Study Report
On
Understanding the Implementation Status of Scientific Forest Management in Lumbini Province, Nepal

Submitted to

Provincial Government
Ministry of Industry, Tourism, Forest and Environment
Butwal, Nepal

Submitted by

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ABBREVIATION

ACOFUN	Association of Collaborative Forest users Nepal
CF	Community Forest
CFM	Collaborative Management Forest
CFUG	Community Forest User Group
CSO	Civil Society Organization
DBH	Diameter at Breast height
DFO	Division Forest Office
DoF	Department of Forest
Exp.	Expenditure
FECOFUN	Federation of Community Forest Users Network
FSS	Forest sector Strategy
GOs	Government Organizations
HH	Household
IGAs	Income Generating Activities
MoITFE	Ministry of Industry, Tourism, Forest and Environment
NGOs	Non-Governmental Organizations
NRs.	Nepalese Rupees
NTFPs	Non-Timber Forest Products
OP	Operational Plan
ScFM	Scientific Forest Management

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Contents

List of Tables

List of Figures

Executive Summary

Scientific forest management in Nepal was introduced as one of the government programs to produce timber for national consumption and ensure sustainable production in future. For this, silvicultural principles of forest growth have been applied to regenerate and develop forest stands that supply timber in a sustainable manner. The scientific forestry essentially involves science and art of tending trees and forests in a given biophysical and socio-economic context of forest development. Therefore, scientific forestry program can be viewed in the interface of socio-economic and biophysical context of forest management.

This study is an initiative of the Ministry of Industry, Tourism, Forest and Environment of the Lumbini province to assess status of scientific forestry program. It has been designed to explore general status of scientific forestry program in the province. It covers 12 districts including six districts from hill and six districts from Terai region of the province. The management regimes included are community forestry, collaborative forestry and block forest management which have implemented scientific forestry program.

The main aims of the study are to assess current status; production of forest products, incomes and expenditure from forest management, regeneration status and implementation status including governance practices relating to scientific forest management. The study adopted multi-phased sampling design to collect data relating to status, timber production, income and expenditure patterns, regeneration, implementation status and user group opinion. The status data was collected from office records of each division office. The data related to timber production, income and expenditure and regeneration status was collected from sub-samples from the list of community forest, collaborative forest and block forests of the province. The assessment of implementation and user opinion was carried out from a series of discussion with forest user groups.

There are 228 community forests, 8 collaborative forests and 2 block forest which have prepared and implemented scientific forest management in the province. The average size of the community forests in the province is 236.8 hectare. In the Terai, the average size of community forests is 270.7 hectare and it is 135.2 hectare in the hill. In Terai, the number of forests implementing scientific forestry program was 181 including collaborative and block forests. In the Hill, the number was 57and includes only community forests. The annual trend of scientific forest implementation was

climbed up until 2075 BS before its expansion stopped. Despite large number of community forestry adopting scientific forestry, many of them (15 %) are not performing well due to the low motivation of forest users as well as biophysical constraints.

Whereas overall status of regeneration is satisfactory, variations was found in different management regimes and regions. In community forests, seedling density is 16000 per hectare which is higher than the density found in block (15000 per hectare) and collaborative (13000 per hectare) forests. For sapling, the density in community forests is about 6000 per hectare which is higher than the density found in collaborative (3000 per hectare) and Block (9000 per hectare) forest management regimes. In hills, the seedling density is 18000 per hectare which is slightly lower than in Terai community forests. Similarly, the sapling density is 7000 per hectare in the Hill and 5500 per hectare in the Terai. The regeneration status of scientific forest management in the province is higher than reported by national forest inventories of Nepal.

Timber production and income of community forests in Terai and Hill varies substantially. Average annual timber production from community forests in the Hill and Terai is 3869.1 cft and 7797.7 cft respectively. Of the total timber produces, 12.4 percent in Hill and 31.1 percent in the Terai was used for internal consumption by the users. Similarly, average quantity of fuelwood production by the community forests in the province was 17.2 *chatta* which varies substantially in the Hill (9.4 *chatta*) and Terai (22.7 *chatta*).

In Hill, average annual income is NRs 49,780, 47 where as it is NRs, 97, 88, 843 for Terai. In collaborative forest, total average annual income is NRs. 8, 85, 29, 581 which includes balance amount from previous years. Timber contributed largest proportion of incomes in both community and collaborative forests in the province. In average, out of total income, more than 75% has been invested by CFUGs in Terai and more than 85% has been invested by CFUG in Hill for different activities each year. The average expenditure is 44% on forest development, 42% in community development, 13% in administrative expenses and 1% in training and capacity development in Hill CFs whereas in case of Terai CFs the expenses is 39% in forest development, 32% in community development, 24% in administrative expenses and 5% in training and capacity building. In average, out of total income, more than 39% has been invested by collaborative forests for different

activities each year. The average expenditure is 83% in forest development, 13% in community development, 2% in administrative development and 2% in training and capacity development.

In both Terai and Hill the study reflects that the ScFM implementation is particularly focused on forest management activities. Though there are several other activities on-going around community development, major focus is on the activities relating to IGA, empowerment and forest management. The representation in committee leadership is one of the key community empowerment activities in both Terai and Hill forests.

In case of community development and empowerment, majority of CFUGs in Terai and Hills seems focused on some of the key activities like infrastructures, revolving funds, employment generation and socio-cultural activities. However, the implementation of forest-based enterprises seems absent or non-existent in both Hill and Terai. We found increasing user's participation in forest management activities by 67%, followed by resources distribution activities (67%) particularly in timber distribution and also in EC meetings (42%). The participation of women in forest management activities and EC meetings is found increasing in majority of CFUGs. The increasing women participation in EC meetings is observed in 60% of CFUGs. Interestingly, we found no change in timber distribution activities with respect to women participation. Equally, in terms of IGA, we observed no substantial changes.

The study suggests to emphasize regeneration management as equally as regeneration felling. Regular monitoring of regeneration growth is required to ensure that regeneration growth has progressed as planned. The ScFM has multiplied the production and income therefrom. However, the communities are not sufficiently capable to manage this fund for forest management, community development and institutional efficiency. Thus, it is recommended to prepare financial plan as an integral part of forest management and capacitate CFUGs to mobilize fund for transparency and accountability. Further, the production, income and expenditure data maintained by forest user groups and DFOs is inconsistence, sporadic and incomplete resulting ambiguity while generalizing the outcome. Thus, it is recommended to develop and institutionalize common data management portal governed by the province Ministry and operated by respective Division Forest Offices.

1. Background

1.1. Context of the Study

The study is the part of the annual program (fiscal year 2076/77) of the Provincial Government, Ministry of Industry, Tourism, Forest and Environment, Butwal, Nepal. About 50.43% of the province is covered by the forest area which is being managed under different forest management regimes. Lumbini province is one of the pioneer provinces to initiate and implement scientific forest management-based forest management system in different forests regimes with the objective to conserve and manage forest resources, to supply forest products and to enhance socio-economic condition of the people while contributing to overall economic prosperity of the province. Having the implementation experience of scientific forest management of around one decade in case of collaborative forests and around five years on community forestry program, it is important to bring the status, experiences and learning of this new forest management initiatives. Some of the early results of scientific forest management implementation have shown positive results in terms of forest regeneration and productivity. Equally, the increasing interest of local people towards ScFM has been a positive sign. In this context, the study on the overall implementation status of ScFM in the province, through understanding its coverage and distribution status, analyse the regeneration condition, and forest resource governance could be vital to further guide forest management policy amendments and resource allocations in the province. Thus, this study has been proposed to document and understand the implementation status of scientific forest management in Lumbini Province, Nepal. The study is undertaken by the Global Sustainable Research & Development Center Butwal-9, Milanchowk, Rupandehi, Lumbini Province, Nepal.

1.2. Context of Scientific Forest Management in Nepal

Scientific Forest Management (ScFM) is the silviculture system-based forest management. It is the systematic application of forestry science and knowledge for the management of forests based on the correct assessment of attributes of forest crop to maximize and sustain benefits (including indirect benefits such as environmental and ecosystem services) accruing from the forest (Subedi et. al. 2017). It was implemented in different forest management regimes including Community Forests (CF), Collaborative Forest Management (CFM) and government managed block forests in Nepal. In 2000, a revised forestry policy proposed the Block Forest Management Approach in

Nepal's Terai and Siwalik forests. This laid a firm foundation for the adoption of ScFM in subsequent forest policies and strategies.

Appropriate silviculture-based management has been always the question for forest management in Nepal particularly on the economically valuable Sal Forest of Terai region (Gilmour, 2017). There have been several discussions on adoption of several silviculture practices but very few have been adopted and largely not being able to materialize the potential benefits (Thompson, 1990; Webb, and Gautam 2001). According to Scientific Forest Management Guideline, 2014, the objectives of SFM are set to obtain environmental benefits through the development of healthy forest, consistent supply of the forest products, help in local economy and development by increasing the income of user groups, increase in tax for the government and improve the governance of the forest user groups.

In recent dates Ministry of Forest and Environment (MoFE) has prioritized ScFM as a potential option for improving depleting forest quality and productivity, and for harnessing the true economic potential of the forest resources (MSFP, 2015). Recently introduced policies and strategies, such as Forest Act 2019, Forest Policy 2014, National Biodiversity Strategy and Action Plan 2014, Forests Sector Strategy 2015-, and thirteen-year Development Plan (2013-2015) including Fourteen Year Development Plan (2016-2018) and Forestry Decade 2015 have clearly envisaged ScFM as a sustainable option for forest management. Similarly, there are growing policy initiatives in the community forests, collaborative forests management and block forests in recent decades with the aim of ensuring sustainable yield of timber by adopting scientific management systems of those forests. It involves division of the forest into compartments and sub-compartments based on rotation age; adoption of silviculture system-based management; systematic harvesting of sub-compartment and marking and systematic harvesting of marked trees (MoFE, 2020). Under the ScFM, the forest area is divided into eight periodic blocks assuming the 80 years rotation age and 10 years regeneration interval (Subedi et al., 2018). ScFM was officially implemented from 2012 from Tilaurakot Collaborative forests of Kapilvastu district in the Lumbini province, one of the leading province in terms of ScFM implementation (Poudel, 2018). In Lumbini province ScFM has been implemented in 8 CFM, 2 BFM and 204 CFUGs (MoITFE, 2020).

1.3 Current State of Knowledge and Gaps

The recent studies on ScFM in Nepal have opened several debates among the forestry stakeholders. There is varied opinion of stakeholders (Bhusal et al., 2020; Poudel and Bhusal 2018) on justification in implementation of ScFM, its relevance and necessity, potential benefits, capacity and preparedness of community and forest authority, involvement of CFUGs in plan preparation and implementation and revenue generation and its governance. Several scholars argue that ScFM has primarily focused on techno-bureaucratic domination and control over the CFUGs resources (Ribot, 2001; Ojha, 2006; Shrestha and McManus, 2008; Ojha et al., 2009 Sunam et al., 2013).

Studies argue that ScFM limits users' participation in decision-making and forest management activities as it becomes highly technical for users to understand (Basnyat et al., 2018; Bhusal et al., 2020; Rutt et al., 2015). It limits the participation of users in ScFM technical activities, including from operational plan preparation to tree felling and their involvement in CFUGs meetings and discussions (Basnyat et al. 2018). The involvement of technicians and hired workers increases the dependency of users on technicians and limits their deliberation (Poudyal et al., 2020). In terms of monetary value, forest products collection costs, including both the timber fee and the time for the collection of forest products, account for more than half of the total costs of users in CF. This finding supports the argument that Nepal's ScFM is timber centric (Basnyat et al., 2018; Subedi et al., 2018) and therefore the users get a considerable amount of timber and invest time to obtain timber from the forest.

