UNIVERSITY OF COPENHAGEN

Where Only Rhinos Roam

Governance, Participation, and Resource Management: A Deep Dive into the Ward 10 User Group of the Krishnashar Buffer Zone Community Forest

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Word Count: 10,997

Author's note: The title, "*Where Only Rhinos Roam"* refers to one of our observed results during the fieldwork. It was found that since the forest had become denser, wildlife has increased, specifically the presence of Rhinos, which has led to many forest users decreasing their frequency of forest visits due to the fear of encountering them.

I cleared that forest with my gaze
thinking it useless to render it so, my eyes
turned back immediately.
The forest was not blessed
with the security, solitude and pleasure
I thought there to be
I could not pass through that forest.

Manju Kanchuli

Translation: 1998, Wayne Amtzis and Manju Kanchuli
Exerpt from: TWO SISTERS
Publisher: Book Faith India, Delhi, 1998

Table of Contents

List of Figures

List of Tables

Work Distribution

Section	Main author	Contributing author
Abstract	Erin	All
Acknowledgements	Andrea	All
1. Introduction	Nghilinawa, Andrea, Alexandra	All
2. Methodology	Erin, Nghilinawa	All
3. Results		All
3.1 Governance	Eduarda	All
3.2 Participation	Eduarda and Alexandra	All
3.3 Collection of Environmental Products	Nghilinawa, Elena	All
3.4 Conservation Efforts	Andrea, Elena	All
3.5 Changes in Forest Use	Elena	All
4. Discussion	Alexandra, Erin, Andrea and Eduarda	All
5. Conclusion	Eduarda	All

Abbreviations

BZCF	Buffer Zone Community Forest
BZCFUG	Buffer Zone Community Forest User Group
BZMC	Buffer Zone Management Committee
BZUG	Buffer Zone User Group
BZUGC	Buffer Zone User Committee
CBC	Community-based Conservation
CF	Community Forest
CNP	Chitwan National Park
DFID	Department for International Development
DFO	District Forest Officer
DNPC	Department of National Park and Conservation
EPs	Environmental Products
FAO	Food and Agriculture Organization of the United Nations
NP	National Park
NPR	Nepalese rupees
OP	Operational Plan
PA	Protected Area
SLF	Sustainable Livelihoods Framework

List of Definitions

Access	Access, as defined by Ribot and Peluso's Theory of Access (2009) is: "the *ability* to derive benefits from things".
Buffer Zone	Buffer Zone is an area in and around protected areas (PAs) that can be considered as an impact zone, and includes the area directly affected by (i) the prohibited use of forest products of PAs, (ii) the grazing in the PAs, and (iii) the wildlife (e.g., crop damage) of PAs regularly or occasionally (Thing and Poudel, 2017).
Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use. (FAO, 2020).
Buffer Zone Community Forest	Buffer zone community forest (BZCF) is a form of decentralized and community-based forest management in the buffer zone (BZ) with several key objectives, such as (i) to address the local communities' needs and demands of forest resources (e.g., fuelwood and fodder) and generate income from tourism, (ii) to reduce the dependency of local population on the PA resources and thereby mitigate the pressures on PA forest resources and eventually improve biodiversity and wildlife habitat restoration, (iii) to conserve forest as extended habitat for the wildlife, (iv) to motivate local communities for PA management, biodiversity conservation, forest management, and (v) to eventually resolve park-people conflicts over resource use (Straede and Treue 2006) and thereby harmonize 'park-people' relations (Thing and Poudel, 2017).
Community Forest	Community forest means the national forest handed over to users group pursuant to section 25 for the development, protection and utilization of common interest in the interest of the community (Forest Act, 1993).
Household	A household is defined as a group of people (normally family members) living under the same roof, and pooling resources (labour and income)" (Smith-Hall et al. 2018, p. 13).

Environmental Products	As defined in our survey: all the non-cultivated products that can be collected from the community forest, from the buffer zone and in non-private land.

Local Quantity Conversions

Environmental Products Collection Quantities:

Local Name	**Conversion**	**Notes**
Mutha	bundle of edible plants - weight varies (approx. 500g)	For edible products (i.e. ferns)
Bhari	= 30 - 50 kg	Baskets for fuelwood collection

Abstract

The Nepal Forest Act of 1993 signified the legal delegation of forest resource management authority from the central government to local communities and forest users (Acharya, 2002). Community forestry is now widespread throughout Nepal, with an estimated one third of the country's forested land being managed by communities (Paudel et al., 2022). With Protected Areas (PAs) also covering 23.3% of Nepal's land (Dixit et al., 2024), a Buffer Zone Programme was implemented in 1992 as part of the National Park and Wildlife Conservation Act, to achieve a balance between conservation and the sustainable use of natural resources (Dixit et al., 2024). This research project aims to explore the use, governance and community participation in the management of the Krishnashar community forest, located in the buffer zone of the Chitwan National Park. A mixed methods approach was adopted, consisting of household surveys, key informant interviews, transect walks and a focus group discussion. One key result was the mapping of the complex and hierarchical governance structure surrounding the Krishnashar community forest. Generally low levels of community participation in the management of the community forest were found. However, despite the heavy restrictions placed upon the use of environmental products, user group members were found to still be heavily reliant upon such products, in particular fuelwood. Many participants found that their subsistence needs are not being met under the current management regime, which highlights a key theme of this research project, namely the struggle of balancing conservation with sustaining local livelihoods and development.

Acknowledgements

Firstly, we would like to thank our translator Anjana, and the teachers Bikash and Khanal who made this project possible. Our homestay mothers Tika and Netu who kept us well fed throughout our time in the field and made us feel so welcome. We'd also like to thank the Ward Officer, Forest Office, buffer zone community forest user group committee and the Lamnichar Chairman who all dedicated their valuable time to our project. Our gratitude also extends to all the participants of our surveys and focus group, as well as the drivers. Thank you also to the whole Chilaha community and homestay programme for making our experience so smooth and enjoyable. Finally, we'd like to thank Marième, Christian and Dorette for organizing the trip and providing guidance throughout.

Secondly, we would like to acknowledge our own bias and positionality going into this research. Our initial synopsis proved to be inadequate for the reality we found, which shows how our own preconceptions influenced our research framework. However, upon arrival, we adapted our research ideas and approach to better align with local realities. As a group of six women, our perspectives on gender are inevitably shaped by our own experiences, which we must consider when reflecting on results and interpretations, as well as the interactions we had with the local community members. Additionally, our position as foreign researchers, or "outsiders", with no preliminary understanding of the Nepali language, meant that all information was mediated through translation. This prevented us from accessing firsthand knowledge and information directly. We therefore acknowledge that the language barrier, as well as complex social and cultural dynamics, coupled with the limited timeframe of the fieldwork, directly influence our understanding, and, consequently, also our findings.

1. Introduction

If you are a tourist taking a safari within the buffer zone (BZ) of the Chitwan National Park (CNP), and your point of entry is through the Krishnashar buffer zone community forest (BZCF), you most likely will have come across this sign:

Figure 1. *Photo of the welcome sign of the Krishnashar forest office to the buffer zone of the Chitwan National Park.*

"Together, let's protect our natural treasures" is stated in exclamation points. The sign is part of a larger open-aired information center about the CNP, its ecosystem, endangered species and the overall achievements regarding conservation in the area since the previous decade. Underneath the signs are the logos of various international NGOs supporting the projects described on the signs.

Established in Nepal in 1973, the CNP was the first of its kind in the country and has "extensively utilized buffer zone programmes as a key conservation and management strategy" (Dhakal and Thapa, 2015). The idea of buffer zones was implemented in Nepal during the National Park and Wildlife Conservation Act of 1973, which brought both the concept and its

aligning perspectives together (Bhandari and Jianhua, 2017). One of the principal objectives was to form a partnership between the park and local people in biodiversity conservation which can be seen as aligning with the concept of community-based conservation (CBC), where the focus is on the participation of local people and their inclusion, often through financial incentives, in conservation and management activities (Campbell Vainio-Mattila, 2003).

1.1. Nepal's Conservation Approach

Nepal has been regarded "as one of the leaders among developing countries in setting conservation priorities" (Agrawal and Ribot, 1999; in Jones 2007) and has additionally embraced a community-based conservation approach through governmental support. CBC is a conservation theory that emerged as a shift in conservation practices and policies, which can be followed back to the World Parks Congress in Bali, Indonesia in 1982. Here emphasis was laid on the devolution of power to local communities and the need for their participation in managing protected areas (PAs) (Baral and Heinen, 2007). The overall idea of CBC is the active involvement of local communities, with the assumption that local participation leads to a more effective and equitable outcome, as Baral and Heinen (2007) argued in their comparative study of two user groups of buffer zone areas in the Nepalese Terai. This research focuses on the effectiveness of a decentralized participatory conservation approach compared to more traditional, centralized models.

A key focus of CBC is the effectiveness that these benefit-sharing programs have had compared to approaches like "fortress conservation"[1] or the "fences and fine"[2] perspectives, which do not integrate locals into decision-making processes and attempt to keep nature and humans separate in the name of conservation. Measuring this effectiveness has been explored in Dixit et al.'s recent 2024 paper *Effectiveness of protected area revenue-sharing program: Lessons from the key informants of Nepal's buffer zone program,* which looks specifically at the buffer zone programs implemented around Nepal's protected areas. Their findings have suggested that these programs have been effective, but could be improved if local autonomy, conservation education and wildlife conflict compensation were enhanced (Dixit et al. 2024).

[1] "The creation of protected areas for terrestrial or marine wildlife by the coerced displacement or exclusion of the existing inhabitants. People may be evicted, their land may be seized, and customary rights to water, fishing, hunting, and resources may be curtailed." (Rogers et al., 2013)

[2] Commonly referred to as the "fence and fine" approach/perspective, meaning to fine or castigate those who cross the boundary (of a fence/wall) into a protected area.

To further understand Nepal's national parks, community forests and buffer zones, a brief introduction to their establishment will be presented. The forests of Nepal were nationalized in 1957, and it is believed during this time heavy deforestation took place as people felt their forests had been taken away from them, resulting in a lack of incentive to maintain them (Acharya, 2002). Due to growing concerns of deforestation from communities and in an effort to prevent further degradation and create sustainable forestry habits, the government implemented community-forestry in 1978 (Gautam et al., 2004). Subsequently, in 1993 the Forest Act was introduced. This act provided full authority to the user groups for the management of forest resources (Acharya, 2002). The act recognized the dominant role of local people in the decision-making process and outlined the ground for local people to benefit from managing the forests (*ibid*.). The act intended to give ownership of forest resources back to the people in an effort to attain social and economic development whilst promoting a healthy environment and ensuring the development and conservation of forests and the proper utilization of forest products (Nepal Law Commission, 2019). Despite community forestry being quite successful in the hilly regions of Nepal, it was found through studies in the western Terai region, that the level of participation of lower castes and females in decision-making was low and less, compared to middle and upper castes and males (Gauli and Rishi, 2012).

As indicated above, one of the practical applications of CBC is seen through the community forestry program, specifically within the buffer zones of National Parks. Benefits of the buffer zone, as argued by Jones (2007) are that the BZ not only serves as a protective barrier for biodiversity but also provides local communities with opportunities for sustainable resource use and income generation (Jones, 2007). Furthermore, PAs cover about 23.3% of Nepal's total area (Dixit et al. 2024), with buffer zones being an integral part of the protected area concept, contributing to the ability to conserve the biological and resource values (Hall and Rodgers; 1992).

In Nepal, the BZ program has been implemented in 12 national parks and 1 wildlife reserve, which vary significantly in area coverage. The management of BZs is governed by the Buffer Zone Management Regulation of 1996, which has a structure consisting of three levels of BZ institutions: Buffer Zone User Groups (BZUGs), Buffer Zone User Committee (BZUCs), and Buffer Zone Management Committee (BZMC). According to Dixit et al. (2024), these zones are designed as a gradient in which management intensity increases away from the core of the protected area. The overall goal is to enhance conservation, and it is achieved in two ways: by

providing suitable habitats for core species and through the provision of natural resources for residents or adjacent people, reducing dependence on protected area's core resources (Hall and Rodgers, 1992). Usually, the model presumes concessions that allow traditional gathering of renewable products in a manner that does not significantly change the ecosystem (*ibid*.) In the cases of the protected BZCFs, this is quite similar, where "local consumptive use is restricted to a limited range of forest products for a few days a year" (Jones, 2007). Over the years, it has been argued that a more harmonious solution should be established for both local people and the restrictive authorities, and such was found through the UNDP's People and Parks Programme where access and legal rights have been granted to both use and manage the BZCFs (ibid.)

1.2. Access Linked to Conservation

A pivotal notion here lies in the concept of access, which is tightly linked to conservation and a community's ability to benefit from the areas they are aiding in preserving. Ribot and Peluso (2003) define access as *"the ability to derive benefits from things"* emphasizing that access extends beyond formal property rights. Following this understanding, the notion of access should be looked at as a "bundle of powers", which allows for the integration of complex social relationships that either constrain or enable people's access.

Access theory is directly linked to "relations among people regarding benefits or values – their appropriation, accumulation, transfer, distribution, and so forth. Benefits are important because people, institutions, and societies live on and for them and clash and cooperate over them". (Ribot and Peluso, 2003, p.155). Given that local communities, governance, and conservation efforts are all intertwined with these access dynamics, it is critical to examine closer the access (or lack thereof) that community members have to the BZCFs.

According to the theory of access there are several mechanisms of access at stake: for example, mechanisms through which actors gain, control and maintain access to resources; in this case pertaining to environmental products. Specifically, the rights-based access mechanism stands out within our research. Ribot and Peluso argue that this mechanism can be used to "directly gain benefits (*ibid., p.160*), and they understand this to be "that which is sanctioned by law, custom or convention…" (*ibid, p. 161*). We further relate rights-based access arguments within the discussion section of our research (see paragraph 4.1).

1.3. Analytical Framework (SLF)

A widely used framework for assessing livelihoods is the Department for International Development's (DFID) Sustainable Livelihoods Framework (SLF), which recognizes the multifaceted strategies people use that go beyond purely economic dimensions (Nunan 2015, p. 107). This report will adopt Natarajan et al.'s (2022) reformulation of the Sustainable Livelihoods Framework (SLF), which is widely used in development practices to understand the nexus of local realities and livelihood strategies and the factors influencing this. This SLF recognizes the relational and structural powers that influence livelihoods. This revised understanding of the framework understands vulnerability, which is a central part of the framework, to be dynamic and includes the notion of "opportunity" (Natarajan et al., 2022, p. 11). In this, there is a recognition as well that livelihoods are shaped by historical processes, as well as political factors at the "local, national, and supra-national levels" (ibid., p.5). Furthermore, their framework attempts to visualize the interlinkages between the different components. We will primarily look at livelihood-environment dynamics and how the three intertwined pentagons are linked together (see Fig. 2). The framework consists of three pentagons; the *climate and environmental context/relations*, which looks at the local-level contextual factors in a relational sense; the *relational power*, which refers to class, gender, ethnicity, caste, and other material power relations, and the financial and physical *assets* people might have.

