

# **Buffer Zone Planning in Nepal's Shivapuri-Nagarjun National Park**

Inclusive Program Development for More Resilient Park-People Relations and the Protection of Ecological Services in the Kathmandu Valley

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# Table of Contents

1   Acknowledgements .....	2
2   Abstract .....	3
3   Introduction .....	4
4   Objectives .....	4
5   Background .....	5
5.1 Urbanization .....	5
5.2 Water Demand .....	6
5.3 Shivapuri-Nagarjun National Park .....	7
5.4 Ecological Services .....	8
5.5 Park Management .....	9
5.6 Tradition of Nepal’s Protected Areas .....	9
5.7 Buffer Zone Community Forestry .....	10
5.8 Payment for Ecosystem Services .....	11
6   Methods.....	12
6.1 Data Collection .....	12
6.2 Case Study Communities .....	13
6.2.1 Mulkharka .....	13
6.2.2 Salkote Community Forest .....	13
6.3 Analysis .....	14
7   Results .....	15
8   Discussion .....	16
9   Conclusion .....	26
10   References .....	28
11   Appendices .....	30
11.1 Appendix A: Questionnaire .....	30
11.2 Appendix B: List of Interviewee Specifics.....	31
11.3 Appendix C: Emergent Interview Response Themes and Sub-Themes.....	33
11.4 Appendix D: Coding Table- Quantitative Interview Analysis.....	35

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## 2 | Abstract

Keywords: Buffer zone, national park, urbanization, watershed protection, community rights, decentralization, relationships

Institutional application of 'buffer zones' around areas of importance for biological conservation has grown significantly since the 1980's - perhaps nowhere as much as in Nepal, where 24% of the nation's total land area is allocated under such a program. In practice, the intention of a buffer zone is to simultaneously alleviate the pressures from human development on conservation areas and to address the socio-economic requirements of affected populations. While the buffer zone concept has been hailed by many for its consideration of indigenous rights, it is far from the magic elixir that some would hope. We spent 3 months in Kathmandu, Nepal over the summer of 2016 interviewing members of government and local environmental organizations to glean insight into what has been learned from 20 years implementing the buffer zone concept. The timing of our study couldn't be more critical, as the Nepalese government in early 2016 declared a new buffer zone around Shivapuri-Nagarjun National Park (SNNP), located less than 10 miles north of the nation's capital, Kathmandu. SNNP protects many regionally and internationally important ecological and cultural assets, but its most significant purpose is as the source of Kathmandu's primary water supply. We hypothesized that the urbanization of the Kathmandu Valley (KTMV) is going to present new and unprecedented challenges for sustainable and equitable land management in a buffer zone program. From the rapid, unplanned urbanization of the capital, in conjunction with strict rights on access of resources, we sought evidence to support the assumption that the government would rely on buffer zone communities for successful management and protection of the SNNP region. With the aid of a local translator, we spoke with dozens of community members living in the park and in the proposed buffer zone to get a sense for their ways of living and their perspectives on the conservation policies that have impacted them.

Research results ultimately confirmed the most pressing issues for SNNP-BZ communities today, and highlighted strengths for community support that could be built upon for greater future success. SNNP is falling quickly behind on land management due to limited staff numbers. Without local community support for strong BZ development, encroachment from the city on their most valuable ecological resource seems eminent.

### 3 | Introduction

The institutional application of the 'buffer zone' concept has grown significantly since the 1980's, perhaps nowhere as much as in Nepal, where 24% of the nation's total land area is allocated under such a program (CBS Compendium of Environmental Statistics, 2015). In practice, the intention of a buffer zone is to simultaneously alleviate the pressures from human development on conservation areas and to address the socio-economic requirements of the affected population (Ebregt & De Greve, 2000).

The theory of land conservation in Nepal is supported with the use of integrated conservation and development projects (ICDPs), which were developed by the World Wildlife Fund in the 1980's. The core of ICDP theory is the development of infrastructure, the promotion of the economy, the improvement of environmental protection, the preparation of human resources and the formulation of technology and policy. Infrastructure development is an integral part of ICDP to meet the basic needs of the local community (Peters, 1998).

While the buffer zone concept has been hailed for its consideration of indigenous rights, it is far from the magic elixir for sustainable and just conservation practices that some would hope. The implementation of any buffer zone is as unique as the cultures and the conservation challenges endemic to the environment in which it has been deployed. Until such matters are addressed in each specific region of implementation, the ICDP theory is likely to face significant roadblocks, like research costs, participatory willingness, community support, etc. before success. Factors such as traditional land use practices, social customs, governance structure, and the presence of effective regulatory bodies and political representation will either promote or inhibit the success of any buffer zone.

### 4 | Objectives

The objective of this research was to disassemble the structure and functionality of Nepal's buffer zone program to assess assumptions about its long-term sustainability and the efficacy of its intended outcomes as they regard the recent introduction of a buffer zone in Kathmandu's Shivapuri-Nagarjun National Park.

#### ***Specific Objectives:***

- A. To determine the ways in which local property rights are altered by the buffer zone, as well as the aspects of villagers' household and community lives (i.e. economic and social dimensions) that are going to be affected by the change.

- B. To better understand how programs designed to compensate and provide support to communities within the SNNP-BZ are implemented, and how other policy interventions such as community forestry and payment for ecosystem services (PES) schemes might offset any difficult impacts from living within the buffer zone.
- C. To uncover the ways in which cultural, gender, and ethnic dynamics are traditionally manifested in our study areas, and to theorize how these aspects of community will impact representation in decision-making processes and the allocation of benefits in the buffer zone user groups.
- D. To characterize Kathmandu's rapid urbanization and more gradual push towards democratization as these relate to the vulnerability of conservation management practices in SNNP and the buffer zone, alike.

## **5 | Background**

### ***5.1 Urbanization***

The rapid and unplanned urbanization of the Kathmandu Valley (KTMV) has resulted in hazardous environmental concerns and societal struggles. With issues ranging from air and water quality to a lack of housing, conditions at present are alarming to the human rights of most citizens in Nepal's capital region. Consisting of the districts of Kathmandu, Lalitpur, and Bhaktapur, as well as the municipalities of Kirtipur and Madhyapur-Thimi, Kathmandu Valley had a population of roughly 2.5 million residents as of 2011. About 1.5 million constitute the 'urban' population, per the Central Bureau of Statistics. Kathmandu metropolitan city alone, with a population of 1,003,285, accounts for 22.2% of Nepal's total urban population (CBS, 2014).

The surge of human migration into KTMV is a result of families seeking refuge or reconnecting, educational pursuits, or economic opportunities; none of which appear to be decelerating. This problem was compounded by the Maoist insurgency that lasted from 1996 to 2006, which delivered many refugees to the valley due to its relative safety from the violence and persecution seen throughout other regions of the country (personal conversation with S. Bajracharya).

In the years to follow, the 2011 census reported a 5.3% annual population growth average in KTMV between 2001 - 2011 (6.1% in Kathmandu District), with population density during the same period increasing from 1,830 people/km<sup>2</sup> to 2,799 people/km<sup>2</sup> (2,739 to 4,416 people/km<sup>2</sup> in Kathmandu District). Furthermore, the Central Bureau of Statistics projects another one million people will be born or will migrate into Kathmandu Valley over the next 10 years (CBS National Population and Housing Census, 2011). Even if all three districts in the valley maintained a conservative annual growth rate of 3%, population would double in less

than 24 years (CBS Compendium of Environmental Statistics, 2015).

Urbanization of the Valley has resulted in an increasingly fragmented landscape and heterogeneous land use development (Thapa & Murayama, 2009), both of which result in unstable environmental conditions for the people and ecosystems alike. The construction of Ring Road, which encircles the metropolitan area, rapidly accelerated the urbanization process. In conjunction with the road construction, 3.8% of agricultural land was transformed to urban build as development followed the advancing road network (Thapa & Murayama, 2009).

The accelerated growth of the capital has given rise to incredibly difficult living conditions. In 2016, the World Health Organization (WHO) listed Kathmandu in the bottom 10% of cities in the world in its “Global Urban Ambient Air Pollution Database” (WHO, 2016). The study measures environmental particulate matter 10 (PM10) and 2.5 (PM2.5) micrometers or less in diameter in 2,997 cities. Concentration of PM10 in the Kathmandu Valley is “several times higher” than the WHO safe limit (CBS Compendium of Environmental Statistics, 2015). In 2016, personal recommendations to the research crew were to wear face masks at least every other day while outdoors in KTMV. Nearly one year later, as the Melamchi Water Supply Project nears completion, the plumbing installation (waterline...) only amplified the poor environmental conditions for valley residents- by leaving the house and coming home at the end of the day, it was said that one could expect to be covered in a layer of soot.