Though the implementation of SciFM increased forest products harvesting, contributed to generate employment opportunities and enhanced investment in community development activities in the user groups (Bhusal et al., 2020; Subedi et al. 2018; Khanal et al. 2017) users perceive it as an intense Silviculture intervention in forest management, which has largely ignored the traditional management system. It has equally contributed to decreasing users' voluntary support and participation in CF activities. ScFM has prioritized timber production (Khanal and Adhikari, 2018; Poudel, 2018; Subedi et al., 2018) and it has directly increased the supply of timber to users. Therefore, users' benefits from forest products are substantially higher than the benefits derived from other sources. However, there are elites and higher casts domination in benefits as most of the benefits is reaped by the Brahmins/Chhetris over the other castes (Adhikari, 2002; Paudel,

2015). Furthermore, the techno-centric approach of ScFM, with a focus on timber production, which is considered lucrative, is a possible explanation of this growing interest and participation of the Brahmin/Chhetri caste (Bhusal et al. 2020; Bhusal et al. 2020).

Additionally, Poudyal et al. (2019) observes that though ScFM supports increased income and employment there are more risks associated with this approach particularly to maintain post harvesting management and it is more critical in low income and ineffective CFUGs with bad governance performance. However, de Avila et al. (2015) held a view that actively managed forests contribute to biodiversity conservation and sustainable management, which requires an in-depth study of ecological responses with silviculture interventions. The elites capture and bureaucratic control in ScFM implementation while defeating the primary purpose of community forests, i.e. assisting local communities in fulfilling the basic needs of forest products and facilitating an equitable sharing of benefits is the key finding of Basnyat (2020). It further argues that the economic rationale has been smartly used to commodify the CFs for commercial timber production. This has ultimately reduced poor and marginalized access in timber and limited the fund available to take community development and wellbeing activities. In case of forest regeneration, the ScFM interventions seems positive and is found remarkable to increase the regeneration of Sal, however, there is decrease in plant diversity in managed stands (Awasthi et al., 2015; 2020). The study by Gandaki province on ScFM impacts in 2019 illustrated that the silviculture in Terai resulted good regeneration of pure Sal Forest (being strong light demander and opening of canopy) whereas this needs further research on Mid-hills where forest is mixed and dominated by *Schima wallichi* and *Castonopsis indica*. Furthermore, the species diversity and richness are related to management activities resulting low value of indices in felled as well as control series in Terai whereas higher in Mid-hills.

The lack of clear and broad understating of the implementation of ScFM and the contested and varied understanding of the stakeholders might further aggravate the issues around ScFM implementation. As the pioneer province to initiate ScFM implementation in the country, there are stacks of experiences, issues, and practices that need to be explored, documented and disseminated. In this context, this study is designed to fulfil this gap with the aims of exploring the implementation status of ScFM in the Lumbini province. The study will document the overall

implementation status of ScFM in the province, analyse the regeneration condition, and explore the forest product distribution, income, expenditure dynamics and its socio-economic impacts and understand the user groups' opinion. The study has also brought insights drawn from the review of policies and practices on ScFM. This study is expected to be instrumental to inform policy and decision-making process for effective and efficient forest management in the province.

The report is organized into four sections. The executive summary of the study is presented before the introduction section. The introduction in the first section discusses on the scientific forest management, knowledge and policy gaps followed by the objectives of the study. Second section describes the overall methodological approach and study area details. Third section present the findings and the data collection and analysis process in each of the finding headings. The section is organised into seven chapters reflecting the objectives of the study. Finally, the last section discusses on the conclusion and the recommendations of the study.

1.4 Objectives

Overall aim of this study is to assess the three years' implementation status of scientific forest management in community forests, collaborative forests and block forest management program in the Lumbini province of Nepal.

Specifically, the study will focus on following objectives:

1. Document the status of scientific forest management.
2. Understand the implementation status of the activities as per the operational plan
3. Analyze the status of annual regeneration condition, forest increment and identify condition, activities and methods of forest conservation
4. Document the status of forest products (timber) generated from regeneration felling and analyses the income and expenditure patterns
5. List activities wise financial support and investment for the implementation of ScFM from government and UGs.
6. Understand the socio-economic impacts of ScFM on community level.
7. Understand the user's opinion on ScFM in terms of participation, involvement and decision-making process.

8. To review policy and the reports of government and document history and current context of ScFM in the province.
9. To recommend operational ways and areas of improvement for the effective implementation of ScFM in community forest, collaborative forest and block forest of the province.

2. Overview of Methodology

This chapter provides general overview of study area, data collection methods and analysis approaches adopted in the study. We adopted multi-phase sampling strategy to collect and analyse overall status of scientific forestry in the province. It provided us to explore and analyse the implementation context of context of scientific forestry program from general to specific issues.

Detail of the methods is provided in the respective chapters.

2.1. Study area

The study was carried out in the Lumbini Province of Nepal. The province is the pioneer country to showcase scientific forestry management for the production of timber from Terai Sal (*Shorea robusta*) forest. Therefore, it is one of the best venues for studying the concepts and practices of scientific forestry in Nepal.

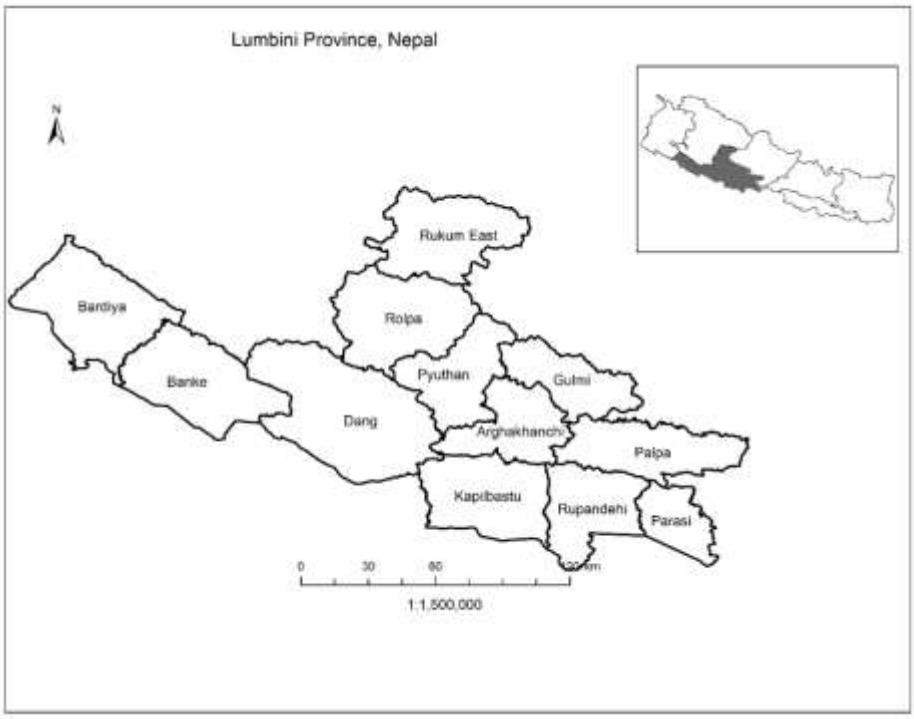


Figure 1: Map of study area: Lumbini Province with the districts

The province consists 12 districts and encompasses large stretch of low-lying region with natural mixed hardwood forests associated with *Shorea robusta*, *Terminalia tomentosa* and *Adina cordifolia.* The scientific forestry program is largely implemented in the Terai region which is gradually spreading in the hill district.

The geographic location and area of study area have been provided in the map. The map depicts the boundaries of the district in the province.

2.2. Study population and sampling procedure

The study population comprises the community forests, collaborative forests and block forests in the province. A complete list of these forests was first collected from the division forest offices and compiled for further reference. We categorized three major forest management regimes, namely, collaborative forest, block forest and community forests to implement scientific forestry program. Altogether, there are two block forests, eight collaborative forests and 228 community forests in the province.

The study population was further categorized into hill and Terai region. We considered six districts (Arghakhachi, Pyuthan, Rolpa, Rukum, Gulmi and Palpa) as hill region and six districts (Nawalparasi, Rupandehi, Kapilvastu, Dang, Banke and Bardia) as Terai region. Despite this division, it is important to note that most of the community forests (with scientific forest) of the hill are situated in the low region of the province with management context very similar to the Terai region. One of the purposes of differentiating forest between hill and Terai is to explore and understand subtle differences of implementation practices and achievements of scientific forestry in the respective regions.

The forests belonging to hill and Terai districts were stratified as hill and Terai forests. The forests were then categorized according to the number of regeneration felling completed. We focused our sampling from the category of forests which have completed at least three regeneration felling. We presented our results according to the regions (Terai and Hill) and management regimes for comparative analysis.

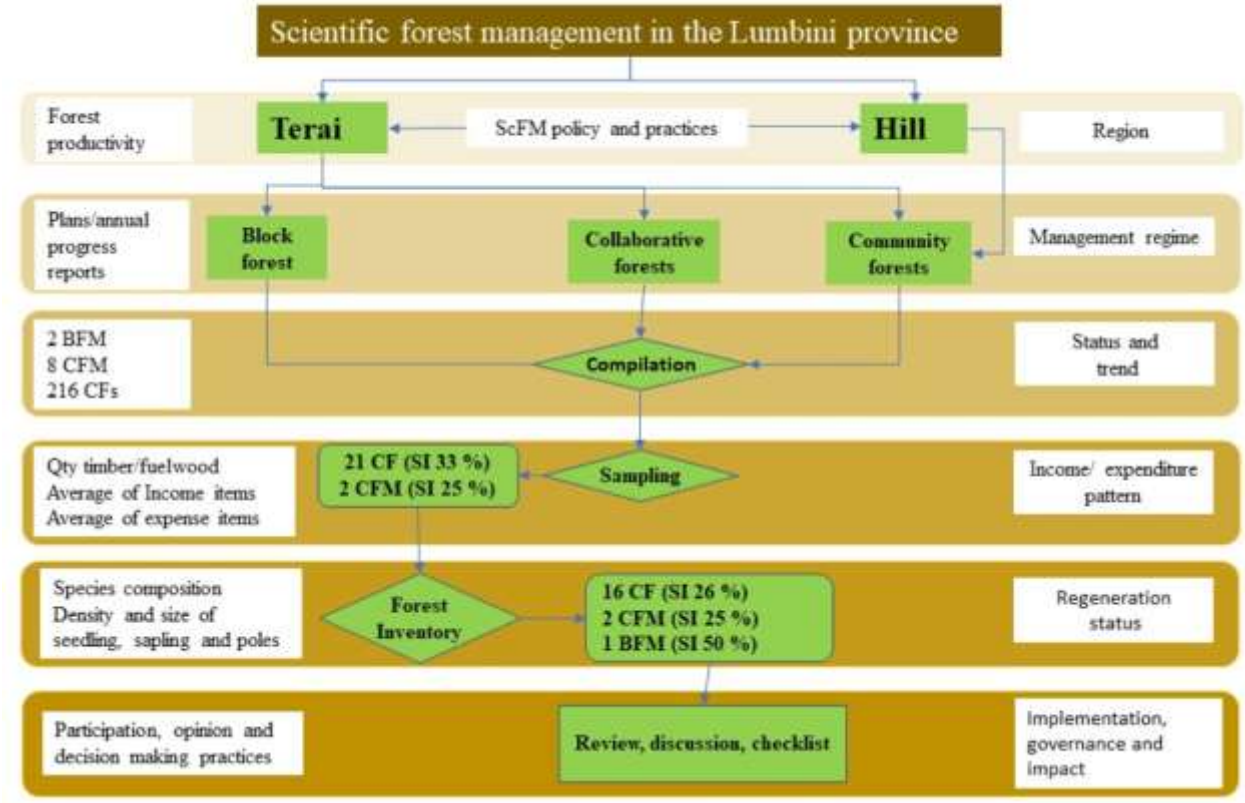


Figure 2: Overview of study methods. Colour depth indicates details of data collected

2.3. Data, analysis and presentation

The data and analysis are specific to the different objectives. Qualitative information was collected and synthesised from policies and reports, office progress reports and discussion with the forestry officials. The quantitative data were collected from division forest office, community forest and collaborative forests.

