

LOCAL PERCEPTIONS OF ALTERNATIVE LIVELIHOOD PROGRAMS IN THE BUFFER ZONE
AROUND BARDIA NATIONAL PARK, NEPAL

By

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ABSTRACT

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Around the world, effective solutions are needed to support communities to live in harmony with protected natural areas. In Nepal, many rural people are extremely dependent on forest resources such as firewood, thatch grass, and animal fodder to meet daily survival needs. This pressure on the forest has become a serious problem as resources are depleted and habitat for wild animals is shrinking. The National Trust for Nature Conservation (NTNC), a local environmental organization, has introduced alternative livelihood programs to communities in buffer zones around Bardia National Park, in the western lowlands of Nepal. The purpose of these interventions is to give local communities more diverse opportunities for income and thus reduce the pressure on natural resources in the buffer zone as well as national park forests. In addition, many of these programs are designed to reduce human-wildlife conflict. To date, there has been minimal evaluation to determine if these programs are succeeding in these goals. This study takes a qualitative approach, using interviews and focus group discussions with participants to understand whether local people find the alternative livelihood interventions worthwhile and beneficial. This study also reports information on whether local people have changed their use of the forest and if there has been any reduction in human-wildlife conflict due to these interventions. Finally, this study attempts to reveal if there are gendered costs and benefits to these programs.

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TABLE OF CONTENTS

LIST OF TABLES.....	v
LIST OF FIGURES.....	vi
1. INTRODUCTION AND LITERATURE REVIEW.....	1
1.1. Local Perceptions of Benefits.....	3
1.2. Natural Resource Use.....	5
1.3. Human-Wildlife Conflict.....	6
1.4. Gendered Differences.....	7
2. METHODS.....	8
2.1. Study Area.....	8
2.2. National Trust for Nature Conservation.....	11
2.3. Data Collection.....	13
2.4. Data Analysis.....	16
3. RESULTS.....	18
3.1. What are the issues?.....	18
3.1.1. Natural resource use.....	18
3.1.2. Human-wildlife conflict.....	21
3.1.3. Gendered differences.....	22
3.2. What has NTNC done?.....	23
3.2.1. Natural resource use.....	25
3.2.2. Human-wildlife conflict.....	26
3.2.3. Gendered differences.....	28
3.3. How do local people respond?.....	30
3.3.1. Natural resource use.....	35
3.3.2. Human-wildlife conflict.....	40
3.3.3. Gendered differences.....	41
3.4. What would they like to see in the future?.....	42
4. CONCLUSION.....	44
4.1. Natural resource use.....	44
4.2. Human-wildlife conflict.....	45
4.3. Gendered differences.....	46
4.4. Final thoughts.....	47
APPENDICES.....	49
Appendix A: Data collection instruments.....	50
Appendix B: Thematic Analysis.....	52
REFERENCES.....	55

LIST OF TABLES

Table 1. <u>Complete sample</u>	15
Table 2. <u>Coding rules, definitions, and examples</u>	52

LIST OF FIGURES

Figure 1. <u>Map of study area</u>	9
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1. INTRODUCTION AND LITERATURE REVIEW

Rural communities around the world are very dependent on local natural resources. In regions around protected areas, this dependence can be in conflict with conservation goals, creating animosity and distrust between local people and environmental organizations. This is particularly pronounced when rules are newly established and people feel that their traditional rights have been taken away. West and Brockington (2006) found that establishment of protected areas puts constraints on livelihood options for local people through strict management regulations and can have far reaching impacts on the health, economic well-being and social lives of local communities.

Alternative livelihood programs are intended to provide people with sources of income other than their traditional, forest-extractive, ones so that they do not rely so heavily on limited natural resources. Theoretically, alternative livelihood programs allow local communities to earn an income and potentially be more supportive of conservation efforts. In this way, the local community benefits while biodiversity is simultaneously conserved. This philosophy came about at the 1982 World Parks Congress in Bali where Western and Pearl (1989) stated that “protected areas in developing countries will survive only in so far as they address human concerns” (pg. 134).

Ferraro and Kramer (1997) present several ways to affect resident behavior to promote conservation around a protected area by reallocating their labor, capital and natural resources away from activities that damage the natural resource base. Conservation organizations can encourage this by helping to make current non-destructive livelihood practices more profitable or introduce new economic activities that do not depend on destruction of biodiversity. To make these programs successful and target the

right individuals in the community, the organization must have a good understanding of the way local households currently make a living, and how they divide responsibilities among different members of the household based on age or sex.

Barrett and Arcese (1995) state that while alternative livelihood programs, which are a part of the integrated conservation and development program (ICDP) approach, sound good in theory, they are based on limited biological and economic assumptions. An explicit connection between conservation and development is often lacking (Kerr et al, 2014; Brandon, 2000). Programs like skills development training and credit provisions have no direct link to conservation or natural resource use decisions. Without this obvious link, even residents who take up the alternative livelihood approaches are not necessarily likely to change their resource extraction habits or their opinions about the value of conservation.

Despite the fact that alternative livelihood programs, in various forms, have been implemented around the world, by many different types of agencies, for over twenty years, “very little is known about what has worked, what has not worked and why” (Roe et al. 2014, pg. 2).

In buffer zone communities around Bardia National Park in southern Nepal, the National Trust for Nature Conservation, a semi-governmental environmental organization, has been implementing alternative livelihood programs of various types for over twenty years. However, there has never been an investigation of these programs from the perspective of local people. This study aims to fill this gap in understanding with the following research questions:

- How do local people view the alternative livelihood interventions introduced by NTNC to buffer zone areas around Bardia National Park? Do local people find that they are useful or a burden not worth their time and energy?
- How have NTNC's alternative livelihood interventions impacted local people's use of the forest?
- How have NTNC's alternative livelihood interventions impacted human-wildlife relations?
- Are there gendered differences in costs and benefits from these interventions?

1.1. Local Perceptions of Benefits

Hilson and Banchirigah (2009) found that alternative livelihood programs intended to replace artisanal gold mining in Ghana were highly unpopular with the groups meant to implement these programs. The programs were designed to please outside donors and powerful organizations, rather than the people most impacted by the change. They argue that this type of top-down approach, valuing the opinions of donor agencies and industry bodies over local participants is destined for failure. Without recognizing and acknowledging the needs of the people to be served, the programs are unlikely to be adopted and maintained.

Ferraro and Kramer (1997) point out that if local people are not supportive of the conservation goals at a protected area, then protecting the ecosystem will be close to impossible. They explain that community members will seek to improve their own well-being, so it is up to environmental organizations to show how conservation will not impede their welfare. They say this can be achieved with economic incentives, such as subsidies, education, and law enforcement, which simultaneously promote conservation goals.

Brandon (2000) states that individuals will not necessarily perceive economic incentives in the same way. While one person may find that a certain alternative livelihood activity could be sufficient to reduce their need to utilize natural resources, the same might not be true for their neighbor. In addition, people will be affected differently by new rules introduced to regulate natural resource management. Understanding these differences and their implications for conservation can be very difficult, however, due to complex social relationships often found in village settings (Agrawal and Gibson, 1999; Leach et al., 1999). It can be particularly difficult in communities undergoing rapid social change (Barrett et al., 2001). As a result, it is easy to over simplify perceptions of communities' views about conservation, development, and incentives and this can lead to ineffective programs (Barrett et al, 2001; Agrawal & Gibson, 1999; Berkes, 2004). Under these conditions it is difficult to introduce alternative livelihood activities that directly support conservation goals and that are attractive to all community members.

Karki (2013) found that residents near Bardia National Park did not consider development projects to be a benefit that they were receiving from the establishment of the park. Similarly, Allendorf et al. (2007) found that people living around Bardia National Park did not link non-governmental organizations (NGOs), which had been implementing conservation and development projects, to the national park. These programs are generally intended to decrease illegal extraction of natural resources and improve people's attitudes concerning the park. If the programs are not seen as being related to the presence of the park, this could have negative impacts on conservation of biodiversity within the park. However, Baral and Heinen (2007) found that residents of Bardia buffer zones were more favorable towards conservation than people living round another nearby protected area,

Shuklaphanta Wildlife Reserve. They believed this could be due to greater socioeconomic development and accessibility of resources in the Bardia area.

1.2. Natural Resource Use

Buffer zone forests are meant to provide an extra band of land around a protected area, which extends ecosystem services and wildlife habitat while also allowing local people to continue harvesting resources in a more sustainable way (Brandon, 2000).

Thapa and Chapman (2010) found that forests in and around Bardia National Park that were subject to resource extraction had a lower density of trees, smaller diameter at breast height (DBH), and lower species richness and diversity. The premise on which alternative livelihood programs are based is that while buffer zone communities will continue to require certain forest products, alternative livelihood programs can allow them to be less reliant on these limited resources and more supportive of conservation programs in general.

