

Assessment of policy issues for biodiversity conservation at buffer zone of Royal Chitwan National Park, Nepal

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The present study assesses the effectiveness of the current policy and buffer zone design criteria for Royal Chitwan National Park (RCNP). In spite of various conservation efforts, loss of forest biodiversity is continuing in Nepal at all levels. Loss and fragmentation of habitats, poaching, forest exploitation, extensive human settlements and various social problems are the main reasons for the loss of biodiversity. The needs of people living around protected forests were neglected in the past. The buffer zone is a new development concept in biodiversity conservation in Nepal that embodies protective as well as participatory approaches. Although, the buffer zone management activities have been implemented in RCNP, they are not free from conflicts among stakeholders. The present study identifies, legal and social issues, which directly link with conflicting interests of stakeholders. This article outlines a three-level impact zone approach to design buffer zone in RCNP.

Keywords: biodiversity, national park, buffer zone, forest exploitation, fragmentation of habitat, poaching, social conflicts, impact zone, Nepal.

Today, deforestation and degradation of forest resources are burning issues in Nepal. Ever-increasing human population and heavy dependency on forest resources have caused the country's forests to shrink with subsequent loss in biodiversity at ecosystems, species and genetic levels. With human population pressure and continued dependence for subsistence on forest products in protected areas, the conservation measures have become complicated. However, Nepal has an impressive network of protected areas extended in 18.1 % of total land area of the country, which covers the most vulnerable ecosystems and some of their biodiversity. All parks and other protected areas are adjacent to human settlements. Displacement of these populations may neither be economically feasible nor socially justifiable. Therefore, in principle, Nepal has been adopting protective as well as participatory or collaborative approaches for conservation through buffer zone concept, which was initiated after the fourth amendment of National Park and Wildlife Conservation Act in 1993 (PPP, 1998). The objective of buffer zone is to create transition belts of protected areas with complete set of species in a healthy ecosystem and areas of sustainable exploitation .

Buffer zone should be developed to focus on the special need of the local people who are likely to bear too much of the lost opportunity costs due to conservation (Thapa, 1998). But, the buffer zone concept, as a holistic approach, has created many

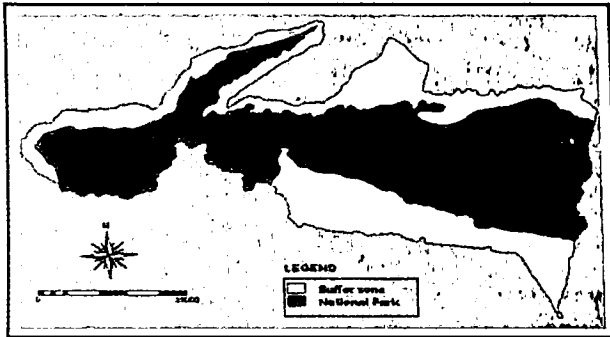
policy issues and social conflicts that limit conservation. First, the criteria for buffer zone designation are clearly not defined for selecting buffer zone, how much area is needed for it and about formation of user groups (Thapa, 1998). For example, how much area should each user groups be covered and what should be the criteria for this ? Second, the problems related to policy and programme levels are not clearly identified. Identification of all these problems and assessment of these criteria are prerequisite for planning and management of biodiversity. In this context, the present study assesses the existing policy issues and attempts to develop viable buffer zone design criteria as local guideline for sustainable biodiversity conservation in buffer zone of RCNP.

Study area

Royal Chitwan National Park and its buffer zone were selected for its high biodiversity and accessibility. The park was established in 1973 as a first National Park of the country to safeguard the rich flora, fauna and natural features of Terai, Inner Terai and Churia hills covering 93,200 ha of land area. It lies between 27° 20' to 27° 40' N and 83° 52' to 84° 45' E and falls in the lowlands of southern central Nepal. (Map). The buffer zone was declared in 1997 under provision made by the forth amendment of NPWC Act 1993. The buffer zone covers about 75,000 ha (PPP, 1998) including whole or portions of 36 VDCs, 2 municipalities of four districts. The climate varies from tropical to

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subtropical with high humidity. The total population in buffer zone is 242,000 and average household size is about 7.1 with diverse ethnic/caste including Brahamin, Chhetri, Newar, Thakuri, Tibeto-Burman groups, Kami, Damai and Sarki (Baskota *et al*, 1996). Majorities of these people are subsistence farmers who depend on Park for timber, firewood, fodder, grass, thatching materials and non-timber forest products (NTFPs).