Policy context of scientific forestry: The policy and institutional context of scientific forestry was drawn from review of relevant forest policies and strategies. The analysis involves the content and intent of the policies to implement scientific forestry program in Nepal and province.

Analysing the status and trend of scientific forestry program: Total number and area of forests with scientific forestry program was analysed for Terai and Hill region. The analysis included community forests, collaborative forest and block forests in the province. The status and trend were drawn from total study population. The results are presented in the maps.

Income and expenditure patterns in scientific forestry program: The incomes and expenditure pattern of scientific forestry program is one of the important components in this study. We selected 16 community forests representing both hill (4 CFs) and Terai (12 CFs) regions of the province. In addition, we selected two collaborative forests (one forest in each of Rupandehi and Kapilvastu district) for this analysis.

We collected data of total timber and fuelwood production from selected forests from official records and compiled for analysis. Likewise, we collected income and expenditure data from audit reports available in the division forest offices and the records of the respective forests. The income and expenditure items were grouped into different categories to understand their general patterns and focus across the forests.

Regeneration assessment: The regeneration status of seedling, sapling and poles was analysed by limited sampling in the forests. We established sample plots in the forest blocks with one- to three-year-old regeneration. The analysis included species composition, density and size distribution the seedling, sapling and poles. The results of the analysis have been reported according to the region and management regimes.

Status of implementation, governance and impacts

We assessed whether the activities planned in the operational plans have been implemented in reality. Further, we assessed the practice of decision making, participation and socioeconomic impacts of scientific forestry program. This analysis was drawn from group discussion, discussion with forestry officials, forest user groups and field observation. The results represent general impression perceived by forest user groups on implementation and its governance status.

Out of total community forests, only 65 have found to complete at least three regeneration felling. Therefore, in our total study population we concentrated our study in these community forests only.

3. Findings of the study

The findings of the study are summarized in the following chapters related to the objectives.

Chapter 1: Status of ScFM in the province and divisions

1.1. Data collection methods, analysis and presentation

The status of scientific forest management in the province was collected from the progress reports published by the respective division forest offices. The forest area under scientific forestry program in the province has been used to analyse the overall status of scientific forestry in the province. Further, the status of scientific forestry has been segregated into Hill and Terai regions in order to provide a general overview of the program in the respective regions.

The analysis of status included the total, average, minimum and maximum area of community forests in each district and region of the province. We analysed the status for community forest, collaborative forest and block forest separately in the province.

Likewise, total area of forest with scientific forestry program in the districts has been presented in the map to better visualize the distribution patterns of scientific forestry across the districts and the regions (Terai and Hill)

The year of commencement of scientific forestry program has been used to understand the general trend of the programme implementation in the different spatial scale of reference like province, districts and regions. In community forest, we considered the year of implementation of scientific forestry programme to evaluate the status and trend. It means that we used the year when scientific forestry program was implemented in the respective community forests.

We categorized the community forest, collaborative forest and block forests in four categories based on their year of implementation. These are: i) one-year of implementation, ii) two-year of implementation, iii) three and more-year of implementation, and iv) not implemented. The implementation awaited forests were defined as the community forests of which scientific forest management plans have been prepared and approved but they have not implemented yet.

Distribution of community forests with scientific forestry programme and collaborative forests have been presented in the map. The positions of each community forest were located in the map according to their addresses and field knowledge. The forests were located within the boundaries

of the ward number of local units, which is the smallest administrative boundary available, as provided in the official records maintained in by the division forest offices. To make as accurate as possible, the boundary map of local units (with wards) was overlaid on standard street map with the QGIS software as well as Base maps of the ArcGIS software to locate the forests within the boundaries. Therefore, locations of community forests marked in the maps are only relative positions based on their present address.

In addition, the locations of the sampled forests have been determined, as far as possible, from the GPS coordinated provided in the operational plans of the respective forests.

The status of scientific forests (total area) in each *Gaupalika* and *Nagarpalika* has been presented in the map. Similarly, total area of forest under scientific forestry program in each district of the province is also presented in the map. These maps depict the relative expansion (total area) of the scientific forestry according to the administrative units (*Gaupalika, Nagarpalika* and district) of the province.

We also categorized community forests according to the total area of scientific forest implementation. For this, we used total area of forest with scientific forestry programme as provided in the community forestry profile published by each forest division office. We employed 100 hectares as the threshold and categorized all forests into less than or greater 100 hectare. The underlying aim of this categorization is to assess whether scientific forestry program has been implemented in the forest area less than 100 hectare in size.

1.2 Overall status of scientific forest management in the province

Total area of community forests with scientific forestry program in the hills and Terai are provided in the table 1. The table shows that 86 percent of the total community forestry with scientific forestry program is located in the Terai region of the province. The forest area is further segregated into the districts of hill and Terai and presented in table 2.

Table 1: Total community forestry with scientific forestry programme in the Terai and hill of Lumbini province

Region	CF area (ha)	Percent
Hill	7708.5	14
Terai	46290.0	86
Total	53998.5	100

Table 2: Total number and size (ha) and distribution of community forests with scientific forest management programme in the hill and Terai region of the Lumbini Province

			Size (ha) of community forests (ha)				
Region	District	Number of CFs	Total area	Average	Minimum	Maximum	Standard Deviation
Hill	Arghakhachi	25	2654.9	106.2	43.2	275.6	61.7
	Palpa	21	2228.2	106.1	42.6	285.6	50.1
	Pyuthan	9	2515.4	279.5	177.4	435.4	85.3
	Rolpa	2	310.0	155.0	103.4	206.7	73.1
	Total: Hill	57	7708.5	135.2	42.6	435.4	87.8
Terai	Banke	17	4171.8	245.4	87.7	488.9	128.8
	Bardiya	27	5329.8	197.4	96.9	495.3	106.3
	Dang	32	12028.9	375.9	124.4	562.8	124.3
	Kapilvastu	54	14034.4	259.9	71.8	499.5	135.6
	Nawalparasi	14	4104.6	293.2	50.3	475.6	126.4
	Rupandehi	27	6620.6	245.2	63.1	584.6	140.4
	Total: Terai	171	46290.0	270.7	50.3	584.6	138.8
	Grand Total	228	53998.5	236.8	42.6	584.6	140.6

Table 2 reveals that total number of community forestry with scientific forest management programme in the province is 228. Of the total, 171 (75.0 %) community forests are located in the Terai region. Maximum number of community forests was recorded in the Kapilvastu district (54) in Terai and Arghakhachi (25) in the hills.

Similarly, the table 2 reveals that the total forest areas with scientific forestry program in the province is 53998.5 hectare. Of the total, Terai region represents 85.7 percent of the total community forest area with scientific forestry program. Further, the size of community forests varied considerably in the province. The average size of the community forests in the province

was 236.8 hectare. The size distribution of community forests demonstrated large variation in the Terai compared to the Hills. In the hill, the average size was 135.2 hectare which ranges from 42.6 hectare to 435.4 hectare. In Terai, average size of the community forests is 270.7 hectare with variation from 50.3 hectare to 584.6 hectare.

The table 3 below presents the number of community forests which are greater than or less than 100 hectares in their size. The operational guidelines of scientific forestry have specified the minimum size of the forest to be 100 hectares to implement scientific forest management program. However, there are 40 (17.5 %) of community forests in the province which are less than 100 hectares in size but planned for scientific forest management program. In the hill, there is 45.6 percent of the total community forests are less than 100 hectares in size but they have implemented and/or planned scientific forestry program. In Terai, about 8 percent of community forests are less than 100 hectares have got scientific forest management program.

Table 3: Size of the community forests in the Hill and Terai region of Lumbini province.

Region	Size of CFs	Number of CFs
Hill	Less than 100 ha	26
	Greater than 100 ha	31
	Total	**57**
Terai	Less than 100 ha	14
	Greater than 100 ha	157
	Total	**171**
	Grand total	**228**

1.3 Community forests with regeneration felling and its status

The community forests which have completed three years of generation felling are provided in the table 4. The table 4 reveals that the community forests are at the different stage of regeneration felling. There were 10 and 78 community forests completing one regeneration felling in Hill and Terai respectively. There were only 60 (29.4 %) community forests in the province completing at least three regeneration felling. While 30 percent of total community forests in the Terai have completed at least three regeneration felling, these were only 13 (22.8 %) in the Hill to do so.

It is also remarkable that 36 (15.7 %) community forests in the province have planned for scientific forestry but none of them have accomplished any regeneration felling yet. Various factors are

attributed for not implementing the regeneration felling by those community forests. It was reported that biophysical constrains of forests and topography coupled with the low motivation of forest users were most important factor for the failure of implementing scientific forest management plans. The operational plans which were not implemented for long have been marked for dismiss Sal by the respective DFOs.

Table 4: Number of community forests with regeneration felling completed years

Region	Number of felling years completed			Felling not implemented	Total
	1	2	≥ 3		
Hill	10	9	13	25	57
Terai	78	30	52	11	171
Total	**88**	**39**	**65**	**36**	**228**

Generally, regeneration felling is caried out in the specified block as of operational plans. The area of regeneration felling in the forests varies according to the size of the forests, the species-specific rotation age and annual harvest cycle. However, it was difficult to obtain year-wise felling area from the respective forests. Though such information is available in respective operational plans, actual area of felling was poorly maintained by forest users. It is particularly evident in community forests where felling area was determined by the financial capacity of the users.

1.4 Status of collaborative forest management in the province

There are eight forests under collaborative forestry program. Out of which, 5 are located in Kapilvastu district followed by two in Rupandehi and one in Nawalparasi. Altogether, there are 21973.2 hectares forests in the Terai region of the province. Of the total, 18683.9 hectares (85 %) of collaborative forests belongs to Kapilvastu district. In hill, collaborative forests have not been reported yet (see table 5).

Tilaurakot is the first collaborative forests implemented in Nepal and occupies the largest size in the province. In general, the size of the collaborative forest is greater than 1000 hectares expect in Devdaha which is only 764.2 hectare (see table 5).

Table 5: Status of collaborative forests in the Lumbini Province

Districts	Names of Collaborative Forest	Forest Areas (ha)
Kapilvastu	Gautam Budhha	3743.4
	Kapilvastu	5087.0
	Mayadevi	1731.0
	Shivaraj	1509.5
	Tilaurakot	6613.0
	Total	**18683.9**
Nawalparasi	Buddhashanti	1204
	Total	**1204**
Rupandehi	Devdaha	764.2
	Lumbini	1321.0
	Total	**2085.2**
	Grand Total	**21973.2**

1.5. Status of Block Forest management

There are two block forests managed by the government (division forest office) in the province. One of them is in Banke district- Samserjung BFM- which is 2578 hectare in size. Another block forest is situated in Dang districts- Kalakhola BFM- and covers 545 hectares. Both of them represent *Shorea robusta* forests.

