SOCIO-ECONOMIC DYNAMICS IN COMMUNITY FORESTRY MANAGEMENT: A STUDY IN BENIGHAT RORANG RURAL MUNICIPALITY, DHADING

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AN ABSTRACT

of the dissertation of *Yurisha Upadhyaya* for the degree *Master in Sustainable Development* presented on *01 August 2024* entitled *Socio-Economic Dynamics in Community Forest Management: A Study in Benighat Rorang Rural Municipality, Dhading.*

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Dissertation Supervisor

Community forestry in Nepal has demonstrated substantial success in enhancing forest conditions and improving local livelihoods through the widespread adoption of Community Forest User Groups (CFUGs). However, in the current context, CFUGs face multifaceted challenges that hinder their effectiveness in sustainable forest management and community empowerment. The study investigates the broader social and economic dimensions influencing CFUGs participation in forest management activities in Benighat Rorang Rural Municipality, Dhading district, by employing a mixed methods approach to explore participation status and identify the challenges. The findings revealed a statistically significant relationship between various socio-economic dimensions and participation within CFUGs and underscore significant demographic diversity within CFUGs, emphasizing the roles of gender, ethnicity, education, and livelihoods in shaping community cohesion and engagement first. Second, the study pinpoints that factors such as social networks, effective communication, and external organizational support are identified as crucial for enhancing community engagement in forest management. Furthermore, economic dimensions, including access to financial resources, skills development, and income diversification, also positively impact participation. Thus, the study highlights organizational barriers, changing forest-people nexus, conceptual ambiguities around sustainable practices, and governance challenges as critical obstacles to effective forest management and participation. It proposes a Triadic Approach framework for sustainable community forestry management, offering a new perspective on

integrating social, economic, and participatory dimensions. This framework aims to enhance CFUG participation and advance sustainable forest management in local contexts.

…… 01 August 2024

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सोध सार

दिगो विकास शिक्षामा स्नातकोत्तर डिग्रीका लागि युरिशा उपाध्यायको शोध प्रबंधको शीर्षक: "सामुदायिक वन व्यवस्थापनमा आर्थिक र सामाजिक आयामहरू - बेनिघाट रोराङ गाउँपालिका, धादिङमा एक अध्ययन" १७ साउन २०८१ मा प्रस्तुत गरिएको थियो।

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सोध निर्देशक हस्ताक्षर

नेपालमा सामुदायिक वनले सामुदायिक वन प्रयोगकर्ता समूहहरूको व्यापक अपनत्वमार्फत वनको अवस्था सुधार्न र स्थानीय जीविकोपार्जनमा सुधार ल्याउन उल्लेखनीय सफलता देखाएको छ। यद्यपि, हालको सन्दर्भमा, सामुदायिक वन प्रयोगकर्ता समूहहरूले दिगो वन व्यवस्थापन र सामुदायिक सशक्तीकरणमा प्रभावकारीता प्राप्त गर्नमा बहुआयामिक चुनौतीहरूको सामना गरिरहेका छन्। यस अध्ययनले धादिङ जिल्लाको बेनिघाट रोराङ गाउँपालिकामा वन व्यवस्थापन गतिविधिहरूमा सामुदायिक वन प्रयोगकर्ता समूहहरूको सहभागितामा प्रभाव पार्ने सामाजिक र आर्थिक आयामहरूको अन्वेषण गर्न मिश्रित विधिहरूको प्रयोग गरेको छ। यसले सहभागिताको स्थिति बुझ्न र चुनौतीहरूको पहिचान गर्न मद्दत गरेको छ।

अध्ययनको निष्कर्षले विभिन्न सामाजिक-आर्थिक आयामहरू र सामुदायिक वन प्रयोगकर्ता समूहहरू भित्रको सहभागिता बीच सांख्यिकीय रूपमा महत्त्वपूर्ण सम्बन्ध प्रकट गरेको छ। सर्वेक्षणका नतिजाहरूले सामुदायिक वन प्रयोगकर्ता समूहहरूमा महत्त्वपूर्ण जनसांख्यिकीय विविधतालाई उजागर गरेका छन्, जसले लिंग, जातीयता, शिक्षा र जीविकोपार्जनको भूमिकालाई सामुदायिक एकता र संलग्नता निर्माणमा महत्त्वपूर्ण बनाउँछ। सामाजिक सञ्जाल, प्रभावकारी सञ्चार, र बाह्य संगठनात्मक सहयोग जस्ता कारकहरू वन व्यवस्थापनमा सामुदायिक संलग्नता बढाउनका लागि महत्वपूर्ण मानिएका छन्।

अध्ययनले आर्थिक स्रोतहरूको पहुँच, सीप विकास, र आय विविधीकरण जस्ता आर्थिक आयामहरूले पनि सहभागितामा सकारात्मक प्रभाव पार्ने देखाएको छ। यसरी, अध्ययनले संगठनात्मक अवरोधहरू, वन-जनको सम्बन्धमा परिवर्तन, दिगो अभ्यासहरूमा वैचारिक अस्पष्टता, र प्रभावकारी वन व्यवस्थापन र सहभागिताको लागि चुनौतीपूर्ण शासन समस्याहरूलाई प्रकाश पारेको छ। यस अध्ययनले सामाजिक, आर्थिक, र सहभागितामूलक आयामहरूलाई एकीकृत गर्ने त्रियाडिक

दृष्टिकोणको ढाँचाको प्रस्तावना गरेको छ, जसले सामुदायिक वन प्रयोगकर्ता समूहहरूको सहभागिता बढाउने र स्थानीय सन्दर्भमा दिगो वन व्यवस्थापनलाई अघि बढाउने लक्ष्य राख्दछ।

..... १७ साउन २०८१

युरिशा उपाध्याय

उपाधि उमेदवार

This dissertation entitled *Socio-Economic Dynamics in Community Forest Management: A Study in Benighat Rorang Rural Municipality* presented by *Yurisha Upadhyaya* on *01 August 2024*.

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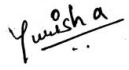
I understand that my dissertation will become part of a permanent collection of the Kathmandu University Library. My signature below authorizes the release of my dissertation to any reader upon request for scholarly purposes.



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DECLARATION

I hereby declare that this dissertation has not been submitted for the candidature of any other research degree to any university.

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DEDICATION

I dedicate my thesis to my parents, Ramesh Kumar Upadhyaya Luentel, and Susila Upadhyaya, for their immense support, love, and care.

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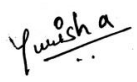

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ABBREVIATIONS

CF	Community Forest
CFM	Community Forestry Management
CbFM	Community based Forest Management
CFUG	Community Forest User Group
DAG	Disadvantaged Groups
DFO	District Forest Office
DFRS	Department of Forest Research and Survey
EC	Executive Committee
FAO	Food and Agriculture Organization
FECOFUN	Federation of Community Forest Users Nepal
FGD	Focus Group Discussion
FM	Forest Management
FUG	Forest User Group
Ha	Hectare
IGA	Income Generating Activities
KII	Key Informant Interview
NDAG	Non-disadvantaged Groups
NTFP	Non-Timber Forest Products
PFM	Participatory Forest Management
RECOFTC	Regional Community Forestry Training Center for Asia and the Pacific
SDFO	Sub Division Forest Office
UNDP	United Nations Development Programme

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CHAPTER I
INTRODUCTION

This chapter introduces the context of the study, presents a problem statement, identifies gaps in prior research, and develops the study's rationale. The section further outlines the conceptual framework, research purpose, research questions and the scope and limitations of the study.

Background

Community Forestry (CF) initiatives in Nepal are vital for addressing the complex interplay of socio-demographic, organizational, and economic factors that influence community participation and enhance sustainable forest management. These initiatives are essential not only for aligning practices with national policies but also for improving livelihood conditions. Understanding the status of participation within Community Forest User Groups (CFUGs) is crucial for optimizing forest conservation and management strategies.

Nepal, with a population of nearly 29 million population, relies heavily on agriculture and forestry, which are pivotal to the economy and way of life (Chhetri et al., 2023, p. 413). Forests, which cover 44.7% of Nepal's land area, are crucial for economic growth and employment opportunities for local communities (Poudyal et al., 2023; World Bank, 2018). Until the late 1970s, Government of Nepal had control over local forests (Gilmour, 2016). The introduction of the Community Forestry (CF) system marked a significant shift towards participatory forest management in Nepal, achieving notable success (Kumar, 2002).

In Nepal, CF is the dominant approach among existing community-based forest management (CbFM) models, covering more than 79% of total CbFM area (Ministry of Forests and Environment [MoFE], 2021). Other CbFM models include leasehold forests, collaborative forest management, protected forests (proposed), religious forests, and buffer zone community forests, which together account for approximately 21% of the CbFM area (Ghimire & Lamichhane, 2020). Globally, various CbFM practices exist, such as Joint Forest Management, Communal Forest Management, Village Land Forest Reserves, Community Forests, and Collaborative Forest Management, all under the broader umbrella of Participatory Forest

Management (Duguma et al., 2018). These models highlight the diversity of approaches to forest management.

According to the Forest Act (2019)[1], community forests are a portion of national forests set aside for the sustainable management, conservation, utilization, and development by a local user organization known as CFUGs. According to Euphrat and Shrestha (2002), this initiative has successfully restored damaged forests and effectively engaged people in forest management, empowering communities to meet their needs while serving the environment.

Initially focused on forest conservation and community rights, CF programs in Nepal evolved to address broader societal challenges like inequality, climate change, and Sustainable Development Goals (SDGs) (Aryal et al., 2020; Oli et al., 2016). The 2015 Constitution of Nepal further decentralized forest management, involving federal, provincial, and local governments. This framework empowers CFUGs under the Forest Act (2019) to develop and revise forest operational plans in collaboration with local authorities, enabling revenue generation from natural resource management. These adaptations have helped reverse forest degradation, ensure sustainability, and enhance community livelihoods (Sapkota et al., 2020).

Today, more than 40% of national forests are managed by local people, demonstrating the importance of community participation in the success of community forestry in achieving both environmental and socio-economic objectives (Acharya et al., 2022). However, the efforts to promote community involvement in forest governance and forest management have encountered complexities influenced by social and economic dimensions (Cadman et al., 2023; Marin & Kuriakose, 2017). Nepal's CF system faces contemporary challenges exacerbated by the outmigration of youth from rural areas, diminishing local reliance on CF resources, and weakening community participation and leadership within CFUGs (Paudel et al., 2021, p. 19; Shahi et al., 2022). Effective CF management hinges on active community engagement and robust leadership to achieve sustainable forest management and socio-economic development objectives (Adhikari et al., 2007; Agrawal & Ostrom, 2001; Paudel et al., 2021). However, with shifting demographics, evolving livelihood

[1] Forest Act (2019), amendment to the Forest Act (1993) has been adopted to meet Nepal's commitment to Paris Agreement

strategies, and global influences such as labor migration, the dynamics of community forestry are evolving (Laudari et al., 2024).

This study explores how social and economic dimensions influence the participation of CFUGs. The detailed explanations of social and economic dimensions and all indicators are provided in Appendix H. By examining CFUGs' participation through these indicators, this study aims to uncover the drivers of effective engagement and highlight challenges faced amidst evolving socio-economic realities. The goal is to demonstrate the importance of these socio-economic dimensions in enhancing participation and achieving sustainable forest management, which in turn contributes to broader social, ecological, and environmental benefits.

Previous research, such as studies by Sapkota et al. (2020) and Shahi et al. (2022), highlights the critical need to adapt community forestry practices to local needs and socio-economic contexts. This adaptation is essential for improving community livelihoods and promoting sustainable forest management. Therefore, this study seeks to enhance CFUG participation by aligning with contemporary socio-economic realities, aiming to conserve and sustainably utilize forest resources while fostering social equity, ecological health, and environmental resilience. Identifying persistent challenges in CFUGs' participation will guide strategies for enhancing community engagement and leadership within these groups.

Statement of Problem

Nepal has experienced a notable increase in forest coverage from 26.2% in 1992 to 44.94% in 2015 largely attributed to the successful implementation of the CF system (Department of Forest Research and Survey [DFRS], 2015; Fox et al., 2019, p. 7). While CF in Nepal is often cited as a prime example of effective successful community participation in forest management, such narrative overlooks critical weaknesses and emerging challenges. The traditional reliance on forest resources for livelihoods has diminished due to a significant transition from agriculture-based to non-agricultural livelihoods, adding complexities that remain under-investigated (Shahi et al., 2022). This shift has led to reduced reliance on forest resources and a subsequent decline in collective community efforts in forest management (Paudel et al., 2021).

The Dhading district reflects these broader changes, where increased migration and a shift towards non-agricultural sectors have reshaped livelihood patterns. This evolution underscores the changing socio-economic landscape, moving

local communities away from traditional forest reliance (Kanel, 2006; Pandit & Bevliacqua, 2011; Regmi, 2003; Luintel, 2014). Limited research on Dhading's shifting livelihoods and CFUGs' dependency dynamics highlights the critical need for this study. Study by Oli and Treue (2015) has noted that reduced resource use correlates with decreased participation in CFUGs, implying that as community dependence on forest resources declines, so does their engagement in forest management activities. This observation is pivotal as it challenges the assumed sustainability of the CF model under changing socio-economic conditions. The declining participation in CFUG activities raises concerns about the long-term viability of forest ecosystems and the livelihoods traditionally supported by them.

This study aims to investigate how social and economic dimensions influence the participation of CFUGs. By examining CFUGs' participation through specific social and economic indicators, the research seeks to identify the drivers of effective engagement and the challenges CFUGs face within evolving s socio-economic realities. This study also aims to uncover the underlying weaknesses in current community forest management practices and provide insights to enhance their effectiveness. The goal is to demonstrate the importance of these socio-economic dimensions in improving participation and achieving sustainable forest management, ultimately contributing to broader social, ecological, and environmental benefits.

Research Question

This research seeks to answer the following research question:

a. How do various social and economic factors influence the participation in CFUGs?

Research Objective

The specific objective is:

1. To investigate the social and economic aspects of community participation in CFUGs.

Hypothesis

Hypotheses 1

H_0: Social dimensions do not significantly influence the community participation dynamics within CFUGs.

H_1: Social dimensions significantly influence the community participation dynamics within CFUGs.

Hypotheses 2:

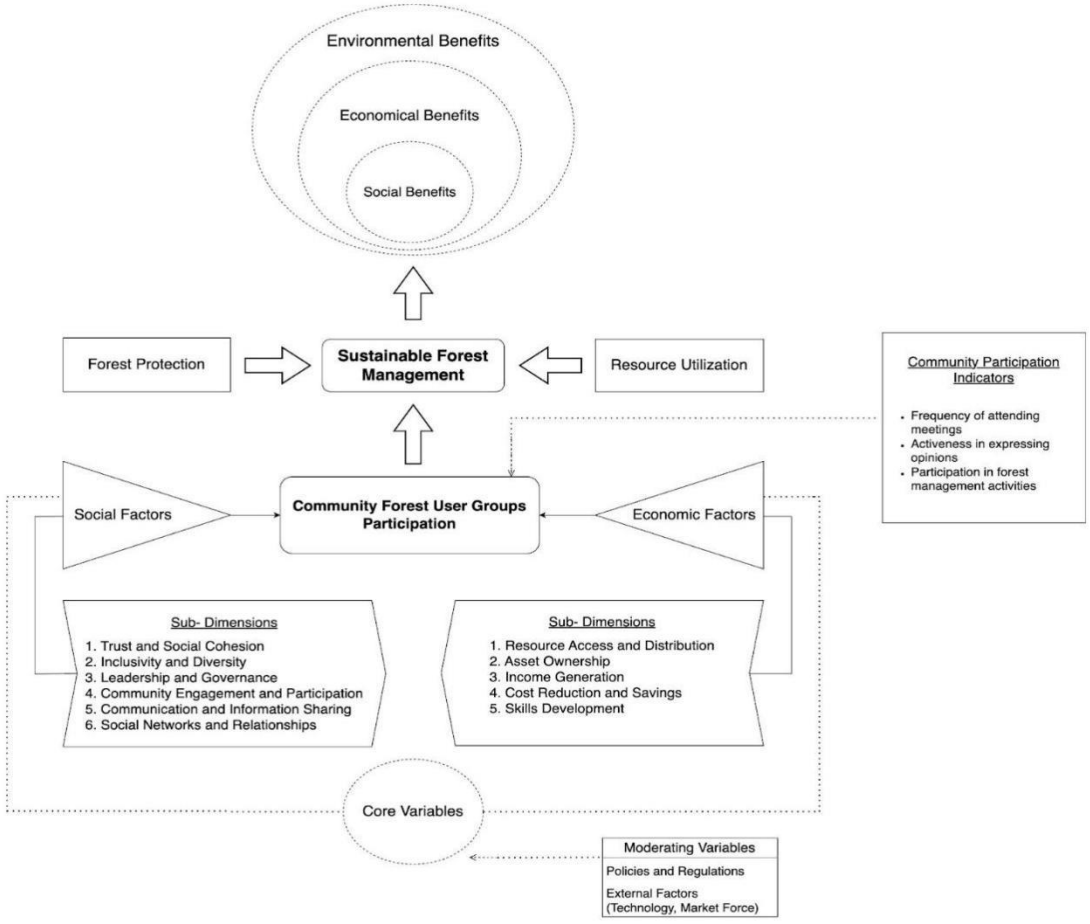
H_0: Economic dimensions do not have a significant relationship with the community participation dynamics within CFUGs.

H_1: Economic dimensions have a significant relationship with the community participation dynamics within CFUGs.

Conceptual Framework

Figure 1

Conceptual Framework of the Study



The conceptual framework above views CFUGs participation as the dependent variable, where indicators such as frequency of attending meetings, activeness of opinion, and engagement in forest management activities determine their participation dynamics. Meanwhile, it identifies social and economic dimensions within the community as pivotal factors influencing this participation. The framework delineates how these dimensions impact participation and contribute to the state of community forests. It asserts that robust social cohesion, effective leadership, inclusive decision-making, and economic benefits from forest resources collectively enhance CFUG engagement. This heightened involvement is anticipated to foster sustainable forest

management practices, encompassing responsible resource utilization, reduced deforestation rates, and adoption of ecologically sound harvesting techniques (Chhetri et al., 2013; Poudyal et al., 2019).

Forest management, a fundamental process in CF, involves two major sub-processes i.e. forest conservation and forest utilization (Yadav et al., 2003). Forest conservation refers to the preservation and protection of the natural ecosystem through stricter regulations on resource extraction, controlled logging or Non-Timber Forest Products (NTFP) harvesting, controlled deforestation, protection against forest fire, afforestation, etc. On the other hand, forest utilization deals with the sustainable use of forest resources to meet the needs of local communities while maintaining ecological health. Activities here include selective logging with replantation programs, controlled collection of NTFPs, sustainable harvesting, processing and disposal of forest produce, etc.

Integrating both conservation and utilization within the framework of sustainable forest management is essential. This approach ensures ecological health while also providing a wide range of social, economic, and environmental benefits. Socially, it improves livelihoods within CFUGs, strengthens community cohesion, and promotes equitable access to forest resources (Bowler et al., 2012; Savari et al., 2020). Economically, it enhances income generation, diversifies livelihoods, and reduces costs associated with resource procurement (GC et al., 2016; Heinen & Shrestha-Acharya, 2011). Moreover, sustainable forest management plays a crucial role in environmental well-being by conserving biodiversity, improving soil and water quality, and mitigating climate change impacts (Ghimire & Lamichhane, 2020)

In this study, the terms "participation," "involvement," and "engagement" are used interchangeably to encompass the multifaceted roles of CFUGs in Community Forest Management (CFM). "Participation" denotes a broader spectrum including passive involvement, where CFUG members contribute based on availability or interest; this is measure through indicators such as meeting attendance. “Involvement" signifies process-based engagement, focusing on active participation in planning, monitoring, and implementing forest management tasks, which is gauged by the activeness in expressing opinions. ‘Engagement" emphasizes content-based involvement in policy-making, lobbying, or direct management activities, assessed through direct participation in practical forest management tasks. By linking these indicators to the interchangeable use of participation, involvement, and engagement,

we aim to understand CFUG members' contributions to sustainable forest management in the long run. This holistic approach ensures that all aspects of CFUG members' contributions—whether they are attending meetings, actively voicing opinions, or directly participating in forest management tasks—are considered in understanding their impact on sustainable forest management in the long run.

This framework allows for a more inclusive and detailed analysis of CFUG members' participation, involvement, and engagement in CFM. This conceptual framework underscores the intricate relationship between social and economic dimensions within CFUGs, where robust community cohesion, effective leadership, and equitable economic benefits from forest resources are pivotal in enhancing participation dynamics. By promoting active engagement through inclusive decision-making and responsible resource management practices, this framework aims to foster sustainable forest management. Ultimately, it seeks to achieve ecological resilience, socio-economic prosperity, and environmental stewardship in CFUGs, ensuring the long-term viability of community-based forest management initiatives.

Significance of the Study

This study is crucial for understanding the participation of CFUG in Nepal's mid-hills, particularly in the Dhading district. It examines the factors influencing participation within CFUGs, providing valuable insights into how adaptive CF practices can be aligned with the region's current socio-economic realities. By analyzing different types of participation—ranging from passive involvement to active engagement in meetings, opinion expression, and practical forest management tasks—this research aims to develop practical strategies to enhance CFUG participation in daily CF operations. The findings are intended to inform changes in CF operational plans and day-to-day activities, ensuring that participation evolves to meet community needs. These insights could serve as a guiding document for policymakers to strengthen CFUG participation, thereby ensuring long-term livelihoods and forest ecosystem viability in Nepal and similar global contexts. This region is particularly significant as the mid-hills are where the CF program originated and have the highest concentration of CFUGs in Nepal's physiographic regions (Laudari et al., 2022; MoFE, 2020). Nepal's pioneering role in CF has influenced global forest policies, making this region critical for understanding CF dynamics amid rapid socio-economic changes (Poudyal et al., 2020).

Scope and Limitations of the Study

This study focuses exclusively on six specific CFUGs within the Benighat Rorang Rural Municipality of Dhading district, Nepal. These CFUGs were selected based on consultations with the rural municipality, DFO, SDFO, and field observations. The area was chosen due to the research grant supported by the EFFORT project and its alignment with the project's research area of interest. The research investigates the participation within CFUGs, emphasizing the influence of various social and economic factors on community participation. The goal is to explore how these factors contribute to meaningful participation in sustainable forest management, encompassing ecological, economic, and environmental benefits. While acknowledging the potential impact of external factors such as government policies, regulations, and market forces on CFUG autonomy and resource management rights (Friedman et al., 2020), this research specifically examines the socio-economic dimensions of participation. The study is constrained by its geographical focus and a defined sample size of 102 households, which limits the generalizability of its findings beyond this specific context. Moreover, the temporal scope of the study restricts observations to a specific timeframe, ensuring a focused analysis within this period.

Organization of the Thesis

The thesis comprises six chapters. Chapter one outlines the study, encompassing the introduction, problem statement, research questions, conceptual framework and significance of the study. Chapter two reviews pertinent literature, while chapter three details the research methodologies employed. Chapter four presents data analysis results, followed by chapter five, which delves into the discussion of findings. Chapter six and seven includes conclusion followed by recommendations.

CHAPTER II
LITERATURE REVIEW

This chapter reviews existing literature, books, journals, research papers, and articles from various scholars to explore the social and economic dimensions of CFUGs and their participation in CFM activities in Nepal. The review encompasses thematic, empirical, theoretical, and policy perspectives to identify a research gap and underscore the necessity of conducting this study.

Introduction of Community Forestry

CF involves local communities in the management and utilization of forest resources, aiming to balance environmental conservation with community development. This approach integrates local knowledge and needs into forestry practices, evolving significantly since its inception. Table 1 provides a comprehensive overview of the concept of CF from its origins to its current multidimensional approach.

Table 1

Definitions and Concept Evolution of Community Forestry

Definitions and evolution of CF	Source
Community forestry is any situation that involves local people in forestry activities. It includes activities ranging from woodlots and farm-level tree growing to processing forest products and activities by forest-dwelling communities. Excludes large-scale industrial forestry.	FAO (1978)
Community forestry is viewed as a process to increase local involvement and rewards, balance outside and community interests, and enhance local responsibility for forest management.	Sarre and Update (1994)
Social forestry/ community forestry involves afforestation, reforestation, and other forestry programs that directly involve local people and their institutions. It is synonymous with participatory forestry and rural development forestry.	Helms (1998)
A community forest is owned and managed by a community, with benefits shared among its members.	Helms (1998)

Community forestry has a long history, with communities in Asia managing forests before colonial times. It reflects a response to development programs that failed to address structural causes of poverty and environmental degradation.	Harrison and Suh (2004)
Community forestry should be understood as linking rural people with forests and trees, encompassing economic development, sustainable forestry, and community participation. It includes management for non-timber forest products and values beyond timber production.	Gilmour et al. (2004)
Community forestry involves multiple forms of engagement, including legal and institutional frameworks that support local management and benefit-sharing. It is increasingly integrated into broader rural development and environmental sustainability strategies.	Charnley and Poe (2007)
The role of community forestry is recognized in achieving Sustainable Development Goals (SDGs), particularly in relation to poverty reduction, sustainable land management, and climate action.	Hoogeveen and Verkooijen (2010).
The concept of community forestry is evolving to emphasize participatory governance, capacity building, and integration with global environmental frameworks such as climate change mitigation and adaptation strategies.	Cronkleton et al. (2011)
Community forestry practices are increasingly being scrutinized for their effectiveness in addressing issues of equity and power dynamics within communities, with a focus on ensuring that marginalized groups have a voice in decision-making processes.	Suiseeya (2014)
New approaches in community forestry highlight the importance of resilience and adaptive management in response to climate change impacts, emphasizing collaborative governance and the integration of traditional knowledge with scientific approaches.	Assuah (2014)
The concept has expanded to include urban community forestry initiatives, addressing the needs of growing urban populations for green spaces, ecosystem services, and community well-being.	Ferrini et al. (2017)

Community forestry is increasingly recognized as a tool for enhancing socio-environmental justice, with a focus on participatory approaches that address historical injustices and promote inclusive governance structures.	Villamayor-Tomas and García-Lopez (2018)
Recent trends in community forestry emphasize the integration of technological innovations, such as remote sensing and geographic information systems (GIS), to improve forest management and monitoring at the community level.	Roka (2020)
The concept continues to evolve with a growing emphasis on holistic approaches that combine community forestry with other land management practices, such as agroforestry and ecosystem-based adaptation strategies, to enhance overall sustainability and resilience.	Sapkota et al. (2022); Wang et al. (2023)

Emerging in the 1970s as a response to deforestation, CF initially focused on mitigating environmental degradation through local involvement in forest management (Food & Agriculture Organization [FAO], 1978). In its early years, CF was primarily concerned with conservation and resource management, emphasizing community participation in protecting forests (Wiersum, 1995). The 1980s marked a shift towards participatory management, empowering communities with rights and responsibilities over forest resources (Hobley, 1996). By the 1990s, decentralization further enhanced community autonomy, allowing for greater local decision-making in forest management (Kanel & Niraula, 2004). This period was pivotal in integrating community governance with resource management.

The 2000s expanded CF's focus to include sustainable livelihoods and poverty alleviation, recognizing its role in improving economic conditions in rural areas where forest resources are vital (Ojha et al., 2009). The 2010s saw the integration of climate change strategies, with CF contributing to climate adaptation and mitigation by highlighting ecosystem services provided by community-managed forests (Timilsina-Parajuli et al., 2014). In the 2020s, CF has been recognized as a model for biodiversity conservation and global sustainability, demonstrating its capacity to deliver ecological, economic, and social benefits (Bista et al., 2023; Njurumana et al., 2020).

While CF has made significant strides in sustainable forest management and community empowerment, challenges persist. Issues of equity and power dynamics continue to hinder the participation of marginalized groups in decision-making processes (Villamayor-Tomas & García-Lopez, 2018). Additionally, there is an ongoing need for inclusive governance and adaptation to changing socio-economic and environmental conditions (Bista et al., 2023).

Community Forestry in Nepal

Community forestry in Nepal has evolved into a significant approach for managing forest resources and enhancing local livelihoods. Rooted in ancient communal practices of forest governance, the modern CF concept emerged in the 1970s in response to severe deforestation. The objective was to empower local communities through participatory management strategies (Charnley & Poe, 2007). The 1993 Forest Act formalized this shift by transferring forest management rights to user groups, resulting in notable improvements in forest cover—from 26.2% in 1992 to 44.94% in 2015 (DFRS, 2015; Fox et al., 2019). Today, CF manages approximately 2.3 million hectares of forest, involving around 23,000 CFUGs and benefiting about 3 million households (Bista et al., 2023; Pandey & Pokhrel, 2021). Nepal's extensive engagement in CF underscores its leadership in this field, surpassing the global average. The success is attributed to strong legal frameworks, secure land rights, inclusive governance structures, and adaptable management systems (Baynes et al., 2015; Greijmans et al., 2015; Pagdee et al., 2006). CF has significantly contributed to sustainable development by improving forest conditions, increasing household incomes, and empowering local communities (Gilmour, 2016; Dahal et al., 2017a).

This review explore CF in Nepal from two perspectives: legislative provisions and practical application. These perspectives provide a comprehensive understanding of both the legal framework supporting CF and the real-world challenges and successes experienced in its implementation.

Legislative Provisions Perspective

The governance and management of CF in Nepal involve a complex interplay of legislation across various levels of government. This framework includes constitutional provisions, federal policies, strategies, acts, and guidelines that collectively shape the landscape of community forestry. Table 2 provides a detailed overview of the key legislative documents and policies at each level of government.

Table 2
Legislative Framework for Community Forestry in Nepal

Level of Government	Category	Specific Legislation
Federal Government	Constitution	Constitution of Nepal (2015)
	Policy	National Forest Policy (2018)
	Strategy	Forestry Sector Strategy (2016-2025)
	Act	Forest Act (2019)
	Regulations	Forest Regulations (2022)
	Guideline	Community Forestry Development Guidelines (2014)
	Plan	National Adaptation Plan (2021-2050)
	Plan	Strategic Action Plan for Improvement of Forest and Environment Sector of Nepal (2021)
Provincial Government	Act	Provincial Forest Act (2019) - Bagmati Province
Local Government	Act	Local Government Operation Act (2018)
	Guidelines	Local Government Planning Guidelines (2018)

The evolution of community forestry in Nepal is marked by critical legislative milestones. The Panchayat Protected Forest Act (1978) was an early attempt to formalize community involvement in forest management. This was followed by the Decentralization Act (1982), which aimed to decentralize forest management and enhance the roles of local user groups (Kanel, 2006). The Forest Act (1993) was a significant advancement, granting CFUGs the rights to manage, harvest, and sell surplus forest products, thus incentivizing sustainable practices and empowering local communities (Dahal et al., 2017a). The Community Forestry Development Guidelines (2014) further refined CFUGs' roles and responsibilities, providing clearer operational guidance.

Recent legislative developments have continued to evolve the CF framework. The National Forest Policy (2018) adopted a more inclusive approach, addressing social security, integration, and governance issues to ensure equitable access to forest

resources for all communities, including marginalized groups (Rai, 2020). The Forest Act (2019) and Forest Regulations (2022) refined forest management practices and established detailed regulatory frameworks. However, the transition to a federal republic introduced complexities. The Constitution and the Unbundling Report (2017) outlined the separation of powers between federal, provincial, and local governments in forest management. While the Constitution mandates cooperation, it lacks explicit definitions of community groups' rights or their interactions with the three government spheres. This has led to inconsistencies in local government roles, with the Local Government Operation Act (2017) placing community forestry under local jurisdiction, while the Forest Act retains oversight with the Division Forest Office (DFO) (Dahal et al., 2011; Malla, 2000; Ojha, 2009).

Despite legislative advancements, there is a need for better alignment between forest policies and non-forestry sector regulations, such as tax collection and revenue sharing. Additionally, the new frameworks must align with Nepal's global commitments on biodiversity, ecosystem services, climate change, and REDD+ (Gilmour, 2016). The restructuring processes and lack of deliberative policy-making have led to criticisms and policy confusion, potentially undermining the effectiveness of community forestry (Gilmour, 2016).

Practical Approach Perspective

In practice, community forestry in Nepal has seen considerable success, evidenced by the establishment of over 22,000 CFUGs. These groups have significantly contributed to improved forest conditions and enhanced livelihoods for forest-dependent communities (Ghimire & Lamichhane, 2020; MoFE, 2020). CFUGs actively engage in forest management tasks such as timber harvesting and the collection of NTFPs, which supports sustainable resource management and community development (Acharya et al., 2022).

However, practical challenges persist. Governance issues, including hierarchical social structures and gender discrimination, complicate decision-making within CFUGs. Elite members often dominate decision-making processes, marginalizing less privileged groups and resulting in inequitable benefit distribution (Koirala et al., 2008; Kanel & Niraula, 2004). The recent federal structure has introduced further complexities. The lack of coherent policy formulation and communication gaps between federal, provincial, and local levels exacerbate these issues (Dahal et al., 2021).

Bureaucratic constraints also pose significant challenges. CFUGs are required to renew their operational plans every 5 to 10 years, raising concerns about potential revocation of management rights by the DFO. This oversight undermines community autonomy and effectiveness (Cadman et al., 2023). Additionally, discrepancies between government authorities and local communities regarding rights and resource utilization continue to impact the effectiveness of CF policies (Dahal et al., 2017a; GC et al., 2016; Joshi, 2022).

Despite legislation mandating the inclusion of women and marginalized communities, decision-making within CFUGs is often dominated by elite and educated individuals, leading to token representation and limited influence for marginalized groups (Cadman et al., 2023; Pagdee et al., 2006). The National Forest Policy (2018) has been criticized for inadequately addressing the needs of marginalized groups, which may perpetuate social disparities and constrain the overall efficacy of CF programs (Basnet, 2021).This questions the notion of community forestry, as CF is not only about protection and utilization, but has also evolved into an issue of human rights.

According to the literature, addressing these challenges requires several actions. Studies have pointed out that conducting orientation programs for forest officials and CFUG members can enhance understanding of policies and procedures. Furthermore, integrating CFUG plans into local government planning processes can improve alignment with local development goals and enhance sustainability (Acharya et al., 2022; Rijal et al., 2021). Strengthening capacity building, promoting greater inclusivity, and ensuring transparent decision-making processes are essential for improving community forestry governance. Enhanced collaboration among stakeholders and ensuring that marginalized groups have a meaningful role in decision-making will be crucial for advancing the effectiveness of CFUGs and achieving sustainable forest management (United Nations Development Programme [UNDP], 1997; United Nations Economic and Social Commission for Asia and the Pacific [UNESCAP], 2007). Overall, while legislative updates have advanced community forestry management, practical implementation faces significant obstacles. Addressing bureaucratic inefficiencies, enhancing community empowerment, and ensuring fair representation of marginalized groups are critical for realizing the full potential of community forestry to foster local economies, create jobs, and improve livelihoods for those living close to forests.

Key Features and Governance Structures of CF in Nepal

The following table presents the governance structures of CF in Nepal, detailing the roles and responsibilities of various governmental levels institutions involved in managing CFUGs. At the federal level, the Ministry of Forest and Environment, along with its associated departments, sets national policies and provides oversight. The provincial level includes seven ministries responsible for forests and environment, supported by provincial forest directorates and numerous division forest offices. At the local level, CFUGs play a crucial role in managing forest resources. This multi-tiered governance framework underscores the decentralized approach to forest management, emphasizing community empowerment and sustainable resource utilization.

Table 3

Governance Structures of Community Forestry in Nepal

Level	Category	Authorities/ Departments
Federal Level	Ministry	Ministry of Forest and Environment
	Department	Department of Forest and Soil Conservation
		Department of National Parks and Wildlife Agencies
		Department of Plant Resources
Provincial Level		7 Provincial Ministries responsible for Forest and Environment
		7 Provincial Forest Directorates
		84 Division Forest Offices and Sub-Division Forest Offices
Local Level		Thematic committee in municipal level

CFUGs operate as autonomous, self-governing institutions, legally registered at Division Forest Offices (DFOs) under the CFUG Constitution, which defines the rights and roles of forest users. These groups are democratically formed, with General Assemblies serving as decision-making bodies. They elect or select Executive Committees responsible for overseeing daily operations and enforcing forest protection measures. The participatory governance model of CFUGs aligns with principles of local democracy, fostering community cohesion and resilience (Ojha et al., 2022). Members actively participate in decision-making and practical forest

management tasks such as timber harvesting, collecting NTFPs, and livestock grazing. This involvement not only ensures sustainable resource use but also generates essential income for community development (Ghimire & Lamichhane, 2020).

Despite these successes, CF in Nepal faces persistent challenges, particularly concerning governance, inequitable benefit distribution, and inadequate representation of marginalized groups (Kanel & Niraula, 2004; Koirala et al., 2008). The hierarchical social structure and gender discrimination further complicate effective governance and decision-making within CFUGs (Koirala et al., 2008). Addressing these challenges necessitates robust policy frameworks, enhanced capacity building, and greater inclusivity in decision-making processes.

Good governance in CF emphasizes the systematic management and utilization of forest resources with the participation of all stakeholders, including women, the poor, and disadvantaged groups, in a transparent manner that ensures equitable resource harnessing (UNESCAP, 2007). Key elements of good governance include participation, transparency, accountability, and predictability (UNDP, 1997). Participation ensures that all stakeholders have a voice in decision-making processes, including marginalized groups whose involvement is often minimal due to social hierarchies and inadequate representation (Pokharel et al., 2011; Pokharel & Tiwari, 2013). Transparency involves disclosing all relevant information to stakeholders in a regular, accessible, and understandable manner, fostering trust and informed decision-making (Maharjan et al., 2004). Accountability requires mechanisms to hold decision-makers responsible for their actions and ensure that they meet established standards and expectations (Asian Development Bank [ADB], 1995). Predictability ensures consistency and reliability in governance processes, enhancing the effectiveness and legitimacy of governance institutions (Maharjan et al., 2004).

Recent constitutional reforms have decentralized national forest management rights to provincial governments, introducing complexities in power and resource distribution. There are seven provincial ministries responsible for forests and environment, aimed at leading the management of national forests along with the regulation of private forestry. These reforms have led to a lack of coherent policy formulation and communication gaps between federal, provincial, and local levels (Dahal et al., 2021), which hampers the effective management and monitoring of community forests. CFUGs advocate for greater involvement of local governments in

monitoring activities but encounter resistance from forest officials. There is also a noted lack of coordination, awareness, and cooperation between local governments and CFUG members, leading to uncertainties in local forest resource management. Issues such as non-compliance with benefit-sharing provisions further underscore governance challenges, indicating gaps in policy implementation and adherence.

