Full Length Research Paper

Effectiveness of the Integrated Conservation and Development Program (ICDP) in conserving wildlife in the Annapurna Conservation Area in Nepal

Ashok P. Ojha[1] and Tapan K. Sarker[2]*

[1]Western Terai Landscape Complex Project, United Nations Development Programme, Nepal.
[2]Asia Pacific Centre for Sustainable Enterprise, Griffith University, Australia.

Nepal has established 22 protected areas (PAs) with the primary aim of conserving wildlife biodiversity. The protected area system of Nepal has gone through various stages of trial and learning. Various problems relating to management of protected areas have emerged during such trials and processes. In the course of this process, the Integrated Conservation and Development Program (ICDP) approach in protected area management has emerged as an important tool to link conservation and development, with the aim of resolving various problems associated with existing protected area management regimes in the country. We investigated the success of the ICDP approach from the perspective of wildlife conservation. The perceived success of the ICDP approach to conserving wildlife in protected area management systems was examined in the Annapurna Conservation Area (ACA), Nepal. An extensive field study was carried out with selected Village Development Committees (VDCs) within the ACA. We employed a social survey method using tools such as, Participatory Rural Appraisal (PRA), structured and semi-structured interviews, and a questionnaire survey conducted in two VDCs. Participatory tools such as matrices were also used to gain further insights into impact of the ICDP approach. We found that a significant positive impact resulted from the ICDP approach in study sites when compared with the pre-ICDP scenario. This study suggests that the Snow Leopard (*Uncia uncial*), Blue Sheep (*Psedois nayaur*) and Musk Deer (*Moschus moischiferous*) populations have increased since implementing the ICDP approach. Participatory tools, such as, interactive matrices, involving local people were used to obtain insights and identify changes in wildlife populations. Based on these findings, we argue that the ICDP approach is significantly enhancing wildlife conservation efforts throughout the ACA and it can also be stated that the ICDP approach could be a better alternative to the conventional approach of the protected area management systems in Nepal.

Key words: Wildlife conservation, Integrated Conservation and Development Program, Nepal.

INTRODUCTION

Protected areas are cornerstones of biodiversity and species conservation (Buddhathoki, 2003). Protected areas such as, national parks, wildlife sanctuaries, game reserves and conservation areas are considered to provide the foundations of biodiversity conservation in Nepal. National Parks represent the outcomes of the prime ideology where people are functionally and theoretically excluded from conservation policies. This pro-conservation strategy, which does not consider local human populations, originated in western conservation ideology and has been replicated by the Government of Nepal since 1972. There is a growing body of evidence that suggests National Park designation is not an

*Corresponding author. E-mail: tapan.sarker@griffith.edu.au.
Tel: +61 (0)7 3735 3249. Fax: +61 (7) 3735 3272.

effective method of promoting bio-diversity conservation (Pimbert and Pretty 1997). The protected area management regime in Nepal has experienced various paradigm shifts in the biodiversity conservation realm. During the 1970's, the thrust was mainly focused on creating national parks and wildlife reserves using a command and control approach. In the late1980's, the focus shifted to the creation of conservation areas and ecotourism as a means of conservation. Since the late 1990's the focus has been on linking conservation and development, with the aim of resolving park-people conflict and integrating economic, social and environmental aspects (Heinen and Yonzon, 1994).

The emergence of an Integrated Conservation and Development Program (ICDP) approach in Nepal follows the global biodiversity conservation scenario. ICDPs have a combined objective of improving the management of natural resources and the quality of life for local people. ICDPs rely upon new methodologies in conservation and emphasise the participation of local communities in sustainable development, land management and conservation initiatives (Brown and Wychoft-Baird 1992). Evidence suggests that a basis for successful ICDPs involves fostering genuine local community participation and effective reconciliation regarding conflicts over resource use and conservation (Baral et al., 2007). The recognition of the limitations of traditional National parks and wildlife reserves within Nepal has led to alternative approaches, like Nepal's first ICDP approach in protected area management systems, and the emergence of the Annapurna Conservation Area Project (ACAP), launched in 1986 (Parker, 2004). By the late 1990s, most plans or proposals for protected area management in Nepal placed an emphasis on considering local people. At the same time, ICDP initiatives were being summoned as radical new approaches for the management of protected areas. But now, more than one and half decades after the ICDP approach was vigorously promoted, there are still very few clearly successful cases in which local people's needs and aspirations have been reconciled with the protected area management domain. There is growing recognition of the risk that ICDPs may not contribute effectively either to conservation or to development (Katheleen, 2003).