1.6 Trend of scientific forest management program in the province

The table 6 and figure 3 show the yearly progress of scientific forest management implemented in the community forests of the province. The figure 3 depicts that the implementation of scientific forestry has increased rapidly until 1975 which is then plunged afterward.

Table 6: Status of ScFM (ha) in since 2069 in the Lumbini province

	Total CF area (ha) with ScFM		
Year	Hills	Terai	Total
2069	0	20	20.0
2070	0	28	28.0
2071	849.82	1286.01	2135.8
2072	1245.92	34.4	1280.3
2073	613.85	2857.37	3471.2
2074	676.01	7710.51	8386.5
2075	1205.15	11751.73	12956.9
2076	1084.5	11871.04	12955.5

2077	631.61	921.62	1553.2

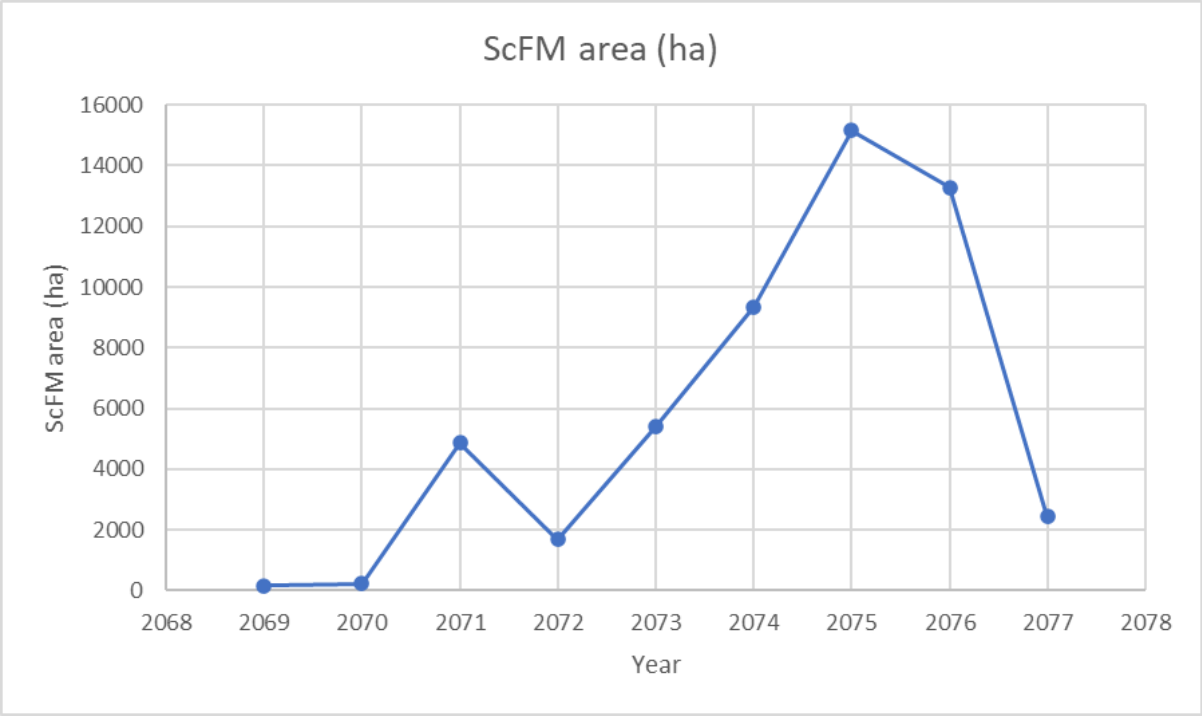


Figure 3: The yearly trends of ScFM in community forests

1.7 Distribution pattern of scientific forestry in the province

The spatial distribution of community forests, collaborative forest and block forests are presented in the map. Figure 4 presents the location of scientific forests in the province. Figure 5 provides

total area of community forests (with scientific forestry program) in the local administrative units of the province.

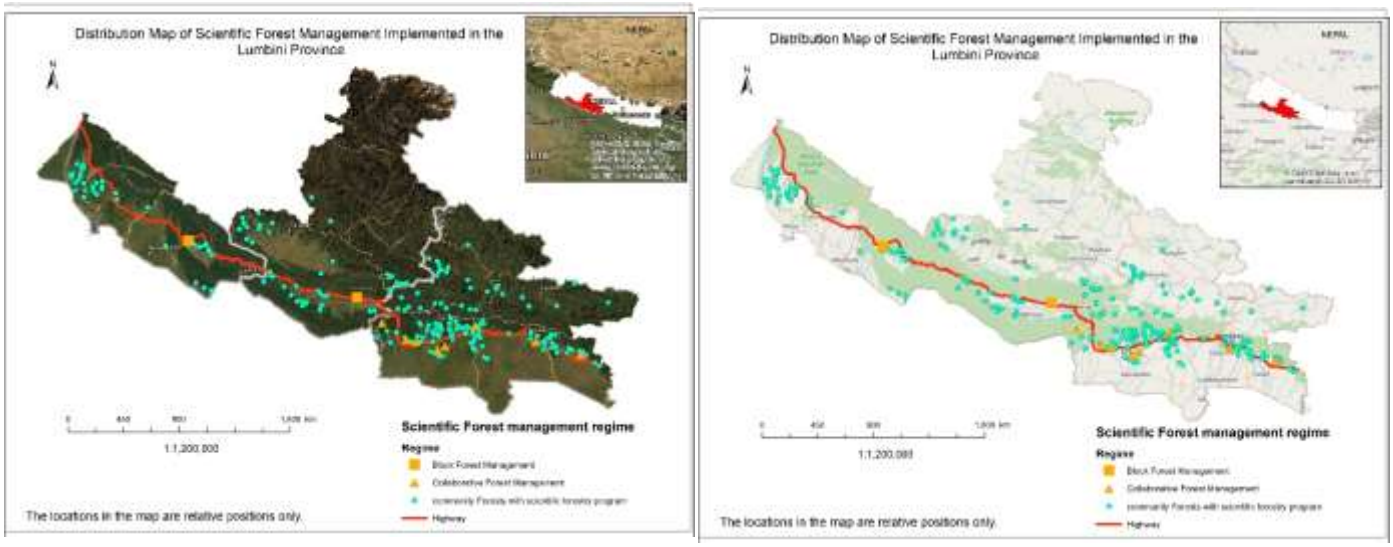


Figure 4: Distribution of scientific forest in the Lumbini province of Nepal

The area of scientific forests in the districts of the province is presented in the figure 6. The Figure 5 excludes the area covered by the collaborative and block forests in the Terai region of the province.

