BUFFER ZONE MANAGEMENT SYSTEM IN PROTECTED AREAS OF NEPAL

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Abstract

Maintenance of eco-system diversity is often carried out by establishing national parks, wildlife reserves and other protected areas. The fourth amendment of the National Park and Wildlife Conservation Act in 1992 made the provision of buffer zone for protected areas considering buffer zone, an area of 2km in the vicinity of the park could benefit from park revenue (30-50 percent) and in return the community is supposed to participate and assist in park management activities. Between 1996 and 2010 Government of Nepal demarcated buffer zones of 12 protected areas covering a total area of 5602.67 square kilometer in 83 VDCs and two Municipalities of 27 districts where benefiting human population is over 0.9 million. In the buffer zone management programme emphasis has been given on the natural resource management where need of eco-friendly land use practices and peoples participation in conservation for long term sustainability are encouraged. This paper is an attempt to outline the various activities that have been executed under buffer zone management programme of Department of National Park and Wildlife Conservation with the internal resources, local communities and support from UNDP, WWF Nepal, CARE Nepal, NTNC and other various partners for the conservation and development of buffer zones in Nepal.

Key words: Bio-diversity, park, conservation, sustainability, buffer zone, community forest, livelihood, wildlife, ecotourism.

Introduction

Nepal is a center of rich bio-diversity and abundance of species due to vast topographic variations, the vertical range which extends from 60m in the South to 8848m (Mt. Everest) in the North within a horizontal distance of 160 km. Because of this altitudinal variations, the climatic condition ranges from tropical in the south to alpine in the north and the abundance of biological diversity is present within a relatively small geographic area of 147,181 sq. km. Geologically Nepal is the youngest and fragile mountainous country on the earth that requires the balanced environmental care and conservation of biological diversity in order to support the stabilization of the susceptible areas and to fulfill the necessities of the present population and future generations.

Biological diversity is the variety of life which exists all its different forms has the contributing capability in maintaining the stability of natural eco-systems (Gorkhali, 1991) and supplying the felt basic needs of the human population living in the areas. Biological diversity is essential for mankind because the improved variety of food production is very much tied to the wild genetic wealth of the world. Not only food but fiber, livestock, trees, medicines and many more scientific innovations depend upon wild genetic diversity. Destruction of vegetation causes the erosion of genetic diversity which then has a negative impact on food and medicinal production. A species ignored one day may suddenly and unexpectedly become useful and important the next (Upreti, 1991).

It is imperative to preserve the diversity of the genetic materials in the rich flora and fauna found at different altitudes and areas which could be essential to enhance the stability of land and improve the productivity of yield and quality of crops, medicinal plants and forest species (Malla, 1991) that can be harvested for human and animal consumptions so far. Maintenance of eco-system diversity is often carried out by establishing national parks, wildlife reserves and other protected areas (Gorkhali, 1991). It was in this line an effective conservation movement in Nepal started in 1970, when Government of Nepal approved in principle the establishment of the Chitwan National Park in the southern lowlands and Langtang National Park in the northern mountains assuming that successful wildlife conservation hinged on the exclusion of human activities who grazed their cattle and were dependent on fuel wood and construction timber within the protected areas.

In 1973 the National Park and Wildlife Conservation Act was promulgated and same year the Chitwan National Park was officially established as the first National Park of the country. It is the policy of the government of Nepal to include pristine areas, representing principal geographic divisions and biotic regions, within the network of parks and protected areas. Accordingly there are a total of 10 National Parks (10853 sq. km.), 3 Wildlife Reserves

(979 sq. km.), 1 Hunting Reserve (1325 sq. km.), 6 Conservation Areas (15425.95 sq. km.) and 12 Buffer Zones (5602.67 sq. km.) in and around National Parks and Reserves (Table: 1). The protected area networks covers 34,185.62 sq. km. (23.23 percent) of the total geographical area of the country. These Parks, Wildlife and Hunting Reserves, Conservation Areas and Buffer Zones are representing different geo-ecological belts, biotic and development regions of the country (Map: 1).