This study analyses the effectiveness of the ICDP approach in addressing conservation issues through examining the wildlife conservation aspects in ACA. The effectiveness of the ICDP approach in protected area management is very difficult to measure because conservation issues have social, economic and ecological dimensions, although the particular mix varies according to circumstances (Mangel et al., 1996). It is also argued that measuring effectiveness, particularly in ICDPs, is value-laden. Local people value biodiversity for its aesthetic, cultural and spiritual values along with its utilitarian values, therefore different stakeholders may hold different values to biodiversity conservation through

the ICDP approach (Lawrence and Elphick, 2002). However, the effectiveness of ICDP approach can be assessed in terms of the objectives and goals of establishing protected areas, and is also one of the acknowledged parameters for measuring conservation of wildlife population worldwide (Brandon and Wells, 1992).

Subsequently, the methodology used in this study with particular reference to sample design, data collection methods, target populations and areas are discussed. Participatory wildlife matrix scoring was a key innovative data collection strategy used, this strategy focussed on the perceived numbers of Blue Sheep (*Pseudois nayaur*), Snow leopard (*Panthera uncia*) and Musk Deer (*Moschus moischiferous*). This paper then presents a discussion of the results, which reflect the perceived changes to wildlife populations as a result of the ICDP intervention.

METHODOLOGY

Study area

The study areas – Jomsom VDC and Marpha VDC – are located on the northern slopes of the Annapurna range in central Nepal (Figure 1). The study sites are located within the villages of the Mustang District, Dhawalagiri Zone which is one of the trans-Himalayan regions of Nepal. The ACA covers 7,629 km^2 with a variable climate, ranging from subtropical to tundra. The geology and topography vary greatly across ACA due to the high altitudinal range. These landscape characteristics provide a wide range of different habitats (Gurung, 2003). The areas targeted for this study lie within the Trans Himalayan zone and represent a steppe habitat, rich in cold desert flora and fauna including, snow leopard, blue sheep and musk deer. Jomsom VDC (28°47′0″N 83°43′50″E) is situated at an altitude of 2710 m, and the Marpha VDC (28°47′24″N 83°40′48″E) is situated at an altitude of 2670 m. It is one of the famous villages in the ACA due to its picturesque appearance and apple orchards.

Sampling design

This study was conducted in the Annapurna Conservation Area (ACA), where ICDPs have now been implemented for more than a decade. Measuring effectiveness of the ICDP approach is difficult because of a lack of baseline information. Therefore, in order to find out the impacts of ICDPs, assessment of the sites in terms of socio-economic and ecological factors was carried out with the help of different field based approaches. The outcomes pertaining to different factors such as socio-economic, biodiversity, infrastructural development, local people's development capacity, policy effectiveness, etc. provides an ideal basis from which to examine the variables and questions that are pertinent to this study. Sampling was necessary to measure defined variables, in order to represent the entire population. For the purposes of this study, sample sizes were set at +10% of the population for each VDC. When administering questionnaires a random sampling method was applied to proportionally represent all the stakeholders irrespective of their age and position in the community for the study. Table 1 depicts the design of sample size.