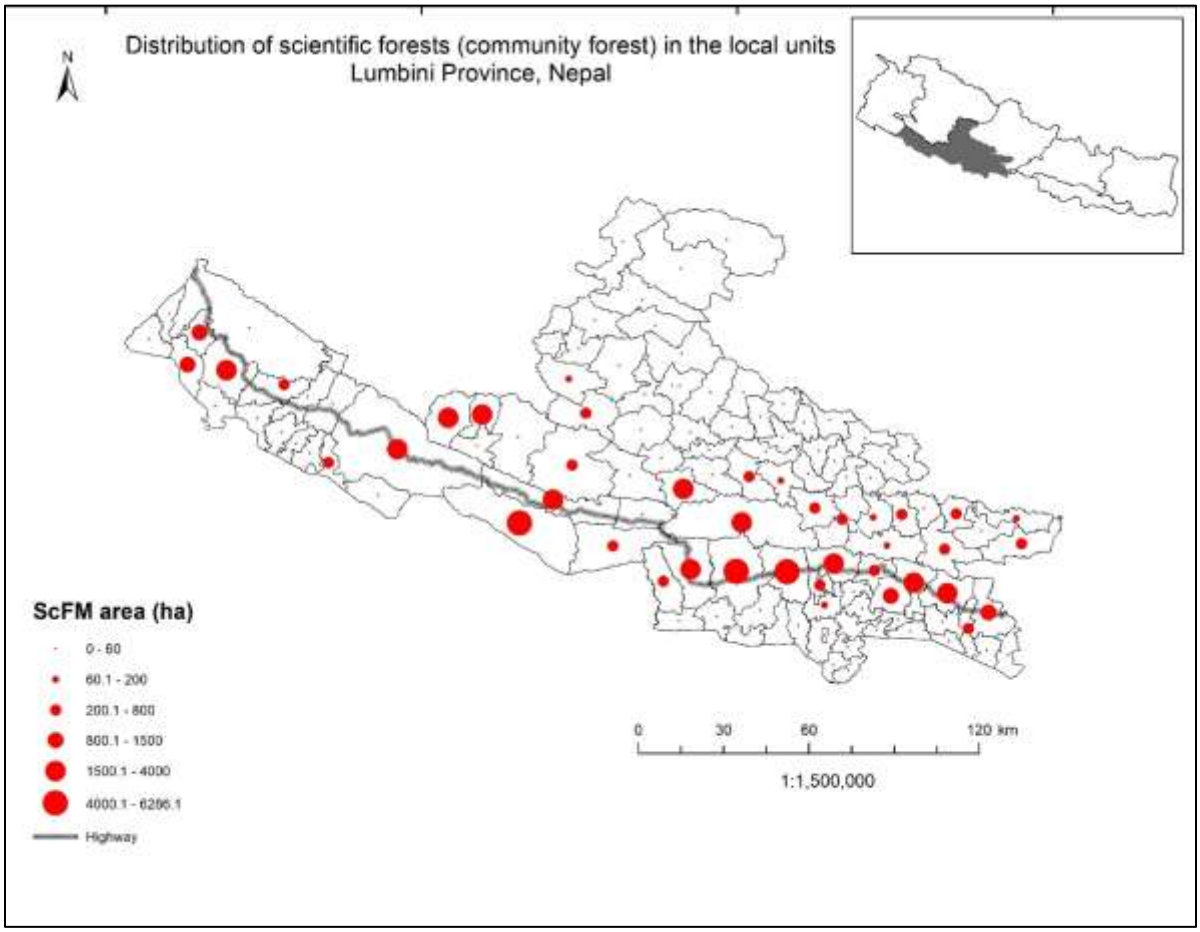


Figure 5: Distribution of scientific forest in Lumbini province

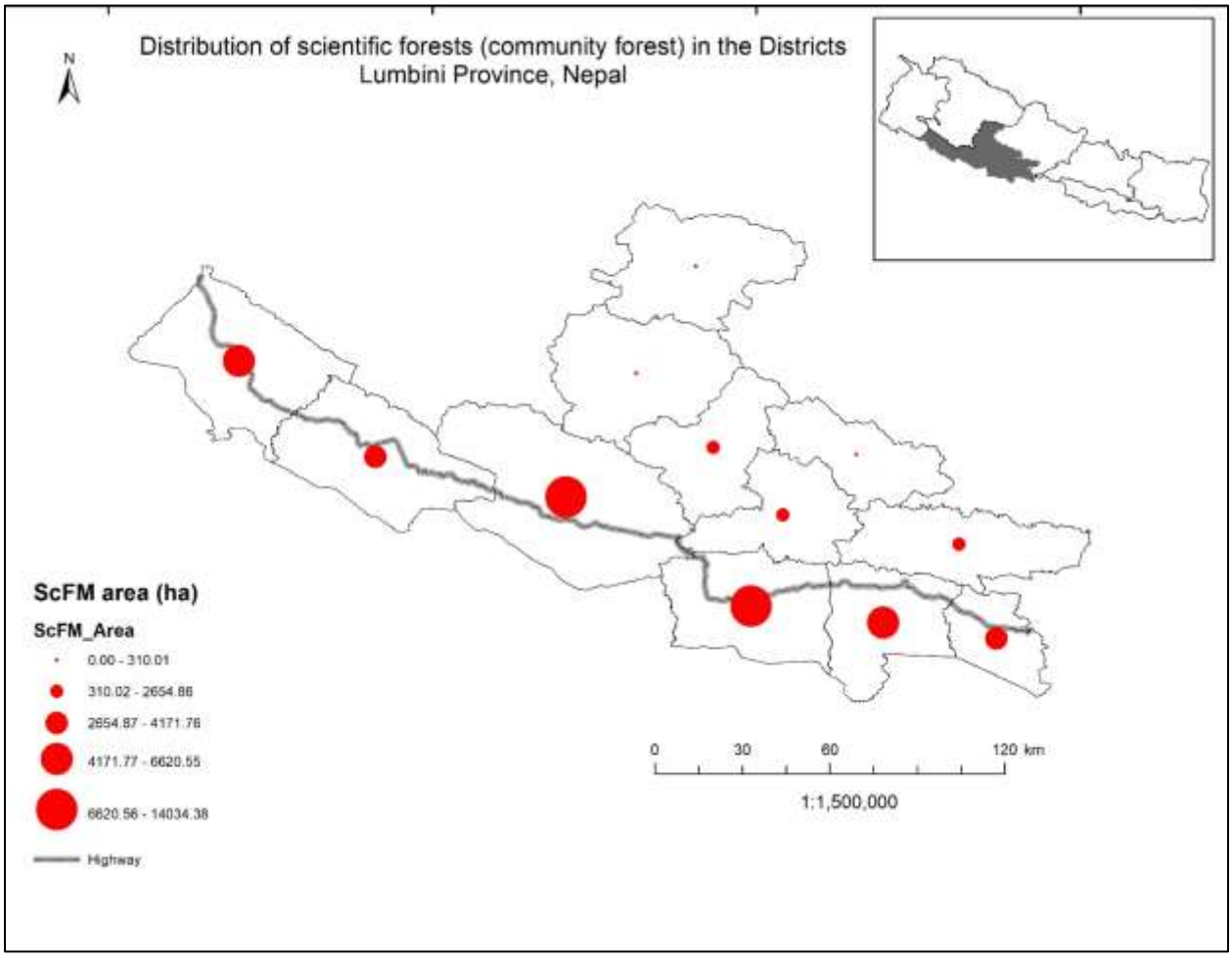


Figure 6: Distribution of scientific forests, block forest and collaborative forests in Lumbini province

Chapter 2: Regeneration status in the ScFM forests

2.1 Data collection, analysis and presentation

We conducted regeneration survey in 16 Community Forests (CFs), 2 Collaborative Forest (CFMs) and one Block Forest (BFMs) within Lumbini province of Nepal. For regeneration survey, we selected CFs that have at least three final felling in the past years (i.e., felling in fiscal year 2076/77 (Year 1), 2075/76 (Year 2) and 2074/75 (Year 3). Regeneration survey was done in the first periodic block where final felling was operated thrice in the past three years. Regeneration status of forest was assessed at three life stages.

Within the selected block, we laid out two random plots in each of the felling series (i.e., two plots each in felling series where final felling was done in FY 2076/77 (Year 1), 2075/76 (Year 2), and 2074/75 (Year 3). It means that the annual variation/trends observed in each felling was not derived from same forests and it should be understood as the average of each year from sampled forests of varying localities. The distance between two plots was kept at 100 meters. In each felling block, first plot was randomly placed and the next plot was established at 100 meter away parallel to the direction of the block shape and/or in random direction. In each plot, we assessed seedings, saplings and poles by counting their number in three concentric plots of area 10 m^2 (radius 1.8m), 25 m^2 (radius 2.8m) and 100 m^2 (radius 5.6m) respectively. In each plot, we recorded and measured species and average height for seedling and sapling. In addition, we measured diameter at breast height (dbh) for poles. We defined regeneration types (seedling, sapling and poles) based on their height and diameter. We defined seedling as any plant with height less than 100 cm, sapling with dbh less than 10 cm and height greater than 100 cm and the poles greater than seedling and sapling but the diameter at breast height up to 30 cm. This definition is consistent with the definition of Community Forestry Inventory Guidelines 2014.

The density of seedling and sapling was calculated by using following generic formula. We calculated the density for each block with one, two and three years of regeneration felling.

*Density (stem/ha) = total number of individuals of species in all plots*10000/Total numbers of plots studied*size of the plots (square m)*

The density of seedlings, saplings and poles were compared across the year and presented in the tables and line graphs. In addition, we calculated the density of seedling, sapling and poles

according to the species. We grouped species in to Sal (*shorea robusta*) and other species that included, among other, Saj (*Terminalia tomentosa*) and Karma (*Adina cordifolia*). The relative abundance of species was analysed as the percentage of species occurrence to the total density of seedlings, sapling and poles. Species composition of regeneration has been presented for the regions (hill and Terai) and regeneration blocks.

2.2 Density of seedling

2.2.1: Seedling density as per the management regime

We found that seedling density of CF as 17,625 and13, 083 and 16,000 seedling per ha in the year 1, 2 and 3 respectively. The seedling density of CFM was 15, 750 and 11, 500 and 9,000 in the year 1, 2 and 3 respectively. Likewise, seedling density of BFM was 18, 000 and 12, 500 and 12,000 seedling per ha in the year 1, 2 and 3 respectively. This shows that the seedling density per ha in all the three-management regime was satisfactory and the seedling density was high in the BFM in the year 1 and high in the CF in the year 2 and high in the CF in the year 3. In comparison the seedling density per ha was slightly higher in the CF then in the BFM and in the CFM (sees table 7 and figure 7).

Table 7: Seedling density as per the management regime in the Lumbini Province

Regime	Year 1	Year 2	Year 3
CF	17,625	13,083	16,000
CFM	15,750	11,500	9,000
BFM	18,000	12,500	12,000

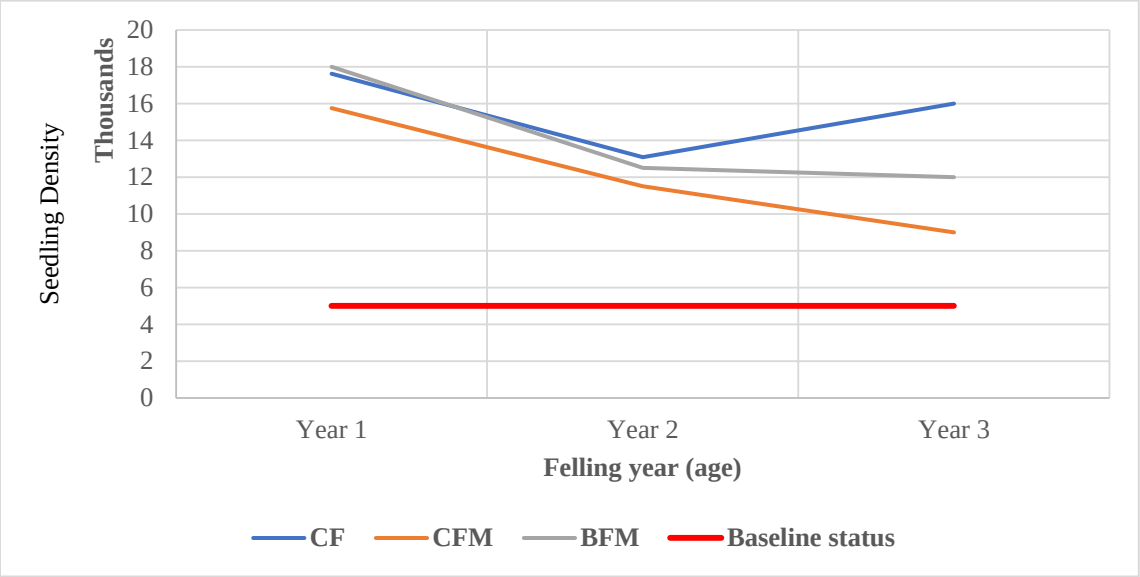


Figure 7: Seedling density comparing with baseline regeneration status

2.2.2 Seedling density in the regions, districts and community forest

Average seedling density of Terai district CF was found higher in the year 1 and 3 and Hill district was found higher in the year 2. Which shows that average seedling density of hill district (i.e. Arghakhachhi) was 19, 750 and 18,875 and 12,750 in the year 1, 2 and 3 respectively whereas the average seedling density of Terai district (i.e. Banke, Kapilvastu, Rupandehi) was 20,417 and 16,292 and 19, 500 in the year 1, 2 and 3 respectively. In the table 1 we can see the average seedling density of the CF in the hill district and Terai district of the all studied 16 CFs (4 from hill district and 12 from Terai districts (see table 8).

Table 8: Seedling density of CF

			Age (year) and density (no/ha) of seedling		
Regions	**Districts**	**Forest Names**	**Year 1**	**Year 2**	**Year 3**
Hill	Arghakhachi	Belghari CF	18,000	15,500	11,500
		Dhiri Khola CF	15,000	28,500	12,000
		Mujure Danda CF	27,000	20,000	14,000
		Pawara CF	19,000	11,500	13,500
		Average	**19,750**	**18,875**	**12,750**
Terai	Banke	Jay Ma Durga Bhawani CF	6,500	5,500	5500
	Kapilvastu	Baijalpur Janakalyan CF	70,000	24,500	25500
		Jurpani CF	19,000	13,500	27500

	Nawa Jagriti CF	2,000	6,500	15000
	Rajapani CF	1,500	5,000	20000
	Ram Laxman CF	23,500	21,500	19500
	Shringighat CF	24,500	18,000	22000
Rupandehi	Buddha CF	9,000	18,000	17500
	Kanchan CF	22,000	30,000	30500
	Pragati CF	11,000	12,500	14000
	Ramnagar CF	34,000	23,500	17500
	Saljhandi CF	22,000	17,000	19500
	Average	**20,417**	**16,292**	**19,500**

2.2.3 Seedling density in CFM and BFM

We calculated seedling density as per the management regime which includes CF, CFM and BFM. Table 9 below shows the seedling density in the CFM and GMF. In total 8 CFM in the province, we did our regeneration survey in the 2 CFM which includes Lumbini CFM from Rupandehi and Tilaurakot CFM from Kapilvastu district. We found that average regeneration in the year 1, 2 and 3 in Lumbini CFM was 27,000 and 19,500 and 20,000 respectively. Whereas, average regeneration in the Tilaurakot CFM was 11, 500 and 9,000 and 8,000 in the year 1, 2 and 3 respectively. In an average the regeneration density in the CFM was 19, 500 and 14, 250 and 14,000 in the year 1, 2 and 3 respectively. In addition, we also did our regeneration survey in the one Shamshergunj block forest management from Banke district and the average regeneration density was calculated as 19,000 and 16,000 and 18,000 in the year 1, 2 and 3 respectively.

