



Biodiversity conservation in community forests

Local values and decentralization in Nepal

Anna Haglund Ståhl

Independent project • 30 credits
Swedish University of Agricultural Sciences, SLU
Faculty of Natural Resources and Agricultural Sciences
Agriculture Programme - Rural Development
Uppsala 2024



Biodiversity conservation in community forests. Local values and decentralization in Nepal

Anna Haglund Ståhl

Supervisor: Harry Fischer, Swedish University of Agricultural Sciences, SLU, Department of Urban and Rural Development

Examiner: Brian Kuns, Swedish University of Agricultural Sciences, SLU, Department of Urban and Rural Development

Credits: 30 credits

Level: Second cycle, A2E

Course title: Master thesis in Rural Development, A2E - Agriculture Programme - Rural Development

Course code: EX0890

Programme/education: Agriculture Programme - Rural Development

Course coordinating dept: Department of Urban and Rural Development

Place of publication: Uppsala

Year of publication: 2024

Cover picture: Photo taken by the author, Anna Haglund Ståhl 2024

Copyright: All featured images are used with permission from the copyright owner.

Online publication: <https://stud.epsilon.slu.se>

Keywords: biodiversity, conservation, community forestry, community-based natural resource management, values, knowledge, decentralization

Swedish University of Agricultural Sciences
Faculty of Natural Resources and Agricultural Sciences
Department of Urban and Rural Development
Division of Rural Development

Abstract

Amidst alarming global biodiversity loss, community-based approaches in natural resource management have been increasingly recognized in environmental policies. Nepal's Community forestry program is an example of community-based natural resource management, in theory consisting of the formation of local institutions with decentralized decision-making regarding the forests. This thesis explores the intersection of local values and forest management in Nepal's community forests, utilizing qualitative methods including interviews and participant observation, along with forest inventories. Research questions addressed include: the values local resource users attribute to forest biodiversity, governance structures in place, and opportunities and challenges in empowering local communities in biodiversity management. The study employs a feminist political ecology framework to analyse the power dynamics and emotional connections of marginalized communities to natural resources. It additionally draws on concepts developed in previous research of authority within decentralized governance structures. The findings show that forest users value a variety of tree species of different benefits and consider active utilization of forests as determinant for the conservation of species diversity. High local autonomy was found to foster local engagement, awareness and valuation of forest species. The study indicates however, that challenges in local empowerment and governance persist in Nepali Community forestry, restricting the influence of local communities in forest management. The research underscores the importance of inclusive governance that integrates local expertise and emotional connections to forests, supported by appropriate government measures. Community-based approaches have the potential to enhance the effectiveness of biodiversity conservation by leveraging local knowledge and fostering adaptive governance.

Keywords: biodiversity, conservation, community forestry, community-based natural resource management, values, knowledge, decentralization

Table of contents

List of tables	6
List of figures	7
Abbreviations	8
1. Introduction	9
1.1 Problem statement.....	10
1.2 Aim and research questions	11
2. Background	13
2.1 Community-based natural resource management.....	13
2.2 The concept and management of biodiversity	16
2.3 Community forestry in Nepal.....	17
2.4 Biodiversity outcomes of Community Forestry	20
3. Research gap	22
4. Theoretical background	23
4.1 Feminist political ecology	23
4.2 Decentralization and governance	24
5. Method	26
5.1 Qualitative interviews and observations	26
5.2 Quantitative forest inventories	27
5.3 Ethical considerations	27
6. Field sites	29
6.1 Sukhare Patal Community Forest.....	29
6.2 Haurdanda Devasthan Community Forest.....	30
7. Findings	32
7.1 Sukhare Patal.....	32
7.1.1 Forest values	32
7.1.2 Management.....	34
7.1.3 Tree species	36
7.1.4 Forest inventory	38
7.2 Haurdanda	40
7.2.1 Forest values	40

7.2.2 Management.....	41
7.2.3 Tree species	43
7.2.4 Forest inventory	44
8. Discussion	45
9. Conclusions.....	51
References	53
Acknowledgements.....	63

List of tables

Table 1. CFUG rights according to the Forest Act (1993). Source: (Ojha et al. 2010).	18
Table 2. Important tree species as mentioned in the Sukhare Patal Community Forest. (+: mentioned by <2, ++: mentioned by 2-6, +++: mentioned by 6 or more).	37
Table 3. Recorded tree species and their numbers in the Sukhare Patal Community Forest.	39
Table 4. Important tree species in the Haurdanda Community Forest (+: mentioned by <2, ++: mentioned by 2-6, +++: mentioned by 6 or more).	44
Table 5. Recorded tree species and the numbers in the Haurdanda Community Forest.	44

List of figures

Figure 1. Part of the Sukhare Patal village bordering to the CF.	30
Figure 2. Haurdanda village with a section of the CF in the background.	31
Figure 3. Woman in Sukhare Patal carrying leaf litter in dokas.	33
Figure 4. The temple on the top of the forest in Sukhare Patal.	34
Figure 5. The nearby forest of Sukhare Patal CF with evidence of pruning	36
Figure 6. Lali gurans (<i>Rhododendron arboreum</i>) in Haurdanda CF.	38
Figure 7. Man in Haurdanda CF carrying pine needles.	41
Figure 8. Forest slope in Haurdanda CF.	43

Abbreviations

CBD	Convention on Biological Diversity
CF	Community Forest
CFP	Community Forest Program
CFUG	Community Forest User Group

1. Introduction

Halting biodiversity loss is one of the biggest challenges of our time as species are declining globally during what is deemed to be a current mass-extinction (CBD 2010). Biodiversity is crucial for the sustainability of ecosystem services, and livelihoods for people (Reid et al. 2005; Cardinale et al. 2012). Over the last twenty years, the role of indigenous people and local communities in biodiversity conservation have increasingly been acknowledged through shifts in conservation approaches (IPBES 2019). The foundation for this is the local communities' close connection to the land, reliance on natural resources for livelihoods, and traditional ecological knowledge, which position them as important stewards of biodiversity (Mauro & Hardison 2000; Sneed et al. 2000). Indigenous peoples and local communities are now recognized in global environmental endeavours and the importance of their participation in natural resource governance is cemented by major frameworks like the Convention on Biological Diversity (Parks & Tsioumani 2023) and by the endorsement of the COP26 the Glasgow declaration of forests and land use (The National Archives 2021).

Forests are home to most of the world's terrestrial biodiversity (UNEP & FAO 2020), while a substantial portion of the global population rely on forests for their livelihood, subsistence and income (Newton et al. 2016; UN 2021). Recognizing the key contributions of forests to rural livelihoods and communities' role in protecting them, many governments have decentralized the management of forests to local user groups (Agrawal et al. 2008). The formal recognition involves a decentralization of the legal ownership, usufructuary rights and decision-making powers to local communities, and has predominantly occurred in the global south (Rights and Resources Initiative 2018).

Community forestry entails a range of ways for organizing forestry with local community authority in forest management and distribution of benefits, often in partnership with the government (Charnley & Poe 2007). The history of community forestry goes back to the 70's as a response to global concerns of resource and nature degradation and forest loss and international policy sought to promote a community-based model. Nepal launched community forestry as one of the world's first countries (Bartlett 1992), partnering the authority of management between communities and the state. Today, it is estimated that one-third of the global forests are managed through some form of community forestry (FAO 2016). A

community-based model and the formation of local institutions, could help to promote local collective action in management (Poteete & Ostrom 2004). This was thought to be the way to achieve restoration of the Nepali forests whilst also enhancing people's livelihoods (Ojha et al. 2010; Oldekop et al. 2019).

Nepal is part of a biodiversity hotspot due to its unique climatic and topographic conditions in the Himalayan region (Shakya et al. 2007; CBD n.d.). The dominantly small-scale, subsistence-based agricultural system in Nepal is closely linked to forest resources, especially in the typical systems with terrace cultivation and livestock production of the Mid-hills of Nepal (Mahat et al. 1987).

The community forestry programme in Nepal has been credited with positive outcomes in protection of forests, curbing deforestation and supporting rural livelihoods (Oldekop et al. 2019). At the global level, community managed forests often harbour high levels of biodiversity (Fischer et al. 2023). However, the connection between the local use, values and biodiversity outcomes needs further exploration to turn the tide of biodiversity loss. In Nepal, with widespread community managed forest, we can explore how local values of biodiversity translates into management decisions.

1.1 Problem statement

Nepal's Community Forestry Programs have been an internationally praised system for sustainable forest management, livelihood promotion, and conservation through decentralization and participation (Pokharel et al. 2007a; Ojha et al. 2010). Globally, the outcomes of community forestry initiatives have been uneven, but Nepal has been regarded as a comparatively successful example (Libois et al. 2021). In many cases, it has been shown that forests have grown back and community members can enjoy the benefits (Pokharel et al. 2007a; Oldekop et al. 2019). However, the program has faced criticism for its ambitious reforestation efforts that has in many instances overshadowed other aspects. For example, aims of increasing forest cover and economic growth have, in many cases, led to strict forest protection or plantations of non-native trees of little benefit to locals and biodiversity (Shrestha & McManus 2008; Ojha et al. 2009; Hajjar et al. 2021; Paudel et al. 2022).

In Nepal, the Mid-hills are the most diverse in terms of ecosystems with high species diversity (Government of Nepal 2014), and at the same time have the highest concentration of Community Forests (Springate-Baginski et al. 2003; Thwaites et al. 2017). Nepal has committed to the Convention on Biological Diversity and its biodiversity mainstreaming framework, prompting a priority of biodiversity in policies, programs and investments in forestry (Harrison & Chepstow-Lusty 2024). Nepal's economy is predominantly agricultural and is vulnerable to climate change through its effects on temperatures and water resources (Bartlett et al. 2010). Effects of climate change will exacerbate present

vulnerabilities in communities and the environments they rely on (Adger & Kelly 1999; The World Bank 2023) and is considered one of the biggest threats to biodiversity (IPBES 2019). Biodiverse ecosystems often have higher resilience to environmental disturbances (Oliver et al. 2015).

Biodiversity is however a concept with a complexity of levels, scale and interactions (Boudouresque 2011). It is increasingly recognized that the richness in biodiversity is shaped by intricate historical and socio-cultural processes not easily quantified and understood (Ellis 2015). Biodiversity's intrinsic value, cultural significance, and utilitarian benefits add layers of complexity to its conceptualization (Koziell & Saunders 2001). Biodiversity is thus an abstraction – stemming from, existing in, and influenced by complex systems, not entirely captured in ecological research models. This complexity underscores the need for integrated approaches that consider both ecological and social dimensions to sustainably manage land resources and conserve biodiversity (DeFries et al. 2004). In this case study located in the Nepali Mid-hills, we will study the attitudes and values regarding forest biodiversity in Community Forests, ultimately influencing the local management decisions.

1.2 Aim and research questions

The objective of the study is to provide insights on perceptions of biodiversity of members of the community forestry program. In this decentralized structure, the local values connected to the forest and its species are assumed to directly shape how different villages manage their forest. The study used qualitative interviews and participant observation to investigate how forest biodiversity is connected to people's everyday lives, values, traditions and knowledge. Also, forest inventories were carried out to provide the local ecological context, providing the basic data for the species mentioned in the interviews. Further, the study includes an assessment of how the local inhabitants perceive community forestry management strategies and how local values may contribute to sustainable biodiversity conservation.

This research aims to explore how community-managed forests, and in particular local dynamics and practices of participation, can contribute to biodiversity conservation, ultimately improving the knowledge of sustainable governance of forest biodiversity. Without a better understanding of how values and actions in forests can affect biodiversity, efforts to mitigate the development can produce unintended or antagonistic effects.

Research questions:

- What are some key ecological, cultural, and socio-economic values attributed to forest biodiversity by local resource users?
- What formal and informal governance structures are in place for managing forest biodiversity, and how do they align with the priorities and preferences of local forest users?
- What are some opportunities and challenges for empowering local communities in forest management, particularly regarding biodiversity conservation?

2. Background

This section provides a background, touching on how community-based approaches gained attention in general nature conservation, the theoretical benefits of local participation, and previous research on the community forestry program of Nepal. This provides an explanation of the context of the case studies for this thesis and leads to the presentation of a research gap and the relevance of this study.

2.1 Community-based natural resource management

Community forestry is a form of governance that involves the collective management and stewardship of forest resources by local communities. Typically, it involves some degree of devolution of decision-making authority from the central government to local institutions that govern resource management practices, establish rules, and facilitate community engagement (Agrawal & Gibson 1999). It requires recognition and legally secure rights of communities to access, use, and manage resources. This empowers communities to take ownership and responsibility for conservation efforts (Ostrom 1990). In order for local communities to make decisions and implement management strategies, they must have the authority. This discretionary power allows for adaptive and context-specific management (Ribot 2004).

The community-based approach in natural resource management is built on several theoretical frameworks developed since the early environmental movements of the 60's and 70's (Lowe et al. 1995). The ideal at that time was conservation based on assessments and plans drawn up by experts, as land-use by local populations was seen, particularly in developing country contexts, as inherently destructive to nature (Dryzek, 2005). Concerns about resource degradation were growing, specifically in forests and other ecosystems that were exploited as 'commons', such as fisheries and grazing lands (Ostrom 2008). As it is difficult to exclude the use of such resources and given the fact that such resources are often limited in supply, it was assumed that individuals acting in their own self-interest would over-exploit 'common' resources, resulting in the depletion of the collective good, also known as the "tragedy of the commons" (Hardin 1968). The recommended solution for this

dilemma, presented by the ecologist Garrett Hardin, was either state control over the resources through regulation or privatization.

However, in works such as those of the economist Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (1990) another approach was presented. It was argued that collective action undergirded by genuine local institutions in fact could successfully regulate common (pool) resources in a way that was adaptive to the needs of the community. (Ostrom 2010). Local institutions with a common ground of trust, norms and rules were shown to support collective action and control over resources and activities, resulting in a more sustainable resource use (Ostrom 1990).