Social Dimensions of Community Forest

Community forestry hinges on various social dimensions that shape and support effective forest management. These dimensions, including social trust, inclusivity, leadership, communication, and social networks, play a critical role in fostering community engagement and ensuring the sustainability of forest resources.

Social Trust, Cohesion, and Conflict Resolution

Social trust and cohesion are foundational to successful community forestry. High levels of trust among community members facilitate collaboration and collective action, essential for managing forest resources effectively. When communities have strong social bonds, they are better equipped to work together and address challenges related to forest management (Oktalina et al., 2022). Additionally, effective mechanisms for conflict resolution are crucial. These mechanisms help maintain harmony within the community, allowing members to address and resolve disputes constructively. Without such mechanisms, conflicts could undermine efforts to manage and conserve forest resources (Lise, 2000).

Inclusivity and Leadership

Inclusivity ensures that diverse groups within the community are represented and involved in the management of forest resources. Effective inclusion encompasses various demographic factors, including age, gender, and ethnicity, and ensures that all voices contribute to decision-making processes. This broad representation helps to harness a wide range of perspectives and expertise, which can enhance the effectiveness of forest management practices (Elias et al., 2017). Effective leadership is integral to this inclusivity. Leaders within CFUGs are responsible for guiding the community, mobilizing resources, and mediating conflicts. Strong leadership can motivate members, foster an environment of collaboration, and ensure that diverse viewpoints are considered (Gentle et al., 2020; Thapa et al., 2020).

Communication and Social Networks

Effective communication is essential for the success of CF. Clear and accessible communication channels facilitate the sharing of information, enable

coordination among members, and foster a sense of ownership over forest management practices (Lise, 2000; Santos, 2018). Additionally, social networks—both within the community and with external stakeholders—provide crucial support and resources. Strong social networks can enhance the capacity of CFUGs to manage forest resources effectively by leveraging external expertise and support (Oktalina et al., 2022). These networks also help build relationships that can aid in resource mobilization and problem-solving.

In summary, the social dimensions of community forestry—trust and cohesion, inclusivity and leadership, and communication and social networks—are fundamental to fostering effective forest management. Addressing these factors can enhance community engagement and contribute to more sustainable and resilient forest management practices.

Economic Dimensions of Community Forestry

Community forestry in general, is profoundly influenced by economic dimensions that address income generation, resource distribution, and asset management. These dimensions not only contribute to the livelihoods of community members but also play a pivotal role in the sustainability and success of forest management practices.

Income Generation and Livelihood Enhancement

One of the primary economic benefits of community forestry is its capacity to create income-generating opportunities through forest-based enterprises. These enterprises, which can include activities such as timber harvesting, non-timber forest product collection, and ecotourism, offer substantial financial incentives for community members (Dahal et al., 2017a). By capitalizing on the economic potential of forest resources, communities are encouraged to adopt sustainable practices that both conserve and utilize these resources efficiently. This economic engagement provides a direct link between forest management and improved livelihoods, fostering a greater commitment to sustainable forest practices (Pokharel et al., 2011).

Additionally, access to microcredit and financial incentives supports the economic activities related to community forestry. Microcredit schemes and savings programs reduce the financial burdens on community members and improve their ability to invest in forest management and related enterprises (Bashyal, 2005). These financial tools, along with favorable forest policies, are crucial in shaping the

economic landscape of community forestry and enhancing the overall economic stability of the participating communities (Ranjit, 2014).

Fair Resource Distribution and Asset Ownership

Equitable distribution of forest resources and transparent management of income are vital for ensuring that all members of CFUGs benefit economically. Fair resource distribution helps in building trust within the community, as members perceive tangible benefits from their involvement in forest management (Adhikari et al., 2014; Baynes et al., 2015). This equitable approach ensures that both wealthier and poorer members receive a fair share of benefits, thus promoting social equity and stability within the CFUGs (Tamrakar & Sharma, 2002).

Secure land tenure and ownership of essential assets also play a significant role in the economic dynamics of community forestry. Ownership of land and assets such as livestock provides a foundation for effective forest management and empowers CFUG members by aligning their economic interests with sustainable forest practices (Adhikari et al., 2014). Furthermore, access to market products and information is crucial for enhancing the economic outcomes of community forestry. By improving access to markets and relevant information, CFUG members can better engage in economic activities and optimize the benefits derived from forest resources (Zenteno et al., 2013).

Skill Development and Cost Reduction

Skill development and capacity building are essential components in the economic framework of community forestry. Training programs that equip CFUG members with skills for effective forest management contribute to their ability to engage in various economic activities related to forestry. These programs enhance members' practical skills and knowledge, which in turn supports sustainable management practices and improves their economic prospects (Apipoonyanon et al., 2020; Mwambeo et al., 2022).

Cost reduction mechanisms also play a significant role in enhancing economic efficiency. Collective use of tools and resources, as well as cost-saving measures such as joint investments and resource-sharing schemes, can significantly lower the financial burdens associated with forest management (Bashyal, 2005). These mechanisms not only improve economic outcomes but also promote more efficient and sustainable use of forest resources.

In conclusion, the economic dimensions of community forestry encompass income generation, fair resource distribution, asset ownership, and skill development.

These factors collectively enhance community livelihoods and contribute to the sustainable management of forest resources. Addressing these economic dimensions effectively supports the broader goals of community forestry, ensuring both economic and environmental benefits for the communities involved.

Theoretical Framework

In examining the dynamics of CFM in Nepal, it is essential to understand the theoretical underpinnings that guide participation in community forestry. The framework below explores how different social and economic theories relate to community forests and how these theories connect with the Theory of Participatory Approach to enhance the participation of CFUGs.

Social Capital Theory

Social Capital Theory emphasizes the value of social networks, relationships, and trust within communities as a means of facilitating collective action and resource management. In the context of community forests, social capital plays a pivotal role in enhancing cooperation and collaboration among CFUG members. According to Putnam (1993), social capital theory posits that strong social networks and trust among individuals facilitate information exchange, cooperation, and the development of norms that support sustainable resource management. Within CFUGs, these social networks enable community members to share knowledge about forest management practices, identify common goals, and coordinate efforts to achieve them.

The theory also underscores the importance of collective action in managing common-pool resources like forests (Ostrom, 1990). CFUGs rely on social capital to organize and govern forest resources, ensuring that rules and regulations are adhered to and that benefits are distributed equitably. Strong social capital fosters a sense of ownership and responsibility among community members, encouraging them to participate actively in forest conservation and management efforts. Social capital also promotes community cohesion, which is essential for resolving conflicts and building consensus on forest management issues (Woolcock & Narayan, 2000). By fostering inclusive decision-making processes, CFUGs can harness social capital to bridge divides and create a shared vision for sustainable forest use. In sum, social capital theory highlights the importance of social relationships and networks in enabling

effective community forest management, thereby contributing to the long-term sustainability of forest resources.

Economic Incentives Theory and Resource Dependency Theory

Economic Incentives Theory and Resource Dependency Theory focus on the role of economic factors in motivating individuals and groups to engage in resource management activities. In the context of community forests, these theories provide insights into how economic considerations influence the participation of CFUG members. Economic Incentives Theory posits that individuals' behavior is significantly influenced by economic rewards or penalties. This theory is highly relevant to understanding shifts in community priorities regarding forest management. Economic incentives theory suggests that individuals are motivated to participate in resource management when they perceive tangible benefits, such as access to forest resources and economic returns (Adhikari & Lovett, 2006). CFUGs allocate forest resources based on agreed-upon rules and regulations, ensuring that community members have equitable access to timber, non-timber forest products, and other benefits.

Resource Dependency Theory, as proposed by Pfeffer and Salancik (1978), suggests that organizations or communities rely on external resources for their survival and will adjust their behavior based on the availability and control of these resources. In the context of community forestry, the theory can be applied to understand how changes in resource availability and economic opportunities affect community behavior. Resource distribution theory emphasizes the importance of equitable distribution of resources and benefits to enhance community well-being (Leach et al., 1999). CFUGs generate income through the sustainable use of forest resources, which can be reinvested in community development projects, infrastructure, and social services. This income generation potential incentivizes community members to engage in forest management activities and contribute to the long-term sustainability of the forest.

These theories highlight the need for economic equity and inclusion in resource distribution to ensure that marginalized and disadvantaged groups benefit from forest resources (Agrawal & Gupta, 2005). CFUGs implement benefit-sharing mechanisms that prioritize women, disadvantaged groups, and the most vulnerable members, promoting social equity and reducing poverty in rural areas. Overall, economic incentives theory and resource distribution theory underscore the

significance of economic factors in motivating participation and ensuring the equitable distribution of benefits in community forest management. Economic Incentives Theory and Resource Dependency Theory are particularly relevant. Economic Incentives Theory explains the shift in focus from collective forest management to personal financial gains due to changing perceptions of economic rewards. Resource Dependency Theory helps understand the decreased dependency on forest resources as alternative economic opportunities become more prominent. Both theories provide a framework to interpret the observed changes in behavior and resource utilization within the community.

Linking Theories to Theory of Participatory Approach

The participatory approach in natural resource management emphasizes the active involvement of community members in decision-making processes, which is essential for the effective management of shared resources such as community forests. This approach integrates social and economic theories to enhance the participation of CFUG members, promoting sustainable forest management and equitable benefit-sharing. By prioritizing stakeholder engagement and inclusive decision-making, CFUGs can leverage the social and economic dimensions of participation to foster long-term sustainability in community forestry initiatives in Nepal.

A foundational aspect of the participatory approach is community involvement. This ensures that diverse perspectives and needs are considered, leading to more inclusive and effective forest management strategies. Sherry Arnstein's seminal work on citizen participation highlights that active community involvement is crucial for meaningful engagement in decision-making processes. By engaging community members at all levels, the participatory approach incorporates local knowledge, fostering a sense of ownership and accountability that strengthens community commitment to sustainable resource management (Arnstein, 1969).

Empowerment is another critical component of the participatory approach. Empowering community members enhances their capacity to influence decisions and take ownership of forest management activities, leading to sustainable practices. Rowlands (1997) argues that empowerment is achieved through capacity building and knowledge sharing, equipping individuals with the skills necessary for effective participation in resource management. This empowerment fosters a sense of agency and responsibility among community members, contributing to the success of participatory forest management initiatives.

Equity and inclusivity are also central to the participatory approach, as they ensure that marginalized groups have a voice in forest management. Gaventa and Cornwall (2006) emphasize that inclusive decision-making processes promote social justice and reduce inequalities by considering the diverse needs and interests of all community members. This aligns with the participatory approach's emphasis on inclusivity, ensuring that forest management practices are responsive to local needs and promote equitable benefit-sharing.

Capacity building is integral to the participatory approach, as it enhances the ability of CFUG members to contribute to sustainable forest management. Ojha et al., (2013) highlights that building the capacity of community members through training and collaborative learning empowers them to manage resources efficiently. This process involves equipping community members with the tools and knowledge necessary for effective participation, thereby fostering a sense of ownership and responsibility.

The theoretical foundations of the participatory approach are enriched by the contributions of scholars like Elinor Ostrom and Robert Chambers. Ostrom's work, particularly her book *Governing the Commons* (1990), provides valuable insights into how communities can successfully manage common resources through participatory governance structures. Her principles emphasize the importance of collective action and self-governance, aligning with the participatory approach's focus on community involvement and empowerment. Ostrom argues that individuals affected by operational rules should have a voice in modifying them, highlighting the importance of participatory governance where local knowledge and stakeholder involvement are crucial for effective resource management.

Ostrom's concept of "Nested Enterprises" suggests that for large-scale resource systems, management should be organized in multiple layers of nested enterprises. This principle supports the idea of participatory governance within CFUGs, where local knowledge and stakeholder involvement are crucial for effective resource management. Additionally, Ostrom underscores the importance of monitoring resource use and holding individuals accountable, which aligns with participatory approaches in CFUGs where community members are involved in monitoring and ensuring compliance with agreed-upon rules.

Robert Chambers, known for his work on participatory rural appraisal and community-led development, emphasizes putting local people at the center of the

development process. Participatory Rural Appraisal (PRA) facilitates the collection and analysis of information by and for community members, emphasizing local knowledge and involving communities in the inventorying, monitoring, and planning of local forest management. Chambers advocates for empowering local communities by valuing and utilizing their indigenous knowledge in decision-making processes. This approach aligns with the participatory approach, where CFUG members' local knowledge is essential for sustainable forest management.

Chambers also emphasizes participatory learning and action, where community members actively engage in identifying and solving their problems. This approach fosters a sense of ownership and responsibility, enhancing the effectiveness of participatory forest management. Furthermore, Chambers highlights the need for equitable participation of all community members, including marginalized groups. This ensures that diverse voices are heard and considered in resource management, aligning with the participatory approach’s emphasis on inclusivity.

In the context of our research, we explore how CFUG members participate in forest management decisions and examine how social and economic dimensions influence community participation. The participatory approach, informed by the insights of Ostrom and Chambers, underscores the importance of active community involvement, empowerment, and inclusivity in decision-making processes for sustainable natural resource management. By integrating these theoretical perspectives, our study aims to provide a nuanced understanding of the factors influencing CFUG participation and their implications for sustainable forest management. These theories collectively underscore the importance of both social and economic dimensions in shaping participation and offer valuable insights for enhancing community engagement and forest management practices.

In conclusion, the theory of participatory approach integrates the principles of social capital and economic incentives to foster inclusive participation and sustainable resource management in community forests. By prioritizing stakeholder engagement, inclusive decision-making, and equitable benefit-sharing, CFUGs can harness the potential of social and economic dimensions to enhance participation and promote the long-term sustainability of Nepal's community forestry initiatives. This theoretical framework provides a comprehensive understanding of the factors influencing participation in community forest management in Nepal, highlighting the interplay between social and economic dimensions and their impact on CFUG engagement.

Research Gap

Despite extensive global and national research into CF, including studies by Apipoonyanon et al. (2020), Chhetri et al. (2013), Kaskoyo et al. (2017), and Oli and Treue (2015), there remains a gap in comprehending the intricate interaction between social and economic dimensions within CFUGs. Existing literature primarily focuses on social and economic factors such as demographic characteristics, cultural norms, education levels, household income, and resource access. However, there is a lack of comprehensive exploration into broader contextual factors like social cohesion, leadership effectiveness, community awareness and skills, access to resources and forest benefits, and institutional frameworks governing resource allocation within CFUGs.

In this line especially, in rural areas like Benighat Rorang Rural Municipality, Dhading district, Nepal, where CF plays a vital role, limited studies exist on these factors. While studies in Dhading district have assessed the general impacts and outcomes of CF programs, they often do not delve deeply into how these various social and economic dimensions interact within today's evolving socio-economic landscape. This knowledge gap is crucial for understanding the complexities of community engagement in forest management actions and for developing targeted strategies that bolster community resilience, optimize resource management, mitigate conflicts, and promote sustainable development goals tailored to local contexts within CFUGs.

Moreover, despite Nepal's policy framework aimed at decentralizing forest management to local communities for sustainable forest resource use, CFUGs face persistent challenges such as inadequate funding, limited technical support, jurisdictional overlaps with District Forest Offices (DFOs), and inconsistent policies (Kaskoyo et al., 2017). The recent Forest Regulations (2022)[2] have been critiqued for to diminishing rights granted to CF user committees under the Forest Act (2019), exacerbating governance instability and policy inconsistencies affecting CFUGs. While these challenges are acknowledged in policy discussions, there is a need for empirical research that explores their specific impacts on CFUGs ability to effectively manage forest resources and engage community members. This gap highlights the

[2] Forest Regulation (2022) has been issued following the previous Forest Regulation (1995).

necessity for deeper investigation into the socio-economic dimensions influencing individual participation within CFUGs, which is crucial for developing targeted strategies to enhance their effectiveness and resilience.

Concluding the Chapter

CF in Nepal emerges as a robust framework with substantial successes in environmental conservation, poverty reduction, and local empowerment. The extensive adoption of CFUGs, managing vast forested areas, underscores its effectiveness in enhancing forest conditions and improving livelihoods. This success is supported by Nepal's progressive policy and legal frameworks, which decentralizes forest management and promoting sustainable practices. However, challenges such as bureaucratic hurdles, overlapping roles between authorities, insufficient capacity building initiatives, lack of economic opportunities, governance issues persist, hindering the full potential of CFUGs in achieving equitable and sustainable forest management. Despite these challenges, opportunities exist through initiatives like the National Forest Policy of 2018 and grassroots institutions that empower local communities. Moving forward, integrating social cohesion, inclusive governance, and equitable benefit-sharing will be crucial for enhancing participation within CFUGs. This review highlights the need for comprehensive approaches that address socio-economic dimensions and institutional frameworks to foster resilient and effective community-driven forest management in Nepal.

CHAPTER III
RESEARCH METHODS

This chapter explores various aspects related to conducting research, encompassing the research paradigm and design. It commences with the post-positivist philosophy that guided this study. The survey methodology is detailed, including the thorough validation process used to develop the questionnaire. The middle section covers the population of CFUGs in Benighat Rorang Rural Municipality, alongside the sample size of 102 households and the sampling methodology employed. Similarly, the process of collecting and analyzing data is examined. The conclusion of this chapter addresses reliability measures to ensure the dependability and validity through content, construct, and criterion-related approaches.

Post Positivism: A Guiding Philosophy

This study employs a post-positivist perspective to investigate the participation dynamics within CFUGs in Benighat Rorang Rural Municipality of Dhading. Post-positivism recognizes that reality is not fixed but shaped by various viewpoints, highlighting the role of individuals engaged in research (Hughes, 1994).

This research employs a quantitative approach with structured survey questionnaires to rigorously collect and analyze data, aiming to establish objective truths using systematic observation, measurement, and logical reasoning. Additionally, it utilizes qualitative methods such as open-ended questionnaires and Key Informant Interviews (KIIs) with representatives from various fields. These qualitative approaches are essential for exploring subjective experiences, contextual nuances, and the complex social interactions within CFUGs. By integrating both quantitative and qualitative methods, the study seeks to provide comprehensive insights into the socio-economic factors influencing community engagement in forest management.

The epistemological foundation of post-positivism acknowledges the role of empirical evidence in research but emphasizes that knowledge is socially constructed and interpretation-driven rather than purely objective (Forbes et al., 1999). It recognizes the impossibility of complete objectivity and instead aims for partial objectivity by minimizing biases through rigorous methodological approaches and

reflexivity. This approach seeks to maintain impartiality and reduce researcher influence on the findings, aiming for neutrality and fairness in interpreting research outcomes.

A deductive research approach was employed, involving the formulation of hypotheses based on existing theories and prior research. Empirical data was collected through a standardized tool, such as a survey questionnaire, to test these hypotheses quantitatively. The resulting data underwent rigorous quantitative analysis to identify patterns and draw conclusions. The study design incorporates both descriptive studies, providing socio-economic profiles and characteristics of the study population, and survey research, exploring relationships among variables.

This structured post-positivist approach recognizes the role of the researcher in shaping the research process and findings. Unlike a purely positivist approach, where researchers aim for objective truths, post-positivism acknowledges the researcher's active participation engaging with participants to grasp their perspectives and experiences (Ryan, 2006). This engagement allows for flexible deployment of diverse methodologies to deepen comprehension and significance within the research context.

Quality standards such as objectivity, reliability, and validity are paramount in post-positivist research, further strengthened through triangulation of data, methods, and theories (Medina & Taylor, 2013). This paradigm enables the researcher to engage in collaborative research with participants, learning from their insights and experiences rather than conducting research solely on them. By adopting post-positivist perspectives, this study endeavors to offer detailed understandings of CFM dynamics, contributing both theoretically and practically to the field.

Research Framework

Figure 2
Research Framework of the Study

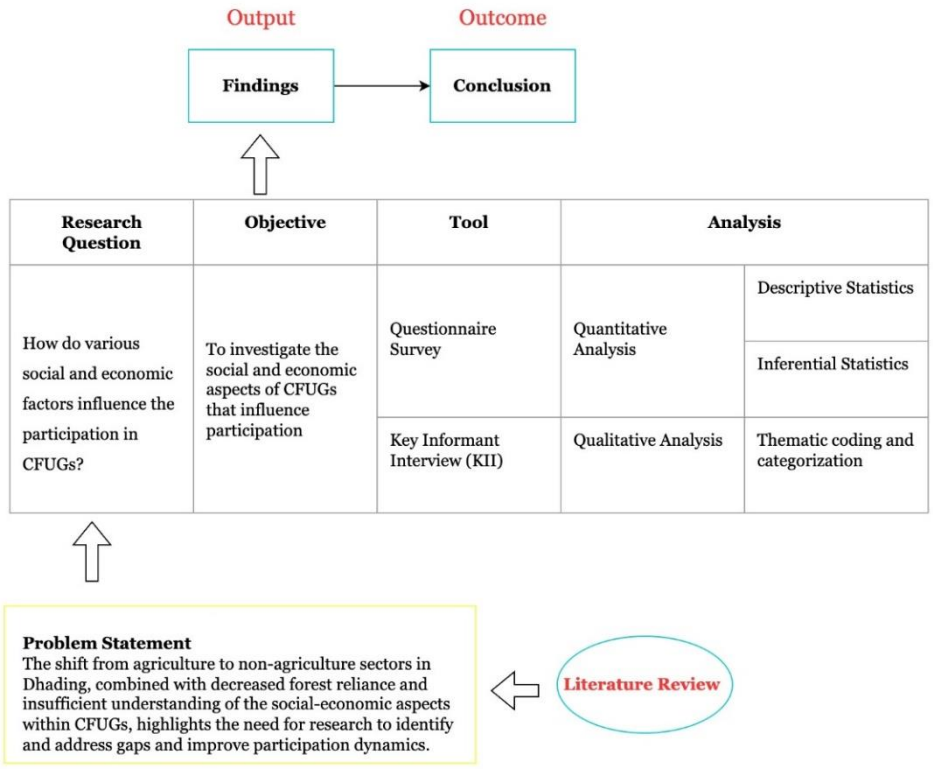
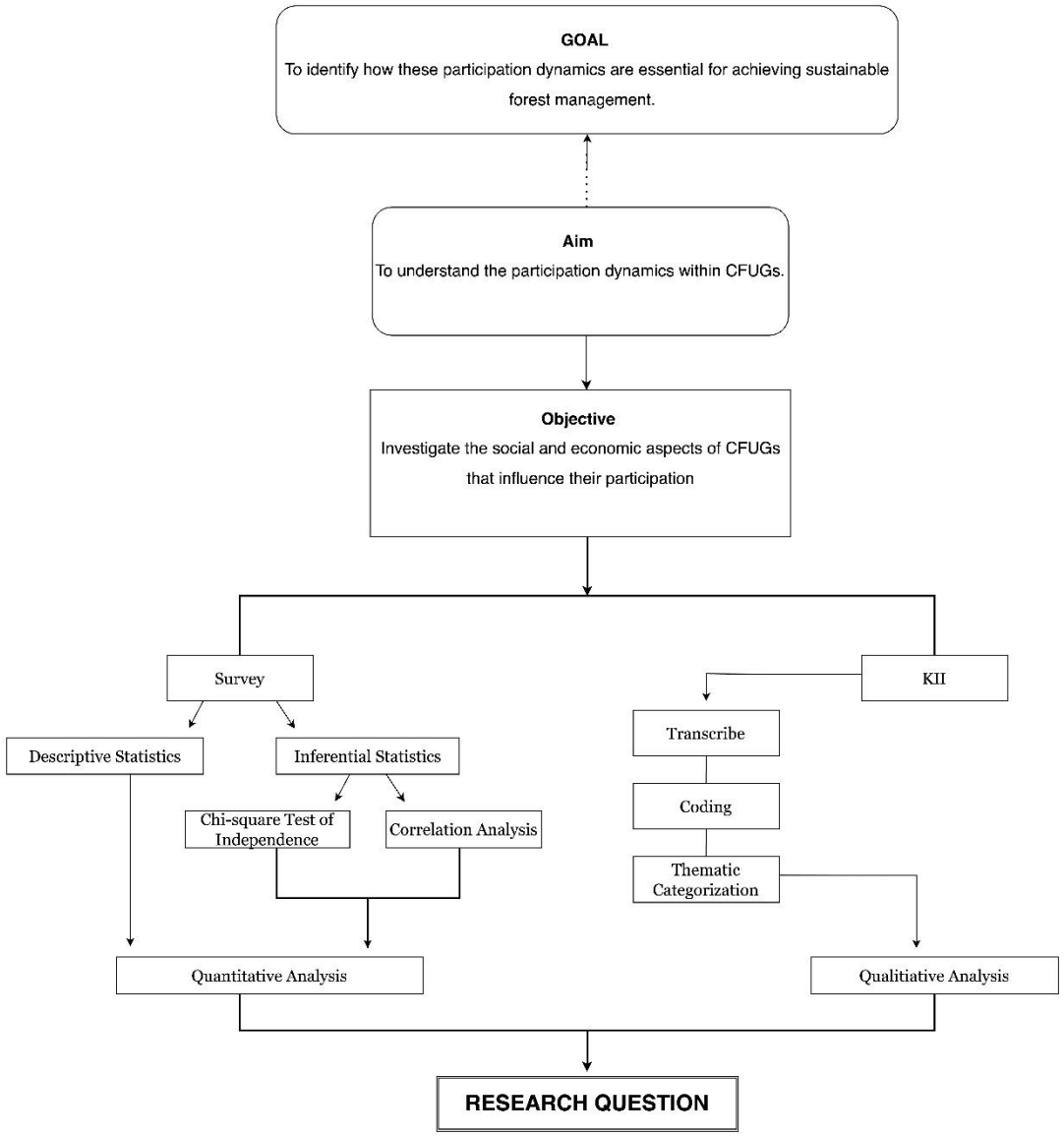


Figure 2 presents the research framework that guided our study. It outlines the research process, starting with the problem statement which highlights the research gap related to understanding the social and economic factors influencing participation in CFUGs in Dhading. This led to the formulation of the research question, which focused on investigating these social and economic aspects.

To address the research question, we employed a mixed-methods approach. Quantitative data was collected through a questionnaire survey and analyzed using descriptive and inferential statistics. Qualitative data was gathered through key informant interviews and analyzed using thematic coding and categorization. These data collection methods and analysis techniques contributed to the findings of the study. The findings were then synthesized to draw conclusions about the relationship between social and economic factors and participation in CFUGs. This process allowed us to identify key patterns, trends, and insights, ultimately contributing to a deeper understanding of the research problem. Additionally, a literature review was conducted to provide a theoretical foundation for the study and to situate the research within the existing body of knowledge on community forestry and participation.

Figure 3
Methodological Framework of the Study



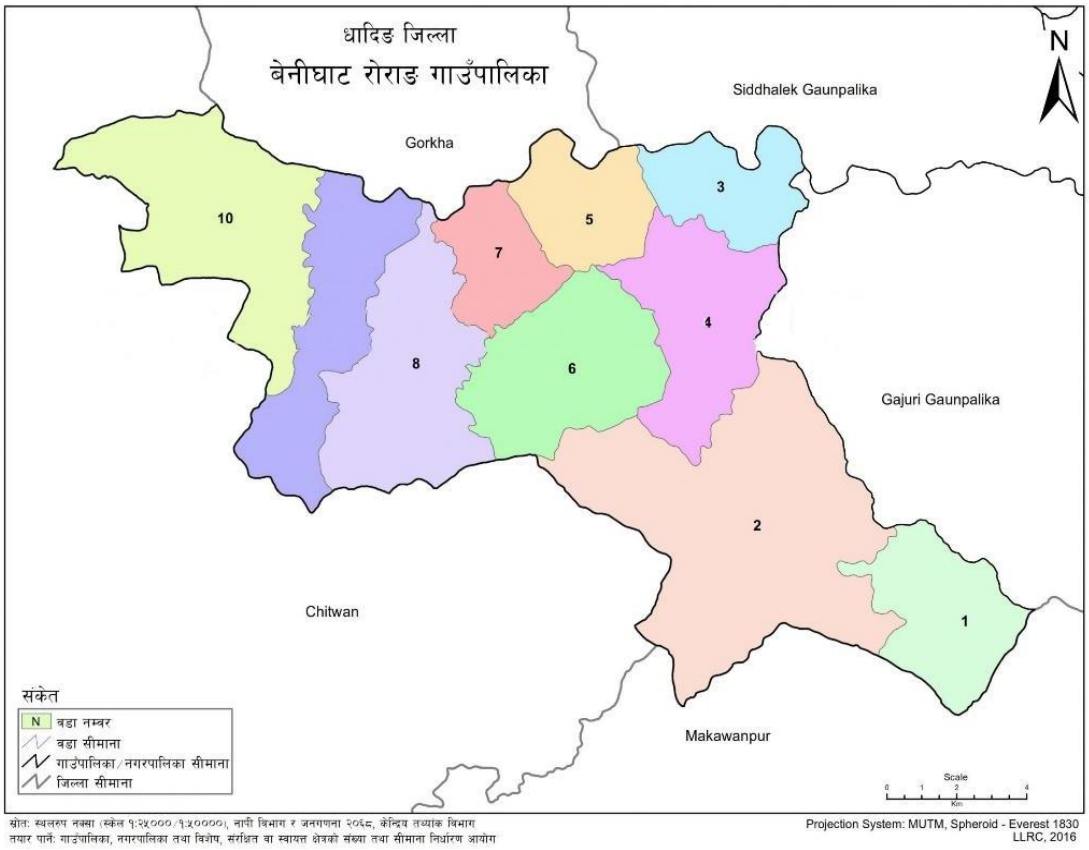
Study Area, Population, and Sample

The study was conducted in the Benighat Rorang Rural Municipality of Dhading District, located within Bagmati Province, Nepal. It covers an area of 206.52 square kilometers and is characterized by predominantly hilly terrain. It is administratively divided into 10 wards, with Bishaltar serving as the administrative hub, strategically positioned along the Prithvi Highway. This highway not only connects the municipality to Kathmandu and other parts of Nepal but also enhances accessibility.

Geographically Benighat Rorang is bordered by Gajuri Rural Municipality and Makwanpur District to the east, Chitwan District to the west, Gajuri, Siddhalek Rural Municipalities and Chitwan District to the north, and Chitwan and Makwanpur Districts to the south *(Figure 3).*

Figure 4

Map of Benighat Rorang Rural Municipality



(Ministry of Federal Affairs and Local Development [MOFALD], 2O21)

According to the Benighat Rorang Rural Municipality Profile Report (2022), is notable for its diverse land use, with 41.51 % cultivable land, 38.02% forested land, 0.52% is rivers and wetland, 0.36% is rocky land, and 19.59% others. The municipality's terrain analysis reveals that 2.88% of the land area lies on slopes above 5 degrees, and 9.64% is on very steep land above 50 degrees, presenting both challenges and opportunities for development.

Community Forest in Benighat Rorang

Dhading district is known as the hub of community forestry in the mid-hills of Nepal (Dhungana & Deshar, 2019), with 717 community forests, the highest number in the country according to the report published by Division Forest Office, Dhading in 2022. The forest quality and community perception towards community-based

conservation are positive. Since the establishment of community forestry, forest cover and quality have improved significantly, earning the district the 1st prize for best management practices from the DFO Dhading in 2015 (Division Forest Office [DFO], 2016).

According to the Sub-Division Forest Office (SDFO) of Benighat Rorang Rural Municipality, out of the 717 CFs in Dhading District, 57 are located in Benighat Rorang. The list of the community forests in Benighat Rorang Rural Municipality is presented below. The detailed list is attached in the Annex.

Table 4

Details of Community Forest in Benighat Rorang Rural Municipality

Ward Number	Total Number of Community Forests	Total HHs covered	Total Area (ha.)	Total Annual Production of Forest Produce	
				Timber (Cu. ft.)	Firewood (headload)
01	2	129	25.65	1269	3121
02	11	1383	1101.13	11447	23940
03	5	224	95.33	16403	4611
04	6	796	1030.83	3252	14946
05	4	755	398.31	7674	6106
06	3	242	419.7	980	4300
07	8	691	358.86	3226	42750
08	3	560	137.63	125	1900
09	5	425	265.53	470	6150
10	10	831	556.1	213	3035
Total	57	6036	4389.07	45059	110859

(SDFO, Benighat, 2023)

Phases of Data Collection

The study proceeded through three distinct phases to systematically achieve its research objective of understanding participation dynamics within CFUGs in sustainable forest management. Initially, preparation and planning were conducted, which included KIIs with stakeholders such as representatives from the Rural Municipality, the DFO, and the SDFO. These interviews provided valuable insights

into stakeholder perspectives and contextual understanding of community forestry issues in Dhading district and Benighat Rorang Rural Municipality.

Following this, a review of secondary data and literature was undertaken to gather background information and validate initial findings. Subsequently, field observations were carried out to further validate and triangulate the information gathered from stakeholders and secondary sources. This phase ensured the accuracy and reliability of the data collected.

In the final phase, CFUGs were selected based on consultation outcomes and field observations. A list of CFUGs was obtained from the SDFO, Benighat, and six CFUGs were chosen for detailed survey through convenience sampling (Table 5). This sampling method facilitated selection of CFUGs that were easily accessible and located near the researcher, ensuring a balanced representation including CFUGs with renewed operational plans and those without.

These systematic phases of data collection were designed to provide a comprehensive understanding of participation dynamics within CFUGs, laying the groundwork for effective analysis and insights into sustainable forest management practices in the study area.

Table 5

Description of the Community Forests Selected for this Study

Name of Community Forest	Year of Handover (BS)	Area (ha)	Total Annual Production of Forest Produce		OP Renewal Status
			Timber (Cu. Ft.)	Firewood (headload)	
Bishal Sayukta	2065	69.01	4614	1965	Renewed
Chailing	2069	19.28	20	150	Not Renewed
Dumre Kalika	2056	228.33	300	11004	Renewed
Janajagriti Mahila	2073	9.96	180	125	Renewed
Naagpani	2058	37	56	1000	Not Renewed
Siddhakali Salleni	2063	447.51	1800	500	Renewed

The consideration of renewal status aimed to explore participation dynamics, acknowledging that CFUGs with renewed operational plans may possess updated and potentially effective management strategies or mechanisms impacting participation and engagement. The selection was made in consultation with the SDFO Forest Office of Benighat Rorang Rural Municipality to ensure relevance and feasibility.

Selection of Sample Size

According to the list provided from the SDFO, the total number of households (HHs) in the selected six CFUGs was 1103 HHs.

The sample size for the study was determined using Taro Yamane's (Yamane, 1967) formula:

$$\mathbf{n = N / (1+N (e)^2)}$$

Where,

n = sample size,

N = total population

e[3] = the acceptable standard error or precision levels

For a 10% margin of error (e), sample size is:

$$n = N / (1+N (e)^2)$$

$$n = 1103 / (1 + 1103 (0.10)2)$$

n = 92 HHs

The sample size obtained by using Yamane formula was 92 HHs. However, based on recommendations from researchers such as Bisits-Bullen (2014) and Alshibly (2018, as cited in Majid et al., 2020) suggest for a minimum sample size of 100 participants in community studies to ensure reliable results, our study included 102 HHs. This adjustment reduced the degree of error to 9.44%.

Although our sample size is smaller than the theoretically ideal size that would achieve a 5% error, it is still considered adequate for the study's objectives. This sample size allows for thorough data collection and detailed analysis, enabling the identification of significant trends and associations within the data set.

---

[3] *For this study, a 10% precision level was considered. Practical constraints and expert recommendations further justified this sample size, aligning with the general rule for acceptable margins of error in survey research, which ranges from 5-10% (Suresh & Chandrasekhara, 2012).*

The selected 102 HHs were distributed as shown in table below.

Table 6

Number of HHs Selected for Study from Six CFUGs

Community Forest User Groups	Ward Number	Selected HHs	Total Number of HHs
Bishal Sayukta CF	05	14	271
Chailing CF	08	17	44
Dumre Kalika CF	04	26	177
Janajagriti Mahila CF	02	15	39
Naagpani CF	07	16	54
Siddhakali Salleni CF	02	14	518
Total		102 HH	1103 HH

This distribution ensures inclusive representation from the community, encompassing a broad spectrum of perspectives and experiences concerning the management of community forests. Overall, the selected sample size is practical and adequate for the study's objectives, ensuring the research remains feasible while providing valuable insights into the CFUGs.

Data Collection

The data collection process involved administering semi- structured questionnaire surveys to 102 HHs across six CFUGs. This approach ensured a comprehensive representation of the community, capturing both quantitative and qualitative information essential for the study.

The formulation of key survey questions and research questions were guided as per the framework (Figure 5) attached in next page.