In reality, there is not much evidence in the literature that this type of program can succeed in these goals. Barrett et al. (2001) found that very few programs of this type have been carefully studied due to the fact that the organizations running them were not open to critical review or rigorous testing. Brandon (2000) points out that while most reviews of ICDPs carried out in the 1990s acknowledge an evolution in the scale and conceptualization of the programs, they are still hindered by problems relating to the details of implementation and few are successful.

1.3. Human- Wildlife Conflict

One of the main negative impacts of a national park on surrounding communities is the increasing likelihood of human-wildlife conflict. This usually occurs when wildlife leave the park and enter human habitation to feed on agricultural crops or livestock. In some areas, compensation programs have been established to repay local people for their economic losses due to wildlife leaving protected areas. Ferraro and Kramer (1997) point out that compensation can have both positive and negative aspects: it can mitigate inequity and conflict in the community; however it can also be very difficult to estimate the true costs and it may encourage undesirable behavior.

Economic development near a protected area may attract new migrants to the area, ultimately increasing rather than decreasing pressure on natural resources (Ferraro & Kramer, 1997; Sanjayan et al. 1997). This would likely raise rather than lower the incidence of human-wildlife conflict, particularly if initial conservation efforts are successful in promoting a growing wildlife population.

Those people who live around Bardia National Park say they have suffered from crop damage by wildlife and restricted resource use since the establishment of the park (Karki, 2013). Thapa (2010) found that 88% of households in two buffer zone villages claimed crop damage, livestock loss, and harassment of humans by wildlife were severe problems impacting their livelihoods. The main species of concern are elephants, rhinos, tigers, leopards, wild boar, and deer. As this area is primarily agricultural, depredation of crops is a serious livelihood issue. Alternative livelihood programs give these communities other options for sources of income that are less vulnerable to damage by wild animals. In addition, certain livelihood programs are specifically designed to reduce human-wildlife

conflict. These include electric fences, predator proof corrals for livestock, and cultivation of crops that are unpalatable to wildlife but economically valuable.

1.4. Gendered Differences

When programs of this kind are introduced to a community, there is often an issue of unequal access and distribution of benefits leading to exacerbation of social differences (Naughton-Treves et al., 2005; West and Brockington, 2006; Allendorf et al., 2007).

Selection for programs may tend to favor certain households or certain individuals within the household, especially male heads of household. However, Allendorf et al. (2007) found that women who were active on committees felt that they learned to work together and be more independent through NGO projects.

In addition, Katz et al. (2007) found that a small steady stream of income for women led to an overall improvement in the welfare of the women and their families. Women with a source of income were more likely to report being decision-makers in their home and their children had a better quality of education.

Women are often the main resource collectors because of their duties in the home, such as cooking (which requires firewood) and tending to livestock (which requires fodder). There is a lot of potential for women to be engaged in conservation. Byers and Sainju (1994) claim that “women’s integration into environmental initiatives builds sustainability across many sectors, and may be strengthened through community organizations, secure access to resources, and recognition of their vital role in...resource management” (pg. 28).

2. METHODS

2.1. Study Area

Bardia National Park is a 968 km² protected area, located in the western Terai lowlands of Nepal. It was established as a national park in 1989, having previously been designated as a hunting reserve for royalty. The park is home to diverse wildlife including tigers, leopards, rhinos, elephants, wild boar, crocodiles, several types of deer, and over 250 species of birds. With the exception of cutting thatch for a short period each year, extraction of natural resources from the park is illegal. Despite these restrictions on gathering natural resources from the park, it is common for local people to illegally extract various forest products (Allendorf et al., 2007).

In 1996, a buffer zone area of 372km² was established around Bardia National Park (Thapa, 2010). Buffer zone forests around protected areas allow local people to legally collect forest products while simultaneously providing extended habitat and corridors for animals (Budhathoki, 2004). Communities around Bardia depend on the forest for leaf litter for fertilizer, firewood for cooking, and fodder for livestock (Karki, 2013). If they are not able to collect these resources from a buffer zone forest, they are often forced to illegally extract from the park.



Figure 1. Map of study area showing location of Bardia National Park and Suryapatuwa, Thakurdwara, and Shivapur VDCs along the southern border of the park (Shova & Hubaceck, 2011).

This study took place in the Village Development Committees (VDCs) of Thakurdwara, Suryapatuwa, and Shivapur along the southeastern border of Bardia National Park. VDCs are the smallest administrative unit of the Nepali government, similar to a municipality. According to the 2011 census, Thakurdwara, Suryapatuwa, and Shivapur have populations of 8772, 9947, and 7706, respectively (ISRC, 2014). Each of these VDCs is further sub-divided into nine wards. All nine wards of Thakurdwara and Shivapur fall within the buffer zone area, while only four wards of Suryapatuwa are included. Inclusion in the buffer zone means that these communities benefit from community development

programs funded by 30-50% of park income generated from tourism, fines, and concessions (Karki, 2013; Allendorf et al., 2007).

The headquarters of Bardia National Park and the National Trust for Nature Conservation offices are both located in Thakurdwara. This area is also home to many small lodges accommodating tourists – both national and international. Immediately to the south is the VDC of Suryapatuwa. This area also has a few lodges and a wide network of homestay accommodation available to visitors. Both Thakurdwara and Suryapatuwa are characterized by an extensive system of canals, distributing water from nearby rivers to the local farmlands and giving the area a lush, green appearance. Thakurdwara has a buffer zone community forest where residents can gather certain resources. Suryapatuwa has a government forest, which is also available to the community. North of Thakurdwara is the VDC of Shivapur. This VDC is closer to the main east-west highway known as the Rajmarg (King's Highway) which runs across the entire breadth of the country and is the main artery for land travel. Of the three VDCs being studied, this is the only one without a government or buffer zone community forest accessible to the local people as an alternative to the national park forest. The fields here are dotted with large lookout towers, known as *machans*, oriented towards the park forest so that farmers can watch over their crops and protect them from rhinos and elephants.

In Karki's (2013) survey, 92% of respondents in these three VDCs identified agriculture as their main source of livelihood. She also found that residents of Shivapur generally had smaller landholdings than those of Thakurdwara and Suryapatuwa. This fact, combined with the absence of buffer zone community forest or government forest meant that 65% of the households in Shivapur reported that they are dependent on illegally

extracted park resources to meet their daily needs and supplement their subsistence agriculture. While each of these communities has participated in NTNC's programs, they each have their own unique set of needs and challenges.

The indigenous inhabitants of this area are from the Tharu ethnic group. After the eradication of malaria from the region in the mid-1950s, other ethnic groups began to migrate from the hill regions. However, Tharus are known to be more reliant on forest resources than other ethnic groups (Müller-Böker, 1991). Tharus currently make up more than 50% of the population of the three VDCs in this study (ISRC, 2014).

2.2. National Trust for Nature Conservation

In 1995, the National Trust for Nature Conservation (NTNC) (then called the King Mahendra Trust for Nature Conservation) was the only organization conducting development and conservation projects in the buffer zone areas around Bardia (Allendorf et al., 2007). While there are now a number of other organizations working in the region, NTNC maintains a strong presence and commitment to their programs. In 2013, Karki (2013) found that 85% of all households in three buffer zone communities were involved with NTNC programs.

NTNC has introduced various alternative livelihood programs with the intention of increasing household income, reducing reliance on forest resources, lessening human-wildlife conflict, and empowering women. While these intentions are obvious in the interventions, to this point there has not been much investigation of how these programs are perceived by local people. This study was undertaken at the request of NTNC and this analysis aims to fill these gaps in understanding and provide information to NTNC about how they may better serve these communities and protect local natural resources in the

future.

The alternative livelihood programs include:

- Green enterprises
 - Mentha, chamomile, lemon grass, and other aromatic plant cultivation
- Micro-Enterprise
 - Livestock raising (pigs, goats, poultry)
 - Predator-proof corrals
 - Vegetable farming
- Eco-Tourism
 - Nature Guide Training
 - Cook Training
- Skills Training
 - Sewing and tailoring training
 - Handicraft training (mostly basket making using local grasses)
 - House wiring electrical training
- Savings and Credit (women only)
- Alternative Energy
 - Biogas

All of these programs are intended to increase household income or decrease the amount families need to pay to others for certain services. Biogas very directly and significantly reduces the need for firewood by collecting methane from human and animal waste for cooking and lighting in the homes. The aromatic plants are unappetizing to

wildlife such as rhinos and elephants, so they are planted along the forest border as a deterrent for wildlife near human settlements. The plants are harvested and distilled into essential oils for commercial sale. NTNC has also established several distillation plants throughout the communities so that farmers are able to market a finished product. Predator-proof cages also significantly decrease the incidence of livestock loss due to tigers. Women are mainly involved with sewing and tailoring training, handicraft training, and savings and credit groups.