Table 9: Seedling density in Collaborative Forest and block forest management

Districts	**Forest Names**	**Age (year) and density (no/ha) of seedling**		
		Year 1	**Year 2**	**Year 3**
Rupandehi	Lumbini CFM	27,500	19,500	20,000
Kapilvastu	Tilaurakot CFM	11,500	9,000	8,000
	Average	**19,500**	**14,250**	**14,000**
Banke	Shumshergunj BFM	19,000	16,500	18,000

2.2.4 Species wise average seedling density

We found that Sal density was high in the entire region and in all three years. Seedling density of Sal was 15, 750 and 17,125 and 10,875 seedling per ha in the year 1, 2 and 3 respectively in contrast, seedling density of other species was found to be 2,167 and 1,625 and 1,542 seedling per ha in year 1, 2 and 3 respectively.

Similarly, seedling density of Sal in Lumbini CFM was found to be 23,000 and 18,000 and 13,500 seedling per ha in the year 1, 2 and 3 whereas seedling density of other species in CFM was found to be 4,500 and 3,000 and 6,500 seedling per ha in the year 1, 2 and 3 respectively.

Similarly, seedling density of Sal in Tilaurakot CFM was found to be 8,500 and 5,000 and 4,500 seedling per ha in the year 1, 2 and 3 whereas seedling density of other species in CFM was found to be 3,000 and 4,000 and 7,000 seedling per ha in the year 1, 2 and 3 respectively.

In addition to this seedling density of Sal in Shamshergunj government managed forest was found to be 18,000 and 12,500 and 12,000 in the year 1, 2 and 3 respectively. But the seedling density of other species was 2,000 and 2,333 and 3,000 respectively. This shows that regeneration density of Sal was higher than other species and the regeneration was good in comparison with each other and regeneration in both CFM and government managed forest was quite high then the standard for the good regeneration.

Table 10: Species wise seedling density of CF

		Seedling density (no/ha)		
Region	**Species**	**Year 1**	**Year 2**	**Year 3**
Hill	Other	2,167	1,625	1,542
	Sal	15,750	17,125	10,875
Terai	Other	1,902	1,799	2,212
	Sal	17,625	13,083	16,000
Lumbini CFM	Other	4,500	3,000	6,500
	Sal	23,000	18,000	13,500
Tilaurakot CFM	Other	3,000	4,000	7,000
	Sal	8,500	5,000	4,500
Shumshergunj BF	Other	2,000	2,333	3,000
	Sal	18,000	12,500	12,000

2.2.5: Frequency of Seedling with height class

Percentage frequency of seedling with respect to height class is shown by the figure 8 below. The highest frequency of seedling was found in the height class 10-20 cm i.e., 38.4% followed by 20-30 cm i.e., 34.1% and lowest seedling frequency was found on the height class greater than 100 cm with 0.4 % followed by height class 70-80 cm with 0.4 % and 60-70 cm with 0.8 %.

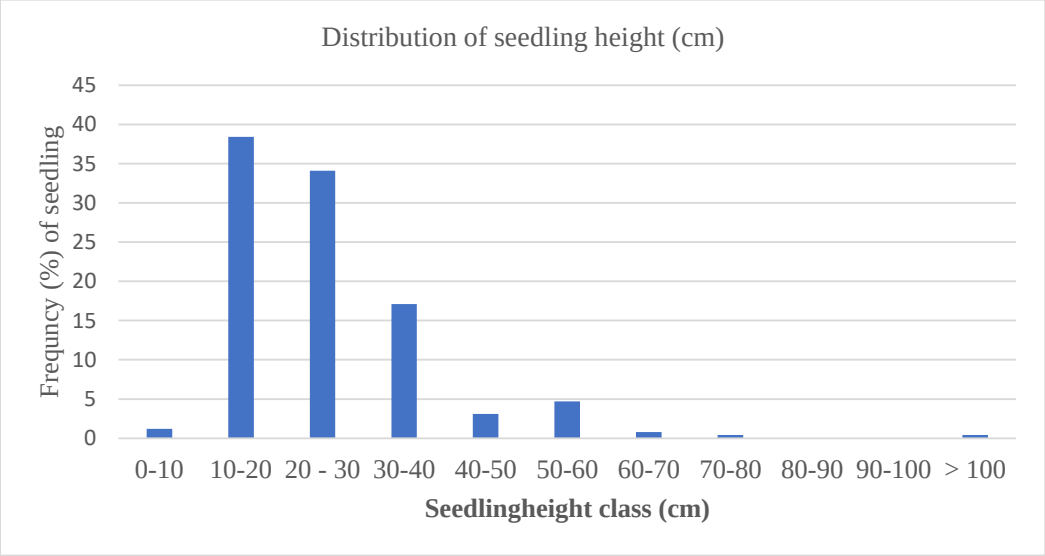


Figure 8: Frequency distribution of seedling height

2.2.6: Frequency of Seedling species with height class

Percentage frequency of seedling species with respect to height class is shown by the figure 9 below. The highest frequency of other species was found in the height class 10-20 whereas highest frequency of Sal was found in height class 20-30. None of the species were recorded from height class 60-70 and 70-80.

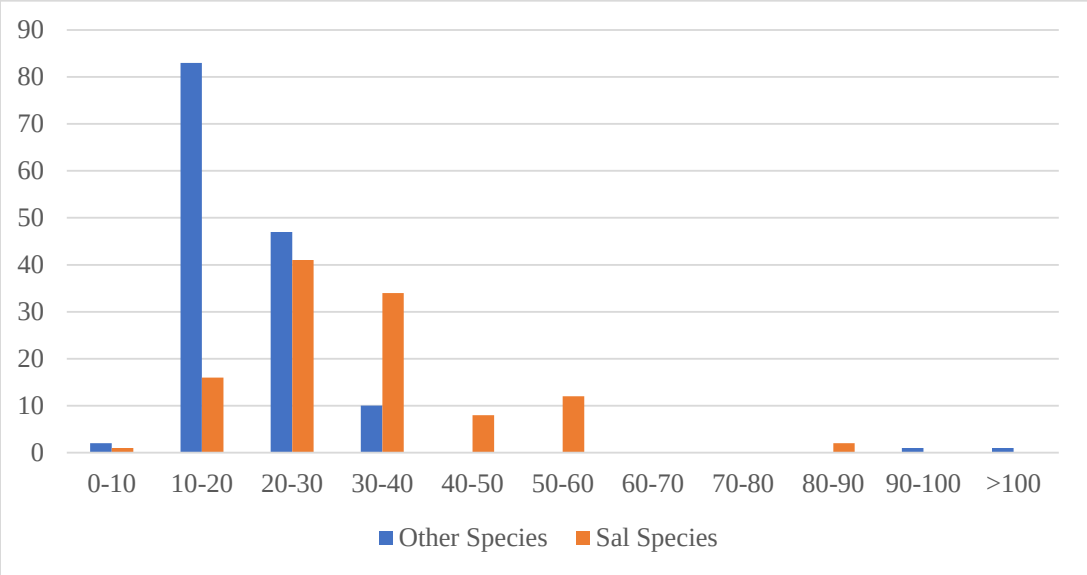


Figure 9: Frequency of Seedling species with height class

2.3 Density of Saplings

2.3.1: Saplings density with management regime

Sapling status and density was determined and represented as given in the table 11 and figure 10 below. Table 11 below shows that sapling density of CF in the year 1, 2 and 3 was 4,495 and 6,116 and 6,000 saplings per ha respectively. In contrast sapling density of CFM was 1,689, 4,080 and 3,385 saplings per ha in the year 1, 2 and 3 respectively. Whereas, Sapling density of BFM was 8,933 and 8,400 and 8,300 in the year 1, 2 and 3 respectively.

Table 11: Sapling density with respect to management regime in different years

	Sapling density (no/ha) in different forest management regime		
	Year 1	**Year 2**	**Year 3**
BFM	8933	8400	8300
CF	4495	6116	6000
CFM	1689	4080	3385

The figure 10 below shows the comparison between different management regime with respect to saplings density per ha in different years. This shows that sapling density was high in BFM and then in CF and CFM. However, sapling density was satisfactory in all the year in the entire management regime with respect to national standard.

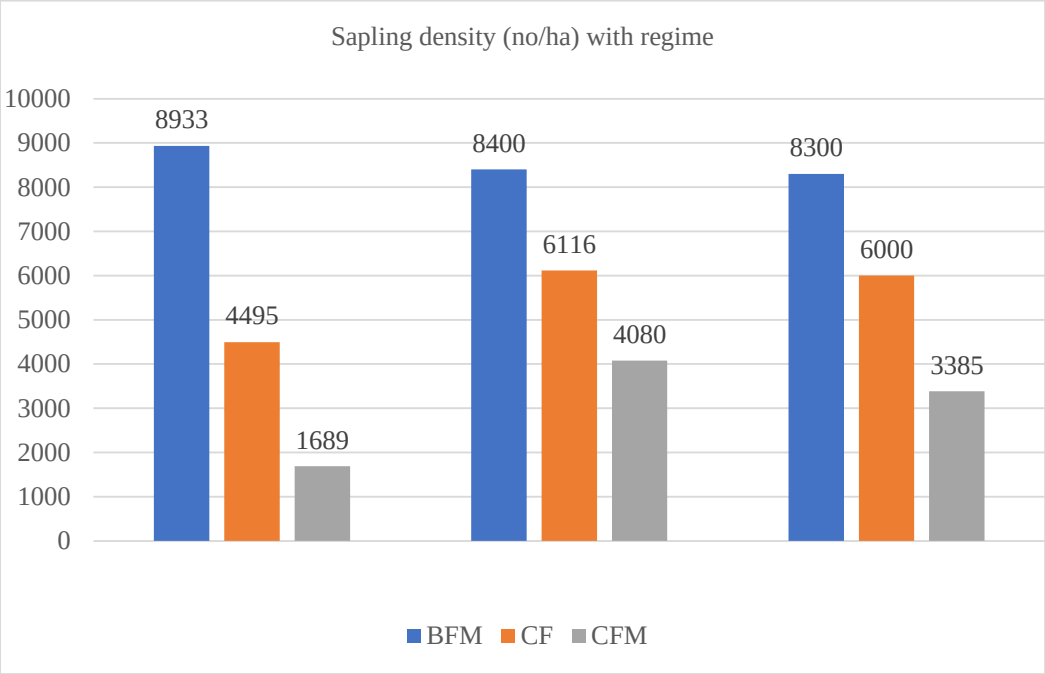


Figure 10: Comparison of saplings density of different management regime in different year

2.3.2 Species wise sapling density in different management regime

Table 12 below shows the sapling density of CF in hill district and Terai district, CFM, BFM with respect to species and sapling density. Sapling density of Sal species in the hill CF was 4,050, and 12,450 and 12,112 saplings per ha in the year 1, 2 and 3 respectively where as other species was 1,200 and 600 and 2,667 in the year 1, 2 and 3 respectively. Likewise, sapling density of Sal species in the Terai CF was 7,965, 9,050 and 10,350 in the year 1, 2 and 3 respectively whereas other species was 1,322, 876 and 912 in the year 1, 2 and 3 respectively.

Similarly, sapling density of Sal species in the Lumbini CFM was 5,400 and 9,400 and 16,000 sapling per ha in the year 1, 2 and 3 respectively whereas other species was 400 and 400 and 560

in the year 1, 2 and 3 respectively. Likewise, sapling density of Sal species in the Tilaurakot CFM was 1200 and 9,800 and 3,600 saplings per ha in the year 1, 2 and 3 respectively whereas other species was 400, and 400 and 500 in the year 1, 2 and 3 respectively.