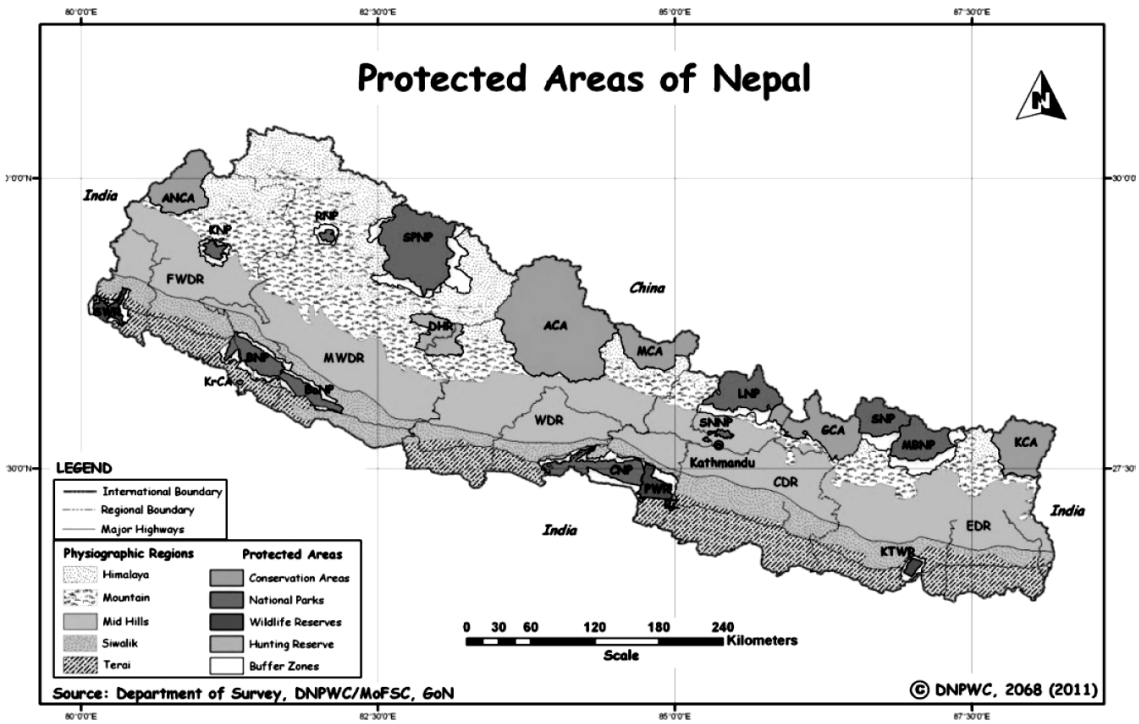

Table 1: Network of Protected Areas and Buffer Zones in Nepal

Protected Areas	Year of Establishment		Area (Sq. Km.)	
	Protected Area	Buffer Zone	Protected Area	Buffer Zone
Chitwan National Park (World Heritage Site: 1984)	1973	1996	932.00	750.00
Sagarmatha National Park (World Heritage Site: 1979)	1976	2002	1148.00	275.00
Langtang National Park	1976	1998	1710.00	420.00
Rara National Park	1976	2006	106.00	198.00
Shey- Phoksundo NP	1984	1998	3555.00	1349.00
Khaptad National Park	1984	1998	225.00	216.00
Bardia National Park	1984	1996	968.00	507.00
Makalu-Barun National Park	1991	1999	1500.00	830.00
Shivapuri Nagarjun NP	2002	…	159.00	…
Banke National Park	2010	2010	550.00	343.00
Suklaphanta Wildlife Reserve	1976	2004	305.00	243.50
Koshi Tappu Wildlife Reserve (Ramsar Site: 1987)	1976	2004	175.00	173.00
Parsa Wildlife Reserve	1984	2005	499.00	298.17
Dhorpatan Hunting Reserve	1987	---	1325.00	---

Annapurna CA	1992	---	7629.00	---
Kanchanjunga CA	1997	---	2035.00	
Manaslu CA	1998	---	1663.00	---
Krishnasar CA	2009	---	16.95	---
Gaurishankar CA	2010	---	2179.00	---
Api Nampa CA	2010	---	1903.00	---
Total	…	…	28582.95	5602.67

Source: *Department of National Parks and Wildlife Conservation, 2011.*

Since the National Park and Wildlife Conservation Act that was enunciated in 1973 there has been a tremendous socio-political development in the vicinity of protected areas. The protection of bio-diversity has come into direct conflict with the traditional linkage and practices in one side and the need of communities to use those resources for livelihoods on the other side during the past period. This sort of park and people conflict situation has demanded an appropriate strategy that can ensure of the local community and the sustainable objectives of the protected areas. Therefore, the fourth amendment of the National Park and Wildlife Conservation Act in 1992 made the provision of BUFFER ZONE (low human interference around the park) for protected areas. In the buffer zone concept an area of 2km in the vicinity of the park could benefit from park revenue (30-50 percent) and in return the community is supposed to participate and assist in park management activities.

Buffer Zone Management Act was started to implement in the protected areas of Nepal by the Department of National Park and Wildlife Conservation (DNPWC) in 1994 with a major shift in government policy from wildlife centered approach to people centered approach for conservation. In buffer zone management programme the integrated conservation and development approach with emphasis on participation of local community is adopted. This is principally described as 'empowering people' to mobilize their own capacity to make decisions and to control the activities that affect their life (New ERA, 2004).

