and 24% of the local trekkers were against the view $r=.599$, ($t=2.17$, $p>0.05$ at 8df). Of the local residents 34% and 41% of local trekkers agreed that tourist activities support the forest conservation while 50% of local

residents and 44% of local trekkers were disagreed with the statement $r= 0.742$ ($t=2.87$, $p>0.05$ at 8df).

The perception on increase in awareness building of sanitation and solid waste disposal problem due to tourist activity 36% of the local residents and 43% of local trekkers agreed while 36% of local residents and 39% of local trekkers were disagreed with the statement $r= 0.658$ ($t=6.08$, $p>0.05$ at 8df).

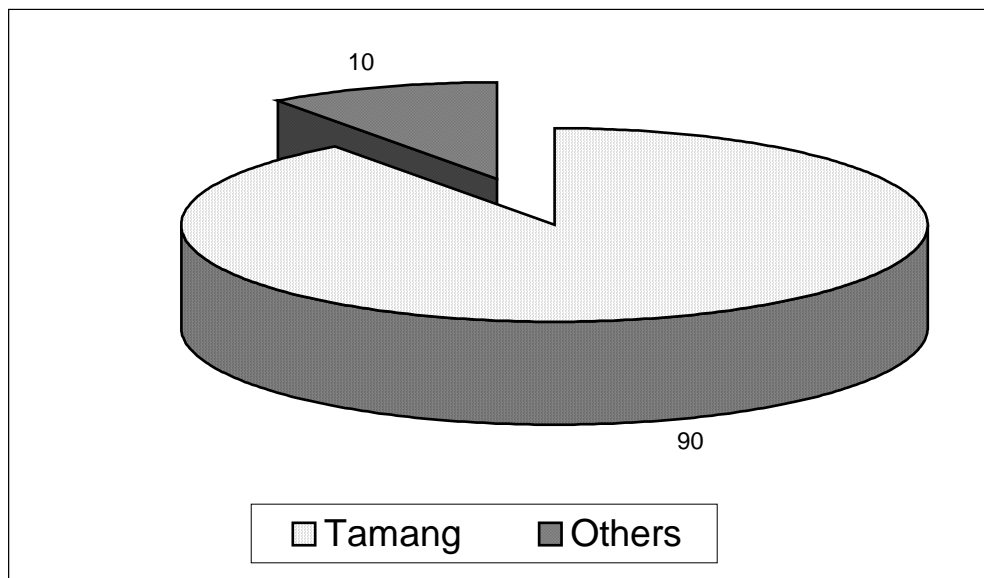
5.11. Tourism Increases Environmental Awareness

The humans and environment are two major parts hence there should be a symbiotic relationship between them that enhance the development of an area. The development of tourism in area has increased environmental awareness among local communities.

The perception on increase in environmental awareness due to tourist activity 36% of the local residents and 50% of local trekkers agreed that tourist activities support the forest conservation while 54% of local residents and 44% of local trekkers were disagreed with the statement $r= 0.582$ ($t=1.94$, $p>0.05$ at 8df).

5.12 Cultural Impact

The richness in culture of an area represents the characteristics of the area. More than 90% of total respondents were Tamang. Other 10% included castes *Brahmin*, *Chettri* and *Newar* (mostly from the lower area).



5.8: Ethnic Representation in Study Area

Source: Field Survey 2003

Cultural diversity is the main identity of the local community.

Today is the world of entertainment and nobody can be apart from it. In the study area one can observe mushrooming of cassettes and VCD shops. They easily get the VCD and cassette especially of Hindi movies. The younger generation seems to be influenced by such movies, which are deteriorating the cultural value among them.

The view of local people and local trekkers towards the impact of tourism on local culture is $r= 0.85(t=4.84, p>0.05$ at 8df).

CHAPTER SIX

DISCUSSION, RECOMMENDATION AND CONCLUSION

Tourists from different countries come here to experience the natural beauty and culture. Tourists usually come from the European countries and America. Mostly the tourists visit this site during the month of Oct-Nov and in months of March-May, which offers spectacular scenery of the Rhododendron species. The flow of tourist increases in this area during Gosainkunda mela, which falls in month of Aug/Sep.

Garden of flowers, the name given to this area offers a wide range of spectacular natural beauty, traditional culture and peaceful environment that attracts thousands of tourists yearly. The natural beauty of the landscapes magnetizes most of the tourists that come here. The tourists mainly come here with the purpose of trekking & mountaineering wilderness adventure, unique Himalayan culture, natural beauty and research. The tourists can be mainly divided in two groups, i.e. individual and group trekking.