Map: Royal Chitwan National Park and its Buffer zone

The buffer zone, which is highly subjected to cultivation, has its land use as: agriculture (46.3%), forest (50.2%), and grazing land (3.5%). Approximately 70% of the park vegetation are *Shorea robusta* forest. Grassland, Riverine and Pine forest cover the remaining area (Baskota *et al*, 1996). The park is renowned for the endangered one-horned rhinoceros, the tiger and the gharial crocodile along with many other common wild animals

Methods

Rapid appraisal methods like semi-structured interview, key informant survey, discussions, observation, workshops and local experiences of various people were used for data collection and identifying problems. During the field period, personnel of RCNP, District Forest Office, Chitwan, Nepal Conservation Research and Training Center, Sauraha, Buffer Zone Development Council (BZDC), User Committees (UC) (Bharatpur and Devnagar) and Buffer Community Forest User Group (BZCFUG), Baghmara were visited to collect primary data. Similarly, secondary information were collected through publications such as NPWC regulations, Master Plan for Forestry Sector, Ninth five-year Plan and other articles. On these basis the following results were obtained:

Policy level problems

Forestry Sector Master Plan (MPFS) 1988, the Ninth Five-Year Plan (1997-2002) and the Buffer Zone Legislation of 1993 with subsequent rules and

guidelines are the main policy documents in buffer zone management. The Master Plan has emphasised the needs of healthy production forestry to supply the peoples' needs to alleviate pressure from the adjoining protected areas. It does not state the holistic vision for the buffer zone management that would have made the communities more authentic and empowered stakeholders for conservation (Baskota *et al*, 1996). The Ninth Five-Year Plan has encouraged the local users to participate in conservation of protected areas through buffer zone design and management. It has targeted to be seeking massive peoples' participation in the management and implementation of buffer zones by promoting income generating activities such as education, agriculture, forestry, tailoring, hosiery and so on (NPC, 1998).

The Buffer Zone Legislation of 1993 has given new direction in protected area management by introducing buffer zone management of surrounding area through participatory approach. The forth amendment of the National Park and Wildlife Act (2029) in 1993 has adopted the buffer zone concept and empowered the park authority to declare any forested or agricultural areas, including settlements around the protected areas as buffer zone. The designs of buffer zones depend on impact caused by the protected areas. The Park Warden is a responsible authorities to manage the buffer zone. It has given the legal provision to plough back 30-50 percent revenue for the community development. Buffer zone is to be divided into several management units i.e. Functional Groups (FG), User Groups (UG), BCFUG, UC and BZDC to facilitate the community development activities by small groups of local users. This regulation and guidelines are designed to promote the community forestry, community development, wise-use of natural resources, income generation activities, and sustainable land use in the buffer zone. Ultimately it has focused to reduce the local dependency on protected areas and sustained biodiversity conservation in buffer zone. However, present policy shortens the power and responsibilities of the users and their organisations. The functional power concentrates around the warden and treats local people only as supporter. All policy gaps that are responsible for slowing the buffer zone activities and active people participation are summarised in table 1.

Organisational problems

According to the legal provision, UGs, UCs and BZDC are responsible to prepare conservation and development programmes and to implement these activities. Park authorities are responsible for

Table 1: Main features of buffer zone legislation and their drawbacks

Elements in legislation	Gaps in new legislation
Buffer zone design	Criteria have not described to delineate different level of impact zone within buffer zone. People participation in buffer zone design has also not well outlined.
Management of Buffer zone	The responsibilities rest with warden. The local people have been treated only as supporters.
Delegation of authority	The executive power is centralised with Chief Warden. No legal and management authorities have been delegated to other staff and committee members of BZDC.
Compensation of wildlife damages	Buffer Zone Development Council or UC members have no authority to investigate the crop and livestock depredation by wild animals and to fix its compensation, rather it is provided from the plough back money allocated for development. There is no provision of a separate fund for it.
Wild animal damage prevention	There is no provision to implement the control measures against wild animals' damage in buffer zone.
Revenue plough back provision	Ministry of Forest and Soil Conservation is authorised to fix a certain percent of plough-back revenue for the buffer zone development without involving users' organisations.
Committee dissolution	The Warden has power to dissolve the User Committees, and Buffer Community Forest User Groups. They can not appeal in the court.
Buffer Community forest (BCF)	The handing over process of BCF is long. User committees can obstruct the handing over process within their Village Development Committees.
Use and distribution of forest products	Legal provisions restrict the local people to use only grasses, dead, dying and fallen trees. And, BCFUGs are not solely authorised to sell and distribute the forest products.
Restriction of illegal works	The Warden has authority to restrict any illegal work in buffer zone, but User Committees and Buffer Zone Development Council do not enjoy such authority.
Auditing of the committee funds	Only the Warden can do the auditing of users' income and expenditure, no other registered auditors could be employed.
Co-ordination mechanisms	A co-ordination mechanism is poorly defined in legislation.
Tourism	There is no clear provision of Ecotourism and distribution of tourist in all areas.