Between 1996 and 2010 government of Nepal demarcated buffer zones of 12 national parks and wildlife reserves covering a total area of 5602.67 sq. km. in 83 VDCs and two Municipalities of 27 Districts where benefiting human population is over 0.9 million (DNPWC, 2011). This paper is an attempt to present and familiarize the buffer zone development programs in the protected areas of Nepal that was initiated by e DNPWC to implement the amended National Park and Wildlife Conservation Act, 1994 in order to resolve and mitigate the park and people conflicts.

Materials and Method

This paper is based on desk review of documents on government policy, strategy and buffer zone management programmes implemented by Department of National Park and Wildlife Conservation and other programme implementing partners such as UNDP, WWF Nepal, Care Nepal and NTNC. Secondary data and information related to buffer zone management in protected areas were solicited from project documents, progress reports, mid-term/terminal evaluation reports and annual reports from DNPWC.

Park and People Conflicts in the Protected Areas

The experience of the national parks and protected areas system in Nepal and other countries of the third world followed the conservation philosophy of the United States indicates that many protected area management authorities failed to adopt appropriate principle and guideline to protect their areas against the threats of inevitable human pressures for traditional exploitation of natural resources (Sharma, 1991). Relocation, obsolescence of cultural values, social disintegration, economic dependency, unsustainable harvesting and severe conflicts over resources use are some of the negative impacts of the establishment of national parks.

Wells (1992) reported the expansion of the protected area network in the third world has laid the heaviest burden on local communities, which has proven to be a gross disincentive to effective conservation. In a sample of 100 parks from 49 countries, Machlis and Tichnell (1985) identified 1611 specific threats to parks. The fundamental issue of these conflicts was the customary right of use of park resources by local people, which has raised basic questions of humanity survival (Nepal and Weber, 1995).

The creation of protected areas has indeed saved some endangered wildlife species from the verge of extinction, but in the process it has also alienated subsistence, agriculture based local people they are denied access to or restriction on the use of park resources which they had been traditionally dependent to meet basic needs (Sharma, 1990;

Wells, 1992). In this context indigenous Tharus of Chitawan become the victim of a double repression: on the one hand, imparted upon the exploited by the immigrants and the others rubbed by the national park of their freedom to use their living space and natural surroundings as they have traditionally done (Muller-Boker, 1999). This applies equally the people of other park areas such as Parsa, Bardia, and Kanchanpur (New ERA, 2004).

There are numerous causes, which lead to conflict between the park management and local people. Population pressure on natural resources, especially land and forest, in order to meet daily needs such as food, fuel wood and fodder requirements for the people and cattle living in the periphery are the major causes of conflicts at the boundaries of protected areas. The foremost cause is the crop damage and livestock depredation by wildlife going outside the park. Another equally important cause is the restriction imposed on the use of forest resources, which are available only inside the protected areas. The increasing number of population and its associated demands are exerting pressure on the natural resources, which in many cases are already at crisis point (NPC/IUCN, 1988).

Wildlife damage is a major concern for wildlife conservation and the prime causing factor for human wildlife conflicts. Human death/casualties, property damage including crop depredation are reported from different wildlife every year mainly in the periphery of the protected areas. Livestock killing by snow leopard in mountain protected areas where human settlement is inside the park is noticed quite often. In fiscal year 2009/10, 26 persons killed by elephant, 6 persons killed by tiger, 5 person killed by rhino 1 person killed by guar, 8 persons killed by leopard, 5 persons injured by arna, 3 persons injured by elephant, 8 injured by rhino and 7 persons injured by bear were reported. Likewise in the fiscal year 2010/11, 4 persons killed by elephant, 2 persons killed by leopard, 2 persons killed by rhino, 1 person killed by arna, 2 person injured by elephant and 1 person injured by arna (DNPWC, 2011). The dispersal of wildlife to human settlement areas can be taken either as an indication of poor habitat management or increasing their population beyond carrying capacity of the designated protected areas.

The lack of effective two way communication and a comprehensive management system combined with regulatory procedures, at time lead to acrimonious relationships between the local villagers and for those park administrations and management (NPC/IUCN, 1988). It was lacking from the park management to provide the notion of ownership for the communities who are the traditional resource users from the protected areas for their livelihood. Thus the conflict was heightened and an antagonistic relationship between the park management and the local community has been established in most of the protected areas.

The increase in population and the necessity of growing more food for survival have led to exploitation of resources within the parks. In certain case, the park has been illegally encroached either by farmers for crop cultivation or livestock grazing, or by influential persons to exploit rare natural resources (Nepal and Weber, 1993). For example, in Chitwan valley, during the sixties, waves of people from the hill and other areas were encouraged to migrate, pushing out the traditional community and wildlife habitats. Successive intrusions by the elites and new migrants have steadily eroded the land, water and biological resources and rights of the local communities (Shah, 2002) creating conflicts between various communities and protected area systems.

