

Park – People Interaction and Public Perceptions towards Parsa Wildlife Reserve, Nepal

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Abstract: Protected areas (PAs) are established to conserve biodiversity and ecosystems. PAs also provide natural resources to local people that support their livelihoods. However, local people residing nearby PAs often face diverse costs that may influence their overall attitude towards PAs. This actually determines the degree of participation and support of local people in nature conservation. This paper assesses the attitude of local people towards PAs taking a case of Parsa Wildlife Reserve (PWR). The research methods employed were household survey followed by focus group discussions, key informant's interview and participant observation. This study found that the local people in and around the PWR have negative attitude towards it. Only 34 per cent liked its presence whereas 58 per cent of the respondents were not happy to be included in the buffer zone. Reasons for disliking the reserve was mainly due to wildlife damage; restrictions in resource use; and arrest and prosecution by the park authorities. In contrast, reasons for liking the reserve were the opportunities for natural resource use, biodiversity conservation, and tourism/business. The paper concludes that by addressing the negative attitudes of local people helps the reserve authority to enhance long term sustainability of PWR.

Key words: Attitude, buffer zone, Parsa Wildlife Reserve, protected area, Nepal

INTRODUCTION

Protected areas (PAs) are seen as the key strategy for biodiversity and nature conservation worldwide. Over, 209,000 PAs of different sizes and categories exist globally, from more than 193 countries and territories (Juffe-Bignoli *et al.* 2014). Aichi biodiversity target 11 of the Convention on Biological Diversity envisions that by 2020 at least 17 per cent of the terrestrial and 10 per cent marine areas will be protected. Among countries, there is a great variation in terms of PA coverage. Increasing number of PAs at the global level can be attributed to the lobbying and conservation advocacy by the global and/or regional conservation organizations (Vedeld *et al.* 2012). Nepal has established different categories of PAs and cover 23.23 per cent of its land area (DNPWC 2012).

Despite the growing coverage of PAs in Nepal, there is an increasing incidences of

park-people conflict. In several occasions, creation and management of PAs are the breeding ground of conflicts (Paudel *et al.* 2011). This happens especially when the traditional resource use rights of the people who are residing in the region since time immemorial, even before the creation of PAs are revoked; their properties are damaged or lives harmed by wildlife. Local people have been displaced or resettled and/or deprived of access to natural resources on which they depend on (Weladji and Tchamba 2003; Western 1989 cited in Allendorf 2007; Adams and Hutton 2007). In Nepal too, several PAs experienced translocations and/or displacement and restrictions on resource use after the PAs were established (Dhakal *et al.* 2011; Khadka and Shrestha 2011).

The economic loss incurred by the local people due to wildlife damage is one

of the major issues that triggers park-people conflict, thus endangering the long term sustainability of PAs. This is more pronounced in the villages close to the park boundary (Lamsal 2012; Dhakal and Thapa 2015). Local people living in and around the PAs are compelled to borne the cost of park management in the form of restricted land use, restricted resources and wildlife damage (Mehta and Heinen 2001; Weladji and Tchamba 2003; Allendorf *et al.* 2007; Karn 2008). Therefore, engendering positive relationships between PAs and local people are one of the key strategies in achieving biodiversity conservation (Heinen 1993; Tchamba 1996; Allendorf *et al.* 2007)

Besides conservation of biodiversity, PAs provide opportunities for information and education, recreation, scientific research and contribute to regional and local development (Getzner *et al.* 2012). Importance of these services and the significance of regional development depend on peoples' participation, management objectives and type of PA governance. Benefit sharing with local people is a critical issue when it comes to disproportionate costs and benefits of establishing and managing PAs. Against these backdrop, it is important to explore the relationship between park and people and local people's perception towards the park which shapes the sustainability of the PA.