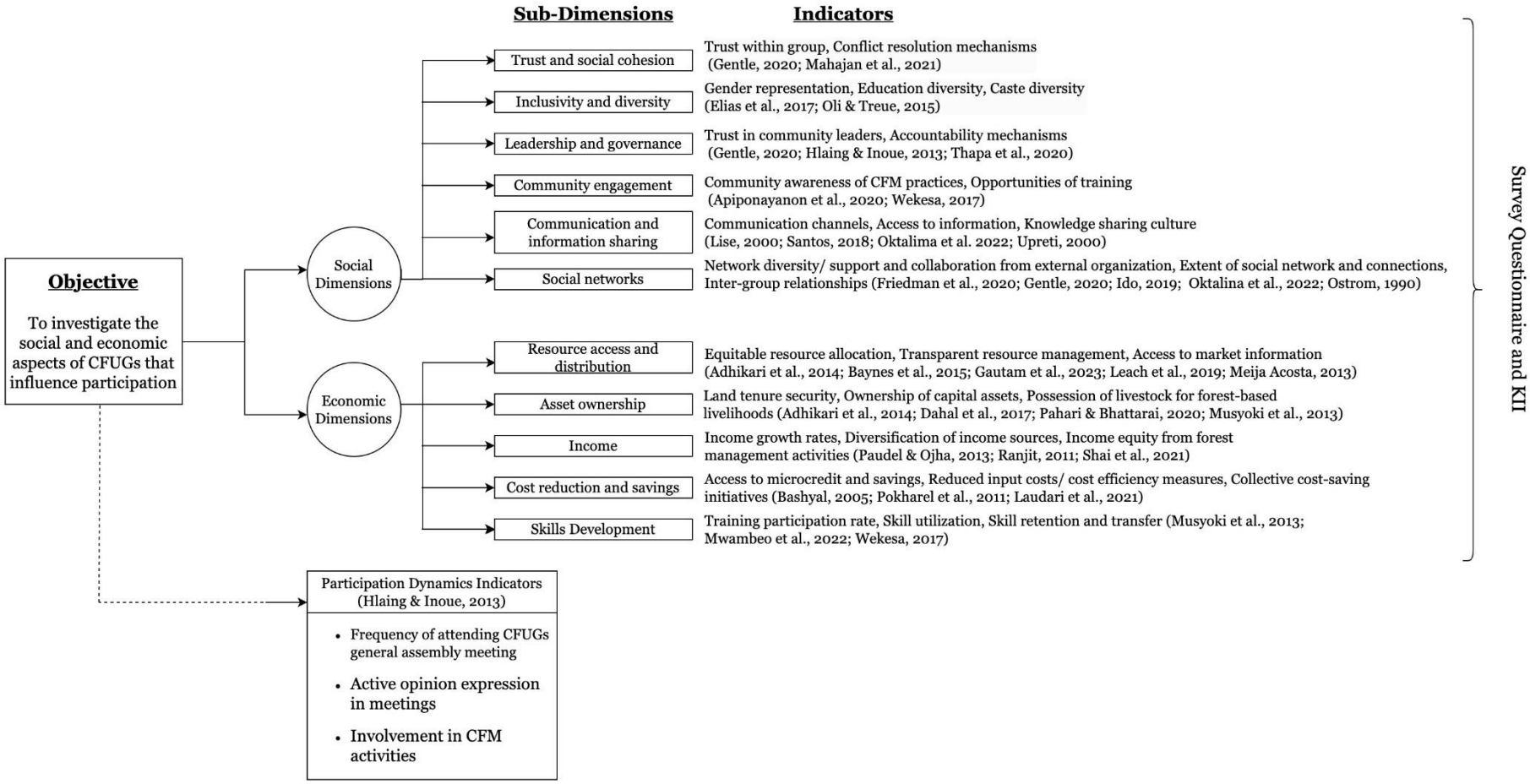
The survey questionnaire incorporated questions about socio-demographic factors such as age, gender, ethnicity, primary source of income, and educational qualifications. Additionally it gathered data on landholding size, livestock ownership and type, monthly income, sources of firewood, fodder, and timber, as well as participation mechanisms within CFUGs. Furthermore, the second half of the questionnaire includes questions regarding social dimensions, economic dimension,

and participation dynamics. The detailed list of the social and economic sub-dimensions, their indicators, and verifiers, is provided in the Annex I. This method facilitated the identification of key informants within the CFUG who provided additional information in CFM status, opportunities and challenges. This helped in fostering rapport and enabling collection of nuanced insights.

To ensure data accuracy and reliability, the surveys were administered using the Kobo tool, an online data collection application. This tool facilitated efficient data collection, storage, and analysis, ensuring accuracy, and enhancing data reliability. The respondents were briefed on the purpose of the study, and their consent was obtained before proceeding with data collection. The measures were in place to safeguard respondents' information, with strict protocols prohibiting the disclosure or secondary use of collected data.

Figure 5

Formulation of Survey Questions Based on Themes Generated From Our Research Objective



Overall, this carefully planned data collection approach aimed to comprehensively explore the CFUGs participation, their challenges, and impacts on community forests in the study area. By leveraging both primary and secondary sources, this research contributes to enhancing understanding and potentially improving community forestry practices.

Data Analysis

The data analysis process integrated both qualitative and quantitative methods for this study.

Qualitative Analysis

Qualitative analysis in this study involved a systematic exploration of textual data gathered from KIIs, open-ended survey responses, and field observations. This approach aimed to uncover underlying themes and patterns related to social and economic dimensions influencing participation within CFUGs.

- **Transcribe**

  Qualitative analysis commenced by transcribing KII transcripts, open-ended survey responses, and observational notes. This step ensured that all qualitative data were accurately captured and ready for subsequent coding and analysis.

- **Coding**

  After transcribing, a coding method was utilized to systematically classify the qualitative information. Codes were applied to identify recurring themes and specific elements within the data, facilitating a structured approach to analysis.

- **Thematic Categorization**

  The process entailed integrating the coded data to uncover overarching trends and insights regarding community involvement in activities related to forest management. Themes such as ambiguity in concepts and gaps in knowledge, economic rationale and incentives, social connections and collective action, exploration of motivations and obstacles to participation, etc., were thoroughly examined to grasp their implications for sustainable management of community forests

Quantitative Analysis

Quantitative analysis utilized numerical data collected from structured questionnaires administered to 102 HHs of six CFUGs. This approach aimed to quantitatively explore demographic, economic, and social variables to understand their relationships with participation levels in community forest management. The

responses were encoded numerically based on the type of variable, with categorical variables often represented by binary codes (e.g., 0 and 1) and ordinal variables assigned ranks (e.g., 1, 2, 3, 4, and 5). Rigorous data cleaning was conducted to rectify errors and inconsistencies before analysis in SPSS (Statistical Package for the Social Sciences).

- **Descriptive Statistics**

  In this study, descriptive statistics were utilized to summarize and present the socio-demographic characteristics of the respondents. Measures such as frequency distributions and percentages, provided a clear overview of demographic profiles and socio-economic conditions within the CFUGs. Graphical representations such as bar charts and pie charts were used where appropriate to visually depict the data. This approach facilitated a comprehensive understanding of socio-economic dynamics within the CFUGs.

- **Inferential Statistics**

  The study also employed inferential statistics such as Chi-Square Test of independence and Spearman correlation analysis to examine relationships between variables. Due to the nature of the variables i.e., categorical data and ordinal data, non-parametric tests were primarily employed for inferential analysis.

- **Chi-Square Test of Independence**

  The Chi-Square Test of Independence was utilized to evaluate the relationship between ordinal and categorical variables, assessing whether the distribution of one variable depends on the distribution of another within our dataset. Specifically, this test aimed to deepen our understanding of the factors influencing community participation in forest management by examining associations with demographic, social, and economic dimensions.

- **Spearman's Correlation Analysis**

  Spearman's correlation analysis was employed to examine the strength and direction of associations between two ordinal variables in our dataset. Spearman's correlation is well-suited for ordinal data and evaluates monotonic relationships, where variables tend to change together in a consistent direction. Positive correlations indicated that as one variable increased, the other also tended to increase, while negative correlations suggested an inverse relationships. No correlation suggested independent changes between variables. The systematic analysis highlighted

significant social and economic factors influencing participation among CFUG members.

The quantitative methods employed were pivotal in deriving evidence-based insights, essential for enhancing community engagement and fostering sustainable practices within community forest management initiatives.

By integrating qualitative and quantitative approaches, this study aimed to provide a comprehensive analysis of participation dynamics in community forest management. Triangulating findings from both methods allowed for a robust exploration of the multifaceted factors impacting CFUGs, thereby contributing to informed decision-making and programmatic recommendations in sustainable forest management.

Quality Standards

Quality assurance of the study was well maintained during the quantitative research by ensuring reliability and validity.

Reliability

Reliability refers to the extent of uniformity in the measurement. For testing the reliability, pilot testing was conducted. Piloting assists in identifying potential issues in the data collection process and allows for adjustments to the questionnaire and interview procedures. For this study, reliability was specifically evaluated using the Cronbach's Alpha coefficient assessment, a metric of internal uniformity (Cohen et al., 2007). The test components were distributed to 10 respondents from the Bishal Sanyukta CFUG. The responses were then entered into the SPSS software for analysis. The Cronbach's alpha coefficient value was discovered to be 0.827, indicating high internal reliability and uniformity in the study's measurement scale.

Validity

Validity pertains to how well the questions asked during the research aligns with the research objectives (Creswell, 2009). Several strategies were employed to ensure this accuracy.

- **Content Validity**

The questionnaire was designed to comprehensively cover all areas relevant to the research questions. This was ensured through an extensive literature review, supervisor consultation, and expert consultation from SDFO Benighat, ensuring that the questionnaire items accurately represented the concepts being measured.

- **Construct Validity**

  This was achieved by establishing theoretical links, analyzing statistical relationships, and interpreting the results to generalize the findings. The research questions and theoretical constructs were carefully aligned to ensure that the study assessed its intended variables.

- **Criterion Validity**

  The findings of the study were validated against established benchmarks and criteria in the field of CFM. This involved comparing the study findings with existing data and theoretical expectations to ensure accuracy and relevance.

These measures collectively ensured that the study maintained high standards of quality, providing reliable and valid results that contribute to the understanding of participation dynamics within CFUGs.

Ethical Standards

In this study, ethical standards were strictly followed to safeguard the dignity of participants and differentiate between appropriate and inappropriate conduct. The researcher ensured the reverence, confidentiality, and informed agreement of all respondents (Cohen et al., 2013). The researcher upheld her ethical duty to ensure the respect for human decency and the truthfulness and authenticity of the data and information in all respects (Gravetter & Forzano, 2006). This research assured confidentiality as it is an important part of the research ethics (Babbie, 2010). Prior to research, informed consent was obtained from all respondents, who were thoroughly briefed on the research objectives, procedures and potential consequences. This approach ensured beneficence (doing good), non-malfeasance (doing no harm), and respect for autonomy, privacy and confidentiality. Other ethical considerations included avoiding deception, ensuring reciprocity, equity and justice, and preventing plagiarism (Fouka & Mantzorou, 2011).

Participants were asked for their consent to use their responses, photographs, and opinions. Anonymity and confidentiality were maintained for respondents who preferred not to disclose their identities. This study strictly adhered to the ethical guidelines for research from Kathmandu University, ensuring the protection of dignity and rights of all research participants.

The researcher hereby affirms that the research proposal entitled, “Socio-Economic *Dynamics in Community Forest Management: A Study in Benighat Rorang*

Rural Municipality, Dhading" is an original work. The data and information presented are authentic to the best of the researcher's understanding.

Concluding the Chapter

A mixed-method survey was performed by exploring the participation dynamics of community forest user groups in sustainable community forest management. The study was performed within 102 households of six CFUGs of Benighat Rorang Rural Municipality of Dhading. Construct, variables, and broad questions were first prepared, and content validation was done on the feedback and interactions with supervisor and expert from SDFO. After the preparation of the questionnaire, a pilot test was done. Reliability and Validity were tested, where the value of the Cronbach Alpha coefficient was 0.827, and validity was checked with the help of the supervisor and experts. The ethical standards were followed, and the guidelines from Kathmandu University were followed.

CHAPTER IV
DATA INTERPRETATION AND ANALYSIS

This chapter begins with a description of the socio-demographic variables of the CFUGs, such as age, gender, ethnicity, literacy, and source of income of the respondents. After the socio-demographic variable, other variables concerning the social and economic dimensions and participation dynamics are presented. The findings of the research are presented in this chapter.

Socio-Demographic Information about the Respondents

To get general idea of the population, some socio-demographic characteristics are discussed here. These characteristics are age, gender, ethnicity, and income of households, primary source of income, education qualifications, and livestock ownership and category. Understanding these demographic factors is necessary as there factors also influence participation dynamics within CFUGs.

Age and Gender

The demographic factors such as age and gender has an important role in understanding participation dynamics within CFUGs as it allows for a nuanced understanding of participation patterns, resource access, decision-making dynamics, and knowledge transfer within CFUGs. The table below shows the distribution of respondent's age and gender. Age class denotes the range of the age group.

Table 7

Age and Gender Distribution of the Respondents

		Gender		Total
		Male	Female	
Age Class	25-35	0 0.0%	6 (5.9%)	6 5.9%
	36-45	9 (8.8%)	28 (27.5%)	37 (36.3%)
	46-55	19 (18.6%)	18 (17.6%)	37 (36.3%)
	56 above	15 (14.7%)	7 (6.9%)	22 (21.6%)

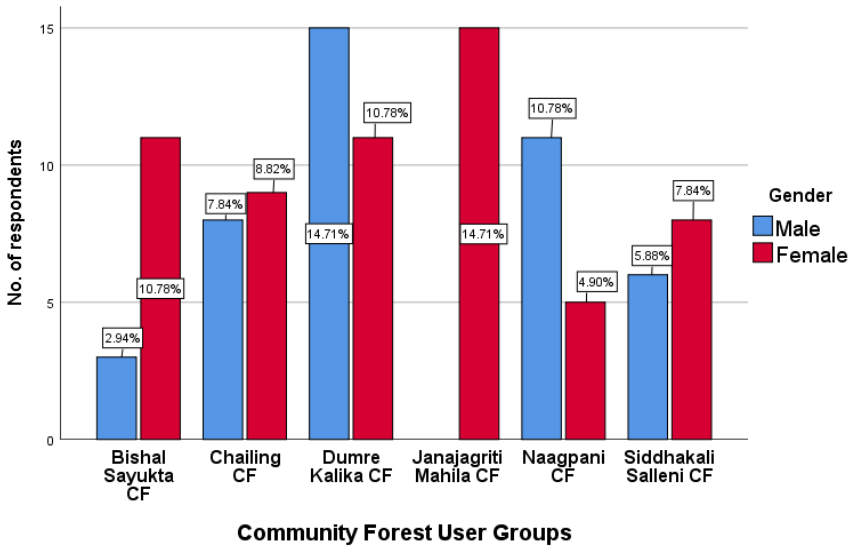
Total	43 (42.2%)	59 (57.8%)	102 (100.0%)

The respondents in the study were predominantly female (57.8%) compared to male (42.2%). Age distribution shows that the largest group falls within the 36-55 age range (combined 72.6%) and the smallest group aged 25-35 (5.9%), indicating a lesser representation among younger adults in these forest user groups. Notably, the 56-65 age group constitutes 22% of respondents, highlighting the presence of experienced and potentially senior members within CFUGs. This highlight the diverse age and gender composition within the study sample, which is crucial for our study to understand their respective contributions and perspective in CFM activities and engagement within CFUGs.

Specifically, the gender distribution analysis across six CFUGs reveals notable variations in respondents' composition.

Figure 6

Gender Distribution Across Six CFUGs



As observed in the chart above, respondents from Bishal Sayukta CF predominantly comprises female members (78.6%), while males constitute a smaller proportion (21.4%) of its respondents, accounting for 13.7% of the total sample. In Chailing CF, female respondents slightly outnumber males (52.9% vs. 47.1%). Dumre Kalika CF shows a different pattern with male respondents comprising the majority (57.7%) compared to females (42.3%), representing 25.5% of the total sample. Janajagriti Mahila CF consists entirely of female respondents as it is women users

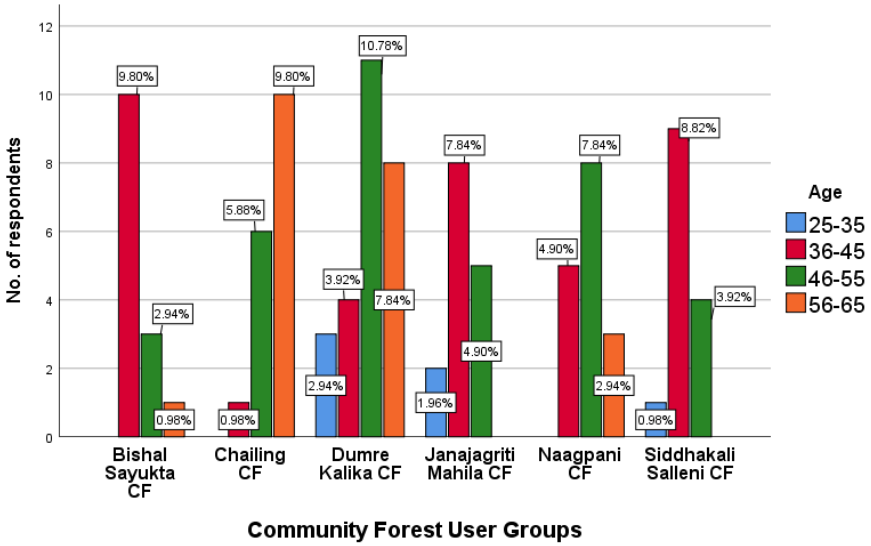
only group (100.0%). Conversely, Naagpani CF is predominantly male-dominated respondents (68.8%), with females making up 31.3% of the respondents and accounting for 15.7% of the total sample. Siddhakali Salleni CF has a majority of female respondents (57.1%) and a minority of males (42.9%).

These findings highlight the diversity in gender representation within CFUGs based on survey respondents, emphasizing the need for further exploration into the broader gender dynamics within these community organizations. The Chi-Square test results indicate a statistically significant association between gender and CFUG membership ($\chi^2 = 20.783$, $p = .001$). This suggests that gender distribution varies significantly across different CFUGs, influencing the overall composition of these community organizations.

The age distribution among members of the 6 CFUGs reveals significant variations across these groups. The chart below shows that Bishal Sayukta CF, Siddhakali Salleni CF, and Janajagriti Mahila CF showing higher concentrations of members aged 36-45 years (71.4%, 64.3%, and 53.3% respectively). In contrast, Chailing CF has a notable majority (58.8%) in the 56-65 age group. Dumre Kalika CF exhibits a more balanced age distribution, while Naagpani CF predominantly consists of members (50.0%) in the 46-55 age group. These insights underscore the diverse age compositions within each CFUG, which significantly influence community dynamics and the specific needs of each group.

Figure 7

Age Distribution Across Six CFUGs



Furthermore, the Chi-Square test confirms a statistically significant association between age groups and CFUG membership ($\chi^2 = 44.038$, $p < 0.05$). This

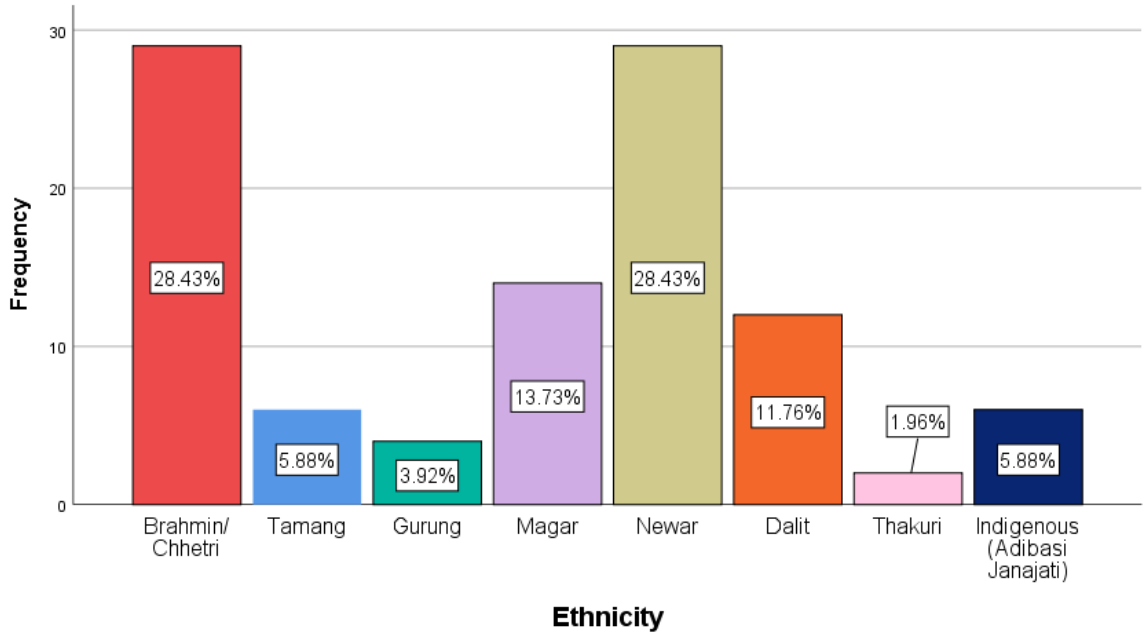
statistical result indicates that certain age groups are disproportionately represented across different CFUGs, suggesting that age demographics play a pivotal role in shaping CFUG compositions. Overall, this highlights the complex age and gender dynamics within CFUGs, influencing community engagement strategies, leadership roles, and the design of initiatives tailored to resonate with diverse age groups. Understanding these demographic nuances is crucial for crafting effective outreach strategies, allocating resources wisely, and promoting sustainable forest management practices that cater to the diverse interests and needs of CFUG members.

Ethnicity

The ethnicity distribution among respondents in the study provides insight into the demographic composition within the sample.

Figure 8

Ethnicity of the Respondents



The largest ethnic groups represented are Brahmin/Chhetri and Newar, each comprising 28.4% of the respondents. Following them, Magar constitutes 13.7%, while Dalit and Indigenous (Adibasi Janajati) each account for 11.8% and 5.9% respectively. Tamang and Gurung ethnicities represent smaller proportions at 5.9% and 3.9% respectively, while Thakuri accounts for 2.0%. This distribution highlights the diversity of ethnic backgrounds within the surveyed population.

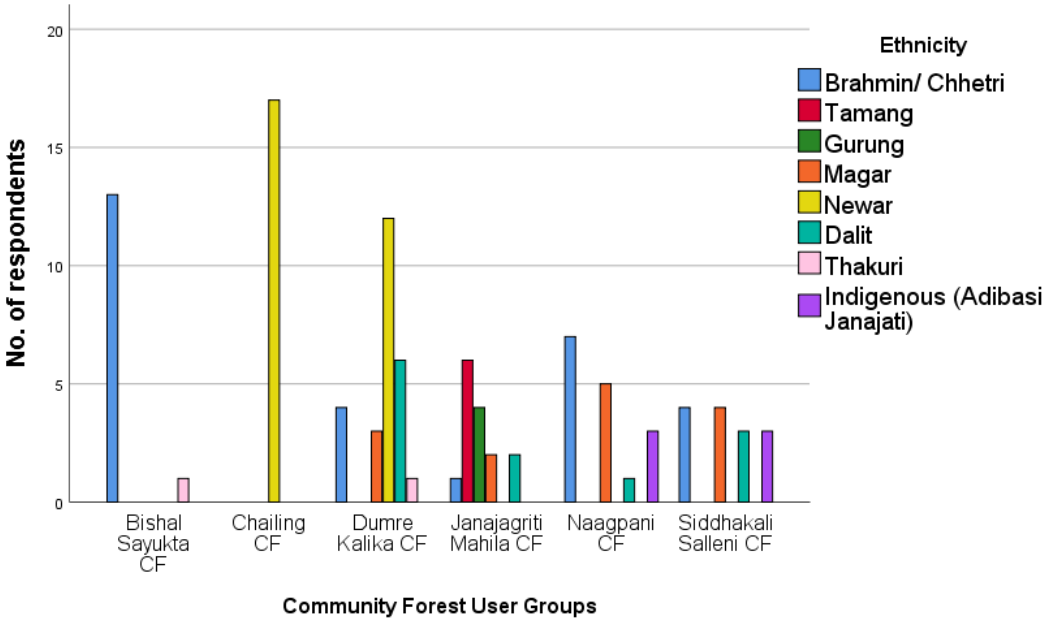
The figure below illustrates a comprehensive analysis of the ethnic composition of households across sixe CFUGs. The data further reveals a significant

presence of Brahmin/Chhetri households that are primarily concentrated in Bishal Sayukta CF, where they constitute 92.9% of the members. They are also present in other CFUGs except for Chailing CF, where all respondents are from Newar households. Tamang and Gurung households are exclusively found in Janajagriti Mahila CF, where they account for 40% and 26.7% of its respondents respectively.

Magar households are distributed across Dumre Kalika CF (11.5%), Janajagriti Mahila CF (13.3%), Naagpani CF (31.3%), and Siddhakali Salleni CF (28.6%). Dalit households are spread across Dumre Kalika CF (23.1%), Janajagriti Mahila CF (13.3%), Naagpani CF (6.3%), and Siddhakali Salleni CF (21.4%). Thakuri households are found in Bishal Sayukta CF (7.1%) and Dumre Kalika (3.8%). Indigenous (Adibasi Janajati) households are present in Naagpani CF (18.8%) and Siddhakali Salleni CF (21.4%).

Figure 9

Ethnicity Distribution Across Six CFUGs



The Chi-Square test between ethnicity and CFUG membership results indicate a highly significant association between ethnicity and CFUG membership ($\chi^2 = 175.224$, $p < 0.001$). This statistical significance suggests that the distribution of ethnicities varies significantly across different CFUGs.

This diverse ethnic representation across the CFUGs indicates an inclusive approach to accommodate diverse ethnic perspectives, practices, and socio-cultural dynamics for this study on community forest management which is crucial for

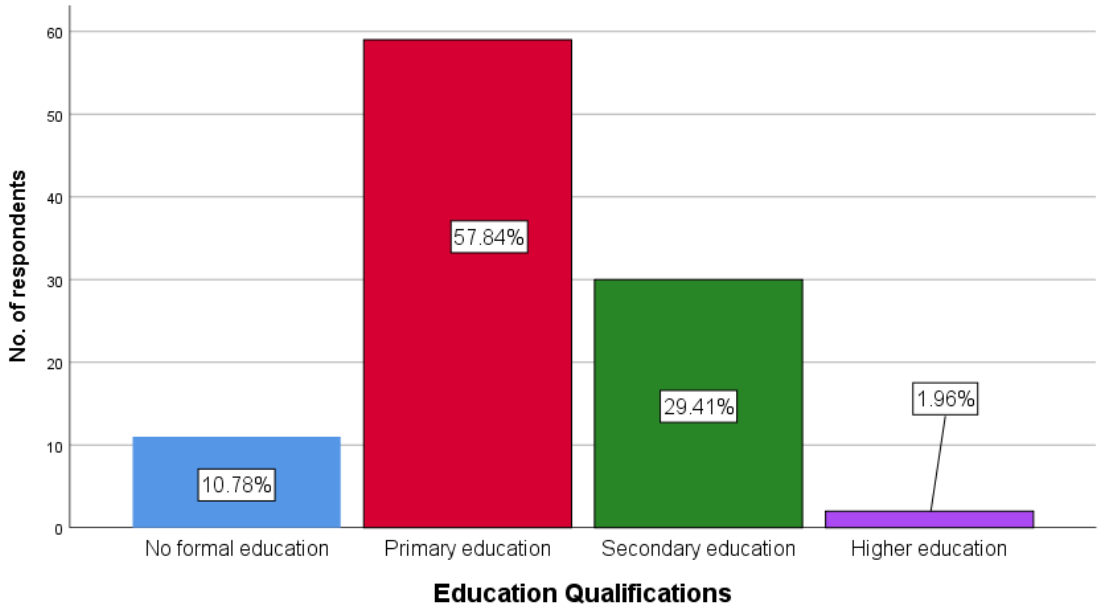
fostering equitable participation, effective decision-making, and sustainable resource management within CFUGs

Education Qualifications

The education qualifications of respondents indicates a diverse distribution among the sample of 102 HHs across the six CFUGs. The majority of respondents have completed primary education, constituting 57.8% of the sample. This is followed by those with secondary education, comprising 29.4% of the respondents. A smaller proportion of respondents have no formal education, accounting for 10.8%, while only 2.0% have higher education qualifications.

Figure 10

Education Qualifications of the Respondents

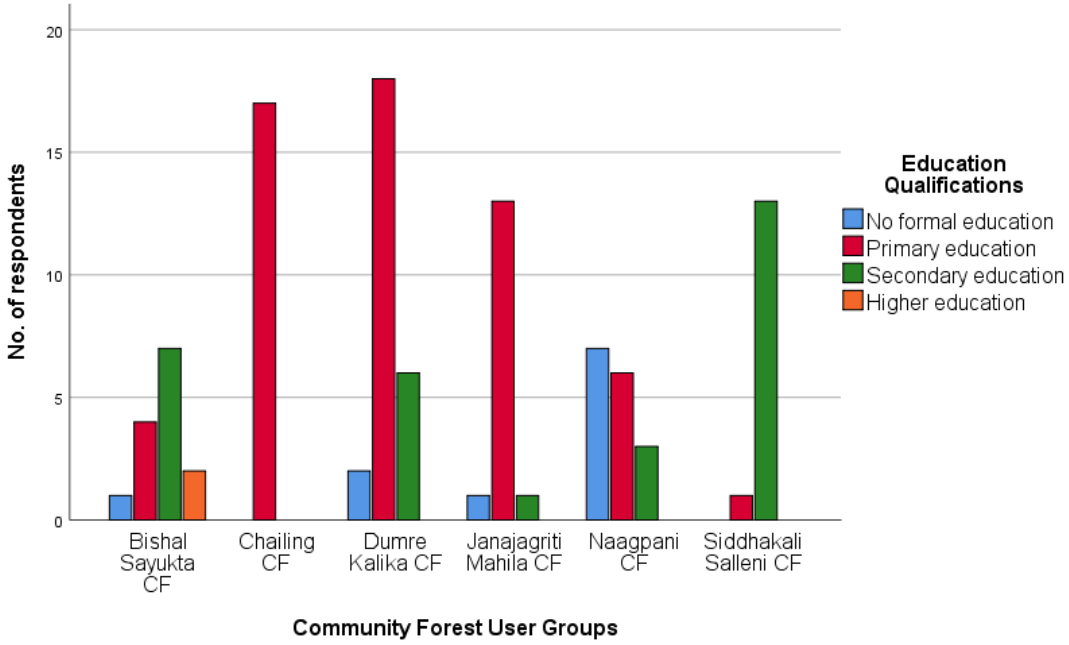


These findings highlight the predominance of basic education levels among the respondents involved in community forest management activities. The high percentage of respondents with primary education suggests a foundational level of literacy and numeracy skills, which are essential for participating in community decision-making processes related to forest management. Higher education is rare (2.0%), likely due to limited access or pursuit among members, which correlates with the older age group (35-55 years) of most respondents, reflecting limited educational opportunities during their formative years. The lower percentages of respondents with no formal education or higher education indicate the spectrum of educational backgrounds within the community, influencing their engagement and roles within the CFUG.

In Bishal Sayukta CF, respondents exhibit diverse educational background: 50.0% have secondary education, 28.6% have primary education, 14.3% have higher education, and 7.1% have no formal education. Notably, this CFUG significantly contributes to the secondary education category (23.3%) and is the only group with members holding higher education (100.0% of that category). In Chailing CF, all respondents have completed primary education (100.0%), contributing substantially (28.8%) to this category within the overall sample.

Figure 11

Education Qualifications Distribution Across Six CFUGs



Dumre Kalika CF shows a majority of its respondents (69.2%) with primary education, followed by 23.1% with secondary education, and 7.7% with no formal education. This group represents a significant portion of the total sample (25.5%) and the primary education category (30.5%). In Janajagriti Mahila CF, most members (86.7%) have primary education, with minimal representations in secondary education (6.7%) and no formal education (6.7%). This CFUG makes up 14.7% of the total sample and contributes notably to the primary education category (22.0%).

Naagpani CF stands out with a significant proportion of respondents (43.8%) lacking formal education, followed by 37.5% with primary education, and 18.8% with secondary education. This CFUG accounts for 15.7% of the total sample and has a substantial representation in the no formal education category (63.6%). Finally, Siddhakali Salleni CF primarily comprises respondents with secondary education (92.9%), and a small portion with primary education (7.1%). This CFUG represents

13.7% of the total sample and significantly contributes to the secondary education category (43.3%).

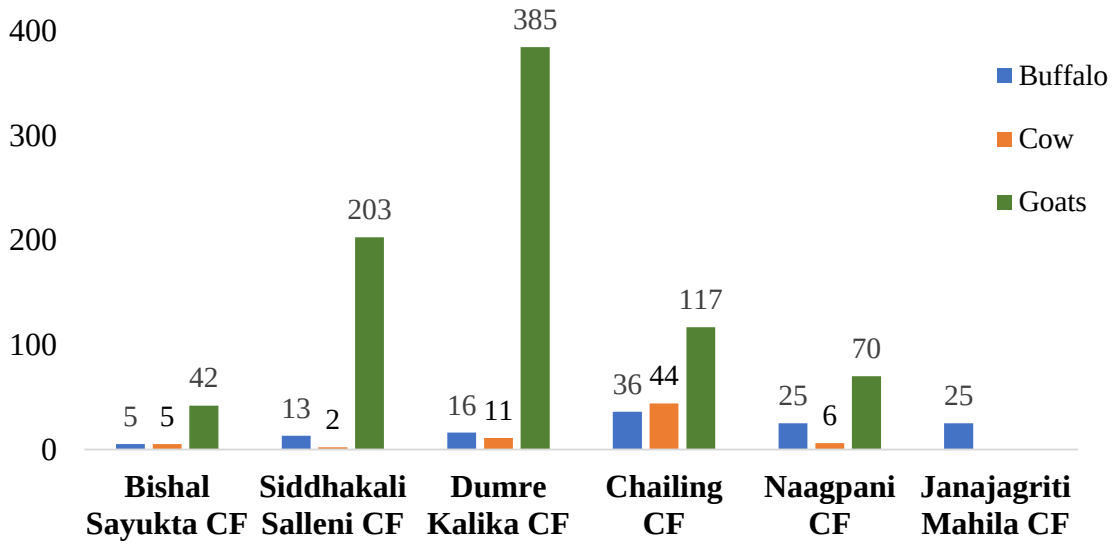
Overall, this distribution underscores the varied educational needs across different CFUGs. Each CFUG's unique educational profile highlights the importance of contextualized interventions to address specific challenges and leverage existing strengths within these communities.

Livestock Ownership and Category

The analysis of livestock ownership across CFUGs reveals insightful patterns in agricultural practices and socio-economic dynamics within these communities.

Figure 12

Livestock Distribution Across Six CFUGs



Among the CFUGs studied, Dumre Kalika CF and Siddhakali Salleni CF demonstrate significant engagement in buffalo farming, with ownership rates of 62.5% and 50.0% respectively. In contrast, Chailing CF stands out for its high prevalence of cow/ox ownership at 88.2%, highlighting a distinct agricultural focus compared to other groups where goat/sheep ownership is more predominant.

Across all CFUGs, goats/sheep emerge as integral to local livelihoods, with ownership rates ranging from 100% in Chailing CF to 66.7% in Janajagriti Mahila CF. These variations reflect community-specific agricultural traditions shaped by environmental factors and resource availability. The absence of cow/ox ownership in Janajagriti Mahila CF underscores unique socio-economic considerations influencing livestock decisions within different CFUGs.

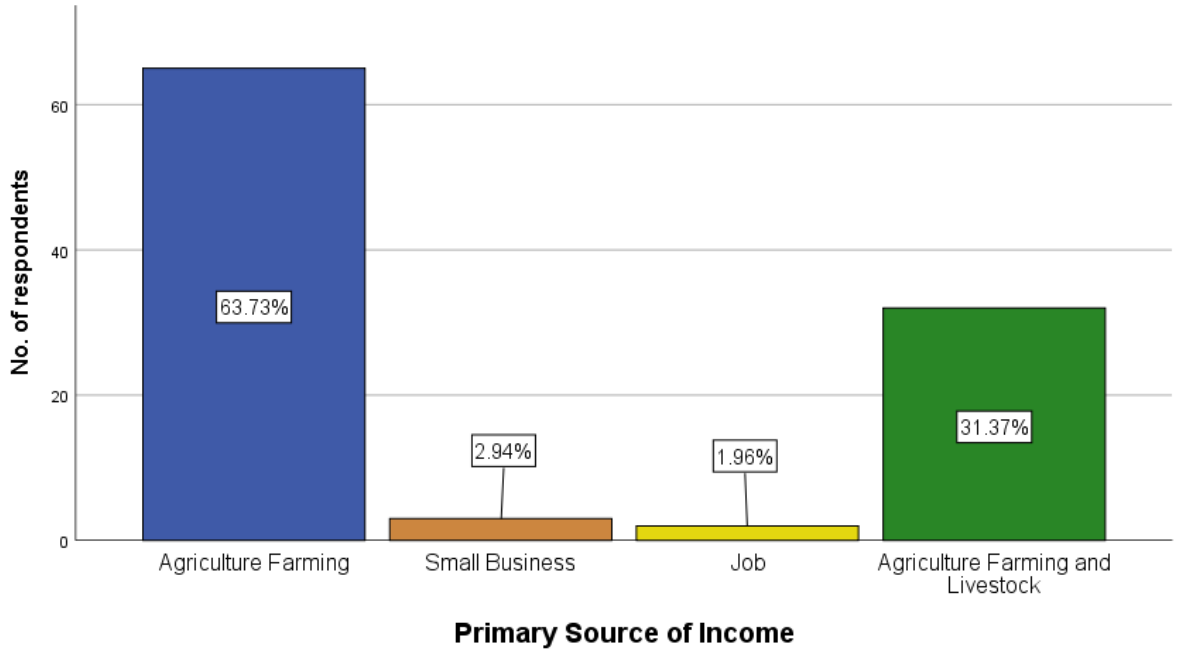
Statistically, the data shows that among the 102 respondents surveyed, there are 55 individuals who own buffaloes, collectively totaling 120 animals. Similarly, 85 respondents report owning goats/sheep, with a combined ownership of 1,016 animals. In contrast, only 28 respondents own cows/oxen, with a total of 68 animals. These numbers illustrate the varying scales of livestock ownership across the CFUGs.

Income Source

The data on the primary sources of income among members of CFUGs reveals a heavy reliance on agriculture, with significant variations across different groups.