Concept of Buffer Zone

According to an influential book emerged from the 1982 World Parks Congress, MacKinnon and others (Wells, 1992) offered the following definition of buffer zone: "Areas adjacent to protected areas, on which land is partially restricted to give an added layer of protection area itself while providing valued benefits to neighboring rural communities" Sayer (Sherpa, 2000) defines a buffer zone as: "A zone peripheral to a national Park or equivalent reserve, where restrictions are placed upon resource use or special development measures are undertaken to enhance conservation value of the area".

The earlier concept of conservation was the "fences and fines" approach, which failed because of its top-down nature, ignorance to traditional use rights as well as social and economic interests of local people and lack of local involvement in decision-making activities (Paudel, 2002). So, the buffer zone concept was first developed by UNESCO to provide additional layer of protection around protected area as well as to bridge the gap between the immediate needs of local people and the long-term objective of protected area system (Aryal, 2008).

Buffer zone may be defined as a process of management of a buffer zone with the objective of optimizing the political, economic, social, cultural, ecological and intrinsic value of resources. It is usually adaptive management and participative, with fairness to all groups, allowing for changing values over time. Buffer zone in Nepal means the peripheral area of national park/wildlife reserve where people have usufruct right on the resources (New ERA, 2004). Buffer zone concept implies that the establishment of protected areas has measurable impact on adjoining areas and the people living there and vice-versa.

Buffer zone concept in Nepal has been adopting an ecosystem approach to resource conservation and a sustainable human development approach to community development, based on self-reliance and community mobilization principles. It aims to provide an alternative natural resource base and livelihood opportunity to buffer zone communities so that their dependence on park resources could be minimized, resulting in park- people harmony for long term biodiversity conservation.

The concept of buffer zone was simply to safeguard the biodiversity of the park and reserve from the surrounding communities, by providing them with alternative economic opportunities and resources and to reduce conflicts between communities and parks/protected areas by compensating them for the depredation caused by wildlife on their crop fields, livestock and even their lives (Sherpa, 2000). These alternatives might include ecotourism, employment, agro forestry, vocational training and other activities which improve the socio-economic condition of the surrounding communities.

Initiation of Buffer Zone for the Protected Areas in Nepal

The Department of National Park and Wildlife Conservation (DNPWC) proposed buffer zone concept for the protected areas of Nepal in 1984. After the fourth amendment of the National Parks and Wildlife Conservation Act of 1973 in 1992 the concept received concrete legal impetus and promulgated Buffer Zone Area Management Regulation, 1996 and Guideline, 1999. Buffer Zone Management Regulation, 1996 has made provision of buffer zone management plan, user committees, forest development, and community development and thus indicated the approach of involving local people in buffer zone management. The Regulation has tried to address the problems of people whose livelihoods are adversely affected by the parks/ reserves through community development.

Buffer Zone Management Guideline, 1999 has elaborated the roles, functions, duties and responsibilities of community institutions (User Groups, Functional Groups, User Committees, Sub-committees and Buffer Zone Development Committee) arrangement regarding forest and community development. This was a major shift in government policy from wildlife centered approach to community centered approach for conservation in protected areas. In this context Nepal is one of the pioneer countries to implement the buffer zone concept in combining conservation goals with the need of local people (Rayamajhi, 2001). After the initiation of buffer zone concept in 1993 the Department of National Park and Wildlife Conservation (DNPWC) have been made community based conservation initiatives to mitigate park-people conflict in the protected areas.

With the support from UNDP, WWF/Nepal, CARE/Nepal, National Trust for Nature Conservation (NTNC), line agencies, local government organizations and NGOs the DNPWC is implementing various infrastructures, socio-economic and natural resource management activities in designated buffer zones. The role of these partners is important in improving the socio-economic condition of the communities living in buffer zones and to contribute to biodiversity conservation by reducing the existing conflict between the park and the people in buffer zones (New ERA, 2004).

Strengthening of buffer zone institutions and promoting targeted community development activities along with capacity enhancement of both the communities as well as park/reserve staff were the interventions that the park and people programmes have been undertaken. Various programmes/activities have been executed for the conservation and development of buffer zones.

Park People Programme

Park People Programme (PPP) funded by UNDP and implemented through DNPWC between 1994 and 2001 has been the pioneer initiative in buffer zone development in Nepal. Following the conservation and development approach PPP implemented conservation and community development activities in the protected areas of Koshi Toppu, Persa, Chitawan, Bardia and Suklaphanta lying in Terai plains and Chure Range and Rara and Khaptad in the mountain. The programme aimed at developing resources in buffer zones to reduce pressure on the protected areas, institutional arrangement to ensure sustainable management of the resources, community mobilization in conservation and socio-economic upliftment and changing people's perception towards biodiversity conservation.