Data collection

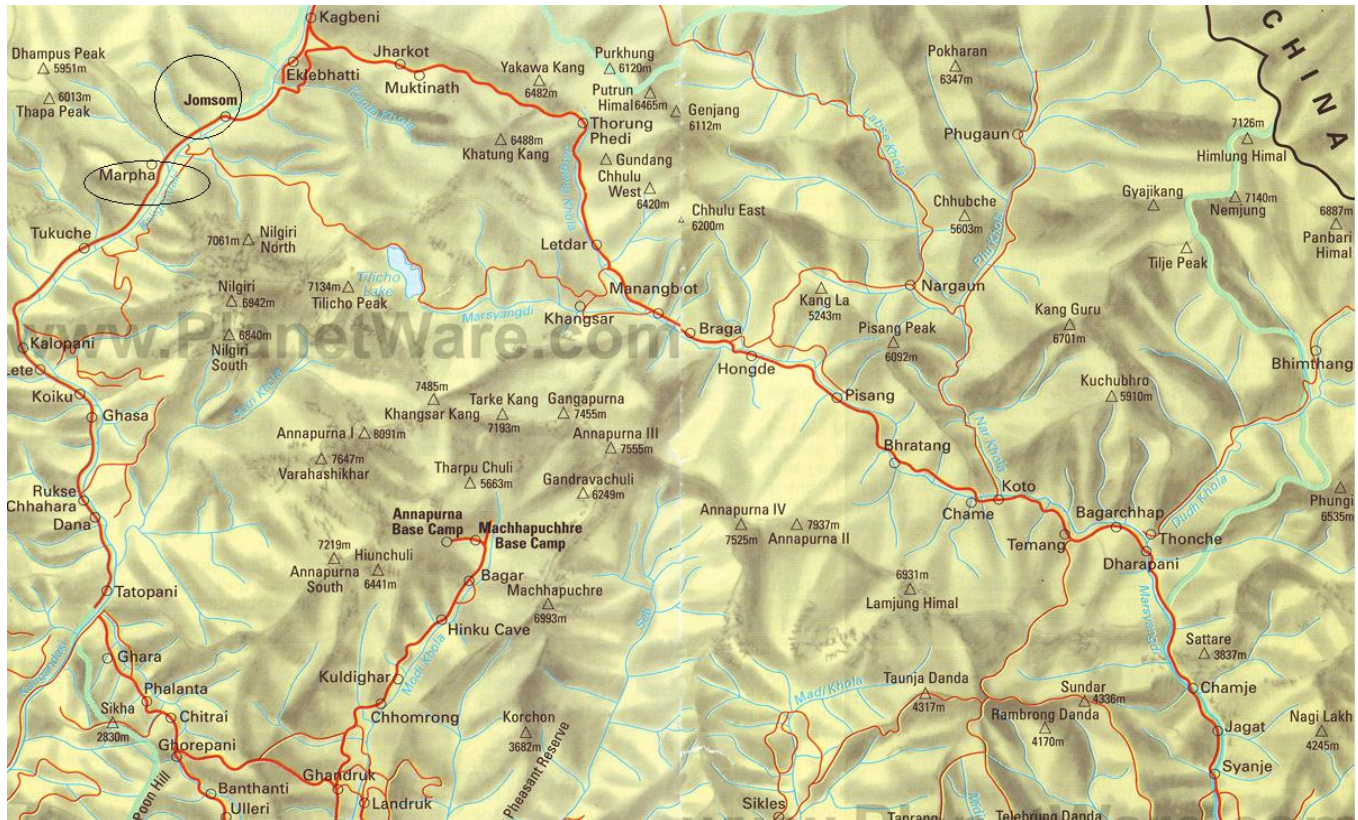The study used both primary and secondary sources of data.

Figure 1. Location of Jomsom VDC and Marpha VDC (circled) within the Annapurna Conservation Area.

Table 1. Design and statistics of sample.

Particulars	Study sites		Total
	Jomsom VDC	Marpha VDC	
Number of total households	410	434	844
Number of selected households	52	52	104
% of selected households (approx)	12	12	24

Primary data was collected using a wide range of data collection techniques including a questionnaire survey, a focus group interview, formal and informal interviews as well as the adoption of a participatory rural appraisal (PRA) method. Secondary data was obtained from various published reports, websites and related studies.

Primary data

Questionnaire survey: The questionnaire survey was administered in the sampled VDCs in order to gather qualitative and quantitative data for set objectives. A semi-structured questionnaire was prepared for this purpose.

Focus group interview: A focus group discussion was organized to discuss the ICDP approach and wildlife conservation. The discussion attendees included 2 Chairpersons and 14 members from Marpha and Jomsom Conservation Area Management

Committee (CAMC)[1] and 4 ACAP staff members. The focus group discussion was directed towards the limitations of ICDP approaches in wildlife conservation regimes.

Formal interviews: Formal interviews were conducted with the persons, who were involved with ACAP directly and indirectly, in order to gauge their perspectives. Altogether, 36 persons were formally interviewed during the study period.

Informal interviews: Some informal interviews were conducted in order to cross check the validity and objective perspectives surrounding ACAP activities, and identifying the prevailing opinions

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[1]Conservation Area Management Committee (CAMC) is the focal institution in conservation areas in Nepal. Conservation Area Management Regulations 1996 of Nepal has clearly outlined the functions and authorities of CAMC.

Table 2. Perceived increase in wildlife population.