2.3. Data Collection

This study used qualitative methods, both individual interviews and focus group discussions, to gather information. These methods were chosen because they are the most effective way to learn about opinions and values of respondents. Since this study aimed to understand the perceptions of local people, speaking to participants in an informal and semi-structured way made the most sense. Qualitative data are typically observational or textual, derived from talking to people about their opinions and feelings concerning certain events or circumstances. Qualitative data differ from quantitative data in that they generally do not depend on numbers, random sampling, and statistical analysis (Chung, 2000). In a qualitative interview, the researcher usually prepares questions ahead of time to gain a deeper understanding about an individual's experiences and opinions. In a focus group, similar questions can be asked to a larger group of people, often eliciting slightly different responses due to the group interaction. In both cases, there is room for flexibility and the researcher can adjust the questions and path of the interview based on the respondent's knowledge and interests. In this way, qualitative research can provide more subtle and nuanced information about motivations, beliefs, and values.

Senior staff members from NTNC (in both Kathmandu and Bardia) and their partner organization World Wildlife Fund Nepal (only in Kathmandu) were interviewed to understand the goals of the project managers and gauge the alignment of these goals with realities in the field (see Appendix A.2). In total, eight staff interviews were conducted in English.

In addition, semi-structured individual interviews and focus group discussions with key informants and participants were used to understand local people's experiences with these alternative livelihood interventions throughout three VDCs (Suryapatuwa, Shivapur, and Thakurdwara) during the month of July 2015, in the middle of the annual monsoon (rainy) season (see Appendix A.1.). These VDCs were chosen based on their high incidence of NTNC alternative livelihood programs and their proximity to the NTNC office.

Subjects for interviews were chosen based on their involvement and expertise with these programs, as well as their availability and willingness to participate. It was rice-planting season during the data collection period, so many local farmers were not able to participate. At least one male and female from each livelihood category (green enterprises, micro-enterprise, eco tourism, skills training, savings and credit, alternative energy) in each of the three VDCs were represented in the sample, as well as one female and one male or mixed focus group in each VDC. When necessary, participant lists and recommendations from other participants and staff were used to find individuals to interview from all the livelihood categories.

Focus groups were conducted with convenience sampling. At least one female and one male or mixed focus group was conducted in each VDC. The female focus groups were limited to only women so that there was no chance of women feeling too uncomfortable to

share their true experiences and opinions in front of men. This can be difficult in a mixed group due to patriarchal norms.

Table 1. Complete sample of interview and focus group categories in each VDC.¹

THAKURDWARA

Program	Male	Female
Green Enterprise	2	1
Micro-Enterprise	2	1
Eco Tourism	1	1
Skills Training	1	5
Savings and Credit	NA	1
Alternative Energy	2	1
Other	1	

SURYAPATUWA

Program	Male	Female
Green Enterprise	5	2
Micro-Enterprise	1	3
Eco Tourism	1	1
Skills Training	1	3
Savings and Credit	NA	1
Alternative Energy	4	2
Other	1	

SHIVAPUR

Program	Male	Female
Green Enterprise	NA	NA
Micro-Enterprise	4	3
Eco Tourism	NA	NA
Skills Training	1	6
Savings and Credit	NA	1
Alternative Energy	3	3

¹ Focus groups containing multiple respondents are listed as just a single entry in these tables.

In total, forty data collections were conducted with local people familiar with NTNC programs. Eight of these were focus groups consisting of two to eight participants (at least one female group and one male or mixed group in each VDC) and 32 were individual interviews. Some respondents had been active in more than one livelihood program, therefore the total counts in these tables add to more than 40. Two respondents had not personally participated in NTNC programs but were familiar with their activities in the community (listed under “Other”). Only women are able to participate in the savings and credit groups, thus NA is listed in the Male column for this category. Also, green enterprise and eco-tourism programs have not yet been implemented in Shivapur, so there are no participants in these categories in that VDC.

A local Tharu female research assistant who speaks Nepali and the local Tharu language was hired to act as a guide and translator throughout the field data collection process. She is a resident of Thakurdwara VDC and was familiar with both Suryapatuwa and Shivapur. She was trained using the Michigan State University Institutional Review Board Human Subjects Training Tutorial. Before each focus group or interview, the

research assistant covered the consent procedure in a conversational way so as to make the participants feel comfortable. Consent was recorded on a separate sheet, using only the general location, date, and gender of the participant. No names or identifying details were recorded.

2.4. Data Analysis

Each participant interview and focus group discussion was digitally recorded, later transcribed into Nepali (usually within 24 hours of the original interview), and eventually professionally translated to English by a translator in Kathmandu who has done this type of work for other international researchers, including Johns Hopkins University staff and students. The interviews with NTNC and WWF senior staff members were conducted in English, so these were transcribed directly in English. Thematic analysis was used to systematically examine the text of the transcripts to identify important themes and concepts that emerged through the discussions (Rubin & Rubin, 2005). These themes and concepts helped to develop a coding system, which was used to label parts of the transcribed text as evidence for each theme or concept. These labels, or codes, allow us to more easily retrieve and categorize the textual evidence into more meaningful and manageable parts (Miles & Huberman, 1994).

These codes went through a series of revisions throughout the analysis process, resulting in a total of eleven codes. All of the text was labeled according to the rules laid out for each of them (listed in Table 2 in the Appendix). The computer program NVivo was used to simplify the analysis process, allowing for electronic coding of all the transcript documents. In addition, NVivo allowed us to easily extract the evidence for a particular code and compile it into one document. From here, all of the data relating to each code

could be read and summarized. These summary statements present the main themes concerning the research questions while the quotes extracted from the documents provide more detailed examples and opinions from participants.

3. RESULTS

For communities living close to a protected area, natural resource management can become a contentious issue. These people have been largely dependent on local natural resources extracted from their nearby forests for many generations and the establishment of the protected area suddenly restricts their rights of usage and penalizes them for their traditional behaviors.

Around Bardia National Park, NTNC has introduced alternative livelihoods programs in the hope that local people can have more sources of income beyond the forest and subsistence agriculture and as a result, pressure on the forests will be reduced. While the National Trust for Nature Conservation has been working in these particular communities for over 20 years, they have not done an assessment of community opinions on these programs. This study aims to fill that gap in understanding and determine if these programs are functioning in the way they were originally intended.

The following sections will first discuss the specific challenges around creating balance between communities and their environment, then point out the interventions put in place by NTNC to address these challenges, followed by the local response to these interventions as they relate to each research question (natural resource use, human-wildlife conflict, and gendered outcomes).

3.1. What are the issues?

3.1.1. Natural resource use

Local people are dependent on natural resources and regularly collect them from whichever forest is closest to their village: community forest, government forest, or national park. They use firewood for cooking, grass for thatching, large pieces of wood and

felled trees for building, and grass and foliage for fodder for their livestock. “From the forest, we collect firewood, grass. Since the community forest was established, there has been no shortage of grass for our cows and buffalos. For making houses, we also bring wood” – DC 10, male participant.

They used to take as much as they wanted from the forest but they are now more aware of their resource use, follow rules established by the government, and are held accountable by their neighbors. “There has been a lot of change. Now people refuse to cut trees. They refuse to unnecessarily use forest resources. Even if somebody wants to, the other villagers wouldn’t let them”- DC 10, male participant. This is especially true if their main forest for gathering is a community forest, managed collectively by the village. “We are conserving the community forest by ourselves. We take care of it ourselves so we bring only according to the rules. We only bring it on those days when the tickets open. We used to cut down green saplings. The forest had nearly depleted completely. It is not like this now” – DC 16, female participant. The establishment of the community forest system has changed local attitudes towards resource use. Now that people feel ownership and responsibility for forest resources, they are more conscientious about how they use them. “It is ours whether we cut it and finish it today or whether we cut it tomorrow” – DC 8, male participant.

There has been a change in the firewood collection. Previously people used to gather firewood freely. They used to bring as much as they wanted. Now after the establishment of community forest there is this concept that it [the forest] needs to be conserved; this is our forest. The dry firewood is opened from time to time. The grasses also open. They cut the grass and bring it at this time. Now it is not like this anymore. They do not do it when and where they like anymore. If you do what you like then you need to pay a fine. Now there is this notion that this forest is ours and we need to conserve it – DC 7, female participant.

At that time [before the establishment of community forests], we didn't even think about how much we took. How much...how much...we can't even estimate how much we took at that time. Every year we would cut down 30 or 40 trees. Some days we would cut down 4 or 5 trees. And that's just one household...who knows how much it was in the whole community – DC 10, male participant.

Once a year, local residents are allowed to enter the national park to collect grass.

This is one of the direct benefits they receive from the presence of the park. "...if the park had not been established there would have been less grass and firewood. Everything would have become depleted by the cutting...It would have been difficult" – DC 18, female participant.

During other times of year, local people collect resources from their village's community forest. Those without a community forest are left with no choice but to enter the national park illegally to collect resources. If they are caught, they are usually severely punished with fines and/or imprisonment. Many feel that the punishment far outweighs the crime and this can create negative feelings towards the park. "We do not have a community forest. We have to go to the park to steal it. The police arrest us if we get caught when we go to steal. Then we have to pay fines" – DC 35, female participant.