Understanding park-people relation is a prerequisite to design appropriate management framework and achieve sustainable management of PAs. Understanding of the conservation attitude of local people and perception towards PAs allows us to explore and address issues of conflict between the park and local people, and thus contributes to improving

park-people relations. Moreover, it contributes to the knowledge of local support and participation in conservation. Positive attitude towards PAs is often linked with benefits which may include recreational opportunities, environmental preservation, economic benefits or resource use for livelihoods as perceived by local people (Heinen 1993; Baral and Heinen 2007; Allendorf 2007). Likewise, negative attitudes relates to economic losses, human casualties, and restriction in resource use (Heinen 1993; Allendorf 2007). Also negative perceptions towards PAs arise due to negative interactions with park authorities or security personnel. There is a general belief that PA benefits are for the government or foreigners; not for locals (Allendorf 2007).

This paper is based on a study on resources used by the local people in the buffer zone of Parsa Wildlife Reserve (PWR). The paper aims to identify issues of conflict between the park and people including wildlife induced damage; and assesses conservation attitude of local people towards PWR. This paper therefore attempts to answer following questions: First, what are the resources extracted from the park and used by locals and their significance for local livelihoods? Second, what are the types of conflicts between the park and people? Third, what are the types of property damages by wildlife occurring in the buffer zone? Fourth, do the local people have favorable conservation attitudes towards PWR and its Buffer Zone?

STUDY AREA

The PWR has an area of 499 sq. km and is located in the sub-tropical zone of Southern Nepal (see figure 1). It was established in 1984 for the conservation of elephant (*Elephas maximus*), tiger (*Panthera tigris*),

and gaur (*Bos gaurus*). The buffer zone of PWR was declared in 2005 covering a total area of 298.17 sq km encompassing three districts and 11 Village Development Committees (VDCs). It extends from Chitwan National Park in the west to Hetauda-Birgunj highway in the East. The northern border consists of Rapti river along with Churia range and its southern

boundary comprises of roads and forests. Small settlements, Rambori and Bhata, lies within the reserve that spread over 55 hectare (ha) and other two settlements, Pratapur and Ramouli lies in the inner Terai that covers 150 ha. Pratapur and Ramouli settlements were undergoing translocation out of the reserve during the study period.