Statements	Responses (%)		
	Yes	No	As before
Increase in Blue Sheep	89.20	3.90	6.90
Increase in Snow Leopard population	53.90	16.70	29.40
Increase in Musk Deer Population	62.25	22.55	15.20

Table 3. Perceived change in wildlife population in Marpha VDC based on the participatory wildlife matrix scoring

Wildlife matrix scoring from 1980-2005	Average matrix scoring[a]					
Year	1980	1985	1990	1995	2000	2005
Blue Sheep	3.85	3.85	3.73	3.95	3.98	4.20
Snow Leopard	2.15	2.16	2.14	2.16	2.55	2.70
Musk Deer	2.85	2.86	2.45	2.54	2.90	2.95

[a] Matrix scoring 1 to 5, 1 is very low and 5 is very high.

in the selected areas. In all, 47 persons were interviewed during the study.

Participatory rural appraisal (PRA): Participatory tools such as matrixes were used to obtain insights and identify changes in wildlife populations. Figure 1 shows the use of smaller stones in a matrix scoring system regarding perceived changes in wildlife populations due to hunting etc. Different locally available materials such as stones and grains were used to facilitate such methods. Information provided during PRA was cross-checked during interviews and questionnaire surveys. Wildlife photographs were used to facilitate discussion regarding wildlife issues. For example, relevant photographs of wildlife species were used to discuss changes in wildlife populations after the ICDP approach intervention in the area.

Secondary data

The secondary data and information for the study were gathered in Nepal, mostly during the field work period; from academic literature; previous studies on the ACA; studies on protected area management; annual progress reports of ACAP; ACAP GIS studies; IUCN and reports by other related international organizations (e.g., WWF, FAO, UNDP etc.). Internet research was also conducted.

Data analysis

Both quantitative and qualitative data were collected and analysed for this study. Quantitative data were analyzed using Microsoft Excel applications and simple arithmetic approaches. Qualitative information was generated mainly from PRA, focal group discussions and formal surveys. The information generated from PRA was validated during other surveys. The PRA information was analyzed and interpreted together with the participants. Elaboration of the information was immediately carried out. The quantitative data for some factors were analyzed using the Likert's Rating Scale. For the purposes of this analysis, all the variables were coded in the same direction. The statements 'agree' and 'strongly agree' were coded 4 and 5 respectively. Whereas, 'neutral', 'disagree' and 'strongly disagree' were coded 3, 2 and 1 respectively. Data concerning attitudes and perception were examined using a 5-point scale in which, respondents were asked to agree or disagree with reference to specific statements. To obtain an overall score for all respondents the responses to each of the statements were added together and average scores were calculated.

RESULTS

Changes to wildlife populations post-ICDP intervention, were predominantly analysed using the questionnaire surveys, focus group interviews, informal meetings and PRA methods. Majority (81.40%) of the respondents knew that Snow Leopard, Blue Sheep and Musk Deer were found in their area, while 18.60% did not. The survey showed that the perceived wildlife populations in the study area had increased (Table 2). Majority (89.20%) of the respondents believed that the Blue Sheep population had increased, which was followed by 62.25% of the respondents, who believed that Musk Deer population has increased and 53.90% of the respondents believed that Snow Leopard population had increased after the ACAP intervention.

One of the reasons behind the perceived increase in wildlife populations can be attributed to the increased level of awareness among the local community. This is evident because the survey found that almost 89.20% respondents indicated that wildlife was not problematic to the community. This perceived increase in wildlife abundance in the study areas was supported by a participatory method of wildlife matrix scoring (Table 3), which showed an increasing number of Snow Leopard, musk deer and Blue Sheep in study areas. The study was carried out separately for Marpha and Jomsom VDCs based on a 5-point scoring scale (1 to 5, 1 is very low and 5 is very high) for different time periods (from 1980 to 2005) (Table 4).

Table 4. Perceived change in wildlife population in Jomsom VDC based on the participatory wildlife matrix scoring.

Wildlife matrix scoring from 1980-2005	Average matrix scoring[a]					
Year	1980	1985	1990	1995	2000	2005
Blue Sheep	3.50	3.56	3.30	3.60	3.92	4.30
Snow Leopard	2.20	2.16	2.18	2.40	2.60	2.85
Musk Deer	2.30	2.32	2.00	2.40	2.57	2.76

[a] Matrix scoring 1 to 5, 1 is very low and 5 is very high.

Table 5. Perception of respondents towards wildlife conservation as indicated in questionnaire survey.