However, some residents are aware that the resources available in the park are beneficial to their daily lives. "The advantage is we can get firewood from the park. Where would we get firewood if the park did not exist? We bring the poles of wood from the park when the poles of the house break. Where would we bring it from if the park did not exist?" – DC 36, male participant.

3.1.2. Human-wildlife conflict

Farmers living near the national park have grown accustomed to their crops being damaged and livestock being eaten by wildlife. Elephants, wild boar, spotted deer, and rhinos often leave the forest to consume rice, wheat, vegetables, and other crops in the village fields. Tigers and leopards attack and kill pigs, goats, cattle, and wild buffalo. Elephants and rhinos sometimes destroy houses and grain storage areas. Occasionally, humans are also injured or killed.

The number of animals has increased because of the national park. It is because of the increase in the number of wild animals that there is damage to our crops and domestic animals. The elephants of the jungle come and kill people. The tigers come and eat our domestic animals. There is a disadvantage because of this. There is no system of compensation for damage done to the crops. Some compensation can be obtained if the people or domesticated animals have been harmed – DC 20, male participant.

Many local residents expressed their feeling of victimization by the Park, particularly the wildlife. “For the National Park, people feel like there’s a benefit and also feel victimized by it. The government doesn’t understand the real situation” – DC 10, male participant. This disconnect between the local community and government institutions extends to the compensation offered for losses due to wildlife.

The wildlife comes directly from the National Park and destroys our crops. They eat our rice and for some people it’s so bad that it makes them want to leave and move somewhere else. What do they get? They give you some money. For someone who’s house has been destroyed, what help is 2000 or 4000 rupees [~\$20 or \$40]? People work hard in the fields all day and get very tired. Then, at night, they [the animals] come and eat everything and go. At the time, the government just looks on and does nothing. If we go onto their land and take something, cut some grass, steal something, we get fined 25,000 or 30,000 rupees [~\$250 or \$300]. They put you in jail for a month. If the wildlife do something, they don’t see it as a big deal but if we do something, they think it is huge. It probably has some benefit, but...due to the park. Whatever they give, the losses are greater – DC 10, male participant.

3.1.3. Gendered differences

Women in these communities generally have fewer opportunities for education and employment than their male counterparts. It is assumed that women will stay at home to manage the household and raise children. “The males can go anywhere for a job. We said we needed to have some work that we can do by staying at home. That is how they gave us this program” – DC 32, female participant.

As part of their household responsibilities, women collect firewood, fodder, and other resources from the forest. They are expected to cook and look after the livestock so these resources are essential to their daily lives. Women are actually the main extractors of forest resources because of this role they play at home.

Basically with sewing and tailoring we are providing training to local women. Generally, local women, they go to the forest. In our local context, women are responsible to make food in the house. So for cooking the food, they need to go to the forest, they need to bring some firewood, and they also have livestock, they need to feed them, they need to collect fodder, grasses...Now, from sewing and tailoring, we are supporting some women and...they make clothes for the villagers so they can earn some money from that. And they reduce keeping livestock in their home. And they also, if they get money from those things, they may buy LPG [cylinder] gas and they may invest some more for the biogas as well – DC 48, staff member.

3.2. What has NTNC done?

NTNC has created various training programs to increase the opportunities for income generation in the community. “We can’t say to community people don’t go to the forest, don’t kill wild animals unless and until we give them some alternative options” – DC 1, staff member. Their programs include skill-based training, vocational training, quick return income generation, alternative energy, ecotourism, green enterprises, and savings

and credit groups. They do their best to determine the best livelihood options based on local knowledge, culture, circumstances, environment, etc.

They want to make sure that they are addressing the true needs of the community and that eventually, local people will become more empowered and economically stable.

Sometimes, we have to revisit our approach because though we are saying that these quick-return IGAs [income generation activities] are giving benefits, providing benefits...but in actual terms, how much is the question that we have to now explore. Because if we are saying that you have to stop using forest resources for your livelihoods and we are providing alternative livelihood options, that means that alternative livelihood option is really helping them to empower economically is the big question. Because though the support is very small, very nominal, are they satisfied with that support? Are they really empowered? That is the question, because we are targeting the poor. So we don't want to support them continuously – DC 1, staff member.

NTNC tries to use pre-existing local committees to disperse information about new programs and NTNC allows them to choose participants within their own villages. “ So whatever demands come about, we create programs to meet them. We look at the market, and we look at the community demands, and we look at how much change we can make. It actually depends on the demand of the community” – DC 44, staff member. They try to target the poorest households first and follow up with others in successive rounds of the program.

For NTNC , income generation is an effective indicator of success for their programs. Their intention is to increase income to the point where dependency on the forest decreases.

The first thing is, if somebody has got enough financial backup, the dependency on the forest decreases. If you are able to buy cylinder gas for your cooking, then why should you go to the jungle everyday? That is also an important point. And these IGAs [income generation activities] are helping

people to earn extra money so the livelihood or the earning capacity is increasing and on that basis, the dependency on the forest, the day-to-day need, or what the women need in their daily life is decreasing. So ultimately, biodiversity conservation is also supported by this – DC 43, staff member.

NTNC has been working in the community for the past 25 years. They have developed a close relationship with the local people and it is not uncommon to see staff members visiting the community or local people at the NTNC office. “The community people and NTNC staff have a very good relation. They are like family. They can even go to the office room and ask and demand all the things in a very informal way as well” – DC 2, staff member. NTNC says this relationship helps them to understand the needs of the community.

And that also helps to continue our activities because this is not a project for five years and then pack up and go. Some activities, like biogas support, community forest management support, even in these IGA activities, we initiated 20 years ago and still we are going on in that field. We have made some changes, we have expanded our activities in broader areas, and that is what we practice actually. Because if you are working with the same communities long term, then you know how the community is doing, what their needs are, what to do next, you know? – DC 43, staff member.

Through this experience in the area over the past few decades, staff members feel they have developed an understanding of what is necessary for local people and the local natural world. They try to balance community needs and the environment to create long lasting benefits in the region.

It is hard to make people understand about just conservation and it is hard to motivate people. For motivation, the income generation programs...alternative energy programs. We ask people to use biogas, we tell people about the benefits of biogas, we tell women about the health benefits of biogas, after you have built a biogas plant, you don't need to steal firewood from the national park, don't go to cut grass, we tell them about rules and regulations. After that, its easy to motivate them – DC 44, staff member.

NTNC wants to encourage feelings of support towards conservation and they find the best way to do that is to help people earn money quickly. “Its these small kind of quick-return IGAs [income generation activities] that we provide them because within two or three months they get return. Make the people engaged and also make them participate in various kinds of conservation activities as well” – DC 1, staff member.

3.2.1. Natural resource use

NTNC cannot tell people to use fewer natural resources without giving them viable alternatives. The primary programs that directly tackle the issue of resource use are the alternative energy programs, particularly biogas plant installation. “Yes, biogas, ICS [improved cook stoves], solar. That means these activities are not directly for the income generation. That ultimately to save their money...time and money both. This ultimately helps the conservation” – DC 4, staff member.

In addition, NTNC hopes their other programs will influence resources use. “So if they learn sewing and tailoring and make money that way, they won’t spend all day fishing, cutting grass, cutting firewood. Some of them have biogas, some of them have other alternative energies so ultimately, in a number of ways, it is linked to conservation” – DC 44, staff member.

NTNC also points out that without the presence of the national park, their programs would not exist to benefit the local community.

There is a national park, and because of the national park, there are certain projects, and because of the projects we have these programs, and because of these programs, you have received these opportunities. If there was no national park, these kinds of programs wouldn’t come. Therefore, we need to protect the national park – DC 44, staff member.

NTNC aims to inform people about environmental issues and gain their support for conservation. Without the support of the local community, conservation in this area will not be sustainable in the long term.

The basic purpose...whatever we are implementing from NTNC is to win the trust of the local community towards conservation. Basically, our main objective is not to uplift the socio-economic condition...not to uplift the livelihood of the local community, but every time we link that to conservation. If community people become more socio-economically improved, their livelihoods improved, then they can contribute more to conservation. We think in that way. So if we talk only in conservation, only for conservation, then we cannot win the trust of the local community towards it. So that's why we are also implementing the livelihood – DC 48, staff member.

3.2.2. Human-wildlife conflict

This constant loss of crops and livestock has impacted local livelihoods. For primarily agricultural people, destruction of crops can have a significant impact on income and household food security. NTNC and the National Park have put in place a system of compensation and support for human-wildlife conflict (HWC) victims and their families. NTNC provides some monetary reparations when livestock are lost. They also support widows and children of wildlife victims, offering a monthly stipend and funding schooling through 12th grade. “If anyone is victimized by HWC, if wild animals destroy their houses, if wild animals attack humans, in those cases, people think of the Trust. They look to the Trust for help” – DC 12, female participant.