Figure 13

Primary Source of Income of the Respondents

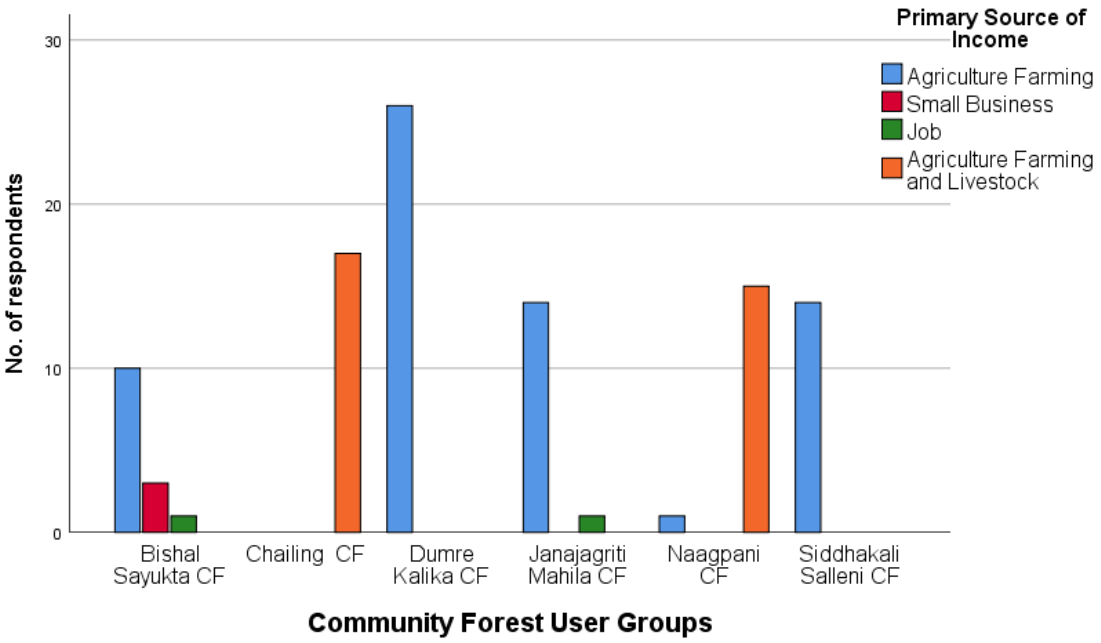


Agriculture farming is the predominant source of income, accounting for 63.7% of the total respondents. This indicates that the majority of CFUG members depend on farming as their primary livelihood. Notably, Dumre Kalika CF and Siddhakali Salleni CF show a complete reliance on agriculture farming, with 100% of their members reporting it as their primary income source. Similarly, a substantial portion of members in Bishal Sayukta CF (71.4%) and Janajagriti Mahila CF (93.3%) also rely on agriculture.

In contrast, a significant proportion of the respondents (31.4%) rely on a combination of agriculture farming and livestock as their primary source of income. This is particularly evident in Chailing CF and Naagpani CF, where 100% and 93.8% of members, respectively, report this as their primary source of income. This suggests

that these CFUGs have diversified their agricultural activities to include livestock, which can provide additional income and stability.

Figure 14
Income Source Distribution Across Six CFUGs

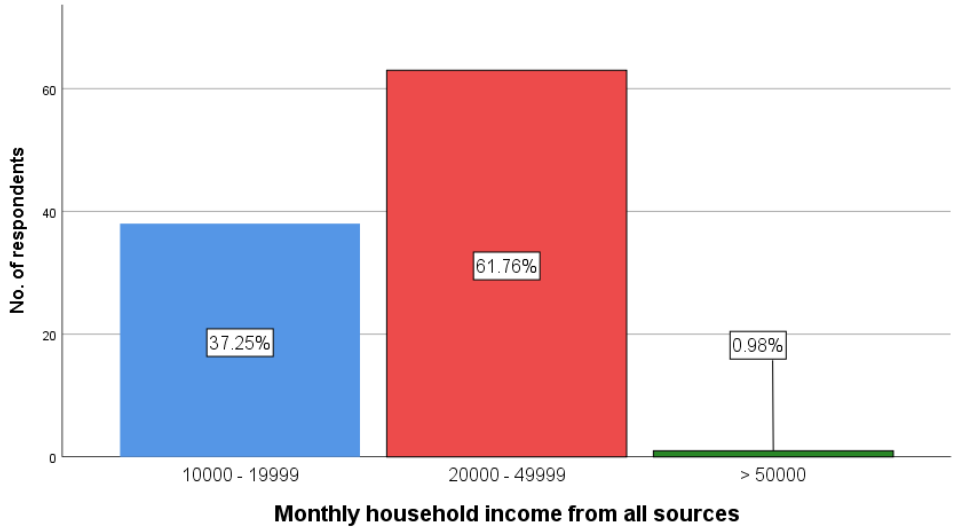


Small businesses and jobs are less common sources of income among CFUG members, accounting for only 2.9% and 2.0% of the total respondents, respectively. The presence of small business income is solely within Bishal Sayukta CF (21.4%), while jobs are reported by members of Bishal Sayukta CF (7.1%) and Janajagriti Mahila CF (6.7%). This indicates limited engagement in formal employment and small-scale entrepreneurial activities within the community.

The overall reliance on agriculture reflects the rural and agrarian nature of these communities. However, the variation in income sources across different CFUGs highlights the diverse economic strategies adopted by different groups. While some CFUGs, like Chailing CF and Naagpani CF, have diversified with livestock, others remain heavily reliant on traditional farming practices. This underscores the importance of promoting diverse income-generating activities to enhance economic resilience and sustainability within these communities. Additionally, the minimal representation of small businesses and jobs suggests potential areas for economic development and capacity-building initiatives, which could provide alternative livelihoods and reduce over-reliance on agriculture.

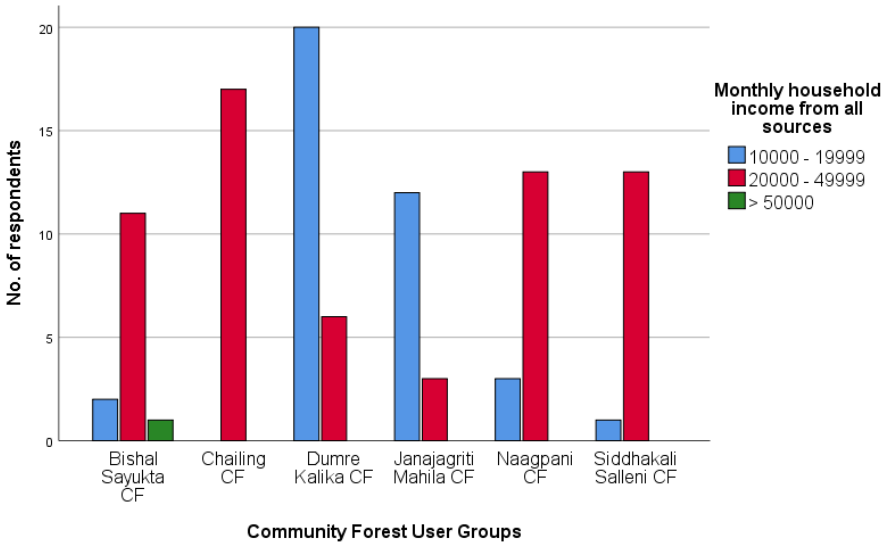
Monthly Income

Figure 15
Monthly Income of the Respondents



The data indicates that the majority of CFUG members have a modest income, with most households (61.8%) earning between Rs. 20,000 - 49,999 monthly. The presence of a higher income range is minimal (1.0%), reflecting limited economic diversity. The notable portion of households in the lower income range suggests the need for economic development initiatives to enhance income levels.

Figure 16
Monthly Income Distribution Across Six CFUGs



Bishal Sayukta CF shows a concentration in the moderate range (78.6%), contributing significantly to the middle-income bracket. Chailing CF uniformly falls within 20,000 - 49,999 (100.0%), indicating economic homogeneity. In Dumre Kalika CF, most households (76.9%), earn less than 20,000 reflecting lower overall incomes.

Janajagriti Mahila CF has a majority in the lower range (80.0%), emphasizing lower income levels. Naagpani CF sees a majority in 20,000 - 49,999 (81.3%), while Siddhakali Salleni CF predominantly earns 20,000 - 49,999 (92.9%). These findings underscore the predominant middle-income status across CFUGs, with notable variation in income distribution.

Institutional Information

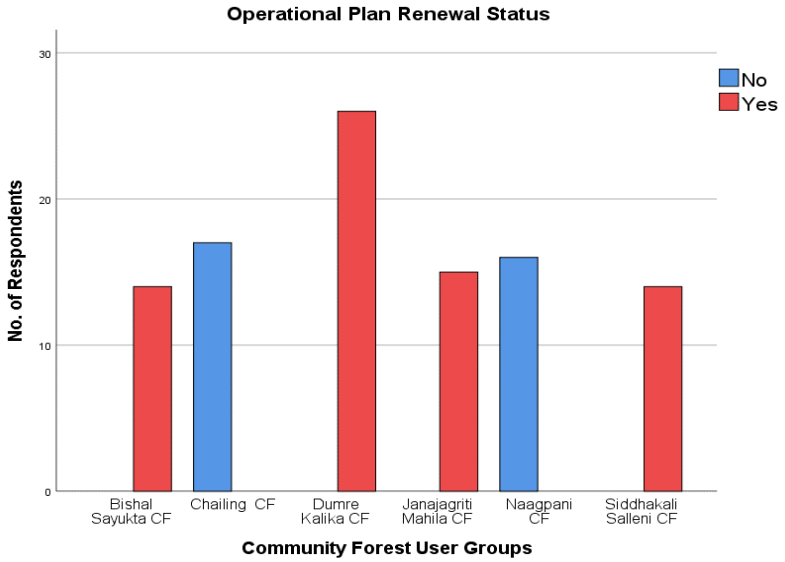
This section provides an overview of the organizational aspects of the CFUGs involved in the study. Specifically, it focuses on the status of the operational plan renewals, which are crucial for the effective management and sustainability of community forests. The operational plan outlines the guidelines and activities for forest management, and its renewal status is an important indicator of the administrative and functional health of the CFUGs. Understanding the current status and reasons for non-renewal can shed light on potential challenges and areas for improvement in community forestry management.

Operational Plan Renewal Status of CFUG

The chart below reveals a notable division among the CFUGs in terms of operational plan (OP) renewal.

Figure 17

Operation Plan Renewal Status Across Six CFUGs



While some CFUGs, such as Chailing CF and Naagpani CF, have not renewed their plans at all, others, including Bishal Sayukta CF, Dumre Kalika CF, Janajagriti Mahila CF, and Siddhakali Salleni CF, have renewed theirs recently. The disparity in

OP renewal suggests varying levels of engagement, management capacity, and possibly different challenges encountered by each CFUG.

Reason for Not Renewal of Operational Plan

The table below indicates that among respondents who provided reasons for not renewing the operational plan, 81.8% cited the expensive cost as a significant factor, while 100% pointed to the lack of interest from the committee.

Table 8

Reason for Not Renewal of Operational Plan

		Responses		Percent of Cases
		N	Percent	
Operational plan not renewed	Expensive Cost for Renewal	27	45.0%	81.8%
	Lack of Interest from Committee	33	55.0%	100.0%
Total		60	100.0%	181.8%

Despite both factors being influential, the lack of interest from the committee is slightly more prevalent, representing 55% of the total responses. This is due to their perception of bureaucratic hurdles and a lack of understanding about the benefits of renewing operational plans. This suggests that financial barriers and committee interest are critical issues in the non-renewal of the operational plan.

Social Factors and CFUGs Participation

For this study, various sub- dimensions of social factors (details of sub-dimensions and their indicators are attached in Appendix H) are considered to explore their relationship with three indicators of participation dynamics: participation in forest management activities, attendance at meetings, and active expression of opinions.

Trust and Social Cohesion

The table below reveals a weak to moderate positive correlation between both the level of trust within the group and the sense of belonging within the group with three indicators of community participation: participation in forest management activities, attending CFUG meetings, and actively expressing opinions during meetings, all significant at $p < 0.05$.

Table 9
Correlation Between Trust and Social Cohesion Indicators and Participation Indicators

			Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
Spearman's rho	Level of Trust Within the Group	Correlation Coefficient	.201*	.234*	.283**
		Sig. (2-tailed)	.043	.018	.004
		N	102	102	102
	Sense of Belonging Within the Group	Correlation Coefficient	.208*	.258**	.284**
		Sig. (2-tailed)	.036	.009	.004
		N	102	102	102

* Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

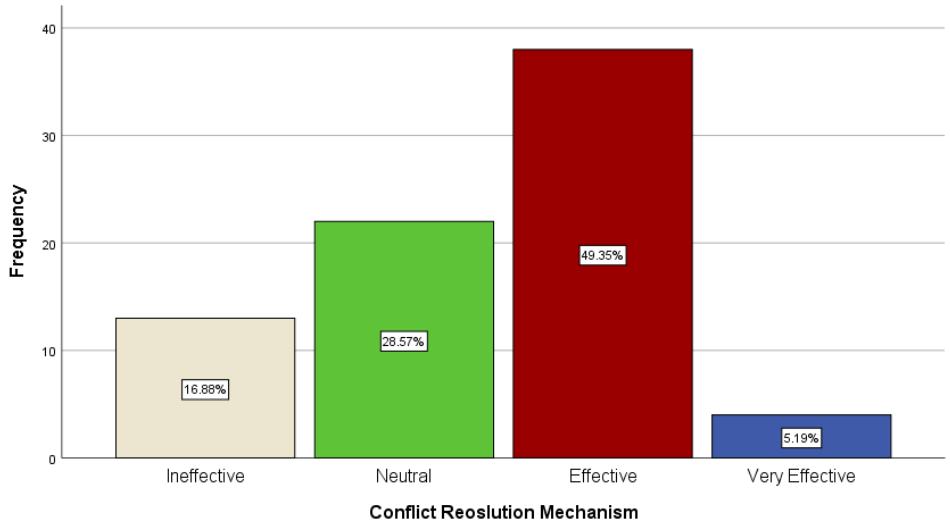
This indicates that social dimensions such as higher trust and a stronger sense of belonging within the group play crucial roles in encouraging participation and engagement in CFUG activities.

Table 10
Chi-Square Tests Between Conflict Resolution Mechanisms and Participation Indicators

	Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
	Value	Value	Value
Pearson Chi-Square	17.159	30.442	40.609
Asymptotic Significance (2-sided)	.002	.000	.000
df	4	6	6
N of Valid Cases	102	102	102

Similarly, the Chi-square test results above indicate a significant relationship between conflict resolution and various aspects of community participation in CFUG activities with p-values ($p < 0.05$). This suggest that effective conflict resolution within CFUGs positively influence members' participation in forest management activities, their attendance at meetings, and their willingness to express opinions during these meetings. The respondents noted that when conflicts or dispute arises within the CFUG, there is an open discussion among members where all are encouraged to voice their concerns and perspectives. They work towards consensus or majority decisions on how to address the conflict. If needed, they refer to their operation plan and legislation to ensure a transparent and unbiased assessment of the situation.

Figure 18
Perception on Effectiveness of Conflict Resolution Mechanism



The graph above also shows that majority of respondents (54.6%) perceive conflict resolution mechanisms as either effective or very effective. It corroborates the statistical significance found in our tests, reinforcing the importance of conflict resolution in promoting engagement. With 28.6% of respondents being neutral about effectiveness of conflict resolution, engaging these groups' thorough targeted communication and involvement in conflict resolution processes can enhance their trust and participation.

Inclusivity and Diversity

The table below shows the Chi-square test of independence of gender, education, and ethnicity with indicators of community participation.

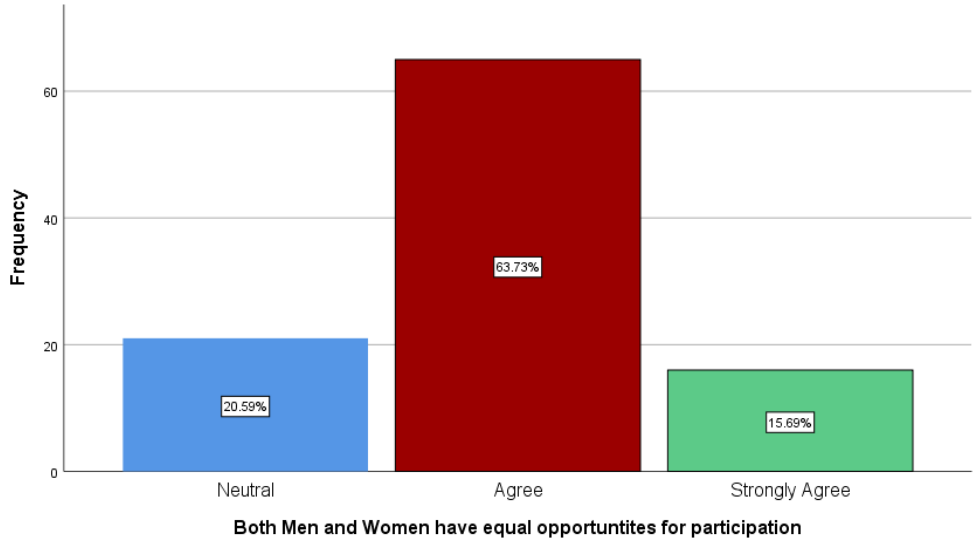
Table 11
Chi-Square Tests Between Inclusivity and Diversity Indicators and Participation Indicators

	Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
	Value	Value	Value
Gender			
Pearson Chi-Square	10.267	8.043	4.609
Asymptotic Significance (2-sided)	.006	.045	.203
df	2	3	3
Education Qualifications			
Pearson Chi-Square	6.272	31.408	29.103
Asymptotic Significance (2-sided)	.393	.000	.001
df	6	9	9
Ethnicity			
Pearson Chi-Square	46.660	56.052	32.212
Asymptotic Significance (2-sided)	.000	.000	.056
df	14	21	21
N of Valid Cases	102	102	102

The significant relationships ($p < 0.05$) between gender and both participation in forest management activities and attendance at CFUG meetings highlight the need for CFUGs to consider gender inclusivity in their strategies. Whereas, the higher significance level ($p > 0.203$) suggests that gender does not have statistically significant associating with actively expressing opinion during general meetings.

Figure 19

Perception on Equal Opportunities for Both Men and Women

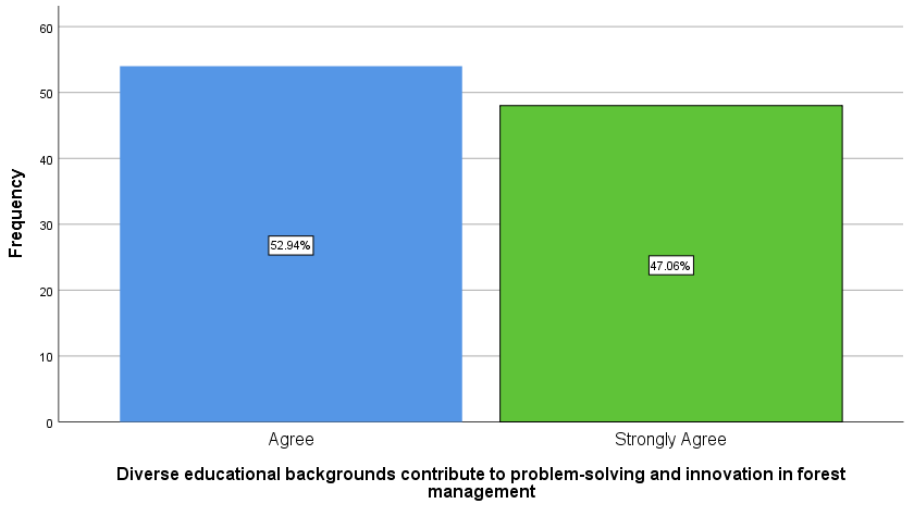


The survey responses further support these findings, with 79.4% of respondents agreeing that both men and women have equal opportunities for participation, indicating a general perception of gender inclusivity within CFUGs.

The strong association between education and participation metrics indicates that higher education levels correlate with increased attendance and activeness in opinion.

Figure 20

Perception on Diverse Education Backgrounds Contribute to Problem Solving and Innovation in Forest Management

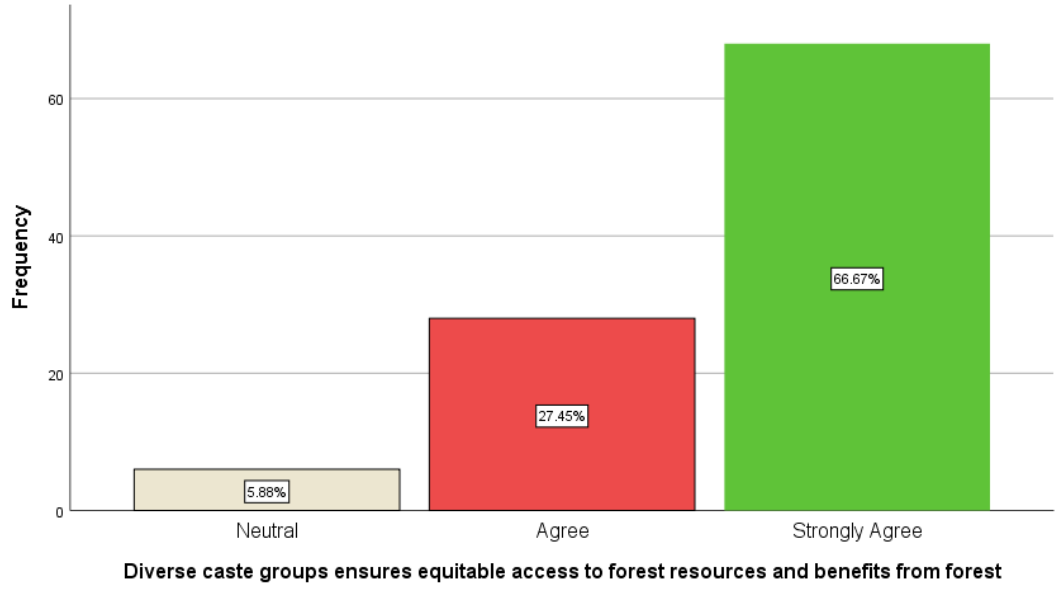


This is corroborated by the survey, where above figure clearly depicts that 100% of respondents agreed on diverse educational backgrounds contributing to problem-solving and innovation in forest management.

Likewise, the statistical significance ($p < 0.05$) indicates a robust correlation between ethnic background and engagement in forest management tasks, as well as participation in CFUG gatherings, implying that ethnic diversity influences attendance and levels of involvement in meetings. Whereas, the significance ($p > 0.546$) is slightly above typical threshold, still suggesting a potential association between ethnicity and actively expressing opinions.

Figure 21

Perception on Diverse Caste Groups Ensure Equitable Access to Forest Resources and Benefits from Forest



Backing these conclusions, 92.4% of survey participants concurred that varied caste categories facilitate fair availability of forest resources and advantages, highlighting the significance of ethnic variety in advancing equity and inclusivity

Leadership and Governance

In terms of leadership and governance within CFUGs, several key correlations emerged.

Table 12
Correlation Between Leadership and Governance Indicators and Participation Indicators

			Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
Spearman's rho	Trust in Community Leaders	Correlation Coefficient	.183	.423**	.199*
		Sig. (2-tailed)	.066	.000	.045
		N	102	102	102
	Leadership Effectiveness	Correlation Coefficient	.119	.019	.0784
		Sig. (2-tailed)	.233	.848	.436
		N	102	102	102
	Accountability Mechanisms	Correlation Coefficient	.377**	.407**	.486**
		Sig. (2-tailed)	.000	.000	.000
		N	101	101	101

* Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

The correlation analysis underscores the critical importance of trust and effective leadership in fostering active participation and cohesive community dynamics. The Spearman's rho correlations revealed that higher levels of trust in community leaders correlate positively with increased engagement in various group activities. Specifically, trust showed significant positive correlations with attendance at CFUG meetings ($\rho = 0.423$, $p = 0.000$) and actively expressing opinions during these meetings ($\rho = 0.199$, $p = 0.045$). These findings highlight trust as a catalyst for enhancing members' willingness to participate actively and engage in decision-making processes within CFUGs. However, the correlation between trust and involvement in forest management activities was less pronounced ($\rho = 0.199$, $p>$

0.05), suggesting that trust may have a modest impact on engagement in hands on forestry tasks.

Table 13

Impact of Trust in Community Leaders on Active Participation, Confidence in Decision-making, and Sense of Belonging

		Responses		Percent of Cases
		N	Percent	
Trust in community leaders	Greater trust, motivates me to participate more actively	91	39.7%	89.2%
	Greater trust, makes me feel more confident in decision-making processes	60	26.2%	58.8%
	Greater trust strengthens my sense of belonging to the community	78	34.1%	76.5%
Total		229	100.0%	224.5%

The survey responses presented in above table further substantiate these correlations, with a significant majority (89.2%) of respondents indicating that greater trust motivates them to participate more actively in CFUG activities. Moreover, 58.8% reported that greater trust in leadership makes them feel more confident in decision-making processes.

Conversely, perceptions of leadership effectiveness did not demonstrate statistically significant correlations with any participation indicators. The correlations for leadership effectiveness were negligible across participation in forest management activities ($\rho = 0.119$, $p = 0.233$), attendance at CFUG meetings ($\rho = 0.019$, $p = 0.848$), and active expression of opinions during meetings ($\rho = 0.084$, $p = 0.436$).

Table 14

Impact of Effectiveness of CFUGs Leadership on Group Effort Contribution, Active Opinion and Attendance in Meetings and Sense of Unity Among Members

		Responses		Percent of Cases
		N	Percent	
Effectiveness of CFUGs leadership	Effectiveness of CFUG leadership inspires me to contribute more to the group's efforts	42	21.1%	41.2%
	Effectiveness of CFUG leadership encourages me to attend meetings and engage in discussions	81	40.7%	79.4%
	Effectiveness of CFUG leadership fosters a sense of unity and cooperation among members	75	37.7%	73.5%
	Effectiveness of CFUG leadership has no effect on participation	1	0.5%	1.0%
Total		199	100.0%	195.1%

While a majority (79.4%) indicated that effective leadership encourages them to attend meetings and engage in discussions, a smaller percentage (41.2%) felt that leadership effectiveness directly inspires them to contribute more to the group's efforts. Furthermore, the effectiveness of CFUG leadership in promoting unity and cooperation among members was strongly affirmed, with 73.5% agreeing that leadership fosters a sense of unity within the group. Given such widespread positive perceptions, the very low percentage (1%) expressing no effect suggests that these respondents may be outliers or their perception is not reflective of the majority experience within the CFUG. Thus, the data supports the assertion that effective leadership generally impacts members' participation positively in CFUG activities.

Moreover, effective accountability mechanisms showed robust positive correlations across all participation indicators. Strong correlations were observed between accountability mechanisms and participation in forest management activities ($\rho = 0.377$, $p = 0.000$), attendance at CFUG meetings ($\rho = 0.407$, $p = 0.000$), and actively expressing opinions during meetings ($\rho = 0.486$, $p = 0.000$). The qualitative findings emphasizes that strong accountability practices such as regular reporting, auditing, transparency, and responsive grievance addressing mechanisms, along with adherence to OPs foster trust in the governance system and leadership of CFUGs. This trust is crucial for sustaining CFUGs participation and cooperation, highlighting the critical role of accountability in promoting active participation and ensuring transparency within CFUGs.

Community Awareness and Skills

The Spearman's rho correlation analysis reveals strong positive correlations between the level of awareness and understanding about the goals, benefits, and practices of CFM and various participation indicators.

Table 15

Correlation Between Community Awareness & Skills Indicators and Participation Indicators

			Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
Spearman's rho	Level of awareness and understanding about the goals, benefits, and practices of CFM	Correlation Coefficient	.528**	.500**	.703**
		Sig. (2-tailed)	.000	.000	.000
		N	102	102	102
	Members within CFUG possess	Correlation Coefficient	-.157	.183	-.248*
		Sig. (2-tailed)	.116	.065	.012

	sufficient skills necessary for CFM activities	N	102	102	102

* Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

There is a notable positive relationship ($\rho = 0.528$, $p = 0.000$) between knowledge and participation in forest management tasks, indicating that members who are well-informed about CFM are more inclined to engage in these activities. Similarly, heightened awareness is significantly linked to increased presence at CFUG gatherings ($\rho = 0.500$, $p = 0.000$), implying that informed members attend these meetings more frequently. The strongest correlation ($\rho = 0.703$, $p = 0.000$) is observed in actively expressing opinions during CFUG meetings, highlighting that a deep understanding of CFM significantly boosts members' confidence and willingness to voice their opinions.

Table 16

Awareness and Participation in Training Sessions Related to CFM Affect Involvement in Forest Management Activities

		Frequency	Percent
Valid	Moderately	29	28.4
	Significantly	73	71.6
	Total	102	100.0

The survey data provided in the table above provides additional support for these conclusions.

A large majority of survey participants (71.6%) noted that awareness and attendance in training sessions related to CFM have a substantial impact on their engagement in forest management activities. Furthermore, according to the data in the following table, 56.9% indicated that understanding CFM goals and practices significantly influences their willingness to actively participate in forest management activities.

Table 17
Understanding of CFM Goals and Practices Influence Willingness to Actively Participate in Forest Management Activities

		Frequency	Percent
Valid	Moderately	44	43.1
	Significantly	58	56.9
	Total	102	100.0

The analysis of the sufficiency of skills required for CFM tasks shows more nuanced results. There is an inverse but statistically insignificant association ($\rho = -0.157$, $p = 0.116$) between skill sufficiency and involvement in forest management activities, indicating that possessing skills may not directly influence participation in these activities. A slight positive correlation ($\rho = 0.183$, $p = 0.065$) exists between skill sufficiency and attendance at CFUG meetings, indicating that skills might play a role, but they are not a strong determinant of meeting attendance. A notable adverse correlation ($\rho = -0.248$, $p = 0.012$) between skill sufficiency and actively expressing opinions during meetings indicates that members with more skills be less inclined to vocalize their perspectives.

Table 18
Acquiring New Skills and Knowledge Relevant to CFM Enhances Your Ability to Contribute Effectively to Forest Management Activities

		Frequency	Percent
Valid	Moderately	41	40.2
	Significantly	61	59.8
	Total	102	100.0

The survey data complements these correlations, with a substantial portion of respondents (59.8%) reporting that acquiring new skills and knowledge relevant to CFM significantly enhances their ability to contribute effectively to forest management activities. Additionally, 54.9% indicated that participation in community forest meetings and activities significantly affects their sense of ownership and involvement in forest management. This result suggests that active engagement in CFUG activities fosters a deeper connection to the forests they manage. It implies that involvement in decision-making processes and hands-on activities increases their commitment and responsibility towards sustainable forest management. While a slightly smaller percentage (45.1%) reported a moderate impact on their sense of ownership and involvement, this still represents a substantial portion of respondents.

The moderate impact could be attributed to varying levels of engagement and commitment among community members. Factors such as individual motivations, prior experiences, and the nature of involvement in CFUG activities can influence the extent to which participants feel ownership and involvement in forest management. Nonetheless, even moderate impacts indicate a positive influence of participation on fostering a sense of responsibility towards forest resources.

Table 19

Participation in Community Forest Meetings and Activities Affect Sense of Ownership and Involvement in Forest Management

		Frequency	Percent
Valid	Moderately	46	45.1
	Significantly	56	54.9
	Total	102	100.0

According to the survey data, the frequency of training sessions related to CFM leadership, good governance, or decision-making is minimal, with 100% of respondents indicating infrequent sessions.

Table 20

Frequency of Training Sessions Related to CFM Leadership, Gender, Good Governance, or Decision-making

		Frequency	Percent
Valid	Low	102	100.0

Among the respondents, 45.1% have low participation, 39.2% have moderate participation, and 15.7% have high participation in these training sessions.

Table 21

Participation in Training Sessions

		Frequency	Percent
Valid	Low	46	45.1
	Moderate	40	39.2
	High	16	15.7
	Total	102	100.0

Communication and Information Sharing

The Spearman's rho correlation analysis reveals several important correlations regarding accessibility to information, willingness to share expertise, and frequency of interaction among members within CFUG.

Table 22
Correlation Between Communication & Information Sharing Indicators and Participation Indicators

			Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
Spearman's rho	Accessibility to information related to CFM practices, policies, and regulations	Correlation Coefficient	-.251*	-.247*	-.282**
		Sig. (2-tailed)	.011	.012	.004
		N	102	102	102
	CFUG willingness to share expertise in CFM among each other's	Correlation Coefficient	.553**	.260**	.505**
		Sig. (2-tailed)	.000	.008	.000
		N	102	102	102
	Frequency of interaction with other members	Correlation Coefficient	.473**	-.010	.413**
		Sig. (2-tailed)	.000	.924	.000
		N	102	102	102

The table above shows significant negative correlations between accessibility to information related to CFM practices, policies, and regulations and various participation indicators. Specifically, there are negative correlations with participation in forest management activities ($\rho = -0.251$, $p = 0.011$), attendance at CFUG meetings ($\rho = -0.247$, $p = 0.012$), and actively expressing opinions during these meetings ($\rho = -0.282$, $p = 0.004$). This negative correlation suggests that as accessibility to information decreases, participation tends to increase.

The data below highlights the sources of information for CFUG members, where 58.7% rely on CFUG meetings and announcements, 25% use government websites and publications, and 16.3% obtain information from training sessions and

workshops. These figures underline the importance of improving information accessibility through multiple channels to ensure that all members are well-informed and can participate actively.

Table 23

Source of Access to Information

		Responses		Percent of Cases
		N	Percent	
Source of access to information	CFUG meetings and announcements	101	58.7%	100.0%
	Government websites and publications	43	25.0%	42.6%
	Training sessions and workshops	28	16.3%	27.7%
Total		172	100.0%	170.3%

The role of phone calls as a communication medium also shows significant associations with participation indicators.

The chi-square tests below indicate a strong relationship between the use of phone calls and various forms of participation. For participation in forest management activities, the Pearson Chi-Square value is (($\chi^2 = 42.350$, $p = 0.000$). For attendance at CFUG meetings, the value is ($\chi^2 = 20.336$, $p = 0.000$). For actively expressing opinions during CFUG meetings, the Pearson Chi-Square value is ($\chi^2 = 42.350$, $p = 0.000$).

Table 24

Chi-Square Tests Between Use of Phone Calls and Participation Indicators

	Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
Phone calls	Value	Value	Value
Pearson Chi-Square	42.350	20.336	42.350
Asymptotic Significance (2-sided)	.000	.000	.000
df	2	3	3
N of Valid Cases	102	102	102

Conversely, the willingness to share expertise in CFM among CFUG members shows strong positive correlations with participation indicators. There is a significant positive correlation with participation in forest management activities ($\rho = 0.553$, $p = 0.000$), attendance at CFUG meetings ($\rho = 0.260$, $p = 0.008$), and actively expressing opinions during meetings ($\rho = 0.505$, $p = 0.000$).

The frequency of interaction with other members also shows significant positive correlations with participation indicators. Specifically, there are strong correlations with participation in forest management activities ($\rho = 0.473$, $p = 0.000$) and actively expressing opinions during CFUG meetings ($\rho = 0.413$, $p = 0.000$). However, there is no significant correlation with attendance at CFUG meetings ($\rho = -0.010$, $p = 0.924$). This suggests that while frequent interactions with other members enhance engagement in practical activities and discussions, they do not necessarily impact meeting attendance.

Table 25

Effective Communication, Access to Information and Information Sharing

		Responses		Percent of Cases
		N	Percent	
Effective communication and information sharing	Neutral	3	1.0%	2.9%
	Agree	159	52.0%	155.9%
	Strongly Agree	144	47.1%	141.2%
Total		306	100.0%	300.0%

The survey data further emphasizes the importance of effective communication, access to information, and a knowledge-sharing culture in enhancing participation. A significant majority of respondents (52%) agree and 47.1% strongly agree that these factors impact participation.

Table 26

Satisfaction with Current Level of Communication, Information Sharing, and Knowledge-Sharing Culture within CFUGs

		Frequency	Percent
Valid	Very Dissatisfied	2	2.0
	Neutral	37	36.3
	Satisfied	63	61.8
	Total	102	100.0

Additionally, satisfaction levels with the current state of communication, information sharing, and knowledge-sharing culture within CFUGs indicate room for improvement. While 61.8% of respondents are satisfied, 36.3% remain neutral, and 2% are very dissatisfied.

Social Networks and Relationships

The analysis of social networks and relationships within CFUGs reveals significant insights into the dynamics of participation, support, and intergroup relations.

The table below shows the correlation between level of support and assistance from external organizations (such as NGOs, government agencies, and development partners) and different participation indicators. Specifically, there is a negligible correlation between external support and participation in forest management activities ($\rho = 0.007$, $p = 0.942$), suggesting that external support does not directly influence members' involvement in these activities.

Table 27

Correlation Between Social Networks & Relationships Indicators and Participation Indicators

			Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
Spearman's rho	Level of support and assistance provided by external organizations to CFUG	Correlation Coefficient	.007	.502	-.230
		Sig. (2-tailed)	.942	.000	.020
		N	102	102	102
	Frequency of CFUG interaction with external organizations	Correlation Coefficient	.069	.535	.291
		Sig. (2-tailed)	.493	.000	.003
		N	102	102	102

Quality of intergroup relations between different groups within your community	Correlation Coefficient	-.413	.178	-.160
	Sig. (2-tailed)	.000	.074	.108
	N	102	102	102

However, the table above shows a strong positive correlation is observed with attendance at CFUG meetings ($\rho = 0.502$, $p = 0.000$), indicating that support from external organizations significantly encourages members to attend these meetings. Furthermore, there is a moderate positive correlation with actively expressing opinions during CFUG meetings ($\rho = 0.230$, $p = 0.020$), suggesting that external support also fosters a conducive environment for members to voice their opinions.

Similarly, the frequency of CFUG interaction with external organizations is positively correlated with both attendance at CFUG meetings ($\rho = 0.535$, $p = 0.000$) and actively expressing opinions during these meetings ($\rho = 0.291$, $p = 0.003$). These correlations underscore the importance of regular interactions with external entities in enhancing members' involvement in CFUG governance. However, the correlation with participation in forest management activities is positive but not significant ($\rho = 0.069$, $p = 0.493$), indicating that frequent interactions with external organizations might not directly translate into increased practical involvement in forest management.

The quality of inter-group relations within the community (encompassing ethnic, religious, and economic groups) also impacts participation. There is a significant negative correlation with participation in forest management activities ($\rho = -0.413$, $p = 0.000$), indicating that poor inter-group relations may increase practical involvement in these activities. However, the correlation with attendance at CFUG meetings is positive but not significant ($\rho = 0.178$, $p = 0.074$), suggesting that while better inter-group relations might encourage meeting attendance, the impact is not substantial. Similarly, the correlation with actively expressing opinions during CFUG meetings is negative but not significant ($\rho = -0.160$, $p = 0.108$), indicating that poor inter-group relations might encourage members to voice their opinions, though the impact is not strong.

Table 28
Social Network and Relationship Impacts Participation

		Responses		Percent of Cases
		N	Percent	
Social networks and relationships impact	Neutral	42	13.7%	41.2%
	Agree	203	66.3%	199.0%
	Strongly Agree	61	19.9%	59.8%
Total		306	100.0%	300.0%

The survey data above underscores the importance of social networks and relationships in influencing CFUG participation. A substantial majority of respondents (66.3% agree and 19.9% strongly agree) believe that social networks and relationships significantly impact their participation in CFUG activities.