Perception statements	Responses n (%)				
	SA	A	N	D	SD
1) ICDP helped to conserve wildlife (n=100)	47(47%)	25(25%)	10 (10%)	18 (18%)	0
2) Conservation Awareness helped (n=102)	31(30%)	60(59%)	8 (8%)	2 (2%)	1 (1%)
3) Wildlife hunting is minimal compared to 11 years ago (n=102)	78(76%)	8 (8%)	8 (8%)	8 (8%)	0
4) Protection of forest helped to increase wildlife (n=102)	8 (8%)	70(68%)	16 (16%)	8 (8%)	0
5) Wildlife was freely hunted before ACAP initiatives (n=102)	39(38%)	31(30%)	8 (8%)	24 (24%)	0
6) Wildlife is freely encountered in forest (n=102)	16(15%)	65(64%)	10 (10)	6 (6%)	5 (5%)
7) Frequency of wildlife damage of crops increased (n=102)	0	24(24%)	8 (8%)	39 (38%)	31 (30%)
8) Number of wildlife in the forest and pasture has increased (n=102)	16(15%)	70(69%)	8 (8%)	5 (5%)	3 (3%)
9) Frequency of livestock killing by wildlife in the forest has decreased (n = 86)	0	8(9%)	54 (63%)	24 (28%)	0

The responses are measured using a five point scale. Where, SA = Strongly Agree; A = Agree; N = Neutral; D = Disagree; SD = Strongly Disagree. Respondents are assigned a score of 5 for SA, 4 for A, 3 for N, 2 for D and 1 for SD.

The participants identified three species for scoring (the Snow Leopard, Musk Deer and Blue Sheep). The matrix scoring indicated that the said species had increased after the implementation of Annapurna Conservation Area Project (ACAP) initiatives. ACAP's records of legal actions after ICDP initiatives showed that there were only seven illegal hunting cases filed (KMTNC-ACAP, 2004). Compared to report cases from other army guarded National parks and wildlife reserves of Nepal, illegal hunting in ACA is comparatively very low. There have been criticisms that conservation areas do not protect wildlife and there have also been reports that incidences of wildlife poaching are far greater in conservation areas than in National parks or wildlife reserves (Bajracharya, 2004), but the present study has indicated that these reports might be invalid, at least for the study areas. This study is also supported by some studies in ACA – a study of Himalayan Tahr (*Hemitragus jemlahicus*) populations indicated that there is a hardy population of the animal in the area (Gurung, 1995). A recent study in the area reported a 20% increase in the population of Tahr over a five-year period (Ale and Shrestha, 2001). A recent monitoring study of snow leopard and blue sheep populations in one of the areas of ACA reported that the area is a potential habitat for both Snow Leopard and blue sheep and sizable populations of these species already inhabit the area (Bajracharya, 2004). The aforementioned findings resulting from this study indicate an increasing trend in wildlife population growth after the ICDP intervention of ACAP in the study areas. The perception of prevailing effective wildlife conservation methods varied between different respondents (Table 5). A Likert's Scaling test showed that 47% of the respondents strongly agreed, and 25% of the respondents agreed that

ICDP approach helped to conserve wildlife effectively. When asked whether the conservation awareness program was helpful or not, a majority (89%) of the respondents either strongly agreed, or agreed that conservation awareness helped wildlife conservation in the ACA, whilst 84% of the respondents either strongly agreed or agreed that wildlife was freely hunted before the ICDP approach intervention in the study area. About 89% of the respondents strongly agreed and or agreed that conservation awareness helped to effectively protect wild life species, whilst 68% of the respondents strongly agreed or agreed that wildlife species were freely hunted before ICDP approaches. Moreover 79% of the respondents either strongly agreed or agreed that wildlife was readily encountered in the forest and 84% of the respondents indicated an increase in the number of wildlife sightings in the forest and pasturelands.

Interestingly, 63% of respondents indicated no change in the number of livestock killings by wildlife in the forest and 68% of the respondents disagreed with an increase in damage to crops resulting from wildlife. The results of this study fall in line with other studies that have suggested that ICDPs in the ACA have been successful in contributing to the increased awareness of the positive impacts of conservation initiatives in local communities through education and participatory mechanisms; however, these positive impacts have occurred over a longer time-frame than was envisaged (Baral et al., 2007).

Conclusion

The results of this study indicate the success of ICDP approaches in conserving wildlife in an efficient and effective way when compared with the conventional conservation approaches. These results also indicate that the ICDP approach has demonstrated improvements in wildlife conservation, evidenced by increased observations of wildlife populations in the study areas. Evidence derived from this study indicates that wildlife poaching has decreased and wildlife populations have increased in the ACA post - ICDP intervention. The ICDP approach is undoubtedly delivering conservation benefits, not only to the protected area but also to the local communities.

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