Additionally, mounting evidence of the inefficiency of expert-driven, top-down projects that overlooked local knowledge, values and needs, led to calls for reforms to decentralize authority over resource use to the local level from central state institutions (Lowe et al. 1995). Thus, with Ostrom's theorization of common property arrangements serving as a point of departure for researchers, participatory and community-based approaches gained traction in the field of natural resource management (Schneider 2003; Andersson et al. 2004). This would contribute to empowerment of local communities, enhance participation in decision-making processes, and promote more effective and equitable management of natural resources (Ribot 2005). Participatory decision-making would give a more comprehensive understanding of the complex nature and the diversity of solutions needed, by taking advantage of place- and time-specific knowledge embedded in local communities (Lemos & Agrawal 2006; Nightingale et al. 2020).

Another driver for participatory governance was the increasing recognition of indigenous, local and traditional knowledge in informing sustainable resource management. Local knowledge is based on long-standing observations and interactions with the environment, and can complement scientific knowledge (Berkes et al. 2000). Such cultural knowledge and views on biodiversity are often undervalued in favour of expert scientific knowledge (Adade Williams et al. 2020; IPBES 2022), which can hinder effective civic participation in the management of and decision-making around natural resource use (Fischer & Young 2007). In effect, scientific knowledge defines and frames forests, shaping the policies for management and conservation, and excluding or undervaluing the values and needs of local communities (Savilaakso et al. 2023).

At the same time, decentralized governance is complex, and not automatically democratic and effective. Some key challenges remain, and local communities' management of natural resources are threatened by multiple forces, both external and internal. Effective decentralization requires democratic representation, characterized by downward accountability and responsiveness to local demands (Ribot 2005). The success of participatory approaches depends on the processes of the local institutions formed, and long-term political reforms and support of

decentralized governance (Ribot 2005; Fischer 2021). Local resource governance is influenced by external actors and social, economic, political and ecological drivers that constrain the autonomy of institutions to function properly (Berkes 2006). Poor or failed implementation of legal instruments to ensure the rights to access lands and resources risks undermining local knowledge and values in an increasingly commodified economic system (IPBES 2022). The local institutions are often lacking empowerment, resulting in insufficient autonomy in their decisions. When communities are empowered and have autonomy, they are more likely to engage in sustainable management practices and protect forest resources. Empowerment also fosters democratic processes within the community, enhancing transparency and accountability in forest management (Pokharel et al. 2007b). Evidence suggest that for community forestry to be effective, local communities must not only participate in, but also have significant control over decision-making processes (Ribot 2005; Fischer et al. 2023). This empowerment is essential for ensuring that the management practices are tailored to local needs and conditions, fostering a sense of ownership and responsibility among community members (Maryudi et al. 2012).

Today, community-based natural resource management is a common approach to address both environmental and socioeconomic goals and to balance the exploitation and conservation of important ecosystem features (Kellert et al. 2000; Heller & Zavaleta 2009). Forty percent of conserved areas globally are now managed by local communities (IPBES 2022). Human-occupied landscapes are increasingly specifically targeted in current restoration interventions due to their significant ecological, social, and economic implications, and are usually located in the global south (Carter & Linnell 2023). Local participation is crucial in current conservation efforts, to align with the livelihoods and needs of local communities inhabiting these landscapes (Brooks 2010). Understanding the history and theories of community-based management is therefore useful for informing more sustainable conservation efforts in the future.

Because of their close connection with, and high dependence on, forest resources and ecosystems, local communities are among the first to witness, understand, and experience the impacts of climate change on forests, as well as on their livelihoods and culture (Parrotta & Agnoletti 2012). It is recognized that many local communities manage natural resource and species sustainably through local knowledge of species, practices and tradition (IPBES 2022). These observatory and responsive mechanisms in local communities becomes especially important in biodiversity conservation. This local ecological knowledge is often based on long-term interactions with their environment, allowing them to notice subtle changes in species populations and ecosystem health that might be overlooked by external observers (WWF et al. 2021).

2.2 The concept and management of biodiversity

Biodiversity has become a very popular term in environmental discourses since it was coined in the 1980's (Harper et al. 1997). However, 'biodiversity' has not clearly been defined – it is generally described as encompassing the variety of life, from genes and species, to ecosystems (CBD 1992; Adom et al. 2019). One reason for the popularity of the concept is that biodiversity as a concept helps frame current, significant environmental issues (Bartkowski 2017). However, biodiversity is arguably more than the numbers of species. The definition of biodiversity has been framed by different constructions, where the domination of Western scientific perspectives has led to the marginalization and displacement of local communities in the name of conservation (Escobar 1998). The social dimension reflects the complex interplay between ecosystems and human societies, such as the cultural identity and livelihoods linked to biodiversity (Berkes 2012). Focusing on only one aspect of biodiversity risks simplification of what is a complex concept (Agrawal & Redford 2006).

In ecological terms, it has been determined that biodiversity stabilizes vital ecosystem services over time, as biodiversity loss has been shown to compromise the efficiency of ecosystem processes, with accelerating impacts as the loss increases (Cardinale et al. 2012). Ecosystem services includes basic processes for life on earth, such as regulating air, water, soil and climate, providing nutrition and materials as well as cultural and recreational values (Daily 1997). In addition to effects on ecosystem services, it is estimated that 70% of the world's poor are directly dependent on wild species and thus, resource depletion and biodiversity loss can directly threaten livelihoods (IPBES 2022).

Several direct and indirect threats to biodiversity have been determined. The direct threats are the changing use of sea and land, direct exploitation of organisms, climate change, pollution, and invasive non-native species. The indirect threats are people's disconnect with nature and the failure to recognize its value and significance in society (IPBES 2019). Land use changes alter habitats and disrupt ecosystems, leading to declines in species richness and abundance, indicating that both spatial and temporal scales needs to be considered when studying land use and biodiversity relationships (Haines-Young 2009). In terms of land use, more intensive land use typically leads to greater biodiversity loss, while less intensive practices may allow for more coexistence of human activities and biodiversity (Tscharntke et al. 2005). In forest- dependent communities, measures such as selective logging, maintaining forest structure, and preserving critical habitats are important in sustainable management for forest biodiversity (Lindenmayer & Franklin 2002).

Community-based approaches have been recognized as a useful approach in human-occupied landscapes for biodiversity management as they are considered an effective tool for better environmental and socio-economic outcomes by

empowering local communities and ensuring their active involvement in conservation projects (The World Bank 2017; UNDP 2017; FAO 2021). This is based on research stating that local communities often have a deep understanding of their environment and possess valuable knowledge about local species and ecosystems, which can greatly inform conservation strategies (Wilder et al. 2016). When local communities are meaningfully involved, they are more likely to take ownership and responsibility for conservation efforts, leading to more sustainable outcomes (Kothari et al. 2013). It can help balance conservation goals with local needs, reducing potential conflicts over resource use (Redpath et al. 2013). Local communities can also effectively monitor biodiversity and enforce conservation regulations, acting as stewards of their environment (Danielsen et al. 2005), and can enhance the resilience and adaptability of conservation projects by involving those who are directly affected and invested in finding solutions (Ruiz-Mallén & Corbera 2013). Climate change further drives the need for biodiversity management to focus on future uncertainty, and an adaptive approach as the understanding of forces for ecological change has developed (Keith et al. 2011). Local communities often have detailed knowledge about their environments and can provide insights into changes and effective adaptation strategies (Heller & Zavaleta 2009). Community-based natural resource management is a pivotal approach in biodiversity conservation, emphasizing the involvement of local communities in the sustainable management of natural resources. In Nepal, Community forestry has empowered local user groups to manage forest resources, leading to improved forest conditions and increased biodiversity (Pokharel et al. 2007b).

2.3 Community forestry in Nepal

The formation of community forestry in Nepal was part of a larger movement toward community-based natural resource management, envisioned as a way to support more local, bottom-up approach to development and nature conservation (Charnley & Poe 2007). The model of Community Forestry was launched in the late 1970's during global concerns about forest degradation and soil erosion in what was termed the "Himalayan crisis" (Ojha et al. 2009). The forests of the Community Forest program are used collectively by user groups with established property rights to benefits derived from the resource (Agrawal & Chhatre 2006). The program and the rights of local people in the management were recognized legally with the Forest Act 1993 (Acharya 2002). There are now about 20,000 community forests (CFs) in Nepal (Pandey & Pokhrel 2021) with use rights distributed amongst the members of the Community Forest User Group (CFUG), while the government still formally retains ownership of the land (Acharya 2002). The CFUG committee assembly is the highest authority of forest management, and decides the rules of the CF and the management of the forest, including protection measures, harvesting and

distribution of benefits (Acharya 2002). In order to obtain and retain this authority, the CFUGs need to have a valid operational plan, approved by the local district forest office. The operational plans of the community forests are the basis for the management. It sets out the objectives for the management, activities, rules and regulations on forest use (Bartlett 1992; Ojha et al. 2010).

Table 1. CFUG rights according to the Forest Act (1993). Source: (Ojha et al. 2010).

1. Rights to self- governance	2. Rights to forest management and utilization
Communities have rights to form a Community Forest User Group (CFUG) as per their willingness, capacity, and customary rights.	There is no limit to the forest area that can be handed over to communities.
Community forest boundaries will not be restricted to existing administrative or political boundaries.	CFUGs can make optimal use of their forest by growing cash crops together with forest crops.
Government can dismantle the CFUG if the latter is found to engage in large scale deforestation, but in such cases it is the duty of the government to reconstitute the CFUG.	CFUGs can mortgage their standing forest products with financial institutions to obtain loans.
CFUGs can elect, select or change executive committee at any time.	CFUGs can utilize their funds for any purpose (but 25% of income from forest must be spent forest development)
CFUGs can punish members who break their rules.	CFUGs can freely set prices and market their forest produce.
CFUGs can amend or revise their constitution at any time	CFUGs can establish enterprises and make profits.
	CFUGs can seek support from any organization.
	CFUGs can raise funds by various forestry and non-forestry means with all income going to group funds with no requirement for sharing financial revenues with the government.
	CFUGs can invest in any areas, persons or development activities according to the decision of CFUG assembly.

According to the Forest Act and associated forest regulations passed, the CFUGs are recognized as legal, autonomous entities with full authority and responsibility to protect, manage, and utilize forest resources (Ojha et al. 2010). They operate based on decisions made by their assemblies and adhere to their self-prepared regulations and operational plans, with minimal interference from the state forestry agency (Pokharel et al. 2007a). However, the context and landscape of the community forestry in the Mid-hills of Nepal have changed since its establishment. In general, socio-economic and environmental forces have affected the interaction between communities and the forests and resource practices (Laudari et al. 2024). These have in different ways contributed to a declining importance of agriculture and forest use in general, impacting the institutions of the community forestry program (Laudari et al. 2024). Migration, whether seasonal or permanent, has become a crucial way for rural households of Nepal to earn a living. This is driven by various factors rooted in the current political-economic landscape, including conflict, climate change, disasters, and global pressures that have made agricultural livelihoods such as farming increasingly precarious (Adhikari et al. 2023). This has led to a labour shortage in the villages and changes in land use and different connected impacts (Schwilch et al. 2017). For example, instead of relying on forest resources, many villages have planted trees for their household needs and income on their private, often classified as abandoned, agricultural lands (Acharya & Kafle 2009; Smith et al. 2024).

Moreover, it has also been shown that governance challenges exist in the Community Forestry program, reinforcing power inequalities between the community and the government (Ojha et al. 2009). Among other things, it has been shown that it is difficult for local communities to participate in and benefit from CF programs due to governance complexities (Sapkota et al. 2020). Also, a trend towards expert-led techno-bureaucracy and devaluation of participatory governance also inhibits community participation in forest governance (Ojha et al. 2009; Sapkota et al. 2020; Khatri et al. 2022). The techno-bureaucratization of forestry management in Nepal involves the dominance of technical knowledge and values of government forest officials over local knowledge and experiences (Ojha 2006). Such processes lead to a disempowerment of local communities, where their decision-making power is undermined. For example, implementation of scientific forestry practices in the making of operational plans with a detailed inventory with prescribed harvesting levels, complicates the autonomy of communities in managing the forests (Ojha 2006; Khatri et al. 2022). In the beginning of community forestry in Nepal, it was heavily funded by donor projects to plant trees, produce operational plans and train the local user group members. Since then, most of the donor have withdrawn and the communities are now reliant on the government, or their own funds and knowledge for maintaining the forests (Pokharel et al. 2007a).

This development of techno-bureaucracy can be seen as part of intricate and subtle processes whereby recentralization of forestry is occurring in Nepal, with negative impacts on true community forestry program (Ribot et al. 2006; Shrestha & McManus 2008; Nightingale 2017), with more obvious actions being the government issuing directives and statements in the forest sector taking back the authority (Pokharel et al. 2007a), as well as several actual attempts to amend the Forest Act of 1993 (Sunam et al. 2013). In some cases, scientific management is argued to be contesting the very aims of community forestry of providing basic forest products and equitable distribution of benefits (Basnyat 2020).

Unequal power distribution has also been shown at the local level in the Community Forestry Program. Local elites have been shown taking leading positions on committees thus dominating both decision-making and receiving more benefits, affecting the inclusion and participation in the forest management (Gautam 2009; Ojha et al. 2010).

Overall, these issues affecting the Community forestry programs involve struggles over authority and empowerment issues, affecting the recognition of local rights, values, needs and knowledge in the management.