The figure shows the decrease in the tourist arrival for few years. The on going conflict in country and the heavy landslide on the road cause the decrease in tourist numbers.

The Langtang National Park is relatively close to Kathmandu, yet the number of tourists visiting this area is less compared to other parks because of the poor condition of the road. The tourists still have to face a lot of troubles, like inadequate information of the area, communication in the area they visit.

The people from adjoining districts of Nuwakot and Sindhupalchowk come here, which is also a reason for population increase. Present study reveals that the family size in the study area is 5.62, which is close to the average family

size of Rasuwa district 5.45 (DDC, 2003) and 5.14 (CBS, 2002) and national famil size 5.2 (CBS, 2001).

The increasing populations whether directly or indirectly are depended on the surrounding environment that in turn has an impacted on the natural environment and expand the gap between natural resources demand and supply in future.

Most of the respondents have relied on agriculture for their livelihood. Beside agriculture, livestock herding, tourism, service is the other occupations. Many families rely on livestock to provide cash income. Nearly 83% of the respondents have found raring at least one kind of livestock. Yak Chauri, Ox and poultry are mostly reared animals. Such families depend upon the nearby forest as grazing areas for their livestock. Although the local authorities have banned grazing inside the park boundary, the local people let free their cattle inside the park for grazing. A bulk of domestic animals is seen grazing openly in the study area. The selling of local products and fuel wood is another source of income.

Due to the growing population in this area and lack of big industries there is lack of work and job opportunities so, young are found migrating to the foreign country.

Environmental condition has studied under positive & negative impacts. All 12 statements of Chapter Five table 5.3 and 5.4 have showed positive correlation between the view of local trekkers & local residents. From SPSS analysis the t-test at 95% of level of confidence at six statements i.e. there is no significant difference between the view of local trekkers & local residents. For Negative Impacts Solid waste disposal problem, deforestation problem, change of wild life behavior & for positive impacts (support for wild life conservation, support for wildlife conservation, increase of environmental awareness show no significant difference between the view of local trekkers and local residents.

Other six statements have showed null hypothesis is rejected i.e. there is significant difference between the view among the local trekkers & local residents. For Negative Impacts Degradation of Sanitation & Water Quality, Soil Erosion in the area, Decrease in Wildlife Population & for Positive Impacts Sanitation and Solid Waste Disposal Problem Increase Supports for Conservation of Forest in the area & Increase Awareness for Alternative Energy show significant difference between the view of local trekkers and local residents.

The behavior of tourists and unhealthy tourism has impact on wild animals. The most extreme effect of tourism on wildlife arises from the demand of the materials of animals both consumptive and non- consumptive (various parts) with their high value in the market attracts the poaching of animals. In spite of the denial of park authorities this is a serious problem of this region.

The activities of local tourists and local residents have enforced the wild animals to change their natural habitat and also affect the breeding behavior of some species including Red Panda.

The local herdsmen make temporary animal sheds during grazing period. The unmanaged animal sheds (spring and autumn) systems and the disturbances by the movement of local people especially the shepherds have altered the habits and activity of these wild animals. The grazing period of animals lies during spring season. Yonzon and Hunter, (1991) found grazing practice captive animals overlaps of with the breeding period of pandas. So the movement of animals likes Yak and Chauri and human activity affects the breeding behavior of red panda, which is the main cause of the decline in the population size of these endangered species.

The human impact on vegetation has greater influence on plant life than on any of the other component of the environment. The activity of tourism and local people has a direct impact on the vegetation.

The collection of fossil fuel is chief source of energy. Prior the establishments of the park local people were free to collect fossil fuels timber and other forest products (Upreti, 1985). The amount of consumption of the fuel wood found varies with the different altitude .A considerable amount of fuel wood is used by the local people and hotel lodges as well. For about 67% of the households are found using 10-20 bhari of fuel wood per month and hotels, lodges use on average of 69.75 kg. of fuel wood monthly. Yonzon and Hunter 1991 studied that total firewood consumption is 313 tonnes in LNP yearly which is more than the sustainable annual increment of Langtang's forest.