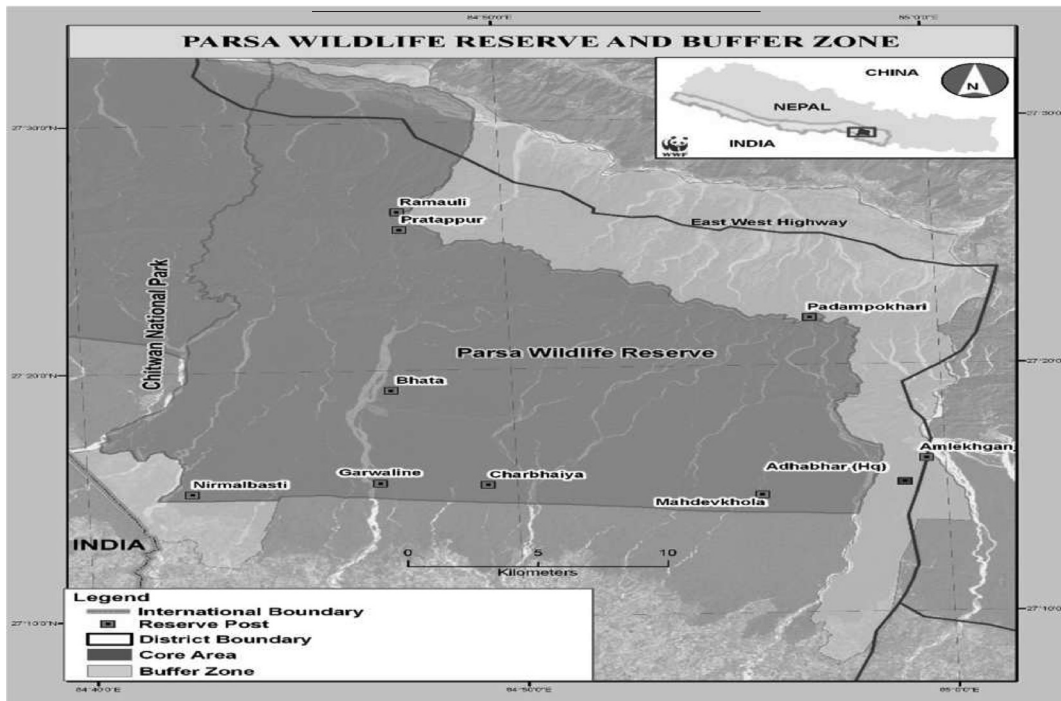


Figure 1: Parsa Wildlife Reserve and Buffer Zone

Source: WWF Nepal

MATERIALS AND METHODS

Fieldwork for this study was conducted during the spring, 2013 in two buffer zone VDCs. Amlekhgunj buffer zone users group in Amlekhgunj VDC (wards 3,4,5,6) in Bara district and Nirmal Basti buffer zone user group in Parsa district were selected based on their proximity as well as distance to the PWR headquarter. Amlekhgunj VDC adjoins the PWR headquarter whereas Nirmal Basti VDC

is at a distance of 70 km. Structured questionnaire surveys were administered to 58 randomly selected households, out of which 24 respondents were taken from Nirmalbasti and 34 from Amlekhgunj. There were 30 male and 28 female respondents in total. The questionnaire primarily aimed of exploring the local peoples' attitude towards conservation with the attitudinal score of 1 (strongly

disagree) to 5 (strongly agree) with score 3 being neutral (based on 5 point Likert scale). Quantitative data was processed and analyzed in MS Excel . The descriptive statistics were used and presented in the form of table, graphs, charts, and pie charts.

RESULTS

Socio-economic Characteristics

The group of respondents in this study belonged to nine different ethnic groups. The highest number of respondents were Tamang (47 per cent) followed by Gurung and Brahmin (both 10 per cent), Newars (9 per cent), Chhettri and Thakuri (5 per cent). Occupational castes were also represented in the study area which comprised 5 per cent of the sample. There were one Magar and three Madhesi households (7 per cent) in the sample. The mean age of the respondents was 42.83 years ranging from 18 to 79 years. The average household members were 6.68 which was higher than the VDC average. The study villages have low educational status as 34 per cent of the respondents were illiterate or unable to read and write whereas 14 per cent were literate but with no formal education. Moreover, 16 per cent had primary level education (upto class 5), 22 per cent had lower secondary level education, nine per cent had secondary level (10 or School Leaving Certificate) and only five per cent had higher degrees.

Resource Use of Local Population

There were seven types of resources used by locals from PWR demonstrating their nature of dependence on park resources. Local people in Amlekhgunj possessed less farmland and livestock in comparison

to Nirmal Basti. The resources used were fodder, fuel wood, thatch grass, leaf litter, edible plants, timber and others (including Non Timber Forest Products). Majority of the local people used fuel wood (84.48 per cent) as the only source of energy for cooking and heating followed by fodder (36.2 per cent), leaf litter (27.58 per cent), timber and other resources such as medicinal plants, taking cattle for grazing and feeding water (3.44 per cent each), edible plants (1.72 per cent) and thatch grass (1.03 per cent).

In Amlekhgunj, the Buffer Zone Community Forest (BZCF) was able to meet the demand of timber for the members of the user group. Extra timber, which was not consumed by the users, was stacked and held by the buffer zone user group for sale, subject to approval from the PWR administration. On the contrary, local people in Nirmal Basti do not have access to timber due to the absence of BZCF in their vicinity. Harvesting of timber from PWR is illegal and do not have any option other than relying on the market. People however revealed that some people carry out illegal timber harvesting as well. The PWR authorities permit harvesting of thatch grass once a year inside the reserve. In the BZCF, permission for collection of fuelwood is granted, twice a week. Local people complained that the thatch grass collection period has been reduced from two weeks to less than a week currently. This has reduced the total thatch grass extraction from the reserve. It is to be noted that the grassland coverage is less than 20 sq. km (4 per cent of the reserve area) in PWR which is very low in comparison to other lowland parks and reserves (Baral 1999).

Wildlife Induced Damage and Resulting Conflicts

Restriction on use of forest resources in the buffer zone is a major source of conflict in PWR. For instance, in Nirmal Basti there is no community forest or government managed forest to meet their daily need of fuelwood, fodder and grazing land for livestock. This has compelled the villagers to access resources from the reserve illegally despite the risk of being fined, tools confiscated or harassments

from the park authorities. Male users have had experienced beatings from the Army when they were caught harvesting forest products illegally.