2.4 Biodiversity outcomes of Community Forestry

Extensive existing research has been carried out about projects and programs with similar dual objectives of conservation and development as community forestry. The research includes various indicators such as physical, demographic, economic, institutional, and socio-political factors affecting the management and the success of the strategies. Results highlighted that decentralization with supported local structures with collective decision-making and effective monitoring is important (Brooks et al. 2006; Nagendra & Ostrom 2012), contributing to the level of enforcement and promotion of sustainable resource management practices (Agrawal & Chhatre 2006). Several reports conclude that an empowered local institution in a polycentric governance system involving actors on different levels, is particularly effective for yielding environmental outcomes (Newig & Fritsch 2009; Nagendra & Ostrom 2012). To promote biodiversity as such, it is claimed that many of these programs are also in need of technical, educational and financial support to efficiently monitor and manage (Berkes 2009; Jones & Kirk 2018),

Positive ecological outcomes from community forestry have been shown in broader terms (Chakraborty 2001; Adhikari et al. 2007). In terms of biodiversity, the studies are predominantly large-scale comparisons (Fischer et al. 2023). In studies comparing community forest and other forests, higher biodiversity has been shown in CFs (Pandey 2007; Luintel et al. 2018). Conclusions have been drawn that forest commons managed for subsistence needs, also support biodiversity (Persha et al. 2010). The positive effects on biodiversity depend on what kind of

management activities are performed (Shrestha & Shrestha 2010). Also, the preferences of tree species matter, as one study concluded: “Community forestry can contribute tree species diversity if people have a broad selection of species preferences.” (Pandey 2007). It should be pointed out that some studies show that the favouring of some useful trees over others in communities, may decrease the biodiversity of the forest (Paudel et al. 2022). Effective local governance and participatory approaches help safeguard various species and their habitats. Controlling wildlife hunting, grazing, forest fires, and conserving soil erosion-prone areas positively impacts forest biodiversity in Community forestry. Conversely, practices such as leaf litter collection, selective species planting, removal of unwanted herbs, shrubs, and climbers, excessive thinning and pruning, and harvesting of dead or fallen trees, as well as forest clearing, can negatively affect the forest's structure, composition, and ecological functions (Shrestha & Shrestha 2010).

Research on the outcomes of these programs are complicated and elusive (Wells et al. 2004; Jones & Kirk 2018). Drawing on the previous sections of community-based natural resource management and biodiversity, the outcomes in terms of biodiversity depend on many variables. The core in these projects are the dual environmental and social purposes. Strong local and empowered institutions determine the success of both aims, because they have the capacity to take account of and adapt to climate change, as well as the needs and priorities of the local community (Nagendra & Ostrom 2012; Fischer et al. 2023).

3. Research gap

From previous research it can be argued that biodiversity under certain circumstances is supported and fostered in the Community Forestry Program (Pandey 2007; Pokharel et al. 2007b; Luintel et al. 2018) and in projects with dual aims of conservation and development in general (McShane & Wells 2004; Sayer & Campbell 2004; Blom et al. 2010). It has also been shown that internal and external governance issues prevail in such programs (Agrawal & Gibson 1999; Cleaver 2002; Ribot 2002) and more specifically in the community forestry program (Acharya 2002; Kanel & Kandel 2004). They all give rich understanding of the complex nature of the governance of community forestry as a decentralized program.

Previous research has set out to explore the physical benefits of forests, however, not the specific values and benefits related to biodiversity for the local communities. Research local communities' values attached to forest and species in the context of the community forestry program is important for several reasons. First, exploring the values and connection to the forest highlights intrinsic social dimensions of biodiversity, beyond ecological and economic dimensions. Second, understanding what knowledge local forest users have of the forest ecosystems can inform sustainable forest management. Third, such insights can inform more inclusive and effective policies that acknowledge local knowledge and values, which are vital for sustainable management.

In this thesis I will focus on the local values and knowledge regarding biodiversity of the individuals in the community, how that relates to best management practices, and whether these aspects have influence on the forest management. What could disempowerment of community-based governance and local values mean in reality?

By doing this question both qualitatively, based on interviews, and quantitatively, based on forest surveys, this thesis can provide a more in-depth description and explanation of community-specific experiences and management practices with respect to biodiversity. By comparing two community forests in different circumstances, external influences and some challenges facing community forestry in Nepal today can be discussed.

4. Theoretical background

This theoretical background will provide the theoretical concepts and theories concerning this case study. This, along with the contextual background of the case studies, will provide the foundation for the discussion on the empirical material. Starting out in feminist political ecology, the emotion and values ascribed to nature are explored in connection to power dynamics. To analyse this in the community forestry program, concepts from decentralization theory is used.

4.1 Feminist political ecology

The importance of integrating social factors into environmental issues has long been acknowledged as key to developing effective and legitimate conservation and environmental management policies (Bennett et al. 2017). Political ecology examines the intricate relationships between human societies and the environment, emphasizing the interplay of power dynamics, politics, and equity within broader social frameworks, and set against geographical and historical backdrops (Escobar 2006). The field aims to uncover linkages between nature and power (Saunders 2010) by analysing control, access and knowledge with respect to natural resources (Watts 2017).

The feminist political ecology approach pays more attention to impacts of environmental change and policies on different genders and marginalized groups (Rocheleau et al. 1996). Moreover, it features marginalized people's emotions and values, practices and knowledge in connection to the environment, as opposed to common patriarchal rational values (Haraway 1988). Feminist political ecology researchers argue that emotions are not merely personal or individual experiences but are deeply entwined with social, political, and ecological processes. Emotions are explored as a critical and often overlooked dimension of environmental conflicts and power dynamics (González-Hidalgo & Zografos 2020). Studies of human-nature relations in this field draw on theories that nature and society continuously and mutually produce each other by definitions and practices, conditions and resources (Castree & Braun 2001). Environmental conditions and resources are not just natural entities but are shaped by social practices and institutions. Conversely, environmental changes and practices influence social structures and relations (Rocheleau et al. 1996; Nightingale 2015).

This thesis will explore the formation of subjectivity and how it is connected to both power dynamics and the socio-natural environments where individuals are situated. Subjectivity here will include the values assigned to the forest and its species, ultimately influencing their decisions and perceptions of the preferred management. Applying feminist political ecology provides an understanding of dynamic relation between social factors and power relations, and people's connections, values, and benefits from forests.

4.2 Decentralization and governance

To analyse the situations of the case studies of this thesis more specifically, it is beneficial to draw on concepts developed in previous research of community-based management. This aims to provide a comprehensive understanding of the dynamics and struggles over authority within decentralized governance structures, focusing on both general principles and specific applications in natural resource contexts.

Decentralization refers to the transfer of authority and responsibility from the central government to lower levels of government. The main goal is to enhance governance efficiency, improve service delivery, and increase public participation (Randinelli et al. 1984). It encompasses various dimensions, including fiscal, administrative, and political decentralization, where fiscal decentralization is the allocation of financial resources and the related decision-making to local governments. Administrative decentralization is the distribution of policy responsibilities, and political decentralization is the devolution of political influence and representation to local communities (Schneider 2003). Effective decentralization requires clear roles and responsibilities across the levels to avoid conflicts and ensure cohesive policy implementation (Di Gregorio et al. 2019). On the local level, the delineation of authority and responsibilities means discretionary authority – the ability to make decisions around use and management (Larson & Soto 2008).

Decentralization in the context of community forest programs revolves around theories of participatory governance and management, and empowerment (Agrawal & Ostrom 2001; Pandit & Bevilacqua 2011). Decentralization generally seeks to empower local communities. Empowerment in this context involves promoting community engagement and recognizing and integrating local knowledge and practices into formal governance structures to get better representation in decision-making (Larson & Ribot 2004). However, the potential for community forestry is not fully captured by opportunities to influence power through formal processes alone. Genuine empowerment involves developing the skills and confidence necessary to exercise power effectively (Lachapelle et al. 2004). It also depends on how representative and accountable the local institution is, and whether it is autonomous in making meaningful decisions (Ribot 2002).

Ribot also emphasizes the importance of discretionary powers for local authorities within decentralized governance frameworks. Ribot argues that for decentralization to be genuinely effective and democratic, local representatives must have secure discretionary powers that allow them to make meaningful decisions regarding natural resources. Discretionary powers in community forestry empower local communities by allowing them to make decisions about the use and management of forest resources (Anderson et al. 2015). These powers enable local authorities to act autonomously and respond to the specific needs and preferences of their communities, thus fostering genuine local participation and accountability in resource management (Ribot 2002). When discretionary powers are not effectively implemented, communities often face challenges like limited capacity, lack of technical knowledge, or external pressures from government and commercial interests, which can undermine the benefits of having discretionary powers (Anderson et al. 2015).

This theoretical background on decentralization sets the stage for analysing authority and empowerment complexities at the local level in natural resource management.

5. Method

The thesis is based on two approaches for the case study: a qualitative of interviews and observations, and a quantitative forest inventory. This was done to describe the biophysical setting, as well as to give insights on how the communities experience biodiversity. The villages were chosen on different distances to the capital of Kathmandu in order to examine case studies of varying contexts within the Mid-hills. The data collection was done during a field study in Nepal during the 2nd to the 23rd of February of 2024. The Southasia Institute of Advanced Studies (SIAS) helped me initiate the study by providing field contacts. The field team consisted of the author of this study as well as one research officer and translator from SIAS.

5.1 Qualitative interviews and observations

To investigate the values and perception of local villagers in relation to their community forest, a case study was performed. A qualitative approach was chosen, as it allows exploration of perspectives and meaning towards a topic (Creswell 2018). The interviews were conducted semi-structurally, and the interview questions were modified or developed throughout the study and depending on the informant. This is in order to be responsive to the situation of the study, and effectively gather rich material and create an understanding (Bickman & Rog 2008). To understand a situation and the subjective, lived experience of individuals based on their own accounts, a phenomenological approach was taken. (Creswell 2018).

In total, 38 informants were interviewed, with 19 interviews performed in each village. Sixty percent of the informants were women, as they were more available around the villages and spent more time in the forest, due to male out-migration. Informants were generally selected in the higher age-span, as they might know more about the history of the forest and management. Key informant interviews were also performed, one with the chairperson of each village and one from the committee. These interviews would either be about the local context, the extent, history and current state of the Community Forest, its regulations and about policies. The interviews would usually last up to an hour, however, some were shortened on request of informants who were busy.

All the interviews were translated continuously and noted down, and some were recorded to be transcribed and extract quotations. The interviewees were anonymized and given a number, along with their age and gender.

5.2 Quantitative forest inventories

To examine the linkages between the perceptions of the forest to the natural scientific biodiversity, a quantitative plot inventory was carried out in both of the study areas. The methodology was according to the manual by the research collective International Forestry Resources and Institutions (IFRI) network (IFRI 2008), in order to contribute to the database over ecological research in Nepal. The forest surveys were conducted by the author, a research officer with bachelor's degree in forestry and two locals for species determination. The team collected data about saplings (species, count and diameter at breast height (DBH)), trees (species, count, DBH and height), and the environment (altitude, slope, canopy cover, soil erosion) (IFRI 2008). The field study area was drawn in Google maps as the borders of the Community Forest, according to the information given by the operational plans, or the committee. A grid of 10x10 squares was then placed over the map. The centre points of these squares were our potential survey plots. As both the forests had very steep areas, the choice of actual survey plots were made whilst in the field. The aim was to get a statistically representative spread of the plots over the whole forest. In total, 18 plots were surveyed in each forest.

Incorporating a forest inventory into this thesis allows for a comprehensive understanding of the forest's current state, which is helpful for interpreting local values and emotions linked to the forest. The inventory provides baseline data that contextualizes community narratives, highlighting the cultural and practical significance of specific species. The inventory builds a connection between scientific research and community insights by comparing local ecological knowledge. For the aims of this study, only the species classified as trees were accounted for with their local name, their scientific name and the numbers found of each species. The scientific names of the species were determined by the author by searching in different research datasets of recorded local names in Nepal, alongside comparing pictures taken at the survey and those found of the species on various websites.

5.3 Ethical considerations

Qualitative, interview-based research involves several ethical issues. Every interview was introduced with a presentation of the team and the purposes of the

study, being education and research. This was followed by requesting their consent to participate. Additional consent was requested in those cases where the interview was recorded. Before the questions, efforts were taken to build rapport with the respondents, to assure the respondents that the purpose was to understand their perceptions and values and to inform them that they should only answer questions if they consent.

For the quantitative forest surveys, permission was asked by the chairperson of the CF. Selecting community forests ensured that they had experienced forest inventories (as it is part of their operational plans), which was expected to lead to greater acceptance of our presence and research activities in the forest. Upon asking around in the villages, a few local assistants in each village were employed during the forest surveys. This was done upon their own voluntariness and with a pre-agreed reimbursement.

6. Field sites

To research the linkages between the local communities and biodiversity outcomes in a changing economic landscape, two villages of different distances to the capital Kathmandu were chosen. Both districts are part of the eastern Mid-hills of Nepal.

6.1 Sukhare Patal Community Forest

The forest and the nearby village lie approximately 110 km from Kathmandu in the Ramecchap district at an altitude of approximately 1900 meters. Around 30 households and 200 people reside in the village, all of Newar caste. Many of the young people have settled in Kathmandu or migrated to other countries. Subsistence farming is most common in the area, usually cropping potato, maize and vegetables, along with livestock keeping of either goat, buffalo or oxen. In some of the households, members would work in the nearby town or in Kathmandu.

The CF was established around 1994 due to heavy deforestation in the area. The forest access was restricted for 10-15 years in the beginning. Informants stated that about half of the agricultural land of the area had been abandoned and that the livestock numbers had decreased in the last 30 years. There were also four areas of leasehold forest in and surrounding the community forest. This was leased to the households in the village two years after the establishment of the CF, in order for them to nurse and plant saplings of mostly pine.



Figure 1. Part of the Sukhare Patal village bordering to the CF. Photo: Anna Haglund Ståhl

6.2 Haurdanda Devasthan Community Forest

The forest and village were located approximately 25 kilometres from Kathmandu in the district of Kavrepalanchok at an altitude of approximately 1800 meters. The roads leading to the village is very damaged and not accessible by car. There were about 36 households in the village and around 150-160 people residing. Many, especially the youth, live partly here and partly in Kathmandu. They all belong to the ethnic group Tamang, with their own language, and are Buddhists. The most common crops in the village are maize and mustard. Almost all the villagers keep goats, buffalo, and cows. Only one of the households interviewed said that they sell some of their produce. The CF was established in 1992. Informants said that earlier, the area around the village would be empty and people would rear their livestock on the hills. As all the forest had been cut down, it was planted with different kinds of pine, as well as Utis, a broadleaf tree mainly used for timber and fuelwood. Since then, the trees have naturally regenerated.