Participatory Conservation Programme

As a follow-up to the PPP, Participatory Conservation Programme (PCP) was implemented for a period of two years (2002-2004) with the support from UNDP. During this period PCP supported for the establishment of Buffer Zone Development Division (BZDD) at DNPWC, amendment of existing regulations and guidelines, up-scaling community mobilization activities, promoting alternative resources and capital enhancement of social institutions through cooperatives (New ERA, 2004).

Bardiya Integrated Conservation Project

Bardiya Integrated Conservation Project has been implemented in Bardia National Park Buffer Zone

area from 1995 to 2000 with the aim to conserve plants and animals in the protected areas and improve the livelihood of buffer zone communities. WWF/ Nepal was involved in this project and implemented conservation oriented programmes. In 2000 WWF/ Nepal has launched Critical Area Programme in Bardiya and Shuklaphanta within the framework of DNPWC/Tarai Arch Landscape (TAL) Project and Nepal Biodiversity Landscape Programme (NBLP). DNPWC /TAL/ Project TAL Strategic Plan (2004-2014) is under implementation that aims to provide habitat for the long term survival in TAL (included Indian trans-borders protected areas) and to improve the socio-economic conditions of local people through economic opportunities (DNPWC, 2011)

Integrated Conservation and Development Programme

NTNC have been implemented environmental conservation and natural resource management in Bardia, Chitwan and Shuklaphanta buffer zones. NTNC has been involved in integrated conservation and development activities such as sustainable agriculture and community forest management, alternative energy, income generation, community development and nature based tourism in Chitwan and Bardiya buffer zones. Buffer zone activities such as preventive measures at crop damage by wildlife, conservation education and women participation in conservation, alternative means of income generation, forest management and some community services are implemented by NTNC and Women and Environment (WE) through various user committees and user groups.

Major Outcome of Buffer-Zone Management Programme

Considerable progress has been made in policy reform for the management of buffer zone adopting integrated conservation and development approach. After the initiation of buffer zone concept in 1993, there have been made community based conservation initiatives to mitigate park-people conflict in the protected areas (Bajimaya, 2002). Formation of Community Based Organizations (CBOs), the initiation of buffer-zone community forest, up-lift of the socio-economic condition of buffer zone communities, local institutional strengthening, gender mainstreaming, pilot conservation activities and mobilization of park resources for buffer zone management are the major outcome of buffer zone management programme that were executed in the buffer zones by the DNPWC with the internal resources and support from above mentioned various partners. Some of the outcomes of the progrmme are outlined below.

Community Based Organizations

To kindle the conservation spirit in the hearts of the people government of Nepal have timely introduced buffer zone approach in 1993 by adopting a participatory approach in buffer zone resource management. To carry out local community development activities in a smooth and effective manner through peoples' participation, and to become self-reliant by removing dependency of forest products of the national parks and reserves and to create a harmonious relationship in promoting mutual co-operation between national parks and reserves by undertaking conservation oriented programs, the people living in village/ hamlet/settlements/ Urban area in the buffer zone and to organize them, Users' Group and Committees have been formed.

Altogether, there are 12 buffer zones have been declared so far where buffer zone management programme aimed at people participation in conservation for long term sustainability. The programme is now spread over 181 VDCs and 3 municipalities of 27 districts and covers the human population of 921319 with 154135 households. There are community based institutions in buffer zones such as Buffer Zone Management Committees (BZMCs): 12, Buffer Zone User Committees (BFUCs): 154 and Buffer Zone User Groups (BZUGs): 4502 (Table: 2).

Table 2: Management committee, user groups, user committees and population by buffer zones

Buffer Zone	MC	UG	UC	Household	Population	Number of VDC/Mun.
Chitawan NP	1	1779	21	44918	250000	37/2
Bardia NP	1	262	19	16619	117633	4
Langtang NP	1	332	21	12256	68865	34
Sagarmatha NP	1	28	3	1400	6000	3
Shey-Phoksundo NP	1	90	17	5852	29854	11
Makalu Barun NP	1	89	12	6378	34467	12
Kanchanjunga NP	1	250	14	5311	33272	21

Rara NP	1	156	10	1987	12121	9
Banke NP	1	61	6	4861	35712	14
Parsa WR	1	448	13	13447	85000	11
Suklaphanta WR	1	501	9	22413	143395	9/1
KTWR	1	506	9	18693	105000	16
Total	12	4502	154	154135	921319	181/3

Source: *Department of National Parks and Wildlife Conservation, 2011.*

The arrangement of Users Committee has been made to function as a mediator between the users group and the council to conduct programs through the users groups formed in their respective areas for natural resources conservation, community development along with utilization of forest products in accordance with the Buffer Zone Management Regulation and Guideline.