technical inputs, co-ordination, monitoring the activities and practical training in conservation and management of buffer zone. The park has insufficient budget, less number of skilled staff coupled with inadequate motivations. Most of the rangers and other staff are posted in locations far from settlements and inside parks. Existing staff are overloaded and are not well trained in participatory process of conservation. Furthermore, the users' organisational structure seems complicated with many hierarchical committees working in buffer zone (figure 1). However, the position of BZDC is on the top but the role and power is unclear. The place and function of BCFUG has not been clearly mentioned. The provision of BCFUG under UC makes the community forestry process difficult and lengthy.

Social problems

Poverty is one of most important social problems, which affect buffer zone management. Most of the

people around park are poor, hill migrants. The demand of local resources and use pattern is different due to divergent cultural traits and values. Free grazing has become tradition around the park that destroys plant regeneration and habitats inside. Many people are still not aware about the importance of conservation, their right and responsibility in management and utilisation of resources. Few have taken advantages. Political interference has created conflicts and obstructed activities of buffer zone in many user groups. The *ad hoc* committee seems function less and paralysed in most cases.

Stakeholders' interest

Different stakeholders were analysed in terms of their rights, roles, responsibilities, activities, interests and problems for buffer zone management. Interest analysis of key stakeholders provided insights and thought regarding problems and present issues.

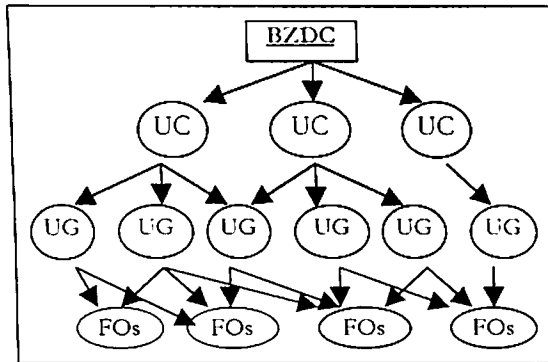


Fig 1: Functional relationship among organisations; Source : PPP, 1998.

All stakeholders are categorised into five groups. Neither all stakeholders are equally interested in conserving a resource, nor equally entitled to have a role in buffer zone management. The primary stakeholders including UGs, BCFUGs, UCs and BZDC have stake in conservation and utilisation because park and buffer forests provide them with fodder, fuelwood and other resources. The second is the NGOs, which are involved in local development, social mobilisation, and conservation. The third is the park authority (including associate and partner agencies) that has main responsibilities of conservation and management as well as generating financial resources primarily through tourism. International donors and visitors are grouped as fourth category. The effectiveness of conservation programme depends on financial support from international organisations. The fifth are the resorts inside and outside the park. Since the conservation of bioresources provide them income through tourism, their conflicting interests and lack of proper co-ordination were found as hindering factors in buffer zone management. The result of stakeholder analysis in terms of their interest, priorities and problems are listed in table 2.

Stakeholders had specific interests, but some were common for managing buffer zone. These should be changed into primary objectives and intervention programmes in biodiversity conservation. The conflicting interests can be managed through group discussion. The existing policies and programmes have to be changed on the basis of past experience and problems encountered in conservation. However, the implementation of the buffer zone concept was encouraging, present programmes were found ineffective due to lack of proper strategic guideline. The strategies need to be focused for proper resource mobilisation, improving local capacity and their functions in resource management and biodiversity conservation.

Preliminary local based guidelines for buffer zone design

The buffer zone legislation 1993 has briefly described about buffer zone design criteria (HMG, 1996). According to this rule, buffer zone could be designed by including a part of hamlet, village or town settlements that are likely to be affected from the national park and taking considerations of geographical situation of park. The status of villages and settlement located inside the park and that could be practicable and appropriate from the point of management of the buffer zone were also the criteria mentioned.