## **5.2 Water Demand**

Air quality aside, there has been a freshwater shortage in KTMV since the 1980s (Karki et al., 2014). The shortage has evolved into an outright public health disaster, as the valley’s civic infrastructure has not been able to accommodate its dramatic population growth and other exacerbating circumstances. A catastrophic earthquake and its numerous aftershocks in 2015 lead to the destruction of many aging and decrepit pipelines and further in-migration to the valley; not to mention the death or injury of more than 29,000 people as a direct result of the earthquake and aftershocks (CITE).

The government entrusted the water supply of Kathmandu Valley to a new company, Kathmandu Upatyaka Khanepani Limited (KUKL) in 2006. By 2008/09 the producer’s surplus tripled to NPR 124 million (Karki et al., 2014), yet in the fiscal year 2014-2015, the estimated 375 million liters per day (MLD) water requirement for valley residents was met at only 32% of the demand in the wet season and 20% in the dry season (after 20% real losses are considered) (KUKL Annual Report, 2015). 20% is even a lenient estimate of “real losses” (i.e. leakage from aging and decrepit pipelines) as some recent estimates listed in the 2015 Annual Report by KUKL suggest that this figure could be doubled- which would not be surprising since in areas of Kirtipur municipality (Kathmandu district) and Bhaktapur, some sections of the pipeline are over 110 years old (KUKL Annual Report, 2015).

This difference in water demand and water supplied by the state is great enough that those KTMV residents who can afford to do so turn to private water tankers for their sanitation,

drinking, and cooking needs. These private suppliers - who transport water from waterways outside of the valley - only account for 30 MLD, or less than 1% of the daily need (The Himalayan Times, 2016). For others, despite the 2.4% increase from 2013, an equivalence to the average annual rate over the last five years, the connection of 4,698 new households connected to waterlines by KUKL in 2014-2015 (KUKL Annual Report, 2015), families are still seeking access to safe water.

About 15% of the water KUKL supplies, comes from unregulated groundwater; extracted from both shallow and deep aquifers through 75 tube-wells and 11 dug wells in Kathmandu Valley (KUKL, 2009; as cited in Karki et al., 2014). Unfortunately, these sources exacerbate a serious issue as the overall groundwater extraction rate exceeds the natural recharge capacity in the valley by 6 times (MPPW, 2002; as cited in Shrestha, 2009). So, in conjunction to the limited groundwater resources, the broken infrastructure, and the limited storage capacity, the Government of Nepal (GoN) was left in need of support for the protection of the human rights of its citizens.

The Asian Development Bank conceived and provided financing for the 'Melamchi Water Supply Project' (MWSP) in the late 1990's to gradually introduce an additional 510 MLD of freshwater to Kathmandu Valley residents by 2030 (GoN/MWSP, 2016). However, construction of pipes to deliver an initial 170 MLD from the Melamchi River – which began in 2003 - has been hampered by significant setbacks and difficulties, causing the project's completion to be rescheduled multiple times since its initial deadline in 2007 (Kathmandu Post, 2015). Per the water demand chart prepared in 2001, Valley drinking water demand was estimated to reach 210 MLD by 2007, and 510 MLD by the year 2030 (Rana, 2007).

The same article quotes the Melamchi Water Supply Development Board's executive director, Ghanashyam Bhattarai, stating that the project's completion is being "sped up" so that it will be completed by September 2017 - ten years later than originally anticipated. Though Sanjeev Bikram Rana, executive director at Kathmandu Valley Water Supply Management Board says that valley residents must wait at least nine more years until the MWSP will be able to match supply with demand (The Himalayan Times, 2016). The long-awaited project leaves the people in KTMV anxiously awaiting better conditions as they have only continued to digress since the initiation of the project.

Of the 26.5 kilometers of tunneling needed to transport the MWSP water to a new treatment plant in the Sundarikal buffer zone municipality, about 1.5 km is aligned to run through the base of Shivapuri-Nagarjun National Park (NTNC, 2004). \*\*Insert map of the MWSP line/plan:

### ***5.3 Shivapuri-Nagarjun National Park (SNNP)***

The valley is fortunate to benefit from the resources and environmental reprieve of an adjacent national park. SNNP serves multiple functions as keeper of the Shivapuri Watershed- for which a reserve was established in 1976 and was re-designated as a Watershed and Wildlife Reserve in 1984 (Azam & Borsha, 2013), and as a network for the new MWSP water pipeline that runs



beneath its peak. SNNP is located just 12 km outside of Nepal's capital, Kathmandu; situated in the northern aspect of Kathmandu Valley, it is in a transition zone between subtropical and temperate climates. Only in 2002 was the area gazetted as a national park, which further expanded to incorporate the Nagarjun Forest Reserve in 2009. (Karki et al., 2014). SNNP is the only protected area (PA) in the country's mid-hills region, and the only national park that has been established to conserve natural resources vital for the preservation of an urban population (ISRC, 2013).

In March of 2016, announcements for a 126 km<sup>2</sup> Buffer Zone (BZ) around SNNP were officially posted after the government completed more than seven years of planning and negotiating with communities surrounding the park (personal conversation with K. Mehta, DNPWC). The announcement makes SNNP the last national park in Nepal's PA system to have a BZ demarcated; all 9 other national parks and 3 wildlife reserves already include BZs (Bhusal, 2014). With the added protection of a BZ, the adjacent ecology of the protected area will benefit from the extended resource regulation tapering out of the PA and into the surrounding communities- creating a sort of transition zone. By limiting resource extraction and encouraging land preservation via participatory management of the BZ communities, both the park and included communities will ideally receive economic and environmental support (Pandey, 2015). The approach for implementation of the BZ in this otherwise highly urbanized region, raised questions of specific challenges and considerations that would be integral to the transition and inspired this research.

\*Discuss BZUG's and other relatable BZ components

#### ***5.4 Ecological Services***

While the primary water supply for KTMV originates at the peak of SNNP, other inviolable contributions to the Valley include an assortment of ecosystem services (ES). Access to SNNP offers significant services to the culture, education, environmental support, and biological condition of the KTMV region and surrounding communities.

Ecologically, SNNP is a source for wildlife habitat and carbon sequestration. The park is home to several rare, threatened, and endangered species of flora and fauna; and boasts 159 km<sup>2</sup> (39,290 ac) of mixed hardwood, Chir pine, and Oak forest (Pandey & Bajracharya, 2015). In waves of forest canopy health, the area of degraded forest in Shivapuri fell by almost 85% while, dense forest area increased more than six-fold between 1988 and 2001 (Karn, 2008). Since humans rely heavily on timber and firewood products, the vulnerability of SNNP to resource decline has been a persistent issue. \*Elaborate

Beyond the use of wood, supplemental energy from the SNNP-BZ is provided via the hydroelectric plant just upstream from the water treatment plant in Sundarijal; producing 4,231,000 kWh annually (Karn, 2008). The value of the electricity generated attributable to the benefits from the watershed comes to be about NPR 4,355/ha under wholesale market to NPR 8,393/ha under retail market conditions (Karki et al., 2014). Food and economic support are additionally attributed to water supplied by SNNP, as over 4,000 hectares (9,884 acres) of

farmland are irrigated by this source (Karn, 2008).

Spiritually, the Bagmati and Bishnumati rivers, (the latter of which is a tributary of the former) originating within the boundaries of SNNP, are considered holy rivers by followers of Hinduism, and the Shivapuri range itself is revered as a Shaktipith, or source of spiritual power for Hindus and Buddhists alike (Kunwar, 2008). Additionally, the Syalmati, Nagmati, Yagyamati, and Rudramati are religiously significant streams within the park (GoN 2014). \*Info annual spiritual pilgrimages. Other visitors include students, locals, tourists, and recreationalists. Frequent school groups are scheduled for field trips to the park and weekend visitors from the Valley flow in by the hundreds.

Considering the ease of access from the geographic situation of the park, highlighted by the implications of Kathmandu's rapid and unplanned urbanization, the region will rely on highly attentive land management practices to preserve the quality and condition of the ecological services associated with this land.

