

Bio-diversity Conservation and Eco-tourism: A Case study from Langtang National Park

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Abstract

The biodiversity conservation and ecotourism co-exists most at the same time. Promotion of bio-diversity bury up the sustainable development of ecotourism or vice versa. The unaccepted technological and economic development resulted different world met and declared for bio-diversity conservation and environmental conservation. In this regard bio-diversity conservation is regarded as the best strategy for projection of environment. In this perspective different attempts have been made in Nepal. Both these concepts were applied in Langtang National Park (LNP) simultaneously. Although the concepts are being applied but there are some constraints like growing number of lodges and hotels, lack of local level planning, lack of alternative sources, park people conflict, resources depletion for proper integration of these concepts. Since tourism is dependent on diversity of nature as well as culture, eco-tourism can be well introduced in LNP through integration of Biodiversity conservation into Tourism Sector Master Plan. This will benefit the interest of local people and community as a whole. The objective of this paper is to analyse the connection of bio-diversity conservation and ecotourism with case study of Langtang National Park, representing ecosystem of middle hill and Himalayan region of central Nepal. Analysis of the study is based on both secondary and primary sources of information.

Key words: *Ecosystem, Bio-diversity, eco-tourism, new approach.*

Introduction

The relationship between biodiversity and ecotourism co-exists. Biodiversity conservation issue has been raised since the Second World War. But significant efforts in this regard started from the Stockholm Conference, 1972. In, early 1980's the World Charter for Nature was succeeded by the First World Conservation Strategy. It was published and launched jointly by IUCN-The World Conservation Union, the World Wide Fund for Nature (WWF) and United Nations Environment Programme (UNEP). Man and Biosphere (MAB) programme initiated voice for protected areas since 1970's. A long complex document devoted to living resource conservation was drafted. The second strategy of its kind was felt essential in the 1990's & documents was published in late 1991 which was titled "CARING FOR THE EARTH". (Atchia Michael and Shawna Tropp, 1995).

Another attempt made in this regard was, 1992, where nations of the world met at Rio for Earth summit & took wide range of decisions for reaching consensus to help and protect environment. Agenda 21 on the conservation of biodiversity & conservation of climate change was the important outcome of this meeting. World Conference on National Parks & Protected areas held during 1992 further emphasized on caring for the earth and global biodiversity conservation. This was the product of the longterm standing partnership of IUCN, WWF and UNEP (Atchia, Michael and Shawana Tropp, 1995). Nepal endorsed National Conservation Strategy in 1988 and ratified the Biodiversity Convention.

After the second world war the tourism industry sought a remarkable change. But as the number of people involved in tourism increased the image of tourism polluted. The process continued for the fifties and sixties. During sixties, the public concern about environment increased and various conservation organizations were set up to lobby governments to set

aside land not just for tourists but also for flora, fauna and healthy ecosystems. Then it was believed that " True eco-tourism can in fact be one of the most powerful tools for protecting the environment" (Hector Ceballos - Lascurian, 1995).

Ecotourism supports conservationists and promotes the sustainable use of natural resources and thereby to reduce the losses incurred in the environment through tourism activities. However, establishment and management of national parks is considered as one of the most important ways of ensuring the protection of natural resources. World's first national park "The yellow Stone" was established in America in 1872. Since then, developing countries adopted similar model and established national parks and protected areas in their countries and regions. Nepal also adopted the same model which began with the establishment of the Royal Chitwan National Park in 1973. Though late start within two decades Nepal made an impressive achievements in setting up series of protected areas.

Nepal's rich resources of natural environment and biodiversity are valuable economic assets for tourism. Tourism is recognized as a major user of biological resources and sources of employment for many Nepalese, supporting secondary industries, and contributing significantly to the economy.

Bio-diversity in Langtang National Park

The protected areas of Nepal ranging from the high peak of the Himalaya to the lowland tropical forest of the Tarai contain more than 500 endemic species of mammals, birds, reptiles, amphibians, fish and butterflies, including over 8.5 percent of the world's known birds (Shrestha, 1999). The Protected Areas (PAs) in Nepal include nine national parks, three wildlife reserves, one hunting reserve and three conservation areas and six buffer zones covering an area of 26,971 sq.km.i.e.18.31 percent of total area of the country. The share of protected area categories are as follows: national parks covering 38.14 percent of the total area of PAs, wildlife reserves 3.62 percent, hunting reserves 4.91 percent, conservation areas 41.99 percent and buffer zone 11.31 percent (CBS, 2002).