Besides fuel wood LPG, solar energy, batteries, electricity is the source of alternative energy. The study area lies in mountainous region where the livelihood status of the people is poor hence the use of alternative energies like LPG, kerosene and biogas are expensive. So, the park authorities cannot make a decision that inhibits the locals to follow traditional practice of collection of local natural resources for energy. Instead they can promote the use of improved stoves to minimize the quantity of fuel wood used and to bring such programs, which promotes the use of other source of alternative energy gradually. The lack of the alternative source of energy in the high altitudes increases the use of fuel wood in excessive quantity.

Fodder collection for bedding and feeding purpose and use of timber for construction is another practice in this region. Yearly new animal sheds are built so every year many new trees are felled down for constructing shed. During fodder collection, important herbs can also be collected which in turn reduces ground vegetation.

From survey deforestation has found caused by tourist, 47% of local residents & 34% of the local trekkers were agreed to the statement that tourist create deforestation problem.

The trampling in the study area is not only by the tourist activity. The mode of transportation in this region is only Chauri, Yaks and Horses. Frequent movement of such animals has caused trampling on trail.

Sanitation & water quality hasn't found to be degraded due to tourist activity. Yet there is lack of the toilets along the trail and most of the houses surveyed. Of the total local residents 53% & 46% of the local trekkers disagreed the statement that tourist create sanitation & water quality problem.

Incase of solid waste disposal problem, majority of the local respondents and local trekkers were against to the statement that tourist were responsible for disposal problem. From the study most of the tourists manage the solid waste properly, bio-degradable by burning & non-biodegradable either by burning, managing in pit or carrying together. The uses of tin, plastic bottles and can foods are the main feeding habit of the tourists. So they cannot separate from such materials. So, the well managed waste management system can reduce the garbage along the trail. The unmanaged construction of campsites along the trail is also responsible for environmental degradations of surrounding area.

Different committees are established here to manage solid wastes generated from hotels and houses. They have put container along the trekking route. They collect the solid wastes and then burn. These committees are established with specific purpose yet they lack the proper management such that one can see the solid wastes like cans, wrappers etc along the trail.

The human wastes and animal excreta can be seen along the trail. The human wastes and animal excreta in the high altitudes don't decay fast thus reduces the aesthetic value of the area.

This area is popular for its traditional values and culture. The tourists coming here are mostly from Western countries, which have open society. The younger generations especially are found influenced by the dress pattern, food pattern, languages and fascinating mode of life of tourists. The local people especially

in this area are seen wearing western cloths like jeans instead of their traditional dresses.

The influx of people from different country and religion may affect the local culture and may lead to social degradation. The nature tourism is concentrated to the remote areas so, its impact on local culture is unavoidable. The dress pattern of this area is related with culture of the area.

An unspoiled natural, cultural and human environment is a fundamental condition for the development of tourism (Rajkarnikar, 1995). Most of the tourism activity in the study area is nature based. Having gifted natural resources it has yet to do more in the promotion of well-managed ecotourism. So, the all responsible parties should instruct the tourists, hotels, lodges about the benefit of ecotourism.

Ecotourism activity in this area is supposed to be supportive tool for lifting the living status of the local residents. The lacks in management policy of the authorities have deprived the locals from enjoying such benefits. If proper management is employed in this region the negative impacts of ecotourism can be minimized and attracting the no of tourists.

The ecotourism practice is usually done in unspoiled natural environment. Because of their location in environmentally sensitive areas, ecotourism operations that fail to live up to conservation principles can have very serious environmental consequences.

The participation of the local people and the sharing of their indigenous knowledge play a vital role in the conservation and development of area. The lack of the participation of the local communities in the management group increases the conflict between the park authorities and local people.

Tourism is a human activity in which tourists go to visit the area. So the locals should be educated the importance of tourism to the area and the relationship between the tourism activity and the fragile environment.

Tourism in this area is important from national and international point of view. So, preservation and promotion of the area is responsibility of all concerned parties including park authorities, local residents and local tourists. Hence tourism strategy in context of this area can be integrated between development of an area and economic gain in such a way which can benefit both the nature and tourists and play a significant, even essential, part of local economy of the area and has the potential to contribution in poverty alleviation, rural development.