### ***5.5 Park Management & Communities***

SNNP VILLAGES: Many families are directly affected by park area regulations and management. According to the current warden at SNNP, the total population "affected by or dependent on the park" is 95,837 from 18,235 households- though this number was previously reported at a total of 101,493 people living in the park or its BZ (Kunwar, 2008). Discrepancies aside, two settlements in the Sundarijal municipality are included in these figures: the villages of Mulkharka and Okhareni, which contain about 500 households. Approximately 2,600 residents of these two communities were permitted to remain within the park's boundaries when the land was first gazetted by the government in the early 1970's (Maskey, 2008), yet conversations with locals revealed that most of the villages on the periphery of the park boundary were relocated by the government to avoid future park-people conflicts. It was unclear if compensation was afforded to those who were moved.

Mulkharka and Okhareni were previously supported by programs that encouraged conservation farming, supported the development of alternative livelihood sources, and helped to raise awareness about conservative use of forest products to prevent further land exploitation. Though these programs were discontinued when disputes between donors and the government erupted (donors wanted to decentralize while the government wanted to retain its authority)" (Nepali Times, 2002), conversations with villagers clearly confirmed the progressive nature of their efforts to continue managing the land responsibly- despite a lack of support.

Funding for the SNNP area is lacking, though this is not reflected in the five-year park and BZ budget proposal that spans from 2014-2019. The total NPR 146,210,000 budget includes: NPR 22,600,000 for Park management, NPR 40,400,000 for proposed Buffer Zone management, NPR 38,500,000 for tourism and culture management, and NPR 44,710,000 for institutional strengthening (GoN, 2014). In theory, the allocation of these colossal plans appears to be well distributed, but considering the management plan was in year 3 of 5 during the time of this

research, it appears as if the stated goals were implausible for actual employment (though the earthquake of 2015 was likely an inhibiting factor to full budgetary access). this area below or above this paragraph would be good for side to side photos of each community

### ***5.6 Tradition of Nepal's Protected Areas***

As of April 2016, a total of 20% (28,582.95 km<sup>2</sup>) of Nepal's total 143,351 km<sup>2</sup> (CIA World Factbook, 2016) land area is protected as a national park, wildlife reserve, hunting reserve, or conservation area. Including the SNNP-BZ, another 24% (34,311.62 km<sup>2</sup>) of land positioned under the buffer zone program (CBS Compendium of Environmental Statistics, 2015). Roughly 23.2 million people, an estimated 83.7% of Nepal's total population, live outside of an urban environment; so, with 44% of land in the country strictly regulated by the government, it is logical to assume a need for compromise or support (based on a calculation using statistics previously presented in this report).

In lieu of the positive connotation an environmentalist, for example, might associate with 'conservation efforts,' associated laws can be profoundly impactful for adhering communities. Opportunity costs for park-dwelling households may run beyond RS 26,873/year. "On average, crop damage costs are worth some NPR 2,873/year for each park-dwelling household. Loss of use of park resources due to restrictions on harvesting amounts to some NPR 16,000/year (comprising timber and NTFP use), and loss of access to agricultural markets incurs average opportunity costs of NPR 8,000/household/year" (Karn, 2008). Without some form of compensation for these net losses, participating communities are likely to face increased complications.

### ***5.7 Buffer Zone Community Forestry***

A source of community-backing has been discovered in Community Forestry (CF). Supported by the improved laws and policy associated with ICDP's, such as the Forest Act of 1993, greater examples of success, experimentation and implementation of socially and environmentally productive practices have been introduced to communities across the nation. Specifically, to the study area around SNNP, Data from the District Forest Office revealed that the SNNP BZ encompasses 25 buffer zone community forests (BZCFs); which vary in size from 0.77 to 63.9 ha and, in several cases, include upwards of 50% of all households of the corresponding municipality. Waves of success and struggle were both reported during CF community interviews and research.

In the Chitwan National Park of Nepal, for example, land management was decentralized to communities in CF situations. The result was an observed phase of further land degradation, followed by a notable improvement of forested land cover throughout the country (Stapp et al, 2015). This result speaks to the environmental response and condition of a locally managed land, though the entirety of the situation reveals largely unsolved issues.

Primary problems understood of CFs in Nepal are that of: benefit distribution inequalities (e.g.

elite capture); capacity building for sustainable and institutionalized program development; decision-making inclusion of all genders, castes, classes, ethnicities and disabled persons; over-utilized technocratic policy development; and the empowerment of communities that can lead to drastic discernment for governmental recommendations and input if trust and strong relationships are not withstood (Neupane, 2003).

People's wavering expectations of the government often result from GoN prognostications that ultimately lose fervor. The five-year (2015-2019) budget and program development section of the SNNP and BZ Management Plan includes efforts to provide the BZCFs with forest fire management training and 12-item firefighting tool sets (GoN, 2014), though these efforts were not ever mentioned by the DNPWC, BCN, SNNP authorities nor BZCF communities during the time of the interviews. Further goals for SNNP BZCF budget allocation include a total of Rs 2,400,000 for participating CF groups over the five-year plan (GoN, 2014). In Nepalese, dispersal of this support was projected at:

- Year 2072- Rs 400,000
- Year 2073 - Rs 400,000
- Year 2074 - Rs 400,000
- Year 2075 - Rs 600,000
- Year 2076 - Rs 600,000

### ***5.8 Payment for Ecosystem Services (PES)***

As ecological awareness, community rights, and urbanization pressures increase, hope for the future is largely structured around the desire for stronger economic support. The potential for integrating Payment for Ecosystem Services (PES) schemes have been explored in Nepal, and many are looking towards the practice as the next step for ICDP success in the KTMV region. The idea is to have "ES beneficiaries make direct, contractual and conditional payments to local landholders and users in return for adopting practices that secure ecosystem conservation and restoration" (Wunder, 2005). There appears to be a strong likelihood for the implementation of a PES approach to conservation in the Sundarijal sub-catchment area soon. Responses from multiple stakeholders, interviewed for this study, revealed that BCN has been in search of funding to assist with the development of such a plan for SNNP.

The Government of Nepal's 'National Strategic Framework for Sustainable Development (2015-2030)' highlights the potential value of PES for nature conservation, including the need for raising awareness about the benefits of PES and crafting national policies that are inclusive of women and other disadvantaged groups (GoN/NPC, 2015). While the government is still in the process of developing national policy guidelines for PES, two piloting studies - one by the International Union for the Conservation of Nature (IUCN) and another by ForestAction Nepal and the International Center for Integrated Mountain Development (ICIMOD) - have already been conducted in SNNP and elsewhere (Karki et al., 2014, IUCN, 2013). Following IUCN's initial study in 2006, at least 8 other PES schemes have been implemented throughout Nepal -

primarily for watershed conservation (IUCN, 2013). Additionally, per a report by the IUCN, a ‘co-management’ scenario that benefits local communities (within the park) and allows some level of sustainable resource use - as compared to ‘status quo’, ‘resettlement’, and ‘no conservation’ scenarios - yielded “the best mix of hydrological, livelihood and economic benefits” (Karn, 2008).

For the watershed management communities, implementation of the BZ program in SNNP might serve as a beneficial catalyst for the development of a PES scheme. If a greater sense of trust and communications can develop between park authorities and locals, there is a likelihood that the betterment of these relations could support a more constructive agreement process during PES benefit sharing negotiations. Further investigations into the structure of existing park-people relationships and land use situations are reported about in the ‘Results’ section.

## **6 | Methods**

The research was initiated in January of 2016 with a review of scholarly literature related to the general issues surrounding urbanization, community forestry and buffer zones in Nepal. An understanding of the socioeconomics, political interventions, ecological context, and community demographics allowed the team to develop a strong sense of the challenges and opportunities that have been encountered in Nepal’s buffer zone regions.

Prior to departure for Nepal, the team applied for approval from the University of Michigan’s Institutional Review Boards (IRB) that they were qualified to conduct fair and humane studies. In addition to the application, the team completed an online training course and exam regarding ethics and compliance within social science research standards to ensure safe practices for all research participants.

### **6.1 Data Collection**

Since the buffer zone program has previously been implemented and revised in 12 other regions in Nepal, the intent of this project was to unveil the progress of buffer zone programmatic efforts that have been made to better support communities and conservation efforts, alike. The goal was to analyze the approach for initiating the SNNP-BZ program by facilitating conversations with government affiliates, community members, and regional stakeholders. Research on the participating communities/organizations generated assumptions about the type of information that would be attainable. Based on the desired feedback, a general questionnaire (Table 1) was developed in preparation for guiding conversations during focus groups and semi-structured interviews. The questions were specifically structured and categorized to maximize access to information that would help interpret local perspectives on the approach to environmental conservation and the impacts from the SNNP-BZ on community lifestyles, accessibility, and human rights [*See Appendix A for a review of the question categories and questions that guided focus groups/interview conversations*].