The Langtang National Park (LNP) was gazetted in 2033 (1976 AD) to protect various ecosystem from mid hills to Himalaya and covers an area of 1,710 km². It is located in the Central Himalayas of Nepal and extends 32 km north of Kathmandu to the Nepal-China border in the north (Figure 1). It covers complex topography, geology together with varied climatic conditions have enabled wide spectrum of ecosystem. The Park provides habitat for a wide range of animals, including threatened species such as wild dog and red panda. It is important as a migratory route for birds in spring and autumn. The park extends over three districts and 28 Village Development Committees (VDC), covering 56 percent of the area in Rasuwa district, 38 percent in Sindhupalchowk, and 6 percent in Nuwakot (Sagun, 1995). The park area is divided into two section: the settlements inside the park and the surroundings. The settlements surrounding the LNP boundary have been declared as buffer zone under the provisions made by fourth amendment of National Park and Wild Life Conservation Act 1973. The buffer zone includes cultivated areas and adjoining forest where the lands are cultivated and the forest products could be collected to meet the needs of the local people. Many rare and endangered species are also available in this region. The details of the bio-diversity is given below.

Floral Diversity

The variation of altitude from 720 meter near Bhotekoshi to Langtang Lirung (7245m) gives

conservation, and slope stabilization. Among commercially utilized medicinal plant SchEMS study shows eight varieties (Chiraito, Timdo, Kurito, Pakhanved, Yeklevir, Ganja and Allo) of medicinal plants in LNP (SchEMS, 2001). However Yonzon (1993) recorded 13 species of medicinal plants that were exported from LNP. They are Bikh, Somlata, Dhupi (*Indica*), Dhupi (*Kurva*), Dhupi (*Squamata*), Angeri, Jatamasi, Kutki, Padmachhal, Dhupi (*Rhododendron Anthopojan*), Chite Kath, Chiraito, and Tuki flower. This shows that there has been decreased of medicinal herbs from thirteen to eight between 1993 to 2001.

Faunal Diversity

Mammals: The National Park is the habitat of number of wild animals. As the park boundary extends in various altitudes, various kinds of animals are also found. The LNP has recorded 56 species of mammals in the park of which 8 species are included in the protected list of HMG. These include Assame monkey, Grey wolf, Red panda, clouded leopard, leopard cat, snow leopard, Himalayan musk deer and Tibetan sheep. According to Jhamak B. Karki, Warden of LNP, Assamese monkey has been reported from Dhunche (1950 m) and Ghattekulo (around 2000 m). Probably it's the first time that this species has been seen in Nepal. Spotted leopard, barking deer, jackal, wild boar, orange bellica, Himalayan squirrel, etc. are usually seen in the river bank of Melamchi, Bhotekoshi, Langtang, and Panchpokhari and these animals use upper slopes of the river. Among them IUCN listed snow leopard and musk deer in endangered species. The high altitude area is occupied by snow leopard and related species of mammals. According to the local informants during early 1970's one could see a lot of Pandas, porcupines coming near the trekking route. However, due to heavy tourist flow in recent years such animals are not seen in this area. (Personal Communication with S. S. Shrestha).

Birds and Fish Species: Longitudinal ranges and altitudinal variation make favorable condition to various species of birds. 206 species of birds have been recorded in the LNP park area. Beside it is assumed that the park area is used by about 150 species of seasonal migratory birds of which some are included in the endangered list of IUCN Red Book (SchEMS, 2001).

Some section of the park is significant from the point of view of fish species. The upper side of the river valley consists of negligible proportion of fish species. It is reported that 30 species of fish do exist in river system of Bhotekoshi, Langtang, and Melamchi including the buffer zone area. Out of total, 11 species are recorded in Melamchi river. 11 species have been found in upper Betrawoti and remaining 8 species recorded in other river systems. Three species of fishes of Asala group are said rare by Biodiversity Preservation Plan (BPP) - 1995 (MoFSc, 2000). 19 species of fishes are in Langtang Khola. Different species of fishes recorded in LNP river system play an important role to maintain the ecosystem of the area.