Buffer Zone and Community Forests

The evolution of community forestry in Nepal is an example of a process that is yielding successful outcomes for institutional and environmental sustainability as well as eco system services downstream and global beneficiaries. Community forestry is defined as any form of forest activity undertaken specially and principally to provide commercial benefit to the local people living in the vicinity of forest area which involve them directly in its management. Over the last 34 years community forestry program has resulted in the formation of over 20,000 forestry user group managing over 1.2 million hectares of forest, with significant increases noted in community income, equitable access to forest products, increased environmental services, and bio-diversity (Campbell,2008). The ultimate success of community forestry in Nepal, however, was driven by the local communities-the main actors in adopting the new policy (Campbell, 2008). The same approach have been applied in buffer zone community forestry that is one of the major components of buffer zone management programme and yielding successfully and gradually supporting to local people of all buffer zones in order to meet their daily basic needs of fire wood, fodder/grass and other natural resources.

Efforts have been made to delineate forest resources in buffer zones under community management and gradually handed over to the community (User Groups) as Buffer Zone Community Forest (BZCF) for management as per the approved operation plans. Since the implementation of Buffer Zone Management Programme in 1996 DNPWC officially handed over 100984 sq. km. of forest area to 389 user groups in 9 different protected areas where over 76142 households are access to BZCF(Table: 3). BZCFs of Rara, Khaptad and Banke national parks are in the process of handed over to the communities.

Table 3: Community forests, user groups and households access to BZCF by Buffer Zones

Buffer Zone	Handed over to User Groups		Area covered by BZCF (Sq. km.)	No. of User Groups	Households access to BZCF
	From	To			
Chitwan NP	2055	2068	8052.55	47	25427
Bardia NP	2057	2065	11790.17	59	11258
Shey-Phoksundo NP	2057	2060	2617.09	24	1541
Sagarmatha NP	2054	2061	22067.60	9	804
Langtang NP	2065	2066	4159.35	69	7685
Makalu-Barun NP	NA	NA	40444.39	89	6564
Suklaphanta WR	2056	2065	1711.56	34	8755
Koshi Toppu WR	2062	2063	126.54	11	1926
Parsa WR	2057	2066	10015.17	37	12182
Rara NP	In the process to handed over				
Khaptad NP	In the process to handed over				
Banke NP	In the process to handed over				
Total			100984.42	379	76142

Source**:** *Department of National Parks and Wildlife Conservation, 2011.*

The expected outcome in buffer zone community forests is slightly different from community forest in other parts of the country. The concept in buffer zone community forest is to primarily improve the bio-diversity status and to restore the lost habitat for wildlife, and secondarily to supply basic community needs such as fuel wood, fodder and to generate income through nature tourism. Buffer zone community forest products are made available only to forest users and they are not allowed to sell the forest products outside the buffer zone area (New ERA, 2004).

Capacity Building

Efforts have been made for the capacity building of Park/Reserve staff, Buffer Zone Support Unit and the members of BZDC, UCs and UGs Group. UNDP, CARE/Nepal, WWF/Nepal and NTNC provided training in leadership, user group/ committee management, UG orientation, book keeping/accounting, conflict management, social mobilization, UG monitoring, evaluation and management, data base system, planning and management, UG ledger management and auditing to local community for smooth running of grass root organizations (New ERA, 2004).

Efforts were made to enhance capacity of UC members in wide ranging topics such as bio-diversity monitoring, farmer to farmer extension methodology and participatory technology development. All the buffer zone partners supported for the capacity building of BZDC of UCs and UGs.

Non Formal Education facilitator training, various conservation awareness activities have been implemented by targeting school teachers, students and local communities, Participatory Conservation Program of UNDP identified formation of cooperatives as the means of insuring financial sustainability of UGs through saving and credit programme and has conducted cooperative management and orientation workshop/training. Follow-up of such activities are continuing in the buffer zones under buffer zone management programme.

Community Capital Mobilization

One of the aims of the Buffer Zone Management Programme is to contribute to the poverty alleviation of the buffer zone community by providing financial as well as technical support for income generating activities. Since capital is an essential component for undertaking any development project, group saving was made a prerequisite for the formation of UG under the Buffer Zone Management Programme. Besides the 30-50 percent Park/Reserve revenue sharing mechanism with buffer zones, the community savings and credit scheme has played a significant role in propelling the programme forward and providing people easy access to loans at low interest rates without having to depend on other sources.

Seed grants and the Bio-diversity Conservation Facility, a revolving fund to finance micro enterprises, are also being provided for buffer zone development. In order to institutionalize these financial mechanisms, a number of cooperative have been operational and some are in the pipeline. The Bio-diversity Conservation Facility and Buffer Zone Community Savings and Credit Working Guidelines have been revised and published taking into account the ground reality to make it more user friendly.