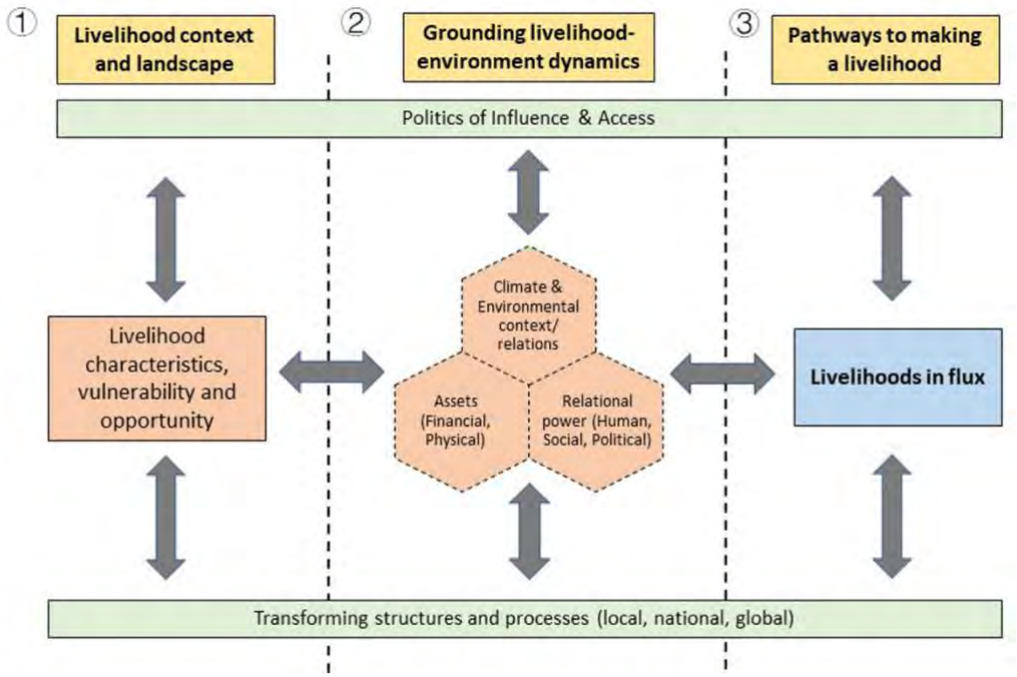

Figure 2. *Sustainable Livelihoods Framework. Source: Natarajan et. al. 2022.*

Natarajan et al.'s revised SLF proves useful to this report for several reasons: firstly, it helps identify the structural conditions alongside local realities and thus offers a multi-scalar and multi-temporal lens through which one can analyze themes such as governance and participation. However, due to the limited time frame of the fieldwork, it was difficult to observe changes overtime for these topics. Therefore, a PRA method was conducted with four women in which a timeline exercise was carried out. (see section 2.5). Moreover, related literature on governance in other areas of the lowlands will be referred to. Secondly, this SLF version integrates relational power dynamics and climate and environmental context and relations – all of which are critical elements to consider in changing contexts where social hierarchies and ecological changes impact access to resources. Furthermore, this SLF framework is valuable in terms of guiding the discussion of this research project.

1.4. Research Gap and Research Questions

While CBC approaches in Nepal have received a lot of attention under both academic and global conservation initiatives spotlights (Danekhu et al., 2018; Dhakal and Thapa, 2015; Bijaya et al., 2016; Agrawal and Gupta, 2005), there remains a research gap regarding the specificities of the dynamics of community forest resource use within buffer zones. While previous literature has focused on the effectiveness of Nepal's "decentralized conservation" methods (Agrawal and Gupta, 2005; Baral and Heinen, 2007), fewer studies have looked into the complex realities of governance, access and participation from the perspectives of both authoritative figures and buffer zone user group members. Additionally, patterns of forest use variation among members in the community, as well as perceived changes since the establishment of the 1993 Forestry Act, have not gained as much attention in recent literature. Therefore, addressing the patterns of forest use and changes over time is a worthy research endeavor. Additionally, we intend to understand the structure of the BZCF and the roles various actors. Our research questions aim to address these gaps by examining how governance structures influence resource access and user participation in the Krishnashar BZCFUG of Ward 10, Kawasoti Municipality.

Hence, our primary research questions guiding this study are:

(1) *What is the governance structure of the Krishnashar community forest within the Lamichaur region of the Chitwan National Park?*

(a) *How does community engagement and participation in forest management vary among the forest user group members?*

(b) *How is the management of community forests within the BZ perceived by various actors?*

(2) *How do patterns of forest use vary between members in the community?*

(a) *What changes have people perceived over time?*

(b) *What are people's perceptions on the balance between conservation and forest use?*

The specific case of a community located within the buffer zone of the oldest national park in Nepal presents a critical intersection between conservation efforts, local livelihoods and the governance structures which dictate the management opportunities and activities of the local communities within the forest. We hope that this research contributes to broader discussions on CBC by looking into these complexities of balancing conservation goals with local livelihoods.

2. Methodology

2.1. Study Site

The study was conducted within Ward-10 of the Kawasoti Municipality, situated in the larger Nawalpur district which is within the Gandaki Province of Nepal (Fig. 3). Located approximately 180 km from Kathmandu, Kawasoti plays a relevant role in the region, as it is the administrative headquarters of the Nawalpur district.

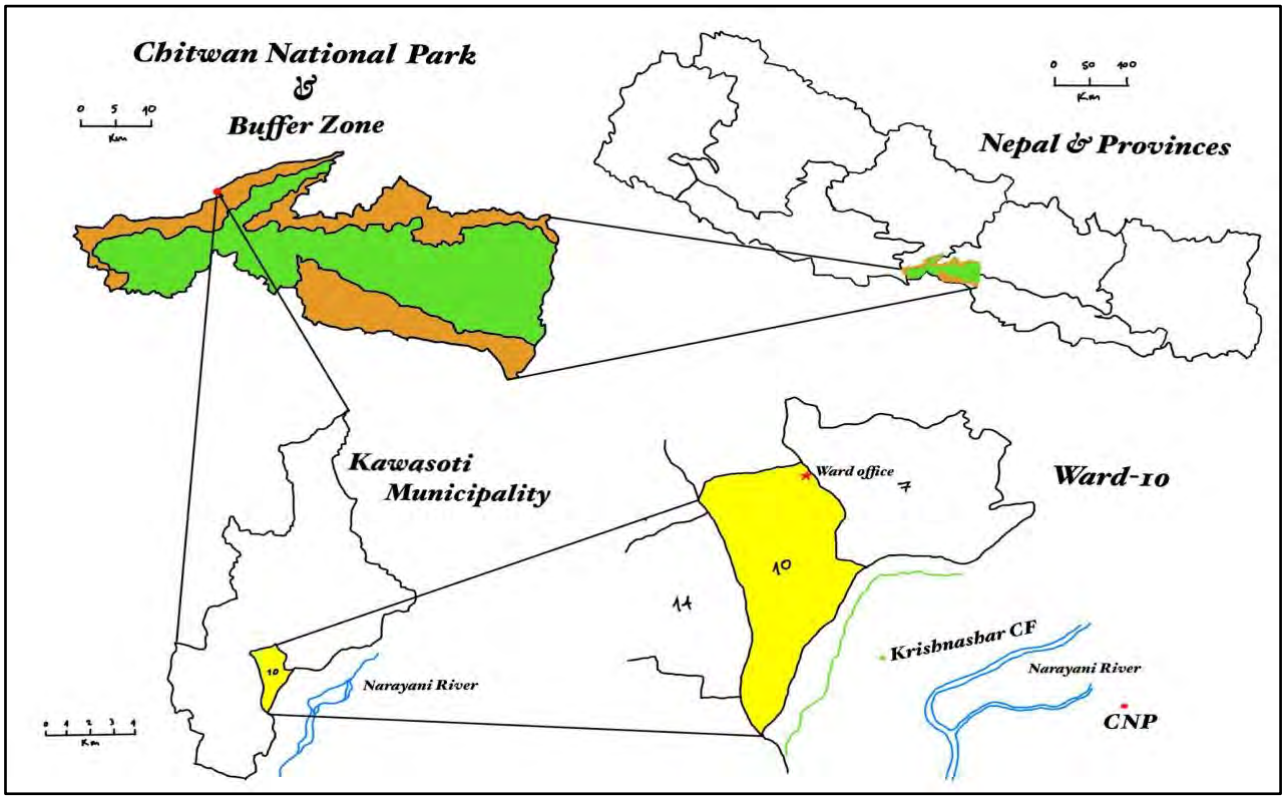

***Figure 3**. Map of the study site within the larger region of Nepal with an overview of the Chitwan National Park and Buffer Zone. Source: own elaboration.*

***Figure 4**. Image of the Krishnashar community forest and the main street of Chilaha in Ward 10. Credit: Nicholas Munk Pedersen.*

Located within the Buffer Zone of the Chitwan National Park, Ward-10 is part of the larger Terai region, a fertile lowland area, also known as the "breadbasket of Nepal" (Aubriot and Bruslé, 2023). The Narayani River, located about 1.8 km from the main road in town, serves as a natural border between the BZCF and the park. The CNP itself is dominated by high-value sal forests (*Shorea robusta*) which together with grasslands house an array of wildlife, from the one-horned rhinoceros (*Rhinoceros unicornis*) to the gharial crocodile (*Galvis gangeticus)*. This wildlife has attracted many tourists, making it a popular place for safaris and other ecotourism activities (Tiwari et al., 2022). Ward-10 is one of the least populated wards, housing a population of 2,820 residents with a household total of 486[3] (National Population and and Housing Census 2021 Results, 2023). In terms of its population by caste, the greater Kawasoti area is primarily dominated by Brahmin (28,6%), Tharu (24,9%), followed by Magar (11.4%), Chetri (7.8%) and smaller ethnic groups (ibid.)

[3] The most recent housing census data available is from 2021, which differs from the information gathered during our research. Since our sampling survey was based on data provided by the BZCFUG executive committee, we will refer to that data in our methodology.

The purpose of this section is to address the methodological approach to the fieldwork. Given the diversity of disciplinary backgrounds, as well as the interdisciplinary nature of the PIF project, both qualitative and quantitative methods were applied, with a particular emphasis on qualitative methods. The above-mentioned research questions were addressed through four different methodologies including transect walks, household surveys, semi-structured interviews and a focus group discussion with integrated PRA activities. All participants from surveys and focus groups are kept anonymous to protect their privacy. Only key informants are identified by citation.

2.2. Transect Walks

During the course of this research, two transect walks were conducted. The first was a guided walk of approximately 5.6 km within the buffer zone. The goal of this walk was to observe the inside of the BZCF, observe possible collection practices as well as used paths and possible wildlife encounters. The second transect walk followed the concrete wall from the main entrance point of the forest approximately 2.5 km to where there was no longer a concrete wall, and only electric fencing. This included walking along sections of the recently constructed wall and fencing, observing collection activities, fence disturbances, trails to and from the BZCF as well as understanding the role of the barrier overall. The coordinates of observations for both transect walks were marked and documented along their entire routes Key observations from both walks were categorized and can be seen in the maps elaborated (see Fig. 11 and Fig. 17).

2.3. Household Survey

Understanding how patterns of forest use vary between households in the community was largely answered through the use of structured household questionnaires (see Appendix C). A systematic random sampling method was used to select participant households. The Krishnashar BZCFUG executive committee provided a randomized list of members of the Krishnashar BZCFUG, comprising 11 units (toles) between wards 10 and 7 (Fig. 3). Of the 11 units, six were located within Magarkot Ward-10 and were therefore relevant to this study. Magarkot Ward-10 comprises 534 households and every 13th household of the list was selected. Hence, 30 households were chosen, with an additional 10 as reserves. In total 34 household surveys were carried out. The questionnaires were conducted with a female member of the household, as typically females were observed as being more involved in collection of environmental products (Jones, 2007; Bijaya et al., 2016).

2.4. Semi Structured Interview

Throughout the fieldwork, a total of six semi-structured interviews were carried out with several officials from different levels of governance related to the community forest. This ranged from the Krishnashar BZCFUG executive committee, the Chairwoman of the Krishnashar BZCFUG executive committee, the Chairman of the Lamnichar buffer zone user group committee and the Conservation Officer of one sector of the Chitwan National Park. All these interviews allowed us to address the first research question regarding the governance of the BZCF within the CNP.

2.5. Focus Group

An additional methodological approach applied was a focus group with three PRA activities, two of them being individual and one being collaborative. We used an opportunistic sampling method, with the sample consisting of four women, who collected environmental products, lived in close proximity to the community hall and were all of the same ethnic group. This approach was applied to limit the potential for tension between ethnic groups and to allow participants to feel as comfortable as possible.

An initial icebreaker activity was carried out, in which participants were asked to stand on either side of the room based on their individual preferences in response to our questions (i.e. “Do you prefer buying EPs at the market or collecting them in the forest?” (see Fig. 5)). We titled this activity the “This or That Game”.

The second activity involved the construction of a timeline in which participants were asked to reflect on several topics related to forest use in the past, present and future (see Fig. 6). The reflection topics *were activities, key events, income* and *feelings*. This provided a detailed insight into access and participation related to forest use and provided additional information for the second research question.

Lastly, a satisfaction ranking was completed individually by each participant. The participants received 8 flowers each and had to place a flower if they felt satisfied and not place a flower if they felt dissatisfied with the following categories “permit price, opening times, fuelwood, tourism, conservation, information sharing, education and safety”. Tea and snacks were provided for participants to show our gratitude for their time (see Fig. 7 and Table 1).

Figure 5. *"This or that" game carried out with the focus group participants as an icebreaker activity.*

Figure 6. *Timeline exercise carried out with the focus group participants.*

Figure 7*. Satisfaction ranking exercise carried out with the focus group participants.*

3. Results

The results section is divided into five main subsections: structure of governance, participation, collection of environmental products, conservation efforts and changes in forest use. Firstly, the observed governance structure, along with rules, accountability mechanisms are explored. The participation section describes user group participation in forest activities and in the governance of the BZCF. Next, collection practices are described, especially considering survey results; a description of the procedures related to collection (i.e. permits) is made, along with a description of respondent's perceptions on their needs being met and punishments in place in case of illegal collection. Lastly, conservation efforts are described, which were proven to be tightly linked to collection practices. Finally, a description of the perceived changes over time and expectations for the future of the BZCF is presented.

3.1. Governance

3.1.1. Structure of Governance

Understanding the hierarchy of the governance structure linked to the Krishnashar BZCF was a key focus of several of the semi-structured interviews. According to the CNP Sector Conservation Officer, the governance structure starts with the Ministry of Forest, which then divides into two branches: a) Department of Forestry and b) the Department of National Parks and Conservation (DNPC). The DNPC oversees the CNP and is divided into 4 sectors, one of which overlooks the Krishnashar BZCF, which was our study focus. As shown in Figure 8, the Krishnashar BZCF is one of the 7 buffer zone community forest user groups (BZCFUGs) under the Lamnichar buffer zone user committee (BZUC), which is one out of 21 BZUCs present in CNP.

The Krishnashar BZCF is managed by an executive committee whose members are nominated from Wards 10 and 7 of Kawasoti. Each tole nominates five representatives, totaling 55 representatives; from these, one representative per tole (11 in total) is selected to serve in the executive committee. Additionally, there is a quota for Dalit and female representatives in the committee, resulting in an executive committee of 15 members - 8 women and 7 men. Moreover, it was found that women have equal decision-making power in addition to being the majority of the BZCF executive committee members. The roles of the selected representatives are divided amongst themselves, and a vote is carried out in circumstances where there is no

consensus. Members of the executive committee meet monthly and a general assembly for all users of the BZCF is held annually.