Ethnic Diversity

Langtang area is famous for its ethnic diversity too. The park area is inhabited by several ethnic groups. Majority are the Tamangs and Sherpa. Tamangs are found everywhere, but Ghale, Nagarkoti, and Magar, occupational caste (Kami, Damai), Brahman, Chhetri, Gurung, Newar, etc. are scattered in small groups in various parts. Sixty-six Tibetan refugees migrated from Tibet in 1968 are living near Syafru village, buffer zone of LNP.

The latest census (2001) shows that the park area is inhabited by 11,703 households with a total population of 58,171. The park area has experienced the growth of population by 24.37

percent i.e. Within the last 10 years 11,402 persons were added in the park area. The average number of family per household is 4.97 persons which is higher than the national average size of 4.25. The sex ratio is 104.92 and overall growth rate between two census periods eg. 1991-2001 of the census is 2.20 per cent per year (CBS, 2002).

Eco-tourism in Langtang National Park

Background

Increasing number of tourists and tourism associated activities have placed negative pressure on bio-diversity and the natural environment of LNP area. As the main source of foreign exchange earner and employment generator tourism is not possible to stop. Therefore LNP needs to conserve ecosystem and attract tourist as well. To address this problem, an eco-tourism model has been adopted in the LNP from the last seven years. Eco-tourism is a response that seeks to reduce the negative environmental and cultural impacts of mass or traditional tourism. In recent years a specific category of nature based tourism has developed along these lines "ecological tourism" or ecotourism as defined by IUCN's ecotourism is "environmentally responsible travel and visit to relatively undisturbed natural areas in order to enjoy and appreciate nature (and any accompanying cultural features - both past and present) that promotes conservation and places low visitor impact, and provides for beneficially active socio-economic involvement of local populations"(Hector Ceballos Lascurain, 1995). Ecosystem has been considered environmentally sustainable an economic alternative to the land use options farming, and cattle raising and an important source of foreign exchange earnings. Nepal generates foreign exchange from tourism industry providing different options to the tourists arriving from different parts of the world. The main thrust of eco-tourism is to limit the number of visitors but increase the number of days.

Trekking Tourism

The Langtang region was open for trekking tourists in 1970's. Proximity and easy access from capital city of Kathmandu and endowment of panoramic natural beauty, beautiful valleys, glaciers, rich in bio-diversity, cultural diversity and varieties of ecosystems are the main importance touristic of LNP area. With advent of motorable road to Dhunche, has become the shortest trek route to Himalaya. Therefore, trekkers prefer to visit LNP.

There was no well managed lodges and hotels prior to the establishment of LNP. Therefore LNP authority supported for the establishment of well managed hotels and lodges. Now there are 91 hotels in LNP area.

In 1999 a total of 120,436 foreign tourist visited to Nepal including national parks, wildlife and hunting reserves out of which 9 percent (8,612) visited LNP. The total revenues of the year was US \$ 125,000 (Shrestha, 1999). About 8,000 to 11,000 tourists visit the park annually, Department of Immigration reports that individual trekkers constitute about 65 percent, whereas group or agency trekker constitute 35 percent. The following are the popular trekking routes to LNP.

- Kathmandu – Dhunche – Bharku – Syafrubensi – Langtang Valley (Western Route)
- Kathmandu – Sundarikal – Gosaikunda - Langtang Valley (Eastern Route)
- Kathmandu – Dhunche – Chandanbari (Sing Gompa) - Gosaikunda (Western Route)

The majority of the visitors arrive at the park through the western route. Only the few visitors who want to experience high mountain climbing follow Ganzala pass (5122 m) through eastern side. They could cross the pass only in July/August when snow melts.

In 2000 a total of 133,455 tourist visited to national parks, wildlife and hunting reserve of Nepal out of which 8.9 percent (10,917) visited LNP.

Capacity Building for Ec lodge Management

To manage and improve ecological condition management is important in any area. In the initiation of LNP and other NGOs, Lodge Management Committee was formed in Thulosyafu, Syafru Bensi, Helambu and other places. They have developed polices regarding lodging and fooding rate organization and the mounition institute task force have developed and published lodge management plan. These organizations have also conducted tours in ACAP, Bhutan and Kathmandu with an objective to make them aware about eco-tourism. In coordination with LNP, different campsites were developed. The lodge management committee is supervising the compliances by lodge owners. At present there are 91 lodges and hotels under the management.

