

## Community Based Conservation: Redefining Boundaries

*Dipesh Joshi*

WWF Nepal

Corresponding author: karnali77@gmail.com

**Abstract:** Conservation and management of biodiversity is complex and a localized phenomenon in the Terai Arc Landscape (TAL) which is inhabited by 7.4 million people out of which 25 per cent are still below the poverty line. There is significant interaction between the human and natural resources with diverse values of biodiversity and ecosystem services to the local populations. The implications of variations in terms of dependence on natural resources are that conservation and management strategies broadly vary across the landscape. Success and failures of conservation strategy/approach cannot commonly be extrapolated across this diverse landscape. While many projects in TAL have failed, some have succeeded too and is shaped by multiple factors including the type and level of human interactions with biodiversity. This review article provides reflections on experiences of decades of Community Based Conservation (CBC) in Nepal with a specific focus on Chitwan National Park and its buffer zone located in TAL. CBC confronts newer challenges and issues pertaining to inadequate mechanisms to address communities beyond buffer zones in a scenario where conservation needs to move beyond the conventional boundaries of parks and buffer zones, equitable benefit sharing, inequalities within communities, increasing human-wildlife conflicts, ecotourism, nexus of poverty-livelihood and conservation. However, CBC offers greater potentials and opportunities for greater local community engagement in a changing context to reconcile local development with conservation.

**Key words:** Buffer zone, community based conservation, conflict, ecotourism, poverty

### SHIFTING CONSERVATION PARADIGMS

The conventional school of thought assumes that resource utilization by the local people in protected areas (PAs) is a conflicting issue for conservation and thus should be avoided. This approach is based on the neo-Malthusian analysis of the problem of biodiversity loss which relates it with growing human population and thus rationalises exclusion of human intervention as the solution. Based on this conventional approach, policy makers and management bodies often excluded local community from the benefits acquired from the PAs by exerting strict control over resource extraction (Brown 1998). This led to increased conflicts between the protection oriented management and resource deprived communities around

the PAs (Fisher and Christopher 2007). Budiansky (1995) states that exclusion of people from the PAs has become an end in itself rather than a means to the end as biodiversity conservation.

Management of PAs affect local livelihoods (Nepal and Weber 1995) and thus whenever they are established or expanded, the mechanisms designed to compensate for the loss of local livelihood requirements have been mostly economic incentives (Straede and Treue 2006). Striking a balance between the long term objectives of PAs and the immediate needs of local communities living in and around them is one of the most pressing challenges facing PA management and conservation

authorities. In most developing countries, participatory biodiversity conservation has become a strategy to address this challenge (Nepal and Weber 1995).

Considering the challenges faced by conservation in isolation, Wilshusen *et al.* (2002) recommend that efforts of promoting protection in isolation or without acknowledging the roles of human societies need to be avoided as they are unaffordable to poor people for whom protection is a luxury. A progressive alienation of the indigenous and local communities from resource consumption intensifies conflicts between these communities and conservation agencies. This mainly arises as a result of virtually no benefit for the restrictions imposed on them and leads to an increasing tendency of small scale but destructive activities such as poaching and encroachment along the fringes of PAs.

By the 1980s, large conservation organizations such as the International Union for Conservation of Nature (IUCN), World Wildlife Fund (WWF) and the United Nations Environment Programme (UNEP) shifted conservation paradigm from conventional approach of 'fences and fines' and flagship species and focal PAs into broader themes such as biodiversity, ecosystems and biospheres as life support systems for rural communities including human development into conservation efforts (Fisher and Christopher 2007; Sarkki *et al.* 2015). The emerging approaches were called 'Integrated Conservation and Development Projects' (ICDP), 'community-based conservation', 'grassroots conservation', 'sustainable development and use', and 'devolution of resource rights to local communities' (Sarkki *et al.* 2015). Buffer

zones around PAs, sustainable resource utilization, ICDPs and various forms of community based natural resource management (CBNRM) approaches were believed to address issues related to poverty, local participation and conflict. The major focus of initial ICDPs was to provide alternatives to resources which was not available for local communities rather than on sustainable use of resources in these areas (Fisher and Christopher 2007).