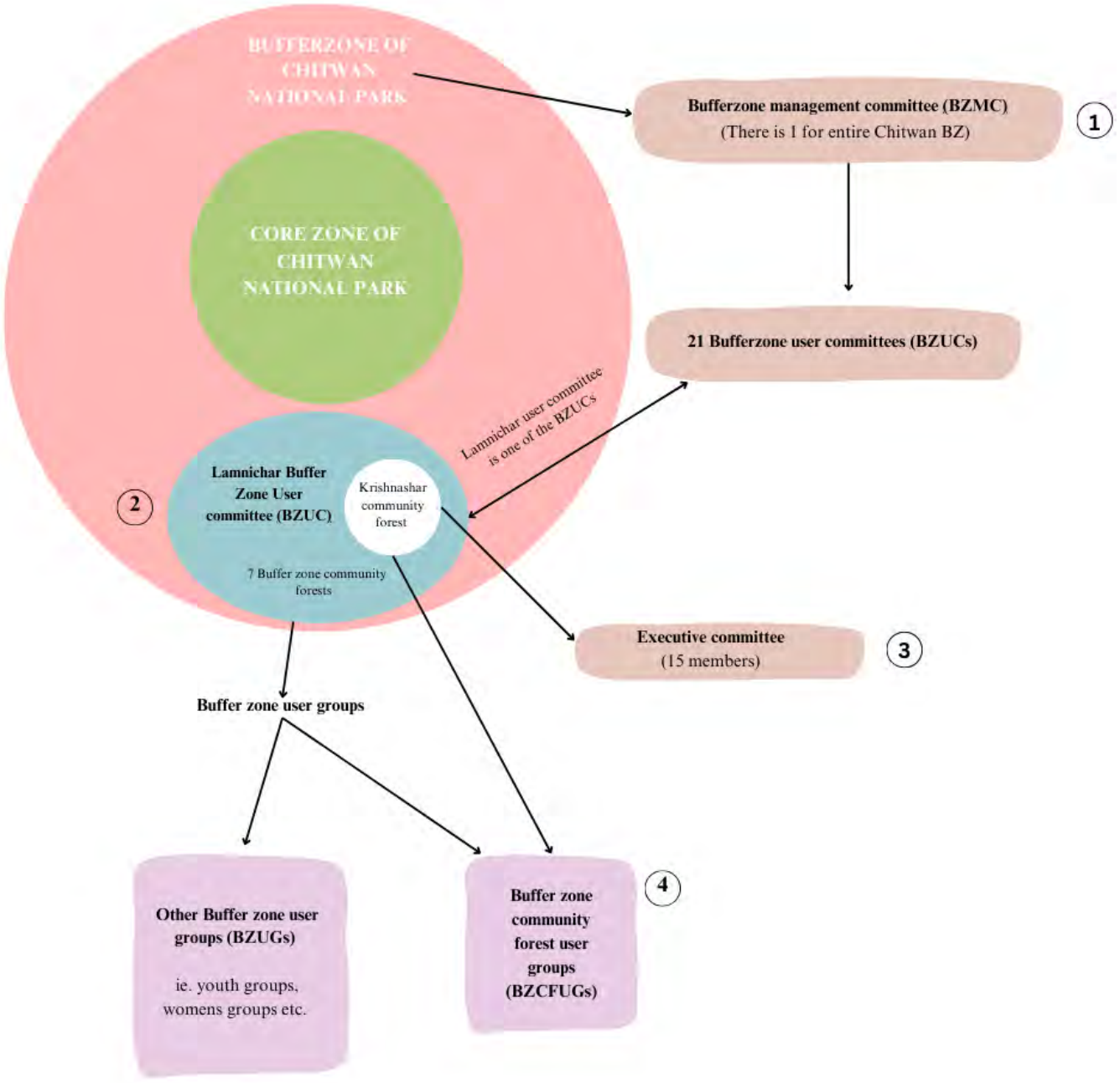

***Figure 8**. Governance structure of the Chitwan National Park and relevant institutions. Numbers indicate the hierarchical flow of power in relation to the management of the Krishnashar community forest.*

3.1.2. Buffer Zone Regulations

The first document regulating the BZCFUG is their constitution, with laws, policies and rules. This is designed by the CNP and the BZCFUG. Secondly, the operational plan (OP) is developed by the BZCFUG executive committee, with the support of the parks' Department of National Parks and Conservation (DNPC). Before it can take effect, this plan must be submitted to and approved by the CNP. To define limits of extraction, a technical assessment is done, in which a forest inventory is carried out and increment rates are defined. Then as explained by the Krishnashar BZCF executive committee *the extraction limits are set, and the OP determines how much fuelwood, timber and grass can be taken by the households.* According to the Chairman of the Lamnichar BZUC, this limit of extraction is an estimate, with space for margin of errors. Specifically for timber, the demand of the CFUG members is calculated and an extraction amount for the next 5 years is determined. Additionally, the CNP Sector Conservation Officer mentioned that social surveys are conducted to understand the socio-economic information of the households. This process is the responsibility of the BZCFUG executive committee and is done through the annual general assembly.

The operational plan is the main document guiding BZCFUGs day to day activities. Any amendments necessary can be proposed during the general assembly, especially in relation to the quantities of timber and fuelwood that can be extracted from the forest. All amendments must be approved by the Lamnichar BZUC and the CNP. These two actors also hold the responsibility of monitoring all activities of the BZCFUG according to the OP. To control extraction, each BZCFUG has their own ticketing system, which defines amounts to be paid for each ticket and setting open timeframes for collection. However, BZCFUGs can be more conservative in relation to what is stated in the OP. According to the CNP Sector Conservation Officer *in some instances, unofficially, when the OP states certain restrictions, for example the grass collection opening times being for the whole year, the BZCFUG can take the liberty of changing the rules to what they deem better for the community forest, for example shortening the length of the opening times*.

The relationship of the park with the Lamnichar BZUC and Krishashar BZCFUG is, as described above, hierarchical. It is the responsibility of the Lamnichar BZUC to grant the BZCFUGs permission for activities within the buffer zone. As this is a buffer zone of the CNP, there is a joint management system between the CNP and the BZUC. According to the

Chairman of the Lamnichar BZUC *this system makes the BZUC more restricted in responding to BZCFUGs complaints.* According to the CNP Sector Conservation Officer, the BZCFUGs file applications with requests for extraction to the Lamnichar BZUC, who then applies to the CNP, who then grants the final approval. When discussing this system with the BZCFUG representatives, they said there is *lots of bureaucracy* and when asked about their relationship to CNP they replied saying *the community forest is linked to Chitwan National Park, through a longstanding relationship*.

3.1.3. Government Communication

The CNP representatives, BZUCs and BZCFUGs have periodical meetings, with no fixed intervals between them, but they take place approximately every month. The aim of these meetings is to raise issues and get park assistance. However, activities in which the park provides assistance were not specified during any of the interviews. Lastly, a few joint activities were mentioned, such as rotational patrolling (between CNP, government and BZCFUG) and fencing for wildlife protection.

In addition to the extraction amounts in relation to the OP, the BZUCs and BZCFUGs are also financially accountable to the park through two mechanisms. The first mechanism is related to the amount of funds allocated to the BZCFUGs[4]. There is also an assembly, in which CNP presents this program and additionally conducts annual audits. The second mechanism is related to the income generated by the BZCFUGs, since a lot of money is generated through safaris. The BZCFUGs should then determine the amount and to which activities the money should be invested; that is also approved in the assembly and by the CNP.

3.2. Participation

Understanding the level of involvement of community members in the management and decision-making processes linked to the Krishnashar BZCF was another key focus of both the household questionnaires and the focus group activities. All community members can join the BZCFUG through the payment of a membership fee, which consists of a joining fee and a renewal fee. The joining fee ranges from 150 to 1500 rupees and is divided into categories

[4] 2.4 million Nepalese Rupees (NPR) was received by the Lamnichar BZUC and distributed to all BZCFUGs, one of those being Krishnashar allocated to BZCFUGs, in which a previously defined program must be followed for expenditures.

based on wealth, location, caste and other factors. The renewal fee is a fixed price of 50 rupees and must be paid every 5 years to renew the membership. All fees are decided by the BZCFUG executive committee.

Despite all 34 survey respondents being members of the BZCFUG, there was a notably low level of participation in the governance and decision-making processes related to the CF. One of the main activities intended to be accessible to all members of the CFUG was the annual general assembly. However, 59% of the respondents said that they did not attend the most recent assembly, stating work commitments (primarily agricultural), time constraints, sickness and lack of awareness and information about the meeting as the main reasons. The issue of insufficient awareness and information sharing was a recurring theme, as 91% of survey respondents did not know the amount of money in the BZCF fund nor how it was distributed, further signifying a lack of transparency between the BZCFUG executive committee and community members. Additionally, 94% of respondents hadn't participated in any training or workshops related to the BZCF in the past 12 months.

A participation index was subsequently calculated in which the following aspects of the survey were incorporated: current membership of the Krishnashar BZCFUG executive committee; past membership of the Krishnashar BZCFUG executive committee; participation in any sub-committees; attendance to the latest annual general assembly; participation in trainings or workshops related to the community forest; participation in forest management activities in the past 12 months and awareness of the use of the community forest fund (amount of money present and how it is distributed). To create the Participation Index Score responses from the governance section of the survey were coded as binary variables (0 or 1). Each answer was assigned an equal weight, and a total was calculated to create a score out of 8. The highest score received by any participant was a 5. A large proportion of respondents (38%) had a participation score of zero, indicating no involvements in any activities related to the governance of the BZCF. This finding highlights the remarkably low levels of community participation in the management of the Krishnashar BZCF (see Figure 9).

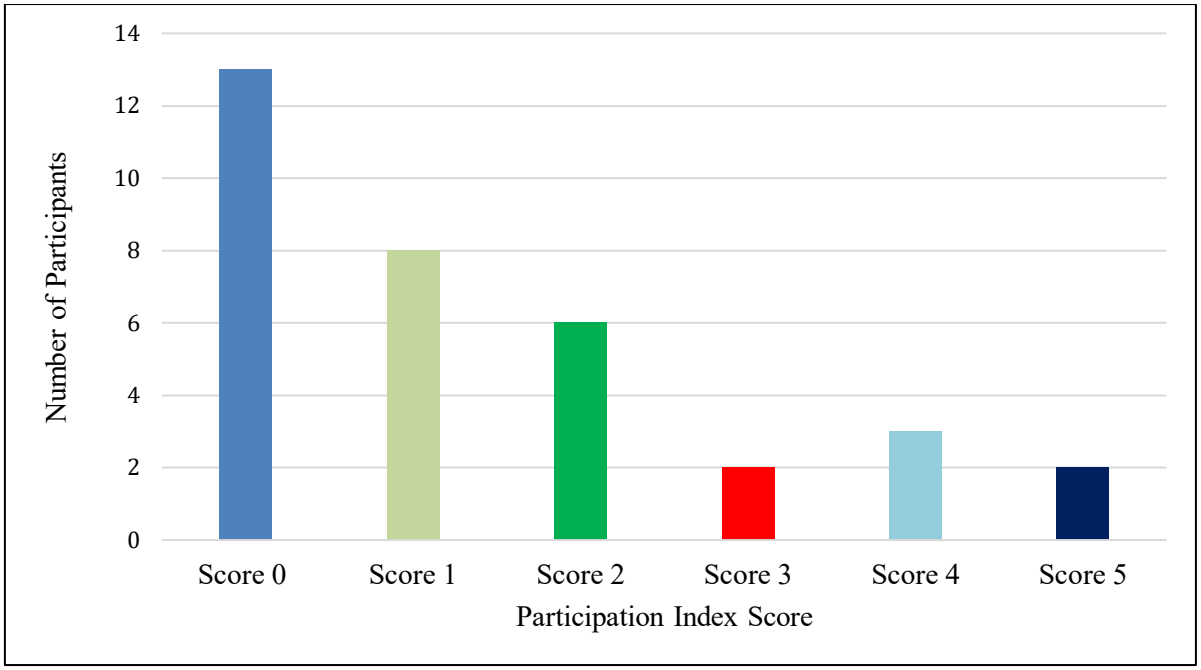

Figure 9. *Summary of each participant's Participation Index Score. The participation index score was calculated based on the eight governance questions of the household survey. Each question was granted an equal weighting.*

3.3. Collection of Environmental Products

3.3.1. Environmental Products

A key focus of the household surveys was to gain an understanding of the community's collection practices regarding environmental products, despite the previously mentioned regulations set out in the OP. Participants were questioned on the products collected, the frequency and times of collection, collection quantities and location (i.e. inside or outside of the BZCF). This allowed for a general understanding of forest use patterns between members in the community. A total of 34 household questionnaires were conducted, of which 27 participants belonged to the Tharu caste. Five of the participants identified as Brahmin, and there was one Dalit and one Chhetri participant respectively. The high proportion of Tharu participants made it difficult to gain a representative insight into the relationship between caste and the use of environmental products.

When asked if they had collected environmental products in the past 12 months, 76% of respondents said yes. This indicates a high level of dependency upon environmental products in this region. The most commonly collected environmental product was fuelwood (see Fig. 10), with 74% of all participants and 96% of the 26 respondents who collected environmental

products having gathered fuelwood in the past 12 months. This was also reflected by the participants' cooking habits, as 88% said they cooked with fuelwood. However, 91% of respondents also used gas to cook, thus reflecting a varying degree of dependency upon fuelwood. When asked to reflect upon such cooking habits in the focus group, preferences for cooking with fuelwood included: *better taste*, *provides warmth in cold season* and *gas is bad for the environment*. The participant who preferred cooking with gas stated that *cooking with fuelwood is painful for her eyes* and *it is time-consuming*.

Edible plants including ferns *(Niuro)* and spinach, followed by grass, were the second and third most commonly collected environmental products. Six participants also collected other products, including fish and construction materials. Only a single participant mentioned timber and none of the participants claimed to have collected leaves as bedding materials in the past 12 months (see Fig. 10).

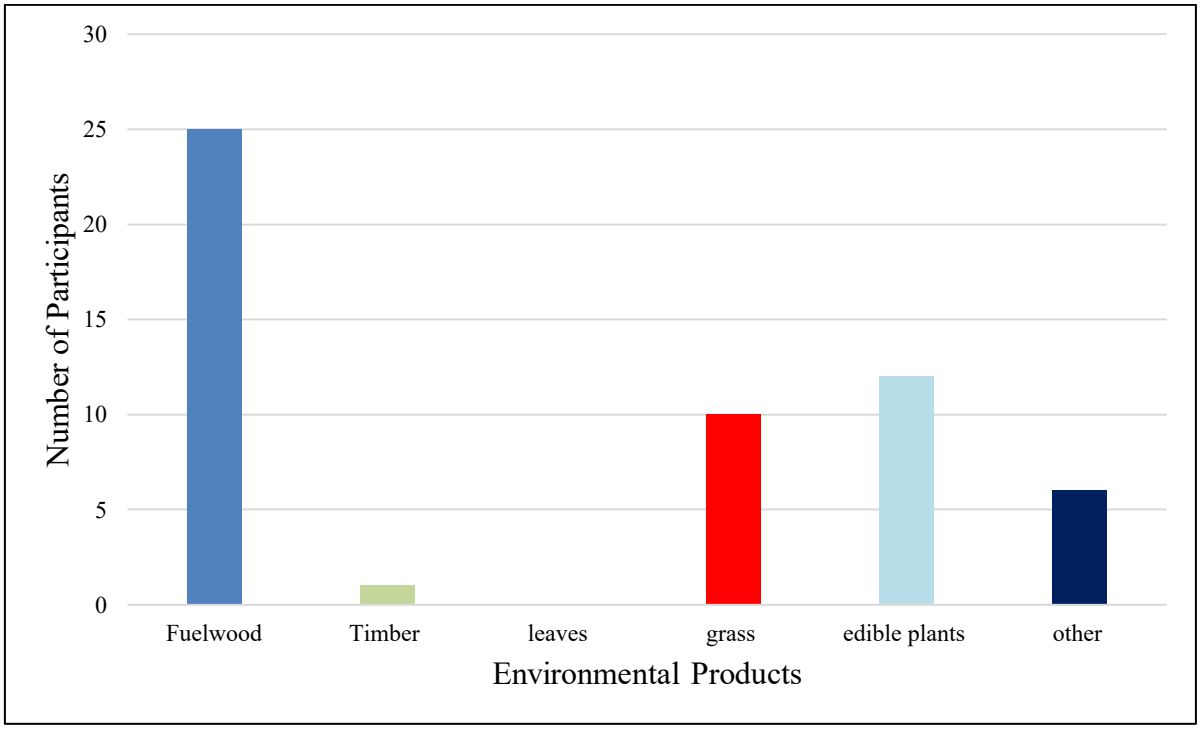

Figure 10. *Summary of most frequently collected environmental products of participants who engaged in collection in the past 12 months.*

To triangulate the results of the survey, a primary transect walk was conducted along the designated areas (Fig. 11) within the Krishnashar BZCF to assess patterns of human movement and resource collection.