New legislation highlights on impact area to be included into the buffer zone. But the buffer zone design criteria have not been defined properly in this legislation and in subsequent guideline. The mentioned criteria look more like principles. It was found in the field that buffer zone delineation was done in personal judgement without ensuing prescribed criteria. In the present study, two major approaches for assessing the suitable buffer zone design criteria were identified, which are described below.

Impact zone approach: Protected area buffer zones have been developed to focus on the special needs of the local communities, who are adversely affected by the conservation measures. Although offering limited access to park resource can help improve their livelihood, but it is un sustainable. The traditional buffer zone and transitional zone can preclude but not eliminate the pressure on core areas. The impact zone approach differs from that of the buffer zone. It aims for strict control of protected and adjacent forest resources, and park management should implement the programme to produce natural resource on public and private land in buffer zone (Sharma, 1999). The management objective of an impact zone approach is stability and sustainability in community development and conservation of biodiversity in the long run. The land-use in buffer zone should be intensified at the micro level and should be focused for both forestry and agriculture.

The impacts of the park are not evenly distributed across the buffer zone. The nearest communities suffer more from wildlife as these animals damage more crops than that of distant communities. Similarly, adjacent inhabitants depend more on park resources and protection of park become more difficult from them. To reduce pressure on park cores the programmes and their importance should be administered differently in various parts of

Table 2: Priorities, and problems of selected stakeholders

Stakeholders	Interest priority	Problems and constraints
International donors / INGOs	<ul style="list-style-type: none"> Sustainable biodiversity conservation Local level capacity-building on conservation 	<ul style="list-style-type: none"> Conflicts with national interests and mandates Political influences of Government and political parties
Park Authority (including partner organisations)	<ul style="list-style-type: none"> Endangered species conservation Community participation in conservation and development of buffer zone. Promotion of ecotourism in and around the park Sustainable management and wise use of buffer zone resources Biodiversity conservation in long run 	<ul style="list-style-type: none"> Lack of sufficient budget and staff Poaching Unclear buffer zone design criteria Conflict with local people and District Forest Office Inadequate co-ordination among stakeholders Absence of management zone in BZ Political interference in buffer zone design
NGOs	<ul style="list-style-type: none"> Partnership on community development, income generation and poverty alleviation Ecotourism, and biodiversity conservation Fulfillment of local needs Sustainable use of forest resources 	<ul style="list-style-type: none"> Inadequate knowledge, skill and lack of training Lack of resource Insufficient interaction with park management Lack of legal authority and co-ordination among NGOs Lack of trust and transparency among NGOs
The resorts inside and outside the park	<ul style="list-style-type: none"> Ecotourism development Local employment generation Attraction of more tourists Foreign exchange earning 	<ul style="list-style-type: none"> Unhealthy competition among hotels Inadequate communication facilities Controlled by park in free mobility Displacement of traditional Tharu communities Lack of effective tourism guidelines
Local People (including UGs, BCFUGs, UGs and BZDC)	<ul style="list-style-type: none"> Fulfillment of local needs of forest products Provide relief to victims of wildlife injuries and deaths (people and livestock) Community development, income generation and employment generation Promotion of ecotourism in and around the park Sustainable management and wise use of buffer zone resources 	<ul style="list-style-type: none"> Crop depredation and wildlife victims Soil erosion and non-productive lands Conflicts among user groups and with park authority Lack of awareness and technical knowledge Inadequate legal rights and authority Inadequate managerial capabilities Lack of technical support in community development Poverty, high population and Social heterogeneity

impact zone. The entire impact zone could be separated into the levels i.e. primary impact zone, secondary impact zone and tertiary impact zone. The present research has shown that the impact zone concept should follow to delineate the buffer zone. Movement of great one-horned rhino is the primary indicator wild animal for this impact. The crop and livestock depredation by wild animals should also be considered. On the other hand, the

impact of local people to the park should also be a criteria. Some questions related to local people are important such as 'who were the traditional users and where did they come to the National Park to collect forest products for daily use?'