Accordingly, Incentive-Based Programmes (IBPs) were formulated around PAs encompassing local communities (Heinen and Shrestha 2006). These IBPs are broadly categorized into two: Community-Based Conservation (CBC) (Western and Wright 1994) and ICDPs (Brandon and Wells 1992). Despite some differences, the term IBP is broadly used to denote projects that aim to balance conservation with the local livelihood needs (Spiteri and Nepal 2008). CBC has been projected as the most practical approach to stem biodiversity loss in developing countries (Mehta and Kellert 1998). CBC has two broadly recognized objectives: to enhance wildlife/biodiversity conservation, and to provide incentives, normally economic, for local people. The assumption is that the local people benefit from and take ownership of conservation, and thus are more likely to support it (Campbell and Vainio-Mattila 2003: 421).

Western and Wright (1994) argue that the core thrust of CBC is the co-existence of people and nature, as distinct from the protectionism and segregation of people and nature. CBC emerged in an effort to balance conservation and local livelihood needs of the surrounding communities. The term encompasses both the traditional

form on protection of PAs and modern participatory conservation by advocating a bottom up approach and the core principle of this approach is to benefit the local communities. Likewise Alcorn (2005) stresses that conservation is a social and political process aimed at maintaining biological diversity, and thus both biological and socio-political information are important for conservation. She further claims that CBC approach at the WWF–United States was initiated viewing its huge potential to attract donors and also advocates for policy changes to support grassroots institutions to sustain CBC rather than having to depend on seasonal donors.

Despite all the optimism stated above in the context of Nepal, McLean and Straede (2003) argue that PAs have been managed with a low level of community participation and benefit-sharing with a thrust still on preservation-oriented management paradigm. Though the provisions of buffer zones – co-managed with local population – demand community participation in affairs of conservation and development, these are also seen as an extension of the park warden’s authority beyond the park boundaries, and are fraught with numerous socio-economic challenges (Paudel *et al.* 2012). This also makes it imperative to inquire CBC in CNP. Straede and Helles (2000) conclude that the park people conflict resolution has been one of the major management thrusts of CNP and its success is indicated by reduced poaching of rhinos and tigers around the park. But they further argue that such conflicts have not been totally resolved but only postponed.

On this premise of shifting paradigms in conservation at the global scale and its implications on the ground this article reviews evolution of community based

conservation approaches in Nepal with a specific reference to faunal conservation around CNP.

## **COMMUNITY BASED CONSERVATION IN NEPAL**

Nepal is regarded as one of the leading countries in setting and achieving conservation targets (Agrawal and Ostrom 2001) where the government has been in favour of community-based conservation approaches (Sah and Heinen 2001). The establishment of PAs are seen as the most feasible strategy to wildlife conservation as the landmass set aside as national parks is regarded to be a superficial indicator of a nation’s political commitment to biodiversity conservation (Chape *et al.* 2005). Accordingly, building a network of PAs has been Nepal’s main strategy for the long-term protection of biodiversity. Gradually, Nepal’s conservation policies have evolved from a single species-protection to landscape management, and from strict protection by armed forces to community participation (Bajracharya *et al.* 2007). Protected areas in Nepal were established after the strict protectionist approach by deploying armed forces, started facing challenges despite some success in curbing illegal activities in the form of displacement of local communities, poaching of protected species, and confrontation between authorities and local communities (McLean and Straede 2003). To address these problems, the Government of Nepal has over the past three decades supported community-based approaches to PA management. An example is provided by establishment of the Annapurna Conservation Area (ACA) to support CBC in mid-1980s, where local communities have been involved in conservation planning and

management while being able to continue their traditional land-use practices (Bajracharya *et al.* 2006). Handing over of Kanchenjunga Conservation Area to Kanchenjunga Conservation Area Management Committee is an additional step signifying the importance and success of CBC (Bajracharya *et al.* 2007).

Until the early 1990s, conservation strategies, particularly in the lowland Terai were mainly focused on the protection of wilderness rather than on the inclusion of people. This 'fences and fines' approach gave rise to direct conflicts between communities and parks resulting from denial of access to resources for subsistence of local communities (Heinen and Mehta 2000). As an effort to address local subsistence needs, provisions for access to thatch grass for surrounding communities and reduce their discontents with park restrictions was initiated in 1976. Participation of local people in conservation and development was further institutionalized by legal designation of buffer zones around PAs. It was also intended to ameliorate the effects of abrupt landuse changes between the PAs and any other landuse with a different priority (Heinen and Mehta 2000).