Figure 2. Hurdanda village with a section of the CF in the background. Photo: Anna Haglund Ståhl

7. Findings

The empirical material is here presented in two parts for each village: first the qualitative interviews divided into themes, followed by the quantitative forest inventories.

7.1 Sukhare Patal

7.1.1 Forest values

In Sukhare Patal, villagers are allowed to cut grass and fodder leaves in the forest during the winter season when it is open. In the summer months, the CF is closed for the collection of fresh materials, making villagers more reliant on their private lands and leasehold forest. Upon request, user group members can obtain timber after discussions in the committee, which then decides whether cutting is permissible and selects the appropriate tree. A specific type of thin timber, known as Hariss, is used to create tools for ploughing agricultural fields. Timber from the forest is primarily used for building animal sheds rather than residential houses, as many villagers now prefer cement and metal structures following earthquake damage to traditional houses.

Most residents cut their fodder in the forest and carry it to their animals, which are kept at their homestead, rather than grazing them the forest which was common practice before the establishment of the CF: “Now, less goats are taken by the leopards” (Respondent #9, 71 years old man). Those who have time graze their animals on their private lands between cropping or on marginal lands along trails and roads. Animals can also graze in the leasehold forest, which is collectively managed by community members and features planted pine trees and grasslands. The leasehold rules differ from those of the CF: “The rules are set as they wish after discussions at the opening, they can change every year” (Respondent #13, 64-year-old man).



Figure 3. Woman in Sukhare Patal carrying leaf litter in dokas. Photo: Anna Haglund Ståhl

Historically, the village has used many different medicinal herbs from the forest, and some villagers continue to do so for ailments like headaches, fever, and menstrual cramps. One villager (Respondent #2, 48-year-old man) demonstrated various herbs with different purposes, such as Dhasingre, Pakhanbed, Churato. Despite a decline in the need for forest products due to planting of trees on their own lands, a man stated: “How we use today is because of the old days, there are things we simply like to get from the forest still” (Respondent #13, 64-year-old man). Although most villagers have gas stoves, they prefer cooking over a fire for additional heating, and they collect fuelwood for this purpose.

At the top of the village in the forest, there is a Shiva temple represented by a large boulder with a Bajho tree growing on it. Decorative strings of Bajho leaves and marigold flowers hang from the tree, and traditional Hindu rituals, including the ringing of bells and burning of incense, are performed there. On celebratory days, people from nearby villages gather at the temple for food, prayers, and milk sacrifices.



Figure 4. The temple on the top of the forest in Sukhare Patal. Photo: Anna Haglund Ståhl

7.1.2 Management

Respondents identified the most significant change in the forests as occurring before and after the establishment of the CF. This transition marked a shift from dry, barren grasslands to areas now covered in trees. Previously, they had to travel long distances to other forests for timber and fuelwood, and they grazed their livestock on the bare hills. The use of timber for building houses and the grazing of animals were cited as causes of forest degradation at that time. With the establishment of the CF, access was restricted for several years to allow the forest to regenerate. As the forest began to grow, limited access was permitted for collecting leaf litter. Although there are now fewer areas available for grazing, respondents are content to carry fodder back home, as they rarely have the time to graze their animals anyway.

It was told by the committee and some villagers that upon establishment of the CF, they collectively decided that the forest will be protected from grazing for at least 50 years. Some suggested that after this period, allowing grazing might be beneficial. Villagers expressed concern that some herb and grass species are declining as the forest becomes denser and darker. One fern was especially

mentioned by a few: “That fern grows everywhere and pushes away the good grasses for the animals.” (Respondent #7, 43 years old woman). Another kind of grass reported to be declining is Amriso, that is important for making brooms. One man also said that significant flowers for worship, Chilia and Jhimbu, that is usually found in the forest, are going extinct. Almost all respondents mentioned increasing animal disturbance due to the growth of the forest. They are also generally very afraid of the presence of leopards in the forest, and the women and elderly were urged not to go alone.

The notion that there is less usage of the forest today due to outmigration is widespread in the village. Many have migrated to Kathmandu or abroad to earn more income. Because of the lack of people, it was generally stated that there was a lack of time in the households to collect forest products. This was stated to cause less usage of the forest, and also a lack of manpower to carry out management activities such as thinning and pruning. Many of the elder informants of the village stated that they cannot go to the forest very often and would rather grow most of the needed materials on their own lands. As one woman stated: “The benefits are good, as long as they have manpower, or help each other.” (Respondent #11, 65 years old woman).

All the villagers said the forest is very dense nowadays and that they are concerned about that, as one villager in Sukhare Patal said: *If more people would come to live here, the forest would be better*. (Respondent #6, 47 years old man). One man said that the trees that were still present in the area when he was young were bigger than they are today (Respondent #1: 48 years old male). He stated that because the forest is growing so dense, they have no room to grow, which effects the quality of the wood. About 15 years ago, they would thin and prune the forest upon request and when funds were made available by the forest department. Several committee members in the village said that they would like to manage the trees and the shrubs in the forest, but it is too much work to go so far into the large forest and they would need to get paid for that. A few villagers suggested during the interview that they should sell more forest products in order to raise money for forest management. Many have high hopes of increasing market access by a new road built through the forest. Some villagers, specially one military man, dream about making the forest into a national park for employment: *“we could be employed to protect the forest, its animals and herbs”* (Respondent #2, 48 years old man). Before, the committee used to charge the user group for fodder and leaf litter collection but now it is free. Informants states that the fee was supposed to have been used to pay for forest officials doing surveys of the forest at the time. They had not revised their operational plan for Sukhare Patal CF for about 20 years, and it did not include a forest inventory.

In Sukhare Patal, they have a system of rotating the plots in the forest to be used for different purposes. The vice chairperson said that this is because the areas of the

forest closest to the village is the most vulnerable as it is the driest and rockiest, and regeneration is slower. Some in the user group said that this system compromises their access to collection of materials, as these plots might be further away from the village. The villagers state however that they agree with this method, as it is said to benefit the forest, and especially trees such as Chilaune, Falat, Chanp and Katus: “They have increased because the cutting is managed by the rotation of areas” (Respondent #6, 47 years old man). The selection of areas is done during the annual meeting for the opening of the forest. Generally, in the user group meetings, it was said that they discuss the protection of the forest and the trees. Some said that they like to go because they acquire knowledge about the forest and relating issues.



Figure 5. The nearby forest of Sukhare Patal CF with evidence of pruning of Bajho trees. Photo: Anna Haglund Ståhl

7.1.3 Tree species

In Sukhare Patal, the individuals would name a variety of tree species being the most important trees, collectively naming over ten different, with the most frequently mentioned being Angeri (*Lyonia ovalifolia*), Arkhaula (*Lithocarpus elegans*), Bajho (*Quercus lanuginose lanata*), Chanp (*Magnolia champaca*), Kafal

(*Myrica esculenta*), Katus (*Castanopsis Indica*), Khanyo (*Ficus semicordata*), Khasru (*Quercus semecarpifolia*), Phalant (*Quercus lamellose*), Utis (*Alnus nepalensis*). Out of these ten most important, eight are fodder trees and are often used for fuelwood as well. A villager stated (Respondent #15, 52 years old man) that because the livelihoods of the Sukhare Patal are heavily dependent on livestock production, the fodder trees are most important to the people. Several villagers have noticed a decline in Paheli, a tree commonly used for timber in the past. One woman said: “The trees we need the most are the most supported” (Respondent #3, 48 years old woman), saying that in the CFUG, supportive measures for particularly fodder trees are most often discussed. For instance, several villagers mentioned issues with the crown being cut of the Bajho tree, restricting its growth. One man said that the herbs in the forest are declining because their importance has decreased: “They are no longer used, there is no market” (Respondent #13, 64 years old man). A valuable tree, Lokta, had been observed to have appeared in the forest, which a man said they need to protect and support the spread of, as they can make paper from it.

It was mentioned that they need to have many different trees to choose from, as they grow in different areas of the forest and these areas change (Respondent #2, 48 years old man). It was stated by several that is good to have trees of multiple uses, as they can cut big branches to carry home and use the leaves for fodder and the remaining wood for good fuelwood (Respondent #12, 49 years old woman). Additional to their uses as fodder and fuel wood, the Kafal and Chanp bears fruits, and the Lali gurans, being the national flower, carry large, red flowers used in religious rituals.

Table 2. Important tree species as mentioned in the Sukhare Patal Community Forest. (+: mentioned by <2, ++: mentioned by 2-6, +++: mentioned by 6 or more).

Local name	Scientific name	Purpose/use	Importance
Angeri	<i>Lyonia ovalifolia</i>	Fodder, fuelwood	++
Arkhaula	<i>Lithocarpus elegans</i>	Fodder, timber	++
Bajho	<i>Quercus lanata</i>	Fodder, fuelwood	+++
Chanp	<i>Magnolia champaca</i>	Timber, fruits	++
Chilaune	<i>Schima wallichii</i>	Fodder, timber	+
Dudhilo	<i>Ficus nemoralis</i>	Fodder	+
Gobre salla	<i>Pinus wallichiana</i>	Timber	+
Jhingane	<i>Eurya accuminata</i>		
Jure kafal	<i>Eriobotrya dubia</i>		
Kafal	<i>Myrica esculenta</i>	Fodder, timber, fruits	++
Katus	<i>Castanopsis indica</i>	Fodder, timber	+++
Khanyo	<i>Ficus semocordata</i>	Fodder	++
Khasru	<i>Quercus semecarpifolia</i>	Fodder	++
Kutmiro	<i>Litsea monopetala</i>	Fodder	+

Lali gurans	Rhododendron arboreum	Fodder, religious	+
Pakhanbed	Bergenia ciliata		
Phalame	Mesua ferrea L.	Timber, leaf litter	
Phalant	Quercus lamellose	Fodder, timber	+++
Utis	Alnus nepalensis	Timber	+++

In Sukhare Patal, they also mentioned that the planted pine was beneficial, as it was planted in wet areas where landslides would occur during the monsoon. However, they are convinced that no other trees than native ones will survive in the area. They have tried to plant many different ones over the years, such as fruit and nut trees, but they have all failed. Some villagers said that they have discussed in meetings to plant more of the trees Kutmero and Dudhilo, as they provide nutritious fodder. However, they would need to submit applications to the forest department for that.



Figure 6. Lali gurans (*Rhododendron arboreum*) in Haurdanda CF. Photo: Anna Haglund Ståhl

7.1.4 Forest inventory

Here the forest inventory data is presented, the species recorded in alphabetical order according to their local name. The most common species found in Sukhare Patal were Falat (99), Bajho (91), Chilaune (83) and Angeri (81), in a total of 656

recorded trees. A total of 33 different species were found on the 20 plots distributed over the forest, approximately covering 0.3412 ha. The forest spanned over a mountain ridge and contained various conditions, from grasslands to compact, tall forest filled with bamboo shrubs. Different types of areas were dominated by different tree species.

Table 3. Recorded tree species and their numbers in the Sukhare Patal Community Forest.

Local name	Scientific name	Count
Aarupate	<i>Prunus napaulensis</i>	2
Angeri	<i>Lyonia ovalifolia</i>	81
Arkhaula	<i>Lithocarpus elegans</i>	28
Bagkada	Unknown	1
Bajho	<i>Quercus lanata</i>	91
Bhalayo	<i>Anogeissus latifolius</i>	5
Bonkset /Bongshet	<i>Quercus</i> sp,	2
Chanp	<i>Magnolia champaca</i>	2
Chilaune	<i>Schima wallichii</i>	83
Dudhilo	<i>Ficus neriifolia</i>	1
Falat	<i>Quercus lamellosa</i>	99
Ghurpis	<i>Leucoseptrum</i> sp.	2
Harabire	Unknown	2
Jhingane	<i>Eurya acuminata</i>	16
Jhure Kafal	<i>Eriobotrya dubia</i>	6
Kafal	<i>Myrica esculenta</i>	57
Katus	<i>Castanopsis</i> sp.	11
Kauli	<i>Brassica oleracea</i> Linn.	3
Kaulo	<i>Persea duthiei</i>	5
Khasru	<i>Quercus semecarpifolia</i>	7
Lakhuri	<i>Fraxinus floribunda</i>	5
Lali gurans	<i>Rhododendron arboreum</i>	46
Lapche	<i>Capsicum frutescens/ Croton tiglium</i>	1
Mel	<i>Pyrus pashia</i>	3
Paheli	<i>Litsea doshia</i>	4
Paiyu	<i>Prunus cerasoides</i>	1
Phalame	<i>Mesua ferrea</i>	36
Pwale	<i>Ilex excelsa</i>	6
Rani salla	<i>Pinus roxburghii</i>	7
Saur	<i>Betula alnoides</i>	6
Siresh/Sirish	<i>Albizia</i> sp.	13
Sisi	Unknown	5
Utis	<i>Alnus nepalensis</i>	19

7.2 Haurdanda

7.2.1 Forest values

In Haurdanda, they are allowed to cut grasses and subvegetation, collect leaf litter and dry branches off the forest floor. Villagers stated that no one uses timber for building houses anymore because they prefer modern materials such as cement and metal for more sturdy houses. Instead, the timber is used for energy-intense processes, such as making of alcoholic beverages and buffalo fodder. However, they are not allowed to cut timber for household use anymore. The villagers graze their animals on their private lands, mostly agricultural fields turned into grasslands. Before, they used to graze their animals on the hill where the forest is standing now. Some said, contrary to other statements, that they still graze their animals in the CF and that they are allowed to do so. A few in Haurdanda said that even if they could collect fresh fodder in the forest, it does not provide any palatable fodder for the animals. A few elders in the village would collect berries from the Kafal tree and mushrooms in the outskirts of the forest.

In Haurdanda, many emphasized that the forest provides fresh air and shade to the village and visitors in the forest. Some mentioned that they enjoy the scenery of the hills now that the trees have grown. They also have two cremation sites for funerals in the forest and they are allowed to cut trees of the CF for the pyre.