The three-zone concept is prescribed to reduce pressure on park, which help achieve sustainable

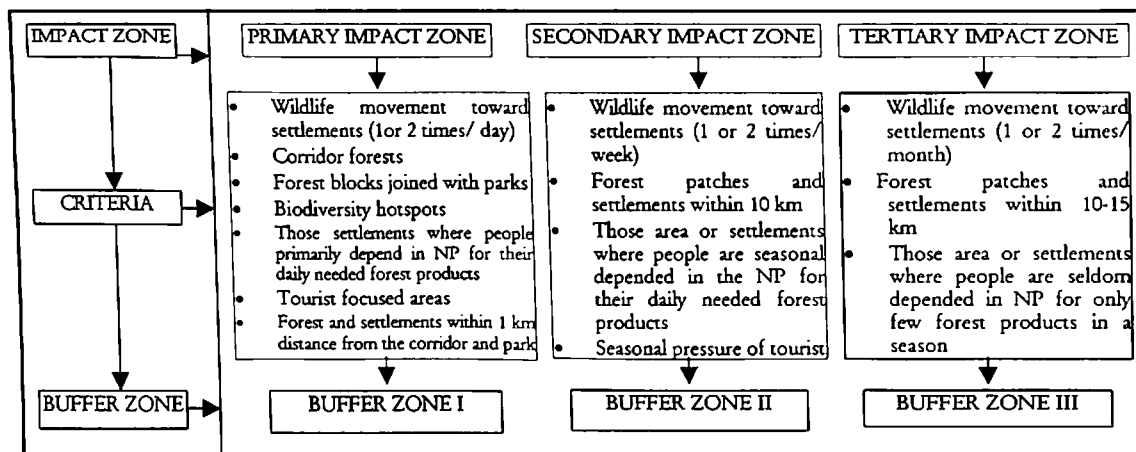


Figure 2: Flowchart showing relationship between criteria for impact zone and buffer zone

biodiversity conservation in core and buffer. Zone-I represents the inner core of the buffer immediately around the park and work as a protective layer. Basically the buffer zone programme should be focused in that zone. Zone-II is a lower impact area but important in park and buffer zone management for income generation and tourism promotion. Zone-III is the supporting part in buffer zone and less affected. It is also a prime location for potential ecotourism development. This could further reduce dependency on core areas by increasing employment from the tourism sector. The guideline criteria for buffer zone design are summarised in figure 3 that will be basis for further buffer zone management.

Participatory approach: The new legislation has emphasised the local participation on biodiversity conservation but it is not implemented in the field. Active involvement of park management authorities and surrounding buffer zone people in promoting sustainable development of local communities can only help to achieve stability in buffer zone while supporting the park. Besides, this research has shown that no local people are familiar about pre-defined criteria and boundary delineation, and such confusion will disrupt buffer zone management activities. The provision of ploughing back revenue to the communities will create an interest to on buffer zone. In spite of pre-defined criteria local and political pressure will come to delineate the buffer zone. However, active public participation in criteria selection and buffer zone design will minimise this problem. Peoples' participation and two-way interaction should, therefore be the base of buffer zone design.

Conclusion

The threats to biodiversity are complex in nature with social, economical and other factors involved. Protected areas are the instruments for conservation

of vulnerable ecosystems. The most important thing is that genuine problems of the local need have to be addressed properly in conservation programme. The buffer zone approach has fostered protective as well as participatory approach to the protected area management. Few positive impacts were observed in community development through plough-backed revenue in buffer zone. However, the conflicting interests and priorities of stakeholders made the buffer zone programme largely unsuccessful. Many pit-falls like unclear buffer zone design criteria, inappropriate policies, poor participation, human casualties, crop damage, livestock depredation, unmanaged tourist pressure, inadequate co-ordination, social conflicts and lack of effective buffer zone development guidelines were identified during the actual implementation of new legislation. Present policies restrict the legal power and responsibilities to users and their organisations in place of recognising the local inhabitants as partners in buffer zone management and conservation. Impact zone approach has been found to be the best criteria for buffer zone design, which should be followed to implement the buffer zone activities.

Recommendation

At the end of the research, it is recommended that a separate detailed study should be carried out to assess the impact zone of the park. The buffer zone should be re-designed and categorised in different zones on the basis of level of impact. Remote sensing and geographical information system will be advantageous for extended study. Policy should be revised focusing the local people and to authorise BZDC and UCs. Grassroots institutions need to be formed, strengthened and mobilised to develop local partnerships and to ensure the decentralisation in conservation of biodiversity within buffer zone. An independent park organisation is also needed to co-ordinate all buffer zone activities separately.

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