Wildlife induced damages has often resulted in human-wildlife conflicts and have economic loss for the local people. Some of the wildlife that have involved in damaging crops were wild boar, elephant, spotted deer blue bull and porcupine. Peacock and monkey also appeared in the farms but were less damaging compared to other problem animals (see Table 1).

Table 1: Wild Animals and Type of Crop Damage in PWR

Animals liable to damage	Crop damage
Elephant (<i>Elephas maximus</i>)	Maize, Rice, Wheat
Cheetal (<i>Axis axis</i>)	Maize, Rice, Millet, Lentil, Mustard
Boar (<i>Sus scrofa</i>)	Maize, Rice, Wheat, Mustard
Porcupine (<i>Hystrix indica</i>)	Maize, Rice
Blue Bull (<i>Boselaphus tragocamelus</i>)	Lentil, Mustard

Comparatively, the most damage causing animals, depending on the damage to various crops, was spotted deer (*Axis axis*) as it fed on almost every crop grown locally. Other animals mostly fed on Maize, Rice and Wheat but the crop loss depends on the situation of the field and varied from year to year. In Nirmal Basti, crop and livestock depredation was much more pronounced than in Amlekhgunj. The study found that the highest percentage of damage was in Maize (32 per cent), followed by Rice (25 per cent), Lentil (18 per cent), Mustard (17 per cent) and Millet (8 per cent).

Almost half of the crop losses incurred in Maize and Mustard whereas, damage to

Rice accounted to a quarter of total loss. In monetary terms, the greater loss was incurred in Maize (see Figure 2). This amounted to NRs. 99,800. The second most damaged crop was Rice (NRs. 78,500) followed by Lentil (NRs. 57,000), Mustard (NRs. 53,800) and Millet (NRs. 25,000). It was found that the local people grew cash crop, such as Tobacco, during the winter and spring. This crop was sold to the Surya Tobacco Company in Bara district. Respondents did not have any problem with the wildlife when the field was fully grown with Tobacco as this crop is not consumed by the animals mentioned above.

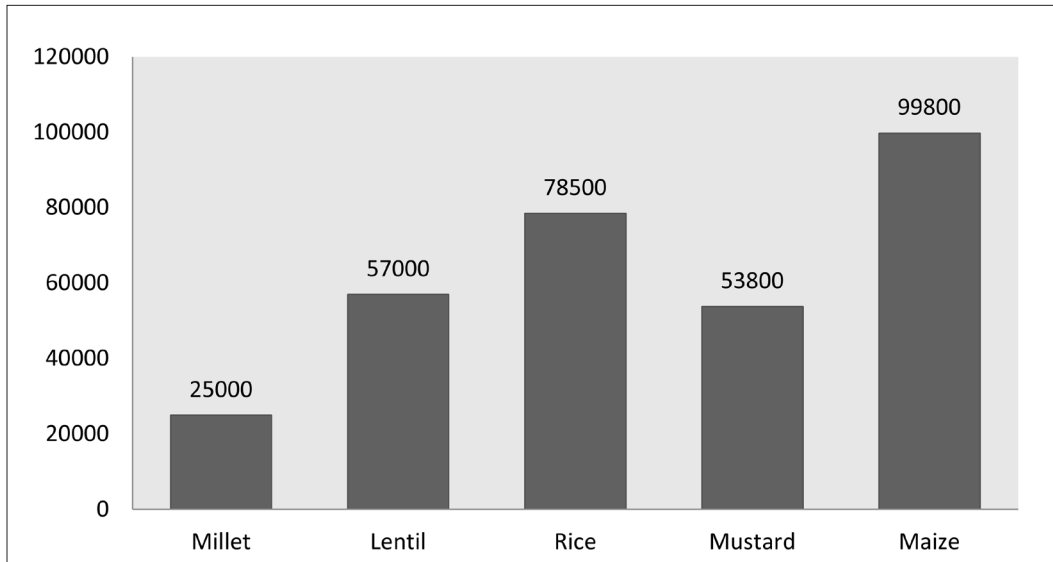


Figure 2: Loss of Crop Damage in Monetary Unit (NRs.)