Figure 7. Man in Haurdanda CF carrying pine needles. Photo: Anna Haglund Ståhl

7.2.2 Management

The villagers in Haurdanda stated that the management activities in the forest have ceased in the last ten years. Before, there would be some cutting and pruning of trees for the household use of timber and fuelwood in the village. In Haurdanda, some say that they would like to harvest and sell the full-grown pine trees. They are not allowed to do so anymore, which has been brought up by villagers during user group meetings. A few said these meetings are being boycotted nowadays, and that people will not pay the monthly fee of membership in the user groups because they are not allowed to cut material in the forest for the households to use. Some in the village also mentioned that they previously would have benefited from educational material provided during meetings with forest officials. Now, many state that only the chairperson goes to the meetings with the forest department, and they do not know what was discussed. The chairperson and some villagers said that they would like to cut down pine trees, so they could plant other trees that could bring more benefits or revenues to the villagers. The chairman in Haurdanda (Respondent #19) said: *“The trees just stand there; we cannot cut them, and no one will tell me why”*. It is a widely held notion in the village that pine trees are draining their ground water. Natural water sources were damaged in the 2015 earthquakes and some state

that the water struggles have accelerated since then. Many in the village states that the forest is very important, as it provides fresh air and shade. After the earthquake, they donated pine trees to the CFUG to repair their houses. Referring to this, one man said: “*We should not cut the forest and destroy it. We might need it in the future.*” (Respondent #23, 65 years old man). The operational plan for the CF was 12 years old. In the forest, it was observed that large areas of the forest floor had been burned. One respondent said that they would burn to remove the dry grasses from time to time. When asking the chairperson, he said that they have had problems with forest fires, and that they would not burn on purpose to his knowledge.

In Haurdanda, a few villagers directly express distrust to the chairperson as he does not live full-time in the village. Some villagers would go to the meetings simply to monitor the decisions made, as one woman said: “They do not know the needs of the villagers” (Respondent #20: 57 years old female). A few also said that when building the cremation sites, trees were felled and believed to be sold, however, they said that they think the chairperson and committee stole the money. When asked whether they would bring up issues at meetings, one woman said she would not like to, as: “They are powerful people and knows better than me” (Respondent #21, 59 years old woman).

It bothers the villagers that the activity and the overall presence of people is declining in the forest. Many reported that occasionally, people from other villages steal timber. Moreover, letting the forest grow attracts wild animals that would destroy the fields and eat crops in the village. One elderly man was convinced it was due to the growth of the forest: “There were no [wild] animals in our fields here when I was young” (Respondent #33, 78 years old man). Leopards were now frequently seen in the area, threatening the livestock.



Figure 8. Forest slope in Haurdanda CF. Photo: Anna Haglund Ståhl

In Haurdanda, they are very protective of their forest and are worried that there will be more illegal cutting and in order to prevent it they need to inform people and spread the word about why they need to conserve the forest. The forest guard is a very important instrument for protecting the forest there, however, some said he has not been paid for a long time.

7.2.3 Tree species

In Haurdanda, they generally name the pine (Salla) as important. A few specify that pine needles are good for bedding for animals. Some of the villagers claim that every kind of tree is important: “They all make a forest” (Informant #24, 65 years old man). They would also mention Utis and Chilaune as important, however, they only use the ones they have planted on their private lands. One man said that “*there are many different trees in the forest: Kafal, Utis, Chilaune, Salla, Lali Gurans*” (Respondent #23: 65 years old man). A majority of the villagers in Haurdanda grew Utis and Chilaune on their private lands, amongst different trees for timber, fuelwood, fodder and fruit, such as Lalupate, Gogun, Pana, and Lopsi. One household mentioned that they would cut and sell the Utis on their lands as timber.

Table 4. Important tree species in the Haurdanda Community Forest (+: mentioned by <2, ++: mentioned by 2-6, +++: mentioned by 6 or more).

Local name	Scientific name	Purpose/use	Importance
Angeri	<i>Lyonia ovalifolia</i>		
Bhercup	Unknown		
Chilaune	<i>Quercus lanata</i>	Timber	
Gobre salla	<i>Magnolia champaca</i>	Animal bedding, timber	+++
Jhingane	<i>Schima wallichii</i>		
Jure Kafal	<i>Ficus nemoralis</i>		
Kafal	<i>Quercus lamellose</i>		
Lali gurans	<i>Pinus wallichiana</i>	Religious	+
Pana	<i>Eurya acuminata</i>	Food	
Pate salla	<i>Pinus patula</i>	Animal bedding, timber	+++
Rani salla	<i>Pinus roxburghii</i>	Animal bedding, timber	+++
Utis	<i>Myrica esculenta</i>	Timber	

7.2.4 Forest inventory

Here the forest inventory data of Haurdanda is presented, the species recorded in alphabetical order after their local name. The most common species found were Gobre salla (172), followed by Rani salla (43) and Pate salla (19) in a total of 264 recorded trees. A total of 11 different species were found on the 20 plots distributed over the forest, approximately covering 0.3412 ha. The forest was predominantly tall pine trees, with low shrubs spreading over the forest floor. In the fringes of the forest, a variety of leafy trees were found, mostly Chilaune (12), Lali gurans (5), and Utis (4).

Table 5. Recorded tree species and the numbers in the Haurdanda Community Forest.

Local name	Scientific name	Count
Angeri	<i>Lyonia ovalifolia</i>	2
Bhercup	Unknown	1
Chilaune	<i>Schima waliichii</i>	12
Gobre salla	<i>Pinus wallichiana</i>	172
Kafal	<i>Myrica esculenta</i>	2
Lali gurans	<i>Rhododendron arboreum</i>	5
Pana	<i>Pyrus pashia</i>	1
Pate salla	<i>Pinus patula</i>	19
Rani salla	<i>Pinus roxburghii</i>	43
Tegar	<i>Eurya acuminata</i>	3
Utis	<i>Alnus nepalensis</i>	4
		Total: 264

8. Discussion

In this section I will discuss the findings in relation to the research questions. I will draw my analysis on previous research and theories. By combining feminist political ecology and decentralization theories, the analysis will focus on how emotions, values, and governance structures influence resource management in the communities.

The values and emotions linked to the forest, as expressed by the informants, are most often tied to their livelihood. Many villagers keep livestock and appreciate the trees, fresh branches, and grasses they can use as fodder, or the leaf litter they can use as bedding. The forest survey in Sukhare Patal shows that the three most important trees mentioned in the interviews—Falat, Kafal, and Bajho—are also the most frequently found in the CF. This aligns with studies indicating that the use of trees encourages protective and promotive measures (See Pandey 2007). This was further evidenced during the interviews, where committee members stated that it is prohibited to cut the main stem or the crown when harvesting from fodder trees. It was also stated specifically from villagers that they are protecting trees they can use, for example for producing materials they can sell.

Interestingly, the number of important tree species stated in the interviews varies between the villages, even though they are both highly dependent on livestock rearing. In Sukhare Patal, up to ten different species of fodder trees were mentioned, while in Haurdanda, only three species were noted as significant. If the question of important species did not specifically reference to the Community Forest in Haurdanda, the villagers there would often mention trees they would grow on their own lands. During the forest inventory, many trees were found that were not mentioned by the villagers. Only one elderly man in Haurdanda spoke generally about species variety in the community forest, naming five different fodder trees. In Haurdanda's CF, up to ten different kinds of leafy, common fodder trees were identified, though villagers only pointed out Utis, Chilaune, and Salla (pine) for their use values like timber and pine needles. In contrast, Sukhare Patal's forest inventory almost only included the trees already mentioned by villagers.

The relationship between villagers and different tree species reflects the extent of their forest dependence and the sophistication of their management systems. In Sukhare Patal, the need for a variety of native, naturally regenerated trees due to their rotational harvest system indicates a deep-seated ecological knowledge and an

adaptive management approach. This diversity in tree species also mirrors the multifunctionality valued in private lands, showcasing the intertwined relationship between ecological diversity and livelihood security.

When asked about other important forest species such as animals, villagers highlighted the negative impact of wildlife on their agricultural practices, attributing this to the increasingly dense forest and specific species attracting wildlife. In Haurdanda, where there is less agricultural land and more diverse income sources, the impact of wildlife issues is not as severe, though reported by many. In Sukhare Patal, the issue was reported by all villagers, with severe impacts on crops and the villagers' livelihoods. The growth of the forest, and even certain species attracting wildlife, was described as the cause of the problem. The villagers' concerns about the negative impact of wildlife on their agricultural practices reflect a relational and practical relationship with the forest. The negative emotions may be amplified by the exclusion in wildlife management, in combination with their reliance on increasingly precarious subsistence farming and livestock rearing (See González-Hidalgo & Zografos 2020; Adhikari et al. 2023). Overall, the exclusion of the local communities in the decision-making in forestry and related matters can exacerbate vulnerabilities, as the management directly affect their livelihoods and well-being (See Rocheleau et al. 1996).

Beyond livelihood, other values related to the forest are emotional and spiritual. In Sukhare Patal, villagers worship the wonders of the forest, such as the boulder lodged in the hill at the top of the village and the Bajho tree growing on top of it, symbolizing the community's most significant tree for the livestock rearing. The values and emotions tied to the forest, as expressed by the informants, highlights the dependency on natural resources for sustenance, and intricate connections with their everyday lives. Beyond economic values, the emotional and spiritual connections to the forest in Sukhare Patal, such as the worship of natural elements like the boulder and the Bajho tree, illustrate a holistic understanding of nature that integrates ecological and cultural dimensions (See Haraway 1988). Local communities with close relationship with the forest often foster an emotional connection and a sense of responsibility towards its preservation (Maryudi et al. 2012). The communities' sense of responsibility in protecting the forest was very prominent in both villages. In Sukhare Patal, a number of villagers felt personally responsible for the forest and species health, and expressed distress that they were not able to do more to combat the perceived threat of increasing density of the forest.

Comparing Sukhare Patal to Haurdanda, villagers in Sukhare Patal seem more aware of forest species, often noting specific changes such as species decline. Their active involvement with the forest makes them more likely to acknowledge these changes. It was evident that the villagers would discuss practical matters concerning the forest on a regular basis in user groups meetings, and in between neighbours,

sharing various ideas and perceptions. In Haurdanda, the forest management seemed to be a more rarely discussed topic, with differing interpretations of the CF regulations, and limited ambitions linked to the forest; often echoing the chairperson's ideas of planting income-generating trees. In Sukhare Patal, the villagers and committee highlight that the community is tightly knit, they tackle issues collectively, and that they rely on each other, for example by labour exchanges. In Haurdanda, they express more distrust, for example to villagers living on the other side of the village, and the chairperson. They express concern that the focus of the CFUG is deviating from the needs of the village and is leaning toward economic interests of the chairperson. Whilst this may be an approach aiming for development of the village, the villagers do not feel encouraged to take part in the meetings. Many feel disempowered and refuse to take part in the meetings at all, as they no longer receive benefits from the forest. Several members of the user group state that they do not have the expertise to discuss about the forest at meetings, nor during our interviews. The villagers' influence on forest management appears limited. Local elites taking over decision-making in the CFP have been shown in research (Ojha et al. 2010). In the case of Haurdanda, a chairperson who does not live full-time in the village is distrusted by many and the members of the user group feel like they must guard their needs. Democratic representation, characterized by downward accountability and responsiveness to local demands are the keys to effective decentralization (Ribot 2005). The local institution of Haurdanda seems vulnerable, whilst empowered local governance is found to be the most determining factor in positive social and environmental outcomes (Fischer et al. 2023).

The trust amongst the members of the local community found in Sukhare Patal, may be enabling the continuous usage of the forest, despite the expired operational plan. The lack of renewed operational plans is surprising given their importance to forest management. Without renewal every ten years, community forest use is not permitted by the forest department. Despite this, villagers in Sukhare Patal continue informal forest use, deciding annually what and where to harvest. In Haurdanda, expired operational plans might explain the rules restricting the cutting or pruning trees for materials. Sukhare Patal's approach, with a large variety of trees and a system of rotating harvest areas, suggests a degree of local autonomy and a potentially stronger collective management system. These discretionary powers found in Sukhare Patal can lead to more resilient and sustainable management practices that better reflect the needs and knowledge of all community members (See Ribot 2002).

Research indicates that while community forestry has led to improved forest conditions and increased community participation, the decentralization of forest management has been incomplete or under withdrawal (Ojha 2006; Ribot et al. 2006). According to decentralization theory, local governance aims to make communities more responsive and adaptable to local management needs.

Meaningful decentralization depends on empowering local institutions. The power dynamics in forest management are evident in how different villages perceive and manage their resources. As highlighted in previous research, the distribution of management authority between local institutions and the forest department in Nepal's community forestry is a current issue (Sapkota et al. 2020). In this thesis, the division of management authority between local institutions and the forest department remains unclear. Villagers and chairpersons cite a lack of resources and information from the forest department, as a hinder in performing management activities. In Haurdanda, the authorities have halted all forest management entirely, whilst in Sukhare Patal, the local community has, despite the the CFP rules and the lack of legally necessary operational plans, taken the authority in the decision-making.

Sukhare Patal has an interesting system of rotating forest plots for different purposes, allowing intensive and regular material cutting without degrading the forest. This rotation helps manage forest health and counteracts overgrowth without formal activities like pruning and thinning by the forest department. However, they are aware that this usage does not cover all the thinning and pruning that the forest needs and that is a disappointment to several members of the committee.