The lodge owners are also being provided with training, aiming at the improving, the environmental quality of their lodges. Basically local youths are trained in the group. Such training programme also teaches them the fuel wood saving devices such as the use solar water heater, kerosene, electricity, and LPG gas. In addition, people were also made aware of about fresh food, sanitation of households, hygiene, etc. in Syafrubensi. Partnership for Quality Tourism (PQT / UNDP) has provided some technical assistance to the hotel and lodge owners for maintaining the quality and standard of services. SAGUN, an Non governmental Organisation and the Mountain Institute taskforce have published a lodge management planning in 1996.

Although the number of tourist visiting remains almost stagnant for the last decade, the number of lodges / hotels and shops are increasing. Therefore minimization of this impact in the environment is very crucial. The lodge owners must maintain some sort of hygienic standard in and around the lodges and LNP has provided following facilities for this purpose

- Demarcation of Camping sites
- Levy fee for Camping site.
- Price rate of lodges are given, and established standard price for the lodge
- Set up of kerosene depots

These efforts of GO and NGO have been effective to control hazard campsite development, camping, forest fire, etc. for the last five years.

Energy and Electricity

Lodges and hotels use kerosene and LPG gas for fuel. About 60% of lodges use LPG gas and firewood for cooking purposes in Thulo Syafru, Syafru Bensi and Dhunche. About 30 percent use kerosene and 20% use fuelwood for energy. They use improved stove for cooking purpose. However, local people not associated with tourism business use only fuel wood which are collected from the nearby forest.

These days almost all lodges / hotels are levelled as eco-lodge because they use electricity for lightning, solar energy for boiling, kerosene and gas for cooking and improved stove for room heating. Kerosene depots have been established in Syafrubensi and in Dhunche. Kerosene stove maintenance shop has been established in Syafrubensi.

Completion of Chilime Hydroelectricity Project (CHEP), has notably support for cooking,

heating, lighting, and operating small industries. The construction of Langtang Hydroelectricity Project (LKHP) will further help in supplying the electricity in the area.

Information and Awareness to the Visitors and Tea Shops

Information brochure on biodiversity and others are made available to both national and international visitors. The information on tourists, lodges is being demonstrated at main gate of tourist entrance. The signboards of lodges are posted in the main tourist trekking area. Almost every tea shops are designed according to culture and local environment. Indigenous techniques adopted to design and maintain tea shops, lodges has helped to add cultural attraction in the area. Women are more active and regular for these activities. Reportedly rural people specially women are more benefited economically.

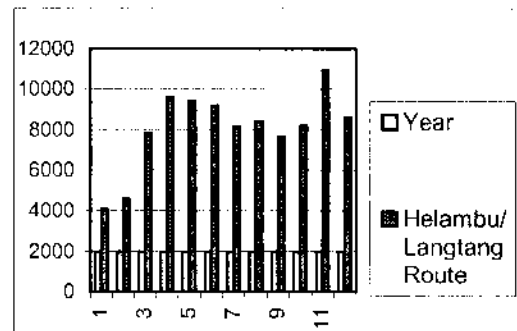
Perception of Local People

Generally national parks and conservation reserves or natural areas opened for tourist are also open to public. Langtang National Park (LNP) had very few number of tourist arrival prior to a national park status. The tourist arrival grew exponentially after the declaration of park.

Langtang communities have mixed feeling about the declaration of national parks. Negative feelings developed at the time of declaring National park due to the assumptions that they will be restricted for mining, hunting, grazing, collecting firewood, etc. that they were practicing

Table - 1: Number of Trekking Permits Issued by Department of Immigration

Year	Helambu/Langtang Route
1980	4,113
1985	4,610
1990	7,826
1991	9,603
1992	9,457
1993	9,187
1994	8,167
1995	8,427
1996	7,687
1997	8,201
1998	10,952
1999	8,612



Source: Shrestha (1999) and Watanabe et. al., (2000)

Within five years (1995-2000) the numbers of tourists visiting to Langtang National Parks increased by 50 percent (Table 1). But, the number of hotel/lodges and their capacity nearly tripled. Consequently, the impact of tourism in natural and cultural environment became noticeable.

from historical time. Even local people thought that the life of human in Langtang area is less than a wild animal. However, attitude of public changed to a great extent over time. Now, the perception of local people towards park management is positive. Biodiversity conservation promoted tourism in the area helped the local people to boost their economy, and provide employment. However, some of them are of the opinion out that price of most goods have gone up and has become more expensive because of tourists. Also firewood is excessively used in the hotels and lodges.