Sapling density of Shumshergunj BFM was also determined in among the two BFM of the province. We found that Sal species in this block forest was 12,800 and 15,600 and 15,600 in the year 1, 2 and 3 respectively. While other species density was 1,200 and 1,200 and 1000 in the year 1, 2 and 3 respectively.

Table 12: Sapling density in different management regime with species

Region	Species	Sapling density (no/ha) in different forest management regime		
		Year 1	Year 2	Year 3
Hill CF	Other	1200	600	2667
	Sal	4050	12450	12114
Terai CF	Other	1322	876	912
	Sal	7965	9050	10350
Lumbini CFM	Other	400	400	560
	Sal	5400	9400	16000
Tilaurakot CFM	Other	400	400	500
	Sal	1200	9800	3600
Shumshergunj BFM	Other	1200	1200	1000
	Sal	12800	15600	15600

2.3.3 Sapling density in the regions, districts and community forest

Sapling density as per the hill and Terai district was also obtained. Table 13 below shows the sapling density in the individual CF with respect to the sample district in the year 1, 2 and 3. It shows that average sapling density of the hill district was 3,733 and 10,080 and 7,754 sapling per ha in the year 1, 2 and 3 respectively. Whereas, average sapling density of the Terai district was 4,643 and 5,236 and 5,535 saplings per ha in the year 1, 2 and 3 respectively.

Table 13: Sapling density in the of community forest

			Sapling density (no/ha) in the forests		
Region	**District**	**Forest Names**	**Year 1**	**Year 2**	**Year 3**
Hill		Belghari CF	2400	11400	3600
		Dhiri Khola CF	5600	18600	12600
		Mujure Danda CF	3600	8400	5900
		Pawara CF	3400	5200	17000

		Average	**3733**	**10080**	**7754**
Terai	Banke	Jay Ma Durga Bhawani CF	9867	13800	9800
	Kapilvastu	Baijalpur Janakalyan CF	2000	3900	6533
		Jurpani CF	4300	5333	3200
		Nawa Jagriti CF	800	4000	6800
		Rajapani CF	2200	3000	6400
		Ram Laxman CF	3600	2480	3760
		Shringighat CF	9067	8133	8800
	Rupandehi	Buddha CF	12400	12400	5200
		Kanchan CF	4800	3920	3867
		Pragati CF	3360	4667	5467
		Ramnagar CF	2640	1920	4400
		Saljhandi CF	4800	13000	5760
		Average	**4643**	**5236**	**5535**

2.3.4 Sapling density in CFM and BFM

Sapling density in the CFM and BFM was calculated and it was compared with respect to years. The figure 11 below shows that sapling density of BFM is higher than that of CFM. It shows that sapling density of CFM is 1,689 and 4,080 and 3,385 saplings per ha in the year 1, 2 and 3 respectively. Whereas, sapling density in the BFM was 8,933 and 8,400 and 8,300 saplings per ha in the year 1, 2 and 3 respectively.

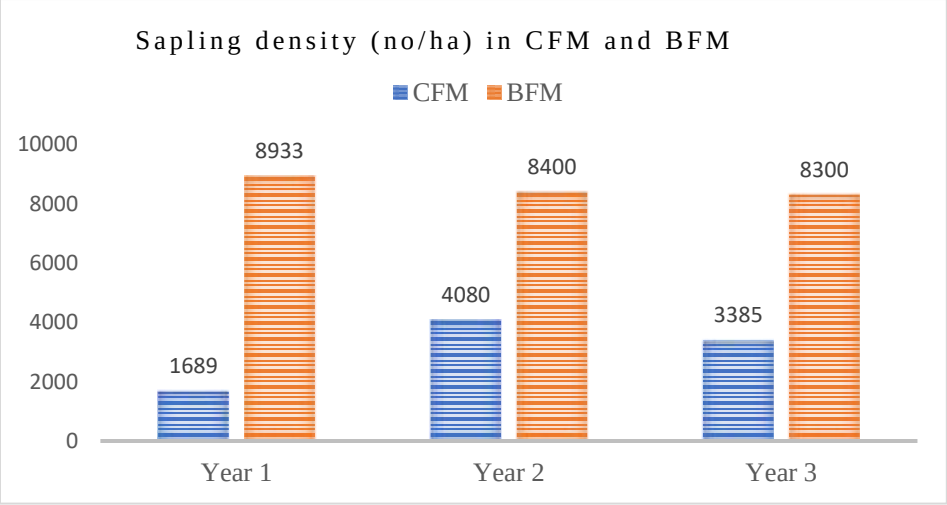


Figure 11: Sapling density in CFM and BFM

2.4 Distribution of pole

2.4.1 Distribution of poles in the CF

Distribution of poles in the CF was recorded in the studied CF of the hill and Terai districts. We found that there were 25 and 188 and 113 poles for ha in the year 1, 2 and 3 in the hill district CF. Similarly, it was 79 and 121 and 142 poles per ha in the CF of Terai district.

Table 14: Distribution of poles in the community forests (no/ha)

Distribution of poles in the community forests (no/ha)					
Region	**Districts**	**Forest names**	**Year 1**	**Year 2**	**Year 3**
Hill	Arghakhachi	Belghari CF	0	250	0
		Dhiri Khola CF	50	150	50
		Mujure Danda CF	0	50	150
		Pawara CF	50	300	250
		Average	**25**	**188**	**113**
Terai	Banke	Jay Ma Durga Bhawani CF	50	150	250
	Kapilvastu	Baijalpur Janakalyan CF	0	0	0
		Jurpani CF	0	0	100
		Nawa Jagriti CF	0	0	0
		Rajapani CF	0	0	0
		Ram Laxman CF	50	50	100
		Shringighat CF	0	250	350
	Rupandehi	Buddha CF	500	250	200
		Kanchan CF	0	200	300
		Pragati CF	0	200	50
		Ramnagar CF	100	0	50
		Saljhandi CF	250	350	300
		Average	**79**	**121**	**142**

2.4.2 Species wise pole distribution

Species wise pole distribution was calculated and obtained in the below table. We found that pole density of the Sal species in the hill district CF was 100 and 750 and 450 pole per ha in the 1, 2 and 3 years respectively. Likewise pole density of other species in the hill CF was not found.

In addition, pole density of Sal species in Tilaurakot CFM was 50, 0 and 400 in the year 1, 2 and 3 respectively and of other species was 200, and 0, and 0 in the year 1, 2 and 3. Similarly pole density of Sal species in Lumbini CFM was 200, and 350, and 450 in the year 1, 2 and 3

respectively and of other species was 0, and 50 and 100 in the year 1, 2 and 3 respectively (see table 15).

Likewise pole density of BFM in the Sal species was 300, and 550 and 550 in the year 1, 2 and 3 respectively and in the other species was 50, and 50 and 100 in the year 1, 2 and 3 respectively. This no of pole per density is higher than the national standards which are 167 pole per ha.

Table 15: Species wise pole distribution

Region	Management regime	Species	Pole density (no/ha) Y1	Y2	Y3
Hill	CF	Other	0.0	0.0	0.0
		Sal	100.0	750.0	450.0
Terai	CF	Other	100.0	400.0	150.0
		Sal	850.0	1050.0	1550.0
	Lumbini CFM	Other	0.0	50.0	100.0
		Sal	200.0	350.0	450.0
	Tilaurakot CFM	Other	200.0	0.0	0.0
		Sal	50.0	0.0	400.0
	Shumshergunj BF	Other	50.0	50.0	100.0
		Sal	300.0	550.0	550.0

Percentage frequency of poles with respect to diameter class is presented in the figure 12 below. From the bar diagram given below we can clearly see that highest frequency of poles is found between diameter class 10-15 cm i.e. 44.89% followed by the diameter class 15-20 cm i.e. 35.80% and lowest frequency of poles is seen in the diameter class 20-25 cm i.e. 11.93%.

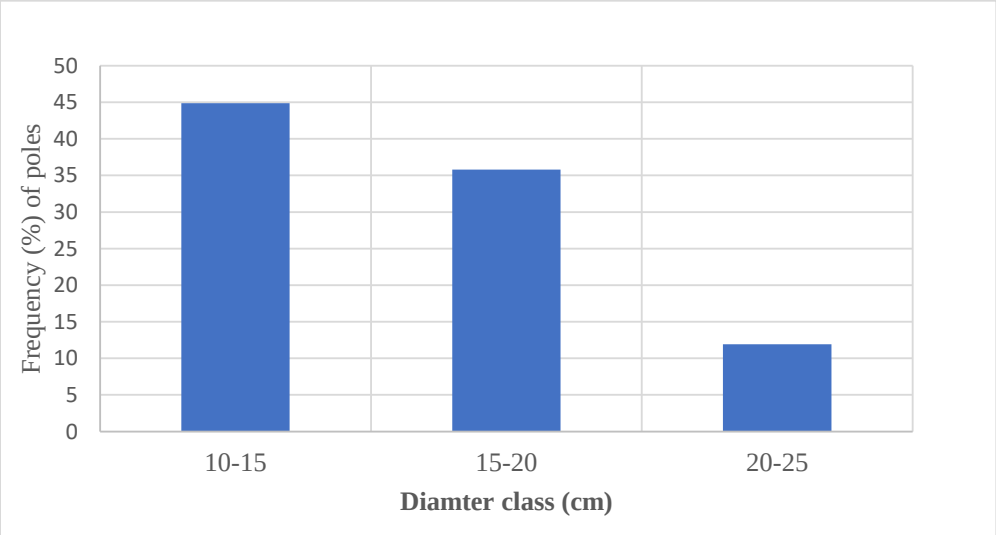


Figure 12: Frequency of poles with respect to diameter class

Status of regeneration (seedlings and saplings) in terms of number per hectare determines the condition of the forest. Most of the regeneration were seedling (height up to 1m) whilst few were saplings (height >1m). Thus, the density of seedlings was higher than the density of saplings in all the measurements. Regeneration of *Shorea robusta* shared major portion in the study area, which was followed by other different species. In this study, regeneration density (in terms of total number of seedlings and saplings/ha) was found to be decreasing in three consecutive measurements. Regeneration density was higher in Sal species then in other species. As per the FRA 2014 the number of seedlings (height <1.3m) were about 30,000 per ha whereas the number of saplings (height >1.3m, and diameter <5cm DBH) were approx. 1,700 per ha. Our findings also support the findings of FRA. In our study *Shorea robusta* was the dominant species of seedlings (over 18,000/ha) and sapling (over 3000/ha).

Forest regeneration was found excellent in all the forest types. Whereas overall status of regeneration is satisfactory, variations was found in different management regimes and region. In community forests, seedling density is 16000 per hectare which is higher than the density found in block (15000 per hectare) and collaborative (13000 per hectare) forests. For sapling, the density in community forests is about 6000 per hectare which is higher than the density found in Collaborative (3000 per hectare) and Block (9000 per hectare) forest management regimes. In

hills, the seedling density is 18000 per hectare which is slightly lower than in Terai community forests. Similarly, the sapling density is 7000 per hectare in the Hill and 5500 per hectare in the Terai. The regeneration status of scientific forest management in the province is higher than reported by national forest inventories of Nepal.

While comparing our result with the national level, we found that our result is higher than the national level which is; the number of stems less than 10 cm DBH was 11,566 per hectare. The average number of seedlings (<1.3 m height) was 10,095. The corresponding figures for saplings (≥1.3 m height and <5 cm DBH) and bigger saplings (5–10 cm DBH) were 1,045 and 426, respectively and our findings is in accordance with the national level.