REFERENCES

- ADB. 2001. *Natural Resources Management and The Environment*. Asian Environment Outlook, Asian Development Bank.
- Banskota, K and Sharma, B. 1998. *Mountain Tourism for Local Development. Training Manual for Local Community Groups and Organizations*. ICIMOD. Kathmandu, Nepal.
- Bhatta, R. N. 2000. *Tourism and Environment: A Quest For Sustainability*. New Delhi, Indus Pub.
- Bhattra, S.1989. *Environment Impact of Tourism on Mountain Ecosystems*. People and Protected Areas in the Hindu Kush- Himalayas. 49-52p.
- Boo, E. (1990). *Ecotourism: The Potentials and Pitfalls. Vol. 1 and 2*. World Wildlife Fund. Washington, DC, USA.
- Bookbinder, M.P. et al. 1998. **Ecotourism's Support for Biodiversity Conservation**. *Conservation Biology*. **12** (6), 1399-1404p.
- Cater, E; Lowman, G. 1994. *Ecotourism A Sustainable Option?* Wiley and Sons, Chischester, UK.
- CBS, 2001. *Statistical Year Book of Nepal*. Central Bureau of Statistics. Kathmandu.
- CDG, 1997. *Socio Economic Survey of Langtang region contributed to UNDP/Partnership for quality tourism*. Central Department of Geography. Kirtipur, Kathmandu, Nepal.
- Ceballos-Lascurain, H. 1996. *Tourism, Ecotourism and Protected Areas*. IUCN, Gland, Switzerland.

- Chaudhary, R.P. 1998. *Biodiversity in Nepal: Status and Conservation*. (Know Nepal series no. 17). Saharanpur (U.P.), S.Devi/ Bangkok, Tec press Books.
- CI, 2003. *Tourism and Biodiversity: Mapping Tourisms Global Footprint*. Conservation International, Washington, DC.
- Cruz, R. 1999. *The Impact of Ecotourism in the Annapurna Region: The Baragaon, The Annapurna Sanctuary and Sikles Sector*. Kathmandu, Cornell-Nepal Study Programme.
- Dixit, K. M. 1989. *An Obsession with Tourism*. *Himal* 2 (3): 3-12p
- HMG/LNP 2001 *Buffer Zone Management Plan*. Langtang National Park. Dhunche, Rasuwa.
- Gupta, S.C. 1999. *Fundamentals of Statistics*. Himalayan publishing House. Mumbai, India.
- Gurung, C. 1995. Ecotourism: Nepal's Experience. In: Jackson, R.; Ahmed, A. eds. *Proceedings of the Eight International Snow Leopard Symposium, 12-16 Nov. 1995*, Islamabad, Pakistan. Seattle, WA, International Snow Leopard Trust/Islamabad, WWF for Nature-Pakistan. 170-177p
- HMG/MOCTCA 2003, *Annual Tourist Statistical Report*. His Majesty's Government of Nepal, Ministry of Tourism and Civil Aviation. Kathmandu
- HMG/MOCTCA 2004, *Annual Tourist Statistical Report*. His Majesty's Government of Nepal, Ministry of Tourism and Civil Aviation. Kathmandu

- Jha, P. K., 1999. Ecotourism. In: Majapuria, T.C.; Majapuria, R.K. eds. *Nepal Nature's Paradise: insight into diverse facets of topography flora and ecology*. Gwalior, M.Devi. 488-495p
- Joshi, D.R. 2004. *Paryatan Sanga Gashiya Ko Saino*. *Space time Daily News Paper*. Kathmandu, Nepal.
- Joshi, D.R. 2004. *Promoting Tourism in Nepal*. *The Rising Nepal*. Kathmandu, Nepal.
- Koirala, N. 2001. *Impact of Tourism on Plants, Animals and Environment of Modikhola Valley of ACAP*. Thesis Submitted for Master's Degree. Department of Zoology, Tribhuvan University, Katmandu, Nepal.
- Lindsay, H.E. 2003. *Ecotourism: The Promise and Perils of Environmentally-Oriented Travel*. www.ectourism.org.
- Marion, 1994. *An Assessment of Trail Conditions in Great Smoky Mountains National Park*. Department of Interior National Parks Service, Southeast Region. Atlanta, Georgia.
- MOPE, 2004. *State of the Environment Nepal (Ecotourism)*. Kathmandu, Nepal.
- Nepal, S. K. 1999. *Tourism-Induced Environmental Change In The Nepalese Himalayas; A Comparative Analysis of The Everest, Annapurna and Mustang Region*. PhD Dissertation Submitted to The Faculty of Natural Science University of Berne.
- Nepal, S. K. 2002. *Mountain Ecotourism and Sustainable Development, Ecology, Economics, and Ethics*. *Mountain Research and Development*, **22** (2). 104-109p