NTNC tries to find ways to reduce human-wildlife conflict and highlight the benefits from wildlife. They take time in all of their alternative livelihood program trainings to

create awareness about conservation issues and try to make the connection between the existence of the national park and NTNC's programs in the community.

...we motivate, we tell them that there are lots of opportunities; there are lots of profits and benefits compared to the losses they are facing. So, it's working very nicely and if you compare the results of conservation and poaching and these activities, that trend is slowly decreasing – DC 43, staff member.

To address this issue of substantial losses, NTNC has built an electric fence along parts of the border of the park to separate the forest from human settlements and crops. NTNC has also provided predator-proof corrals and cages to protect livestock from attack.

But that electric fence is providing very crucial impact to their livelihood and food security because if you observe that fence is still at the fringe area because it is separating core area from agricultural fields so once the elephant or rhino are stopped from entering the cropland then you can see the impact on their livelihood and food security – DC1, staff member.

In addition, NTNC has introduced mentha as a cash crop, which is unpalatable to wildlife. It can be planted close to forested areas, deterring wildlife from exiting the forest and entering crop fields.

By ensuring that local people receive certain benefits and by increasing local awareness, NTNC is able to gather some support for conservation. "It [NTNC program] has also been conducted for changing the mentality of the people so that they can become closer to the wild animals and also so that they may think that it is necessary to conserve them" – DC 21, male participant. Some local people even believe that the main aim of NTNC's programs is to protect wildlife.

The main aim is to save wild animals. It is necessary to conserve the wild animals. There is equal importance of wild animals and community. We will be able to save ourselves if we can save the jungle. All are equal, all are equally important – DC 6, male participant.

NTNC hopes to encourage this type of positive attitude towards the National Park and towards wildlife in particular. One of their strategies is creating the opportunity for local people to experience the Park as a tourist might.

And we give them the tourist experience so they can feel what it is like to go around the National Park in a car. They are able to go into the Park once a year to cut thatching grass, but they never go in to just look around. So, by taking them in and getting them to feel the satisfaction of experiencing how nice the jungle is for its own sake, it is easier for us to explain the importance of the park...So in the course of showing them those things, sometimes they are also able to see wildlife. Compared to seeing them only in photos, when they see them for real, they develop more affection for them – DC 44, staff member.

3.2.3. Gendered differences

Since women are the main resource collectors, it would make sense to focus alternative livelihood programs around their needs. Some staff members even feel that women have the greatest potential to be engaged as conservationists.

Now it has become a time for us to explore for new alternative livelihood options that really engage local women in their own community, they can raise their standard of living as well. They can even realize that we have been involved in these livelihood activities and also supported in a way to reduce forest pressure. They even need to think they are not only beneficiaries of all the natural resources but they could be the real conservationists, really helping in reducing forest pressures. That means if they know such things, they can take the stewardship of the forest. That will be good. – DC 2, staff member.

NTNC has tried to create programs that specifically appeal to women in the community, such as sewing and tailoring and handicraft production.

It depends on the community interest. Sewing and tailoring...men aren't very interested in that. Because women are the ones showing interest in handicrafts...you also don't see men traditionally making handicrafts. Men will make fishing nets and big baskets, but the small handicrafts are usually made by women so it is natural for them to be interested in those types of

training programs. In subject areas where women already have interest, it's good to focus on them. If we do programs in a subject area where they have no interest, that won't be good – DC 44, staff member.

In the future, NTNC would like to encourage women to participate in programs that are typically considered to be for men. However, there is currently some resistance due to strong traditional gender roles.

That's a really challenging thing for Nepali girls. There's a very traditional stereotype of things...they again choose the same type of livelihood options, for example, tailoring, beauty parlor, and those types of trainings, and what we are trying to provide is mason training, we are trying to provide carpenter training, we are trying to provide different types of trainings to girls but it is still difficult to convince them, to convince their parents – DC 3, staff member.

In addition to alternative livelihoods programs, there are specific groups for women in the community such as environmental groups and savings and credit groups. These allow women to come together and share ideas, support each other, and learn about conservation issues. NTNC feels that their programs have done a lot to improve the status of women in these communities.

...when you compare the situation of women now to what it was 17 or 18 years ago, there has been a big improvement. Before, they couldn't do anything, they couldn't go outside their house...now these women are able to talk about their problems, a number of them are able to earn their own money. That is a type of success – DC 44, staff member.

So now when the community, or when the women get a chance to interact with the community, in their own locality, they understand a lot of things. They share a lot of things. Every person who used to break the rules, or was against the conservation, they also realize this is what we should not do, and this is what we should follow. So it made an impact on the community, I think – DC 43, staff member.

3.3. How do local people respond?

Community members say they participate in NTNC's programs to improve their economic situation and gain skills. They choose to take part in programs that make sense for their lifestyle and have the potential to create some extra income.

Among these programs, I find sewing and tailoring program the most useful because...I can have income to meet my household expenses while staying at home. It is not necessary to go anywhere else. I can complete my housework and do sewing in my spare time and have an income – DC 41, female participant.

Certain participants simply expressed an interest in developing their skills and maintaining local traditions. "I participated so that our tradition would not be lost totally and I can also earn some money by weaving baskets and also because the skills of my hand would develop" – DC 15, female participant.

Participants feel that NTNC wants to encourage local people to be independent and to support victims of human-wildlife conflict. Very few say that the goal of NTNC's programs is conservation.

The trust has introduced these programs so that the people of the community can learn something and have skills on their hands so that they do not have to look to others for anything. They must have introduced these programs so that they would be able to do something for a living – DC 39, female participant.

The programs have been introduced so that there can be a way for the people of the village community to get ahead in life. The programs have been introduced so that we, the poor and backward people, can move forward in any way possible. These programs must have been introduced to help us, a very backward community, so that we can do something to earn a living and get ahead in life – DC 16, female participant.

They run awareness raising programs for the local people. They try to find ways to improve their standard of living...move them forward. 'Let there not be anyone in the community who is backward. Lets give everyone all the

information necessary to bring them forward'. That's why they run these programs – DC 12, female participant.

People in the community say that generally everyone who is interested in a program will eventually get a chance to participate. However, they often have to wait for their turn because there are limited places in the trainings.

The reason for not taking part is because of lack of opportunity and because of lack of information. Many got the opportunity earlier. Now the exact number is predetermined. Then the leaders of the village have a meeting to decide whom to send for participation. Everyone does not get information... If the people of the trust had come and told us about these programs and that this type of program was suitable for this category of people, everyone, including me, could have had the opportunity – DC 21, male participant.

In some cases, community members felt there was not enough information about the programs or that NTNC staff members favored certain people over others when spreading news about programs or choosing participants. "There is not much information in the village community about the programs. It is not possible to take part in the programs because of lack of information" – DC 18, female participant. "It is because they inform their own people (friends and relatives) and do not inform other people" – DC 11, female participant. Certain participants feel that the same individuals in the community receive the benefits from the programs. "...there are a few leaders who always look for the opportunities. And sometimes they take all the opportunities for themselves and they don't share all the things in their group because of lack of governance. They don't have such sharing practices" – DC 20, male participant. While the NTNC staff members say they try to reach the poorest families first and extend their reach as funding makes it possible, those in the community don't always feel that it works in the same way. "It would have been better if they look to see who were the most poor and who will be the next in line to go after that

and classified it accordingly. But it is not done in this way. If they had done it according to this everyone would have had the opportunity” – DC 21, male participant.

Most community members benefit from an NTNC program in one way or another. Some participate in trainings, others receive support for human wildlife conflict, and even those who have not engaged with NTNC directly have most likely benefitted from the presence of the electric fence and other such community wide facilities.

It has been very much beneficial. It is beneficial to those who understand. It is not beneficial to those who do not understand. There are those who kick away profitable programs because they do not understand. It is because of lack of public awareness that people have not been able to understand about the programs. Many beneficial programs have been lost in this way. They have not been able to understand what is beneficial and what is not – DC 20, male participant.

There is generally a positive view of NTNC in the community. Local people feel that NTNC has done its best to fulfill their goals and responsibilities in the community, though there is more that could be done.

The people in our community look on the trust with a positive point of view. The trust is providing good services and facilities; therefore it has to be looked upon in a good perspective. You cannot look upon it in a bad perspective. If we look upon it with a good point of view the trust will provide even better service and facilities I think – DC 25, female participant.

However, most local people expressed the desire for more communication between NTNC and community members when creating new programs so that they more accurately address the specific needs of the community. “The trust has to look at which programs to conduct, which places are suitable to conduct them, whether it is in the forest group or wherever it is suitable. It has to see where it is suitable. It has to understand the people’s wishes and the wishes of the community” – DC 20, male participant.

The program should be given to the victims [of human-wildlife conflict]. We can distinguish who the victims are in our village by ourselves. The programs are designed for the victims but those designing the programs are people from above. They don't know what is happening in the community. It is necessary to ask the people of the community before designing the programs – DC 29, male participant.