The training on the sustainable use of water supply, solar power, lodge development, sanitation and solid waste management, literacy programme are conducted in the past by quality tourism.

Issues and Constraints

Management of a biotic and biotic resources is implicit in all aspects of an ecologically sustainable economy, including tourism. Management of resource is not a simple concept, nor an easily achievable practice, but requires the development of broad national strategies, local efforts and their desire.

The existing impact of tourism includes damage of jungle, disturbances to Pandas, bird nesting, over-collecting of fire wood (by army people) fecal contamination of sites, plant collection, disturbances of animal and their habitats, cutting of vegetation, etc. To overcome these problems United Nations Development Programme (UNDP) Eco-tourism with assistance of SAGUN have started various training packages to conserve the environment of the area. With the support of the Park Management Authority, the local people are attempting conservation of biodiversity through ecotourism. However, some issues still do exist over the area. Some of them are discussed below.

Increasing Number of Lodges and Tea Shops

With the establishment of LNP, dependence of people on tourism for income has been growing over years. The alternative sources of income accruing from the traditional forest related activities (e.g., handicraft production and collection of medicinal and other non-timber forest products) are now no longer permitted. Under the present rate of tourist arrival, the existing number of lodges in LNP is believed to have reached its maximum. However, the numbers of hotels and lodges are increasing by five to ten per year. Some of the lodge owners are redesigning their lodges and hotels each year. Unnecessary tensions like jealousy among hotelers, over expenditure in building materials have increased. All these activities have indirectly helped to lower the price rates of their hotels and some of them have overburden of bank debt. Some lodge owners have invested as high as two million Nepalese rupees for simply hotel construction only.

Issues Related to Local Level Planning and Management

Rasuwa district is dependent on neighbouring districts Nuwakot and Kathmandu for food and other edible items. Most hotels and lodges import food and vegetable items from Kathmandu and Trishuli although there is ample scope of producing such foods items locally. As such, benefits from tourism that could be retained locally and distributed among settlements have not materialized.

Government Tax

LNP office has been raising entrance fee of Rs. 1000.00 (one thousand) to each foreign visitors. The total collection of 1999 revenue was US\$ 125,000 (Shrestha, 1999). The proportion of revenue has been utilized for conservation and development activities in the park area. Legally, though the 33 percent of the revenue generated from park should afford in development of park and buffer zone area, but it has not been utilized properly. In most cases the amount are released to park area uneffectively due to various bureaucratic problem.

The Industrial Policy of HMG has granted a five years tax exemption for the lodge owners. The lodge owners are reluctant to invest in the lodges, since they feel that the five-year exemption is too short to make any investment worthwhile.

Fuel wood and Lack of Other Alternate Sources

There are 21 forest user committees with 315 user groups in LNP. But forest in many parts of LNP is not properly managed. Regeneration is also very weak, largely because of excessive livestock grazing, shading, and unfavorable climatic conditions for seedling germination. There must be natural generation of trees under decaying of natural trees nearby. The small trees gets natural nutrient from the decay of manure and other trees. Local people collect all the dead trees and take it away to their homes, which make regeneration of natural vegetation difficult. The present condition of road is not good enough for heavy transport. But due to the lack of kerosene they ultimately need to cut trees in order to heat the rooms and other cooking facilities.

For most tourist agencies and lodges, firewood is still the only source of energy. Army personnel and Cheese Factories continue to use large amounts of fuel wood. Although fire wood collection from the forests in the park is prohibited, there is evidence that such collection takes place against LNP regulations for use in lodges and teashops. At higher elevations, it is even sold. Most of the local people are poor and, even if alternatives are provided, they will not be able to afford them. Hence, the local demand for firewood will continue to remain high which has to be duly addressed by the Park authority.