Key informant interviews [See Appendix B for a list of interviewee details by organization/village] were approached as either focus groups or semi-structured interviews. Along with formal note taking, all conversations were recorded and transcribed for future analysis – key memories and contextual scratch notes were included in each interview record. After semi-structured conversations with the influential governing bodies and organizations, qualitative methods of assessment were used to engage with the buffer zone communities.

Connections to local participants were made with a snowball sampling approach to establish relationships that would support our ability to effectively access the communities during data collection. Qualitative research methods during community sessions included: individual interviews; observations; interpretation of records and previous publications; and four focus groups, with two impromptu and two organized sessions. Due to traditional gender roles and expectations in Nepal, males and females were generally separated during community focus group interviews (totaling 22 women & 18 men). Additionally, the heightened language barrier between English and Nepali in the rural communities required a Nepali translator to be hired communication assistance.

Each conversation began with an introduction of the team and research, followed by the IRB protocol to acknowledge interviewee rights to confidentiality and their ability to end the interview at any point. Community interviews were recorded with the same techniques as the key-informant interviews.

## **6.2 Case Study Community Profiles**

### **6.2.1 Mulkharka**

Municipality: Sundarimal

District: Kathmandu

The village of Mulkharka is part of the Shivapuri Watershed, and is one of four villages situated within the SNNP boundary. The village can be reached by foot via an hour-long hike uphill along dirt and stone trails, with some paved stairways. Between Mulkharka and Okhareni (the next nearest internal park village), the total number of households is estimated around 547, with an average of 5.5 people per household (GoN, 2014). Agriculture contributes to 15% of household income, while an average of 41% of income is accounted for by off-farm activities. The two communities illegally produce alcohol (raksi) from millet, which contributes to another 19% of total household income; additionally, an estimated 77.5% of homes use firewood for cooking (Karn, 2008).

Raksi, although illegal to brew at home with the intention of distribution, has some significance as a customary component of many traditional ceremonies. However, restrictions from the park on land use protection, and the high market values attainable in Kathmandu and elsewhere for the product's relative purity from SNNP, have motivated conversion of former agriculture plots for the growing of millet. Some say that alcohol production has also had the additional effect of

incentivizing collection of firewood from the park- which is explicitly prohibited, but, as a woman from the Sundarijal focus group said, is inconsistently enforced by park authorities. Bhandari (2008) calculated that community members from Mulkharka and Okhareni collect 19 kg (42 lbs.) of firewood/household/day for various purposes, indicating a high dependency (GoN, 2014).

### **6.2.2 Salkote Community Forest**

Municipality: Jitpurphedi (*also spelled Jeetpurphedi*)

District: Kathmandu

The second study area, Salkote, adjacent to the Nagarjun side of SNNP, is within the Jitpurphedi municipality. This 26 ha. community forest is documented with the Department of Forestry to support a total of 33 households, with an average of 4.66 people per household. 86% of homes are estimated to use firewood for cooking (GoN, 2012) While previous information is not published on the Salkote community, conversations with community members revealed their shared autonomous community practices such as: land patrol, reforestation, and financial management and spending. They have faced challenges such as fluctuations in governmental support for funding and resource provisioning, as well as an increase in crop depredation and loss of life from wildlife.

Current leadership for the Community Forest committee consists entirely of men, though previously the women of the village led for 3 years. Our understanding is that the responsibilities of women have increased since governmental support subsided and since the 2015 earthquake. While the education of women appears to be on the rise, there is still a lot of pressure to contribute to the support of forestry and agricultural practices in the village, so they are making daily commutes to Kathmandu for school and to assist in community activities.

The women reported that prior to the establishment of their community forest, 20 years ago, the land was barren and primarily consisted of shrubs and small plants. They explained that their efforts in protection and the process of reforestation had significantly increased canopy cover. Since they are without a nursery, and because it had been a few years since the GoN had provided the community with saplings, they have been begun propagating trees by rooting a cutting (or live-stake) during the monsoon season. Though Salkote has a well-established community forest organization, they have been facing increased difficulties and report life in the village to be difficult based on their current incomes.

### **6.3. Analysis**

Upon return to the United States, data analysis was initiated. Participant responses were organized, analyzed and processed by a single team member to avoid discrepancies in linguistic variations and interpretation. Each interview/focus group recording was twice reviewed to highlight primary points that frequently appeared in conversation. A process of organization then occurred organically and ultimately filtered responses into one of six overarching emergent themes. Due to differences in interviewee group dynamics, these key topics varied in specificity and were thus broken down further into distinguishable topics labeled by the 25

subthemes (*Table 2*). This process of organization was then explained to and replicated by a second team member to confirm accuracy. Variations in response categorization or suggestions for label modifications were reviewed and discussed until agreed upon by both parties. The analysis team then wrote descriptive conclusions for each sub theme to provide a general sense of the response received.

Response similarities in structure and frequency presented an opportunity for basic supplemental quantitative analysis to be included in this study. By coding responses based on their subsequent neutral (0), encouraging (- 1), or pessimistic (+ 1) reaction to questions, the scores could be summed into a coding table. The frequency of responses with the type of reaction yielded information about the popularity of questions that were asked to the groups or individuals. Final scores provided insight to specific sub themes that fell on the high spectrum of optimistic responses, and those which fell under greatest frustrations or grievances. This information was used to compare community conversation discoveries to the research team’s assumptions about SNNP-BZ life quality standards that had been formulated during initial literature review research.

## 7 | Results

Based on interview and focus group responses, 6 primary themes emerged- with a distinguished 25 sub themes [*See Appendix C for emergent themes and sub themes from interview responses, along with a summary of each sub theme*].

From the response reaction type, being neutral, optimistic or an expressed frustration, the commonality of results supported the opportunity for a supplemental quantitative review of the data [*See Appendix D for interview analysis coding table results for frequency of and reaction type to each subtheme*].

*Table 1: Subtheme response ranking by reaction type*

Emergent Themes	Subtheme Ranking	Score	Reaction
Participatory Mgmt.	Mgmt. Techniques	-3	OPTIMISTIC RESPONSES
	Local govt	-3	
	Interest levels	-1	
	BZ facts	-1	
Returns	PES	0	
	Park staff	0	
	SNNP facts	0	
	Army	1	
Community Attitudes	Resources	1	
	Programmatic	2	



	Support		GREATEST FRUSTRATION S
	Monetary Payment	2	
	Resource Conservation	2	
Organization	Participation levels	2	
	Policy	2	
	Land Uses	3	
	Projects	3	
Mechanics	BZ issues	3	
	Research + Education	4	
	State govt	4	
	Funding	4	
Context	SNNP issues	4	
	Capacity Building	5	
	Relationships	5	
	Advocacy	5	
	Other Benefits	9	

## 8 | Discussion

*[See Appendix B for references to the quote examples from interview and focus group responses used below]*

Overall emergent response themes were further broken down into sub themes which are discussed below in terms of their relationship to the four question categories [Appendix A]. Based on the Quantitative Reaction Analysis [Table 1] results, sub themes containing the most optimistic responses were associated with questions in the ‘ecosystem provisioning’ category; while subthemes exposing the greatest overall frustrations were associated with questions pertaining to the ‘urbanization of KTMV’ and ‘BZ efficacy/sustainability.’ Responses related to ‘programmatic structure’ generally fell between reaction extremes. These results provide concrete support of the concerns that the research team anticipated in regards to a more tightly organized buffer zone plan for SNNP.

### Program Structures:

Programmatic structure questions addressed specific objectives related to cultural dynamics, impacts from urbanization, and influences on conservation efforts from the shift to strengthened democratic law in Nepal. This question category primarily drew out the participatory management and organizational response themes. The following headings highlight the subthemes that emerged from conversation responses:

#### Structure of hierarchy

Results reveal that a centralized structure of hierarchy poses a primary concern for benefit distribution and decision making within the BZ area. Underrepresented settlements may

experience difficulties when faced with land use policy changes. Based on these anticipations, most participants in the villages preferred direct cash benefits over communal compensation.

*'Elites will probably receive benefits, but poor people won't get any money out of it.'* (11.2.3)

*'BZ People are not truly receiving the 30-40% benefit compensation from the national parks.'* (11.2.3)

Reports on the quality of relationships with park staff, authority, the army and elites had a certain negative tendency- though the BCN and SNNP relationship appears quite strong.