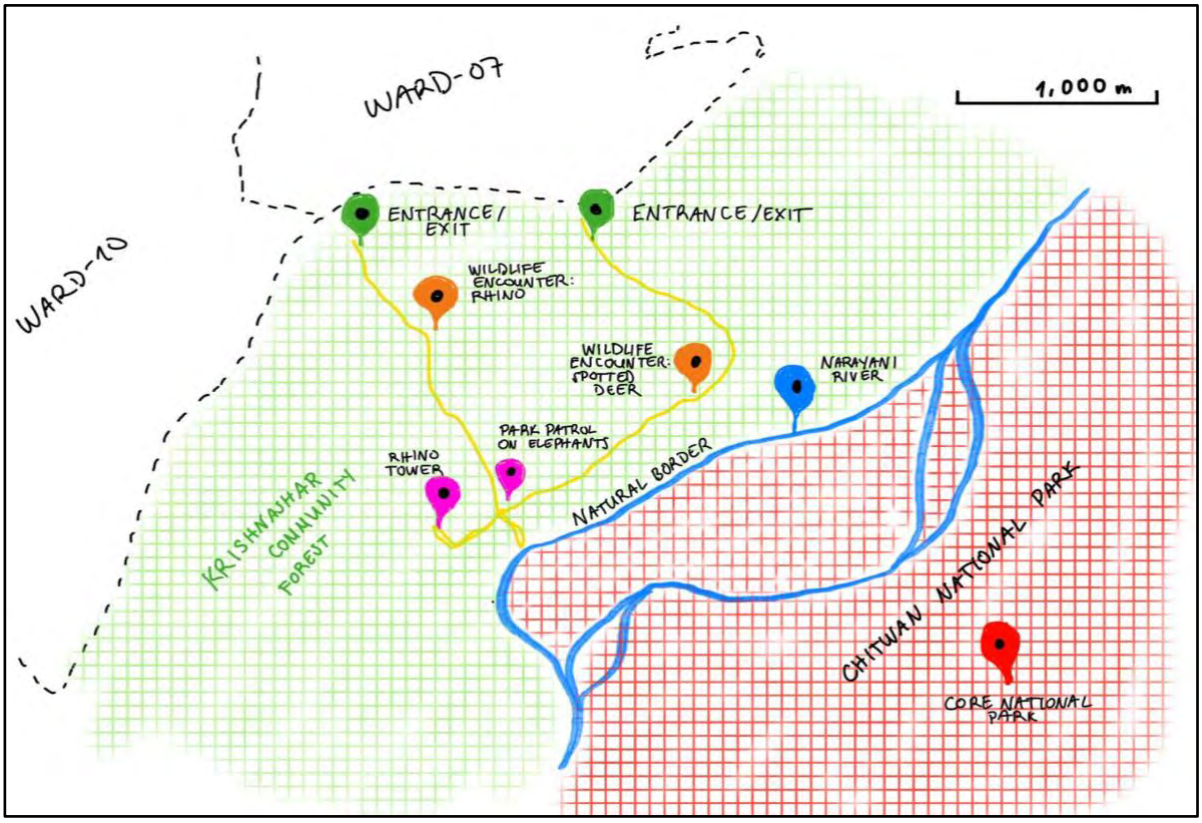

Figure 11. *Guided transect walk within the BZCF (yellow trail). Approximate distance of 5,6km with observations marked.*

This method allowed for the identification of two key entry points (indicated in Fig. 11 as the "*Entrance/Exits*"), commonly used pathways and some of the resources gathered by local inhabitants. Human activity was documented through deviations from the main safari jeep route, as well as visible slash marks indicating fodder harvesting. Additionally, informal interviews with local guides provided insights into the collection of edible products (Fig. 13), with ferns, honey, and mushrooms being casually mentioned. Although this transect walk was not followed by a formal discussion or assessment, it provided valuable insights into the risks associated with forest resource collection, particularly the potential encounters with rhinos. Additionally, the walk also led us to the natural boundary between the BZ and the core area of the NP, marked by the Narayani River (see Fig. 12).

Figure 12. *Post transect-walk, crossing the natural barrier from the BZCF.*

Lastly, a second transect walk was conducted, with the main goal of understanding the border wall that separates the BZCFUG from the Krishnashar BZCF (Fig.17). Along the transect, three main collection activities were observed: fishing, fodder collection and edible plant collection. It was possible to engage with a group of women and one man who had just emerged from the forest having collected both fodder and ferns. They described the amounts collected (mutha) and their uses for it (Fig. 13). Figure 13 also shows other collected species that were observed during fieldwork.

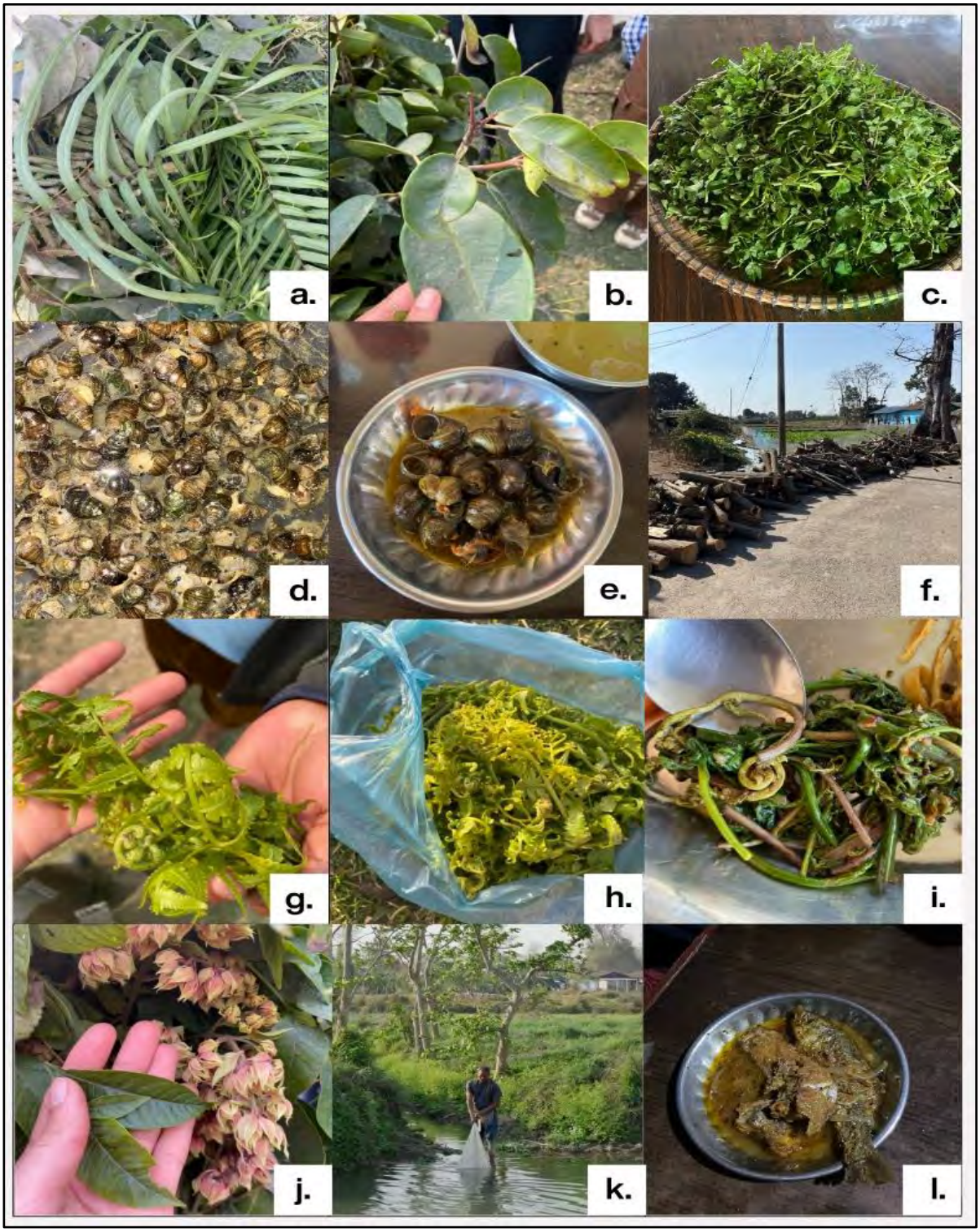

Figure 13. *Compilation of observed species and their collection practices: a) Forest fern (potentially* Pteris vittata*), commonly used for fodder. Younger ferns collected as an edible product; b) Unknown species, collected as fodder for goats primarily; c) Watercress or possibly* Nasturtium officinale; *d) Freshwater snails, known locally as* Ghonghi*; e) Preparation of* Ghonghi*; f) Timber collected outside of collection period, most likely special permission granted; g) Young edible ferns known locally as* Niuro; *h)* Niuro *are collected in measurements known as Mutha; here we have around 2 mutha collected by local women in the forest; i) Preparation of* Niuro*; j) Likely* Lagerstroemia parviflora, *commonly used as fodder. Collected together with other species in Bahri (local measurement of approx. 30kg); k) Fishing along the BZCF riverbank; l) Locally caught and prepared fish.*

3.3.2. Permits and Regulations

The collection of environmental products within the BZCF is highly regulated, with the BZCFUG members requiring a permit for the collection of fuelwood, timber and grass (fodder) with specific collection periods being predetermined by the executive committee. There are no permit requirements for other products, such as edible plants, fish, or medicinal plants, since their collection is technically prohibited. However, obtaining clear and non-conflicting information on these regulations was challenging. According to the executive committee, fuelwood can be collected for one day every four months after paying 20NPR for a ticket. However, later it was also stated by the executive committee that the collection period is open twice a year, while according to the Ward Chairperson fuelwood can be harvested every month. It was stated that dry fodder can be harvested every four months, however it was not clear how long the collection period is open for. According to the Chairwoman of the Krishnashar BZCF, the permit for grass allows collection for a full month, which previously was restricted to two weeks. The executive committee, however, first stated that it's only possible to harvest grass one day per season at the price of 50NPR before then claiming that it's allowed twice a week. Finally, the Chairwoman of the CNP conservation office claimed that the collection period for grass is open every 2-3 months in the Krishnashar BZCF and that it's the role of the executive committee to issue the permits, following what is stated in the operational plan. Ultimately however, the opening period for the collection of each environmental product is determined by the executive committee with recommendation from the Lamnichar BZUC and generally it takes *lots of bureaucracy and long waiting time to get a permission* (Ward-10 Chairman).

The ban on the collection of edible plants was clearly stated on several occasions. However, the Ward Chairperson claimed that *a permit is required for each kind of environmental product extracted from the forest, including edible plants*. He also added that *people can enter the community forest 3 times a week to collect non-valuable environmental products necessary for subsistence*. This was later contested by the executive committee, who reaffirmed that *a permit for edible plants is not mentioned in the OP and thus it is not legally permitted to harvest them inside of the BZCF*.

The regulations regarding timber were more highly agreed upon by the various actors. The head of the Lamnichar BZUG explained that a preliminary technical survey of the whole BZCF is carried out by foresters following a scientific methodology. This allows a general forest

inventory to be created from which the OP is designed. This is done in accordance with the guidance on harvesting quantities for the next 5 years presented by the foresters. At the time this research project was conducted the annual timber harvesting quota had been set at 1652 cubic feet in the Krishnashar BZCF. Prior to harvesting, the executive committee together with the national park (NP) mark trees which match the harvesting criteria, which includes dead, dying, damaged and decayed trees. Members of the BZCFUG are also requested to declare their demand for timber, to determine if demand matches the quota set in the OP. Finally, CNP is required to give permission before the trees can be harvested. Prior to distribution, a check is carried out to ensure that the quote set by the OP was followed and 20% of the harvested timber is held in an emergency reserve. Finally, the timber is distributed to the users at a subsidized price compared to the market price.

3.3.3. Subsistence Needs and Punishments

The household surveys provided an insight into the community members' perspectives on the regulations governing the collection of environmental products. This is significant as 56% of respondents said that the fuelwood permit did not allow them to meet their household subsistence needs (Fig. 14) and 60% of respondents said the grass permit did not allow them to meet their household subsistence needs (Fig. 15). Observations within the community demonstrated that occasionally people will ignore these restrictions and collect fuelwood and other environmental products from the BZCF outside of the designated collection days. The CNP conservation officer touched upon this, stating that *if anyone is caught breaking the rules by the patrolling guards, the general rule of thumb is that the first time they are excused and only receive a warning; the second time the tools used to collect might be confiscated and the third time they have to pay a fine, which amount might vary in relation to the wealth and caste of the person*. However, if someone is caught violating BZCF imposed rules that differ from those outlined in the OP (e.g., the OP states that the grass collection permit is valid for two weeks, while the BZCFUG committee enforces a rule allowing collection only two days a week), they cannot be fined or punished, as the official OP contradicts the *de facto* regulations.