Saving and credit programme of user groups could be self-sustaining if it is properly institutionalized and closely monitored. However there are issues of poverty, gender, deprived group and other essential service sector that would require external financial and technical support. A strong linkage with local development and line agencies could enhance sustainability of buffer zone programme (New ERA, 2004). UG members have initiated both on-farm and 0ff-farm small enterprises to generate income and employment with credit from Area Conservation Facility (ACF)/Internal Credit Facility (ICF) and other institutional support in buffer zones.

Awareness and Orientation Training

Buffer zone management programme have been conducted a number of different activities for environmental awareness such as adult literacy class, child education classes and other awareness programmes for disadvantaged households in the buffer zones. Environmental awareness classes were undertaken in the local schools that are distributed in the buffer zones. Reportedly in some of the buffer zones these educational activities have positive impact in the communities such as due to the awareness, cleanliness in the community and household environment is improving and households have prioritized for tree plantation, stall feeding practiced, keeping a small size of livestock and bio-gas installation (New ERA, 2004).

Under Various programmes/projects of BZDP a number of job oriented training activities in different sector such as crop and livestock farming, bee keeping, fishery, forest nursery, sewing/ tailoring, knitting, health worker, sub-overseer, livestock health worker, improved stove-making, noodle making, bicycle repairing, tile making, bio-gas installation, improved toilet construction, house wiring, shop keeping, lodge management, nature guide and village tour guide and bamboo craft and propagation were undertaken.

Anti-poaching Initiative

There is some good example of local community involved in anti-poaching activity in all protected areas. Conservation awareness program implemented by park authority, UNDP, WWF, NTNC has motivated some youths to lead anti-poaching activity (New ERA, 2004). WWF and NTNC have encouraged local people in anti-poaching activities in Bardia and Chitwan National Parks and had some positive results. In Chitwan an organization named Anti-poaching Youth Awareness Campaign have been registered and has established Eco-club in schools, implemented awareness campaign in the community, organized journalist camp and made contacts with the local communities considered to be involved in poaching activities. This group works in coordination with Users Committees, and Bio-diversity and Wildlife Sub-committee of Buffer Zone Development Committee.

Infrastructure Development

DNPWC, UNDP, CARE/Nepal, NTNC and local community are the major partners who were involved in infrastructure development in buffer zones particularly concentrated in Chitwan and Bardia nationa parks buffer zones. Between 1997/98 and 2002/03 fiscal year efforts have been made on infrastructure development such as road gravelling, culvert construction, school building construction, gabion dam, irrigation, drinking water and so on in the buffer zones. NTNC provided funding support for the establishment of the community health post, veterinary care centre, Tharu cultural museum and handicrafts stalls in Chitwan and Bardia buffer zones, erection of 7km long electric fence to minimize wildlife damage to community property in Bardia buffer zone and supported building renovation and other basic infrastructures in schools in Bardia, Chitwan and Suklaphanta buffer zones.

TAL programme supported for road maintenance, drinking water, pit latrines, biogas plants, improved cooking stoves, trench and bio-fencing, menthe processing plant, construction of gravel road and wooden bridge and repair of health post in Bardia buffer zone. In other buffer zones than Chitawan, Bardia and Suklaphanta the physical infrastructure development activities are under way as per the need of buffer zones. The much needed community infrastructures such as roads, irrigation system, drinking water, educational facilities, agriculture and marketing facilities can boosts up socio-economic development in buffer zones could enhance sustainability element of buffer zone programme.

Relief Distribution to Wildlife Victims

Government of Nepal has made a provision of Wildlife Damage Relief Guideline, 2009 that provide NRs 150000 for human death and up to NRs. 50,000 for human injuries caused by seven specific species namely tiger, rhino, elephant, common leopard, snow leopard, bear and arna. In the fiscal year 2010/11 NRs. 8.8 million was distributed for human death/casualties caused by wildlife as per Wildlife Damage Relief Distribution Guideline, 2009 (DNPWC, 2011). However, relief could not be provided for crop depredation and other property loss as per the guideline.

Ecotourism

Ecotourism typically involves responsible travel to fragile, pristine and usually protected areas where flora and faunas as well as natural and cultural heritage sites are the primary attractions for the tourist (Bhusal, 2010). Ecotourism has increasingly recognized as an important tool for biodiversity conservation worldwide. The natural and cultural heritage sites, ethnic diversity, spectacular landscape, panoramic views of the Himalayas and mountain to low lying Terai landscapes, bio-diversity, rivers and lakes are the major attractions for the foundation and acceleration of ecotourism in the protected areas. Therefore, the protected areas are the legacy of the country to attract the tourist from different parts of the world (Bhusal, 2007). The Sagarmatha National Park in the High Mountain and Chitwan National Park in the Terai has been designated on behalf of the world community as World Heritage Natural Sites by UNESCO in 1979 and 1984 respectively.