Buffer zone management has two major objectives; first is to improve resource conditions within the area to fulfil the increasing resource demands of the communities and second is to improve the ecological conditions within such areas and provide additional inhabitable areas for wildlife. The Buffer Zone Management Regulations (1996) which provided legal basis for co-management of buffer zones between institutions of local communities and park management authorities, is one of the major strengths of the CBC approach.

It also includes community forestry with the assumption that it can provide adequate substitutes for local communities while at the same time reduce their impacts and dependency on PAs (Nepal and Weber 1995). It also aims to mitigate the adverse impacts of wildlife on communities and vice versa. This suggests a shift in the emphasis from state bureaucratic interests to local priorities resulting in a higher acceptance for PAs and conservation among local population (Budhathoki 2004).

As prescribed by the law, local communities in buffer zone currently receive 50 per cent of the total revenue generated in the PA, of which 30 per cent goes into conservation activities, 30 per cent for community development, 20 per cent for income generating activities, and 10 per cent into conservation education whereas the remaining 10 per cent covers the administrative costs (MFSC 1999).

## THE CHALLENGES AHEAD

### Expanding Area for Protection

Most of the PAs in Asian region are too small to maintain a viable population of larger mammals for a long time. This aspect also makes their population vulnerable to habitat loss (Sodhi 2008). But surrounding areas such as buffer zones, biological corridors and multiple land-use areas may support these populations for a longer period (Dinerstein *et al.* 1998). Smaller PAs can result in wild animals raiding agricultural field and human settlements thus resulting in a fatal retaliation. Another major concern of smaller PAs is that the buffer areas (not necessarily buffer zones) and corridors are necessary for population exchange among smaller parks. Unlike PAs, compensation mechanisms are not relatively prompt along the corridors.

This raises the concern regarding support from local communities for conservation. At the same time, wildlife outside PAs is vulnerable to poaching as state control is minimal in such areas.

But for species like tigers which are highly sensitive to human disturbances around their habitats (Dinerstein *et al.* 1998), conservation and maintenance of core areas is the only solution to restrict populations within PAs. Any disturbances in the core areas of tiger habitats can agitate the animal to move into villages. This will further aggravate the situation and instigate retaliation. Thus it is crucial to address the ecological aspects of the habitats for certain species to promote CBC. But, still there is a need and an opportunity to manage areas outside of core PAs with wider community participation and enhanced compensation mechanisms. Conservation efforts need to transcend the conventional boundaries of PAs and buffer zones.

Considering the challenges of growing wildlife population of key flagship species such as tigers, rhinos and elephants which need a comparatively larger habitat, it is evident that mechanisms to promote biodiversity conservations outside the conventional domain of PAs and buffer zones are imperative. Community based management regimes and institutions such as community forests, protection forests including network of community forests and collaborative forests are critical. Incorporation of different aspects of biodiversity and human wildlife conflicts in a robust manner by these institutions will be vital in the coming days.

### **Addressing Human Wildlife Conflicts and Iniquities**

Human-wildlife conflict is a crucial issue in Nepal as it results in loss of lives and

property, increased risks to food insecurity and livelihood options. Chitwan National Park is subject to extensive utilization of forest resources by the local communities as it forms an important part of the community territory used for obtaining their livelihood needs (Straede and Helles 2000). Increasing number of man eating tigers and livestock depredation around CNP areas has posed a serious concern for the local people and also for the survival of the tiger. The issue is that tigers are using buffer zone habitat of CNP more frequently and are establishing breeding territories (Gurung *et al.* 2006) in community forest. This is mainly because degraded forests have been restored as a result of community management. Once tigers settle in the buffer zone, confrontations with humans increases significantly. Consequently, cases of local communities poisoning tigers to get rid of them has been reported (Gurung *et al.* 2008). Concurrently, most studies and cases are focussed around casualties with limited attention to cases of minor or major injuries. Silwal *et al.* (2016) have assessed the scenario and recommend creation of awareness among local people about species-specific behaviour of attacking animals and strengthening local medical centres around CNP and establishing medical trauma centre in the vicinity of the park to respond to emergency cases.