Local residents also call for more programs in general. “In order to strengthen the relationship between the trust and community it is necessary to conduct new programs. It is necessary to conduct programs that are beneficial to the community” – DC 14, male participant.

Some community members expressed concern about the way money is handled by NTNC, and requested more transparency about budgets. “The people are not aware of the budget that comes from above. It gets lost without reaching the concerned place. The people of the lower status do not know anything about it. They do tell you about it though but they do not do what they say” – DC 29, male participant.

There is a trend among community members of speaking about NTNC in a way that reinforces a hierarchy of NTNC over the community. “The relations are good and to keep it up they should keep on looking after us in this way” – DC 28, male participant. “I don't know anything about what to do to improve the relations of the trust with the community. The people of the village who are wiser and more knowledgeable will know better. What would ignorant people like us know?” – DC 37, female participant.

The programs have been introduced so that there can be a way for the people of the village community to get ahead in life. The programs have been introduced so that we, the poor and backward people, can move forward in any way possible. These programs must have been introduced to help us, a very backward community, so that we can do something to earn a living and get ahead in life – DC 16, female participant.

While some in the community still speak in this way, others feel empowered by their new opportunities. “They supported us for a long time. As long as people didn’t understand or couldn’t do anything on their own, they supported us. But when we became self sufficient, its time to give other people a chance” – DC 10, male participant.

Most participants report an overall increase in their household income, however variation still exists. The main difference to the lives of local people seems to be the creation of year-round possibilities for income, instead of being limited to what they could make during the harvest season. As most participants are primarily subsistence farmers, they usually only receive income during the harvest season if there is excess. They report that these programs allow them to have a more consistent source of income throughout the year, even though most still state agriculture is their primary income source.

It has been very much more than before. Earlier when we planted only rice so we used to have money only in the season. Now we have mentha farming and vegetable farming we are able to sell these throughout the year and we can get money. Earlier there used to be money only in the season otherwise there was no money. It was necessary to take money from the moneylender after paying interest. It has become very good now” – DC 30, female participant.

One family used to work as bonded laborers for others before being introduced to vegetable farming by NTNC. “For those of us in the vegetable program, it’s been going really well. Because of the help I got from this program, I was able to start this vegetable shop. We had nothing. The money I earned from vegetable farming enabled me to start this shop” – DC 10, male participant.

Although not the norm, certain participants have experienced significant changes in their income. “Compared to before the program, now, it’s the difference between earth and

sky. Its 100% different. We didn't have anything before – DC 10, male participant. “Before, it used to be difficult to feed ourselves. It is good now – DC 26, female participant.

Some participants, particularly women, point out that programs that allow them to work during their free time are the most useful because they do not disrupt various other responsibilities. Also, programs such as sewing and tailoring, which reduce their need to purchase items are beneficial because of the money saved.

The most useful of these programs I find are sewing and tailoring. I only sew clothes of my household because I have problems of headaches. I cannot sew for others. We are poor people. We buy cloth with difficulty but it costs a lot of money to get the clothes stitched. I can save money if I do the sewing myself. It is possible to earn some money by sewing clothes for other people. It is therefore profitable – DC 16, female participant.

3.3.1. Natural resource use

While decreasing natural resource use and dependence is one of the main goals of alternative livelihood programs, there is not much evidence in these interviews that local people have changed their resource use based on income from these programs. Any changes in behavior have primarily occurred because of alternative energy options and rules about when and where they can gather resources from the forests. There has also been some increase in conservation awareness. For local people, it seems there is no conscious link between the income generated from alternative livelihood programs and forest resource use.

It has not affected the gathering. Our knowledge has increased. That is it. The income has not increased too much. The knowledge that conservation is necessary has increased. For those of us working in the tourism industry we know that it is necessary to conserve this forest. Foreign tourists come and our own Nepali tourists come if we conserve the forest. We need to show this to our generation – DC 6, male participant.

Those who have installed biogas or switched to cylinder gas (only one family interviewed used cylinder gas) use a lot less firewood than they used to and even those still cooking on wood fires take care to extinguish their firewood and save it for later use. “We used to cook on a wood fire, but for the past four or five years we have been using cylinder gas. We now only have wood fires in the cold months...to keep warm” – DC 10, male participant. Interestingly, one participant pointed out that they have not needed to install biogas because they are able to get enough firewood for cooking from the community forest. “If there had been no forest it would have been necessary to install a biogas plant. But for the moment it is enough from the community forest. The firewood is enough as the forest is open from time to time” – DC 19, male participant.

The rules put in place concerning resource use have severely limited what is allowed. Some local people feel that these restrictions are unfair because they used to be able to collect as much as they wanted. However, others are more supportive of the limitations and realize the improvements in forest condition. Local people are more aware of the fact that there are very limited resources and a growing population. They realize that without limitations, there will be nothing left in the future.

We collect less than we used to. We collect according to how much the forest produces. The population is growing a lot. Where there used to be one house, now there are two. Where there used to be two, now there are three. When you divide up the forest resources among all these people, you get less. The jungle isn't growing. Only the population is growing – DC 12, female participant.

The establishment of the National Park and community forests have made local people more aware of the impacts of their resource use. “There has been a change in the collection after taking part in the program. There used to be a lot of stealing earlier

because of lack of education. But it is not so now” – DC 38, male participant. They have seen the growth and development of the forests now that gathering is limited by rules.

If you say whether there is any benefit then yes. It is necessary to protect the environment. Since I was a kid, I have been hearing that we should protect the environment. Before it was naked, they say you could see the other village from here [due to depleted forest in between]. In that way, we should protect things now. After they gave the conservation program, everyone’s awareness was raised. Everybody started planting trees. That’s how it got like this – DC 6, male participant.

There is a feeling among local residents that the National Park is beneficial for environmental conservation. Not only have local people become more aware of conservation issues, but there are more resources available when the park is open for collection. Some in the community are still upset about the imposition of new rules and the limitations on resource use as compared to before.

... many people of the community do not understand and compare with earlier times. Before the establishment of the trust firewood and fodder and thatching grass could be brought in carts. We could bring them anytime we wanted. We could graze the cattle anywhere we wanted. They complain about this. They think that establishment of the park has made it very difficult for us. – DC 33, male participant.

Some community members acknowledge this relationship between their proximity to the park and NTNC’s programs in their villages. “I think the main goal for conducting these programs is mainly to lessen the burden on the park and to maintain that both the park and the people are one” – DC 33, male participant.

The National Trust for Nature Conservation has introduced these programs for the good of the people in the community. The park is nearby. These programs have been introduced so that the burden on the park becomes less, less firewood is necessary, and it does not become necessary for the people to go to the park to steal firewood – DC 37, female participant.

3.3.2. Human-wildlife conflict

NTNC has tried various methods of reducing human-wildlife conflict. For example, they have introduced mentha as a cash crop that wildlife are not interested in eating. It is meant to discourage wildlife from leaving the forest in search of food in human settlements. However, local people say that although wild animals do not eat the mentha, it does not deter them from entering fields. “It is not because of the mentha that the animals come less frequently. The animals come and step on the mentha and look for other crops” – DC 14, male participant.

NTNC has also set up an electric fence along parts of the border of the park. Community members feel that the electric fence is no longer effective. Also, there has not been enough maintenance and upkeep on the wires themselves so the current is only sometimes running. Some community members claim that large sections of wire have been stolen and have not been replaced.

It [human-wildlife conflict] has become less because of the secure cages. The animals have been safe. But it is not due to the electrified wires. Small animals can pass through it. The elephants step on the poles and come inside. But it has decreased since earlier – DC 34, female participant.

In addition, NTNC provides some compensation for losses due to wildlife. However, many local residents feel that the compensation is insufficient as it does not cover the full cost of replacing their lost livestock or repairing the damage to houses. They also state that there is no compensation for loss of crops, an important factor for subsistence farmers. In addition, there is a feeling among community members that wildlife is favored over human needs.

When we fire to make a sound with a small gun to drive the animals away they take us away and lock us up in the park because of the firing. This is the situation. People do this to save themselves. But they lock us up according to the law – DC 21, male participant.

Despite these efforts by NTNC, community members feel there could be more done to prevent human-wildlife conflict. “If there were programs to stop the animals, the crops would not be damaged. Our harvest would be better. We would not have to be the victims of the wild animals. This would be beneficial to the community” – DC 40, male participant.

In spite of these challenges, some community members feel that the park and its wildlife can provide benefits. Tourism is a major source of income for many families in the area. Not only do people work in the hospitality industry, but they are able to sell vegetables and livestock to tourist hotels and restaurants. In addition, tourists buy souvenirs and pay an entrance fee to the national park, 50% of which goes back to the community. NTNC’s programs also exist because of the proximity between human settlements and a protected area.

For example it is because of the establishment of the national park that the people who are incurring damages because of the animals of the Bardia National Park can have trainings from the Trust instead – DC 42, male participant.