- Nepal, S.K. (1997). *Tourism Induced Environmental Changes In The Everest Region: Some Recent Evidence*. Unpublished Research Report.
- Nepal Traveler, 2005. *Travel and Trade Reporter*. 8(41)
- Nepal, S.K. 2002. *Tourism as a Key to Sustainable Mountain Development: The Nepalese Himalayas in Retrospect*. *Unasyuva*, 208 (53) 38-45p
- NEPAP. 1993. *Nepal Environmental Policy and Action Plan: Intregating Environment and Development*. HMG, Kathmandu.
- NTB. 2001. *National Ecotourism Strategy and Marketing Programme of Nepal*. Kathmandu, Nepal Tourism Board
- Puntenney, P.J. 1990. *Defining Solutions: The Annapurna Experience*. CS 14(2): 9-14 pp
- Rajkarnikar, S. 1995. *Environmental impact of tourism on Nepal*. Thesis Submitted for Master's Degree. University of Surrey, U.K.
- Robinson, David W. 1992. *Sociocultural and Ecological Impacts of Mountain Tourism in Nepal's Sagarmatha (Everest) National Park: Implications for Sustainable Tourism*.
- Sapkota, B. 2002. *Tourism in Nepal: A Case Study of Helambu Region, Nepal*. Thesis Submitted for Master's Degree. Department of Economics, Trivhuvan University, Katmandu, Nepal.
- Satyal, Y.R. 1988. *Tourism in Nepal: A Profile*, Nath Publishing House, Vanarasi.
- Sharma, P. 1995. *A Framework for Tourism Carrying Capacity Analysis*. International Center for Integrated Mountain Development, MEI Series No. 95/1, Kathmandu, Nepal.

- Sharma, U.R. 1991. *Park-People Interactions in Royal Chitwan National Park*. A Thesis Submitted in Partial Fulfilment of the Requirements for the Degree of Doctor of Philosophy in the Graduate College. The University of Arizona, U.S.A.
- Sherpa, M.N, O. Gurung, C.P. Gurung, D.Reed, and R.Kayastha. 1989. *Pilot Program Evaluation and Stage 1 Needs Assessment for Annapurna Conservation Area Project*. KMTNC/WWF, Washington, DC.
- Shrestha, I, Joshi. N. and Shrestha, K. 2002. *Report on Some Plants from Langtang National Park*. Natural History Museum. Vol(21)
- Shrestha, M.K. 1998. *Vegetation Study of the Red Panda habitat Langtang National Park, Central Nepal*. Thesis Submitted for Master's Degree. Department of Zoology, Tribhuvan University, Katmandu, Nepal.
- Shrestha, R.K. 2002. *The Impact of Tourism on The Environment of Royal Chitwan National Park, Nepal*. Thesis Submitted to University of Rajasthan for The Degree of Ph D (Zoology), Environmental Biology Department of Zoology, University of Rajasthan. Jaipur, India.
- Upreti, 1985. *The Park-People Interface in Nepal: Problems and New Directions." People and Protected Area in Hindu-Kush-Himalayas. Proceeding of the International Workshop on the Management of National Parks and Protected Areas in the Hindu-Kush-Himalayas* 6-11 May 1985, Kathmandu Nepal.
- Wall, G. 1997. *Forum: Is Ecotourism Sustainable? Environmental Management*. 21(4): 483-491p. Department of Geography. University of Waterloo. Waterloo, Canada.
- Wall. 1994. *Ecotourism: Old Wine in New Bottles. Trends*, 31(2), 4-9p

- Weaver, D. B. 1998. *Ecotourism in Less Development World*. Oxon, CAB International.
- Weaver, D.B. 2001. *The Encyclopedia of Ecotourism*. Oxon, CAB International.
- Wood, M.E. 2002. *Ecotourism: Principals, Practices and Policies for Sustainability*. UNEP, France. www.uneptie.org/tourism.
- WTO, 2002. *World Ecotourism Summit, Final Report*. Quebec city, Canada, 19-22 May 2002.
- Yonzon, P. and Hunter Jr. Malcolml, 1991. *Cheese, Tourists and Red Pandas in the Nepal Himalayas*. *Conservation Biology*, **5(2)**: University of Maine, Maine, U.S.A.196-202pp
- Yonzon, P.B. (1989). *Ecology and Conservation of Red Panda in the Nepal-Himalayas*. A Thesis Submitted in Partial Fulfilment of the Requirements for the Degree of Doctor of Philosophy in Wildlife. University of Maine, Maine, U.S.A.