Land-use change is identified as a major driver of human-wildlife conflicts in Nepal. As habitats are fragmented with villages and agriculture fields surrounding the parks, the invasion in cropped fields and villages is high. In case of CNP, these incentives are in the form of compensation for crop and livestock damage by wildlife or sharing the revenues from park entry fees between the parks and surrounding buffer zone communities. Losses due to

human-wildlife conflict is mostly at the individual level whereas compensation by conservation agencies is rather in the form of public goods. Such facilities do not separate a person who is losing at the cost of biodiversity conservation from a person who is gaining at the cost of biodiversity loss. This will create resentment within the individual and thus raises the issue of communal benefits versus individual losses. When they are excluded from income generating opportunities and other benefits, there is a danger of pushing them to poaching as a self-compensatory, retaliatory and livelihood coping strategy (Kideghesho *et al.* 2005).

Human behaviour regarding wildlife conservation has been seen to be regulated by their existing livelihood strategies (Kidegheso and Mtoni 2008), impact of wildlife conservation on them and possible compensation for their losses. Further, researches on economic values of PAs have also been widely conducted. Theoretically, these calculations should try to establish a relation between how much a “loser” should be compensated by a “winner” (Straede and Treue 2006). How much do hotels and resorts around PAs and within the buffer zones, as winners, pay to the individuals as losers of the conflict is the key question. Further, when such economic incentives are met from conservation activities itself rather than from direct economic compensation mechanism, it will make conservation valued. Thus community support will largely depend on economic opportunities or the costs of conservation at the individual/household level. Further, an effective land-use planning that reduces fragmentation can have the greatest impact on reducing economic losses of such conflicts. This becomes pertinent

due to the fact that agricultural lands along the fringes of PAs could largely be owned by communities vulnerable to such conflicts. Also, when decisions are made by the elite members of such heterogenous communities, they may not always be in favour of these vulnerable communities. Dhakal and Thapa (2015) emphasize the fact that the disparities within buffer zones are not identified explicitly and thus also not addressed though there are significant differences between the impacts that the wild animals have on adjoining communities and their livelihoods.

### **Poverty, Livelihood and Conservation**

Biodiversity for rural population is the major means of subsistence in the form of food supplies, shelter, medicines, income and employment. As the guardians of biodiversity hotspots, the value of resources to rural population are of utmost importance and is promoted to safeguard the future of these resources. The level of success of biodiversity conservation is largely dependent on the socio-economic conditions of the surrounding communities (Fisher and Christopher 2007). Sodhi (2008) has also stressed the need to better understand the socio-economic and political causes of biodiversity loss and integrate poverty alleviation in conservation programs. Likewise, Fjeldsa and Burgess (2008) highlight that it is impractical to try and maintain PAs near densely populated areas without any effort for betterment of socio-economic status of the local communities. But at the same time, integrated conservation and development projects have proven to be highly expensive; slow to start with and tend to lose focus on conservation

and create confusion regarding whether conservation or development is the means or end (Wells 1995).

Local communities depending on forests for livelihoods, when act collectively to ensure their livelihoods and construct better opportunities, can be important in altering the deforestation dynamics at the local level in a developing country (Barracough and Ghimire 1995). Despite their annoyance due to restrictions, communities do acknowledge the fact that PAs are not only for conservation but they also provide resources for their subsistence (Allendorf *et al.* 2007). It is observed that projects that are successful in generating community support are the ones which provide non-cash benefits or support for enterprise which are not linked to biodiversity. In such cases, a positive relationship and mutual trust between local communities and project staffs can be the most crucial factor. But what needs attention is that this mutual trust and positive relationship may, to an extent, be a result of enterprise support rather than an attitude change towards conservation. In this case it is always possible that as soon as such support is withdrawn, it can be business-as-usual. The dilemma may lie in how to change the perceptions of the local communities so that they perceive conservation as a part of their livelihood strategy rather than as a threat to their livelihoods. Socio-economic benefits of community based approaches to conservation can outweigh the costs though the later is also significant in recent times (Bajracharya *et al.* 2006). It is critical to acknowledge the nexus between poverty-livelihood and conservation although it is neither complex, nor straight forward.