*'[DOF] personnel rarely come to the village, 1 or 2 times a year only.'* (11.2.4)

*'The National Park authority is quite strict and difficult to work with. They are not very friendly and it is very time consuming to make attempts at working with them.'* (11.2.9)

### **BZ planning process involvement and understanding**

The DNPWC interview representative explained that there had been an 8-year negotiation process for buffer zone planning- but responses from the community leaders and active community members who were interviewed, were generally 1) Unaware that they were now a part of the BZ and 2) Unsure of what it meant to be a part of the BZ. In turn, the communities interviewed did not have optimistic perceptions of buffer zone support due to a perceived lack of governmental effort towards education and the slow timeliness for announcing BZ implementation plans.

*'I learned about BZ regulations only by going to Chitawan BZ areas to learn about what it meant.'* (11.2.9)

*'No, I haven't heard of the buffer zone program.'* (11.2.6)

The national park authorities are positioned to act as intermediaries between local and state governance for community planning and decision making. They aim to support communities during the user group/committee organization and individual management plan development process- though this is one area where an understaffed and underfunded organization may struggle to be as supportive on the front-end of this implementation process. The SNNP staff was functioning with only 34% of their ideal employment during the time of the interview. Community outreach for BZ awareness was thus recognized to be moving very slowly. The park authorities spoke with strong intentions for inclusion and support but were also evidently in need of additional resources.

*'If a community is unable to develop a management plan or constitution,*

*park staff will assist, but we will not make mandates for them.’ (11.2.7)*

*‘Our park staff is making concerted effort to go to every household to educate families about how their lives will be affected by the BZ.’ (11.2.7)*

### **Representation during policy making now & in the Future**

Community groups trend when common needs arise. A variety of locally organized village groups were encountered and represented during the focus group gatherings. For example, Women’s groups frequently formed for financial family support; conservation groups formed when park visitor frequency increased; and community forests were initiated when pressing needs for reforestation were recognized. Based on the success of these independently organized committees, it is apparent that these groups are opinionated and committed to various causes. During the development of BZUG/UC’s, their leaders and members will be likely candidates capable to represent their communities in decision making and management plan development.

*‘I was doing [park] clean-up with 30 other women and from there was asked to work for other women’s groups.’ (11.2.10)*

Based on information of previous BZ issues in Nepal, NGO and community skepticisms were evident in regards to the inclusionary planning and community oriented benefit allocation. Mulkharka was without Dalit (impoverished) settlements, so their representation was limited in our case study- but the community leaders interviewed spoke of ‘elites’ as a separate class of individuals from their own. Despite act amendments, concerns persisted:

*‘If the laws remain as they are, people will not have collaboration or benefits.’ (11.2.3).*

*‘We are fighting for 100% profit for the communities, void of the 40% GoN tax on forest products.’ (11.2.3)*

*“Educated people don’t have the desire to give back” (11.2.10)*

Well-defined community group governance structures became evident during the interviews. Internal organization was discussed mainly with the community forest user group. These organizations make compelling statements about the inclusion of women and local-level investment.

*‘...about 7 years ago, all the 11 people on the committee were women. During that time, we saw significant growth in the forest density.’ (11.2.4)*

*‘If there is the need for a vote, all general members are called to order for a collective, democratic decision.’ (11.2.5)*

*'Our committee meetings have rotations so various generations can participate and learn the experience of committee participation.'* (5;2-4)

The clear majority of women with whom we spoke in the villages were uneducated but had initiated women's support groups or were making other efforts to be involved- despite a lack of formal education. Interviews revealed that the education of women is on the rise based on the younger generations of girls staying in school with hopes of attending college.

Women are active in the field year-round in the Salkote community forest area. Their availability for conversation was limited to the end of their work day, so it was important to consider how these strenuous days impacted their community involvement. Between the two communities interviewed, Salkote openly accepted the input of women and had them lead the community for a three-year term, while the Mulkharka community area was reported to exclude female representation by physically and emotionally making it difficult for women to be involved. Because of such discrepancies across the buffer zone area, the national park system representative discussed intentional inclusion of women by requiring their nomination in community leader roles within the buffer zone user groups. These variances allude to shifting gender dynamics in the KTMV region, but highlight the fact that significant progress regarding the representation of women is still being made.

*'The women have just as much a voice at meetings and are listened to.'*  
(11.2.5)

*'I have a strong will to give back to my community. I take charge to do so- but as a woman, the committee keeps trying to exclude me.'* (11.2.10)

### **Impact from PA to NP shift on organization/community; anticipated or. unexpected**

Discussions resulted in feedback regarding both the strengths and weaknesses of policy development and implementation. When programmatic planning and policy is written from disconnected systems, there is a tendency towards inequitable decision making that stems from a misunderstanding of feasibility for the original intention of the policy. Where local decision-making is set in place from a decentralized governing system, community members agree on terms and can have more direct say and control over how matters are most justifiably handled.

*'Law does not consider people as partners; they are considered as workers and security (employed security forces in the BZ and PA).'* (11.2.3)

The DNPWC assured that there would be zero difference in property rights with the implementation of the BZ, except in the case of community or governmental land (i.e. with school buildings). Though property rights may not be affected, there will be land use changes as well as requests for community participation and planning. Killing wildlife and sources for firewood are issues that Mulkharka and Salkote have already been dealing

with.

*'It was a difficult transition because permission was needed for everything- including bringing water to our houses.'* (11.2.9)

In the national park BZ communities, raksi (alcohol) production and sales are primary sources of income-since subsistence farming has become such a challenge without the ability to control nuisance wildlife. Firewood is the primary energy source for cooking food, and the only resource used in raksi distillation (since it needs to be done outdoors for safety precautions). As land use opportunities become more restrictive for communities, they will likely need more efficient support.

### **BZ Efficacy/Sustainability:**

BZ efficacy/sustainability questions addressed specific objectives related to the potential for community forestry, PES schematic development, changes in households and community lifestyles, property rights, and BZ area programmatic implementation. This question category primarily drew out response themes related to community attitudes, mechanics, and participatory management. The following headings highlight the subthemes that emerged from conversation responses:

#### **Conservation success/challenges**

Community forestry has proven to not only be successful for canopy reestablishment, but profitable as well. Such points could likely inspire communities in the direction of community forestry, but they will need commitments from the government that their efforts will be rewarded instead of taken away, as seen in the past.

*'Communities were [previously] given degraded land- they made it into productive forest, and then the government wanted in on the profits so they reclaimed the land.'* (11.2.3)

As the only national park protected area designated for mid-hills biodiversity, there are special circumstances associated with this buffer zone delineation that will need to be addressed for ultimate success. Reliable funding and a supply of essential resources will be necessary to support the SNNP BZ communities and organizations in these early stages of BZ adoption. The 2015 earthquake caused catastrophic damage to homes in the region and the wall around the park. This unique SNNP wall was built in the 1970's to prevent encroachment of land conversion to agriculture and aids in the prevention of resource poaching. With home reconstruction, rebuilding significant portions of the wall, and protecting village farmers from wildlife intrusions, it seems that the region will need to import materials to support these communities until they are reestablished with the livelihood comforts and security that they once had.

*'[SNNP] Integrity is in trouble; there is no maintenance budget, and much has been damaged/demolished after the earthquake.'* (11.2.8)

*'The government needs to make a fence or we will need to cut down trees to make fences for ourselves- but it is problematic for forest degradation'*  
(11.2.4)

### **Capacity building and knowledge of international best practices in conservation and ecological monitoring & BZ designation/policy/goals**

The rich history of ICDP's in Nepal has afforded a significant number of research projects on best practices for community and environmental support. The FECOFUN mission is to transform the well-versed knowledge from the Terai, to this sole mid-hills national park area, as well as the Himalayas. Knowledge transfer of community organization and management techniques is likely some of the best support to offer communities since a persistent lack of funding has inhibited the process of community support.

*'So many researchers have come to study our communities, but not enough support has come in from the government or others to actually change anything.'* (11.2.11)

### **Relationships**

Relationship structure and quality can play a significant role in the success of participatory management practices. Historic and current relationship dynamics seem to be creating both reasons for concern and optimism for SNNP BZ progress.

*'Community members are starting to come to park headquarters (rather than DFO) for related issues. It seems a good sign of building trust.'* (11.2.7)

*'Elites were calling me derogatory names as in 'trash collector' on the street, with a disrespectful tone. I was helping the park.'* (11.2.10)

*'Armies are not socially interactive with communities and this creates a barrier for progressive relationships.'* (11.2.3)

### **Management practices**

Sound management practices were at work in the villages interviewed for this study. As a community forest and national park area community, these groups had been at work trying to support conservation efforts well before the BZ was implemented. They recognize the benefits of organic farming and make sincere efforts to follow wildlife protection laws and forest regulations.