Table 29
Satisfaction With the Current Level of Support, Social Networks, and Inter-group Relationships Within Your CFUGs

		Frequency	Percent
Valid	Very Dissatisfied	1	1.0
	Dissatisfied	73	71.6
	Neutral	25	24.5
	Satisfied	3	2.9
	Total	102	100.0

However, satisfaction levels with the current state of support, social networks, and intergroup relationships within CFUGs indicate substantial dissatisfaction. A significant 71.6% of respondents express dissatisfaction, while only 2.9% are satisfied, and 24.5% remain neutral. The analysis overall highlights the complex interplay between external support, frequency of interactions with external organizations, and the quality of intergroup relations in influencing participation within CFUGs.

Economic Factors and Community Participation

Resource Access and Distribution

The data provides a comprehensive view of how resource access and distribution within CFUGs influences participation in forest management activities, attendance at CFUG meetings, and the expression of opinions during these meetings.

Table 30
Correlation Between Resource Access & Distribution Indicators and Participation Indicators

			Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
Spearman's rho	Rate the availability of forest resources within your CF	Correlation Coefficient	-.114	.211	-.021
		Sig. (2-tailed)	.253	.033	.832
		N	102	102	102
	Rate the ease of accessing forest resources	Correlation Coefficient	-.042	.375	.131
		Sig. (2-tailed)	.679	.000	.189
		N	102	102	102
	Fairness in the distribution of forest products among CFUG members	Correlation Coefficient	.099	.284	.229
		Sig. (2-tailed)	.321	.004	.020
		N	102	102	102
	Transparency in decision-making processes related to resource allocation and utilization	Correlation Coefficient	.016	.481	.159
		Sig. (2-tailed)	.876	.000	.110
		N	102	102	102
	CFUG Members are informed about resource management decisions and outcomes	Correlation Coefficient	.008	.417	.123
		Sig. (2-tailed)	.936	.000	.219
		N	102	102	102

Accessibility of market information and price data for forest products	Correlation Coefficient	.182	-.020	.065
	Sig. (2-tailed)	.066	.843	.517
	N	102	102	102
Access to market information affecting decision-making in forest product collection, production, and sales	Correlation Coefficient	.035	.019	.010
	Sig. (2-tailed)	.728	.853	.917
	N	102	102	102

The correlation between the availability of forest resources and participation indicators reveals interesting patterns. There is a weak negative correlation with participation in forest management activities ($\rho = -0.114$, $p = 0.253$), suggesting that as the perceived availability of resources increases, participation in these activities may slightly decrease, though this relationship is not statistically significant. Conversely, there is a positive correlation with attendance at CFUG meetings ($\rho = 0.211$, $p = 0.033$), indicating that better availability of resources may encourage members to attend meetings more frequently. The correlation with actively expressing opinions during meetings is negligible ($\rho = -0.021$, $p = 0.832$), suggesting that resource availability does not significantly impact members' willingness to voice their opinions.

Ease of accessing forest resources shows a similar pattern. There is a weak negative correlation with participation in forest management activities ($\rho = -0.042$, $p = 0.679$), a significant positive correlation with attendance at CFUG meetings ($\rho = 0.375$, $p = 0.000$), and a weak positive correlation with actively expressing opinions during meetings ($\rho = 0.131$, $p = 0.189$). These findings indicate that while easier access to resources does not significantly influence practical participation, it does enhance members' involvement in meetings and discussions.

Fairness in the distribution of forest products among CFUG members is positively correlated with participation indicators. There is a weak positive correlation with participation in forest management activities ($\rho = 0.099$, $p = 0.321$), suggesting that perceived fairness encourages members to engage in these activities. A significant positive correlation is observed with attendance at CFUG meetings ($\rho = 0.284$, $p = 0.004$), indicating that fair distribution practices motivate members to attend meetings. Additionally, there is a positive correlation with actively expressing opinions during meetings ($\rho = 0.229$, $p = 0.020$).

Transparency in decision-making processes related to resource allocation and utilization also plays a crucial role. While there is a negligible correlation with participation in forest management activities ($\rho = 0.016$, $p = 0.876$), a strong positive correlation is found with attendance at CFUG meetings ($\rho = 0.481$, $p = 0.000$). There is also a positive but not significant correlation with actively expressing opinions during meetings ($\rho = 0.159$, $p = 0.110$).

Members being informed about resource management decisions and outcomes shows a negligible correlation with participation in forest management activities ($\rho = 0.008$, $p = 0.936$). This suggests that simply being informed does not significantly drive active participation. A strong positive correlation with attendance at CFUG meetings ($\rho = 0.417$, $p = 0.000$) indicates that well-informed members are more likely to attend meetings. A weak positive correlation with actively expressing opinions during meetings ($\rho = 0.123$, $p = 0.219$) suggests that information dissemination might slightly encourage members to voice their opinions. These findings indicate that effective communication about resource management decisions encourages meeting attendance and may slightly influence members' willingness to express their opinions.

Access to market information and price data for forest products also influences participation. There is a weak positive correlation with participation in forest management activities ($\rho = 0.182$, $p = 0.066$), indicating that access to market information encourages practical participation. A negligible correlation with attendance at CFUG meetings ($\rho = -0.020$, $p = 0.843$) suggests that market information access does not significantly impact meeting attendance, and a weak positive correlation with actively expressing opinions during meetings ($\rho = 0.065$, $p = 0.517$) implies that access to market information might slightly increase the willingness to express opinions. These correlations suggest that access to market

information primarily enhances practical participation in forest management activities and may have a minor influence on discussions and decision-making processes.

Table 31

Chi-Square Tests Between Legal Barriers for Accessing Forest Resources, Specific Policies to Ensure Equitable Access and Participation Indicators

	Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
	Value	Value	Value
Legal barriers in accessing forest resources			
Pearson Chi-Square	29.209	11.340	38.875
Asymptotic Significance (2-sided)	.000	.010	.000
df	2	3	3
N of Valid Cases	102	102	102
Specific policies or practices to ensure equitable access to forest resources			
Pearson Chi-Square	13.718	57.968	27.660
Asymptotic Significance (2-sided)	.008	.000	.000
df	4	6	6
N of Valid Cases	102	102	102

The analysis also examines the impact of legal barriers and specific policies or practices on participation in CFUG activities. The Pearson Chi-Square test results show significant associations between legal barriers in accessing forest resources and participation indicators. The chi-square values for participating in forest management activities ($\chi^2 = 29.209$, $p = 0.000$), attending CFUG meetings ($\chi^2 = 11.340$, $p = 0.010$), and actively expressing opinions during CFUG meetings ($\chi^2 = 38.875$, $p = 0.000$) indicate that legal barriers significantly impact these aspects of participation. This suggests that legal or regulatory barriers create substantial obstacles for members, hindering their ability to engage fully.

Similarly, the availability of specific policies or practices to ensure equitable access to forest resources also shows significant relationships with all three participation indicators. The chi-square values for participating in forest management

activities ($\chi^2 = 13.718$, $p = 0.008$), attending CFUG meetings ($\chi^2 = 57.968$, $p = 0.000$), and actively expressing opinions during CFUG meetings ($\chi^2 = 27.660$, $p = 0.000$) highlight the importance of implementing policies that ensure equitable access.

Table 32

Improved Access to Forest Resources Influence Participation in Forest Management Activities

		Frequency	Percent
Valid	Disagree	6	5.9
	Neutral	3	2.9
	Agree	19	18.6
	Strongly Agree	74	72.5
	Total	102	100.0

The survey responses provide additional insights into members' perceptions of resource access and distribution. A significant majority of respondents (72.5%) strongly agree that improved access to forest resources influences participation in forest management activities, with another 18.6% agreeing. This consensus underscores the importance of resource accessibility in promoting active participation, meaning that CFUGs should focus on reducing barriers to resource access to boost engagement.

Table 33

Equitable Distribution of Forest Resources Influence Participation in Forest Management Activities

		Frequency	Percent
Valid	Neutral	1	1.0
	Agree	67	65.7
	Strongly Agree	34	33.3
	Total	102	100.0

Similarly, a large proportion of respondents (65.7% agree and 33.3% strongly agree) believe that equitable distribution of forest resources influences participation, highlighting the critical role of fairness in resource distribution.

Table 34
Level of Transparency in Resource Management Practices Affect Participation in CFM Activities

		Frequency	Percent
Valid	Strongly Disagree	1	1.0
	Agree	36	35.3
	Strongly Agree	65	63.7
	Total	102	100.0

Regarding transparency, 63.7% of respondents strongly agree and 35.3% agree that the level of transparency in resource management practices affects participation in CFM activities.

Table 35
Market Information Access Impact on Participation

		Responses		Percent of Cases
		N	Percent	
Impact of access to market information	Increases motivation to participate due to better market opportunities	80	44.2%	78.4%
	Helps in planning and managing forest resources more effectively	99	54.7%	97.1%
	Reduces participation due to market challenges	2	1.1%	2.0%
Total		181	100.0%	177.5%

Finally, the impact of access to market information on participation is also significant. A substantial portion of respondents (54.7%) believe that it helps in planning and managing forest resources more effectively, while 44.2% feel that it increases motivation to participate due to better market opportunities. Only a small fraction (1.1%) think it reduces participation due to market challenges, indicating that overall, access to market information is viewed positively in enhancing participation and resource management.

Overall, the analysis highlights the multifaceted impact of resource access and distribution on participation within CFUGs. While the availability and ease of

accessing resources primarily enhance meeting attendance, fairness in distribution and transparency in decision-making significantly boost both meeting attendance and active participation in discussions. Effective communication about resource management decisions and access to market information further supports practical participation and decision-making processes.

Asset Ownership

The analysis of asset ownership and its impact on participation in CFUG activities reveals several significant patterns.

Table 36

Chi-Square Tests Asset Ownership Indicators and Participation Indicators

	Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
	Value	Value	Value
Secure land tenure rights and ownership			
Pearson Chi-Square	5.976	18.592	14.836
Asymptotic Significance (2-sided)	.050	.000	.002
df	2	3	3
N of Valid Cases	102	102	102
Own forest management tools and equipment to support CFM activities			
Pearson Chi-Square	2.116	16.934	4.595
Asymptotic Significance (2-sided)	.347	.001	.204
df	2	3	3
N of Valid Cases	102	102	102
Possession of livestock			
Pearson Chi-Square	.864	1.402	3.098
Asymptotic Significance (2-sided)	.649	.705	.377
df	2	3	3
N of Valid Cases	102	102	102

The Pearson Chi-Square test results indicate that secure land tenure rights significantly influence participation indicators. For participating in forest management activities, the chi-square value ($\chi^2 = 5.976$, $p = 0.050$), suggests a marginally

significant relationship. This indicates that secure land tenure rights might encourage members to participate more actively in forest management activities. For attending CFUG meetings, the chi-square value ($\chi^2 = 18.592$, $p = 0.000$), highlights a highly significant relationship suggesting that secure land tenure rights strongly motivate members to attend these meetings. Regarding actively expressing opinions during CFUG meetings, the chi-square value ($\chi^2 = 14.836$, $p = 0.002$), also indicates a significant relationship. This suggests that members with secure land tenure are more likely to voice their opinions and contribute to discussions.

The ownership of forest management tools and equipment also shows significant associations with participation indicators, although to a lesser extent than land tenure. For participation in forest management activities, the chi-square value ($\chi^2 = 2.116$, $p = 0.347$), indicating no significant relationship. This suggests that while owning tools might be beneficial, it does not significantly drive participation in these activities. For attending CFUG meetings, the chi-square value ($\chi^2 = 16.934$, $p = 0.001$) is indicating a significant relationship. This suggests that ownership of tools and equipment positively influences attendance at meetings. Regarding actively expressing opinions during meetings, the chi-square value ($\chi^2 = 4.595$, $p = 0.204$), suggests no significant relationship. This indicates that while tool ownership might encourage meeting attendance, it does not necessarily translate to a higher likelihood of expressing opinions.

The possession of livestock shows no significant relationship with any of the participation indicators. The chi-square values for participating in forest management activities ($\chi^2 = 0.864$, $p = 0.649$), attending CFUG meetings ($\chi^2 = 1.402$, $p = 0.705$), and actively expressing opinions during CFUG meetings ($\chi^2 = 3.098$, $p = 0.377$) all indicate non-significant relationships. This suggests that livestock ownership does not substantially impact participation in CFUG activities.

The analysis underscores the significant impact of secure land tenure rights on enhancing participation within CFUGs, particularly in terms of attendance at CFUG meetings and the active expression of opinions. Ownership of forest management tools and equipment also plays a crucial role in promoting meeting attendance, though it does not significantly affect participation in forest management activities or the expression of opinions during meetings. Conversely, ownership of livestock does not show a meaningful relationship with any participation indicators.

Income Generation

The analysis examines the relationship between income generation and perception of income equity from forest management activities and various participation indicators within CFUGs.

Table 37

Correlations Between Income Generation Indicators and Participation Indicators

		Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
Spearman's rho	Perception of income equity in the distribution of income generated from FM activities	.100 .320 102	.277 .005 102	.146 .143 102
	Monthly household income from all sources	-.428 .000 102	.065 .514 102	-.196 .048 102

A weak positive correlation is observed between perception of income equity and participation in forest management activities ($\rho = 0.100$, $p = 0.320$), suggesting that members who perceive fair income distribution may be more inclined to participate, although this relationship lacks statistical significance. In contrast, a significant positive correlation exists between income equity perception and attendance at CFUG meetings ($\rho = 0.277$, $p = 0.005$), indicating that perceived fairness motivates members to attend meetings. Similarly, there is a weak positive correlation with actively expressing opinions during meetings ($\rho = 0.146$, $p = 0.143$), suggesting that fair income distribution might encourage members to voice their opinions.

However, monthly household income from all sources shows a significant negative correlation with participation in forest management activities ($\rho = -0.428$, $p = 0.000$), indicating that higher household income is associated with lower

participation levels. Monthly household income shows negligible correlation with attendance at CFUG meetings ($\rho = 0.065$, $p = 0.514$) and a weak negative correlation with actively expressing opinions during meetings ($\rho = -0.196$, $p = 0.048$), implying that higher income levels might reduce the likelihood of participating in discussions.

Table 38

Income Diversification Motivate You to Participate More in Forest-related Activities

		Frequency	Percent
Valid	Yes to some extent	33	32.4
	Yes definitely	69	67.6
	Total	102	100.0

The survey reveals that income diversification significantly motivates participation in forest-related activities, with 67.6% of respondents indicating they are definitely motivated by income diversification, and another 32.4% agreeing to some extent.

Table 39

Income Generation from CFM Activities is Distributed Equitably

		Frequency	Percent
Valid	I don't know	10	9.8
	Yes to some extent	65	63.7
	Yes definitely	27	26.5
	Total	102	100.0

Moreover, perceptions regarding the equitable distribution of income generated from forest management activities are positive, with 63.7% of respondents believing it is distributed to some extent and 26.5% stating it is definitely equitable.

Table 40

Household Engaged in Generating Income from Forest-related Activities

		Frequency	Percent
Valid	No	101	99.0
	Yes	1	1.0
	Total	102	100.0

Regarding household engagement in income generation from forest-related activities, the vast majority of respondents (99.0%) report their households are not engaged in such activities, with only 1.0% indicating otherwise.

The analysis underscores the role of income equity and diversification in influencing participation within CFUGs. Perceived fairness in income distribution

positively impacts attendance at meetings and encourages members to voice their opinions during discussions. Conversely, higher household income correlates negatively with participation in hands on CFM activities, indicating a need to address barriers that may deter more affluent members from active engagement.

Cost Reduction and Savings

The analysis explores the association between access to microcredit or savings mechanisms and participation indicators within CFUGs.

Table 41

Chi-Square Tests Between Cost Reduction and Savings Indicators and Participation Indicators

	Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
	Value	Value	Value
Access of microcredit or savings mechanisms for funding CFM activities or income generating ventures			
Pearson Chi-Square	6.822	21.727	11.046
Asymptotic Significance (2-sided)	.033	.000	.011
df	2	3	3
N of Valid Cases	102	102	102
Aware of cost reduction strategies implemented within group to improve resource management practices			
Pearson Chi-Square	19.031	29.939	45.088
Asymptotic Significance (2-sided)	.001	.000	.000
df	4	6	6
N of Valid Cases	102	102	102
Participation in collective cost saving initiatives			
Pearson Chi-Square	19.023	27.886	39.901
Asymptotic Significance (2-sided)	.000	.000	.000
df	2	3	3
N of Valid Cases	102	102	102

The Pearson Chi-Square tests reveal significant relationships between financial access and participation. Members who perceive access to these financial resources as beneficial are more likely to engage in forest management activities (χ^2 = 6.822, p = 0.033), attend CFUG meetings (χ^2 = 21.727, p = 0.000), and actively express opinions during meetings (χ^2 = 11.046, p = 0.011).

Awareness and perception of benefits of cost reduction strategies within CFUGs significantly impact participation in CFM activities. The Pearson Chi-Square tests reveal strong associations across all participation indicators: participating in forest management activities (χ^2 = 19.031, p = 0.001), attending CFUG meetings (χ^2 = 29.939, p = 0.000), and actively expressing opinions during meetings (χ^2 = 45.088, p = 0.000). These results indicate that members who are aware of and perceive the benefits of cost-saving initiatives as substantial are more likely to believe in the importance of active participation in all aspects of CFM.

The chi-square analysis also reveals a significant and positive relationship between perception of participation in collective cost-saving initiatives and various engagement indicators within CFUGs. The strong chi-square values for participation in forest management activities (χ^2 = 19.023, p = 0.000), attendance at CFUG meetings (χ^2 = 27.886, p = 0.000), and actively expressing opinions during meetings (χ^2 = 39.901, p = 0.000) suggest that these initiatives are perceived as significantly enhancing member engagement. Members who perceive cost-saving measures as beneficial are more likely to participate in forest management tasks, attend meetings, and voice their opinions.

Table 42

Cost Reduction Strategies Expected Impact on Participation

		Responses		Percent of
		N	Percent	Cases
CRS Implementation Expected Impact	Improved resource management practices	33	50.8%	94.3%
	Reduction in input costs (e.g., seeds, fertilizers)	32	49.2%	91.4%
Total		65	100.0%	185.7%

The survey responses indicate a perception of frequent implementation of cost-saving strategies, with 50.8% of respondents expecting improved resource

management practices and 49.2% highlighting anticipated reductions in input costs such as seeds and fertilizers.

Table 43
Effectiveness of Cost Reduction Strategies in Improving the Economic Viability of Your Community Forest Management Activities

		Frequency	Percent
Valid	Not sure	67	65.7
	Somewhat effective	19	18.6
	Very effective	16	15.7
	Total	102	100.0

Regarding the perceived effectiveness of cost-reduction strategies, respondents had mixed perceptions, with 65.7% unsure about their effectiveness, 18.6% considering somewhat effective, and 15.7% rated them as very effective.

Table 44
HHs Engaged in Cost Saving Initiatives

		Responses		Percent of Cases
		N	Percent	
Cost saving initiatives activities	Group purchasing of tools or equipment	30	93.8%	93.8%
	Shared transportation arrangements	1	3.1%	3.1%
	Group purchasing of seeds	1	3.1%	3.1%
Total		32	100.0%	100.0%

Engagement in cost-saving initiatives was predominantly high, with 93.8% of respondents engaging in group purchasing of tools or equipment. However, shared transportation arrangements and group purchasing of seeds were less common, at 3.1% each.

Table 45
Collective Cost Savings Impact

		Responses		Percent of Cases
		N	Percent	
Collective cost saving initiatives impact	Enable access to necessary resources	31	33.3%	96.9%

	Reduce financial burden on individual members	32	34.4%	100.0%
	Increase efficiency of forest management initiatives	30	32.3%	93.8%
Total		93	100.0%	290.6%

The impact assessment of collective cost-saving initiatives further emphasizes their perceived role in supporting CFM activities. Respondents highlighted that these initiatives are believed to enable access to necessary resources (33.3%), reduce financial burdens on members (34.4%), and increase the efficiency of forest management initiatives (32.3%).

Table 46

Perception of Various Factors Influencing Participation in CFM Activities

		Frequency	Percent
Participation in collective cost-saving initiatives, motivates to participate more actively in CFM activities			
Valid	Agree	68	66.7
	Strongly Agree	34	33.3
Awareness and implementation of cost-reduction strategies within CFUG encourage participation in CFM activities			
Valid	Agree	67	65.7
	Strongly Agree	35	34.3
Access to microcredit schemes and savings mechanisms enables to participate more effectively in CFM activities.			
Valid	Agree	47	46.1
	Strongly Agree	2	2.0
	Neutral	53	52.0
	Total	102	100.0

The table above presents survey response regarding perception of various factors influencing participation in CFM activities. A significant majority of respondents (66.7% agree, 33.3% strongly agree) perceive that participation in collective cost saving initiatives motivate then to participate more actively in CFM activities. Similarly, awareness and implementation of cost-reduction strategies were positively acknowledged, with 65.7% agreeing and 34.3% strongly agreeing that these

efforts are seen as encouraging greater participation in CFM. This indicates the perceived importance of efficient resource management and financial stewardship.

A notable proportion (48.1%) of respondents agreed or strongly agreed that access to microcredit mechanisms and savings mechanisms enables more effective participation. However, 52.0% remains neutral, suggesting a potential area for improvement in facilitating financial access and inclusivity within CFUGs.

These perceptions underscore the perceived benefits of collective actions, awareness of cost-reduction strategies, and the potential impact of financial access on enhancing participation in sustainable forest management practices within CFUGs.

Skills Development

The data analysis on skills development programs within CFUGs underscores their perceived impact on participation and skill retention in CFM activities, despite challenges in regular implementation.

Table 47

Chi-Square Tests Between Skills Development Indicators and Participation Indicators

	Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
	Value	Value	Value
Participation in skills development or capacity- building programs related to CFM, entrepreneurship, or value-added processing			
Pearson Chi-Square	29.869	34.149	48.499
Asymptotic Significance (2-sided)	.000	.000	.000
df	2	3	3
N of Valid Cases	102	102	102
Application of the skills acquired through training programs in practical CFM activities			
Pearson Chi-Square	29.869	34.149	-
Asymptotic Significance (2-sided)	.000	.000	-
df	2	3	-
N of Valid Cases	102	102	-

The significant findings from Pearson Chi-Square tests reveal strong associations between participation in skills development and various engagement

indicators. Members engaged in these programs demonstrate higher involvement in forest management activities ($\chi^2 = 29.869$, $p = 0.000$), attendance at CFUG meetings ($\chi^2 = 34.149$, $p = 0.000$), and active participation in discussions ($\chi^2 = 48.499$, $p = 0.000$). These statistical relationships highlight the perceived importance of skills acquisition in fostering proactive engagement within CFUGs.

Table 48

Correlations Between Skill Sharing, Skill Retention Indicators and Participation Indicators

			Participate in forest management activities	Attend CFUG meetings	Actively express opinions during CFUG meetings
Spearman's rho	Opportunities to share or transfer the skills acquired with other members	Correlation Coefficient	.676	.341	.708
		Sig. (2-tailed)	.000	.000	.000
		N	102	102	102
	Frequency of retaining skills practically in CFM	Correlation Coefficient	-.330	-.519	-.567
		Sig. (2-tailed)	.043	.001	.000
		N	38	38	38

Further exploring the dynamics of skills retention and application, correlations underscore positive associations between opportunities to share acquired skills and increased participation across all measured dimensions (ρ ranging from 0.341 to 0.708, all p-values = 0.000).

Table 49

Confidence in Applying and Retaining Skills Learned from Training Programs in FM Activities

Confidence in applying the skills learned from training programs to practical FM activities

		Frequency	Percent	Valid Percent
Valid	Neutral	3	2.9	7.7
	Somewhat Confident	35	34.3	89.7
	Very Confident	1	1.0	2.6
	Total	39	38.2	100.0
Missing	System	63	61.8	
Total		102	100.0	

Confidence in retaining the skills learned from training programs over time

		Frequency	Percent	Valid Percent
Valid	Neutral	2	2.0	5.1
	Somewhat Confident	36	35.3	92.3
	Very Confident	1	1.0	2.6
	Total	39	38.2	100.0
Missing	System	63	61.8	
Total		102	100.0	

Moreover, respondents' high confidence levels in retaining (92.3% somewhat confident, 2.6% very confident) and applying (89.7% somewhat confident, 2.6% very confident) learned skills from training programs, highlight the perceived efficacy of these programs in equipping members with practical abilities essential for CFM activities.

Table 50

Satisfaction in Training Content and Delivery

		Responses		Percent of Cases
		N	Percent	
Training session content and delivery	Satisfied	68	97.1%	194.3%
	Very Satisfied	2	2.9%	5.7%
Total		70	100.0%	200.0%

The effectiveness of these programs is further supported by members' satisfaction with both the content (97.1% satisfied or very satisfied) and delivery (97.1% satisfied or very satisfied) of training sessions.

Concluding the Chapter

The findings from this study provide a thorough insight into the factors impacting community participation within CFUGs. The socio-demographic profile of respondents of CFUGs is diverse, with a predominant representation of females (57.8%) and members aged predominantly between 36-55 years. The communities also exhibit notable ethnic diversity, with Brahmin/Chhetri and Newar communities being the most represented. Education levels are primarily focused on primary and secondary education, reflecting foundational literacy skills essential for community engagement. Livelihoods are centered on agriculture and supplemented by livestock ownership, highlighting the rural and agrarian nature of these communities.

Organizational dynamics regarding the renewal of operational plans vary significantly among CFUGs. While some groups (Bishal Sayukta CF, Dumre Kalika CF, Janajagriti Mahila CF, and Siddhakali Salleni CF) have renewed their plans, others (Chailing CF and Naagpani CF) face challenges leading to non-renewal. Financial constraints and lack of committee interest emerge as primary barriers, underscoring the importance of addressing these organizational challenges to ensure sustainable forest management practices across all CFUGs.

Social factors, such as social networks, relationships, and effective communication channels, play crucial roles in fostering community cohesion and enhancing engagement in CFM activities. External organizational support facilitates participation through knowledge sharing and resource mobilization. However, challenges in intra-group relations may hinder practical involvement in forest management tasks, highlighting the need for strengthened internal dynamics.

Economic factors significantly influence community participation within CFUGs. Skills development programs, access to financial resources like microcredit, and income diversification strategies are positively correlated with increased engagement in forest management activities and meeting attendance. However, higher household incomes show a negative correlation with direct participation in practical forest tasks, suggesting potential trade-offs between economic status and hands-on involvement in CFM activities.

These findings highlight the intricate interaction of socio-demographic, structural, societal, and economic elements in influencing community engagement and the sustainable management of forests within CFUGs.

CHAPTER V
FINDINGS AND DISCUSSION

This chapter provides the summary of the findings from Chapter IV. Additionally, the results are also discussed in this chapter.

Summary of Findings

The study sample comprising 102 respondents across six CFUGs provides a detailed socio-economic demographic profile that is essential for understanding participation dynamics within these CFUGs. Notably, females constitute a majority of CFUG members at 57.8%, underscoring their pivotal role in community forestry initiatives. This gender distribution varies significantly among CFUGs respondents, with groups like Bishal Sayukta and Janajagriti Mahila showing predominantly female respondents, whereas Naagpani CF displays a male-dominated respondents, underscoring diversity in gender participation within CFM. In terms of age demographics, the majority of CFUG respondents fall within the 36-55 age group (72.54%), indicating a mature demographic profile characterized by experienced individuals actively engaged in CFM activities. Variations across CFUGs reveal distinct age distributions, influencing community dynamics and leadership roles. According to KII and field observation, groups such as Chailing CF having a higher proportion of older members (56-65 years) compared to younger groups like Siddhakali Salleni CF. Ethnic diversity among CFUGs respondents is notable, with Brahmin/Chhetri and Newar ethnicities each comprising 28.4% of respondents, followed by Magar (13.7%), Dalit (11.8%), and Indigenous groups (5.9%). Overall, the Chi-Square tests showing strong associations ($p < 0.001$) confirms the significant diversity in gender, age, and ethnicity among members. These findings highlight the imperative for gender-sensitive, inclusive strategies in forest governance and culturally sensitive approaches to accommodate varied socio-cultural dynamics in community forest management.

Educationally, primary education prevails (57.8%), followed by secondary education (29.4%), while higher education attainment is limited (2.0%) among respondents. This distribution reflects the educational background of older members within CFUGs and underscores the need for targeted literacy and capacity-building programs to support effective forest governance. Agriculture remains the

predominant income source among CFUG households (63.7%), with variations noted across groups like Chailing CF and Naagpani CF, where respondents also engage in livestock farming. Limited involvement of respondents in small businesses and formal employment highlights opportunities for economic development initiatives aimed at diversifying income sources and enhancing community resilience. Livestock ownership patterns also vary significantly, with buffalo farming prominent among respondents of Dumre Kalika and Siddhakali Salleni CFs, while goat/sheep ownership prevails across all groups. These patterns underscore the importance of livestock in local livelihoods and resource management strategies tailored to specific community needs. Household incomes vary widely, with a majority respondents earning between Rs. 20,000 - 49,999 monthly, indicating economic disparities requiring targeted economic initiatives aimed at uplifting lower-income households and promoting economic resilience across CFUGs.

The qualitative findings further points that women in all six CFUGs are found to be occupying leadership roles as mandated by policy, underscoring their integral role in community forestry initiatives. However, it was identified that their participation varies notably based on economic activities; women engaged in agriculture or as housewives express a heightened demand for training and skill-building programs to leverage community forestry for economic gain. Conversely, those involved in business or government services exhibit lower levels of active involvement, indicating the need for gender-sensitive strategies that accommodate diverse economic roles. Age demographics indicate a mature profile of members, suggesting a wealth of experience but also highlighting the need for engaging younger generations for sustained participation. Ethnic diversity within CFUGs reflects the community's socio-cultural fabric. Despite this diversity, all ethnic groups face challenges in deriving economic benefits from community forestry, primarily due to low awareness, inadequate skills, and limited external support. Economic disparities are evident across CFUGs, with households predominantly reliant on agriculture reporting lower incomes (Rs. 10,000 - 20,000), contrasting with those engaged in livestock farming or formal employment reporting higher earnings (Rs. 20,000 - 50,000 and > Rs. 50,000, respectively). These findings underscore the necessity for targeted economic initiatives aimed at uplifting marginalized ethnic groups and promoting equitable participation across all sectors of the community.

The findings also underscore several critical issues affecting the renewal of operational plans among two CFUGs (Naagpani CF and Chailing CF) of our study sites. The significant lack of understanding among committee members of this CFs about the importance and benefits of renewing these plans highlights a gap in awareness, and perceiving the process as a bureaucratic formality rather than a strategic tool for effective forest management and sustainability. High costs (81.8%) and financial constraints further exacerbate the situation, making the renewal process daunting due to its resource-intensive nature in terms of time, money, and effort. Additionally, the qualitative information collection from the executive committee member suggested that they often see renewal process as lengthy and cumbersome, presenting administrative and bureaucratic hurdles that discourage committee members. This combination of high costs and lack of interest (100%) has serious implications for sustainable forest management, potentially leading to forest degradation and mismanagement. Addressing these issues requires capacity-building initiatives to educate committee members, financial and technical support to alleviate resource constraints, and the simplification of administrative procedures to make the process more accessible and less intimidating. Such measures can encourage CFUGs to renew their operational plans, fostering more effective and sustainable forest management practices.

These findings highlight the imperative to overcome barriers for achieving consistent governance and sustainable practices across all CFUGs. Emphasizing inclusive, gender-sensitive, and culturally informed approaches in forest governance and management is crucial. The study reveals the intricate interplay of socio-economic factors like gender, age, and ethnic diversity within CFUGs. Addressing financial constraints, streamlining bureaucratic procedures, and implementing capacity-building initiatives are essential steps to empower CFUGs in effectively engaging in sustainable forest management.

Social Dimensions and Influence on Community Participation

The research on social dimensions influencing community participation dynamics within CFUGs highlights several critical factors that shape engagement and governance effectiveness. Social trust and cohesion emerge as pivotal drivers: higher levels of trust significantly correlate with increased participation in forest management activities ($\rho = 0.201$, $p = 0.043$), attendance at CFUG meetings ($\rho = 0.234$, $p = 0.018$), and active expression of opinions during meetings ($\rho = 0.283$, $p =$

0.004). Effective conflict resolution mechanisms further amplify these metrics (forest management: $\chi^2 = 17.159$, $p = 0.002$; assembly meetings: $\chi^2 = 30.442$, $p = 0.000$; opinions: $\chi^2 = 40.609$, $p = 0.000$), although neutrality among some respondents suggests opportunities for enhancing communication and inclusivity in conflict resolution efforts. The qualitative findings reveal that trust among CFUG members is often built through shared experiences in managing forest resources. The CFUG members emphasized the importance of open communication and mutual respect in resolving conflicts and making collective decisions. They further highlighted trust as crucial for fostering cooperation during forest management activities, as it encouraged them to actively participate in discussions and decision-making processes.

Gender, education, and ethnicity also significantly influence participation dynamics. Gender inclusivity correlates with engagement in forest management activities ($\chi^2 = 10.267$, $p = 0.006$) and meeting attendance ($\chi^2 = 8.043$, $p = 0.045$), advocating for strategies that promote gender equity within CFUG decision-making processes. Higher education levels positively correlate with participation across all indicators ($p < 0.05$), underscoring education's role in enhancing members' capacity for informed governance. Ethnic diversity shows robust associations with participation in forest management activities ($\chi^2 = 46.660$, $p < 0.001$) and meeting attendance ($\chi^2 = 56.052$, $p < 0.001$), highlighting the importance of inclusive representation for community involvement and cohesion. The qualitative narratives highlight that gender inclusivity within CFUGs is influenced by cultural norms and historical roles in decision-making. Women often expressed challenges in accessing leadership roles but note improvements when supported by educational opportunities and inclusive policies. Similarly, ethnic minorities underscored the importance of representation and cultural sensitivity in governance structures, enhancing their engagement and sense of belonging within the CFUG.

Trust in community leaders significantly correlates with meeting attendance and active participation ($\rho = 0.199$ to 0.423, $p < 0.05$), emphasizing leadership's critical role in fostering organizational cohesion and member engagement. Effective accountability mechanisms exhibit strong positive correlations with all participation indicators ($\rho = 0.377$ to 0.486, $p < 0.001$), promoting transparency and trust among CFUG members. Community awareness of CFM goals and practices significantly correlates with engagement across all participation metrics ($\rho = 0.500$ to 0.703, $p < 0.001$), underscoring the pivotal role of informed members in driving collective action

and decision-making processes. Interviews with community leaders and members emphasized the role of effective leadership in promoting transparency and accountability. Leaders of CFUGs who actively seek input from all members and ensure fair representation in decision-making were perceived positively. Accountability mechanisms, such as regular reporting and clear guidelines for resource allocation, were lacking and hence perceived as essential for maintaining trust and cohesion within the CFUGs.

External relations and social networks also influence participation dynamics within CFUGs: external support positively correlates with meeting attendance and opinion expression ($\rho = 0.502$ to 0.291, $p < 0.05$), while regular interaction with external organizations strengthens these metrics ($\rho = 0.535$ to 0.291, $p < 0.05$). Strained intergroup relations paradoxically increase engagement in practical forest management activities ($\rho = -0.413$, $p = 0.000$), suggesting shared environmental concerns may drive cooperation despite social tensions. However, intergroup dynamics show less impact on meeting attendance and governance-related activities, indicating a need for balanced attention to foster cooperation in both practical and governance contexts. The qualitative data suggest that community awareness of CFM goals is often shaped by educational workshops and experiential learning in forest management practices. Previously, external partnerships and interactions with governmental and non-governmental organizations provided technical support and resources that enhanced community capacity and confidence in managing forest resources sustainably, which was mentioned to be lacking now.

Survey responses underscore these findings strongly, with a significant 89.2% of respondents agreeing that greater trust serves as a motivating factor for more active participation within CFUGs. Moreover, 79.4% express a belief in equal opportunities for both men and women within CFUGs, highlighting a commitment to inclusivity. Additionally, a substantial 73.5% agree that effective leadership is pivotal in fostering unity and cooperation among members, thereby driving collective efforts within the community. The survey further reveals that training sessions play a crucial role in enhancing member involvement, with 71.6% indicating that participation in these sessions significantly impacts their engagement in forest management activities. Furthermore, 59.8% of respondents emphasize that acquiring new skills and knowledge enhances their ability to contribute effectively to CFUG activities. The importance of social ties is underscored by the survey results, as 66.3% agree and

19.9% strongly agree that social networks significantly enhance participation. However, there is widespread discontent (71.6%) with current levels of social support and networks. Thus, to enhance member involvement in sustainable forest management, CFUGs should prioritize strengthening external partnerships, improving intergroup relations, and nurturing cohesive networks. Addressing these social dimensions comprehensively will not only foster inclusive participation but also enhance governance effectiveness and enable the sustainable management of community forests resources.

Summary

The study underscores that social dimensions significantly shape participation dynamics within CFUGs, emphasizing the critical roles of social trust, cohesion, and effective leadership. Greater trust correlates positively with increased engagement in forest management activities, meeting attendance, and active participation in decision-making. Gender inclusivity and higher education levels are pivotal for promoting equity and informed governance, while ethnic diversity enhances community cohesion and involvement. Robust conflict resolution mechanisms and accountability practices enhance transparency and member trust. Qualitative insights highlight the importance of open communication and mutual respect in fostering cooperation. External support and social networks are instrumental in augmenting participation. To optimize sustainable forest management, CFUGs should prioritize strengthening partnerships, improving intergroup relations, and nurturing cohesive networks. This holistic approach, encompassing trust-building, inclusivity, and skill development, fortifies CFUGs' resilience and capacity for effective resource management and community engagement.

Economic Dimensions and Influence in Community Participation

The analysis across various economic dimensions impacting community participation dynamics within CFUGs reveals significant insights into how economic factors intersect with social and developmental aspects. Economically, access to forest resources influences engagement differently across activities: while plentiful resources correlate with increased attendance at CFUG meetings ($\rho = 0.211$, $p = 0.033$), they show a weaker correlation with practical forest management tasks ($\rho = -0.114$, $p = 0.253$). Fairness in distributing forest products positively correlates with meeting attendance ($\rho = 0.284$, $p = 0.004$) and participation in forest management ($\rho = 0.099$, $p = 0.321$), fostering inclusivity. Transparent decision-making processes

strongly correlate with meeting attendance ($\rho = 0.481$, $p = 0.000$), crucial for building trust and encouraging governance participation.