## Rethinking Ecotourism as Economic Incentives

Several areas in Nepal have eco-based tourism run through innovative community management models which have helped develop tourism-based revenue-sharing in PAs. But, economic incentives and benefits for local communities from ecotourism are negligible around parks in Nepal. Ecotourism has minimal employment opportunities and the influence on household income is marginal (Bookbinder *et al.* 1998). Bookbinder *et al.* (1998) have stated that the identification of economic incentives providing direct benefits for communities that are appropriate in space and time to the scale of threats to biodiversity are crucial factors for successful integration of conservation and local economic development. They argue conservation is more sustainable when economic incentives are met from conservation activities rather than from direct economic compensation mechanism. Further, ecotourism is bound to increase cash flow around PAs but the critical question remains on how the income from tourism in and around PAs is distributed (Sarkki *et al.* 2015)

Although projects attempting to incorporate local livelihood enhancement along with biodiversity conservation have failed in many instances, the ones that have succeeded are also exemplary. One of such examples is the Baghmara community forest that lies in the buffer zone of CNP. It has not only generated substantial amount for community development but has also created a sense of ownership among the locals (Dinerstein *et al.* 1998). This situation is possible due to the community forest adjoining the national park resulting

in a natural movement of wildlife into the forest. Such circumstances may not be available and so this success may not be replicated elsewhere. At the same time there is always a high possibility that with high incomes, such opportunities can be exploited by outsiders who can reduce the benefits of local communities due to the fact that locals lack required knowledge and skills (Wunder 2000; Spiteri and Nepal 2005). Even in case of ACA, which receives a very high inflow of tourists, relatively few people have received minimal financial income from tourism (Bajracharya *et al.* 2006). Oates (1999) further argues that ICDPs can be counter-productive in the sense that it might trigger an inflow of people from other areas which further exerts pressure on remaining resources. Areas around CNP in Nepal is an exemplary of ecotourism which has seen a steep rise in population as a result of lucrative tourism enterprise. This practically has been the case in Nepal where tourism industry around PAs is run by socio-economically powerful individuals residing in cities. This can be a major challenge for conservationists who regard ecotourism as a tool for community participation and social development of rural areas. Unless ecotourism can provide adequate opportunities including income for the local communities, it will be unable to change the local attitude towards PAs. The concern for ecotourism as a sustainable mechanism for conservation is that there are many PAs where biodiversity is very rich while the income from tourism is negligible. So there might be a need to regulate tourism in PAs in Nepal.

## CONCLUSION AND THE WAY FORWARD

This paper provides an overview of CBC in PAs, with particular focus on CNP in Nepal. It conveys that despite PAs offer opportunities for linking conservation with development, yet there are several challenges ahead towards meeting the target. Many studies are conducted to assess the success and failures of integrated conservation and development projects. Most of these cover the socio-economic development of communities with some focus on cases of human wildlife conflict and poaching as their indicators and almost none on ecological outcomes of supports to buffer zones (Heinen and Mehta 2000). This is attributed to lack of a framework, funds and human resource to assess the impact on endangered species and habitat conservation (Dinerstein *et al.* 1998). Studies to assess the impacts of ICDPs initiatives will be critical to measure the success of projects whose means is community development and the end is biodiversity conservation.

Agrawal and Gibson (1999) argue that the notion of 'the mythic community' fails to embrace the differences within communities. Regarding communities as homogenous intact units raises expectations for cooperation which is a flaw in the approach. This notion fails to meet the expectations for cooperation in conservation. Contrary to this, proponents of CBNRM argue that heterogeneity should not be an excuse for undermining the potential of the approach. Interventions should be more focused on institution



building and conflict management at all levels (Fisher and Christopher 2007). There is a need to shift our understanding of communities from the usual assumptions of communities as small sized, territorially fixed homogenous groups with shared understandings and identities to a diverse one with a stronger focus on the divergent interests of multiple actors within communities. The interactions or politics through which these interests emerge and different actors interact with each other, and the institutions that influence the outcomes of political processes (Agrawal and Gibson 1999). Parker *et al.* (2015) and Dahal *et al.* (2014) emphasize the need to specifically target the disparities within communities by addressing the needs of marginalized sections of communities in order to distribute benefits of decentralized conservation. They further emphasize the need to empower local communities to create level playing fields because these local groups are usually the least powerful among the different stakeholders of conservation and thus advocate to design mechanisms to channel greater authority and power towards local groups.