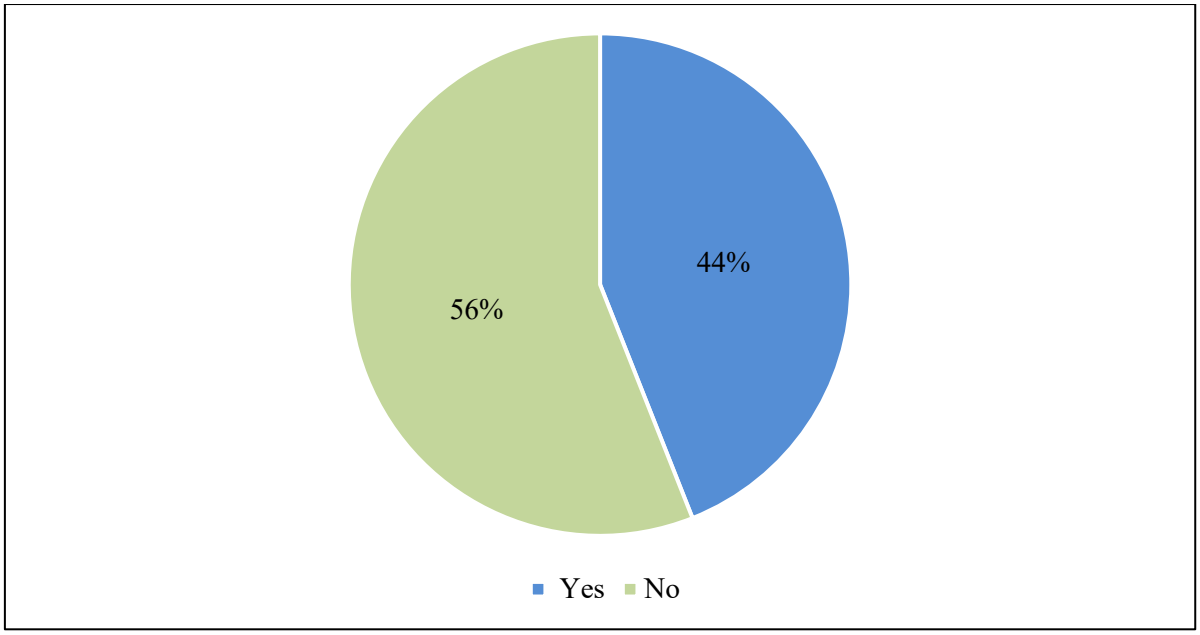

Figure 14. *Summary of respondents who collect fuelwood and whether they feel the permit for fuelwood allows them to meet their household subsistence needs. This graph shows that 56% of participants responded No to this question and 44% responded Yes to this question.*

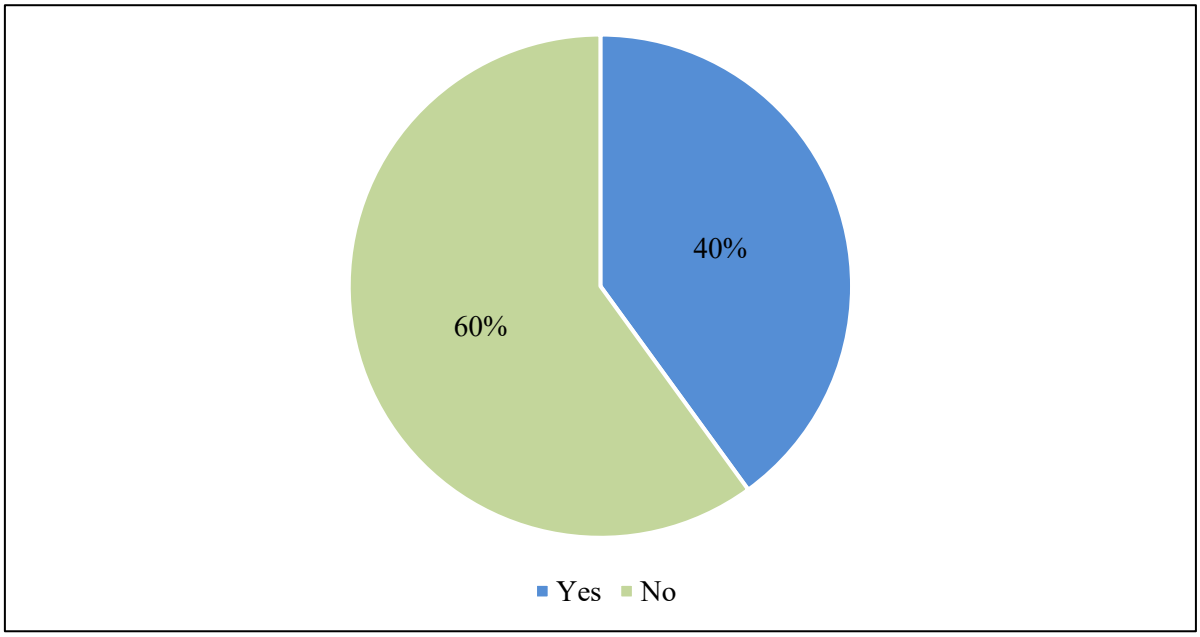

Figure 15*. Summary of respondents who collect grass and their response to if the grass permit allows them to meet their household subsistence needs. This graph shows that 60% of participants responded No to this question and 40% responded Yes.*

3.4. Conservation Efforts

Ecotourism is an important economic driver in the Magarkot area and is promoted by both the CNP and the BZUC. The importance of conserving the BZ area was stressed by the authorities at every level of the governance structure; particularly their focus on wildlife conservation for the promotion of tourism.

According to the Krishashar BZCFUG executive committee, *there are two main activities since the establishment of the BZCF for conservation purposes that led to economic improvements in the Magarkot area: the homestay program and the jungle safaris.* According to the Ward Chairman, the former works as follows: 90% of the income generated is kept by the hosting households, while the remaining 10% goes to the executive committee, with the purpose of planning activities in and for the community. Moreover, the 1000 tourists who came to the area annually are distributed rotationally among the households, to give an equal chance of benefiting from tourism activities to everyone who's part of the homestay program. However, the homestay program requires a certain amount of initial wealth as the program must be bought into and an annual membership renewal fee must be paid.

The activity that generates more money for the community, however, is the jungle safari, since this is the major tourist attraction in the area. The money is kept almost entirely by the Krishnashar BZCFUG executive committee, as only around 2% to 5% must be given to Lamnichar BZUC. However, the CNP Conservation Officer stressed that the percentage varies depending on the OP of each BZCF. The money generated from the safaris is also reported to the CNP, as a mechanism of upward accountability. The efforts to promote conservation are not limited to sponsor tourism; in the interview with the CNP Conservation Officer, it was highlighted that *over the past 15 years highly successful efforts have been made to reforest the BZCF as well, resulting in increased biodiversity and a greater variety of wildlife.* In that aspect, NGOs such as WWF have funded activities such as constructing ponds for rhinos and providing training activities to the members of the Krishnashar BZCF, with a focus on creating new alternatives for conservation, but currently people are less interested. According to the President of the Krishnashar BZUGCF executive committee, *people are motivated to go only if they receive money in return*. This is corroborated by the survey data, since only 6% of the respondents participated in training related to the BZCF in the past 12 months.

As a form of understanding participants' perceptions of the balance between conservation efforts and their access and use of the forest, a satisfaction ranking was made. It was possible to observe that all participants (n = 4) of the focus group were satisfied with conservation and tourism efforts, while 3 were satisfied with permit price, fuelwood needs and safety against wildlife. Lastly, opening times for collection was the least voted aspect for satisfaction.

Table 1. *Focus group satisfaction ranking findings.*

CATEGORIES	SATISFACTION
Permit price	🌸🌸🌸
Opening times	🌸
Fuelwood	🌸🌸🌸
Tourism	🌸🌸🌸🌸
Conservation	🌸🌸🌸🌸
Information sharing	🌸🌸🌸
Education	🌸🌸
Safety	🌸🌸🌸

3.5. Changes In Forest Use

This section describes how respondents perceived changes in how the forest has been used over time. The household survey considered differences in collection habits within a specific time frame, namely before and after the Covid-19 pandemic. Furthermore, during the focus group participants were asked to construct a timeline consisting of past, present and future in a non-specified recall period. Results from surveys, focus group discussion and from key informant interviews point to a decrease in forest use. The participants of the focus group confirmed the implementation of stricter laws and said that they used to collect more timber, fuelwood, fish and edible plants in the past compared to today. Furthermore, focus group participants reported a decrease in livestock ownership, which is related to the prohibition of grazing within the BZCF.

Complementarily, survey participants reported that collection of fuelwood and edible products was more significant before Covid-19, as can be seen in Figure 16. Conversely, for grass, other and timber most respondents collected the same amount. For this question, each participant was asked if they collected less, the same amount, or more of the environmental products they collected.

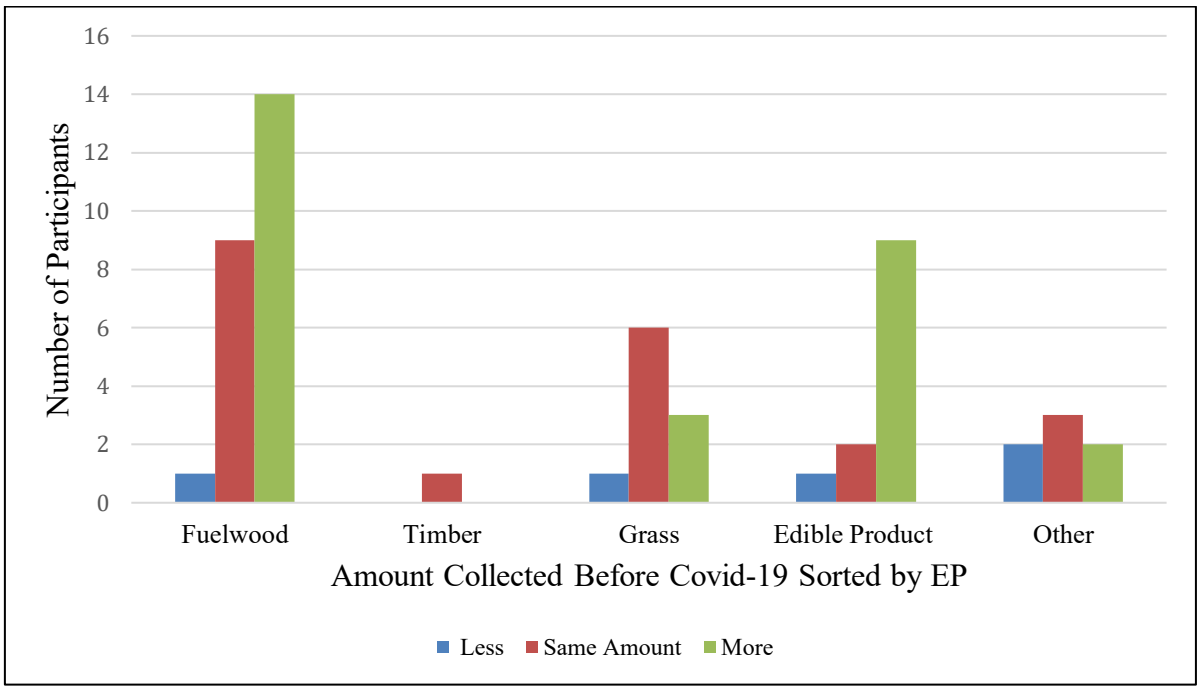

Figure 16. *Summary of participants answers to amount collected before Covid-19, out of the 26 participants who collected environmental products in the past 12 months.*

In addition to legal aspects influencing collection, the increase in forest density and cover is also an important factor. This aspect is related to more biodiversity and wildlife and less visibility, as it was pointed out by focus group respondents, that said that they *used to go more often into the forest because there was less wildlife and more visibility* (see Appendix B). Hence, fear of encountering wildlife (rhinos mainly) is a key factor for the reduced use of the forest for environmental product collection. This was also mentioned by survey respondents, that due to fear of wildlife *only go when the neighbors say it is safe* or *only collects with family members* and *fears of encountering wildlife during collection influenced when she went collecting.* Moreover, the "ice breaker" exercise of the focus group asked participants whether they prefer the forest or market for collection. One of the respondents said that she prefers the market due to fear of wildlife; still, three of the four participants prefer the forest due to

financial reasons (saving money) and the possibility of collecting more varied products (Appendix B).

Conversely, several of our key informants said that the human wildlife conflicts are happening less compared to the past. The Chairperson of the Lamnichar BZUC discussed an *80% decrease* compared to the past*, which is linked to the construction the electrical fence and the ongoing construction of the concrete wall between the BZCF and the surrounding area.* Hence, a second transect walk of approximately 2.5km was done to get a better understanding of the boundary that separates the CFUG from the Krishnashar BZCF. The coordinates of observations were marked along the total walk, which was approximately 2.5 km long. Along the transect walk, notable aspects observed were: 7 damages in the wall (red), 5 collection observations (yellow) one which was very close to the official entrance, and another 4 in the area where the wall was not built yet (Fig. 17).

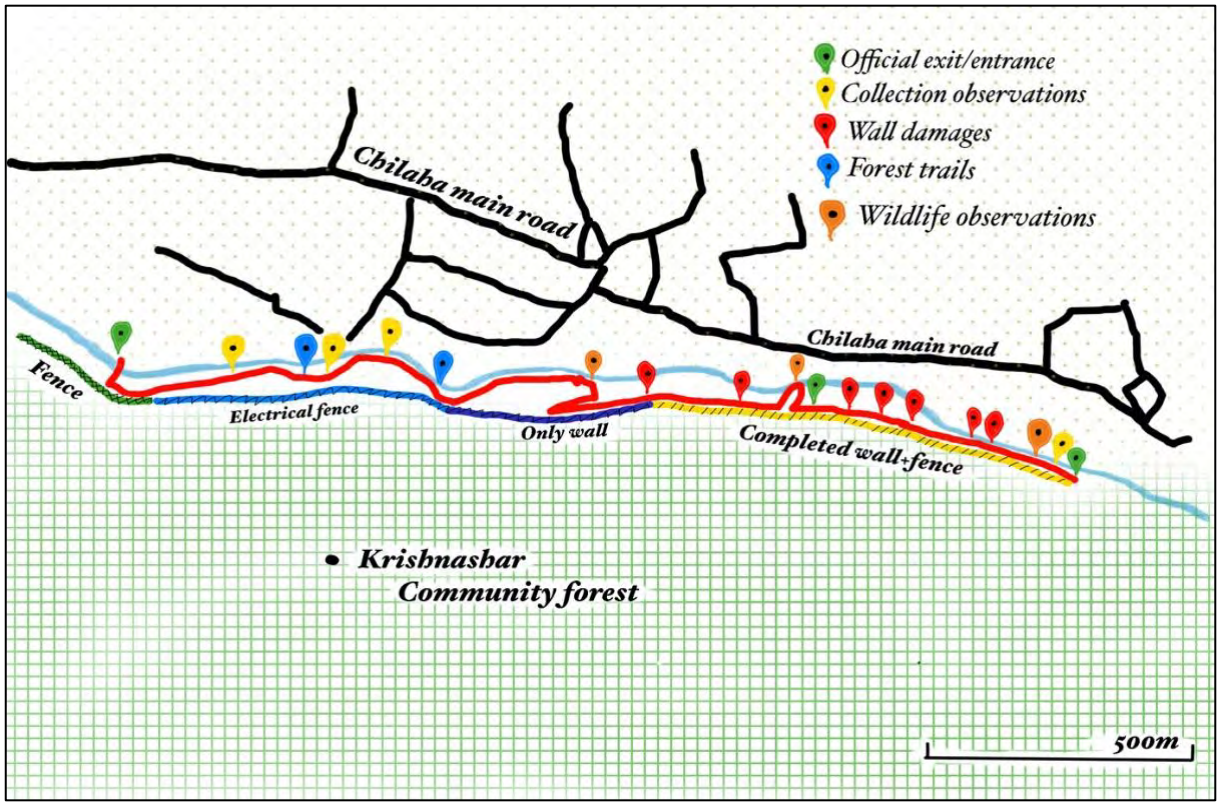

Figure 17*. Second transect walk along the concrete wall that separates the BZCF and the surrounding area.*

The Chairman of the Lamnichar BZUC explained that *in the past the National Park Forest Act followed a fortress conservation model, however, due to growing migration and population pressures, a BZ was established to safeguard the core area of the CNP.* The primary purpose

of the BZ is to conserve wildlife, rather than to prevent people from entering the forest. The purpose of the wall was also described purely as a measure to keep wildlife from entering the village, rather than preventing villagers from entering the forest.