The forest's importance for providing materials has somewhat shifted to private lands and leasehold forests in both villages, reducing its perceived value enough to call into question the need to pay fees. Studies have shown that as households increasingly rely on private resources, the direct dependence on community forests for everyday needs diminishes (Gautam 2009; Smith et al. 2024). One potential income source for community forests could be the forest itself, but renewing operational plans and regular management activities is costly. Producing an operational plan involves significant costs and time, historically funded by donors. Now, if community forests must fund this work independently, it sets high expectations for revenue generation, requiring villagers to pay fees, which they are reluctant to do in Haurdanda due to perceived insufficient benefits. The costs of operational plans and forest management activities can create a financial burden on CFUGs, potentially leading to commercialization pressures (See Acharya 2002). Instead, integrating community-based monitoring and low-cost management practices such as these developed in Sukhare Patal, have potential to both alleviate some financial pressures and benefit biodiversity conservation. Local communities in the CFP has been shown to frequently face challenges due to a lack of resources, technical support, and clear governance structures from the forest department (Acharya et al. 2022). Communities wish to revitalize community forest income by planting income-generating trees, building roads for market access, and promoting tourism in the forests. The desire of a few villagers in Sukhare Patal to form a national park suggests a shift from forest dependence to cash income potential, as

the villagers are assumingly willing to give up much of their forest use for this purpose. The aim of Community forestry being both conservation and development can be perceived as being fluid. In Haurdanda, both the chairperson and the user group seem increasingly excluded from forest use and management, expressing perceptions that the forest department's restrictions hinder economic development promises. While villagers wish to plant income-generating trees in Haurdanda is not put up to discussion, they feel excluded from decision-making, leading to a forest that provides less benefit, and that no longer meaningfully supports livelihoods (See Shrestha & McManus 2008). Instead, the forests are increasingly restricted, not engaging the local community, and not supporting local subsistence practices. To not support the use of forests, the forests may simply overgrow and suppress the diversity of species, and no one will be there to observe and respond to it.

Indigenous and local communities have been acknowledged for their monitoring capacity in the context of climate change (Danielsen et al. 2005). To seize this potential and effectively monitor biodiversity conservation, the communities need educational and financial support (Berkes 2009). As shown in Sukhare Patal, the community holds great knowledge of the species and have a great record of species populations declining, increasing, disappearing, or appearing. They also express distress for negative changes in the forest, for the issues of overgrowth of the forest and disappearing species of grasses and flowers. To enable them to report such changes nationally or internationally, gives leverage to biodiversity conservation on a larger scale. To not have any other formal way of reporting to the forest department other than in the technical forest inventories, undermines the emotions, knowledge and power of local communities (See González-Hidalgo & Zografos 2020).

In previous research, there are also risks for biodiversity in community-based forest management. In the case study of Haurdanda of this thesis, forest users might for example be taking too much dead wood from the forest floor, as they are restricted from harvesting from live trees for their household needs. In Sukhare Patal, they show evidence that they are favouring valuable trees over other. Such activities may over time compromise the composition and diversity of microhabitats in the forest (See Shrestha & Shrestha 2010). These risks might, based on the findings in this thesis, be mitigated by less restrictive use of the forest in combination with promotion of native, varied forests, and educational efforts on biodiversity conservation, organized by the forest department. Whilst the decision-making according to research should be community-based, the local institution needs to be empowered and supported by the central agencies. Theories highlight the importance of inclusive and equitable approaches in natural resource management to address the specific needs and contributions of local communities. If the operational plans were funded and updated and the inventories in them were

basis for discussion with the locals, it could be a great exchange of knowledge between forest officials for efforts to mitigate biodiversity loss.

As forest use declines and timber needs decrease, central agency control over forest use may be excessive, complicating forest management. Moreover, leaving forests unused poses risks to biodiversity. Local communities have traditionally managed forests in ways that support both ecological health and their subsistence needs. This management is vital in the context of climate change, as local knowledge and practices are essential for adapting to changing environmental conditions.

9. Conclusions

Forest biodiversity on the local level entails forests that support the local communities' livelihoods, as well as place of life quality, and spirituality. Biodiversity is reproduced in the connection to the people, in harvesting and engaging in the forest and its many trees and species. The high amount of tree species found in Sukhare Patal is not only a scientific high value, but it is also in the lived realities of the local communities. If the values are linked to biodiversity specifically, such as a high variety of trees, the monitoring capacity of species increases, and community will promote management approaches to protect it. The use of a great variety of trees indicates a traditional use of forests and a form of management that stems from the local ecological knowledge and values. The recentralization of the Community forestry can in this thesis be seen as a threat to biodiversity conservation, as empowerment issues, techno-bureaucracy and decision-making power is taking over the important competencies of the local communities.

Overall, community-based approaches gained attention in natural resource management due to their potential to improve effectiveness, equity, and sustainability by harnessing local knowledge, empowering communities, and fostering adaptive governance processes. Such governance is now particularly promoted in biodiversity conservation as these capacities will support biodiversity. The question of this thesis comes down to whether decentralization efforts are being implemented in a manner that theory indicates will result in positive outcomes for natural resource management, and biodiversity conservation. It has been shown that lacking empowerment and authority of local institutions, has severe implications on awareness and engagement with respect to biodiversity in the forests. In a community such as Sukhare Patal, with low influence from central government, have high discretionary powers in the forest management. This adapts the use of the forest to the local values. However, with this high responsibility for the forest management, they personally feel distress when the resources are insufficient to upkeep the forest health.

The discussion highlights the critical roles of emotion, local knowledge, and power dynamics in forest management. It underscores the need for inclusive governance structures that recognize and incorporate local communities' expertise and emotional connections to the forest. By doing so, communities can foster

sustainable and equitable management practices that honor both the ecological and social values of the forest, with appropriate support measures from the government.

People living in biodiversity hotspots and forest dependent people will experience the effects of climate change and suffer from the same processes that threaten biodiversity. The inherent relationships and reciprocal support found between forest species and local communities need to be acknowledged and supported for more sustainable management in future challenges.

References

- Acharya, A. & Kafle, N. (2009). Land Degradation Issues in Nepal and Its Management Through Agroforestry. *Journal of Agriculture and Environment*, 10. <https://doi.org/10.3126/aej.v10i0.2138>
- Acharya, K., Talpā, N., Hālālīṣan, A.F. & Popa, B. (2022). The Way Forward for Community Forestry in Nepal: Analysis of Performance against National Forestry Goals. *Forests*, 13 (5), 726. <https://doi.org/10.3390/f13050726>
- Acharya, K.P. (2002). Twenty-four years of community forestry in Nepal. *The International Forestry Review*, 4 (2), 149–156
- Adade Williams, P., Sikutshwa, L. & Shackleton, S. (2020). Acknowledging Indigenous and Local Knowledge to Facilitate Collaboration in Landscape Approaches—Lessons from a Systematic Review. *Land*, 9 (9), 331. <https://doi.org/10.3390/land9090331>
- Adger, W.N. & Kelly, P.M. (1999). Social Vulnerability to Climate Change and the Architecture of Entitlements. *Mitigation and Adaptation Strategies for Global Change*, 4 (3), 253–266. <https://doi.org/10.1023/A:1009601904210>
- Adhikari, B., Williams, F. & Lovett, J.C. (2007). Local benefits from community forests in the middle hills of Nepal. *Forest Policy and Economics*, 9 (5), 464–478. <https://doi.org/10.1016/j.forpol.2005.11.002>
- Adhikari, J., Rai, M.K., Baral, C. & Subedi, M. (2023). Labour Migration from Nepal: Trends and Explanations. I: Rajan, S.I. (red.) *Migration in South Asia: IMISCOE Regional Reader*. Springer International Publishing. 67–81. https://doi.org/10.1007/978-3-031-34194-6_5
- Adom, D., Umachandran, K., Ziarati, P., Sawicka, B. & Sekyere, P. (2019). The Concept of Biodiversity and its Relevance to Mankind: A Short Review. *Journal of Agriculture and Sustainability*, 12 (2), 219–231
- Agrawal, A. & Chhatre, A. (2006). Explaining success on the commons: Community forest governance in the Indian Himalaya. *World Development*, 34 (1), 149–166
- Agrawal, A., Chhatre, A. & Hardin, R. (2008). Changing Governance of the World's Forests. *Science*, 320 (5882), 1460–1462
- Agrawal, A. & Gibson, C. (1999). Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation. *World Development*, 27, 629–649. [https://doi.org/10.1016/S0305-750X\(98\)00161-2](https://doi.org/10.1016/S0305-750X(98)00161-2)
- Agrawal, A. & Ostrom, E. (2001). Collective Action, Property Rights and Decentralization in Resource Use in India and Nepal. *Politics and Society*, 29. <https://doi.org/10.1177/0032329201029004002>
- Agrawal, A. & Redford, K. (2006). Poverty, Development, And Biodiversity Conservation: Shooting in the Dark? *WCS Working Paper*, (26)
- Anderson, J., Mehta, S., Epelu, E. & Cohen, B. (2015). Managing leftovers: Does community forestry increase secure and equitable access to valuable resources for the rural poor? *Forest Policy and Economics*, 58, 47–55. <https://doi.org/10.1016/j.forpol.2014.12.004>
- Andersson, K., Gibson, C. & Lehoucq, F. (2004). The Politics of Decentralized Governance of Natural Resources. *Political Science and Politics*, 37, 241–248. <https://doi.org/10.1017/S1049096504004597>

- Bartkowski, B. (2017). *Economic Valuation of Biodiversity: An Interdisciplinary Conceptual Perspective*. Routledge.
- Bartlett, A.G. (1992). A Review of Community Forestry Advances in Nepal. *The Commonwealth Forestry Review*, 71 (2), 95–100
- Bartlett, R., Luna, B., Dhruba, P., H, H. & G, M., P. (2010). *Climate change impacts and adaptation in Nepal*. IWMI.
- Basnyat, B. (2020). Commodifying the community forestry: a case from scientific forestry practices in Western Hills of Nepal. *Journal of Forest Research*, 25 (2), 69–75. <https://doi.org/10.1080/13416979.2020.1743406>
- Bennett, N.J., Roth, R., Klain, S.C., Chan, K., Christie, P., Clark, D.A., Cullman, G., Curran, D., Durbin, T.J., Epstein, G., Greenberg, A., Nelson, M.P., Sandlos, J., Stedman, R., Teel, T.L., Thomas, R., Verissimo, D. & Wyborn, C. (2017). Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological Conservation*, 205, 93–108. <https://doi.org/10.1016/j.biocon.2016.10.006>
- Berkes, F. (2006). From Community-Based Resource Management to Complex Systems: The Scale Issue and Marine Commons. *Ecology and Society*, 11 (1)
- Berkes, F. (2009). Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *Journal of Environmental Management*, 90 (5), 1692–1702. <https://doi.org/10.1016/j.jenvman.2008.12.001>
- Berkes, F. (2012). *Sacred Ecology*. 3. uppl. Routledge. <https://doi.org/10.4324/9780203123843>
- Berkes, F., Colding, J. & Folke, C. (2000). Rediscovery of Traditional Ecological Knowledge as Adaptive Management. *Ecological Applications*, 10 (5), 1251–1262. <https://doi.org/10.2307/2641280>
- Bickman, L. & Rog, D.J. (2008). *The SAGE Handbook of Applied Social Research Methods*. SAGE Publications, Incorporated.
- Blom, B., Sunderland, T. & Murdiyarto, D. (2010). Getting REDD to Work Locally: Lessons Learned from Integrated Conservation and Development Projects. *Environmental Science & Policy*, 13, 164–172. <https://doi.org/10.1016/j.envsci.2010.01.002>
- Boudouresque, C. (2011). Insights into the diversity of the biodiversity concept. *Mésogée*, 67, 13–26
- Brooks, J.S., Franzen, M.A., Holmes, C.M., Grote, M.N. & Mulder, M.B. (2006). Testing Hypotheses for the Success of Different Conservation Strategies. *Conservation Biology*, 20 (5), 1528–1538. <https://doi.org/10.1111/j.1523-1739.2006.00506.x>
- Brooks, T. (2010). Conservation planning and priorities. I: Sodhi, N.S. & Ehrlich, P.R. (red.) *Conservation Biology for All*. Oxford University Press. 0. <https://doi.org/10.1093/acprof:oso/9780199554232.003.0012>
- Cardinale, B.J., Duffy, J.E., Gonzalez, A., Hooper, D.U., Perrings, C., Venail, P., Narwani, A., Mace, G.M., Tilman, D., Wardle, D.A., Kinzig, A.P., Daily, G.C., Loreau, M., Grace, J.B., Larigauderie, A., Srivastava, D.S. & Naeem, S. (2012). Biodiversity loss and its impact on humanity. *Nature*, 486 (7401), 59–67. <https://doi.org/10.1038/nature11148>
- Carter, N.H. & Linnell, J.D.C. (2023). Building a resilient coexistence with wildlife in a more crowded world. *PNAS Nexus*, 2 (3), pgad030. <https://doi.org/10.1093/pnasnexus/pgad030>
- Castree, N. & Braun, B. (2001). *Social Nature: Theory, Practice and Politics*. Wiley-Blackwell.
- CBD (1992). *Convention on Biological Diversity*. Secretariat of the Convention on Biological Diversity. <https://www.cbd.int/convention/articles/default.shtml?a=cbd-02>