*'Pesticides and insecticides adulterate the water.'* (11.2.10)

*'Porcupines eat our crops- so every year we must plan for a certain amount to be destroyed.'* (11.2.9)

*'Alcohol made in the valley is tarnished by chemicals; product from this area is revered for its purity.'* (11.2.11)

Some problematic issues occur in land management attempts, so further education on environmental protection and best practices within the communities would likely help to raise awareness.

*'We burn the plastic and trash as a means of disposal and clean-up. In areas where I can't reach trash, I just light the area on fire to burn the rubbish'* (11.2.10)

*'If we remove the invasive plants where the deer use land for grazing; thorny species come.'* (11.2.8)

*'[During water treatment for the capital] Yes, the same amount of chlorine is always added.'* (11.2.6)

Some compromises were made during the earthquake aftermath, but cutting was still not allowed at the time of the fuel outage several months prior to the interviews. Consequences for breaking laws or overstepping community forest regulations do prevent a lot of criminal activity. When community members set the restrictions, govern themselves, and hold each other responsible, there seems to be concerted effort for responsible practices.

*'When people illegally cut trees, they are generally fined at Rs 100 for a local caught during rounds, and Rs 500 for a person of the CF community being caught.'* (11.2.4)

### **BZ regulation adoption and livelihood practice adaptation**

Certain cultural heritage traditions pose threats to the integrity of the forest biodiversity and water quality in SNNP.

*'When Bolbom pilgrims take their annual pilgrimage to the Bagmati River in SNNP, they defecate in or around the water.'* (11.2.11)

*'Raksi was originally a cultural necessity but later became commercialized and profitable to produce.'* (11.2.10)

### **Knowledge transfer**

Communities and their leaders remain skeptical about buffer zone implementation. With stronger efforts in education and building awareness, comfort and interest levels are likely to increase. BCN conducted a review and found that certain communities ultimately came back around to the buffer zone after feeling left out. There is a strong need for striking a balance to help people trust the scheme and creating one that will truly be supportive and representative of all BZ communities.

*'Plain and simple, people don't want to be part of the Buffer Zone, no matter how we negotiate. '(1; 3-3)*

### **Institutional or financial barriers**

Locally organized financial cooperative programs have supported many families and boosted community involvement. Participatory management efforts have been underway in the study areas, but lack of funding and recognition creates barriers between the government and communities. Many of the community leaders we spoke with desire healthy lifestyles, clean communities and the ability to maintain their livelihoods at home. Committed contributors to National Park protection are seeking support so that they may continue.

*'The National park did not support or cooperate with helping us to get uniforms, so we protested and stopped cleaning certain areas.'* (10; 3-1)

Financial and institutional barriers for these BZ communities push them to rely on illegal activities to provide for their families. Hardships under strict regulations and efforts to prevent deforestation make the ability to farm very difficult-because of crop damage by wildlife. While tourism in SNNP has been on the rise, this increases efforts for communities to maintain the land but also present opportunities for eco-tourism practices that could afford some financial benefits- though the competitive salary earned from high-quality raksi production holds many people to this practice.

*'Raksi earnings are Rs 600/day when you produce from morning to night.'* (11.2.10)

*'If the community sells firewood, we make decent money, but really we do not have a large dependency on firewood.'* (11.2.4)

*'[Governmental funding of] Rs 5,000/mo. for thinning the forest was initially received to provide food for the community but that money no longer comes.'* (11.2.4)

Continued efforts for understanding livelihood needs and circumstances of the SNNP BZ communities will be necessary to support them as local-level participants. While the region may not seemingly present interesting research related to charismatic megafauna and more pristine natural areas, community linkage studies are necessary to prevent further land degradation and to promote reforestation. Affiliated partners at BCN began collecting data for ecosystem services, but encountered some preventative issues for thorough studies.

*'There seems to be little interest for studies in SNNP.'* (11.2.1)

### **KTMV Urbanization**



KTMV urbanization questions addressed specific objectives related to the function and structure of conservation efforts. This question category primarily drew out conversations related to participatory management, returns and contextual response themes. The following headings highlight the subthemes that emerged from conversation responses:

### **Foreseeable future for village youth**

Environmental and economic roadblocks have hindered the ability of family units to remain in their villages. These land and cultural changes in recent decades, due to land use changes and restrictions, creates struggle to legally support families. Subsequently, employment and educational opportunities are now primarily sought outside the BZ villages. Remittance and commutes are common which means younger generations are participating less in land management. Many interviewees do not expect their children to live in the community as they age because of limited income generating opportunities- and this can be anticipated as a reduction in able participants for land management.

*'Young men, the millennials, are all going to the city and working or receiving education there. '(11.2.5)*

*'Children are encouraged to leave the village because of the lack of economic opportunities if they stay.' (11.2.11)*

*'Many local boys join military.' (11.2.11)*

We asked the young ladies during the focus group in Salkote if they would interview with us in English, but none of them were comfortable nor confident enough to do so.

*'So much educational literature is written in English, so if you do not have a sufficient education in the language, there are likely to be struggles.' (11.2.5)*

### **Institutional relationships for research, education and training in biological resource management**

The importance of programs and educational opportunities have been recognized across the spectrum of the interview groups, though. Some efforts are underway to support children who are interested and willing to remain as a part of their native villages, despite the popular push towards the capital.

*'If we can inspire a love of nature, then our youths are more likely to seek work in Nepal instead of fleeing for the middle east.' (11.2.1)*

### **Ecosystem Service Provisioning:**

ES provisioning questions addressed specific objectives related to property rights, and programmatic implementation. This question category drew out a more generalized spread of response themes. The following headings highlight the subthemes that emerged from

conversation responses:

### **PA management techniques/involvement/protocol/chain of command structure**

Common understandings are that the government prefers greatest power and control over land and systems of management. Though when the government is overwhelmed by their areas of control, successful management is compromised and there is a tendency for public opinion and support to falter. Subsequently, the poor treatment of citizens who have worked to enhance quality of life and environmental conditions in local communities seem only to inflate issues for the government. The willingness to decentralize power to the people or local parties has supported a reduction in the risk involved with misrepresentation and appears to accelerate rate of action for environmental support, it is thus recommended that the process of decentralization for land use rights continues.

### **Land management independence**

Community forest participation has seemed to slow with a reduction in government support. When Salkote received saplings to plant for reforestation or an income for thinning the forest, the CF was successful and profitable. Women have since had to go back to attending to the fields and the committee is now run by the men of the village.

### **SNNP revenue sharing budget modifications for communities/organizations**

The BZ communities interviewed need financial support, as their reliance on raksi production and field work are not sufficiently supply for home repairs, educational ambitions, and putting food on the table. The SNNP BZ system will require committed families in conservation efforts based on the current conditions and foresight for Kathmandu. With the intention of repaying community efforts with a portion of park revenue, the anticipated support is less than mediocre.

*'BZ funds will help a lot financially, but not enough, but some is better than nothing.'* (11.2.9)

*'GoN attempted a Forest Act amendment so the government could be more strongly sided in forest profits- but parliament disregarded these proceedings.'* (11.2.3)

Not only do the communities appear to be struggling financially, but SNNP staff also live in difficult conditions. One concern is that the army is also receiving benefit from the park revenue- it has been argued that their funding should come from national budgets instead.

*'Unimpressive motivations and facilities for people to stay, they leave if they are offered greater opportunities.'* (11.2.8)

### **Programmatic opinions & desirable/anticipated support**

Two well-intentioned examples that simply didn't work for the community were experimented with, but later abandoned. One was the handicraft purse production

program, started with funds and training from Action Aid; the other was a beekeeping initiative for honey production.

*'I could produce 1 small bag/day, but with age it now takes me even longer. The project didn't stick because we earned less than Rs 600/day.'* (11.2.10)

*'A larger bug was eating the non-native honey bees, so this bee keeping project failed.'* (11.2.9)

Communities and supportive external organizations have explored various programmatic avenues for livelihood support in the SNNP BZ region, but have not yet found anything to work long-term for the villagers.