Ownership dynamics also significantly influence participation: secure land tenure correlates with meeting attendance ($\chi^2 = 18.592$, $p = 0.000$) and active participation in discussions ($\chi^2 = 14.836$, $p = 0.002$), emphasizing its role in fostering stability and ownership. Conversely, while ownership of forest tools boosts meeting attendance ($\chi^2 = 16.934$, $p = 0.001$), it shows minimal impact on practical forest management tasks ($\chi^2 = 2.116$, $p = 0.347$). Livestock ownership does not significantly influence participation indicators. In terms of income generation, perceptions of fair income distribution strongly motivate meeting attendance ($\rho = 0.277$, $p = 0.005$) and modestly encourage opinion expression ($\rho = 0.146$, $p = 0.143$). Higher household incomes correlate negatively with practical forest management activities ($\rho = -0.428$, $p = 0.000$) and moderately affect meeting participation ($\rho = -0.196$, $p = 0.048$), indicating potential disincentives for wealthier members.

Moreover, financial access and awareness of cost-saving strategies significantly correlate with active participation: access to microcredit and savings mechanisms increases engagement in forest management ($\chi^2 = 6.822$, $p = 0.033$) and meeting attendance ($\chi^2 = 21.727$, $p = 0.000$). Awareness of cost-saving benefits enhances participation across all indicators (forest management: $\chi^2 = 19.031$, $p = 0.001$; meeting attendance: $\chi^2 = 29.939$, $p = 0.000$; opinion expression: $\chi^2 = 45.088$, $p = 0.000$), highlighting their role in promoting community cohesion and sustainability.

Skills development programs significantly enhance community engagement: participation correlates with skills acquisition (forest management: $\chi^2 = 29.869$, $p = 0.000$; meeting attendance: $\chi^2 = 34.149$, $p = 0.000$; opinion expression: $\chi^2 = 48.499$, $p = 0.000$), yet irregular implementation challenges sustained impact (Spearman's $\rho = -0.330$ to -0.567, $p < 0.05$). Despite this, high confidence in skill retention and application (92.3% somewhat confident, 2.6% very confident) underscores their perceived efficacy in equipping members for effective forest management.

The survey responses from CFUGs affirm key factors influencing participation, emphasizing their economic dimensions and implications for engagement. A significant 72.5% strongly agree that enhanced access to forest resources fosters active involvement in forest management activities, highlighting the critical role of resource accessibility. Interviews with CFUG members further underscore this sentiment, revealing that community members perceive access to

forest resources not only as vital for livelihoods but also as a means to strengthen community cohesion. Participants expressed that greater access empowers them to contribute actively to forest management decisions, viewing themselves as stewards of these resources.

Equitable distribution of resources is also perceived as crucial, with 65.7% believing it positively impacts participation. Qualitative insights reveal concerns about fairness in resource allocation processes within CFUGs. Members voiced frustration over past perceptions of resource favoritism, which had eroded trust within the community. Transparency in allocation processes emerged as a key theme in interviews, with community members now valuing clear and inclusive decision-making that ensures fair distribution of benefits from forest resources. Discussions highlighted that perceptions of fairness significantly influence trust in leadership and the willingness to engage in decision-making processes.

Moreover, transparency in resource management practices is widely viewed as beneficial among CFUGs, reflecting a preference for open and accountable governance. Qualitative findings underscored the importance of transparent decision-making processes. Participants expressed a desire for opportunities to voice opinions and understand the rationale behind decisions, which they believe strengthens their trust in leadership and encourages active participation

Economic incentives play a crucial role in motivating participation within CFUGs, as highlighted by survey findings. A significant 67.6% of respondents endorse income diversification as a strong motivator for engaging in forest-related activities. Moreover, perceptions of fair income distribution from forest management activities (63.7%) are shown to positively influence meeting attendance and active engagement, underscoring their pivotal role in fostering community cohesion. Qualitative insights gleaned from discussions further illuminate these findings, revealing that economic incentives derived from forest-related activities are perceived as vital in encouraging broader community involvement. Participants emphasized that fair distribution of income from forest products encourages sustained participation.

However, challenges such as market fluctuations and limited access to market information were identified as significant barriers to maximizing economic benefits from forest resources. Despite 54.7% expressing positive views on market information access, concerns persist about its impact amidst market uncertainties. The survey also reveals substantial challenges, with 99.0% of households reporting no

engagement in income-generating activities related to forests, indicating existing barriers or limitations in economic resource utilization. Expectations for future strategies primarily focus on improving resource management (50.8%) and reducing input costs (49.2%) to enhance economic benefits within CFUGs.

Participation in collective cost-saving initiatives within CFUGs is perceived as beneficial across various dimensions. A significant proportion of participants believe these initiatives enhance access to resources (33.3%), reduce financial burdens (34.4%), and increase efficiency in forest management (32.3%). This collective pooling of resources allows for joint investments in tools and infrastructure, which not only economizes costs but also streamlines operational processes. However, sustaining collective commitment poses challenges, especially given the varying financial capacities among members.

Moreover, CFUG members express high confidence levels in applying (89.7% somewhat confident) and retaining (92.3% somewhat confident) skills acquired through training programs. These programs are highly valued for equipping members with practical abilities crucial for effective forest management. The satisfaction rate with past training sessions is notably high at 97.1%, underscoring strong support and the perceived necessity of ongoing skills development initiatives within CFUGs. Qualitative feedback emphasizes the practical knowledge gained from these sessions and its direct application in daily forest management tasks.

Despite the positive impact observed, concerns about the sustainability of skills development programs persist. Participants highlight the need for continuous training to address evolving environmental challenges effectively. This underscores the importance of integrating skill-building initiatives into long-term strategies for enhancing community resilience and sustainable forest management practices within CFUGs.

These findings underscore the pivotal role of economic factors in shaping community engagement within CFUGs, emphasizing access to resources, fair distribution practices, and transparent decision-making. Economic incentives like income diversification and collective cost-saving initiatives are crucial for fostering participation and enhancing operational efficiency. Sustainable management hinges on addressing challenges such as market uncertainties and skill sustainability, ensuring CFUGs can adapt and thrive amidst evolving environmental and socio-economic landscapes.

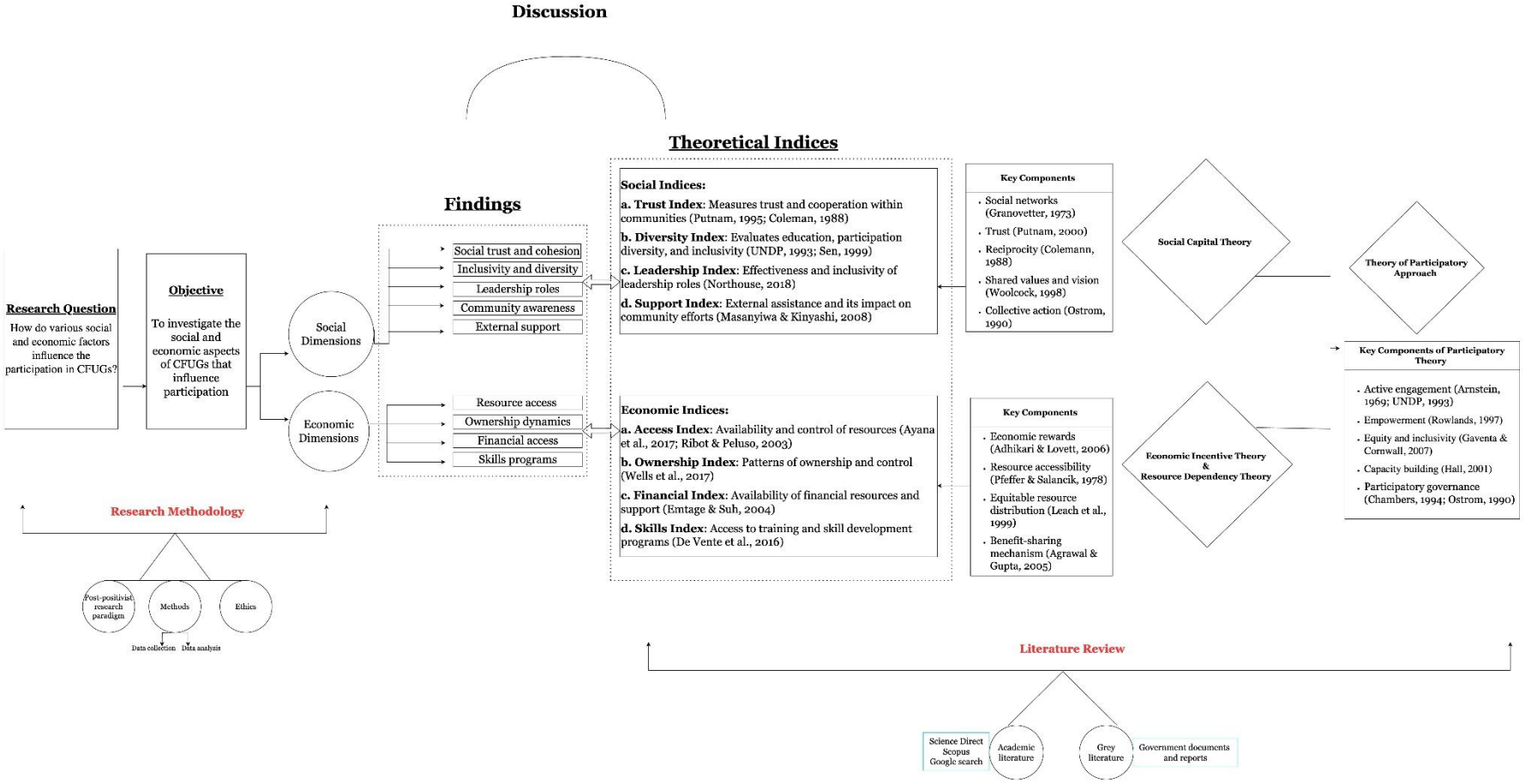
Summary

The economic dimensions influencing participation in CFUGs reveal crucial insights into sustainable forest management. Access to forest resources not only enhances engagement in forest activities but also fosters community cohesion and livelihoods. Equitable resource distribution and transparent decision-making processes are essential for building trust and encouraging active participation. Economic incentives such as income diversification and collective cost-saving initiatives motivate broader community involvement, despite challenges like market uncertainties and skill sustainability. High satisfaction with skills development programs underscores their effectiveness in equipping members for sustainable forest management. Addressing these economic factors is vital for CFUGs to adapt and thrive, ensuring forests are managed sustainably while meeting community needs beyond mere reliance on forest resources. Regarding sustainability, while direct reliance on forests is significant, SFM requires broader community engagement beyond resource extraction. Economic diversification, transparent governance, and skill development enhance forest stewardship, ensuring long-term ecological health and community resilience. Thus, sustainable forests depend not only on resource utilization but also on equitable economic practices and community participation in decision-making and conservation efforts.

Discussion of Findings

This section outlines the analytical framework of the study, highlighting the integration of research objectives, methodology, and theoretical foundations. The framework, illustrated in the Figure 22, underscores how various theories inform and guide the research process. A mixed-methods approach, combining quantitative and qualitative data, was utilized to explore these theoretical constructs. The discussion then explores the key themes identified from the data. These themes from social and economic dimensions are examined through the lens of both theoretical frameworks and empirical evidence, offering a thorough understanding of the factors affecting CFUG participation.

Figure 22
Analytical Framework of The Study



Social Dimensions

Rebuilding Social Trust and Cohesion: Enhancing Participation in CFUGs

Our research demonstrates a significant correlation between social trust and active participation in CFUGs, with 89.2% of respondents affirming that trust enhances engagement. This finding aligns with Social Capital Theory, which posits that trust and social networks are pivotal for facilitating collective action and effective resource management (Putnam, 1993; Claridge, 2004). The theory underscores that robust social networks and mutual trust among community members foster a cooperative environment essential for successful communal management of resources.

Qualitative data further support this relationship by highlighting that traditional communal practices previously played a crucial role in building trust and cohesion, thereby contributing to effective forest management. A local teacher shared:

In the past, we had regular training and awareness sessions that kept us updated on best practices in forest management. There were different NGOs and government bringing different programs. Now, I don't see such programs. Without such programs, many of us are unknown and not prepared to contribute meaningfully. And hence interest also decreases with time. (Local resident, personal communication, 11 April, 2024).

Historical evidence from our interviews reveals that these practices fostered a sense of shared responsibility and collective effort in managing forest resources. However, our study also uncovers a significant challenge: the shift from utilitarian to protective forest management strategies has undermined these traditional trust-building mechanisms. As one participant pointed out, the focus on forest protection has led to a decrease in community engagement and a weakening of the sense of shared ownership and responsibility.

This erosion of trust and cohesion is consistent with Ostrom's (1990) emphasis on social capital as a critical component for successful collective management. Ostrom's work highlights that social networks and trust are essential for the sustainability of common-pool resources, and our findings validate this perspective. The diminishing bonds within the community due to the shift in management focus highlight the need for renewed efforts to rebuild trust and foster a sense of shared ownership. Revitalizing community forestry management requires

addressing these trust deficits and reinvigorating communal practices that enhance social cohesion.

In summary, our findings not only reinforce the Social Capital Theory's assertion about the importance of trust but also illustrate the practical challenges that arise when traditional mechanisms for building trust are disrupted. Rebuilding trust and enhancing social networks are essential for improving CFUG participation and achieving effective forest management outcomes. This comprehensive analysis underscores the need for strategies that reestablish and strengthen trust within the community, thereby fostering a more engaged and collaborative approach to forest management.

Enhancing Community Engagement in Forest Management: The Impact of Inclusivity, Education, and Gender Sensitivity in CFUGs

Our research highlights the critical importance of inclusivity, education, and gender sensitivity in fostering effective community engagement in CFUGs. Data indicates that 79.4% of respondents advocate for gender-sensitive strategies, underscoring a strong preference for equitable practices within the CFUG framework. This finding is supported by the Theory of Participatory Approach, which asserts that inclusivity and diversity are essential for effective participation (Gaventa & Cornwall, 2006). Gender-sensitive strategies are not just a matter of representation but are fundamental to creating a more engaged and equitable community.

Similarly, skill development is a pivotal factor in enhancing participation. Our data reveal that 59.8% of respondents link skill acquisition to increased involvement in CFUG activities. This supports the notion that ongoing education and training are crucial for maintaining and boosting community engagement. Qualitative insights corroborate this, showing that past educational programs significantly enhanced community participation. However, a notable decline in such initiatives has been observed, which aligns with findings from Paudel et al. (2021), who stress the importance of continuous educational opportunities for sustaining active involvement.

The intersection of gender roles and skill development further complicates the dynamics of CFUG participation. While there is a growing trend of women assuming leadership roles within CFUGs, they face persistent challenges due to entrenched traditional gender roles and limited access to training opportunities. This situation calls for targeted interventions, including gender-specific training and capacity-building programs, to empower women in both production and leadership roles.

Berkes (2009) and Paudel et al. (2021) support this approach, emphasizing that diverse representation and skill enhancement are key to improving CFUG effectiveness.

Our findings not only validate the importance of inclusivity and education but also reveal a significant gap in current training and capacity-building efforts. The decline in educational programs has led to decreased community engagement, highlighting a need for renewed focus on these areas. Addressing these gaps through gender-sensitive and skill-focused strategies will be crucial for enhancing CFUG participation and achieving more effective forest management outcomes. By aligning our practices with the principles of inclusivity and ongoing education, we can better support community involvement and improve the management of forest resources.

Critical Role of Leadership in Enhancing CFUG Participation and Effectiveness

Effective leadership is a cornerstone for successful CFUGs, as our research highlights. The data reveals that 73.5% of respondents view strong leadership as crucial for fostering unity and cooperation within CFUGs. This finding supports the theoretical framework that dynamic leadership enhances community involvement and forest management (RECOFTC, 2020; Thapa et al., 2020).

Our study also indicates a notable absence of young individuals, particularly males under 35, among the respondents, which raises concerns about the sustainability and future leadership of CFUGs. The lack of youth involvement may be attributed to several factors, including migration to urban areas for better opportunities and a general disinterest in participating in community forestry activities. This demographic gap highlights the challenge of succession planning and the risk of leadership stagnation as current leaders' age.

Qualitative data provide further insight into the critical role of leadership and the impact of an aging leadership base. Interviews and observations indicate that inactive or ineffective leadership significantly impedes engagement and governance. For instance, an executive member shared:

The group has been inactive so long that I almost forgot I'm on the committee. I want to hand it over to others who are interested. But no one comes forward. (CFUG executive member, personal communication, 13 April, 2024).

This account of neglected committee responsibilities underscores how poor leadership and the lack of young, engaged leaders can disrupt functionality and motivation within CFUGs. This aligns with the Theory of Participatory Approach,

which asserts that effective leadership is essential for inclusive decision-making, capacity building, and maintaining community commitment (Ostrom, 1990; Chambers, 1992).

The presence of strong, proactive leadership is not merely a facilitator of unity but a driver of overall CFUG success. Dynamic leaders who actively engage members, address concerns, and foster a collaborative environment can substantially enhance participation and governance outcomes. This is consistent with the findings of RECOFTC (2020) and Thapa et al., 2020, who emphasize that effective leadership is instrumental in achieving successful community forestry management.

In contrast, the impact of ineffective leadership and the absence of youth involvement reveals a critical gap in CFUG functioning. Our findings validate the need for investment in leadership development and creating structures that encourage youth participation and active engagement. This approach aligns with the Theory of Participatory Approach, which underscores the necessity of effective leadership in achieving inclusive and effective forest management.

Therefore, to enhance CFUG participation and management success, it is imperative to focus on developing leadership skills, attracting younger members, and ensuring that leaders are actively involved in community and management activities. By bridging the generational gap and empowering youth, CFUGs can sustain effective management and foster a more resilient and engaged community.

Enhancing Participation through Education and Training in CFUGs: Bridging the Knowledge Gap

Our findings underscore the critical role of awareness and knowledge in influencing participation within CFUGs. Specifically, the data indicate a robust correlation between higher levels of education and increased engagement in CFUG activities. This observation is supported by the Theory of Participatory Approach, which emphasizes the importance of education and training in empowering community members and enhancing their involvement in resource management (Bhandari et al., 2019; Gilmour, 2017). Our quantitative analysis shows that educated members exhibit higher levels of participation, reinforcing the theoretical perspective that knowledge acquisition directly contributes to more active and effective engagement.

Qualitative insights further corroborate this finding, revealing a significant gap in skill development opportunities. A notable percentage of respondents, specifically

71.6%, acknowledged the importance of ongoing training but also highlighted the inadequacy of current training programs. This gap underscores a critical need for more robust and targeted capacity-building initiatives. A participant shared:

Without proper training, we don't know how to contribute effectively. We women from villages that depend on agriculture often find ourselves idle during off-seasons, as we don't have much else to do. When you came here, I realized how much potential our forests have and how we can benefit from them. But, like many others, I also feel lost and unmotivated because we don't know where to start. Our children have also migrated for work and there is no one to teach us new things. We really need training programs to get us on track and manage our forests better. Without training, we can't contribute effectively. (Local resident, personal communication, 10 April, 2024).

This testimony highlights a critical issue: the impact of outmigration on community capacity. As many young people migrate in search of better job opportunities, communities are left with fewer individuals to participate in forest management, leading to a loss of local knowledge and skills. This outmigration exacerbates the existing knowledge gap and underscores the need for accessible education and training programs to empower those who remain.

A respondent's call for continuous education and skill enhancement aligns with the theories of Ostrom (1990) and Rowlands (1997), who argue that sustained knowledge and capacity building are fundamental for effective participation and resource management. The lack of sufficient training opportunities is a major barrier to maximizing community involvement. Participants expressed a strong desire for enhanced training programs, which they believe would significantly improve their ability to contribute to forest management.

The challenges posed by outmigration further emphasize the importance of education and training in maintaining active community participation. Without adequate training programs, community members may feel disempowered and less capable of managing forest resources effectively. This sentiment reflects the broader theoretical framework that highlights the necessity of ongoing education and skill development to sustain high levels of engagement in community resource management. This sentiment reflects the broader theoretical framework that emphasizes the need for ongoing education and skill development to maintain high levels of participation and engagement in community resource management.

In summary, our findings support the notion that increasing awareness and knowledge is crucial for boosting community engagement in CFUGs. The correlation between education and participation highlights the effectiveness of capacity-building programs, while the identified gap in training opportunities emphasizes the need for more comprehensive and continuous education initiatives. By addressing these educational needs and considering the impact of outmigration, we can enhance participation and improve the overall management of community forests.

Enhancing CFUG Participation through External Support: Bridging Gaps and Strengthening Resource Dependencies

External support emerges as a pivotal factor for enhancing CFUG participation and forest management. Our quantitative findings reveal that while 66.3% of respondents recognize the importance of social networks in CFUG operations, a substantial 71.6% express dissatisfaction with the current level of external support. This discrepancy highlights a significant gap in necessary resources and underscores the crucial role of external assistance in fostering effective community engagement.

This concern aligns with the Resource Dependency Theory, which posits that organizations rely on external resources to function effectively (Pfeffer & Salancik, 1978). The theory suggests that the success of collective efforts, such as CFUGs, is heavily dependent on the availability and quality of external support and resources. Our data corroborate this perspective by demonstrating that insufficient external support impairs CFUG effectiveness and hinders active participation.

Qualitative insights further substantiate this issue. Respondents and executive committee members alike have voiced frustrations over inadequate support from local government and agencies. An executive committee member expressed,

We've been struggling without proper support for a long time. The last program we had was an orientation on plant and forest protection, but since then, there's been no additional help. This lack of support from the local government really affects our ability to engage and manage forest effectively. (CFUG executive member, personal communication, 12 April, 2024).

Additionally, our KIIs revealed that Benighat Rorang Rural Municipality has yet to adopt any specific policies regarding CFUGs. This lack of local policy development exacerbates the existing disconnect between CFUGs and local government, despite established frameworks in the Local Government Operation Act and the National Forest Act. While these policies outline a structured linkage between

CFUGs and local authorities, the absence of a local policy undermines these guidelines and further impedes effective participation and resource management.

The lack of coordination and policy support creates barriers to effective support and collaboration, undermining the potential benefits of external assistance and policy mandates. The absence of meaningful engagement with local government hampers the ability of CFUGs to leverage external resources and implement effective forest management practices. This misalignment between policy and practice highlights the need for addressing these coordination gaps to enhance community involvement and forest governance.

Our findings indicate that strengthening external partnerships and improving the consistency and quality of support are critical for enhancing CFUG participation. By addressing the existing support deficits and fostering more reliable and impactful external relationships, communities can be better equipped to manage resources and engage more effectively in forest governance. This integrated approach not only supports theoretical frameworks but also provides practical recommendations for improving CFUG effectiveness and community involvement in forest management.

Economic Dimensions

Economic Dynamics and CFUG Participation: Aligning Incentives with Evolving Economic Conditions

Economic factors play a crucial role in influencing participation in CFUGs. Our quantitative findings reveal that 72.5% of respondents directly link resource access and economic stability to their involvement in CFUG activities. This correlation is consistent with the Economic Incentives Theory, which asserts that economic stability and resource access are fundamental for fostering active engagement (Balla et al., 2014; Society of American Foresters [SoAF], 2003).

Qualitative data further elucidate this relationship, highlighting a trend where declining forest-based income and the emergence of alternative economic opportunities have diminished traditional forest management activities. For instance, a local government reported:

> We used to see more participation when people relied heavily on forest resources for their livelihood. Now, as alternative income sources outside the forest, like agriculture and small businesses become more common, fewer people engage in traditional forest management. Our recent programs, focused primarily on awareness and protection, have not been enough to reinvigorate

> interest. Economic shifts are crucial to understanding the current drop in participation. We are looking into ways to link new economic opportunities with forest management to boost engagement. For this we are also coordinating with SDFO to separate a budget required for upcoming year. (Local government, personal communication, 10 April, 2024).

Our study also found that 55% of respondents who have not renewed their OPs cited a lack of interest from the committee as the primary reason. This lack of renewal not only indicates a concerning shift in the future of community forestry but also highlights issues with utilizing forest resources effectively. The declining interest in renewing OPs reflects broader economic dynamics, where some community members are increasingly engaged in alternative income sources, leading to reduced commitment to traditional forest management.

These findings corroborate a significant reduction in community interest in forest management as economic conditions shift. This situation challenges the notion that traditional economic incentives alone are sufficient for maintaining engagement in forest management (Adhikari & Lovett, 2006). Our results suggest that existing economic incentives are not adequately aligned with contemporary economic opportunities and community needs. This misalignment has led to decreased participation and engagement in CFUG activities.

To address these challenges, our findings advocate for a reevaluation of how forest management practices can be integrated with new economic opportunities. By exploring and implementing strategies that merge traditional forest management with emerging economic opportunities, it is possible to revitalize community involvement and enhance the effectiveness of CFUGs in managing forest resources. This approach not only validates the Economic Incentives Theory but also highlights the need for innovative solutions to sustain and enhance community engagement in forest management.

Impact of Equitable Resource Management on CFUG Participation

Equitable resource management is a cornerstone for fostering active participation within CFUGs. Our research highlights that 65.7% of respondents highly value fair and transparent distribution of resources. This aligns with established theories suggesting that equitable management is crucial for enhancing engagement and effective resource use (Ayana et al., 2017; Ribot & Peluso, 2003).

However, the data also reveal significant dissatisfaction among respondents with current resource distribution practices. The prevalence of inequitable allocation leads to noticeable disengagement and underutilization of resources. Qualitative feedback underscores this issue, with a young CFUG member expressing frustration over perceived inefficiencies in current practices;

When resources aren't shared fairly, it leads to frustration and disengagement. In our community, there has been a noticeable lack of active involvement from both members and the committee, resulting in underutilized forest resources. Because of this, many have lost touch with the purpose and benefits of our forest, and there has been minimal engagement over the years. The recent focus solely on protection rather than practical utilization highlights that we're not making the most of our resources. Since there's been no effective utilization or equitable distribution, it's hard to gauge fairness in the allocation. This inefficiency and lack of opportunity have made me consider migrating for work, as staying here feels less promising and motivating. (CFUG member, personal communication, 11 April, 2024).

This dissatisfaction reflects a broader pattern observed in our study, where inequitable practices erode trust and reduce community cohesion.

These findings support the Economic Incentives Theory, which posits that fair distribution of resources is essential for motivating community participation and improving management outcomes (Balla et al., 2014; SoAF, 2003). In practical terms, transparency in decision-making processes is vital for building trust and fostering a sense of fairness among members. As noted in our qualitative data, the frustration expressed by community members points to the need for a more just and transparent approach to resource management.

The integration of both quantitative and qualitative data emphasizes the importance of equitable management practices. Our results validate the theoretical assertion that fair resource distribution enhances CFUG participation and effectiveness. Ensuring transparency and equity in resource allocation not only improves engagement but also strengthens community ties, ultimately leading to more successful forest conservation and utilization.

Impact of Secure Land Rights on Community Engagement in Forest Management

Our research underscores the pivotal role of secure land rights in fostering active community engagement in forest management. Over 70% of our respondents indicated a strong correlation between land ownership and increased CFUG

participation. This finding aligns with Wells et al. (2017), who emphasize that secure land rights are fundamental to community engagement and effective forest management. Our data indicate that secure land rights instill a profound sense of ownership and responsibility among community members, which significantly enhances their involvement in CFUG activities.

The Resource Dependency Theory supports this observation, highlighting that access to and control over resources—such as land—are crucial for community involvement (Pfeffer & Salancik, 1978). Secure land rights empower communities to take active stewardship of their forests, which drives sustainable management practices and yields long-term benefits. This empowerment is crucial as it fosters a sense of responsibility and ownership, encouraging community members to invest in and care for their resources.

Qualitative data from our study reinforce these findings, showing that the lack of secure land rights undermines participation and reduces the effectiveness of CFUGs. For instance, community members who do not have clear ownership or usage rights are less likely to engage in forest management activities and are more prone to conflicts over resource use. This supports the theoretical perspective that clear and secure rights are essential for fostering meaningful engagement and ensuring effective resource management.

Our findings validate the necessity of securing land rights to sustain CFUG engagement and improve forest management outcomes. The positive correlation between secure land rights and active participation underscores the importance of implementing policies that ensure clear and enforceable land rights. By addressing issues related to land tenure and ownership, we can enhance community involvement, support sustainable forest management, and achieve long-term ecological and social benefits.

Economic Factors Influencing CFUG Participation: Equity, Stability, and Challenges

Our study reveals that economic factors play a critical role in influencing participation in CFUGs. Specifically, 63.7% of respondents believe that fair income distribution positively impacts CFUG involvement, aligning with research by Paudel et al. (2021), Paudel and Paudel (2021), and Shahi et al. (2022). This supports the Economic Incentives Theory, which suggests that equitable distribution of resources

fosters greater engagement and collective action within communities (Balla et al., 2014).

Qualitative data from our study underscore this finding. For instance, an elderly respondent highlighted how diminishing collective spirit, due to perceived inequities in resource distribution, negatively affects participation;

In the past, we pooled resources to buy tools and improve our forest management. Now, with fewer young people and aging members, we've lost that collective spirit and efficiency. **Money-oriented mindsets** and dwindling participation have made managing resources much harder. (CFUG member, personal communication, 11 April, 2024).

This observation is consistent with the Resource Dependency Theory, which emphasizes that effective management of economic resources is essential for sustaining community engagement (Pfeffer & Salancik, 1978). Moreover, collective investments and fair distribution practices were noted to improve participation, reinforcing the idea that equitable economic practices can enhance community involvement in CFUGs.

Despite these positive correlations, our study also identified significant challenges related to economic instability and market fluctuations. Approximately 54.7% of respondents expressed concerns that these economic challenges undermine their engagement in forest management. The Theory of Economic Incentives supports the view that economic stability is crucial for maintaining participation, as it impacts members' ability to engage effectively and manage resources efficiently (SoAF, 2003).

The need for diversifying income sources emerged as a significant motivator for increased participation, with 67.6% of respondents advocating for economic empowerment strategies. This finding aligns with the recommendations of Paudel et al. (2021), who emphasize the importance of diversified income sources to bolster community engagement. However, our research also highlights barriers such as high operational costs and bureaucratic hurdles in operational plan renewal. These barriers can obstruct effective forest management and resource utilization, indicating a need for cost-effective approaches and streamlined processes to overcome these challenges (Shahi et al., 2022).

Our findings, hence validate the importance of addressing economic factors—particularly income equity and cost management—in sustaining CFUG participation.

The combined insights from both quantitative and qualitative data, supported by Economic Incentives Theory and Resource Dependency Theory, emphasize that managing economic challenges and implementing equitable practices are crucial for enhancing engagement and ensuring effective forest management.

Enhancing Community Engagement through Continuous Skills Development in Forest Management

Skills development has emerged as a critical factor in fostering active community engagement in forest management. Our research highlights a strong correlation between training and participation, with 89.7% of respondents demonstrating confidence in utilizing skills acquired from previous training. This finding aligns with Paudel et al. (2021), who emphasize that skill development positively impacts community involvement and participation dynamics. The Theory of Participatory Approach further supports this view, asserting that capacity building and ongoing skill development are essential for effective participation and resource management (Chambers, 1992; Rowlands, 1997).

Qualitative data reinforce these quantitative findings, revealing that continuous training is crucial for maintaining skills and motivation among community members. A respondent shared:

Back in 2007-2010, we had excellent training programs that boosted our skills and confidence in forest management. We were engaged and effectively used what we learned. Today, with barely any training or support, our skills are diminishing, and participation has dropped. Despite the high confidence we had in applying and retaining those skills, the lack of ongoing programs has left us struggling. Ongoing training is crucial to adapt to new challenges and keep the community involved. (CFUG member, personal communication, 14 April, 2024).

This comment about the limitations of past training underscores the importance of ongoing support. The lack of continuous training programs has led to skill depreciation and decreased participation, reflecting a significant gap in the current approach. This observation is consistent with the broader literature, which stresses that without regular updates and reinforcement, skills can become obsolete, negatively impacting community engagement (Paudel et al., 2021).

To address this issue and sustain community involvement, it is imperative to invest in ongoing skills development programs. Continuous training will empower community members to adapt to evolving challenges and manage their forest

resources effectively. Our findings validate the necessity of implementing robust and regular training initiatives to enhance CFUG participation and ensure effective resource management. This approach not only aligns with established theories but also addresses practical concerns raised by community members, thereby offering a comprehensive solution to improving engagement in forest management.

Interwoven Dimensions: The Critical Impact of Social Trust and Economic Factors on CFUG Participation and Effectiveness

Building on our previous discussion of social and economic dimensions within CFM, we now turn our focus to understanding how these dimensions specifically relate to three key participation indicators. These indicators are the frequency of attending CFUG meetings, active opinion expression in meetings, and involvement in community forest management activities. Our analysis investigates how various social and economic factors influence these participation metrics, aiming to uncover correlations that can inform strategies for improving engagement and decision-making processes within CFUGs. By delving into these relationships, we seek to enhance the effectiveness and sustainability of community forestry initiatives.

Frequency of Attending CFUG Meetings

Our findings reveal that both social trust and economic stability significantly influence the frequency of attendance at CFUG meetings. Socially, 89.2% of respondents indicated that trust within the community fosters regular engagement. When members feel a sense of belonging and shared responsibility, they are more likely to attend meetings consistently. This aligns with Social Capital Theory (Putnam, 1993; Claridge, 2004), which highlights the role of trust and strong social networks in encouraging participation. However, the shift towards protective forest management and the erosion of traditional communal practices have disrupted trust-building mechanisms, leading to increased absenteeism. As Ostrom (1990) emphasizes, revitalizing communal practices that enhance social cohesion and trust is crucial for addressing absenteeism.

Economically, access to resources and stability also play a vital role in motivating attendance. Approximately 72.5% of respondents pointed to economic factors as key motivators for regular participation, aligning with the Economic Incentives Theory (Balla et al., 2014; SoAF, 2003). However, economic pressures often lead individuals to prioritize immediate financial needs over communal responsibilities (Adhikari & Lovett, 2006). Aligning CFUG activities with members'

economic priorities, such as flexible meeting schedules and integrating discussions on economic opportunities, can enhance attendance. This approach resonates with adaptive management practices that consider the economic realities of community members (Balla et al., 2014).

Active Opinion Expression in Meetings

The expression of opinions in CFUG meetings is significantly influenced by leadership, inclusivity, and economic equity. Socially, 73.5% of respondents highlighted the importance of strong leadership in fostering open and inclusive discussions. Effective leaders create an environment where diverse opinions are encouraged and respected, aligning with the Theory of Participatory Approach (Ostrom, 1990; Chambers, 1992). Inclusivity, particularly through gender-sensitive strategies and ongoing education, empowers underrepresented groups to express their opinions confidently. This diverse representation enhances the quality of discussions and aligns with the views of Berkes (2009) and Paudel et al. (2021), who emphasize the importance of diverse representation in CFUG effectiveness.

Economically, fair and inclusive resource management is crucial for fostering open dialogue. Our findings show that 65.7% of respondents value equitable resource distribution, reflecting its importance in encouraging active participation. Inequitable resource distribution often leads to disengagement and a lack of trust, which stifles open discussion (Balla et al., 2014). Improved feedback mechanisms and inclusive representation in decision-making processes can build trust and encourage members to express their opinions freely, aligning with the principles of participatory governance (Ayana et al., 2017).

Involvement in Community Forest Management Activities

Involvement in CFM activities is heavily influenced by education, leadership, and economic empowerment. Socially, education and training are pivotal in enhancing participation, with 59.8% of respondents linking skill acquisition to increased engagement. Ongoing education empowers members and aligns with the Theory of Participatory Approach (Bhandari et al., 2019; Gilmour, 2017). Leadership also plays a crucial role, as dynamic leaders provide guidance and motivation, enhancing role fulfillment and task completion. This aligns with Ostrom (1990) and Chambers (1992), who assert that effective leadership is essential for inclusive decision-making and community commitment.

Economically, secure land rights and economic incentives are significant motivators for participation. Over 70% of respondents associated land ownership with increased engagement, reflecting the Resource Dependency Theory (Pfeffer & Salancik, 1978). However, economic instability and limited access to resources present barriers to participation. High operational costs and bureaucratic hurdles further obstruct engagement, indicating a need for more supportive policies and practices (Shahi et al., 2022). Continuous skills development and economic empowerment strategies, such as training and income diversification, can enhance participation and align with sustainable forest management practices (Paudel et al., 2021).

In conclusion, the interplay of social and economic factors plays a critical role in shaping participation dynamics within CFUGs. By addressing challenges related to trust, leadership, resource distribution, and economic stability, CFUGs can foster greater community engagement and support effective forest management. The integration of quantitative and qualitative insights offers a comprehensive understanding of these dimensions and provides practical recommendations for enhancing participation and governance in community forestry.

Concluding the Chapter

This chapter provides a critical analysis of the socio-economic dynamics influencing participation in CFUGs within Benighat Rorang Rural Municipality, Dhading. The study reveals that social trust and cohesion are fundamental to effective community engagement and resource management. The erosion of traditional practices has diminished trust, which is crucial for revitalizing CFUG involvement. Restoring these practices and strengthening communal bonds are essential steps for improving participation.

Inclusivity, gender sensitivity, and education are significant factors in fostering engagement. Despite the recognized need for gender-sensitive strategies and continuous education, a decline in educational initiatives has negatively impacted participation. Addressing this through targeted training and inclusive practices is necessary to enhance community involvement. Effective leadership is also critical; it promotes unity and engagement, while ineffective leadership impedes participation and governance. Investing in leadership development is therefore vital for improving CFUG outcomes.

Economically, stability, equitable resource management, and secure land rights are key to sustaining engagement. The study finds that aligning economic incentives with community needs is crucial for maintaining active participation. Fair resource distribution prevents disengagement, and secure land ownership correlates with increased involvement. Economic stability and effective cost management are essential to overcome the challenges posed by high operational costs and to sustain participation.

Externally, a significant gap in resources affects CFUG operations. Strengthening external support and forming robust partnerships are necessary for effective forest management and community empowerment. Overall, addressing the interplay of social and economic factors—restoring trust, ensuring inclusivity, investing in leadership and education, and enhancing economic stability and external support—is vital for the effectiveness and sustainability of community forestry management.

CHAPTER VI
CONCLUSION

This chapter begins with a synopsis of the study, followed by a comprehensive conclusion.