Therefore, trying to maintain a balance between the protection of the wildlife within CNP and meeting the needs of the people living in the BZ is one of the main challenges that all the three levels of governance (Conservation Office, BZUC, BZCFUGs executive committee) addressed. The Chairwoman of the Krishnashar BZCFUG executive committee mentioned that she *would like to see the forest conserved for the wildlife and hopefully meet people's needs for fuelwood and grass*. Furthermore, the CNP Sector Conservation Officer stated that she hopes *to develop the BZCF while protecting the environment.* Nonetheless, the process to reach this goal is going slowly: the Conservation Office acknowledged that *there's a conservation bias that leaves development issues behind and at the same time there are several steps to follow in order to implement development activities, which also need time to show results*. Similarly, the Chairwoman of the Krishnashr BZCFUG argued that *it's complicated to take into account everyone's needs while following the OP.*

The focus group participants expressed conflicting perspectives on their expectations for the future. Respondents expect that the forest will *be used more for tourism and more restricted.* This relates to the survey and focus group respondents pointing out contrasting feelings such as: *fear of more rhinos destroying their crops and of encountering wildlife* and the *necessity of focusing on meeting the people's needs and not only looking at conservation.* Two participants mentioned that they *were happier before the implementation of the permit laws, because they were free to collect whatever they needed* and that *if they got the chance to use the forest more in the future, they would*.

However, it was also possible to observe a positive attitude towards conservation in the focus group. As mentioned above, tourism plays a big role in people's expectations for the future, along with hopes of growth within the homestay program. Respondents also expressed aspirations in terms of diversifying their sources of income, through businesses and improved agricultural practices. Lastly, another participant mentioned that in the future *she would like to receive more training and education to be able to interact and speak with the international tourists coming to the area*.

4. Discussion

The aim of this section is to explore key themes and findings from the results and view them in relation to relevant literature. Using Natarajan et al. (2022)'s *Sustainable Livelihoods Framework (SLF) from the 21st Century* as a guiding framework, this discussion looks at how the following components of this framework – relational power, (access to) assets, and climate and environmental context – influence governance structures, access to resources and the tensions between conservation efforts and local livelihoods. The framework is useful to our discussion because it offers a holistic approach to understanding how different factors influence local livelihoods. Access in this context is especially critical to our analysis as it allows for a more complex understanding of the many mechanisms that regulate who can benefit from resources, seeing as this is shaped by bureaucratic, social, economic and political factors.

4.1. Relational Power

This section will explore the relational power dynamics that were presented in the results. Natarajan et al. (2022) takes relational power as referring to class, gender, ethnicity, caste, and other material power relations, to be an "equally critical and all-too-easily overlooked, element in building, shaping and sustaining livelihoods" (Natarajan et al., 2022, p. 11).

The initial aim of this research was to explore the gender dynamics present within the BZCF governance, since several articles pointed to unequal representation or ineffective participation based on gender (Jones, 2007; Bijaya et. Al., 2016; Baral and Heinen, 2007; Bhattarai, 2020). Additionally, as discussed in the literature review, it was found that in the hilly regions of Nepal, the level of participation of lower caste community members and females was lower (Gauli and Rishi, 2012). However, the observations in this study contradict those findings: in two interviews with the BZCFUG executive committee and one with the Chairwoman of the BZCFUG, respondents acknowledge fair representation of women and the lower caste (Dalit) within the executive committee. Not only was there fair representation, but according to the Chairwoman of the BZCFUG executive committee the women on the committee have an equal voice and, in her perception, *gender doesn't play a role in decision-making.* While gender did not seem to play a large role in the governance of the BZCF. However, this could be an interesting topic to explore when comparing it to other BZCFs.

Thus, a key focus of this study was understanding the governance structure and the regulations regarding the BZCF. As stated in the results, the system is bureaucratic and highly restrictive for the lowest level of government. The aim of the government system was ultimately to conserve the CNP, and this starts by conserving the buffer zone. As introduced in the literature review, the community is utilizing CBC to protect the buffer zone. This approach should allow the community more involvement in decision-making processes whilst also benefiting from the conservation financially. Our findings on Buffer Zone Regulations are aligned with what Rutt et al. (2014) revealed about management of BZCFs, which despite being managed by local groups, tend to remain under the influence of formal, top-down bureaucratic structures that restrict access. As mentioned in the introduction and results section, the system in Nepal requires the formulation of BZCFUG management plans, which intend to safeguard environmental standards and are justified by their importance in daily forest management (Rutt et. al., 2014).

However, due to lack of funds the management plans are elaborated without reflecting actual forest conditions and carrying capacity, which leads to communities mainly managing the forests according to their knowledge and daily contact with the local environment (Rutt et. al., 2014). Additionally, the government imposes regular revisions of community forest management plans, recentralizing the forest bureaucracy's control and allowing forest bureaucrats to access donor projects and forest product value chains, which creates severe imbalances in revenue distribution (Basnyat et. al., 2018). Besides, the Krishnashar BZCF, which is government-owned but locally managed, shows that local communities may hold customary or informal access to resources without possessing formal ownership. This finding is in accordance with Ribot and Peluso (2003).

Another form of relational power is related to unequal benefits derived from tourism. In that sense, a study conducted in seven villages within the Manaslu conservation area of Nepal found that tourism development may favor wealthier individuals and those near to tourist attractions, ultimately resulting in an increase in local inequalities (Bennike and Nielsen, 2024). This corresponds to observations made on the study site, as mentioned in the Conservation Efforts (3.4) section, in which participating in the homestay program presumes a certain level of wealth. Moreover, there was a lack of awareness among survey participants about training in relation to the forest. Nevertheless, focus group participants reported an interest in tourism growth, more training and better access to education in relation to the forest. Hence, having

enhanced conservation education can be related to shaping attitudes towards conservation, which plays a vital role in the success of protected area-community relations (Pathak et. Al. 2023).

Relational power is also present when considering limited access to information about community meetings. This directly influence members' involvement in local governance and is another way (lack of) access can unfold. A lack of participation may reinforce a cycle of exclusion and perpetuate the status quo, as some members of the community continue to be uninformed about governmental decisions that ultimately affect them. This limited or even lack of awareness directly impacts their ability to voice their concerns or influence outcomes.

Lastly, relational power is present when considering who controls access to the BZCF and what can be extracted. According to Ribot and Peluso (2003), rights-based access is contingent upon the enforcement of claims made by either the community, state or government (i.e., a governing authority). In the context of the BZCF in Kawasoti Ward-10, this framework is useful when it comes to explaining how access to environmental resources can be regulated through permits and licenses, as well as the quantity of environmental products the community members can collect from the BZCF. Any community members who lack these formal rights must negotiate access through those who hold them (here: the BZCF executive committee). Community members that are caught collecting environmental products without permits face graduated sanctions, as presented in the results. This is evident in our findings, as several of our respondents noted that their ability to collect environmental products is constrained by permits opening times.

4.2. Assets

Natarajan et al.'s SLF only considers the financial and the physical assets in relation to livelihoods. Therefore, these are the ones we refer to in this section. The household survey directly questioned participants regarding several physical assets, including whether they owned livestock, land titles and the quantity of land people informally "owned". As observed, however, access extends beyond formal property rights. Holding land does not automatically guarantee the ability to benefit from it due to various socio-economic and bureaucratic barriers. Through observations from this research, people entered the forest illegally despite being

landowners and this could be because the land doesn't provide enough for them to meet their subsistence needs.

Furthermore, the enquiry into the collection of environmental products shed light upon further disparities between community members in terms of opportunity and physical capital. Several participants stated that they took a tractor to the forest on collection days, enabling them to collect fuelwood on a much greater scale than other community members. Those findings are in accordance with what was reported by Oli, Treue and Smith-Hall (2016): it was found that the richest households extract almost twice as much fodder from community forests as other households. This could also have further implications in terms of legal versus illegal collection of environmental products, given that those who collect by hand may be forced to collect outside of the specified collection window to meet their household subsistence needs.

Such disparities in financial assets also create tensions with authoritative figures who must create a balance which integrates conservation and sustainable livelihood strategies. The CNP sector conservation officer for example acknowledged that poorer people tend to go to the forest because they are forced to, as they have to feed their livestock, or because they need fuelwood for cooking. Nightingale (2005) described such a tolerance of poverty driven rule breaking in a CF context as a reinforcing mechanism for caste and wealth distinctions, which drive social power and poverty.

4.3. Climate and Environmental Context

A further key element of *A Sustainable Livelihoods Framework for the 21st century* is the "Climate and Environmental Context", which highlights the importance of considering location specific environmental conditions when studying rural livelihoods. The increase in forest cover as a result of conservation efforts and the subsequent observed environmental changes was a common theme throughout both household surveys and key informant interviews. This change is related to the establishment of the BZ through the Buffer Zone Act in 1996 and to the legal establishment of the Krishnashar BZCF in 2009 (2065 in Nepalese years). Therefore, this shift towards the conservation of the flora and fauna within and surrounding the CNP, and the stricter laws and regulations regarding the harvesting of environmental products from the BZCF, has had impacts on the livelihoods of the local community members, as mentioned in the results section.

The construction of the wall, electric fencing and the damages observed, as described in the Changes in Forest Use section (3.5) could be considered a visual representation of the struggle of maintaining a balance between people's use of the forest and conservation. Ribot and Peluso (2003) point out that access to technology can mediate resource access in many ways, using the example of a fence as a type of simple technology that physically controls access by keeping some people away from a certain resource as well as symbolizing or communicating intent to restrict access (Ribot and Peluso, 2003, p. 165). Perhaps in this case, the creation of a physical barrier, although designed to protect the people, does to some degree symbolize the separation that conservation efforts in this area are creating between people and nature.

Moreover, according to the theory of access by Ribot and Peluso, access can manifest discursively as well. They write that "*discourse and the ability to shape discursive terms deeply influence entire frameworks of resource access*" (Ribot and Peluso, 2003, p. 169). Hviding (2003) similarly explores how environmental discourse can manifest and be taken as "universal". When natural resources, such as forests are considered as "global commons", discourses surrounding environmental protection are universalized, justifying the intervention of powerful (often western NGOs) (Hviding, 2003). Such discursive powers may result in the exclusion of local communities from certain resources and practices, in the name of 'environmental protection'. This may be particularly relevant in the case of the Krishnashar BZCF, as the collection of environmental products is much more regulated since the establishment of the BZ.

A key theme which appeared consistently throughout the research project was the struggle of striking a balance between conservation and community development. Thapa and Diedrich (2023) highlighted this issue by surveying households in proximity to PAs to enquire about their perceived costs and benefits associated with the PA. There was also a focus on nature-based tourism, as activities such as jeep safaris often go hand in hand with PAs in Nepal (Thapa and Diedrich, 2023). The loss of crops and livestock was identified as the main cost associated with PAs (Thapa and Diedrich, 2023). Moreover, on several occasions it was mentioned that people were forced to reduce the number of livestock they owned, as grazing within the BZCF was no longer possible after the establishment of the BZ, which directly reflects the findings of this research project. Conversely, Thapa and Diedric (2023) showed that participants perceived that overall, the benefits of conservation initiatives outweighed the costs.

4.4. Limitations and Reflections

It must also be acknowledged that there are limitations to the scope of this research and the methodology that was carried out. The duration of the fieldwork was a key limiting factor and heavily restricted the quantity and depth of knowledge that could be collected. Furthermore, the information from the surveys and key informant interviews were translated from Nepalese to English which may have resulted in incomplete translation in some cases and potential miscommunication. This also made it difficult to consider misleading language (i.e. using the term "illegal" when referring to collection practices), which could result in response bias if participants were not reporting their actual collection habits.

In relation to the structure of the survey, there were several questions which could have been formulated differently, had there been more time to pilot test the survey. At times the answers given in the multiple choices were not very comprehensive of all the possible answers the participants gave; for example, wage labor was not included as a multiple choice for the question about the household's main source of income. Other questions, instead, were not clearly stated: the one about quantities of environmental products harvested in the past 12 months was confusing; it wasn't clear if the question was about the quantities collected each time on average or if it was about the total average collected in a year.

5. Conclusion

This study outlines the hierarchical governance of buffer zone community forests within Chitwan National Park, which shows a collaborative yet bureaucratic resource management process. It was found that there are significant gaps in governance communication and community participation in the management of the Krishnashar buffer zone community forest since the bureaucratic complexities create challenges in decision-making. Hence, the need for more inclusive governance strategies, improved communication and an increase in community involvement is evident.

Secondly, the study highlights the significant use of environmental products (EPs) by the BZCFUG, particularly fuelwood, edible plants, and fodder. It was also possible to observe inconsistencies surrounding the regulations in place and *de facto* EP collection for fuelwood, fodder and edible plants within the BZCF. Currently established regulations do not allow households to adequately meet their subsistence needs, which leads to illegal collection. Therefore, there is a need for governance structures that better align conservation goals with local needs.

In this context, ecotourism emerged as an alternative source of income and economic driver in the Magarkot area. Since tourism and conservation initiatives are in place, there has been an increase in forest cover which has led to a heightened fear of wildlife encounters amongst community members. Despite this, people expect to access more benefits from the safaris and conservation initiatives through job generation to decrease resource extraction in the future.

Ultimately, the study displays which initiatives are in place in the Krishnashar BZCF for finding a sustainable balance between conservation and local livelihoods. Future efforts should focus on improving local autonomy, access to training and education and deriving higher economic benefits in relation to the community forest. Hopefully, this would enhance the overall effectiveness of conservation and people's use of the forest and lead to *a system that could inspire other forests in Nepal*, as desired by the Chairwoman of the Krishnashar Buffer Zone Community Forest User Group.

The Forest Group!

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7. Appendix

7.1 Appendix A: Overview of the Applied Methods

Applied Methods	**Notes**	**Number of participants; or times the activity was performed.**
Transect Walks	First transect walk within Krishnashar BZCF, second transect walk along wall of the BZ	2 transect walks, conducted with the HWC group.
Questionnaires	All female participants from within Kawasoti Ward-10	34 participants.
Key informant interviews	List of Interviewees: 1. Krishnashar executive committee 2. Chairman of Kawasoti Ward-10 3. Krishnashar executive committee 4. Head of Lamnichar buffer zone user committee 5. Chitwan National Park sector conservation officer 6. Krishnashar BZCFUG executive committee Chairwoman	6 interviews conducted, several participants. Some interviwes conducted with other groups.
Focus group Discussion with PRA activities	Activities: 1. "This or that game" 2. Timeline excerice 3. Satisfaction Ranking	4 participants, 1 performed focus group.