*'The people here desire alternative income sources, especially PES. For example, charging an extra Rs 5 per bottle of water would equate to Rs 500/day for all the families- this would be enough to sustain our livelihoods without needing to produce alcohol.'* (11.2.10)

*'If we were a CF, then there might be some helpful benefits, but otherwise, no.'* (3; 2-4)

*'We will need assistance developing infrastructure and amenities to support increased tourism.'* (11.2.11)

*'We would invest additional funds into adult literacy programs for the women; entrepreneurial skill development; use it to promote goat or veg. farming; and/or animal husbandry on a commercial scale.'* (11.2.5)

## **9 | Conclusion**

While it is evident that the knowledge and research efforts exist for applying sound buffer zone planning, it appears as if the goals set by the government are impractical for the issues that communities are facing. With roughly 24% of the country's land allocated under the BZ program, it is logical that villagers being asked to participate must have their basic needs met before or in conjunction with the level of participation needed and requested from the government. By adhering to the needs of communities and BZUG's, funding for programs can be more properly allocated- and this will support the building of strong relationships and inter-organizational trust. Simultaneously, respect for the bottom up and top down governing systems is essential for all BZ stakeholders, because both are significant contributors to the success of community survival in the buffer zone. Healthy communication and strong relationships are necessary to support the needs all various stakeholders in a BZ program.

Insight from external case study reviews, as well as from conversations in this study, highlight the fact that without access to larger social networks, indigenous communities have limited

options for a legal existence. Their land rights, education, economic opportunities, and political rights are all inhibited by the buffer zone program, so external support to compensate for these losses is essential.

While the SNNP BZ management plan and the government forest agency worker 1 presented a strong stance on gender inclusive management, only time, policy and enforcement will tell if these goals for stronger representation will be realized. Better representation and responsible benefit distribution is essential to the success of the SNNP BZ. Progressive cultural dynamics in the capital are flooding to the BZ communities- women are better educated, and the daylighting of elite capture has persisted. Community members are aware of their rights, the challenges they are up against, and the success of advocacy and persistence.

Despite the reported lack of community understanding for forest and wildlife protection in the BZ area eight years ago (Pandey, 2009), the interviews and focus groups from this study provided an alternative reality. They are generally aware and accepting of their laws- but community members in Mulkharka and Salkote were requesting a truce that, for example, by holding up on their end of the deal by allowing for wildlife depredation- the government would also follow the law and provide the compensation promised for the damage or loss of life that incurred from supporting wildlife protection.

The impression from the research site in Sundarijal is that non-existent community consultations during “national legal instrument” development will ultimately lead to village retaliation or un-accreditation of policies that strip communities of their right to survival. Luckily, it appears that this type of community response does have legal backing based on the Constituent Assembly paper submissions in 2008 and subsequent recognition of indigenous people’s rights and needs. Such research information, as provided by the paper related to this information, will likely be influential during the federalization process of developing Nepal’s constitution.

At the time of data collection for this study, SNNP was functioning with staff levels at only 34% their optimal support. Communities had not been directly contacted with information about their rights and regulations within the BZ, nor had a request from government reached them about their willingness to participate in land management that would support SNNP. Expectations, planning techniques, and user group/committee establishment had not been introduced. Without these essential pieces of a BZ plan, let alone the support of communities, a BZ program is going to struggle to take off. The only foreseeable means to success is that the government does everything in their power to provide BZ communities with all their basic needs and conservation requests so that they can effectively manage the land on-the-ground, in numbers that will be impactful and timely.

Research results ultimately confirmed the most pressing issues for SNNP-BZ communities today, and highlighted strengths for community support that could be built upon for greater future success. Advocacy for community rights, relationships between BZ participants and government affiliates, and capacity building for villagers were all primary importance for

strengthened support. Common enthusiastic responses promoted the management techniques of local communities based on their traditional land connections and knowledge; local governing practices that supported community efforts; and interest levels of local people to be involved in their communities and buffer zone planning. By raising awareness of the challenges and opportunities in the SNNP BZ, stronger support for a more efficient ICDP program will only be more feasible.

Times are hard and health conditions are likely to worsen if environmental amelioration is not properly addressed for the Kathmandu Valley. Based on findings of this research, if the Mulkharka community is relocated out of the park, the maintenance support will be eliminated- and with increased tourism/visitation (evidence), the management pressures of the Sundurijal area will increase significantly. Removing community groups, families, and tradition out of Mulkharka is a decision that should be backed by fully well-considered goals and understandings of village situations on-the-ground; not to mention with the financial and emotional support to substantiate an honest operation that will promote a stronger sense of unity and trust for the citizens of Nepal.

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## 11 | Appendices

### 11.1 Appendix A: Questionnaire

*The following questions guided focus group/interview conversations to address specific research objectives-supporting the assessment of SNNP-BZ programming and implementation.*

SEMI-STRUCTURED INTERVIEW/FOCUS GROUP QUESTIONS	
QUESTIONNAIRE THEMES	CORRESPONDING INTERVIEW QUESTIONS
Policy	<ul style="list-style-type: none"> <li>● What is the structure of hierarchy for political/community decision making &amp; benefit distribution?               <ul style="list-style-type: none"> <li>○ Please describe the roles and demographics of people in these leadership/participatory roles.</li> <li>○ Please describe the efficiency of the system in place.</li> </ul> </li> <li>● What impact has the shift from PA to NP had on your organization/community? Was this anticipated?</li> <li>● How are communications most frequently carried out?</li> <li>● What is your role in the SNNP BZ and how do you wish to be perceived by others?</li> </ul>
BZ Efficacy/Sustainability	<ul style="list-style-type: none"> <li>● What is the rationale for the organization/community behind the inception of the BZ program? Describe your involvement in/understanding of the planning process.</li> <li>● Does the organization/community keep abreast of international BP's in conservation &amp; ecological monitoring to retrofit your system of involvement with mgmt. practices in the BZ/SNNP? How is this knowledge transferred throughout the different stakeholders?               <ul style="list-style-type: none"> <li>○ Describe changes you have implemented or recommended.</li> </ul> </li> <li>● In your opinion, what have been the biggest local conservation successes to date? What are some of issues challenging the sustainable management of PAs/NPs/BZs, and what steps has the organization/community taken to manage or offset these issues?</li> <li>● Do you recognize any institutional or financial barriers that exist that might be inhibiting successful conservation practices?</li> <li>● What has the organization's/community's experience with participatory management within BZ/NP areas been like?               <ul style="list-style-type: none"> <li>○ What are some keys to success for the relationships involved in preservation/conservation, and when do they go wrong?</li> </ul> </li> <li>● What type of support does your organization/community anticipate or think will be necessary for a successful SNNP BZ program?</li> </ul>
BZ Efficacy/Sustainability	<ul style="list-style-type: none"> <li>● From your experience with communities in the area, what are the biggest challenges that you think they/you will face in adopting buffer zone regulations and adapting livelihood practices?</li> <li>● How well informed are members of your organization/community on buffer zone designation/policy/goals?</li> </ul>
KTM Urbanization	<ul style="list-style-type: none"> <li>● Describe the perspective of your organization/community on the significance of the SNNP being in such close proximity to the capital.</li> <li>● Explain changes you are anticipating from the urbanization of KTM and the Melamchi Water Supply Project on SNNP/BZ management requirements.</li> <li>● Are there any efforts underway to strengthen relationships with institutions responsible for research, education and training in biological resource management?</li> </ul>



	<ul style="list-style-type: none"> <li>• Describe your culture and the changes it has faced in recent decades</li> <li>• <i>What do you see as the foreseeable future for your child?</i></li> </ul>
ES provisioning	<ul style="list-style-type: none"> <li>• How closely does your organization/community participate in day-to-day matters of protected area management? On what matters is external support mandated to intervene? What is the protocol or chain of command regarding such issues?</li> <li>• What programs or practices have been particularly effective in supporting livelihoods for park-based communities? Describe future opportunities for growth as well as associated challenges.</li> <li>• How will BZ revenue sharing modify budgeting in the organization/community? What level of support is anticipated from the implementation of a BZ?</li> <li>• What is your perspective on PES schemes within buffer zone communities? What is your take on the government establishing national guidelines for introducing such mechanisms, and how do you think they will affect conservation efforts in protected areas?</li> </ul>

## 11.2 Appendix B: List of interviewee specifics by organization/village

### Key-Informant Interviews:

Executive Council - Bird Conservation Nepal (BCN)

Monitoring & Eval. Officer -Dept. of National Parks + Wildlife Conservation (DNPWC)

Coordinator (Sundarijal) - Nepal Environment + Tourism Initiative Foundation (NETIF)

Unnamed representatives - Kathmandu District Forest Office

Plant Operator - Sundarijal Water Treatment Plant (KUKL)

Bandari Branch Personnel- KUKL (water treatment corporation)

Committee Member - Federation of Community Forest Users Nepal (FECOFUN)