Monetary benefits from tourists coming to visit the national park and see the wildlife have a big influence on the level of support for conservation in the community.

The people of our community have understood that it is necessary to save the environment, conserve the environment after the establishment of the national park so they are conserving the environment. They are conserving the animals. Foreign guests come here to look at the animals. This has resulted in benefit to the people of the community. Species that had been extinct have come to the jungle. This has benefitted us – DC 24, female participant.

The various benefits from the national park are making people more willing to be supportive of conservation. When local residents can see a visible link between wildlife and personal profit, it is easier to overlook possible negatives.

The conservation has started after the establishment of the National Park. The animals have increased because the forest has been saved. This is the reason for forming a CBAPU [community-based anti-poaching unit] committee. That is why there are many animals and this place has become a tourist area. There is a lot of advantage because of the coming of tourists – DC 23, male participant.

Certain local people identify the National Park as the main reason for awareness of conservation issues among community members. Their proximity to the protected area allows them to be more conscious of their impact on natural resources and on wildlife in particular.

It is because of the establishment of the national park that the people of the community have the mentality that conservation is necessary, that it is necessary to conserve animals – DC 29, male participant.

Some also see a connection between NTNC's programs and wildlife conservation. "This program has been offered so that no harm comes to the animals and no harm comes to the people. The people can also have some profit and the animals also do not come into any harm" – DC 29, male participant. People point out that there is often a lot of anger when wildlife creates damage and retaliation is common.

...people get very angry when there is some damage and loss. People will feel like killing the animals. These programs might have been conducted so that these incidents do not occur. These programs might have been presented so that no harm comes to the animals and there is some benefit to the people – DC 35, female participant.

3.3.3. Gendered differences

NTNC has created some programs specifically tailored to women's needs. These programs allow women to work from home and still gain some income for their household expenses. A local woman expressed her feeling that NTNC has created these programs so that uneducated women in the community "can do something to get ahead in life. You don't have to be dependent on others if you have skills in your hand. It must also be so that you can do even a little bit with your own skill" – DC 35, female participant. While these programs try to be considerate of women's responsibilities at home, some women are not even able to find time to participate in trainings because of time constraints due to their household duties.

Those women who have received training from NTNC report feeling more empowered due to their newfound financial independence. Money earned by women is more likely to go to improving her household and supporting her family as a whole.

I think it's important to understand how men and women use natural resources differently. So for example, if you're putting money in to women's hands and giving them alternatives, then it means for example they could buy liquid LPG gas and they don't have to walk for hours and hours to collect firewood. Maybe they can even afford water pumps or something to avoid having to go and collect water as well. The more that we can keep out of forests, the less likely human-wildlife conflict is as well. Risk of attack from wild animals, even including snakebite and then there is retaliatory killing. So yeah, no, I think helping women with livelihood activities is really important because also putting the money in women's hands means it tends to get spent on the whole household rather than getting drunk away or something...gambled away. So it means children get educated and they have better nutrition and so on. So that also has a longer-term effect on conservation. Children are better educated so they can therefore get jobs or start up business, which hopefully are less dependent on forests so it has a long term and a short term effect – DC 5, staff member.

3.4. What would they like to see in the future?

Community members expressed the hope that in the future there would be more prevention of and compensation for human-wildlife conflict. “In our area there is a lot of damage because of the wild animals. Programs about how to save ourselves from the wild animals should be introduced. Programs should be introduced which will change the lives of the people” – DC 38, male participant. In addition, they hoped to see more communication between NTNC and the community for creation of new programs. Many participants voiced the opinion that local residents needed to be more proactive and take advantage of the opportunities available to them.

NTNC points out that they need to do more to explore the impacts of their programs on the community. They also hope to engage with local people and get their opinions before creating new programs. “To improve the implementation of programs, and designing as well...to improve, we need to work based on the bottom-up approach. First, we need to consult the local communities, what are the problems there, what do they need, and later on, based on their demand, we need to plan our activities” – DC 48, staff member.

They recognize that they should make more of an effort to link their programs to conservation goals.

I think they [programs] could be improved by...being smart! About those very things. About understanding all those linkages and where the pressures are actually coming from. Are they local? Are they further away? What happens if you reduce pressure here, do you create pressure somewhere else? And then making sure that these interventions you do are as full a package as you need so that you don't just make one change...and monitoring as well. Monitoring to see are you having the desired effect? – DC 5, staff member.

NTNC hopes to expand in the number, volume, and area of their programs if funding allows. “When it hadn't even started, it was hard to motivate people. It was hard to

motivate people for conservation. Now everyone understands conservation issues so now we need to support a little bit larger scale micro-enterprises. If they are more large scale, we can have more change” – DC 44, staff member.

They would like to do more to involve local youth in conservation and give them enough income options so that they have reasons to remain in the area. “We only engage the youth for conservation but we do not provide them with alternative livelihoods. If we are not providing the alternative livelihood for the youth, then ultimately conservation is not sustained” – DC 4, staff member.

Well its tough. I mean, it actually is tough sometimes to find opportunities that work. I mean, what I’d like to see in Nepal I think is creating livelihoods that really help to build the local economy, that enable youth to stay at home and not go overseas to work, so that Nepal isn’t dependent on a remittance economy, but that it actually genuinely has industries of whatever size and commercial activities, and a sound local economy that is in harmony with the local ecosystems and wildlife and all the rest of it. Not necessarily based on it, but in harmony with it. So that people prosper and ecosystems and nature prosper – DC 5, staff member.

NTNC staff members believe that tourism should be promoted to help maintain a steady revenue stream for the area.

If more tourists come, then the local community can get more benefits and they will be more positive towards conservation. And the ultimate aim of the conservation is also to generate more revenue for the wealthy and healthy living beings, you know? Living community. So the ultimate aim is that. We are conserving but not only for conservation. It should generate some revenue as well – DC 48, staff member.

4. CONCLUSION

Over the past 25 years, NTNC has been working in the communities around Bardia National Park to promote conservation, reduce dependence on natural resources, and bring benefits to the local community. While there has been an increase in overall awareness about conservation and a decrease in the use of forest resources, it seems that these two outcomes are not connected in the minds of local people. Participants have not made the explicit connection between the presence of a protected area and the benefits they are receiving.

4.1. Natural resource use

NTNC's goal of increasing local people's income level to the point of no longer having a dependence on natural resources does not seem to have been met, at least not yet. This is consistent with previous studies (Barrett et al., 2001; Brandon, 2000). People's dependence on the forest has decreased, but the main factors contributing to these changes in their patterns of resource use are rules that have been put in place about how often they can collect from the community forests and national park, peer pressure to follow these rules, and installation of biogas, which has greatly reduced the need for firewood. Biogas is a tangible and useful alternative that fits into the local lifestyle and makes sense for participants. Their participation in biogas production is generally driven by the desire to simplify and improve their life, not environmental conservation. NTNC should create more programs like this, which are extremely useful and have a very direct link between conservation and benefits to local people.

Very few community members point to NTNC's programs as being motivated by conservation goals. However, the level of conservation awareness in the community has

increased since NTNC has been active in the area, establishing the community forests and promoting alternative livelihood options.

4.2. Human-wildlife conflict

Local people report that the frequency of human-wildlife conflict has decreased overall due to electric fences and predator-proof corrals. However, community members insist that NTNC needs to do more to prevent human-wildlife conflict before it occurs. They feel that all families should have predator-proof cages and electric fences should be expanded as well. Currently, NTNC's policy is to provide these facilities only after an incident has been reported and confirmed.

Also, local people expressed a serious need for better compensation for their losses due to wild animals. Many people feel victimized by the presence of the national park and feel they are unable to defend themselves without severe consequence. When primarily subsistence agriculturalists lose crops or livestock, or incur damage to their property, they need ways to make up those losses without turning to the forest.

NTNC's attempt to deter wild animals with mentha has not been as successful as they had hoped. While animals do not eat these plants, it has not stopped them from entering fields to eat other crops. However, this program has offered local farmers a way to make income in times of the year when they would otherwise have no money coming in. It has not been as popular as NTNC had hoped because there is fluctuation in market price each year and farmers are reluctant to give up growing their own rice when income from the alternative crop is not consistent. With better marketing, there is the potential for mentha and other aromatic crops to become more prominent in this area and provide

farmers with greater income than their traditional grain crops. This could also reduce the incidence of wildlife entering human settlements and thus decrease conflict overall.

With successful conservation, wildlife populations will continue to increase and with successful development programs, human populations will increase as well (Ferraro & Kramer, 1997; Sanjayan et al., 1997). This means the potential for conflict will also grow. If people choose to remain in this area because of good economic opportunities, there will be times when they must deal with wildlife from the national park. While certain programs from NTNC are starting to improve the situation, there is still a need for better balance between conservation and development, natural areas and communities, wildlife and humans.