Lack of Awareness Among Pilgrims

Hindus visit the Gosainkund lake each year as pilgrimage. Many floras are uprooted or cut during this period to make walking sticks. Although such materials are generally confiscated at the LNP gate. But when the pilgrims return from the Kunda, the damage is already done. Pilgrims are not made aware of the consequence of their actions on the vegetation of the Park. Another problem created by pilgrims is the garbage they leave behind and around the lake while camping en route. Although the pilgrimage occurs once a year, the number of pilgrims is large and its cumulative effects on the biodiversity conservation and the lakeside could be still being seen many months after Janai poornima, the Hindu festival usually occurs in August.

Disturbance in Culturally Sensitive Areas

Human activities and their impact on wild life and vegetation have not been adequately assessed, addressed, or monitored in LNP. Examples of such activities are uncontrolled garbage dumping, construction, grazing, plant extraction, and so on. Lodge operation close to sensitive places such as Gosainkunda has not been checked and monitored. There has been no systematic study on the various aspects of environmental impacts.

People-Park Conflict

Majority of the local people living inside and outside the park indicated loss of benefit due to establishment of the park. This loss takes the form of crop damage and livestock depredation by wildlife. Wild boars, Himalayan black bears, monkeys and deers are the main crop predators. Reportedly two to five deers, wild boars are usually hunt by local people regularly. The major cause of animal killing by villagers is in retaliation to the high incidence of crop raid and livestock depredation in the park. Crop damage by wild animals frequently occurs in almost all part of the park and its surrounding area with range of damage from 50 to 80 per cent of production. Though local people construct fences for the protection but the wild animal like wild boar easily damages the fences or wall by digging the base area. Even most of the cultivated lands are kept fallow due to possible damage of the structure by the wild animals. Moreover, organised traders of northern sides are active in poaching of wild animals by involving economically weak people. It has been suggested to trap wild boars to control crop damage. Wild pigs would, additionally, provide meat and thus economic benefit to the local people. Trapping should, however be carried out carefully by the Park personnel only or else it could lead to abuse. Controlling other wildlife degradation is either too expensive or not feasible. The buffer zone concept, if properly planned and implemented, can provide feasible solutions to such problems (Kharel 1993)

Lack of Proper Zoning Demarcation

The bufferzone concept adapted in LNP other parks of the country is different. LNP incorporates settlements and cultivated land in its buffer zone area. Although there are lots of cultivated lands within parks but these lands are kept fallow. There is no appropriate land use plan and its management in the park and surrounding area. As a result, most of the lands are not used properly either for agricultural purposes or for other purposes. Similarly in the most part of LNP forest lands, grazing lands, marginal lands, and meadows have been used. As a result, forest lands are gradually changing into grass land and shrub lands.

Depletion of Resources

There are 58,171 people living in the park area only. Illegal grazing, fuelwood collection, timber theft, grass and fodder cutting, (Non Timber Forest Production) NTFP collection are frequent. These activities actually challenge the biodiversity conservation attempts.

Natural Hazards

Natural calamities also bring direct loss of wildlife and their habitat during monsoon. The huge land slides near Ghodetabela, Dovan, Syabru benshi and other places have affected the loss of forest and habitat destruction.

The big landslide above Dovan and Ghodetabela is marked in recent arial photographs of 1998. According to local informants it was caused by heavy rainfall of 1989 monsoon. But now due to deforestation, and human interaction the new landslide scars are found enormously at various places of trekking routes.

According to S. S. Shrestha, formerly all sides of the trails are covered either with scrub, reeds, grazing and forest. There was a thick forest in the Ghodatabala. Now the area is changed into barren and bush land. There are good rock shelter places en route to Langtang from both east and west side. Among them Thade (Ghopte Bhir) in route from Sundarijal and Syabru shelter from west are famous. But due to natural calamities and human encroachment these sites have damaged now a days (Personal Communication with S. S. Shrestha).

Conclusion

Poverty, number of hotels /lodges, low capacity building, lack of alternative energy, park people conflict are the issues to be addressed for sound of biodiversity conservation and ecotourism in LNP. Conservation education, sustainable use of natural resources, determination of carrying capacity, effective management of tours are may significantly help both for bio-diversity and sustainable development of eco-tourism. The most essential stakeholders of bio diversity conservation like LNP, tourist and local people should bring in a table and create a understanding that is supportive for both bio-diversity conservation and eco-tourism make aware about the issue related to importance of biodiversity conservation should integrated into tourism sector Master Plan of the government and park management authority.

Note

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