Synopsis of the Study

This study provides a comprehensive examination of the dynamics of participation within CFUGs in Nepal, particularly focusing on the Benighat Rorang Rural Municipality of Dhading district. The research explores how social and economic dimensions influence participation in forest management activities and how these factors impact sustainable forest management and local empowerment.

Nepal's community forestry initiative, which represents shift from centralized control to community-based management has achieved notable successes in restoring degraded forests and aligning conservation with local livelihoods. However, contemporary challenges such as youth outmigration and reduced reliance on forest resources pose threats to the effectiveness of CFUGs.

The study identifies three categories of participants within CFUGs. Firstly, the participants who lack awareness and knowledge about OPs and the benefits of CFUGs. Here, it is identified that participation is driven by protective instincts rooted in ancestral practices of conservation over utilization. Second are the participants who are driven by legal obligations, ensuring members participate as required by law. Women who are in leadership position often engage due to mandatory requirements rather than intrinsic interest, lacking necessary skills and knowledge but expressing a need for capacity-building programs. Other general participants are driven by the pursuit of economic benefits, with members engaging actively only when they perceive direct financial gains.

Findings reveal the demographic diversity within CFUGs, with significant female representation and diverse ethnic backgrounds contributing to community cohesion. Educational attainment and agricultural livelihoods were predominant, influencing community engagement and governance. Organizational challenges, including financial constraints and low committee engagement, were identified as barriers to sustainable forest management, highlighting the need for enhanced organizational capacity within CFUGs.

Social factors such as trust, leadership, and inclusive decision-making emerged as critical for fostering collective action and community engagement in conservation efforts. Economic dimensions, including skills development and income diversification, positively correlated with increased participation, while higher household incomes showed a negative correlation with direct involvement in practical forest tasks, revealing nuanced trade-offs between economic status and hands-on engagement in forestry activities.

The study points out that addressing these challenges requires a multifaceted approach. For forced participation, it is crucial to increase encouragement through awareness campaigns and training initiatives. For mandatory participation, bridging knowledge gaps and emphasizing the importance of legal frameworks and policies are essential. For general participation, making engagement more meaningful and mitigating the social threat perceived by informed members can promote a more inclusive approach.

Additionally, fostering economic diversification within CFUGs and strengthening institutional frameworks through strategic partnerships and sustainable funding mechanisms are crucial steps forward. By integrating these initiatives comprehensively, CFUGs can enhance their resilience and ensure sustainable forest management practices that not only preserve local ecosystems but also promote the well-being of communities across Nepal.

In conclusion, this study underscores several critical challenges and opportunities within CFUGs in Nepal, particularly focusing on participation dynamics. The findings emphasize the importance of adaptive governance practices, gender-specific inclusive participation frameworks, and targeted economic strategies tailored to local contexts. They highlight the need for enhanced understanding and implementation of sustainable forest management practices, addressing financial and knowledge barriers, and fostering active engagement and capacity-building among CFUG members, particularly women. This comprehensive approach aims to align local governance with broader ecological and economic objectives, ensuring effective community forestry and sustainable development. By prioritizing these insights, CFUGs can navigate complexities effectively, fostering environments where community empowerment and environmental conservation mutually reinforce each other's sustainability.

Triadic Approach for Sustainable Community Forestry Management

This study introduces a crucial conceptual framework for understanding the effectiveness and sustainability of community forestry management through the "Triadic Approach" as shown in Figure 23 below. This approach emphasizes the interdependence of social, economic, and participatory dimensions, providing a holistic understanding of how these elements collectively contribute to successful community forestry practices. By integrating theoretical perspectives such as Social Capital Theory, Economic Incentives Theory, and the Participatory Approach, our study elucidates the complex dynamics that drive effective forest management.

Social Dimension

The social dimension is foundational for fostering community participation and ensuring effective forest management. This framework highlights key social factors: social trust and cohesion, inclusivity and gender sensitivity, leadership effectiveness, training and education, and external support. These elements collectively build a robust social foundation that enhances participation and effectiveness within CFUGs.

Social Trust and Cohesion: Social Capital Theory underscores the importance of trust and networks in facilitating collective action. High levels of trust among CFUG members encourage cooperation, reduce conflicts, and promote active involvement in communal activities. Poudyal et al. (2023) emphasize that social capital, including trust and networks, is crucial for promoting community participation and effective resource management. This aligns with findings that social trust and cohesion enhance participation by fostering open communication and collective decision-making (Yami & Mekuria, 2022).

Inclusivity and Gender Sensitivity: Ensuring inclusivity, especially gender inclusivity, promotes equitable participation and benefits for all community members. The Participatory Approach highlights the importance of addressing power imbalances and integrating marginalized groups into decision-making processes. Begum et al. (2022) assert that women's participation leads to more equitable resource management and improved outcomes. Gender-sensitive policies foster broader participation and address power imbalances (Baral et al., 2024).

Leadership Effectiveness: Effective leadership is pivotal for engaging community members, resolving conflicts, and ensuring transparency. Strong leaders motivate members and foster participatory decision-making, aligning with Social

Capital Theory's emphasis on trust and networks. Kimengsi and Bhusal (2022) link effective leadership to improved governance and higher participation levels.

Training and Education: Training and education build members' capacity for forest management, enhancing their understanding and skills for effective participation. Luswaga and Nuppenau (2020) observe that training improves decision-making and sustainable resource use, contributing to informed and active engagement.

External Support: External support from governmental and non-governmental organizations enhances CFUG capacity by providing technical assistance, resources, and policy advocacy. Kailola et al. (2023) note that collaboration with external organizations strengthens resource mobilization and technical expertise, contributing to more effective community forest management.

Economic Dimension

The economic dimension plays a pivotal role in influencing community participation and managing forest resources effectively. The framework identifies key economic factors: economic incentives, equitable resource management, secure land rights and ownership, fair income distribution, and diversification of income sources.

Economic Incentives: Economic Incentives Theory posits that individuals are motivated by tangible benefits such as financial rewards and resources (Adhikari & Lovett, 2006). In the context of CFUGs, economic incentives are crucial for encouraging active participation in forest management. Research indicates that when community members perceive direct economic gains—such as access to forest products or financial returns—they are more likely to engage in and commit to sustainable forest practices (Sapkota et al., 2020; Sharma et al., 2020).

Equitable Resource Management: Equitable distribution of resources within CFUGs ensures that all members benefit fairly from forest resources. Kreye et al. (2021) argue that fair allocation fosters trust and cooperation, essential for effective resource management. Mbeche et al. (2021) support this by noting that equitable practices reduce conflicts and enhance the legitimacy of CFUG activities.

Secure Land Rights and Ownership: Secure land tenure is fundamental for motivating community members to actively participate in forest management. Kusters et al. (2022) highlight that secure land rights provide a sense of ownership and responsibility, which enhances commitment to sustainable practices. This concept aligns with Resource Dependency Theory, which suggests that secure access to resources motivates individuals to manage them effectively (Pfeffer & Salancik,

1978). Wren-Lewis et al. (2020) also link secure land tenure to improved community engagement, highlighting its role in reinforcing members' sense of responsibility.

Fair Income Distribution and Diversification of Income Sources: Ensuring fair income distribution and diversifying income sources are critical for maintaining motivation and reducing dependency on forest resources. Woldie et al. (2023) and Yami and Mekuria (2022) emphasize that equitable income distribution and diversified income sources enhance livelihoods and minimize conflicts over resource allocation.

Skill Development and Utilization: Skill development programs are essential for building community capacity in forest management. Dhungana et al. (2024) and Luswaga and Nuppenau (2020) highlight that training and skill development enhance competencies, enabling effective participation and maximizing economic benefits from forest resources. This aspect aligns with Resource Dependency Theory by building local capacity for effective resource management.

Participation

In the proposed Triadic Approach to SCFM, participation is a critical element influencing the effectiveness and sustainability of CFUGs. Effective participation is assessed through indicators such as meeting attendance, active involvement in discussions, and engagement in forest management tasks.

According to Hlaing and Inoue (2013) and Hayes and Murtinho (2024), regular attendance at CFUG meetings signifies commitment and interest, serving as a fundamental measure of engagement. Further, active participation in discussions and decision-making reflects a deeper level of ownership and influence over management decisions. Moreover, tangible engagement in practical activities such as planting, monitoring, and maintaining forest resources demonstrates a commitment to the forest's well-being and the implementation of effective management practices.

Theoretical Integration

The integration of Social Capital Theory, Economic Incentives Theory, Resource Dependency Theory, and the Participatory Approach provides a robust analytical framework for the Triadic Approach. These theories highlight the interconnectedness of social trust, economic incentives, and community engagement in achieving effective and sustainable CFM.

Social Capital Theory emphasizes the importance of social networks, relationships, and trust in facilitating collective action and resource management

(Putnam, 1993). This theory aligns with findings that social trust and cohesion enhance participation by fostering open communication and reducing conflicts. To fully capture these dynamics, our research employs a blend of subjective indicators, such as perceptions of trust and cohesion, and objective indicators, like network density and participation rates, which together provide a nuanced understanding of social capital within CFUGs.

Economic Incentives Theory elucidates how financial rewards and resource access motivate CFUG members to engage in forest management (Adhikari & Lovett, 2006). This theory underscores the alignment of economic incentives with participation to enhance community involvement and sustainability. Subjective indicators, such as perceived economic benefits, complement objective indicators like actual financial returns and resource access, ensuring a comprehensive assessment of how economic factors influence participation and resource management. Resource Dependency Theory complements this by explaining how communities adapt their behavior based on their dependence on external resources (Pfeffer & Salancik, 1978). It highlights the necessity of equitable resource distribution for sustaining community well-being and effective management (Leach et al., 1999). Our framework uses both subjective indicators, such as community perceptions of resource security, and objective indicators, like actual resource access and control, to capture the impact of resource dependency on management practices.

The Participatory Approach underscores the role of active community engagement in decision-making processes (Arnstein, 1969). This approach fosters ownership and accountability, essential for sustainable resource management. Subjective indicators, such as community members' perceptions of participation and empowerment, are complemented by objective indicators like participation rates and decision-making roles. This dual perspective helps evaluate both the qualitative aspects of community involvement and the measurable outcomes of participatory processes.

Rowlands (1997) emphasizes that empowerment through capacity building aligns with Resource Dependency Theory by enhancing community resource management capabilities. Inclusivity and equity, as discussed by Gaventa and Cornwall (2006), are integral to ensuring fair benefit distribution and fostering trust among community members. Robert Chambers's contributions, particularly his focus on PRA and the importance of listening to marginalized voices, further enrich this

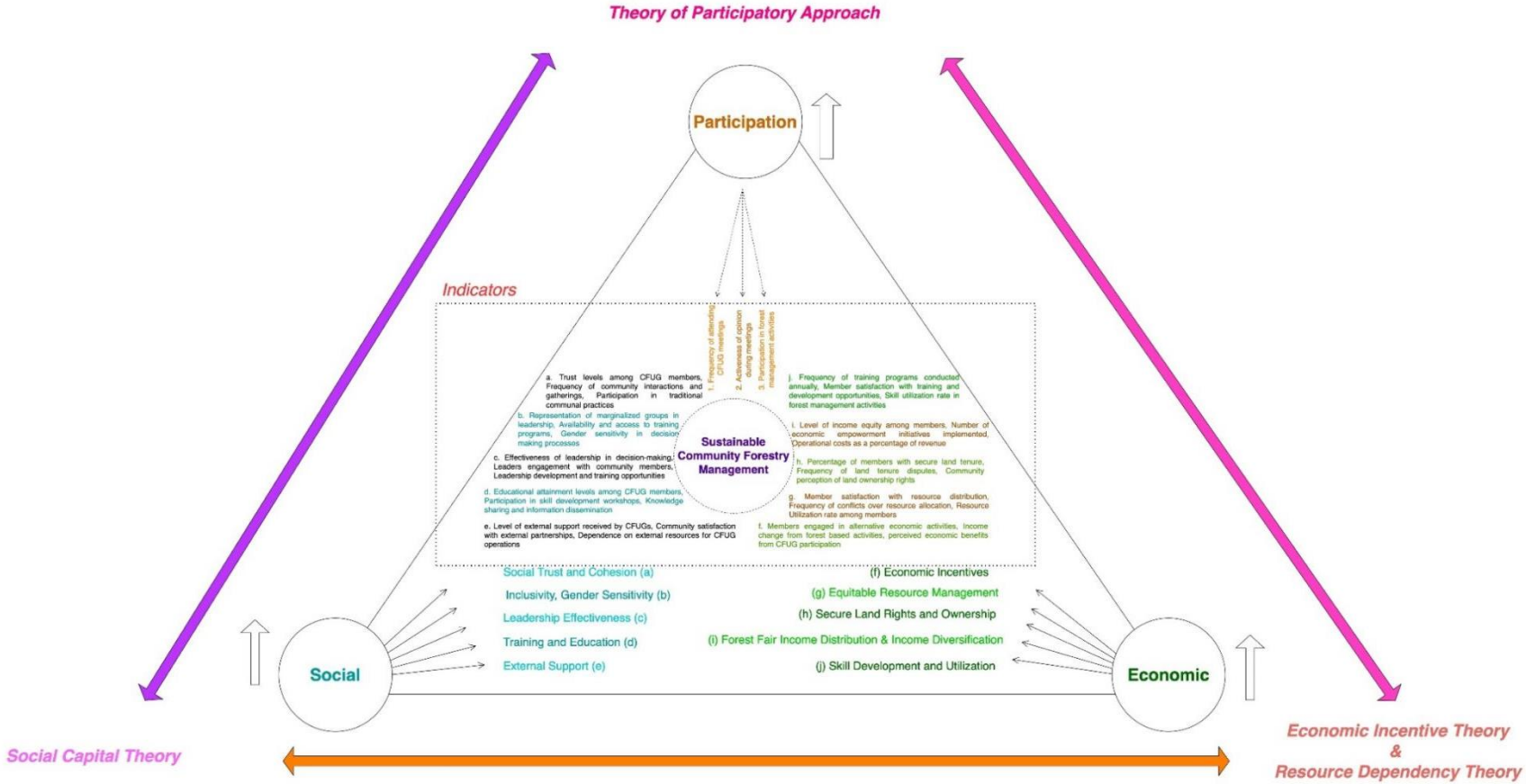
framework. Chambers (1992) and Chambers (1994) advocates for understanding the lived experiences and knowledge of marginalized communities, which complements the Participatory Approach by emphasizing the need for inclusivity and responsiveness to local contexts. His emphasis on 'Putting the Last First' highlights the importance of prioritizing the needs and perspectives of the most disadvantaged in development initiatives (Cornwall & Scoones, 2022). This aligns with the framework's focus on inclusivity and equitable participation, ensuring that all community members, especially those from marginalized groups, are actively involved in and benefit from forest management activities. Elinor Ostrom's principles on collective action and governance integrate with these theories by emphasizing community involvement in rule-making and monitoring (Ostrom, 1990). This supports the observation that strong social capital and inclusive decision-making processes enhance CFM sustainability.

In conclusion, the Triadic Approach effectively links participation with social and economic dimensions, offering a nuanced understanding of the factors contributing to successful and sustainable community forestry practices. By integrating theoretical perspectives with practical indicators, this approach provides valuable insights into the interconnected elements essential for effective CFM.

For immediate implementation, Benighat Rorang Rural Municipality can apply this approach in their initial phase of community forestry initiatives. By focusing on strengthening social networks, offering economic incentives, and promoting active community engagement, the municipality can quickly address key issues and improve the effectiveness of their forestry programs. In the long run, this research provides valuable insights into sustainable forest management and community empowerment, offering a solid framework for ongoing improvements and strategic planning.

Figure 23

Triadic Approach to Sustainable Community Forestry Management (SCFM): Conceptual framework



Components of the Triadic Approach to SCFM

Following Figure 23, which illustrates the triadic approach, Table 50 below provides a detailed outline of the sub-dimensions and indicators associated with each dimension. The table categorizes these components into social, economic, and participation dimensions. Each indicator is classified as either subjective or objective, offering a clear method for assessing various aspects of community engagement, resource management, and participation effectiveness. Our research employs a blend of both subjective and objective indicators under each sub-dimension, supported by theoretical perspectives that advocate for the utilization of both types of indicators. The table below details these indicators.

Table 51

Outline of Components and Indicators in the Triadic Approach to SCFM

Dimension	Sub-Dimensions	List of Indicators	Type of Indicators		Description	Source
			Subjective	Objective		
Social		Trust levels among CFUG members	S		This indicator measures the perceived trust among CFUG members regarding cooperation and effective forest management. It is typically assessed through surveys where members rate their trust in fellow members on a scale (e.g., from low to high trust).	Gentle et al., 2020 Oktalina et al., 2022
	Social Trust and Cohesion	Frequency of community interactions and gatherings		O	This indicator tracks the number of community meetings, social events, and gatherings attended by CFUG members over a given period. It provides quantifiable data on social interactions, offering a tangible measure of community engagement and cohesion.	Gentle et al., 2020 Mahajan et al., 2021 Oktalina et al., 2022
		Participation in traditional communal practices related to CF		O	This indicator assesses involvement in cultural and traditional practices, such as festivals, rituals, and communal ceremonies related to CF. It is objective because it can be measured by counting participation rates and observing the frequency of these events within the CFUG.	Pagdee et al., 2006
	Inclusivity, Education and Gender Sensitivity	Representation of marginalized groups in leadership		O	This indicator evaluates the proportion of leadership positions held by women and marginalized groups within the CFUGs. It is an objective measure, as it involves counting and comparing the number of such individuals in leadership roles against the total leadership positions available.	Elias et al., 2017 Oli and Treue, 2015
		Availability and access to training programs		O	This indicator measures the number of training programs available to community members and their participation levels. It involves collecting data on program offerings, attendance rates, and accessibility, making it an objective assessment.	Sapkota et al., 2020

	Gender Sensitivity in Decision-Making Processes	S		This indicator examines the extent to which gender perspectives are considered in CFUG decision-making. It involves analyzing meeting agendas and resolutions for discussions and decisions that include gender-focused content, which can be subjective due to varying interpretations of gender sensitivity.	Agarwal, 2001
Leadership Effectiveness	Effectiveness of leadership in decision-making	S		This indicator evaluates the perceived effectiveness of CFUG leaders in facilitating decision-making and resolving conflicts. Members provide feedback through surveys or interviews, making this indicator subjective as it relies on personal opinions and experiences.	Gentle et al., 2020 Hlaing and Inoue, 2013 Thapa et al., 2020
	Leaders' engagement with community members		O	This indicator measures the frequency and quality of interactions between leaders and community members. It can be assessed by tracking the number of meetings led by leaders and evaluating communication effectiveness, making it an objective measure.	Hoppe and Reinelt, 2010
	Leadership development and training opportunities		O	This indicator tracks the number and uptake of leadership development programs available to CFUG leaders. It involves counting available programs and participant numbers, providing an objective measure of leadership training efforts.	Cadman et al., 2023 Wekesa, 2017
Training and Education	Educational attainment levels among CFUG members		O	This indicator measures the highest education level achieved by CFUG members. Data is collected through surveys or records, providing an objective assessment of the community's educational background.	Elias et al., 2017 Oli and Treue, 2015
	Participation in skill development workshops		O	This indicator tracks attendance and involvement in workshops and training sessions aimed at building skills relevant to CFUG activities. It provides an objective measure by counting participant numbers and evaluating skill improvements over time	Acharya and Gentle, 2006

		Knowledge sharing and information dissemination	S	This indicator assesses the effectiveness of knowledge and information sharing within the community. It involves evaluating the frequency of knowledge-sharing sessions and the diversity of shared information, which can be subjective due to differing perceptions of effectiveness.	Oktalina et al., 2022 Upreti, 2000
	External Support	Level of external support received by CFUGs	O	This indicator measures the frequency and quality of external support from government agencies and NGOs. It is an objective measure that involves tracking the number of support initiatives and their effectiveness as perceived by the community.	Friedman et al., 2020 Ido, 2019
		Community satisfaction with external partnerships	S	This indicator evaluates the community's satisfaction with existing external partnerships. Surveys gather feedback on the adequacy and impact of external support, making it subjective due to individual perceptions and experiences.	Dhungana et al., 2024
		Dependence on external resources for CFUG operations	O	This indicator assesses the extent to which CFUG operations rely on external resources and support. It involves analyzing the proportion of resources provided externally versus those generated internally, providing an objective assessment of resource dependency.	Devkota et al., 2017
Economic	Economic Incentives	Percentage of members engaged in alternative economic activities	O	This indicator measures the proportion of CFUG members involved in economic activities outside traditional forest management, such as agriculture, handicrafts, or other small enterprises. It is considered objective because it is quantifiable through surveys or community records that document member participation in these activities.	Pandit et al., 2009
		Income change from forest-based activities	O	This indicator tracks the change in income derived from forest-based activities over time, such as timber	Nerfa et al., 2020

				harvesting or non-timber forest products. It is an objective measure, assessed through financial records, member surveys, or interviews that document changes in income levels.	
	Perceived economic benefits from CFUG participation	S		This indicator assesses members' perceptions of the economic benefits they gain through participation in CFUG activities, such as profit-sharing or access to forest resources. It is subjective because it relies on personal opinions and perceptions collected through surveys or interviews.	Pandit et al., 2009
Equitable Resource Management	Member satisfaction with resource distribution	S		This indicator evaluates CFUG members' satisfaction with how resources are distributed among them, including fairness and transparency in decision-making processes. It is subjective because it relies on personal feelings and opinions gathered through surveys or focus group discussions.	Dhungana et al., 2024
	Frequency of conflicts Over resource allocation		O	This indicator measures the number of disputes or conflicts arising from resource allocation among CFUG members. It is objective because it can be quantified by tracking conflict occurrences through meeting records, complaint logs, or interviews with members.	Upreti, 2000
	Resource utilization rates among members		O	This indicator assesses the extent to which members use the resources allocated to them, reflecting equitable distribution and participation in CFUG activities. It is objective because it can be measured by tracking resource usage data, such as resource extraction or consumption records.	McDougall et al., 2007
	Percentage of members with secure land tenure		O	This indicator measures the proportion of CFUG members who have secure land tenure, meaning legally recognized rights to the land they manage or reside on. It is an objective measure, assessed through	Singh and Chapagain, 2005 Dahal et al., 2017b

				land ownership records, member surveys, or government documentation.	
Secure Land Tenure Rights and Ownership	Frequency of land tenure disputes		O	This indicator tracks the number of disputes related to land tenure within the CFUG, which can indicate insecurity and affect community engagement. It is objective because it involves counting the occurrences of disputes using meeting records, complaint logs, or legal documents.	Dahal et al., 2017b
	Community perception of land ownership rights	S		This indicator surveys the community's perception of their land ownership rights and security. Positive perceptions are likely to enhance participation and stewardship. It is subjective because it relies on personal opinions and perceptions gathered through surveys or interviews.	Sharma et al., 2017
Fair Income Distribution and Diversification	Level of income equity among members	S		This indicator measures the perceived level of income equity within the CFUG, assessing how equitably income is distributed among members. It is subjective because it relies on members' opinions and feelings about income distribution, gathered through surveys or focus groups.	Acharya and Upreti, 2015 Maharjan, 2008
	Number of economic empowerment initiatives implemented		O	This indicator counts the number of initiatives aimed at economic empowerment and income diversification within the CFUG, such as skill development programs or microfinance opportunities. It is objective because it can be quantified by documenting the initiatives launched and their outcomes.	KC et al., 2021 Wagle, 2020
	Operational costs as a percentage of revenue		O	This indicator evaluates operational costs relative to the revenue generated from CFUG activities, such as expenses related to forest management and administration. It is objective because it involves financial analysis of cost and revenue data, providing a quantifiable measure of financial efficiency.	Paudel et al., 2021

	Frequency of training programs conducted annually		O	This indicator measures the number of training programs conducted each year for CFUG members, focusing on skills relevant to forest management. It is objective because it can be quantified by counting the number of training sessions held and documented in records.	Musyoki et al., 2016
Skill Development and Utilization	Member satisfaction with training and development opportunities	S		This indicator assesses CFUG members' satisfaction with the training and development opportunities provided, such as workshops or seminars. It is subjective because it relies on personal opinions and perceptions gathered through surveys or interviews.	Mwambeo et al., 2022 Upreti, 2000
	Skill utilization rate in forest management activities		O	This indicator tracks the extent to which skills acquired through training are applied in forest management activities, such as implementing sustainable practices or improving productivity. It is objective because it can be measured by evaluating the application of skills through performance assessments or monitoring reports.	Mwambeo et al., 2022 Upreti, 2000
Participation	Frequency of attending CFUG meetings		O	This indicator measures how often CFUG members attend scheduled meetings. It is an objective measure, as it can be quantified by counting attendance records or logs that track each member's presence at meetings over a specified period. High attendance frequency indicates active participation and engagement in decision-making processes within the CFUG.	Hlaing and Inoue, 2013 Musyoki et al., 2016
	Activeness of opinion during meetings	S		This indicator assesses the level of active engagement and willingness of CFUG members to express their opinions during meetings. It is subjective because it relies on qualitative observations and perceptions of participation dynamics, which can be gathered through surveys, meeting minutes, or observations by	Hlaing and Inoue, 2013 Musyoki et al., 2016

			facilitators. This indicator reflects the confidence and involvement of members in discussing issues and contributing ideas.	
	Participation in forest management activities	O	This indicator evaluates the extent to which CFUG members are involved in forest management activities, such as planting, monitoring, and harvesting. It is objective because it can be quantified by documenting the number of members participating in specific activities, hours contributed, or tasks completed. High participation rates indicate active involvement and commitment to managing forest resources sustainably.	Hlaing and Inoue, 2013 Musyoki et al., 2016

Utilization of the Proposed Framework

The proposed framework, currently in the conceptual phase, includes 33 indicators designed to evaluate participation and sustainability in community forest management. These indicators have not yet been empirically validated. They are intended for future studies and can be adapted to develop a comprehensive questionnaire. Researchers can modify and tailor these indicators to meet the specific requirements and objectives of their studies, ensuring alignment with their research context.

Before applying these indicators in research settings, further refinement and validation are necessary to confirm their relevance and accuracy. Researchers should consider conducting pilot studies and engaging with stakeholders to enhance the reliability and validity of these indicators. Although the framework is initially tailored for community forest management, it may be adapted for other research areas, serving as a foundational tool for assessing various dimensions of community participation and sustainability.

Concluding the Chapter

In summary, this thesis delves into the complexities of participation within CFUGs in Benighat Rorang Rural Municipality, Dhading district, Nepal. By examining the interplay between social and economic factors, the study elucidates their impact on community engagement and subsequent forest management outcomes. To address these complexities and enhance the effectiveness of community forestry, the study proposes a Triadic Approach. This framework emphasizes the interconnectedness of these dimensions, providing a holistic perspective for sustainable forest management. By integrating social capital, economic incentives, and active community engagement, the Triadic Approach offers a promising pathway for strengthening CFUGs and achieving long-term conservation goals.

CHAPTER VII
RECOMMENDATIONS

This chapter includes detailed recommendations aimed at various levels: federal level, provincial level, local level, and suggestions for future research.

The study proposes following recommendations (Table 52) to enhance CFUG participation and promote meaningful engagement among stakeholders:

Table 52
Recommendations from the Study

Level of Government	Key Suggestions
Federal	**Improve Knowledge Management:** Establish centralized systems for documenting and sharing best practices across CFUGs to prevent knowledge loss due to institutional changes. **Focus on Capacity Building:** Allocate federal funds for training programs that enhance economic empowerment and gender sensitivity, specifically targeting leadership skills for women and marginalized groups.
Provincial	**Promote Inter-Provincial Collaboration**: Set up platforms for provinces to share successful CFUG strategies, addressing resource management and participation challenges collaboratively. **Enact Inclusive Policies:** Develop and enforce gender-sensitive policies that ensure women's participation in CFUG leadership roles, aligning with community-specific needs.
Local	**Adopt Triadic Approach Framework** For immediate implementation, Benighat Rorang Rural Municipality should use the Triadic Approach framework to guide their initial phase of community forestry initiatives, in collaboration with external supporting organizations.

	Adopt Scientific Forest Management: Implement evidence-based forestry practices that balance conservation with community needs, enhancing ecological and economic outcomes.
	Boost Community Engagement: Create local employment and income diversification opportunities to reduce youth outmigration and strengthen community participation in CFUGs.

Suggestions for Future Research

- The Triadic Approach framework proposed in the conclusion chapter can be adopted by academicians for further research, with a focus on refining its components and developing a more comprehensive methodology.
- Conduct longitudinal studies to track the long-term impact of governance reforms and community empowerment initiatives on sustainable forest management outcomes.
- Explore comparative studies across diverse geographic regions and cultural contexts to identify contextual factors influencing CFUG dynamics.

Concluding the Chapter

To enhance CFUG participation and engagement, this study provides actionable recommendations for various governmental levels. At the federal level, it is crucial to improve knowledge management by establishing centralized systems for documenting and sharing best practices across CFUGs, thus preventing knowledge loss due to institutional changes. Additionally, the federal government should focus on capacity-building initiatives that enhance economic empowerment and gender sensitivity, particularly through leadership training for women and marginalized groups. Provincial governments are encouraged to promote inter-provincial collaboration by setting up platforms to share successful CFUG strategies and to enact inclusive policies that ensure women's leadership roles in CFUGs. At the local level, Benighat Rorang Rural Municipality should adopt the Triadic Approach framework, as detailed in the conclusion chapter, to guide their community forestry initiatives. Implementing scientific forest management practices and creating local employment opportunities will address youth outmigration and boost community participation. For future research, academicians should refine the Triadic Approach framework and conduct longitudinal studies to evaluate the long-term impacts of governance reforms.

Comparative studies across different regions could also provide insights into factors influencing CFUG dynamics. These steps are designed to align governance with ecological and economic goals, fostering sustainable forest management and community development across Nepal.

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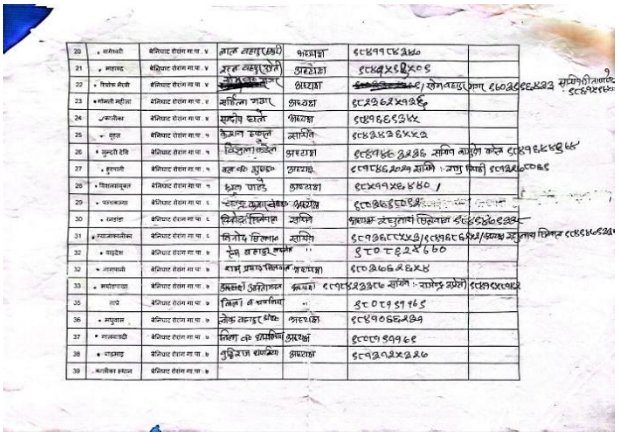
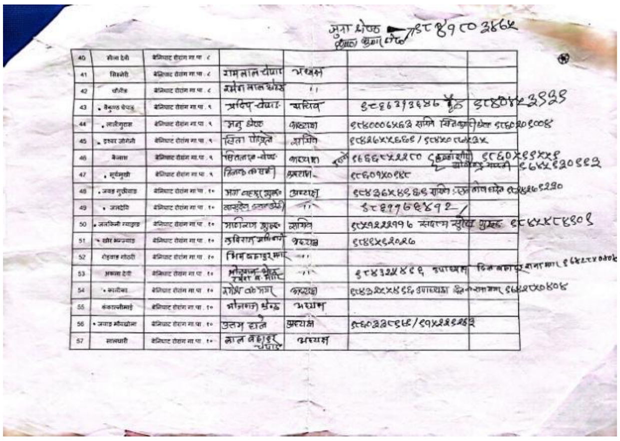
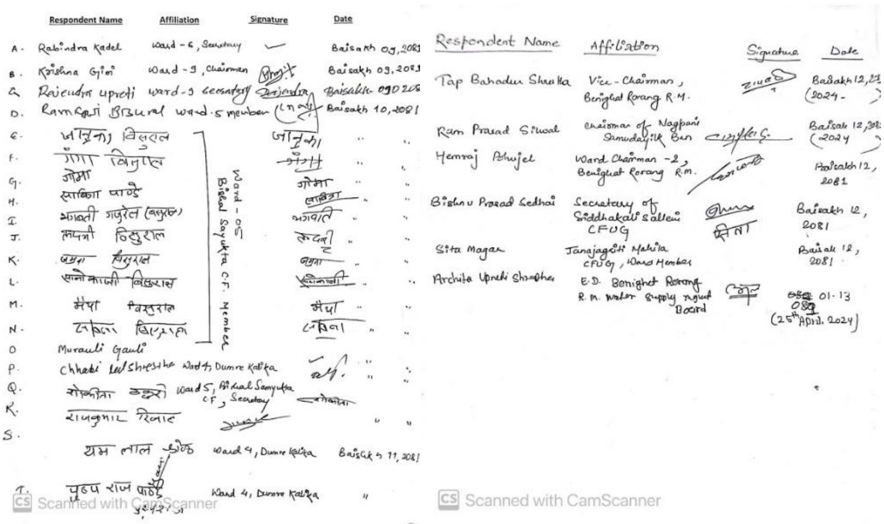
APPENDICES

Appendix A: CFUGs Contact List Provided By SDFO





Appendix B: Written Consent from KII respondents and CFUGs EC members



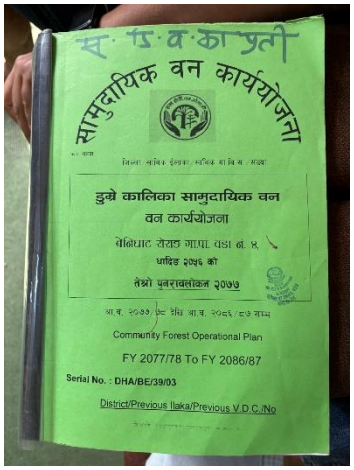
Respondent Name	Affiliation	Signature	Date
A. Rabindra Kadel	Ward - 6, Secretary		Baisakh 09, 2081
B. Krishna Giri	Ward - 9, Chairman		Baisakh 09, 2081
C. Rajendra Upreti	Ward - 9 Secretary		Baisakh 09 2081
D. Ram Gopi Bhurel	Ward - 5 member		Baisakh 10, 2081

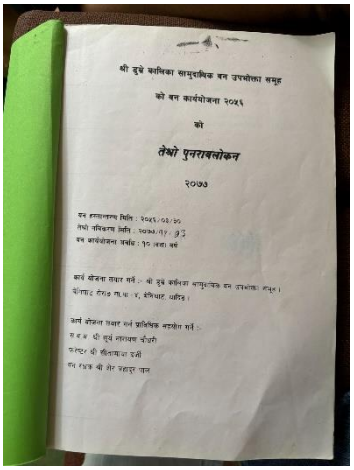
Respondent Name	Affiliation	Signature	Date
Tap Bahadur Shrestha	Vice-Chairman, Benighat Rorang R.M.		Baisakh 12, 2081 (2024-)
Ram Prasad Siwal	Chairman of Nagpani Samudayik Ban		Baisakh 12, 2081 (2024)
Hemraj Bhujel	Ward Chairman -2, Benighat Rorang R.M.		Baisakh 12, 2081
Bishnu Prasad Sedhai	Secretary of Siddhakali Sallew CFUG		Baisakh 12, 2081
Sita Magar	Janajagriti Mahila CFUG, Ward Member		Baisakh 12, 2081
Archita Upreti Shrestha	E.D. Benighat Rorang R.M. Water Supply Board		081 01-13 (25th April, 2024)

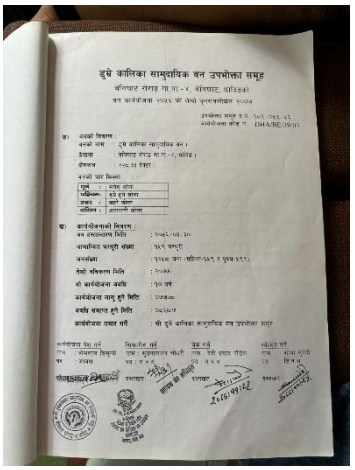
Scanned with CamScanner

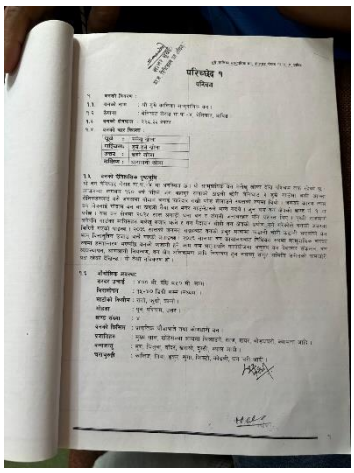
Appendix C: Operational Plan of CFUGs

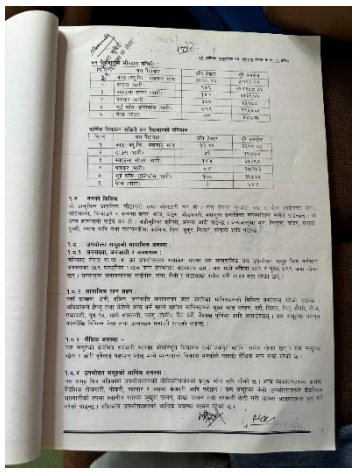
Dumre Kalika CF Operational Plan:

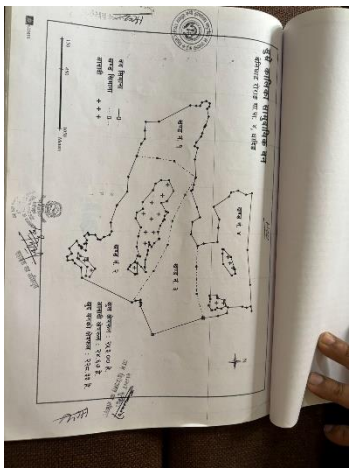


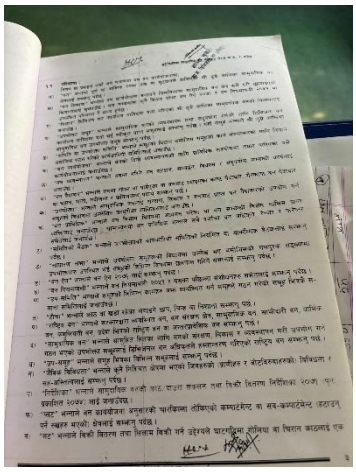


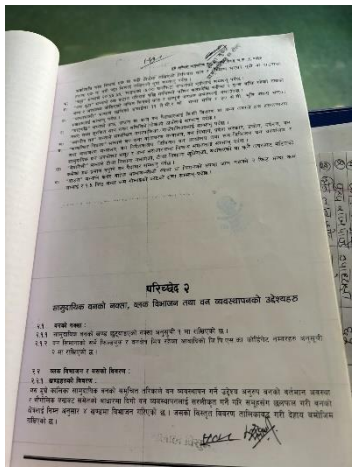




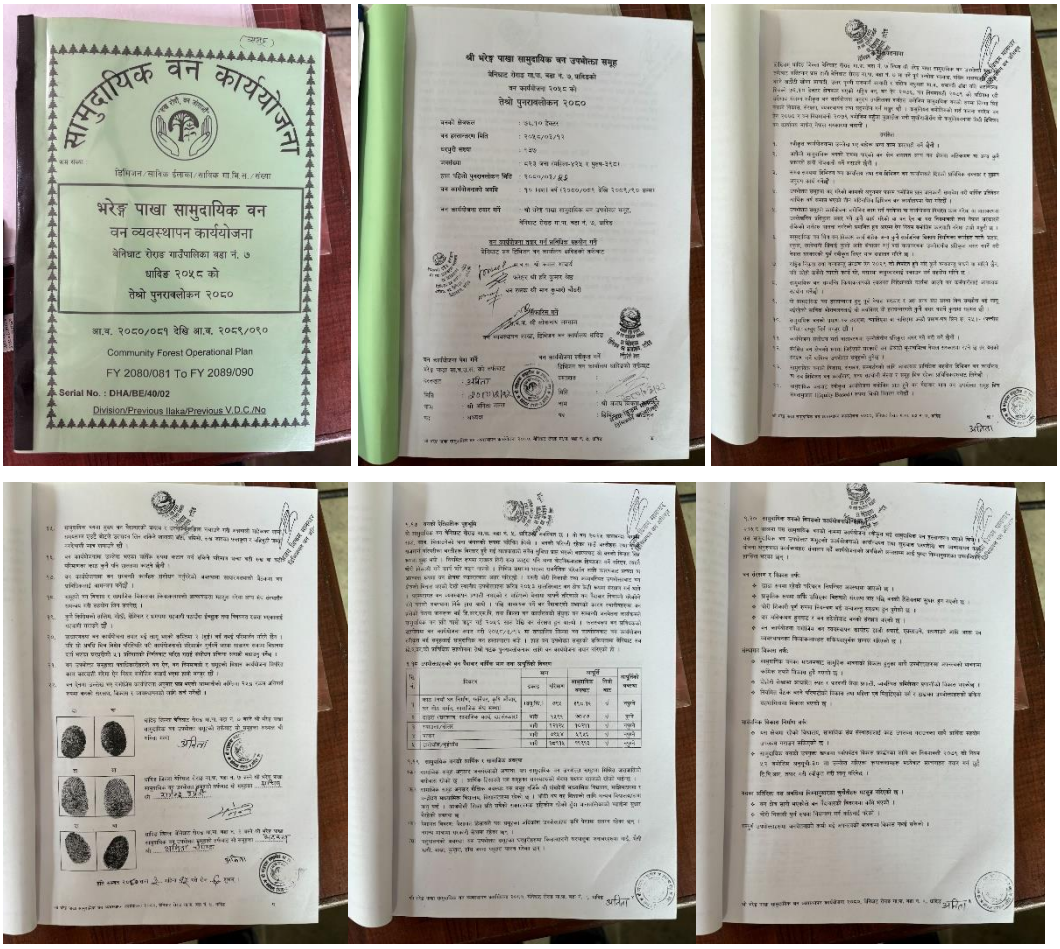




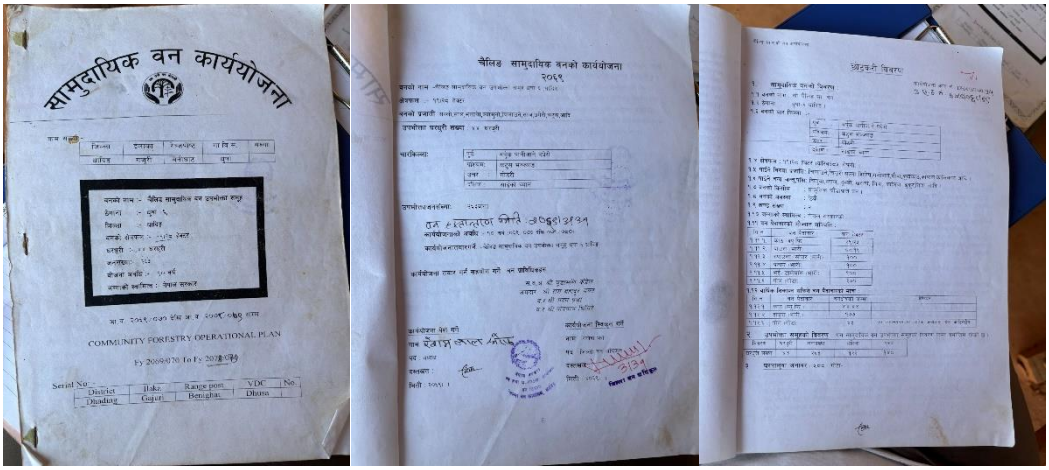


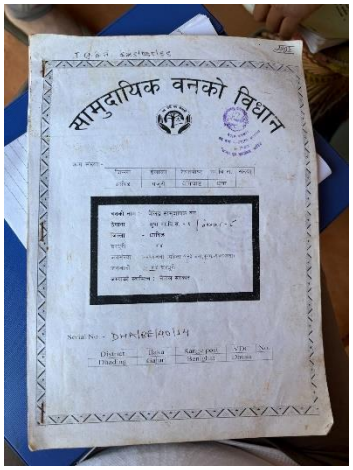


Bharyang Pakha CF Operational Plan:



Chailing CF Operational Plan and Legislation:

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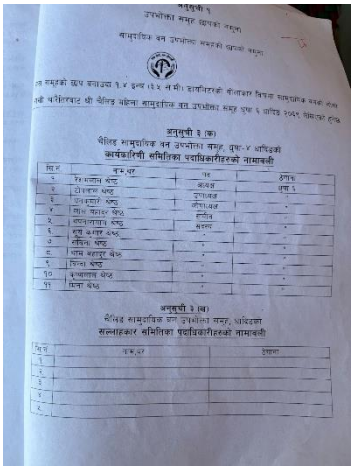

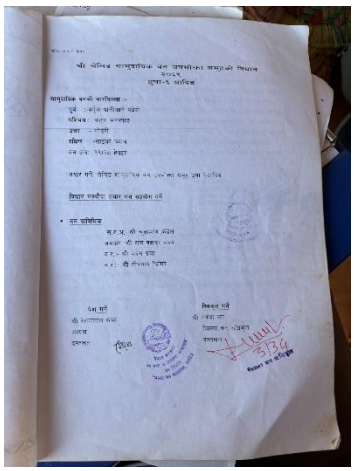

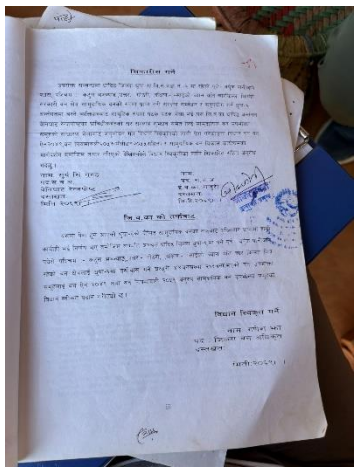

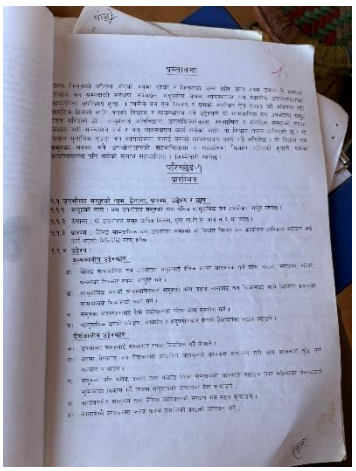

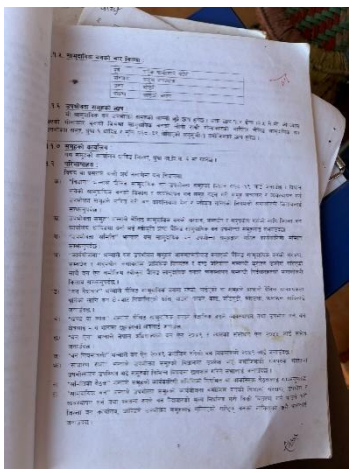

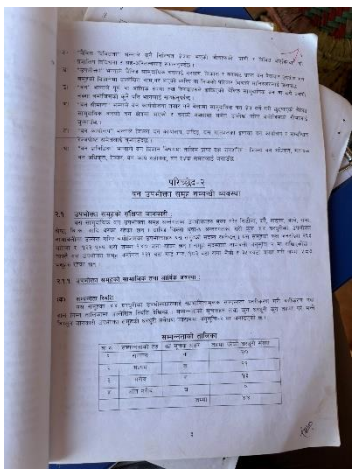

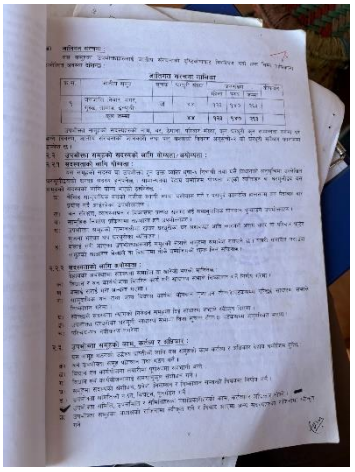

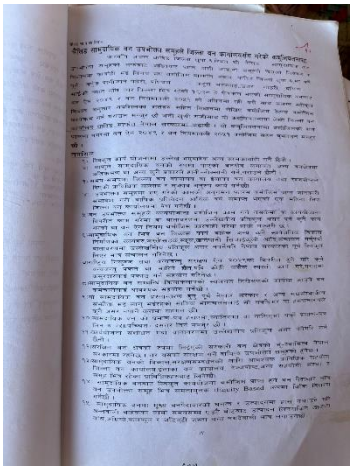
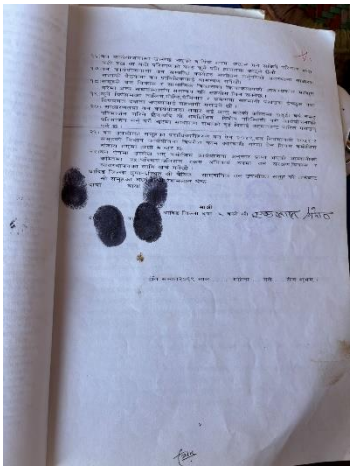

Appendix D: Data Collection – Interaction with CFUGs







Kamal Acharya

Appendix E: Field Observation of Livelihood and Available Resources

Tree leaf fodder for livestock (a) and firewood from agricultural field for HH use (b) Ageratina adenophara, also known as Mexican devil, Crofton weed or banmara (c)

Agriculture based livelihoods (In picture: Okra/ Lady Finger field (a) and Cow dung used as manure as agricultural fertilizer (b)

Livestock rearing (Goats, Cow/ Buffalo, Hen) as observed in communities

Livestock rearing (Goats and Buffalo) as observed in communities

Appendix F: KII with Representatives from Local Level and CFUG EC

With Taap Bahadur Shrestha, Vice-Chairperson of Benighat Rorang RM; Kamal Acahrya, Forest Officer, Sub-division Forest Office of Benighat Rorang RM, and Maniraj Gurung, Assistant Fifth Division of Disaster Branch, Benighat Rorang Rural Municipality (Right to Left)

(a) *(b)*

With Hemraj Bhujel, Ward Chairperson of Ward 02 (a) and Archita Upreti Shrestha, Executive Director of Benighat Rorang R.M. Water Supply Management Board (b), Benighat Rorang - 02


(a) *(b)*

With Ram Prasad Silwal, Chairperson of Nagpani CFUG (a) and Rajendra Uprety, Secretary of Bharyang Pakha CFUG (b) of Benighat Rorang - 07


(a) *(b)*

With Resham Lal Shrestha, Chairperson of Chailing CFUG (a) and Pawan Khanal, Ward Secretary of Ward 08, and Kamal Acharya, Forest Officer of SDFO (Left to Right) (b), Benighat Rorang RM

Appendix G: Submission of Key Findings and Recommendations to the Minister of Forests and Environment, Government of Nepal

With Honorable Minister of Forests and Environment, Government of Nepal, Ain Bahadur Shahi Thakuri

Appendix H: Questionnaire for the Survey

Forest Code:
Name of CF/ CFUG:

Personal Information:
Name of Respondent:
Gender Male Female Other (specify)
Age Under 25 25 – 35 36 – 45 46 – 55 56 -65 Over 65
Caste Brahmin/ Chhetri Thakuri Indigenous (Adibasi Janajati)
Dalit Other (specify)

Open- Ended Questions
1. Operational Plan and Management
Are you aware about the CF operational plan?
Does your CF have an operational plan?
Has the operational plan been renewed? If not, why?
2. Income Sources and Utilization
Main income source for the CF (e.g., forest products, timber sales, medicinal herbs, ecotourism)?
Do HHs utilize forest products? If so, for what purpose?
Main income source for your HH?
Other income sources?
Has the forest contributed to your income?
Has the forest created employment opportunities?
Are there any community-based forest enterprises or businesses?
3. Transparency and Fund Management
Is there transparency in the CFUGs funds?
How is transparency maintained?
How is fund mobilization carried out?
Are you aware of the yearly audit process?
4. Meetings and Participation
How regularly does the committee meet?
Is the CFUG General Assembly held annually?
How active is the participation of members in CFUG activities?
Is there representation of marginalized groups in the CFUG?
5. Forest Management and Activities
How often are forest management activities conducted?
Rate your awareness and knowledge of forest management?
Are you aware of the other services that the forest provides (non-carbon benefits)?
6. Information Flow and Communication
What mechanisms are in place for information flow within the CFUG?
7. Resource Dependency and Livestock Management
What is your level of dependency on forest resources?
How do you manage the resource requirements of your livestock?
8. Participation Challenges and Illegal Activities
What are the hindrances to participation in CFUG activities?
What is the status of illegal resource extraction?

Is there any mechanism in place to control illegal resource extraction?

Close-Ended Questions

Social Factors

Trust and Social Cohesion

Trust within the group

1. Rate the trust level in CFUG members (1-5): Very Low / Low / Moderate / High / Very High

Group Identity/Sense of Community

1. Sense of belonging to CFUG: Very Weak / Weak / Moderate / Strong / Very Strong

Conflict Resolution Mechanisms

1. Are there conflict resolution mechanisms in CFUGs? Yes / No / Not sure
2. Effectiveness of these mechanisms: Very Ineffective / Ineffective / Moderate / Effective / Very Effective

Inclusivity and Diversity

Gender Representation

1. Are women adequately represented in CFUG leadership roles? Yes / No / Not Sure
2. Equal participation opportunities for men and women? Strongly Agree / Agree / Neutral / Disagree / Strongly Disagree

Education Diversity

1. Highest level of education: No Formal / Primary / Secondary / Higher
2. Overall literacy level in CFUG: High / Moderate / Low
3. Contribution of diverse educational backgrounds: Strongly Agree / Agree / Neutral / Disagree / Strongly Disagree

Caste Diversity

1. Diverse representation of caste/ethnic groups in CFUG? Yes / Somewhat / No

Equitable Access to Resources

- Firewood consumption (Headload per household per year): _____
- Timber consumption (m^3 per household per year): _____

1. Equitable access to forest resources for diverse groups: Strongly Agree / Agree / Neutral / Disagree / Strongly Disagree
2. In your opinion, how does ensuring inclusivity and diversity within your CFUG affect participation in forest management activities? MCQ

- ☐ It promotes equitable decision-making and representation.
- ☐ It encourages diverse perspectives and innovative solutions.
- ☐ It fosters social cohesion and reduces marginalization.
- ☐ It increases collective ownership and responsibility.
- ☐ Other (please specify): _____

Leadership and Governance

Trust in Community Leaders

1. Trust in CFUG leaders' decisions: Completely / Mostly / Neutral / Mostly No / No Trust
2. Does this trust influence your participation? Yes / No / Not Sure

   If yes, how?

   - ☐ It motivates me to participate more actively
   - ☐ It makes me feel more confident in decision-making processes
   - ☐ It strengthens my sense of belonging to the community
   - ☐ Other (please specify):

Leadership Effectiveness

1. Leadership effectiveness: Very Ineffective / Ineffective / Moderate / Effective / Very Effective
2. Does this influence your participation? Yes / No / Not Sure

   If yes, how?

   - ☐ It inspires me to contribute more to the group's efforts
   - ☐ It encourage me to attend meetings & engage in discussions
   - ☐ It fosters a sense of unity and cooperation among members
   - ☐ Other (please specify):

Accountability Mechanisms

1. Clear accountability mechanisms in CFUG: Yes / Somewhat / No
2. Influence of these mechanisms on your participation? Yes / No / Not Sure

   If yes, how?

   - ☐ It gives me confidence that decisions are made transparently and fairly
   - ☐ It encourages me to take on leadership roles and responsibilities
   - ☐ It motivates me to actively monitor and participate in CFUG activities
   - ☐ Other (please specify)
3. Satisfaction with CFUG governance: Very Satisfied / Satisfied / Neutral / Dissatisfied / Very Dissatisfied
4. Does this satisfaction influence your participation? Yes / No / Not Sure

   If yes, how?

   - ☐ It encourages me to volunteer for tasks and projects
   - ☐ It motivates me to attend CFUG meetings and events regularly
   - ☐ It increases my willingness to contribute financially or with resources
   - ☐ Other (please specify):

Community Engagement

Community Awareness and Knowledge

1. Awareness and understanding of CFM goals and practices: Low / Moderate / High / Very High
2. Frequency of training sessions related to CFM: Low / Moderate / High / Very High
3. Participation in training sessions: Low / Moderate / High / Very High

4. Skills of CFUG members for CFM: Strongly Agree / Agree / Neutral / Disagree / Strongly Disagree

Communication and Information Sharing

Communication Channels

1. Primary communication method: In-person / Phone / Messaging apps / Email / Other (specify :_____)
2. Frequency of communication: Daily / Weekly / Monthly / Occasionally / Rarely

Access to Information

1. Ease of accessing forest management information: Very Easy / Easy / Moderate / With Difficulty / Not at all
2. Primary information sources: CFUG meetings / Government publications / Training sessions / Local NGOs / Other (specify: _____)

Knowledge Sharing Culture

1. Willingness to share forest management expertise: Very Willing / Willing / Neutral / Unwilling / Very Unwilling
2. Frequency of knowledge-sharing activities: Frequently / Occasionally / Rarely / Never
3. Rate your level of participation in forest management activities within CFUG? Very high / High / Moderate / Low / Very low
4. What influence your level of participation in forest management activities the most?
   - ☐ Effective communication and information sharing
   - ☐ Access to relevant information
   - ☐ Knowledge sharing culture
   - ☐ Other (please specify): _____
5. Satisfaction with current level of communication, information sharing, and knowledge-sharing culture within your CFUG? Very satisfied / Satisfied / Neutral / Dissatisfied / Very dissatisfied

Social Networks and Relationships

Network Diversity/ Support and collaboration from external organizations:

1. Rate the level of support and assistance provided by external organizations (NGOs, government agencies, development partners) to your CFUG? Very high / High / Moderate / Low / Very low
2. Frequency of interaction with external organizations? Daily / Weekly / Monthly / Occasionally / Rarely

Extent of Social Network and Connections:

1. Frequency of social interaction (face-to-face meetings, phone calls, etc.) with CFUG members? Daily / Weekly / Monthly / Occasionally / Rarely

Inter-group Relationships

1. Rate the quality of relationships between different groups (ethnic, religious, economic, etc.)? Very poor / Poor / Moderate / Good / Very good
2. Number of collaborative activities organized between different groups in the past year?

None 1-2 3-4 5-6 More than 6

3. Satisfaction with current level of support, social networks, and inter-group relationships within your CFUG? Very satisfied / Satisfied / Neutral / Dissatisfied / Very dissatisfied

Economic Factors

Equitable Resource Allocation

Availability of Forest Products

1. Availability of forest products: Very Poor / Poor / Fair / Good / Very Good
2. Ease of accessing forest resources: Very Easy / Somewhat Easy / Neutral / Somewhat Difficult / Very Difficult
3. Legal/regulatory barriers to accessing resources? Yes / No (If yes, specify: _____)
4. Fairness in forest product distribution: Very Fair / Fair / Neutral / Unfair / Very Unfair
5. Policies for equitable resource access? Yes / No / Don't Know (If yes, specify: _____)
6. Equitable resource distribution encourages participation: Strongly Agree / Agree / Neutral / Disagree / Strongly Disagree

Transparent Resource Management

1. Transparency in resource management decisions: Not Transparent / Slightly Transparent / Moderately Transparent / Very Transparent / Completely Transparent
2. Frequency of being informed about resource management decisions: Never / Rarely / Sometimes / Often / Always

Access to Market Information

1. Frequency of receiving market information: Very Frequently / Occasionally / Rarely / Never
2. Accessibility of market information: Not Accessible / Slightly Accessible / Moderately Accessible / Very Accessible / Completely Accessible
3. Impact of market information on decision-making: Significantly / Moderately / Slightly / Not at all
4. Impact on participation due to access to market information and price data:

- ☐ Increases motivation to participate due to better market opportunities
- ☐ Helps in planning and managing forest resources more effectively
- ☐ Has no effect on participation
- ☐ Reduces participation due to market challenges
- ☐ Other (please specify): _____

Asset Ownership

Land Tenure Security

1. Secure land tenure rights: Yes / No
2. Impact of secure land tenure on participation: Increases involvement / Provides sense of ownership / No significant impact / Others (specify: _____)

Ownership of Capital Assets

1. Ownership of forest management tools/equipment: Yes / No

2. Ownership of transportation vehicles: Yes / No

3. Impact of owning capital assets: More efficient tasks / Facilitates access / Increases income / No significant impact / Other (specify: _____)

Possession of Livestock for Forest-Based Livelihoods

1. Livestock ownership: Cow/Ox / Goats/Sheep / Buffaloes / Chicken / Other (specify: ____)

2. Impact of livestock on participation: Additional income / Livelihood diversification / Resource utilization / No significant impact / Other (specify: _____)

Income Generation

Income Growth Rates

1 Primary income sources: Forest-related / Agriculture / Livestock / Job/Service / Wage labor / Handicrafts / Ecotourism / Other (specify: _____)

Diversification of Income Sources

1. Monthly household income
   >50,000 20,000 - 49,999 10,000 - 19,999 5,000-9,999
   2,500 – 4,999 1000-2499 <1000
2. Over the past 1 year, engaged in generating income from forest-related activities (such as timber harvesting, non-timber forest product collection) and alternative livelihood options (such as agriculture, ecotourism)? Yes / No
3. If yes, has your HH income from those activities increased? Yes, significantly / Yes, moderately / No, it remained same / No, it decreased
4. Primary expenses incurred in CF activities?
   Forest management activities (e.g., patrols, fire prevention)
   Infrastructure development Capacity building and training
   Marketing and promotion Administrative costs
   Other (please specify)
5. Is your income more than the expenses incurred from forest activities? Yes / No
   Is yes, does this motivate/ encourage you to participate more in forest-related activities? Yes, definitely / Yes, to some extent / No, not really / I don't know

Income Equity

1. Income generated from forest management activities distributed equitably? Yes, definitely / Yes, to some extent / No, not really / I don't know
2. Mechanisms to ensure equitable distribution of income from forest management activities? Yes / Somewhat / No / Not sure
3. Fairness and equity in the distribution of income generated from forest management activities among HHs within CFUG? Very fair / Fair / Neutral / Unfair / Very unfair

Cost Reduction and Savings

Access to Microcredit and Savings

1. Access of microcredit or savings mechanisms for funding community forest management activities or income-generating ventures? Yes / No / Not sure

If yes, how frequently do you utilize microcredit or savings for community forest management activities? Regularly / Occasionally / Rarely / Never utilized

2. Type of expenses covered using microcredit or savings for CFM?

- Purchase of equipment or tools
- Training and capacity building
- Infrastructure development (e.g., construction of facilities)
- Forest management activities (tree planting, fire prevention, etc.)
- Livelihood diversification (agricultural inputs, livestock)
- Other (specify)

3. How has access to microcredit or savings mechanisms benefited your participation in community forest management activities?

- ☐ Enabled investment in forest management initiatives
- ☐ Improved livelihood opportunities
- ☐ Enhanced financial resilience
- ☐ Other (Please specify): _____

Reduced Input Costs / Cost Efficiency Measures

1. Aware of any cost-reduction strategies implemented within your CFUG to improve resource management practices? Yes / No / Partially
   If yes, please indicate which cost-reduction strategies are currently being implemented:
   - ☐ Improved resource management practices
   - ☐ Adoption of energy-efficient technologies
   - ☐ Reduction in input costs (e.g., seeds, fertilizers)
   - ☐ Other (Please specify): _____
2. Effectiveness of cost-reduction strategies in improving the economic viability of CFM activities? Very effective / Somewhat effective / Not effective / Not sure

Collective cost-saving initiatives

1. Participation in any collective cost-saving initiatives within your CFUGs? Yes / No
   If yes, please specify type of collective cost-saving you have participated in:
   - ☐ Group purchasing of seeds
   - ☐ Group purchasing of tools or equipment
   - ☐ Shared transportation arrangements
   - ☐ Other (Please specify): _____
2. Impact of participation in collective cost-saving initiatives in your ability to engage in CFM activities?
   - ☐ Enabled access to necessary resources
   - ☐ Reduced financial burden on individual members
   - ☐ Increased efficiency of forest management activities
   - ☐ Other (Please specify): _____

3. Have these cost-saving measures or efficiency measures resulted in noticeable reductions in input costs or improved cost-effectiveness? Yes, significantly / Yes, to some extent / No, not noticeable

Perception: Influence of the following factors on your participation in CFM activities

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Access to microcredit schemes and savings mechanisms enables me to participate more effectively in community forest management activities.					
Awareness and implementation of cost-reduction strategies within our CFUG encourage my participation in community forest management activities.					
Participation in collective cost-saving initiatives, such as group purchasing or shared transportation arrangements, motivates me to participate more actively in community forest management activities.					

Skills Development

Training Participation Rate

1. Participation in any skills development or capacity-building programs related to forest management, entrepreneurship, or value-added processing organized by CFUG? Yes / No
   If yes, how many training sessions have you attended in the past year? (Choose one)
   None 1-2 3-5 More than 5
2. Did you complete the training programs you enrolled in? (Choose one)
   Yes, completed all Yes, completed some No, did not complete any
3. Satisfaction with the content and delivery of the training sessions? (Choose one for each)
   Content: Very dissatisfied / Somewhat dissatisfied / Neutral / Somewhat satisfied / Very satisfied
   Delivery: Very dissatisfied / Somewhat dissatisfied / Neutral / Somewhat satisfied / Very satisfied
4. How does participating in skills development programs influence your willingness to participate in community forest management activities?
   - ☐ Increases my willingness to participate
   - ☐ No significant impact
   - ☐ Decreases my willingness to participate

Skill Utilization

1. Have you applied the skills acquired through training programs in practical forest management activities within CFUG? Yes / No
   If yes, how frequently do you apply the skills learned from training sessions in your day-to-day forest management activities? (Choose one)
   Rarely Sometimes Often Always
2. Which of the following forest management activities have you actively engaged in using the skills acquired from training programs? (Check all that apply)
   Tree planting Forest inventory Sustainable harvesting techniques
   Others (Specify)

3. Rate your confidence in applying the skills learned from training programs to practical forest management activities? Not confident at all (1) 2 3 4 Very confident (5)

Skill Retention and Transfer

1. How confident are you in retaining the skills learned from training sessions over time? (Choose one) Not confident at all Somewhat confident Moderately confident Very confident
2. Have you had opportunities to share or transfer the skills you have acquired with other community members? (Choose one)
   Yes, frequently Yes, occasionally No, rarely No, never

Participation Indicators:

1, Frequency of attending CFUG meetings: Rarely / Occasionally / Regularly / Always

2. Activeness in expressing opinions during meetings: Not Active / Somewhat Active / Active / Highly Active

3. Frequency of participation in forest management activities: Rarely / Occasionally / Regularly / Always

4. Frequency of involvement in decision-making: Rarely / Occasionally / Regularly / Always

Appendix I: Social and Economic Factors Indicators

Social Factors

Sub-dimensions	Indicators	Description	Verifiers	Source
Trust and Social Cohesion	Trust within the group	This indicator measures the level of trust among members of the community forest user group. Higher trust indicates better cooperation and willingness to work together towards common goals.	Level of trust among CFUG members	Gentle et al., 2020 Lancee, 2017 Lise, 2000 Mahajan et al., 2021 Oktalina et al., 2022
	Group Identity/ Sense of Community	Group identity refers to the sense of belonging and shared identity among members of the community forest user group. A strong group identity fosters solidarity and collective action.	Presence of strong group identity	Gentle et al., 2020 Mahajan et al., 2021 Oktalina et al., 2022
	Conflict resolution mechanisms	The presence and effectiveness of processes to address disagreement or disputes within the group, fostering a cooperative environment.	Presence and effectiveness of conflict resolution mechanisms/ strategies within and outside group	Mahajan et al., 2021
Inclusivity and Diversity	Gender Representation	This indicator measures the representation and participation of both men and women within the Community Forest User Groups (CFUGs). Gender balance ensures diverse perspectives and equitable decision-making in forest management processes.	Representation of women within CFUGs Participation level of women in different levels	Elias et al., 2017 Oli and Treue, 2015
	Education Diversity	Educational diversity assesses the educational backgrounds and levels of literacy among CFUG members. Inclusive participation of individuals with varied educational backgrounds enhances collective problem-solving and innovation in forest management.	Distribution of educational backgrounds among CFUG members	Elias et al., 2017 Oli and Treue, 2015
	Caste Diversity	Caste and ethnic diversity evaluate the representation of different caste and ethnic groups within CFUGs. Inclusive participation of diverse social groups promotes social cohesion, reduces marginalization, and ensures equitable access to forest resources and benefits.	Representation of different caste and ethnic groups within CFUGs	Elias et al., 2017 Oli and Treue, 2015
Leadership and Governance	Trust in Community leaders	This measures the level of trust that community members have in their leaders, including those leading the forest	Trust in CFUGs leaders capability	Gentle et al., 2020

		management efforts, which is crucial for effective leadership and governance.		
	Leadership Effectiveness	This indicator assesses the effectiveness of leadership within the community forest user group. Effective leadership provides direction, resolves conflicts, and mobilizes members for collective action.	Leadership effectiveness in forest management activities	Gentle et al., 2020 Hlaing and Inoue, 2013 Thapa et al., 2020
	Accountability Mechanisms	Accountability mechanisms ensure that leaders and members of the community forest user group are held accountable for their actions and decisions. Transparent and accountable governance structures promote trust and legitimacy	Mechanisms in place to hold members accountable	Gentle et al., 2020 Hlaing and Inoue, 2013
Community Engagement and Participation	Community Awareness and Knowledge	Level of awareness and understanding among community members about goals, benefits, and practices of CFM. Similarly, availability of members with skills necessary for different stages of CFM, and opportunities for members to acquire new knowledge or skills relevant to CFM, including education and training sessions, etc.	Types of training in CF leadership, Gender, Good Governance, Decision making Participation in different training sessions?	Apipoonyanon et al., 2020 Wekesa, 2017
Communication and Information Sharing	Communication Channels	This indicator evaluates the channels and frequency of communication within the community forest user group. Effective communication channels facilitate the exchange of information, ideas, and feedback.	Mechanism of flow of information within CFUG Frequency of communication Perceived effectiveness of communication	Santos, 2018 Upreti, 2000
	Access to Information	Access to information assesses the availability and accessibility of relevant information related to forest management practices, policies, and regulations. Accessible information empowers members to make informed decisions and participate effectively.	Accessibility of information Utilization of information sources Perceived impact of information access	Lise, 2000 Upreti, 2000
	Knowledge Sharing Culture	Knowledge sharing culture refers to the willingness of members to share their expertise, experiences, and traditional knowledge related to forest management. A culture of knowledge sharing promotes learning and innovation within the community.	Willingness to share expertise Frequency of knowledge sharing activities	Oktalina et al., 2022 Upreti, 2000
Social networks and relationships	Network Diversity/ Support and Collaboration	This indicator measures level of support & assistance provided by external organizations (NGOs, gov. agencies,	Membership with federation	Friedman et al., 2020 Ido, 2019

	from External Organizations	development partners, to the community forest user group. Frequency and quality of interactions with these groups can enhance capacity, provide technical expertise, and access to resources.	Frequency of interaction with external organizations and linkages with other line agencies Level of support received Resources accessed	
	Extent of Social Network and Connections	This indicator evaluates the extent and strength of social networks and connections within the community. Strong social networks facilitate communication, resource sharing, and collective decision-making.	Size of social network Frequency of social interactions Strength of social ties	Gentle et al., 2020 Lise, 2000 Oktalina et al., 2022 Oli and Treue, 2015
	Inter-group Relationships	Quality of relationships between different groups within the community (e.g., ethnic, religious, or economic groups), affecting the ability to work together towards common goals.	Formation of sub groups/ special interest groups Quality of inter group relationship Frequency of intergroup collaborative activities Perceived impact of intergroup relationship on CFUG goals	Agrawal and Gibson, 1999 Ostrom, 1990

Economic Factors

Sub-dimensions	Indicators	Description	Verifiers	Source
Resource Access and Distribution	Equitable resource allocation	This indicator examines the extent to which resources, such as land and forest products, or forest benefits are equitably distributed among members of the community forest user group. This will foster inclusivity and reduces conflicts.	Availability of forest products Distribution of forest products	Adhikari et al., 2014 Baynes et al., 2015 Chhetri et al., 2013
	Transparent Resource Management	Assessing the transparency and accountability of resource management practices, including decision-making processes related to resource allocation, utilization and distribution.	Transparency in resource management practices	Gautam et al., 2023 Mejia Acosta, 2013
	Access to Market Information	Measures the availability of market information and price data related to forest products, enabling community members to make informed decisions and negotiate better prices for their products in the market.	Availability of forest products market related information about	Leach et al., 1999
Asset Ownership	Land tenure security	Assesses the tenure rights and land ownership status of community forest user groups, ensuring secure access and control over forest resources.	Landholding size Land use and land ownership	Adhikari et al., 2014 Dahal et al., 2017b

	Ownership of Capital Assets	Possession of productive assets, such as machinery, equipment, vehicles, and tools, owned collectively or individually by community members to support forest management activities and income-generating ventures.	Surveyed households within the CFUG that own forest management tools and equipment, such as axes, machetes, saws, pruning shears, ropes, and measuring tapes Survey households within the CFUG that own transportation vehicles, such as bicycles, motorcycles, or four-wheelers.	Pahari and Bhattarai, 2020
	Possession of Livestock for forest-based livelihoods	Measures the access to livestock assets of CFUG households.	Number of livestock (eg. Cattle, goats, buffaloes, chicken) owner per household within CFUGs	Musyoki et al., 2016 Zenteno et al., 2013
Income Generation	Income Growth Rates	Tracking percentage increase in household income derived from forest-related activities and alternative livelihood options over time, reflecting the success of income generation initiatives.	Percentage increase in household income from forest-related activities	Paudel & Ojha, 2013 Ranjit, 2011
	Diversification of Income Sources	Measuring variety and number of income-generating activities pursued by community members beyond forest-based livelihoods, such as agriculture, livestock rearing, handicrafts, and ecotourism.	Number of income generating activities pursued by community members beyond forest-based livelihoods CFUGs income and sources CFUGs expense sources	Gobeze et al., 2009
	Income Equity	Evaluating the distribution of income generated from forest management activities among community members, ensuring equitable access to economic opportunities and benefits.	Member perception on fairness and equity in distribution of income generate from forest management activities among households within CFUGs.	De Zoysa et al., 2013 Ranjit, 2011 Shahi et al., 2022
Cost Reduction and Savings	Access to Microcredit and Savings	Access to microcredit schemes, savings and investment mechanisms that enable community members to build financial resilience and invest in forest management initiatives and livelihood diversification.	Availability of saving schemes Engagement in savings and investment schemes Type of expense covered using microcredit or savings	Bashyal, 2005 Binayee et al., 2004 Pokharel et al., 2011
	Reduced Input Costs/ Cost Efficiency Measures	Level of awareness and implementation of cost-reduction strategies among CFUGs, such as improved resource management practices, energy-efficient technologies, or reduced input costs.	Aware about cost reduction strategies Implementation of cost reduction strategies Effectiveness of cost reduction strategies	Laudari et al., 2024

	Collective cost-saving initiatives	Participation in collective cost-saving initiative such as group purchasing of seeds, tools, equipment, or shared transportation arrangements	Participation in collective cost-saving initiatives	Laudari et al., 2024
Skills Development	Training Participation Rate	Measures the percentage of community members participating in skills development and capacity-building programs related to forest management, entrepreneurship, and value-added processing.	CFUG records or attendance sheets from training programs Number of training sessions attended Percentage of participants completing training Satisfaction with training content and delivery	Musyoki et al., 2016
	Skill Utilization	Assesses the extent to which community members apply the skills acquired through training programs in practical forest management activities, such as tree planting, forest inventory, and sustainable harvesting techniques.	Frequency of skill application Specific skills used in forest management Impact of skills on forest management outcomes	Mwambeo et al., 2022 Upreti, 2000
	Skill Retention and Transfer	Evaluates the effectiveness of skills retention and transfer mechanisms within the community, including mentoring, peer learning, and knowledge sharing, to ensure the long-term sustainability of capacity-building efforts.	Self-assessment of skill retention Opportunities for skill sharing and transfer Effectiveness of skill transfer activities on participation to engage in FM activities.	Mwambeo et al., 2022 Virji et al., 2012 Wekesa, 2017

Participation

Level of Active Participation	Frequency of attendance at community forest meetings, involvement in decision-making processes, and participation in forest management activities reflects levels of engagement and interest in forest management activities. High levels of active participation indicate strong community involvement and ownership of forest management processes.	Participation in community meetings Activeness of opinion during meetings Participation in forest management activities	Hlaing and Inoue, 2013