7.2 Appendix B: Focus Group Timeline Table

	CATEGORIES	NOTES
PAST	Activities	• Used to collect more fuelwood • Cattles could graze in the forest • More timber collection • Used to own more cattle and take them grazing • More edible products; more fishing and selling
	Key events	• Used go to more often because less wildlife + more visibility • CF became BZCF is a huge barrier for them to go to the forest
	Income	• Agriculture, job, handicraft • Agriculture (mostly), one teacher job, some handicrafts on the side of agriculture • Used to directly sell timber on market
	Feelings	• Happier before
PRESENT	Activities	• For grass, they only go two days a week, while for fuelwood they go monthly • Electric fencing + involved in illegal collection of grass and fuelwood
	Key events	• More dense vegetation, so more fear • Floods means that they have to go to the forest more often • Agricultural land is affected so people are more dependent on the forest • Dense forest; more wildlife (rhinos) • Rhino attacks; damage to crops • Assured they would be given compensation for the flood/crop damage, but they didn't receive the

		money
	Income	• Homestay, livestock rearing, remittance • Now getting forest products to feed livestock
	Feelings	• Forest is consumed and now she's happy; tourism increased • Homestay owner; happy about increased forest + wildlife • Unhappy; wildlife destroying crops, more than the past + more rhino encounters • She likes that the forest is being conserved, it makes her happy
FUTURE	Activities	• More restrictions about the forest • Forest will be used more by tourism • They went to go to the forest, but are fine with going only 2x in the month • More involvement: grazing, fwood + if they get the chance, they would go more
	Key events	• Tourism purpose • Wants more tourists in the forest • Wants more education (upset about not having opportunity to learn)
	Income	• Wants homestay to flourish; wants more international people to come • Want business (shop) • Have better agriculture
	Feelings	• Conflicting feelings for the future • Conservation along fear of crop destruction

7.3 Appendix C: Questionnaire

CONSENT FORM AND PRESENTATION OF THE RESEARCH

Consent Form for participation in the research about BZCF policies in the Chitwan National Park.

1. Purpose of the Research
We are students from the University of Copenhagen (UCPH) conducting fieldwork on how Buffer Zone Community Forest (BZCF) policies of the Chitwan National Park impact local livelihoods in the Magarkot community (Ward 10).
We are not affiliated with any local governmental institutions or the Chitwan National Park.
What you share will be used for our research only.

2. How Your Participation Helps
Your insights and experiences are essential for understanding the structure of the community forest governance and the use of the buffer zone community forest.

3. Use of Research Results
The findings from this research will be used for our final report that will be made available for you and this community, as well as on the University's website.

4. Risks and Disadvantages of Participation
Your participation is voluntary, and you can choose not to answer any question you are uncomfortable with. While there are no direct risks, we will discuss sensitive topics such as changes in access to forest resources, which could be personal.

5. Confidentiality and Anonymity
Your identity will be kept confidential. You may choose to be quoted anonymously (without your name) or with your name if you prefer.
No personal information will be shared outside this research.

6. Your Rights as a Participant
You can withdraw from the study at any time before the final research report is completed.
You may review or comment on the transcriptions of your interview if you wish.
You can ask for clarifications or more information at any time.

If you have any concerns or questions, feel free to ask us before, during, or after the research.

Consent Statement:
I have read (or had read to me) and understood the purpose of this research. I voluntarily agree to participate, knowing that I can withdraw at any time.
(1) ❍ I agree to participate

Who is conducting the survey?
(1) ❍ Duda
(2) ❍ Alexandra
(3) ❍ Nghili

(4) ❍ Erin
(5) ❍ Elena
(6) ❍ Andrea

INTRODUCTION QUESTIONS

1. Personal info

name	_____
age	_____
gender	_____

2. In which unit do you live?
(1) ❍ Bhagadi tole
(7) ❍ Upper Ratawal tole
(2) ❍ Lower Ratawal tole
(3) ❍ Chilaha tole
(4) ❍ Bajar tole
(5) ❍ Gorkhu tole
(6) ❍ Magarkot tole

3. What is your household membership number?

_____

4. How many members are in your household?

children	_____
adults	_____

5. What is your household caste affiliation?
(1) ❍ Brahmin
(14) ❍ Chhetri
(6) ❍ Tharu
(12) ❍ Dalit
(13) ❍ other (please specify) _____

6. Which are your household main sources of income?
(1) ❑ agriculture
(2) ❑ homestay program
(3) ❑ remittances

(4) ❑ livestock
(5) ❑ business
(6) ❑ other (please specify) _____

7. Does your household own livestock?
(1) ❍ yes
(2) ❍ no

8. How much land does your household own?
_____

9. Does your household have a land title?
(1) ❍ yes
(2) ❍ no

COOKING RESOURCES

10. Which of the following resource(s) has your household used to cook in the past 12 months:
It's possible to select multiple options.
(1) ❑ fuelwood
(2) ❑ electricity
(3) ❑ gas
(4) ❑ biogass
(5) ❑ other (please specify) _____

COMMUNITY FOREST AND ENVIRONMENTAL PRODUCTS

In this section we will discuss community forest and environmental products, for which we will define **environmental products** as: "all the non-cultivated products that can be collected from the community forest, from the buffer zone and in non-private land".

11. Did your household collect any environmental products in the last 12 months?
If the answer is no, skip to governance section.
(1) ❍ yes
(2) ❍ no

12. If yes, which of the following environmental products did your household collect in the past 12 months?
It's possible to select multiple options.
(1) ❑ fuelwood
(2) ❑ timber
(3) ❑ leaves (bedding materials)
(4) ❑ grass/fodder
(5) ❑ edible products
(6) ❑ others (please specify)

13. Which of the previously mentioned non-cultivated environmental products did your household collect outside of the Buffer Zone Community Forest? (starting with x)

(1) ❑ fuelwood
(2) ❑ timber
(3) ❑ leaves (bedding materials)
(4) ❑ grass/fodder
(5) ❑ edible products
(6) ❑ others (please specify)

14. How often did your household collect (insert product mentioned previously) in the past 12 months?

	daily	weekly	monthly	seasonally	yearly	never
fuelwood	❍	❍	❍	❍	❍	❍
timber	❍	❍	❍	❍	❍	❍
leaves (bedding materials)	❍	❍	❍	❍	❍	❍
grass/fodder	❍	❍	❍	❍	❍	❍
edible products	❍	❍	❍	❍	❍	❍
others	❍	❍	❍	❍	❍	❍

15. How much of (insert product mentioned previously) do you collect each time on average?

fuelwood	_____
timber	_____
leaves (bedding materials)	_____
grass/fodder	_____
edible products	_____
others	_____

16. When during the day did your household collect environmental products in the past 12 months?

(1) ❑ before sunrise
(2) ❑ between sunrise and midday
(3) ❑ between midday and sunset
(4) ❑ after sunset

17. Compared to now, how much of (insert product mentioned previously) did you collect before covid?

	more	same amount	less
fuelwood	❑	❑	❑
timber	❑	❑	❑
leaves (bedding materials)	❑	❑	❑
grass/fodder	❑	❑	❑
edible products	❑	❑	❑
others	❑	❑	❑

18. Did your household collect anything else before covid that you do not collect anymore?

(1) ❍ yes (please specify) _____
(2) ❍ no

19. With whom did you collect environmental products?

(1) ❑ alone
(2) ❑ household members
(3) ❑ other relatives
(4) ❑ neighboors
(5) ❑ friends
(6) ❑ others (please specify) _____

20. For (insert product mentioned previously) when the period of collection last opened, did you obtain a permit?
N.B: You do not need a permit for edible products and other.

yes no

fuelwood	❍	❍
timber	❍	❍
leaves (bedding materials)	❍	❍
grass/fodder	❍	❍
edible products	❍	❍
others	❍	❍

21. If no to previous question, skip this.
Do you think the quotas set by the permits allow you to meet your household's subsistence needs?

	yes	no (please explain why)
fuelwood	❍	❍ _____
timber	❍	❍ _____
leaves (bedding materials)	❍	❍ _____
grass/fodder	❍	❍ _____
edible products	❍	❍ _____
others	❍	❍ _____

22. Has anyone in your household ever been denied the permit?
(1) ❍ yes (please specify what happened in that situation) _____
(2) ❍ no

GOVERNANCE

23. Is anyone in your household currently a member of the Krishnashar BZCFUG (buffer zone community forest user group) executive committee?
(1) ❍ yes (please specify who) _____

(2) ❍ no

24. In the past, has anyone in your household ever been a member of the Krishnashar BZCFUG (buffer zone community forest user group) executive committee?

(1) ❍ yes (please specify who) _____

(2) ❍ no

25. Is anyone in your household currently a member of any sub-committe?

(1) ❍ yes (please specify) _____

(2) ❍ no

26. Did anyone in your household attend the latest annual general assembly?

(1) ❍ yes (please specify who) _____

(2) ❍ no

27. Skip if the answer to the previous question was no.
Who in your household attended the latest annual general assembly?

❑ member 1
❑ member 2
❑ member 3
❑ member 4
❑ member 5
❑ member 6
❑ no one

28. Did anyone in your household participate in trainings or workshops related to the community forest in the last 12 months?

(1) ❍ yes (please specify who) _____

(2) ❍ no

29. Has anyone in your household been involved in forest management activities in the past 12 months?

_____

30. Do you know the amount of money is in your community forest fund?

(1) ❍ yes

(2) ❍ no

31. Do you know how the money is distributed?

(1) ❍ yes

(2) ❍ no

32. That was our final question and to conclude our survey we would like to ask if you have any additional comments related to the questions we asked you. If not, thank you so much for your time!
Dhan'yavada!

7.4 Appendix D: The Final Synopsis

Synopsis

(WWF Nepal, Ananta Ram Bhandari)

Exploring the gendered dynamics of access, use and knowledge of non-timber forest products (NTFP) in the community forest of Magarkot Village, Nepal

Andrea Elise Soot
Erin Olivia Jones
Alexandra June Victoria Schneider
Nghilinawa Lolonyo Heita Natusch
Eduarda Lara Mendonça Moreira
Elena Cacciamani

Word count: 2721

Introduction

The Kingdom of Nepal stretches 800 km east to west along the southern slopes of the Himalayas in South Asia (Acharya, 2002). Nepal is a land-locked country with its dominant land use system centered around forestry, with 29% of the country being covered in forest (Acharya, 2002). This study takes place in the Terai region of Nepal, within the Magarkot Village and focuses on the surrounding community forest. Magarkot Village is located inside the buffer zone bordering the Chitwan National Park with the community being the primary user of the community forest.

The forests of Nepal were nationalized in 1957 and during this time, heavy deforestation took place due to people perceiving their forests had been taken away from them and a lack of incentive to maintain the forests (Acharya, 2002). Due to growing concerns of deforestation from communities and in efforts to prevent further deforestation and create sustainable forestry habits, the government implemented community forestry in 1978 (Gautam et al., 2004). Later on, in 1993 the Forestry Act was introduced. This act provided full authority to the user groups for management of forest resources (Acharya, 2002). The act recognized the dominant role of local people in the decision-making process and outlined the ground for local peoples to benefit from managing the forests (Acharya, 2002). The act intended to give ownership of forest resources back to the people in efforts to attain social and economic development as well as promote a healthy environment, ensure the development and conservation of forest and the proper utilization of forest products (Government of Nepal, 1993).

Recent literature on Community Forestry in Nepal indicates that livelihoods in rural areas are dependent on forest resources such as food, fuel wood, timber, fodder, construction materials, saleable products, medicines, bedding for animals, and leaves for composting (Bijaya et. al., 2016). Moreover, forest resources have an important income-equalizing and poverty-alleviating effect, even though forest income is relatively more important to the poorest households, while the richest derive significantly higher absolute forest incomes (Oli et. al. 2016). Since Nepal is a highly biodiverse country, especially when considering its small total area, several denominations for forest products have emerged and are used interchangeably, such as Non Wood Forest Products (NWFPs), Non-Timber Forest Products (NTFPs), medicinal and aromatic plants (MAPs), Jadibuti or minor forest products (Bhattarai, 2022). Concerning collection practices, NTFPs were the product category collected most frequently and most uniformly between households with different incomes, which demonstrates how important these products are to people's livelihoods (Strædea and Treue, 2006). Hence, the focus of this research are Non Timber Forest Products (NTFPs) - defined as "products derived from the forest other than timber, such as recreation, aesthetics, wildlife, fish, forage, fruits, herbs, resins, range, water, soils, etc" (Brukas, Meilby and Olsen, 2002).

Community forestry was very successful in the hilly regions, however it was found through studies in the western Terai region that the level of participation of lower castes and females in decision-making was low and less than that of the middle and upper castes and males (Gauli and Rishi, 2012). The Nepal Forestry Sector Strategy and Gender and Social Inclusion Policy related to Climate Change recognized the exclusion and low representation of both women and marginalized groups in forestry sector organizations (Government of Nepal, 1993;

Government of Nepal, 2018). Despite the strong advocacy for women to take up a more equal position in political and decision-making processes, the impacts of these changes had little to show and are fairly unknown (Bijaya et. al., 2016). While these government strategies recognize the need for sustainable production and supply of forestry products and biodiversity in community forests (Government of Nepal, 2018), gender inequality persists regarding both environmental management and access to resources within community forestry. Research regarding community forestry in Nepal, as well as the access and use of NTFPs recognises that these dynamics are gender-specific, yet tend to focus on education, caste, and socio-economic factors rather than gender as a primary reason for exclusion (Agrawal and Gupta, 2005; Dahal and Chapagain, 2008; Bijaya et al. 2016; Basnett et al., 2016). Therefore this project aims to contribute to the research gap that highlights the importance of understanding how community forest policies and buffer zone establishment have impacted women's access to and use of forests.

Access is central to our paper and is interpreted from here on forth as "the ability to benefit from things—including material objects, persons, institutions, and symbols. By focusing on ability, rather than rights as in property theory, this formulation brings attention to a wider range of social relationships that can constrain or enable people to benefit from resources without focusing on property relations alone" (Ribot and Peluso, 2003, p.153). Therefore, the poverty-alleviating and income-equalizing potential held by community forestry is, thus, constrained by the very mechanism (local-level decision-making authority) it has promoted. This could be changed if the disadvantaged majority acquires decision-making positions (Oli et. al. 2016).

Considering the relevance of the above-mentioned topics, this research focuses on the NTFPs derived from the community forest within and around the Magarkot Village. We hope that this research will provide insight into the gendered access, use and knowledge surrounding NTFPs in the community forest of Magarkot Village, Nepal as well as the changes perceived by women since the establishment of the 1993 Community Forestry Act.

Research Objective and Questions

The objective of this research is to explore the gendered dynamics of access, use and knowledge of NTFPs in the community forest of Magarkot Village, Nepal. Continuously, we aim to understand the changes perceived specifically by women regarding their access to the community forest since 1993. We will utilize qualitative methods to understand the perceptions of the locals concerning the community forest. Finally, we will deploy quantitative and qualitative methods to investigate NTFPs collected from the community forest.

To answer this research objective the following questions and sub-questions have been developed:

1. How are NTFPs used by different members of the Margarkot community?
    a) Which NTFPs are found in the Margarkot Village/forest?
    b) Which demographic factors characterize households which harvest NTFPs?
    c) What are the harvesting habits of each household?
    d) Are NTFPs used for subsistence, commercial use or both?

2. What is the role of gender in community forestry?
   a) What are the gender differences in NTFPs collection, use and sale?
   b) What role does gender play in the governance of the community forest?
   c) How do women perceive the ecological, social and access changes in forest use since 1993?

Methodology

Within our research matrix, we aim to address the following research questions through the collection of data using the corresponding methods stated below.

1. *How are NTFPs used by different members of the Margarkot community?*

This research question consists of four sub-questions, with the aim of identifying the non-timber forest products (NTFPs) collected and used by various members of the local community in the Magarkot Village and the associated demographic factors.