In terms of the livestock damage, about 39 were predated by tigers and leopards in the last three years. Among them 32 goats, 6 cattles and 1 calfs were killed. Besides, elephants were responsible for the damage on private properties. During the study an individual from the village bordering

the reserve in NirmalBasti was killed by elephant and an adult boy in the nearby village was attacked by a tiger. In the last one year, elephant demolished three houses and ate Rice and Maize stored in two houses (see Table 2).

Table 2: Damage Caused by Elephants and Tigers

Incident	Loss
House destruction by Elephant	NRs.20,000
House destruction and ate stored Rice by Elephant	NRs.26,000
House destruction and ate stored Maize by Elephant	NRs.16,000
Attacked by Elephant	One death
Attacked by Tiger	One Seriously injured

Local Attitudes towards Conservation and PWR

Majority of the respondents did not prefer being close to the vicinity of PWR. About 40 per cent of the respondents disliked whereas 34 per cent replied that they liked the presence of PWR due

mainly to the benefits they had being close to PWR. Likewise, 26 per cent were indifferent towards the presence of PWR. Contrastingly, local people had positive attitude towards the presence of the

buffer zone (42 per cent), whereas only 20 per cent of the respondents had negative attitude towards it and 37 per cent were neutral in their opinion.

The mean attitudinal score of statement about liking of PWR's presence nearby the village was 3.22 ± 1.06 (Mean \pm SD) (on a 5 point Likert scale). This showed that people had both positive and negative attitude towards PA and the perception are diverse, complex and contradictory. This can be attributed to the dynamic relationship between local people and PAs. Harvesting of natural resources from PA accrue benefits to locals while diverse threats of wildlife and PA restrictions on collection of resources harm them. These findings suggest diverse reasons as to why local people have both positive and negative attitude towards PWR and wildlife as documented by scholars elsewhere (Heinen 1993; Allendorf *et al.* 2007; Allendorf 2007).

In this case, the reason for liking PWR by the local people is due to the role of PA in biodiversity conservation, generating opportunities for employment, tourism and business, provisions for natural resource use, security and moral attachment to the place (see Figure 3). The reason for having negative attitude or disliking PWR is due to the restrictions in resource use, loss of crop and livestock, fear of wildlife, forced evictions, human casualties, beating, arrest and prosecution by PA authorities (see Figure 4).

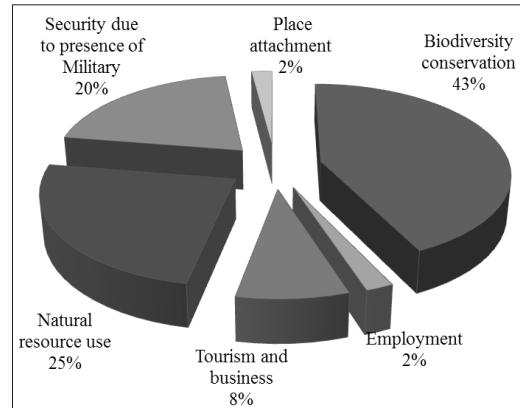


Figure 3: Reason for Liking PWR

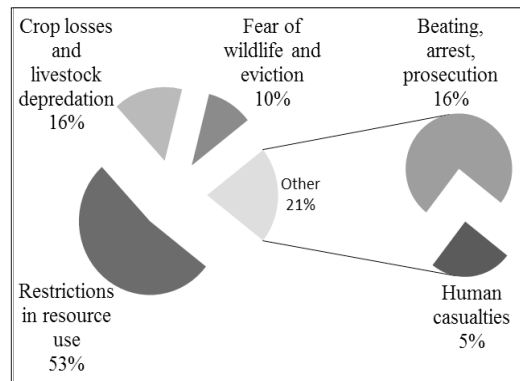


Figure 4: Reason for Disliking PWR

Wildlife damage compensation policy has not been able to compensate the amount of loss incurred by the local people. For, instance about 64 per cent of the respondents commented wildlife damage compensation is not sufficient in comparison to the property damage/loss. The family member of a person who was killed by an elephant attack received NRs. 150,000 from the reserve authority and was dissatisfied with the compensation.