Government Forest Agency Worker 1 - Shivapuri-Nagarjun National Park

Government Forest Agency Worker 2 - Shivapuri-Nagarjun National Park

### Community Focus Groups & Semi-Structured Interviews

10-person focus group (all male) - Salkote community forest

4-person focus group (all female) - Salkote community forest

6-person focus group (all female) - Salkote community forest

4-person focus group (3 male/1 female) - Mulkharka village

6-person focus group (all female) - Mulkharka village

10 interviews (4 male/6 female) - Mulkharka village

Community Forest Chairperson 1 - Maruwadanda community forest

Community Forest Chairperson 2 - Aitabare community forest

11.2 **Appendix B:** Continued

*Dates of interview & Code # for quotation reference*

<b>Interview Code (11.2.#)</b>	<b>Date</b>	<b>Organization</b>	<b>Spokesperson</b>
1	6/20/16	BCN	Executive Council Focus Group ( <i>4 people</i> )
2	5/27/16	DNPWC	Senior Staff Personnel
3	7/20/16	FECOFUN	Executive Committee Member + ForestAction Rep.
4	7/17/16	Salkote CF	Men's Focus Group ( <i>10 people</i> )
5	7/17/16	Salkote CF	Women's Focus Group ( <i>8 people</i> )
6	7/5/16	KUKL	Plant Operator 1
7	6/22/16	SNNP	Government Forest Agency Worker 1
8	7/13/16	SNNP	Government Forest Agency Worker 2
9	7/2/16	NETIF	Community Leader (male)
10	7/5/16	Mulkharka	Mixed Focus Group ( <i>1 female; 3 males</i> )
11	7/13/16	Mulkharka	Women's Focus Group ( <i>7 people</i> )
12	7/13/16	Mulkharka	Short Interviews ( <i>6 females, 4 males</i> )

### 11.3 Appendix C: Emergent Themes and Sub-Themes from Interview Responses

Theme	Sub-theme	Description
Participatory Mgmt.	1. Projects	Specific programs/projects that have/have not worked or are being experimented with (income generation/financial support/job creation, environmental conservation, community development, literacy, community capacity building, collaborative/relationship development).
	2. Programmatic Support	Who is supporting community development, what/how they are doing it, and who/what should be more efficient.
	3. Research + Education	Where and why efforts are needed or have been exercised + their outcomes.
	4. PES	Where it is headed, who is involved, and what is needed.
RETURNS	1. Monetary Payment	Income sources (subsistence farming and raksi), BZ stipulations & park revenue, loans from community groups, remittance, programs that benefitted the community financially, injustices
	2. Resource Conservation	The need for funding to properly maintain parks/protected areas; trees and wood; land uses/degradation concerns
	3. Capacity Building	Significance of youth and adult education (local vs. outsourced); knowledge transformation; barriers
	4. Other Benefits/Support	Perks/challenges of CF in the SNNP BZ area; water resources provided & water related issues; infrastructural needs
COMMUNITY ATTITUDES	1. Relationships	Conflicting reports on the quality of relationships with park staff, authority and elites- though BCN and NP relationship is strong.
	2. Land Uses	Activity types in the BZ and SNNP
	3. Interest Levels	BZ skepticisms/pessimisms, female support, perceived government interest in power
	4. Participation Levels	Negative perception of gov/NP due to weak timeliness of BZ announcement; women are active in the field year-round; Park staff and KUKL contract
	5. Management Techniques	Farming, Conservation, national park, and water mgmt. techniques discussed; methods for stakeholder engagement also mentioned
ORGANIZATION	1. State Government	the government prefers greatest power and control over land and systems of management. While they are sometimes too overwhelmed to manage their areas of control successfully, they only lose footing in public opinion and support when they poorly treat citizens who have worked to enhance quality of life in local communities. Decentralizing power to the people or local parties is being supported for a reduction in risk and ambiguity and to accelerate rate of action.
	2. Local Government	Strong and direct understanding of the inner workings of local governance systems- people were very familiar with the structure and were often participants. These discussions commonly mention the importance of the role of women and how their inclusion. - makes large statements about how invested people are at the local level.
	3. Park Staff	In position to act as intermediaries between local and state governance/decision making.

	4. Army	The army is under resourced in SNNP though they harbor more soldiers than other national parks, many of whom came from local families. Conditions are reported as difficult for the soldiers here.
MECHANICS	1. Policy	Strengths and weaknesses of policy- those created from disconnected systems have a tendency towards inequitable decision making that is at too far a scale for practicality and successful functionality for the original intention of the policy. Where local policy is set in place, community members agree on terms and can have more direct say and control over how matters are most justifiably handled.
	2. Advocacy	To support the side of communities in conservation efforts, advocating for the restoration of people's rights- they have proved themselves responsible and capable, though education for women is still a pressing issue. Women are very aware of their surroundings and capable to act in conservation efforts, but their repression through lack of education has restricted their voice- this must continue to progress. People want power back from the broken system so they can protect their homes. Things in writing do not withstand the corruption of this government.
	3. Funding	Locally organized financial cooperative programs have saved many lives and boosted community involvement. Women and other underserved need to be well represented in community programs and governance, otherwise they seldom receive the support they need.
CONTEXT	1. BZ Facts	Contextual information
	2. BZ Issues	It is difficult for families to remain in the village because of environmental and economic roadblocks.
	3. SNNP Facts	Contextual information
	4. SNNP Issues	Lack of funding and increased environmental issues
	5. Local Resources	Lost access to lime for water treatment

#### 11.4 Appendix D: Coding Table

##### *Interview Analysis for Subtheme Reaction Type and Frequency*

THEMES																									
SUBTHEME CODE	Participatory Mgmt				Returns				Community Attitudes					Organization				Mechanics			Context				
1	Projects				Monetary Payment				Relationships					State govt				Policy			BZ facts				
2	Programmatic Support				Resource Conservation				Land Uses					Local govt				Advocacy			BZ issues				
3	Research + Education				Capacity Building				Interest Levels					Park staff				Funding			SNNP facts				
4	PES				Other Benefits				Participation levels					Army				n/a			SNNP issues				
5	n/a				n/a				Mgmt Techniques					n/a				n/a			Resources				
Interview Analysis Indicating: if a subtheme was discussed, the reaction type, & the number of responses																									
Interview #	1	2	3	4	1	2	3	4	1	2	3	4	5	1	2	3	4	1	2	3	1	2	3	4	5
1	-1	0	2	0	0	x	x	x	-1	x	-2,1	x	x	x	-1,1	x	x	0	x	x	-1	x	x	x	x
2	x	-1	x	x	0	x	x	x	1	0,2	x	-1,1	0	1,0(4)	0	1	0,1	0(3)	-1,1	0	0(4)	x	0(3)	1	x
3	0	0	0	x	3	x	-1,0,3	2	2	x	-1,2	x	0	-2,5	0	x	-1,1	-3,0,5	-5,6	x	-1	x	x	x	
4	1	1	0	x	3,0,0,1	0	1	1,0,0,4	0	0	-1,1	-1,1	-4,2	x	-1,0(3)	x	x	2,0(6)	x	0	0(6),1	x	x	x	
5	0	x	0	x	-1,0,1	x	0,2	x	x	x	x	x	2,0,0,1	-2,0,1	x	0	x	x	-1,0	-1,1	-1	x	x	x	
6	x	x	x	x	x	x	x	0,0,3	x	0	0	0	0(5)	x	0,1	x	x	x	x	0	0(7)	1	x	x	
7	0	0	x	0	-1	-2,0	-1	0	-2	x	-2,1	1	-2,1	x	x	-1	x	0	x	x	0	x	x	x	
8	0	0	x	x	0	-2,5	x	x	x	0,0,1	x	x	1,0,0,2	1	x	-2,2	-1,1	0	x	0,0,1	x	x	0(3)	2	
9	1,-1	0	x	0	3	x	x	0,2	1	x	x	-1,2	-1,1	x	0	x	x	1	x	-1,0,2	0	1	x	1	
10	4	1	x	0	-3,1,0	-1	x	x	4	x	-1	2,0,0,3	-2,2	x	-4,0,1	x	x	1	4	-1,0,5	x	x	x	x	
11	-1	1	2	x	0,0,0,1	2	1	-1,0	0	0	1	x	-3,0,3	x	x	x	0	0(4)	x	-1,0	0	1	x	x	
# of Comments	16	11	13	11	29	14	11	20	13	9	14	21	38	14	18	6	7	34	19	20	23	3	6	4	
Score	3	2	4	0	2	2	5	9	5	3	-1	2	-3	4	-3	0	1	2	5	4	-1	3	0	4	
Theme Total	9				18					6					2				11			7			

Reaction Key	
-1	Positive
1	Negative
0	Neutral
x	None