Sodhi (2008) identifies the need to better understand the socio-economic and political drivers of tropical habitat loss along with improved understanding of indigenous conservation approaches and local knowledge in future planning. Anne Claus *et al.* (2010) state that social research in conservation is undervalued largely due to that fact that social research is a time consuming process whereas conservation moves at a rapid pace and in cases of limited funding, biological research is given a priority. Also conservation organizations are most often staffed by natural scientists who assume to understand human

behaviour simply because they are humans. Hence, additional emphasis is required to comprehend and address social issues related to conservation.

Interventions may have failed but some have succeeded as well which shows that CBC is possible; the only major factor to be considered being the type and level of human interactions with biodiversity and its implications on local livelihood. Regardless of which approach we promote, the linkages between poverty, increasing resource scarcity and unimpeded biodiversity loss should be acknowledged. This can have a positive outcome for both poverty reduction and conservation when such impoverished areas overlap with degraded ecosystems and thus to facilitate in identification of “illusive yet possible, win-win solutions” (Fisher and Christopher 2007). However, we should also consider the fact that it is virtually impossible to create a perfect balance between socio-economic development and conservation in a developing nation like Nepal.

Conservation recommendations which are politically not possible, and socially and economically rejected should be avoided (Putz and Zuidema 2008). In a real world situation, socio-economic and political factors play a much bigger role than anticipated. Thus, what ecologists find and want may never be achievable without considering these factors. Conservation and management of biodiversity is complex and a localized phenomenon. The ecosystems, biodiversity therein, its products, values and services to surrounding communities differ in widest of ranges. Most importantly, what is to be understood is that the communities are not homogenous and this heterogeneity and

disparities therein must be understood to be lowest possible level to entice them into conservation. The implications are that conservation and management strategies will broadly vary across landscapes and there are no blueprint solutions where one size fits all. Due to a linked phenomenon between the local socio-economic systems and the ecological systems, issues such as development, poverty eradication and biodiversity conservation should be addressed as one complex system rather than as individual entities (Fisher and Christopher 2007).

Conservation sector in itself is under funded as it receives inadequate priority and challenges will keep increasing when development is the need. Local communities need additional investment in the form of employment, livelihood support and capacity building. The key will be investing in areas outside the conventional domain of conservation, PAs and buffer zones as additional space will be required to sustain healthy wildlife populations when land use change is exerting pressure on PAs.

## DISCLAIMER

The views and opinions expressed in this article are those of the author(s) and do not necessarily reflect those of the organization of affiliation.

## REFERENCES

- Agrawal, A. and Ostrom, E. 2001. Collective Action, Property Rights and Decentralisation in Resource Use in India and Nepal. *Politics and Society*, 29(4): 485-514.
- Agrawal, A. and Gibson C. 1999. Enchantment and Disenchantment: the Role of Community in Natural Resource Conservation. *World Development*, 20: 629-649.
- Alcorn, J.B. 2005. Dances Around the Fire: Conservation Organizations and Community-based Natural Resource Management. In: J.P. Brosius, A. Tsing and C. Zerner (Eds.), *Communities and Conservation: Histories and Politics of Community-based Natural Resource Management*. Walnut Creek: Altamira Press.
- Allendorf T.D., Smith J.L.D. and Anderson D.H. 2007. Residents' Perceptions of Royal Bardia National Park, Nepal. *Landscape and Urban Planning*, 82: 33-40.
- Anne Claus C., Chan, K.M.A. and Satterfield, T. 2010. The Roles of People in Conservation. In: N.S. Sodhi and P.R. Ehrlich (Eds.), *Conservation Biology for All* (pp. 262-283). Oxford University Press.
- Bajracharya S.B., Gurung G.B. and Basnet K. 2007. Learning from Community Participation in Conservation Area Management. *Journal of Forest and Livelihood*, 6(2).
- Bajracharya, S.B., Furley, P.A. and Newton, A.C. 2006. Impacts of Community-based Conservation on Local Communities in the Annapurna Conservation Area, Nepal. *Biodiversity and Conservation*, 15:2765-2786
- Barracough, S.L. and Ghimire, K.B. 1995. Forests and Livelihoods: the Social Dynamics of Deforestation in Developing Countries. UK: Palgrave Macmillan.
- Bookbinder, M.P., Dinerstein, E., Rijal, A., Cauley, H. and Rajauria, A. 1998. Ecotourism's Support of Biodiversity Conservation. *Conservation Biology*, 12(6): 1399-1404.
- Brandon, K. and Wells, M. 1992. Planning for People and Parks: Design Dilemmas. *World Development*, 20: 557-570.
- Brown, K. 1998. The Political Ecology of Biodiversity, Conservation and Development in Nepal's Terai: Confused Meanings, Means and Ends. *Ecological Economics*, 24: 73-87.
- Budhathoki, P. 2004. Linking Communities with Conservation in Developing Countries: Buffer Zone Management Initiatives in Nepal. *Oryx*, 38(3): 334-341.
- Budiansky, S. 1995. Nature's Keepers: The New Science of Nature Management. Orio, London.
- Campbell L.M. and Vainio-Mattila A. 2003. Participatory Development and Community-Based Conservation: Opportunities Missed for Lessons Learned? *Human Ecology*, 31(3): 417-437.
- Chape, S., Harrison, J., Spalding, M. and Lysenko, I. 2005. Measuring the Extent