Another respondent replied that he went to PWR headquarter three times claiming for compensation for house damage by elephant and gave up the compensation claims as the procedures were bureaucratic and incurred costs for travel to the PWR headquarter (requires more than NRs. 500). Owing to anger due to crop depredation, one man in anonymity replied that,

I take gun with me while I go to the field to guard crops at night. I sleep in watch tower and when I see (wild) animals entering to my field and raiding crops, I dare to open fire (bullet). It depends upon situation if I open fire (bullet) in the air or target at crop raiding animals.

Despite, the property loss and protected area management cost owed by local people, they are very much willing to contribute to biodiversity conservation, however their overall attitude towards various conservation statement is neutral. The score of attitude towards various conservation issues in PWR was explored in the 5 point Likert scale. About 10 conservation statements were applied against five different responses (five points attitudinal scale) in order to understand people's attitude towards PWR and the buffer zone. Table 3 presents the score summary of conservation statement.

Table 3: Score Summary of Conservation Statement (N=58)

Conservation statement	Response (%)						Mean ² ± S.D.
	SA ¹	A	N	D	SD		
Buffer zone area was created for the betterment of our locality	6.77	33.89	42.37	13.55	3.38	3.43	0.79
Buffer zone programme has helped us to support our livelihoods and community development	1.69	35.59	28.81	28.81	5.08	2.77	0.87
I am happy to be included in the buffer zone area	0	42.37	37.28	16.94	3.38	3.43	0.97
I like the presence of PWR nearby my village	3.44	31.03	25.86	32.75	6.89	3.22	1.06
My living condition improved after the establishment of PWR	3.44	43.10	20.68	25.86	6.89	2.58	0.99
Wildlife damage compensation received from reserve/government is sufficient	8.47	10.16	16.94	22.03	42.37	1.72	0.81

¹SA= Strongly Agree (5), A= Agree (4), N= Neutral (3), D=Disagree (2), SD= Strongly Disagree (1)

²Higher mean score indicates positive attitude and vice versa (Mean ± St. Deviation).

It is important to set aside a place for the animals and plants to live in	3.44	70.68	18.96	6.89	0	3.72	0.69
I am satisfied with the functioning of BZUG/BZUC	3.44	41.37	31.03	22.41	1.72	3.22	0.91
There is an equitable distribution of common pool resources and benefits.	13.55	55.93	20.33	10.16	0	3.72	0.85
You are willing to contribute for bio-diversity conservation.	46.55	46.55	5.17	1.72	0	4.37	0.67

The table shows that majority of the respondents agree that the establishment of buffer zone has supported in the livelihood and community development (35.59 per cent) and that they are satisfied with its presence (31.03 per cent). In contrast, majority disfavor the presence of PWR close to their vicinity (32.75 per cent), though 43.10 per cent agree that its establishment has improved their living condition. Likewise, individuals agree that there has been an equitable distribution of common pool resources (55.93 per cent) and that they are willing to contribute to biodiversity conservation in the region (46.55 per cent).

DISCUSSION

The study shows that there is a high dependence of people living near the vicinity of PWR on fuelwood as the only source of energy. The dependence over the forest resources however depended on the availability or possession of farmland and livestock, which comparatively was less in Amlekhgunj. But, the presence of Buffer Zone has played a significant role in addressing the needs, for forest resources including timber, of local communities. Despite the fact that timber harvesting is considered illegal, individuals deriving

fuelwood and thatch grass from the buffer zone has made some contributions towards the livelihood of the local communities in PWR.

The restrictions imposed in buffer zone have implication on the availability of forest resources. However, most importantly, the presence of BZCF determines the access and availability of forest resources for the local communities. As it was evident from the case of Nirmal Basti VDC where absence of BZCF led them to rely on illegal resource harvesting from the PWR. This has been a major source of conflict among the PWR authorities and local communities, where increasing reliance on the forest resources has drawn several cases of punishment and harassments among the local communities. Therefore, despite the presence of buffer zone, access of local communities to forest resources often leads to conflict with the PWR. Similarly, it was observed that wildlife induced damages too has been a source of conflict among the locals and PWR. The damages were primarily observed in terms of loss of property and damage to the crops. As argued by Karanth and Nepal (2012), there is a cost associated to the people living in the proximity of

PAs due to the damage and loss caused by the wildlife. Despite the fact that PWR does provide monetary compensation to the affected families and individuals, the amounts have been counted to be inadequate to cover all the losses incurred.