Protected areas of Nepal are popular international tourism destinations as they attract more than 50 percent of the tourist visiting Nepal. The trend of tourist visiting protected areas in Nepal is increasing in last few years and reached the number of tourist from 245910 in 2006/07 to 455237 visited in all 16 protected areas for the fiscal year 2010/11 (DNPWC, 2011). The number of tourist visited in 11 protected areas with the provision of buffer zones was 120935 for the fiscal year 2006/07. This number was increasing considerably year by year and reached to 206733 for the fiscal year 2010/11 (Table: 4).

Table 4: Number of tourists visiting protected areas and buffer zones (2006/7-2010/11)

Protected Areas	Number of Tourist Visited in the Fiscal Year				
	2006/7	2007/8	2008/9	2009/10	2010/11
ChitwanNP	80630	105844	118685	115181	146620
Bardiya NP	3713	4476	5056	6248	8055
Langtang NP	6097	9219	9915	10603	11119
Sagarmatha NP	23313	28170	29499	31189	33390
Shey-Phoksundo NP	208	607	591	558	519
Makalu-Barun NP	227	594	1443	1903	1666
Kanchanjunga NP	7	10	10	5	27
Rara NP	46	141	105	157	207
Banke NP	NA	NA	NA	NA	NA
Parsa WR	197	34	93	84	112
Suklaphanta WR	352	1420	250	491	358
Koshi-Tappu WR	6145	4575	196	1894	4660
Total	120935	155090	165843	168313	206733

Source: *Department of National Parks and Wildlife Conservation, 2011.*

There is a tremendous potential of ecotourism in all the buffer zones where a number of natural and cultural sites and sounds of tourism importance are distributed. These tourism sites can be managed in better way by making the provision of tourism related services and other infrastructures in order to attract the quality tourists. Ecotourism development in and around the protected areas has made a major contribution in order to accelerate the income generating activities for the people living in the buffer zones. Considering the great potentials of ecotourism in protected areas, there is an inbuilt ecotourism theme plan in protected areas. The promotional activities are convened in coordination with other relevant organizations both at national and international arena (DNPWC, 2010).

Park Revenue Generation and Sharing

The royalty from ecotourism related activities such as entry fee, elephant ride, jungle drive, camping, filming, boating, rafting, issuing hunting license, etc. has contributed significant amount of park/ reserve income. Tourism income from protected areas is used for buffer zone management as there is legal provision that 30-50 percent of the park income directly goes to local community (DNPWC, 2010). According to DNPWC total amount of revenue generation from the protected areas became highest than ever before for the fiscal year 2010/11. The amount of revenue generation from all the protected areas including non buffer zone protected areas was NRs. 140,383,399,00 for the fiscal year 2009/10 and this amount increased to NRs. 248,504,798.00 for the fiscal year 2010/11 (DNPW, 2011).

Buffer Zone Management Guideline: 2099 has made a provision of investing park revenue in buffer zones as 30 percent on conservation, 20 percent on income generation and skill development, 10 percent on conservation education and remaining 10 percent on administration. The government with technical support from UNDP has been developed guidelines and mechanism to smoothly transfer park revenue for respected local community and to mobilize the fund for conservation and development by mobilizing user groups in buffer zones. Park revenue sharing (30-50 percent) in buffer zone by local community was considered an important incentive to reduce the park people conflict, and enhanced community perception and approach towards protected area conservation.

Conclusion

After the provision of buffer zone system in protected areas of Nepal various integrated conservation and community development programmes have been implemented through community participation in order to improve the livelihood of local communities living in buffer zones and reduce anthropogenic activities in protected areas. The fourth amendment (1993) of the National Park and wildlife Conservation Act, 1973 has advanced some innovative policies for bio-diversity conservation and community development in the periphery of protected areas. There is a considerable progress in policy reform for the management of buffer zone adopting integrated conservation and development approach. Buffer zone development program implemented since 1994/95 has made remarkable progress particularly in the area of social mobilization, human resource development at community level, conservation and development awareness, community finance generation and mobilization for micro-enterprises and bio-gas promotion as an alternative source of energy. Buffer zone community forest development is trying to link with park has demonstrated both its ecological–bio-diversity maintenance and habitat

restoration and economic value of conserved forest through nature tourism.

Park revenue sharing under the program and financial and technical support from the various partners has greatly assisted the buffer zone community to develop basic community infrastructures/needs and it has positively changed people's perception towards conservation and park protection. The approach of resolving park-people conflict through mutual consultation is becoming a standard practice. Buffer zone people have recently realized the long-term benefits of park protection and conservation and long-term sustainability of buffer zone management programme. However, buffer zone programme faces a number of constraints and challenges during the process of implementation in various aspects of institutional arrangement, social capital and forest and other natural resources of the buffer zones. Therefore, it is recommended to assess the impact of activities that were implemented under buffer zone management programme in order to identify constrains and prospectus for the conservation and development of buffer zones in protected areas of Nepal.

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