4.3. Gendered differences

Women have responded positively to programs that allow them to earn extra money from home while fulfilling other household responsibilities. If they are expected to leave home for long periods for trainings or work, they are usually less inclined to participate. In addition, women may be less likely to participate in male-dominated programs. Certain staff members expressed a hope that women would become more engaged in stereotypically male programs. However, it seems that most women in this community are not currently willing to explore this option. It is important to give women options that are within the realm of what is comfortable and feasible for their daily lives. Once they have gained some income, have become more empowered, and have trust for the organization, it may be possible to introduce more unconventional options. In addition, as women in Nepal gain greater access to education in the coming years, there may be opportunities for NTNC

to engage the younger generation in a completely different way than what they have done to date.

When women are able to make some of their own income, they are more likely to spend it on improving their household and the status of their families (Katz et al., 2007). In these communities, women are the main resource gatherers and this means they may invest in alternative energies or other technologies that reduce dependence on natural resources. Introducing these new technologies in a way that relates to women's daily lives and benefits them personally will likely boost their interest in the program. For example, pointing out that installing biogas in their home would reduce the time and energy they would need to spend gathering firewood, minimize their potential interactions with wildlife in the forest, and improve air quality in their home for themselves and their families, is a better way to get women interested in making a change than focusing on the conservation benefits of biogas. NTNC staff members hope that women could be a driving force in the conservation movement because of the role they play as resource collectors. If this is to be true, women should receive tangible benefits to their daily lives for making changes to their resource use behaviors.

4.4. Final thoughts

The goals of alternative livelihood programs are to conserve natural resources and wildlife habitat while simultaneously offering local people a way to maintain or even improve their livelihoods. In these communities, it seems that NTNC's activities have either improved conservation or livelihoods, but not both concurrently. The obvious exceptions are those programs that directly tackle livelihood needs and environmental goals such as biogas and predator-proof cages. Moving forward, NTNC could focus their energies and

funds on developing more programs such as these with participatory involvement from the local community. There should be as much transparency as possible between NTNC and the community about how programs are developed, funds are used, information is spread, and participants are chosen.

NTNC has been running alternative livelihood programs in this community for over twenty years, and yet this is the first time participants have been systematically interviewed to learn their opinions on the strengths, weaknesses, and outcomes of these programs. In the future, it would make sense to integrate this type of investigation into the organization's plan every few years. When participants feel heard and acknowledged, even if all of their needs aren't completely fulfilled, they may be more supportive of NTNC's programs and conservation in general. Not only would this ensure that local people are satisfied and receiving benefits, but it would also give NTNC a chance to evaluate if they are using their resources in the best way possible to achieve sustainable conservation goals.

This type of work begs the question of whether creating incentives for humans to settle and develop around a protected area is the best idea for conservation in the long term. Around the world, we struggle to find ways for humans to live in harmony with their environment and Bardia is no exception. Just as we have not found perfect solutions in other places, NTNC and the buffer zone communities they support are still working to find a balance between conservation and development. These alternative livelihood programs may not completely close the gap between environmental goals and community needs, but they have made some progress for both.

APPENDICES

Appendix A: Data collection instruments

A.1. Interview/focus group guide for participants

1. What alternative livelihood programs are offered by NTNC in your community?
2. Which of these programs are most useful to your community? Please explain.
3. Which alternative livelihood programs have you participated in?
 - a. Why did you choose to participate in this/these programs?
 - b. How long have you participated in this program?
4. How did you learn about these programs?
 - a. Who else participates in these programs?
 - b. Does everyone who would like to participate have the opportunity to do so?
5. Why has NTNC introduced these programs? What do you think are the goals of these programs?
 - a. Have they fulfilled their goals? Please explain.
6. Do you still participate in these programs?
 - a. If so, why?
 - b. If not, why not?
7. How do you think people in your community view NTNC?
 - a. Are there ways they could improve their relationship with the community?
8. Before you began participating in this program, what was your household's main source of income?
 - a. Has your household's primary source of income changed?
 - b. If so, what is your household's present main source of income?
 - c. Has your overall household income changed since you began participating in this program?
 - d. If so, can you estimate by how much your total household income has increased or decreased per month?
9. Which forest(s) does your household use for collecting resources?
 - a. What do members of your household collect from the forest? (only prompt if they do not mention – Fodder? Firewood? Leaf litter? Medicinal plants? Thatching grass? Fish? Animals? Other?)
 - b. How much did you collect before this program?
 - c. Has it changed since you began participating in the program? Please explain.
 - d. If you are collecting less from the forest, where are you collecting these resources from instead?
10. Do you think people in your community value the establishment of the national park for protecting the environment?
 - a. Can you give an example?

11. What kind of conflict has your family had with wildlife in the past? (human, animal, crops)
 - a. Has this conflict changed or been reduced by these programs?
 - b. Which species are you most concerned about?
12. Are there any programs you would like to participate in but have not yet been able to?
 - a. What are the reasons you have not been able to?
13. What kinds of programs would you like to see introduced in your area?
 - a. How would this program be beneficial to you or your community?

A.2. Interview guide for NTNC/WWF staff members

Can you describe the alternative livelihood programs introduced in the buffer zones around Bardia National Park?

- How did you decide which programs to introduce?
- What was the role of the local community in deciding which programs to introduce?

What do you think are the goals of these programs?

- Do you think they have succeeded in these goals? Please explain.

Which programs do you consider to be most successful?

- In what ways are they successful? How do you define success?
- What are the factors that contributed to this success?

Which programs have been less successful?

- What were the issues with these programs?

How do people find out about the programs?

- How are people selected or recruited to participate?
- Do you target particular groups for specific programs? Can you give an example?
- Are there any people who don't participate? Why or why not?

How do you think the programs could be improved?

What kind of programs would you like to see introduced in the future?

Appendix B: Thematic Analysis

Table 2: Coding rules, definitions, and examples

Code	Definition	Rule	Example
Change in conflict	There has been a change in conflict with wildlife since these programs have been introduced	Apply to text which indicates a change in conflict with wildlife due to NTNC programs	There is a difference. The animals used to come and eat all the unhusked rice. They used to destroy it but now there is a big difference after the electrified wires have been installed – DC11
Change in resource use	People have changed the way they use forest resources after participating in these programs	Apply to text which discusses changes in forest resource use after NTNC programs	We used to collect as much as we wanted from the community forest. We used to steal from the park sometimes. But it is not like that now. – DC16
Conservation attitude	People have some awareness and concern for the environment	Apply to text depicting people's attitudes towards the environment and conservation	The main aim is to save wild animals. It is necessary to conserve the wild animals. There is equal importance of wild animals and community. We will be able to save ourselves if we can save the jungle. All are equal, all are equally important. – DC6
Future	People have expectations about ways things could be better in the future	Apply to text discussing hopes for the future	The trust should bring other similar programs, it should work together with the community to improve the relationship then it will be better. – DC24

Table 2 (cont'd)

Income amount	There has been an impact on the amount of money earned for families participating	Apply to text referring to the amount of income generated by people in these programs	It has increased a lot since before after taking part in this programme. It must be 50% from 100. This income has increased from medicinal herbs plantation. Earlier it used to be rice and wheat. Now we plant mentha also there. A great deal comes from there. – DC25
Income source	People have various sources of income	Apply to text referring to the source of income either before or after participation in these programs	The main source of income in our household is agriculture. In addition to this there is basket weaving, goat farming and pig farming. – DC18
Motivation	There are many reasons why these programs were created and why people choose to participate in them	Apply to text referring to perceived motivations for these programs (either personally or reasons for the establishment of the program)	They run awareness raising programs for the local people. They try to find ways to improve their standard of living. Move them forward. Let there not be anyone in the community who is backward. Let's give everyone all the information necessary to bring them forward. That's why they run these programs. – DC12
National park	People have various opinions on the national park	Apply to text discussing the national park	The establishment of the park has resulted in an increase in the number of tourists. The local people have got employment. Therefore there has been a lot of benefit. – DC14
Participation	People learn about the programs in different ways and have opinions on who is able to participate	Apply to text discussing who is able to participate and how they learn about the programs	All those who were interested got the opportunity. But many of those who had the opportunity did not take part in the program. – DC15

Table 2 (cont'd)

Relationship with NTNC	People related to NTNC in various ways	Apply to text discussing perceptions and opinions of NTNC	The people in our community look upon the trust in a positive way. It has supported us in even if it something. It has given us something whatever it is. That is why they look on the trust in a positive way. – DC16
Resource use	All families use their nearby forest resources in some way	Apply to text referring to the use of forest resources	The members of our household collect firewood, fodder, and wood from the community forest. – DC18
Wildlife conflict	There is often conflict with local wildlife	Apply to text discussing conflict with wildlife	The elephants are the ones that concern us the most. The other animals come out rarely. Sometimes the leopards come out and prey on goats and pigs. But we fear the elephants the most. – DC7
Women	Women have different opportunities and opinions about the programs	Apply to text discussing circumstances specific to women	Among these programmes, sewing and cutting programme is the best programme for women who cannot read or write. – DC19

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