- CBD (n.d.). *Nepal - Main Details*. Secretariat of the Convention on Biological Diversity. <https://www.cbd.int/countries/profile/?country=np> [2024-01-19]
- Chakraborty, R.N. (2001). Stability and outcomes of common property institutions in forestry: evidence from the Terai region of Nepal. *Ecological Economics*, 36 (2), 341–353. [https://doi.org/10.1016/S0921-8009\(00\)00237-8](https://doi.org/10.1016/S0921-8009(00)00237-8)
- Charnley, S. & Poe, M.R. (2007). Community Forestry in Theory and Practice: Where Are We Now?*. *Annual Review of Anthropology*, 36 (Volume 36, 2007), 301–336. <https://doi.org/10.1146/annurev.anthro.35.081705.123143>
- Cleaver, F. (2002). Reinventing Institutions: Bricolage and the Social Embeddedness of Natural Resource Management. *The European Journal of Development Research*, <https://www.tandfonline.com/doi/abs/10.1080/714000425> [2024-05-29]
- Creswell, J.W. (2018). *Research design: qualitative, quantitative, and mixed methods approaches*. Fifth edition. SAGE.
- Daily, G.C. (1997). Introduction: what are ecosystem services. *Nature's services: Societal dependence on natural ecosystems*, 1 (1). https://www.academia.edu/download/37236591/Daily_1.pdf [2024-04-23]
- Danielsen, F., Burgess, N.D. & Balmford, A. (2005). Monitoring Matters: Examining the Potential of Locally-based Approaches. *Biodiversity & Conservation*, 14 (11), 2507–2542. <https://doi.org/10.1007/s10531-005-8375-0>
- DeFries, R.S., Foley, J.A. & Asner, G.P. (2004). Land-use choices: balancing human needs and ecosystem function. *Frontiers in Ecology and the Environment*, 2 (5), 249–257. [https://doi.org/10.1890/1540-9295\(2004\)002\[0249:LCBHNA\]2.0.CO;2](https://doi.org/10.1890/1540-9295(2004)002[0249:LCBHNA]2.0.CO;2)
- Di Gregorio, M., Fattorelli, L., Paavola, J., Locatelli, B., Pramova, E., Nurrochmat, D.R., May, P.H., Brockhaus, M., Sari, I.M. & Kusumadewi, S.D. (2019). Multi-level governance and power in climate change policy networks. *Global Environmental Change*, 54, 64–77. <https://doi.org/10.1016/j.gloenvcha.2018.10.003>
- CBD. (2010). *Global Biodiversity Outlook 3*. UNEP/Earthprint.
- Ellis, E.C. (2015). Ecology in an anthropogenic biosphere. *Ecological Monographs*, 85 (3), 287–331. <https://doi.org/10.1890/14-2274.1>
- Escobar, A. (1998). Whose Knowledge, Whose nature? Biodiversity, Conservation, and the Political Ecology of Social Movements. *Journal of Political Ecology*, 5 (1). <https://doi.org/10.2458/v5i1.21397>
- Escobar, A. (2006). An ecology of difference: Equality and conflict in a glocalized world. *Focaal*, 2006 (47), 120–137. <https://doi.org/10.3167/092012906780646415>
- FAO (2016). *Forty years of community-based forestry: a review of its extent and effectiveness*. Food and agriculture organization of the United Nations.
- FAO (2021). *Community-based forestry*. <https://www.fao.org/forestry-fao/participatory/en/> [2024-05-17]
- Fischer, A. & Young, J.C. (2007). Understanding mental constructs of biodiversity: Implications for biodiversity management and conservation. *Biological Conservation*, 136 (2), 271–282. <https://doi.org/10.1016/j.biocon.2006.11.024>
- Fischer, H.W. (2021). Decentralization and the governance of climate adaptation: Situating community-based planning within broader trajectories of political transformation. *World Development*, 140, 105335. <https://doi.org/10.1016/j.worlddev.2020.105335>
- Fischer, H.W., Chhatre, A., Duddu, A., Pradhan, N. & Agrawal, A. (2023). Community forest governance and synergies among carbon, biodiversity and livelihoods. *Nature Climate Change*, 13 (12), 1340–1347. <https://doi.org/10.1038/s41558-023-01863-6>

- Gautam, A. (2009). Equity and livelihoods in Nepal's community forestry. *Int J Soc For*, 2, 101–122
- González-Hidalgo, M. & Zografos, C. (2020). Emotions, power, and environmental conflict: Expanding the 'emotional turn' in political ecology. *Progress in Human Geography*, 44 (2), 235–255. <https://doi.org/10.1177/0309132518824644>
- Government of Nepal (2014). *Nepal National Biodiversity Strategy and Action Plan 2014-2020*. | FAOLEX. <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC163672/> [2024-04-10]
- Haines-Young, R. (2009). Land use and biodiversity relationships. *Land Use Policy*, 26, S178–S186. <https://doi.org/10.1016/j.landusepol.2009.08.009>
- Hajjar, R., Oldekop, J.A., Cronkleton, P., Newton, P., Russell, A.J.M. & Zhou, W. (2021). A global analysis of the social and environmental outcomes of community forests. *Nature Sustainability*, 4 (3), 216–224. <https://doi.org/10.1038/s41893-020-00633-y>
- Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies*, 14 (3), 575–599. <https://doi.org/10.2307/3178066>
- Hardin, G. (1968). The Tragedy of the Commons. *Science*, 162 (3859), 1243–1248
- Harper, J.L., Hawksworth, D.L. & Hawksworth, D.L. (1997). Biodiversity: measurement and estimation. Preface. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 345 (1311), 5–12. <https://doi.org/10.1098/rstb.1994.0081>
- Harrison & Chepstow-Lusty, R.D.A.J. (2024). *Mainstreaming biodiversity in forestry*. <https://openknowledge.fao.org/items/4e95ea97-2166-43c6-8569-8bc7f677fa9b> [2024-04-25]
- Heller, N.E. & Zavaleta, E.S. (2009). Biodiversity management in the face of climate change: A review of 22 years of recommendations. *Biological Conservation*, 142 (1), 14–32. <https://doi.org/10.1016/j.biocon.2008.10.006>
- IFRI (2008). *The International Forestry Resources and Institutions (IFRI) Field Manual*. http://ifri.forgov.org/wp-content/uploads/2012/09/IFRI_Manual.pdf [2024-05-08]
- IPBES (2019). *Summary for policymakers of the global assessment report on biodiversity and ecosystem services*. Zenodo. <https://doi.org/10.5281/zenodo.3553579>
- IPBES (2022). *Summary for policymakers of the thematic assessment of the sustainable use of wild species of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)*. Zenodo. <https://doi.org/10.5281/zenodo.7411847>
- Jones, C. & Kirk, N. (2018). Shared visions: can community conservation projects' outcomes inform on their likely contributions to national biodiversity goals? *New Zealand Journal of Ecology*, 42 (2), 116–124
- Kanel, K.R. & Kandel, B.R. (2004). Community forestry in Nepal: Achievements and challenges. *Journal of Forest and Livelihood*, 4(1). <https://lib.icimod.org/record/7883> [2024-05-29]
- Keith, D.A., Martin, T.G., McDonald-Madden, E. & Walters, C. (2011). Uncertainty and adaptive management for biodiversity conservation. *Biological Conservation*, 144 (4), 1175–1178. <https://doi.org/10.1016/j.biocon.2010.11.022>
- Kellert, S., Mehta, J. & Ebbin, S. (2000). S Kellert, J Mehta, SA Ebbin, L Lichtenfeld. 2000. "Community Natural Resource Management: Promise, Rhetoric, and Reality." *Society and Natural Resources*, 13: 705–715. *Society and Natural Resources*, 13, 705–715

- Khatri, D., Paudel, D., Pain, A., Marquardt, K. & Khatri, S. (2022). Reterritorialization of Community Forestry: Scientific Forest Management in the Terai and Chure Region of Nepal. *Journal of Political Ecology*, 29. <https://doi.org/10.2458/jpe.2298>
- Kothari, A., Camill, P. & Brown, J. (2013). Conservation as if People Also Mattered: Policy and Practice of Community-based Conservation. *Conservation and Society*, 11 (1), 1. <https://doi.org/10.4103/0972-4923.110937>
- Koziell, I. & Saunders, J. (2001). *Living Off Biodiversity: Exploring Livelihoods and Biodiversity Issues in Natural Resources Management*. IIED.
- Lachapelle, P.R., Smith, P.D. & McCool, S.F. (2004). Access to Power or Genuine Empowerment? An Analysis of Three Community Forest Groups in Nepal. *Human Ecology Review*, 11 (1), 1–12
- Larson, A. & Soto, F. (2008). Decentralization of Natural Resource Governance Regimes. *Annual Review of Environment and Resources*, 33. <https://doi.org/10.1146/annurev.energy.33.020607.095522>
- Larson, A.M. & Ribot, J.C. (2004). Democratic Decentralisation through a Natural Resource Lens: An Introduction. *The European Journal of Development Research*, 16 (1), 1–25. <https://doi.org/10.1080/09578810410001688707>
- Laudari, H.K., Sapkota, L.M., Maraseni, T., Subedi, P., Pariyar, S., Kaini, T.R., Lopchan, S.B., Weston, C. & Volkova, L. (2024). Community forestry in a changing context: A perspective from Nepal's mid-hill. *Land Use Policy*, 138, 107018. <https://doi.org/10.1016/j.landusepol.2023.107018>
- Lemos, M.C. & Agrawal, A. (2006). Environmental Governance. *Annual Review of Environment and Resources*, 31 (Volume 31, 2006), 297–325. <https://doi.org/10.1146/annurev.energy.31.042605.135621>
- Libois, F., Baland, J.-M., Delbart, N. & Pattanayak, S. (2021). *Community Forestry Management: Mechanisms behind a success story in Nepal*. (DeFiPP Working Paper). <https://edi.opml.co.uk/resource/community-forestry-management-mechanisms-behind-a-success-story-in-nepal/> [2024-06-12]
- Lindenmayer, D. & Franklin, J. (2002). Conserving forest biodiversity: a comprehensive multiscaled approach. *Bibliovault OAI Repository, the University of Chicago Press*,
- Lowe, P., Murdoch, J. & Ward, N. (1995). Networks in rural development: beyond exogenous and endogenous models. *Beyond modernization : the impact of endogenous rural development*,. <https://eprints.ncl.ac.uk> [2024-05-28]
- Luintel, H., Bluffstone, R.A. & Scheller, R.M. (2018). The effects of the Nepal community forestry program on biodiversity conservation and carbon storage. *PLOS ONE*, 13 (6), e0199526. <https://doi.org/10.1371/journal.pone.0199526>
- Mahat, T.B.S., Griffin, D.M. & Shepherd, K.R. (1987). Human Impacts on Some Forests of the Middle Hills of Nepal Part 3. Forests in the Subsistence Economy of Sindhu Palchok and Kabhre Palanchok. *Mountain Research and Development*, 7 (1), 53–70. <https://doi.org/10.2307/3673324>
- Maryudi, A., Devkota, R.R., Schusser, C., Yufanyi, C., Salla, M., Aurenhammer, H., Rotchanaphatharawit, R. & Krott, M. (2012). Back to basics: Considerations in evaluating the outcomes of community forestry. *Forest Policy and Economics*, 14 (1), 1–5. <https://doi.org/10.1016/j.forpol.2011.07.017>
- Mauro, F. & Hardison, P.D. (2000). Traditional Knowledge of Indigenous and Local Communities: International Debate and Policy Initiatives. *Ecological Applications*, 10 (5), 1263–1269. [https://doi.org/10.1890/1051-0761\(2000\)010\[1263:TKOIAL\]2.0.CO;2](https://doi.org/10.1890/1051-0761(2000)010[1263:TKOIAL]2.0.CO;2)

- McShane, T.O. & Wells, M.P. (2004). *Getting Biodiversity Projects to Work: Towards More Effective Conservation and Development*. Columbia University Press.
- Nagendra, H. & Ostrom, E. (2012). Polycentric governance of multifunctional forested landscapes. *International Journal of the Commons*, 6 (2), 104–133. <https://doi.org/10.18352/bmgm-lchr.321>
- Newig, J. & Fritsch, O. (2009). Environmental governance: participatory, multi-level – and effective? *Environmental Policy and Governance*, 19 (3), 197–214. <https://doi.org/10.1002/eet.509>
- Newton, P., Miller, D.C., Byenkya, M.A.A. & Agrawal, A. (2016). Who are forest-dependent people? A taxonomy to aid livelihood and land use decision-making in forested regions. *Land Use Policy*, 57, 388–395. <https://doi.org/10.1016/j.landusepol.2016.05.032>
- Nightingale, A. (2015). Commons and Alternative Rationalities: Subjectivity, Emotion and the (Non)rational Commons. I: *Patterns of Commoning*. <https://res.slu.se/id/publ/74925> [2024-05-30]
- Nightingale, A.J. (2017). Power and politics in climate change adaptation efforts: Struggles over authority and recognition in the context of political instability. *Geoforum*, 84, 11–20. <https://doi.org/10.1016/j.geoforum.2017.05.011>
- Nightingale, A.J., Eriksen, S., Taylor, M., Forsyth, T., Pelling, M., Newsham, A., Boyd, E., Brown, K., Harvey, B., Jones, L., Bezner Kerr, R., Mehta, L., Naess, L.O., Ockwell, D., Scoones, I., Tanner, T. & Whitfield, S. (2020). Beyond Technical Fixes: climate solutions and the great derangement. *Climate and Development*, 12 (4), 343–352. <https://doi.org/10.1080/17565529.2019.1624495>
- Ojha, H., Persha, L. & Chhatre, A. (2010). Community forestry in Nepal: a policy innovation for local livelihoods.
- Ojha, H.R. (2006). Techno-bureaucratic Doxa and Challenges for Deliberative Governance: The Case of Community Forestry Policy and Practice in Nepal. *Policy and Society*, 25 (2), 131–175. [https://doi.org/10.1016/S1449-4035\(06\)70077-7](https://doi.org/10.1016/S1449-4035(06)70077-7)
- Ojha, H.R., Cameron, J. & Kumar, C. (2009). Deliberation or symbolic violence? The governance of community forestry in Nepal. *Forest Policy and Economics*, 11 (5), 365–374. <https://doi.org/10.1016/j.forpol.2008.11.003>
- Oldekop, J.A., Sims, K.R.E., Karna, B.K., Whittingham, M.J. & Agrawal, A. (2019). Reductions in deforestation and poverty from decentralized forest management in Nepal. *Nature Sustainability*, 2 (5), 421–428. <https://doi.org/10.1038/s41893-019-0277-3>
- Oliver, T.H., Heard, M.S., Isaac, N.J.B., Roy, D.B., Procter, D., Eigenbrod, F., Freckleton, R., Hector, A., Orme, C.D.L., Petchey, O.L., Proença, V., Raffaelli, D., Suttle, K.B., Mace, G.M., Martín-López, B., Woodcock, B.A. & Bullock, J.M. (2015). Biodiversity and Resilience of Ecosystem Functions. *Trends in Ecology & Evolution*, 30 (11), 673–684. <https://doi.org/10.1016/j.tree.2015.08.009>
- Ostrom, E. (1990). *Governing the commons: the evolution of institutions for collective action*. Cambridge University Press. (The Political economy of institutions and decisions)
- Ostrom, E. (2008). The Challenge of Common-Pool Resources. *Environment: Science and Policy for Sustainable Development*, 50 (4), 8–21. <https://doi.org/10.3200/ENVT.50.4.8-21>
- Ostrom, E. (2010). Beyond Markets and States: Polycentric Governance of Complex Economic Systems. *American Economic Review*, 100 (3), 641–672. <https://doi.org/10.1257/aer.100.3.641>