Studies carried out around people's perception have been focused on understanding conflicts between PAs and people in terms of the lost access to forest resources and damage caused by wildlife (Allendorf 2007). This study adds to the knowledge by understanding people's attitude over the presence on PWR and its buffer zone. The fact that PWR and its buffer zone belong to the PA category, the general perception among the local communities is that they are two different entities. This is evident from their attitudes in which buffer zone establishment and its contribution to livelihoods is considered important while PWR is rather perceived to have any benefits at all. This is supported by the findings by Allendorf *et al.* (2007), which show that if people's expectations on benefits from PAs are not met, negative attitude towards the park will develop over time. The findings of this study concerning negative attitude towards PWR complements the study by Heinen (1993) on Koshi Tappu wildlife reserve, where similar negative impression over the reserve exists among the local communities. Likewise, PAs in mountain region such as Annapurna Conservation Area and the then Makalu Barun Conservation Area³ too have a separate case where locals had exceptionally favorable attitude towards conservation (Mehta and Heinen 2001). This can partly be attributed to the fact that these mountain PAs adopt a more participatory conservation approaches along with benefit sharing with the local

communities living in and around the region. In addition, opportunities for employment, establishing businesses and tourism and availability of natural resources determined the likelihood of harnessing local support for PA establishment in Nepal. In line with the argument by Karanth and Nepal (2012), where livelihood needs of the local communities is supported by the PAs, there is a better chance of local communities to support biodiversity conservation efforts in the area.

The access of local communities to forest resources is important in order to fulfill its aim to promote people's participation towards conservation (HMGN/DNPWC 1996). The buffer zone concept primarily targets towards addressing the issue on benefit sharing and providing livelihood opportunities in addition to ensure the role of communities in conservation. The findings of this study too exhibits the significance of buffer zone where people agree being happy to be included in the buffer zone area, buffer zone supporting livelihood and community development and that buffer zone was created for betterment of their locality. Thus, the provision on various benefits targeted to local communities from PAs is important in terms of reducing local conflict with the PAs as well as garner local support towards biodiversity conservation.

CONCLUSION

This paper looks at the attitude of the local people towards PWR and its buffer zone. The presence of BZCF has been positive in terms of providing forest products to the local communities living in the vicinity. Mostly seven types of resources are extracted and used by local people which is

³MBCA is now converted into Makalu Barun Buffer Zone Area.

mainly for subsistence living. Livelihood is supported to some extent from those resources. Peoples attitude is directly linked to the cost and benefits they get from PAs as well as their level of awareness on the importance of nature and biodiversity conservation. Therefore, special attention need to be given to increase the level of awareness through various educational and outreach programme.

The supply of critical forest products including fuelwood, fodder and leaf litter has been ensured due to the presence of the BZCF. However, the absence of the same has resulted in conflict due to the absence of provisions on forest product supply, thus depriving local communities from the use of those products. Conflicts between PWR and people existed mainly due to the resource extraction from the reserve and loss of crop and other wildlife induced damage. The presence of BZCF around PAs therefore seems to be crucial in order to ensure supply of forest product, stop illegal harvesting and address park-people conflict. Plantation in the public land to ensure the availability of grasses and fodder, timbers and fuelwood will be important.

The presence of wildlife has had negative impacts on the local communities residing around the PWR area. Most of the losses has been in the form of damage to the crops while incidents of property loss and attacks on humans too have serious implications in the lives of the local people. Financial compensation for wildlife induced damage need to be smart and fund release mechanism has to be timely. Lack of communication between buffer zone communities and authorities has affected the level of awareness among the local people on the provision of compensation scheme. Unless and otherwise the demand

for natural resources can be met through alternative ways, pressure on reserve resources cannot be addressed.

Protected areas itself also act as the living laboratory for various environmental education activities for local people and advance learners. Integrated conservation and development model of parks/reserves and PAs management is required to achieve positive attitude of concerned stakeholders.

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