Data Collection Cethods

- Structured observation[5]: structured observation will likely include random interactions with locals leaving and/or entering the forests with "collection baskets", where we will ask them to talk about what they have collected. This gives a preliminary, qualitative understanding of which NTFPs are collected, how they are collected and by whom.
- Transect walk[6] in the forest with guide / key informants: The aim of this method is to gather a qualitative understanding of used routes in the forest and main collected species.
- A photographic catalogue of plant species and inventory: a photographic catalogue of the identified species, including their local names and uses will be documented throughout the transects to create an inventory of the most relevant NTFPs in the region.
- Household surveys (structured questionnaires): The aim is to understand the harvesting, use and commercialisation behaviours carried out by various households regarding NTFPs. A standardised household survey (see appendix) will be carried out with a minimum of 20 households. Initial household composition data will be gathered to understand how demographic factors may influence NTFP collection and use. This will be followed by an assessment of the species gathered and in which quantities. Moreover, an assessment of the commercial vs subsistence use of NTFP will be carried out in the survey. Finally, some preliminary questions regarding access will be included, which will act as a guide for future key informant interviews. Participants will

[5] Stewart-Whiters (2014) presents structured observation as "*a more purposeful form of observation, which involves determining in advance the phenomena to be observed and the various categories of activity or behavior that the researcher is seeking to observe."*

[6] Kumar (2002) defines transect walks as a method that "*provide a cross-sectional view of different agro-ecological zones. Vegetation and land types, community uses, ownership, key management issues, water sources and so forth can all be discussed as the researcher walks with two or three local participants along a path across the land. The team collaboratively draws the different zones informing the researcher about agro-ecological issues*" (Stewart-Whiters, 2014, p.70).

be asked to recall the species and quantities gathered within a year's recall-period. Visual aids such as collection baskets will guide the participants with regard to the quantities gathered. These quantities will subsequently be converted into comparable metrics (ie. through the use of scales). The survey will be carried out with the assistance of a translator. This is a mostly quantitative method, which will allow us to standardise and compare between households through the use of 'Adult Equivalence Units' (Cavendish, 2002).

Data Analysis

Analysing the data for this research question will primarily take place after the field work. The participant observation and transect walks are more qualitative methods and will require us to identify common themes, such as the most mentioned NTFP species through a thematic and content analysis. This element can be carried out partially during the field course and will act as a guide for our semi-structured interviews for our second research question. The household questionnaires on the other hand is a more quantitative method and will require in depth data analysis post fieldwork. The demographic data will allow us to standardise across households using adult equivalence units. This will be followed by various statistical tests, such as t-tests and ANOVAs for the quantities of NTFPs collected and correlation and regression models for any categorical data we wish to analyse.

2. *How does gender relate to the use of NTFPs?*

This research question consists of 3 sub-questions, with the aim of investigating the gendered difference in the collection, use and sale of NTFPs, as well as the role gender plays in community forestry governance. Finally we will explore how women perceive the ecological, social and access changes in forest use since 1993.
Data from our household surveys will guide us in the selection of participants for the transect walks and semi-structured interviews. The literature points towards women being the main users of forests, having better knowledge than men when it comes to products that are essential for household use (Bijaya et al., 2016). However, their participation in the harvesting of NTFPs and in the decision-making processes about forest management is limited by many factors, such as household responsibilities, care work and cultural norms (Ingram et al., 2016). Through the use of transect walks and semi-structured interviews, we aim to investigate differences between men and women with regard to access to the forest, products collected, collection sites, NTFP uses and participation in the community forest governance.

Data collection methods

- Gender-focused transect walks: transect walks will be carried out with both male and female harvesters, separated in different groups, in order to understand if there are differences in the collected species or routes taken based on gender. Mapping of these transects in order to understand the routes and distance from the village will also be done.

- Semi-structured interviews[7]: to understand the role of gender in the governance of the community forest we will use semi-structured interviews with key informants. The objective is to explore the roles and structure of the management of the community forest.
- Focus group[8]: finally, we will conduct a focus group with PRA methods, consisting of only women who have ideally been actively involved in NTFP collection since the establishment of the 1993 Forestry Act. This will allow us to understand perceived changes over time in the role of women in community forestry.
    - PRA methods: With the focus groups we will combine both resource mapping and timeline analysis to explore changes in women's forest access and use. We will encourage the women to first create two maps—one visually showing the past forest use and another showing recent use—followed by a discussion on the major changes. This will be complemented by a timeline analysis, where women of different age groups can list the major changes since 1993, capturing the different perspectives on shifts in access, use, and knowledge and recalling past events collectively. Together, these methods should provide a visual and historical understanding of the everchanging community forest dynamics and resources available.

Data Analysis

This research question is primarily qualitative and will require a triangulation of data analysis methods. For the transect walks, mapping (ie. through Strava or Google earth) will be carried out to visualise the harvesting routes of both males and females. Statistical analysis such as T-tests could be carried out to determine differences in the distances travelled. The semi-structured interviews will require a thematic analysis for which Nvivo may be used. This will help identify common themes for which we can carry out statistical analyses to study any gender differences in access and NTFP use. Finally, the focus group and PRA methods will require both visual assessments and further content and thematic analyses. This element of the research project will be more descriptive.

Sampling Strategies

Sampling for transect walks, structured observation, photographic catalog of plant species, semi-structured interviews and focus groups will be based on non-probability sampling, as it does not rely on randomization and does not purport to deliver statistically accurate estimates of population parameters (Shively et. al. 2011). Hence, convenience sampling and / or snowball sampling will be used. Convenience sampling is 'haphazard' sampling. An example would be choosing people leaving or entering the forest with collection baskets to participate in any of the above-mentioned data collection methods. Additionally, snowball sampling begins with an initial contact, either someone who matches the selection

[7] Brinkmann (2020) defines semistructured interviews as "*an interview with the purpose of obtaining descriptions of the life world of the interviewee in order to interpret the meaning of the described phenomena*" (Brinkmann and Kvale 2015, p. 6 from Brinkmann, 2020, p.437).

[8] Caillaud (2022) defines focus groups as a method "*that collects data through group interactions on a topic determined by the researcher*". (Caillaud et al., 2022).

criterion or an individual who can serve as a 'key informant' to develop a list of potential respondents. Each individual who is interviewed is asked to provide the names of others who might serve as respondents (Shively et. al. 2011).

Conversely, probability sampling will be used for the survey. Hence, a randomized sample will be collected (Shively et. al. 2011). We intend to stop at every "x" house, starting from a random point and in case there are no respondents in one selected house, move to x+1 house.

Framework for Data Collection and Analysis

This study takes into consideration the reformulated version of the sustainable livelihoods framework, by Natarajan et. al. (2022). The authors focus on a perspective that captures the sense of livelihoods in movement, without imposing a stationary consideration. Thus representing "*a dynamic nesting of assets, climate and environmental context/relations, and relational powers which are not held, but can be built, eroded and transformed over time"* (Natarajan et. al., 2022).

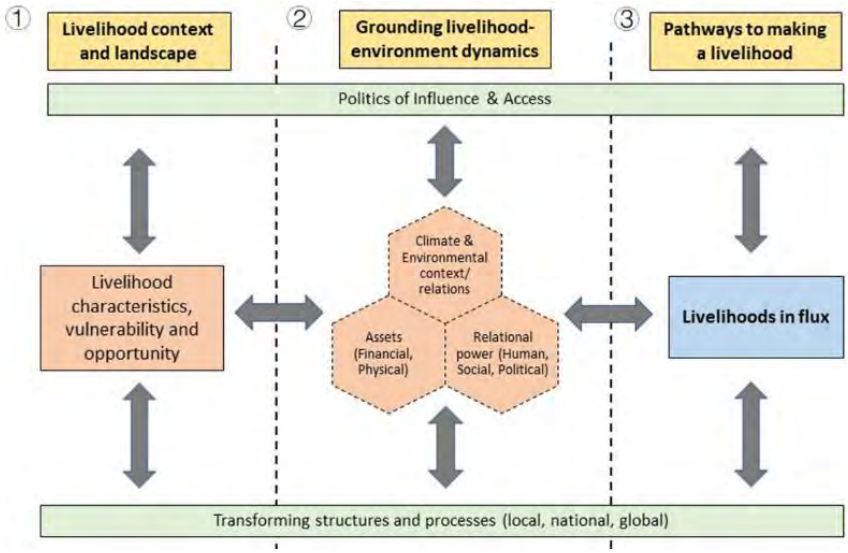

Fig. 1: Sustainable livelihoods framework for the 21st century. Source: Natarajan et. al. (2022).

As mentioned above, the focus of this research is gendered dynamics of access, use and knowledge of NTFPs. Hence, we envision understanding *relational power* with a focus on gendered dynamics of access; *climate and environmental context* are present aspects in the assessment of different NTFPs, its species and collection practices; lastly, *assets*, which can be either financial or physical, are considered through the understanding of use of NTFPs for commercial versus subsistence purposes.

In conclusion, this research primarily uses a qualitative research design to understand the relationship between gender and access, use and knowledge of NTFPs. To analyze the data collected within our second research question *"How does gender relate to the use of NTFPs?,* we will start with the use of thematic coding, relying primarily on the *Nvivo* Software (Version 15). This will aid us in identifying patterns in qualitative responses. Using qualitative discourse analysis, we will explore the gendered narratives surrounding NTFP collection, use, sale and

participation in community forestry governance. The goal is to comprehend how gender, as well as other factors (caste for example), influence access and use of community forests, as well as grasp the perceptions of the marginalized groups (women in this case) of ecological and social changes over time. Additionally, our purpose is to compile a forest inventory of species collected and/or observed during our gender-separated transect walks. This will (hopefully) provide insight into the gendered differences in species selection, collection areas and the intensity of forest use. Finally, by triangulating data from household surveys, interviews, transect walks and focus groups, we hope to gain a deeper insight into how gender shapes the NTFP-related activities and the role of governance.

Proposed Time Schedule

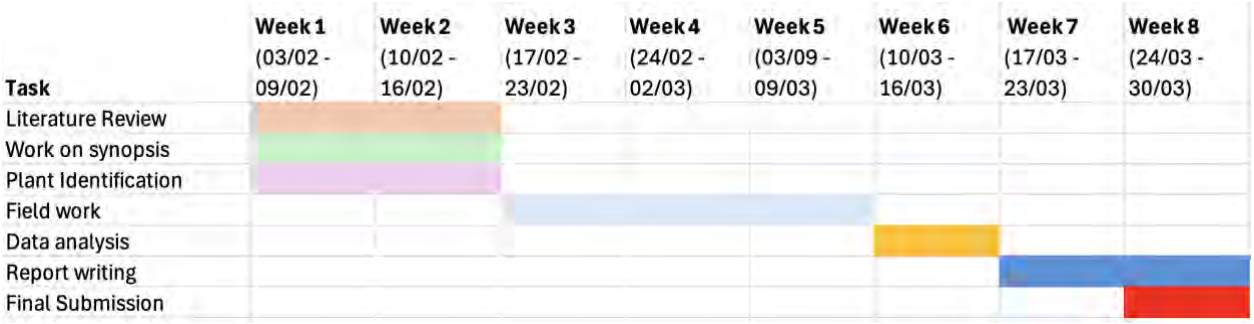

Fig. 2: Rough time schedule for the overall tasks during the course.

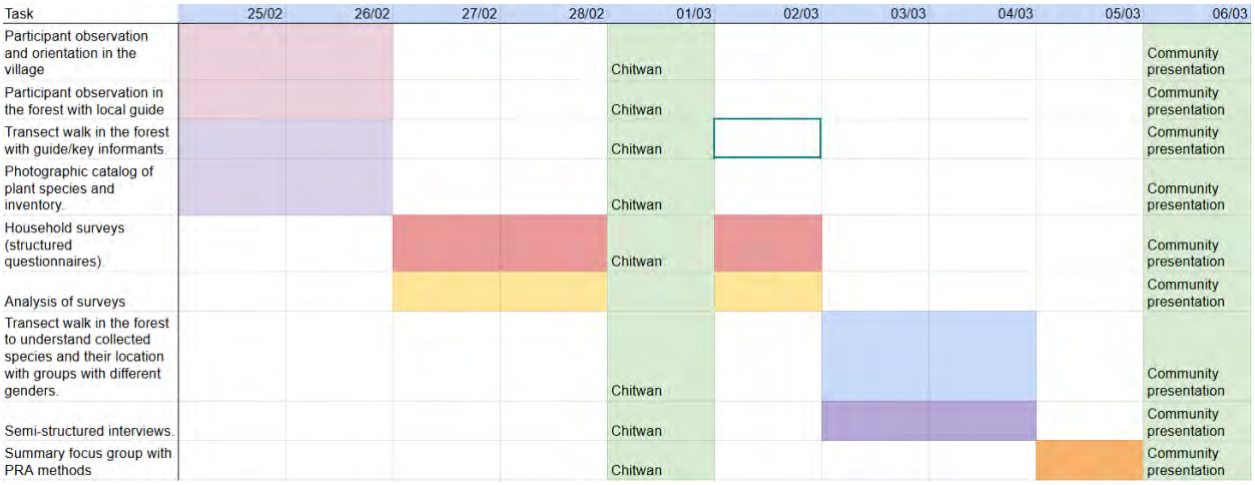

Fig. 3: Detailed time schedule and tasks for the field work in Kawasoti, Nepal.

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7.5 Appendix E: Land Area Measurements

Local name	**Conversion**	**Notes**
Dhur [9]	= 16.93m2	Used for land ownership
Aana	= 1.88 dhur = 31.8 m2	Used for land ownership
Katha	20 dhur = 338.63 m2	Used for land ownership
Bigha	20 kattha = 6772.63m2	Used for land ownership

7.6 Appendix F: Research Matrix

[9] https://nepalwiki.com/nepali-native-units-of-measurement/ reference for the land measurements

Research Objective: Explore the dynamics of access, use and knowledge of non-timber forest products (NTFP) in the community forest of Magarkot Village, Nepal.							
Research Questions	**Sub Questions**	**Data Required**	**Data Collection Methods**	**Data Analysis**	**Inputs/ equipment**	**Relevant References**	**Moment of Analysis**
1. How are NTFPs used by different members of the Margarkot community?	1.1 Which NTFPs are found in the Margarkot Village/forest ? 1.2 Which demographic factors characterize households which harvest NTFPs? 1.3 What are the harvesting habits of each household? 1.4 Are NTFPs used for subsistence, commercial use or both?	Collection of species names and uses. Demographic data on households.[10] Data on types of NTFPs collected in the last year. Data on use of NTFPs in the last year.	Transect walk in the forest with guide/key informants. Photographic catalog of plant species and inventory. Household surveys (structured questionnaires). Participant observation in the forest with the local guide.[11]	Qualitative analysis of preliminary information Statistical analysis	Local species list (FAO) Phones, GPS, Strava Tablet, Survey notebooks/ pens, translator	Smith-Hall et al. 2018, 13	In the field/post-field statistical analysis
2. What is the role of gender in community forestry?	2.1 What are the gender differences in NTFPs collection, use and sale? 2.2 What role does gender play in the governance of the community forest? 2.3 How do women perceive the ecological, social and access changes in forest use since 1993?	Survey data (first survey data) - basic demographic information. Understanding of NTFPs species and different collection habits. Data on access from key informant interviews.	Literature review. Transect walk in the forest to understand collected species and their location with groups with different genders. Semi-structured interviews. Summary focus group with PRA methods (ie.timeline analysis and resource mapping).[12]	Thematic coding; Nvivo; Qualitative discourse analysis; Forest inventory of used species.	Field notes - notebooks and pens, camera for transect walk and species inventory; Prepared notes to conduct post-transect walk discussion. Interview questions, focus group scripts		Post-field work.

[10] Aiming for at least 20 households

[11] Possibly random interactions with local leaving/entering the forests with "collection baskets" and asking them about what they have collected

[12] Try to involve people that already worked with us during the past weeks.