- and Effectiveness of Protected Areas as an Indicator for Meeting Global Biodiversity Targets. *Physiological Transactions: Biological Science*, 360: 443-55.
- Dahal, S., Nepal S.K. and Schuett, M.A.** 2014. Examining Marginalized Communities and Local Conservation Institutions: The Case of Nepal's Annapurna Conservation Area. *Environmental Management*, 53:219-230.
- Dhakal, B. and Thapa B.** 2015. Buffer Zone Management Issues in Chitwan National Park, Nepal: A Case Study of Kolhuwa Village Development Committee. *Parks*, 21.2: 64-72.
- Dinerstein, E., Rijal A., Bookbinder M., Kattel B. and Rajauria, A.** 1998. Tigers as Neighbours: Efforts to Promote Local Guardianship of Endangered Species in Lowland Nepal. In: J. Seidensticker, P. Jackson and S. Hristie (Eds.), *Riding the Tiger: Conserving the Tiger in a Human-dominated Landscape* (pp. 316- 333). Cambridge, United Kingdom: Cambridge University Press.
- Fisher, B. and Christopher, T.** 2007. Poverty and Biodiversity: Measuring the Overlap of Human Poverty and the Biodiversity Hotspots. Kathmandu. *Ecological Economics*, 62: 93-101.
- Fjeldsa J. and Burgess N.D.** 2008. The Coincidence of Biodiversity Pattern and Human Settlement in Africa. *African Journal of Ecology*, 46: 1-10.
- Gurung, B., Smith J.L.D., McDougal C., Karki J.B. and Barlow A.** 2008. Factors Associated with Human-killing Tigers in Chitwan National Park, Nepal. *Biological Conservation*, 141: 3069-3078.
- Gurung, B., Smith, J.L.D. and Shrestha, M.** 2006. Using "Bagh Heralu" Network to Map the Metapopulation Structure of Tigers in Nepal. In: L. McNeely, T. McCarthy, A. Smith, L. Whittaker, E. Wikramanayake (Eds.), *Conservation Biology in Asia* (pp. 214-232). Resources Himalaya.
- Heinen J.T. and Mehta, J.N.** 2000. Emerging Issues in Legal and Procedural Aspects of Buffer Zone Management with Case Studies from Nepal. *Journal of Environment and Development*, 9(1): 45-67.
- Heinen, J. and Shrestha, S.** 2006. Evolving Policies for Conservation: An Historical Profile of the Protected Area System of Nepal. *Journal of Environmental Planning and Management*, 49(1): 41-58.
- Kidegheso, J.R. and Mokiti T.M.C.** 2008. Who Compensates for Wildlife Conservation in Serengeti? *International Journal of Biodiversity Science and Management*, 4: 112-125.
- Kidegheso, J.R., Kaltenborn B.P. and Mokiti T.M.C.** 2005. Serengeti Shall Never Die: Can the Ambition be Sustained? *International Journal of Biodiversity Science and Management*, 3: 150-66
- McLean, J. and Straede, S.** 2003. Conservation, Relocation, and the Paradigms of Park and People Management - A case Study of Padampur Villages and the Royal Chitwan National Park, Nepal. *Society and Natural Resources*, 16(6): 509-526.
- Mehta, J.N. and Kellert, S.R.** 1998. Local Attitudes Toward Community-based Conservation Policy and Programmes in Nepal: A Case Study in the Makalu-Barun Conservation Area. *Environmental Conservation*, 25(4): 320-333.
- MFSC.** 1999. Buffer Zone Management Guidelines 1999. Ministry of Forests and Soil Conservation, Government of Nepal.
- Nepal, S.K. and K.E. Weber.** 1995. Prospects for Coexistence - Wildlife and Local People. *Ambio*, 24: 238-245.
- Oates, J.F.** 1999. Myth and Reality in the Rain Forest: How Conservation strategies are Failing in West Africa. Berkeley and London: University of California Press.
- Parker, P., Thapa, B. and Jacob, A.** 2015. Decentralizing Conservation and Diversifying Livelihoods Within Kanchenjunga Conservation Area Nepal. *Journal of Environmental Management*, 164: 96-103.
- Paudel, N.S., Jana S. and Rai, J.K.** 2012. Contested Law: Slow Response to Demands for Reformulating Protected Area Legal Framework in Nepal. *Journal of Forest and Livelihood*, 10(1): 88-99.
- Putz, F.E. and Zuidema, P.A.** 2008. Contributions of Ecologists to Tropical Forest Conservation. In: W.P. Carson and S.A. Schnitzer (Eds.), *Tropical Forest Community Ecology* (pp. 442-453). Blackwell Publishing Limited.
- Sah, J.P. and Heinen, J.T.** 2001. Wetland Resource Use and Conservation Attitudes among Indigenous and Migrant Peoples in Ghodaghodi Lake Area, Nepal. *Environmental Conservation*, 28(8): 345-356.
- Sarkki, S., Rantala, L. and Karjalainen T.P.** 2015. Local People and Protected Areas:

- Identifying Problems, Potential Solutions and Further Research Questions. *International Journal of Environment and Sustainable Development*, 14(3).
- Silwal, T., Kolejka, J. and Sharma, R.P.** 2016. Injury Severity of Wildlife Attacks on Humans in the Vicinity of Chitwan National Park, Nepal. *Journal of Biodiversity Management and Forestry*, 5. doi:<http://dx.doi.org/10.4172/2327-4417.1000154>.
- Sodhi, N.S.** 2008. Tropical Biodiversity Loss and People - A Brief Overview. *Basic and Applied Ecology*, 9: 93-99.
- Spiteri A. and Nepal S. K.** 2005. Incentive-Based Conservation Programs in Developing Countries: A Review of Some Key Issues and Suggestions for Improvements. *Environmental Management*, 37(1): 1-14.
- Spiteri A. and Nepal S. K.** 2008. Distributing Conservation Incentives in the Buffer Zone of Chitwan National Park, Nepal. *Environmental Conservation*, 35: 76-86.
- Straede, S. and Helles, F.** 2000. Park-people Conflict Resolution in Royal Chitwan National Park, Nepal: Buying Time at High Cost? *Environmental Conservation*, 27(4): 368-381
- Straede, S. and Treue, T.** 2006. Beyond Buffer Zone Protection: A Comparative Study Park and Buffer Zone Products Importance to Villagers Living inside Royan Chitwan National Park and to Villagers Living in its Buffer Zone. *Journal of Environmental Management*, 78: 251-267.
- Wells, M** 1995. Biodiversity Conservation and Local Development Aspirations: New Priorities for the 1990s. In: C.A. Perrings, K.G. Maler, C. Folke, C.S. Holling and B.-O. Jansson (Eds.), *Biodiversity Conservation* (pp. 319-333). Kluwer, Dordrecht.
- Western, D. and Wright M.** 1994. The Background to Community-based Conservation. In: D. Western, M. Wright and S. Strum (Eds.), *Natural Connections: Perspectives in Community-based Conservation* (pp.1-12). Washington: Island Press.
- Wilshusen, P.R., Brechin, S.R., Fortwangler, C.R. and West P.C.** 2002. Reinventing the Square Wheel: Critique of a Resurgent "Protection Paradigm" in International Biodiversity Conservation. *Society and Natural Resources*, 15: 17-40.
- Wunder, S.** 2000. Ecotourism and Economic Incentives: An Empirical Approach. *Ecological Economics*, 32: 465-479.
-