- Pandey, H.P. & Pokhrel, N.P. (2021). Formation trend analysis and gender inclusion in community forests of Nepal. *Trees, Forests and People*, 5, 100106. <https://doi.org/10.1016/j.tfp.2021.100106>
- Pandey, S. (2007). *Tree species diversity in existing community based forest management systems in central mid-hills of Nepal*. https://www.academia.edu/96209408/Tree_species_diversity_in_existing_community_based_forest_management_systems_in_central_mid_hills_of_Nepal CBM CBM CBM CBM MASTER THESESES SERIES MASTER THESESES SERIES MASTER THESESES SERIES MASTER THESESES SERIES International Master Programme at the Swedish Biodiversity Centre [2024-04-10]
- Pandit, R. & Bevilacqua, E. (2011). Forest users and environmental impacts of community forestry in the hills of Nepal. *Forest Policy and Economics*, 13, 345–352. <https://doi.org/10.1016/j.forpol.2011.03.009>
- Parks, L. & Tsioumani, E. (2023). Transforming biodiversity governance? Indigenous peoples' contributions to the Convention on Biological Diversity. *Biological Conservation*, 280, 109933. <https://doi.org/10.1016/j.biocon.2023.109933>
- Parrotta, J. & Agnoletti, M. (2012). Traditional Forest-Related Knowledge and Climate Change. 491–533. https://doi.org/10.1007/978-94-007-2144-9_13
- Paudel, G., Carr, J. & Munro, P.G. (2022). Community forestry in Nepal: a critical review. *International Forestry Review*, 24 (1), 43–58. <https://doi.org/10.1505/146554822835224810>
- Persha, L., Fischer, H., Chhatre, A., Agrawal, A. & Benson, C. (2010). Biodiversity conservation and livelihoods in human-dominated landscapes: Forest commons in South Asia. *Biological Conservation*, 143 (12), 2918–2925. <https://doi.org/10.1016/j.biocon.2010.03.003>
- Pokharel, B.K., Branney, P., Nurse, M. & Malla, Y.B. (2007a). Community forestry: Conserving forests, sustaining livelihoods and strengthening democracy. *Journal of Forest and Livelihood*, 6 (2), 8–19
- Pokharel, B.K., Branney, P., Nurse, M. & Malla, Y.B. (2007b). Community Forestry: Conserving Forests, Sustaining Livelihoods and Strengthening Democracy. *Journal of Forest and Livelihood*,
- Poteete, A.R. & Ostrom, E. (2004). Heterogeneity, Group Size and Collective Action: The Role of Institutions in Forest Management. *Development and Change*, 35 (3), 435–461. <https://doi.org/10.1111/j.1467-7660.2004.00360.x>
- Redpath, S.M., Young, J., Evely, A., Adams, W.M., Sutherland, W.J., Whitehouse, A., Amar, A., Lambert, R.A., Linnell, J.D.C., Watt, A. & Gutiérrez, R.J. (2013). Understanding and managing conservation conflicts. *Trends in Ecology & Evolution*, 28 (2), 100–109. <https://doi.org/10.1016/j.tree.2012.08.021>
- Reid, W., Mooney, H., Cropper, A., Capistrano, D., Carpenter, S. & Chopra, K. (2005). *Millennium Ecosystem Assessment. Ecosystems and human well-being: synthesis*.
- Ribot, J. (2002). *Democratic Decentralization of Natural Resources*. <https://www.wri.org/research/democratic-decentralization-natural-resources> [2024-05-16]
- Ribot, J. (2004). *Waiting for Democracy: The Politics of Choice in Natural Resource Decentralization*. <https://www.wri.org/research/waiting-democracy> [2024-06-14]
- Ribot, J.C. (2005). Choosing Representation: Institutions and Powers for Decentralized Natural Resources Management. I: *The Politics of Decentralization*. Routledge.

- Ribot, J.C., Agrawal, A. & Larson, A.M. (2006). Recentralizing While Decentralizing: How National Governments Reappropriate Forest Resources. *World Development*, 34 (11), 1864–1886. <https://doi.org/10.1016/j.worlddev.2005.11.020>
- Rights and Resources Initiative (2018). *At a Crossroads: Consequential Trends in Recognition of Community-Based Forest Tenure from 2002-2017 - Rights + Resources - Supporting Forest Tenure, Policy, and Market Reforms*. <https://doi.org/10.53892/UCYL3747>
- Rocheleau, D., Thomas-Slayter, B. & Wangari, E. (1996). *Feminist Political Ecology: Global Issues and Local Experience*. 1st edition. Routledge.
- Rondinelli, D.A., Nellis, J.R. & Cheema, G.S. (1984). *Decentralization in developing countries: a review of recent experience*. World Bank. (World Bank staff working papers Management and development series; 8 = 581 [d. Gesamtw.])
- Ruiz-Mallén, I. & Corbera, E. (2013). Community-Based Conservation and Traditional Ecological Knowledge: Implications for Social-Ecological Resilience. *Ecology and Society*, 18 (4). <https://www.jstor.org/stable/26269393> [2024-05-17]
- Sapkota, L.M., Dhungana, H., Poudyal, B.H., Chapagain, B. & Gritten, D. (2020). Understanding the Barriers to Community Forestry Delivering on its Potential: An Illustration From Two Heterogeneous Districts in Nepal. *Environmental Management*, 65 (4), 463–477. <https://doi.org/10.1007/s00267-019-01224-0>
- Saunders, F. (2010). Saunders, F. 2010. ‘A Political Ecology Inspired Critique of Common Pool Resource Research and Practice.’ In (Friman, E. and Gallardo Fernández, G. eds.) *Politicized Nature – Global Exchange, Resources and Power* (pp.23-48) CEMUS, Uppsala University, Uppsala.
- Savilaakso, S., Lausberg, N., Waeber, P.O., Hillgén, O., Isotalo, A., Kleinschroth, F., Djenontin, I.N.S., Boul Lefeuvre, N. & Garcia, C.A. (2023). Whose perspective counts? A critical look at definitions of terms used for natural and near-natural forests. *One Earth*, 6 (11), 1477–1493. <https://doi.org/10.1016/j.oneear.2023.10.003>
- Sayer, J. & Campbell, B.M. (2004). *The Science of Sustainable Development: Local Livelihoods and the Global Environment*. Cambridge University Press.
- Schneider, A. (2003). Decentralization: Conceptualization and measurement. *Studies in Comparative International Development*, 38 (3), 32–56. <https://doi.org/10.1007/BF02686198>
- Schwilch, G., Adhikari, A., Jaboyedoff, M., Jaquet, S., Kaenzig, R., Liniger, H., Penna, I.M., Sudmeier-Rieux, K. & Upreti, B.R. (2017). Impacts of Outmigration on Land Management in a Nepali Mountain Area. I: Sudmeier-Rieux, K., Fernández, M., Penna, I.M., Jaboyedoff, M., & Gaillard, J.C. (red.) *Identifying Emerging Issues in Disaster Risk Reduction, Migration, Climate Change and Sustainable Development: Shaping Debates and Policies*. Springer International Publishing. 177–194. https://doi.org/10.1007/978-3-319-33880-4_11
- Shakya, P.R., Shrestha, S., Basnet, T.B. & Bhujju, Ū.R. (2007). *Nepal Biodiversity Resource Book*. International Centre for Integrated Mountain Development (ICIMOD). <https://lib.icimod.org/record/7560> [2024-04-04]
- Shrestha, B. & Shrestha, S. (2010). Biodiversity conservation in community forests of Nepal: Rhetoric and reality. *International Journal of Biodiversity and Conservation*, 2, 98–104
- Shrestha, K.K. & McManus, P. (2008). The politics of community participation in natural resource management: lessons from community forestry in Nepal. *Australian Forestry*, 71 (2), 135–146. <https://doi.org/10.1080/00049158.2008.10676280>

- Smith, A.C., Hajjar, R., Kanel, K.R., Fox, J., Tuladhar, S. & Van Den Hoek, J. (2024). Out-migration, agricultural abandonment, and community forest management: Drivers of afforestation in privately managed land in Nepal. *Applied Geography*, 167, 103275. <https://doi.org/10.1016/j.apgeog.2024.103275>
- Sneed, P., Nietschmann, B., DeLacy, T. & Stevens, S. (2000). Conservation Through Cultural Survival: Indigenous Peoples And Protected Areas. *Bibliovault OAI Repository, the University of Chicago Press*, 34. [https://doi.org/10.1659/0276-4741\(2000\)020\[0200:CTCSIP\]2.0.CO;2](https://doi.org/10.1659/0276-4741(2000)020[0200:CTCSIP]2.0.CO;2)
- Springate-Baginski, O., Yadav, N.P., Yadav, D., Lfp, & Nepal (2003). Community Forest Management in the Middle Hills of Nepal: The Changing Context. *Journal of Forest and Livelihood*, 3
- Sunam, R.K., Paudel, N.S. & Paudel, G. (2013). Community Forestry and the Threat of Recentralization in Nepal: Contesting the Bureaucratic Hegemony in Policy Process. *Society & Natural Resources*, 26 (12), 1407–1421. <https://doi.org/10.1080/08941920.2013.799725>
- The National Archives (2021). *Glasgow Leaders' Declaration on Forests and Land Use - UN Climate Change Conference (COP26) at the SEC – Glasgow 2021*. <https://webarchive.nationalarchives.gov.uk/ukgwa/20230418175226/https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/> [2024-04-18]
- The World Bank (2017). *Community Participation and Decision-Making in Natural Resource Management*. <https://documents1.worldbank.org/curated/en/890851519417165855/pdf/123673-BRI-PUBLIC-MozDGM-policy-brief.pdf> [2024-05-17]
- The World Bank (2023). *Social Dimensions of Climate Change*. World Bank. [Text/HTML]. <https://www.worldbank.org/en/topic/social-dimensions-of-climate-change> [2024-04-25]
- Thwaites, R., Fisher, R. & Poudel, M. (2017). *Community Forestry in Nepal: Adapting to a Changing World*. Routledge.
- Tscharntke, T., Klein, A.M., Kruess, A., Steffan-Dewenter, I. & Thies, C. (2005). Landscape perspectives on agricultural intensification and biodiversity – ecosystem service management. *Ecology Letters*, 8 (8), 857–874. <https://doi.org/10.1111/j.1461-0248.2005.00782.x>
- UN (2021). *The Global Forest Goals Report 2021: Realizing the Importance of Forests in a Changing World*. United Nations. <https://doi.org/10.18356/9789214030515>
- UNDP (2017). *Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management*. https://info.undp.org/sites/bpps/SES_Toolkit/SES%20Document%20Library/Social%20and%20Environmental%20Standards/UNDP%20SES%20Biodiversity%20Conservation%20and%20Sustainable%20NRM%20GN_Oct2017.pdf [2024-05-17]
- UNEP & FAO (2020). *The State of the World's Forests 2020. In brief*. FAO and UNEP ; <https://openknowledge.fao.org/handle/20.500.14283/ca8985en> [2024-04-24]
- Watts, M. (2017). Political Ecology. I: *A Companion to Economic Geography*. John Wiley & Sons, Ltd. 257–274. <https://doi.org/10.1002/9781405166430.ch16>
- Wells, M.P., McShane, T.O., Dublin, H.T., O'Connor, S. & Redford, K.H. (2004). 17. The Future of Integrated Conservation and Development Projects: Building on What Works. I: 17. *The Future of Integrated Conservation and Development Projects: Building on What Works*. Columbia University Press. 397–422. <https://doi.org/10.7312/mcsh12764-019>

- Wilder, B.T., O'Meara, C., Monti, L. & Nabhan, G.P. (2016). The Importance of Indigenous Knowledge in Curbing the Loss of Language and Biodiversity. *BioScience*, 66 (6), 499–509. <https://doi.org/10.1093/biosci/biw026>
- WWF, UNEP-WCMC, SGP/ICCA-GSI, LM, TNC, CI, WCS, EP, ILC-S, CM & IUCN (2021). *The state of Indigenous Peoples' and Local Communities' lands and territories* | IUCN. <https://www.iucn.org/news/commission-environmental-economic-and-social-policy/202106/state-indigenous-peoples-and-local-communities-lands-and-territories> [2024-05-29]

Acknowledgements

Firstly, I would like to express my deepest appreciation for my supervisor Harry Fischer, for sharing his great expertise in his guidance and feedback on my thesis. I would also like to give special thanks to Dil Khatri for his very valuable input on the matters of this thesis.

I am truly grateful for the opportunity to travel to Nepal for my thesis. For this, I want to thank Harry, Dil and the colleagues at SIAS in Kathmandu for the support and logistics. My most sincere thanks go to Jayaa Pun for her translations, most valuable insights, support, and companionship during the stay at the villages. To Astrid, who accompanied me to Nepal for her own master thesis: I feel so lucky to have shared it all with you.

I would also like to express my heartfelt gratitude for all of the informants in the villages, for thoroughly answering our questions, accompanying us in the forests, and opening their homes to accommodate us and participate in their lives.

Thanks to everyone who has taken their time to review my thesis and give their feedback.

Finally, I would like to express my deepest appreciation to my family – especially my partner, my mother and my sister, in supporting me throughout my studies, and during the travel and work for this thesis.

Publishing and archiving

Approved students' theses at SLU are published electronically. As a student, you have the copyright to your own work and need to approve the electronic publishing. If you check the box for **YES**, the full text (pdf file) and metadata will be visible and searchable online. If you check the box for **NO**, only the metadata and the abstract will be visible and searchable online. Nevertheless, when the document is uploaded it will still be archived as a digital file. If you are more than one author, the checked box will be applied to all authors. You will find a link to SLU's publishing agreement here:

- <https://libanswers.slu.se/en/faq/228318>.

YES, I/we hereby give permission to publish the present thesis in accordance with the SLU agreement regarding the transfer of the right to publish a work.

NO, I/we do not give permission to publish the present work. The work will still be archived and its metadata and abstract will be visible and searchable.