According to Community forestry resource inventory guideline (2004) regeneration status of the forest is said to be good if the forest has seedling > 5000 and sapling > 2000 per hectare. As the regeneration of presently studied forest is in accordance with the above-mentioned criteria, we can say that these forests have good and satisfactory regeneration pattern.

Chapter 3: Timber production, Income and Expenditure Patterns

3.1. Data collection, analysis and presentation

A total of 23 ScFM implemented forests (21 community forests and 2 collaborative forests) were selected from six districts (Arghakhachi, Pyuthan, Banke, Kapilvastu, Nawalparasi and Rupandehi) of Lumbini province to study income and expenditure pattern of the ScFM implemented forests. The sites were selected from ScFM implemented 10 districts (11 DFOs) out of 12 districts of the province. The sites represent about 35% of ScFM with three years of implementation in terms of annual harvesting. We selected the sites based on the discussions with MoITFE Lumbini province and DFOs of respective districts. They were chosen such that the ScFM implemented forests have at least three years of annual audit reports i.e., audit report of fiscal year 2074/75, fiscal year 2075/76, and fiscal year 2076/77. Based on this, 23 forests were selected.

At first, we interviewed DFO, FECOFUN, ACOFUN and forest user group leaders to gain insights on general pattern of income and expenditure flow since the implementation of ScFM in community and collaborative forests. Equally, we discussed how the income and expenditures is coded, recorded and documented.

The detailed information on sources of income and its amount, expenditure types and amount were obtained by careful review of the audit report of each fiscal year. We also reviewed annual progress report, vouchers and original bills of the forests to obtain more detail information on income and expenditure. The recorded source wise data on income and expenditure was later reconciled with key members of the executive committee, mainly president, secretary and treasurer to validate the recorded information. The detailed information on income and expenditure were recorded in fund data recording sheet.

For data analysis, the recorded data were entered in excel, cleaned and categories into different income and expenditure groups based on the nature of income and expenditure sources and following the headings recorded by forest user groups. The income was grouped as timber income, fuelwood income, user's contribution, support from local groups, support from DFO, IGA, other incomes and previous year balance. Similarly, expenditures were categorized as forest development, community development, training and capacity building and administrative

activities. The expenditure is further categories into several sub-headings based on the nature of expenditure. The following table describes the different sub-groups under expenditure category:

Table 16: Categories of expenditure

Forest development	Community development	Training and capacity building	Administrative expenses
• Forest Protection • Harvesting, • Forest Management (ScFM expenses, silviculture operation, plantation, regeneration promotion and cleaning), • Fire line development • Technical support • Others (miscellaneous, labours, snacks etc.)	• Education support • Drinking Water • Road/Trail • Irrigation • Community building • IGA • Donation	• Training and capacity building (skill development, tours, awareness building, trainings and workshops)	• Salary/Wages • Stationery • Communication • Travel and fuel • Meetings • Assembly • Maintenance of office • Donation and membership • Other expenses

The income and expenditure were calculated as an average income per year. Similarly, the average total and sub-total of each category is presented.

3.2. Timber and fuelwood production from community forests

Timber and fuelwood are the major product obtained from scientific forestry program. We collected timber and fuelwood production data from five community forests representing hill and Terai region of the province.

The record keeping practice of timber harvested from community forests is inconsistent and sporadic in the community forests. In some cases, timber is combined with fuelwood while others segregated the timber according to major species of the region. Therefore, we confined our analysis with the community forests where timber and fuelwood data are available for three years after regeneration felling. We analysed the average quantity of timber produced in three consecutive years of regeneration felling in community forest of hill and Terai.

Table 17 provides average timber quantity for three years for community forests in the hills and terai. The table reveals that the community forests in the Terai are the major producer of timber.

Table 17: Average timber production in the hill and terai of Bagmati Province (cft)

Region	Year 3	Year 2	Year 1
Hills	3805.8	4194.5	2710.6
Terai	5172.0	7989.2	8994.6

Year 1...3 denotes the number of years after regeneration felling

Figure 13 depicts that timber production from community forests have increased in Terai and decreased in the hills for last three years. The figure depicts that timber quantity from community forests in the hills has decreased in last three regeneration felling while it is increasing in the Terai region.

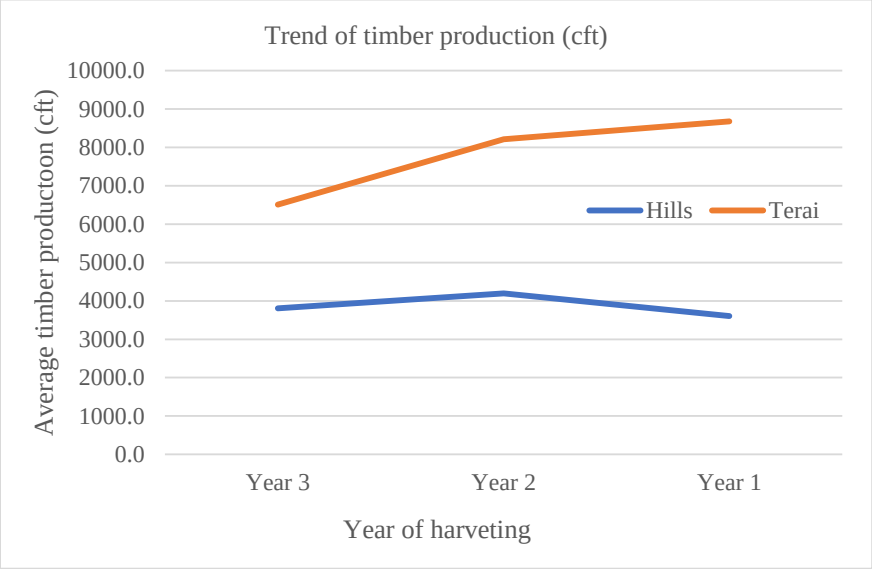


Figure 13: Trend of timber production from the community forests of Terai and Hills

Timber is the main source of incomes for communities. Timber is either consumed internally by local users or sold outside. Table 18 presents the average quantity of timber consumed by the community for their own users.

Table 18: Average quantity of timber consumed internally

Region	Year 3	Year 2	Year 1	Average % of total timber produced
Hills	670.363	358.6525	396.278	12.4
Terai	4099.27	3179.668	2612.1	31.1

Figure 14 presents the portion of total timber for internal consumption. The figure 14 clearly depicts that proportion of internal use of timber is lower in hills than in Terai. The external sale records of timber and fuelwood was sparsely available making detail accounting difficult.

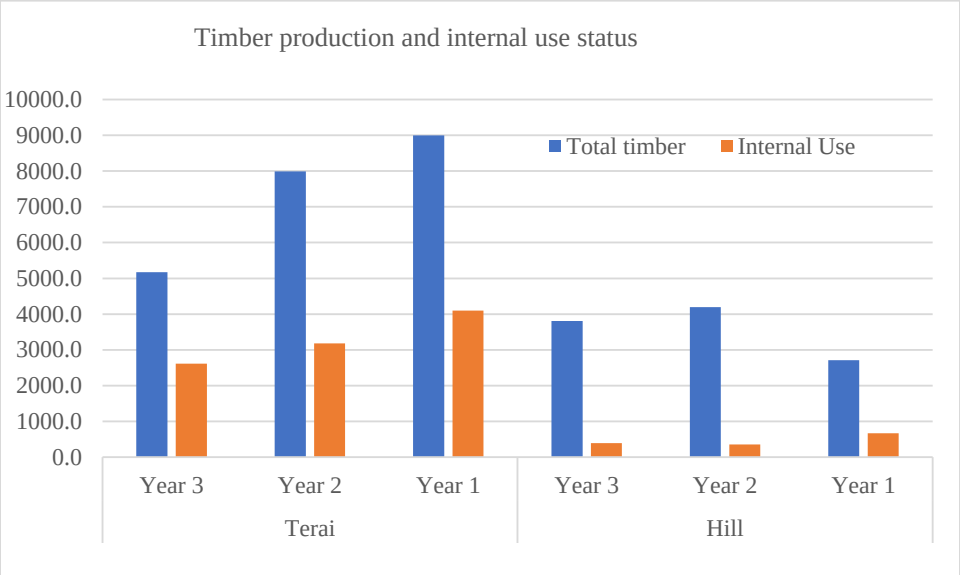


Figure 14: Average quantity of timber consumed internally compared to total production.

Average annual production of fuelwood by community forests in Hill and Terai region is presented in Table 19. The table reveals that fuelwood production has decreased from its first felling (Year 3) in both Hill and Terai. The production in Terai is about two to four time higher than in the hills.

Table 19: Average annual fuelwood production of community forests (*in Chatta*)

Region	Year 3	Year 2	Year 1
Hills	11.58	9.44	9.95
Terai	44.25	36.10	18.82

3.3. Species and quality of timber produced

Sal is the major timber species in the province. Other species used for timber included Asna, Saj. Karma, Jamun and Pines. As the timber other than Sal are grouped together, it is hard to segregate species-wise timber production and its quantity.

Timber is obtained from logs. The quality of logs is graded as A, B and C according to their potential to produced timber of required size. It has been reported that about 30 percent of total logs are qualified as grade A. The grade A logs are free from decay and hollow. The logs graded as B are often with hollow and deep splits. The logs of grade C are with hollow and lowest potential for timber. The timber of grade A fetch higher revenues compared to other grades.

However, it is hard to obtain the timber quantity segregated according to the species and quality grades. In general, it was reported that grade B and C timber accounts respectively about 40 percent and 30 percent of total production. This indicates the quality of existing forests to produce timber.

3.4. Income pattern of community forests and collaborative forests from Terai and Hills

3.4.1 Income pattern of community forests in Terai

The Average annual ScFM implemented CFUG in fiscal years year 2074/75, 2075/76 and 2076/77 was found NRs. 73, 89,242 NRs. 1,01,08,997 and NRs. 1,18,68,290 respectively Table 19 and overall average annual income were found NRs. 97,88,843. Highest mean income was obtained from timber in all three years and this covered about 51% of the total annual average income in all three years. Other incomes, fuelwood income, support from local groups, support from DFO, IGA, and User's contribution including membership fee, new member fee, penalty, user's support, interest application followed the timber income as CFUG income source (Figure).

Fuelwood income contributed 6% income in average each year. Similarly, we observed substantial amount of income contributing from the last year balance in the CFUGs fund. This is about 22% in average per year. The income from timber, fuelwood, and IGAs appear fluctuating. The other income includes leaf litter, other forest resources income except timber and fuelwood.

Table 20: Income sources of community forests in Terai

	FY 2074/75	FY 2075/76	FY 2076/77

CFUG Income sources (Terai, N=16)	Average income	Average income	Average income	Three years average
Timber Income	3364813	5623054	5848356	4945408
Fuelwood income	839843	593718	367254	600272
User contribution	133287	130670	159148	141035
Support from local groups	591802	400633	453888	482108
Support from DFO	51057	481787	474279	335708
IGA	308142	191377	445233	314917
Other Incomes	397999	818142	1162949	793030
Previous year balance	1702299	1869616	2957183	2176366
Total	7389242	10108997	11868290	9788843

3.4.2 Income pattern of community forests in Hills

The Average annual ScFM implemented CFUG in fiscal years year 2074/75, 2075/76 and 2076/77 was found NRs. 59,79,367 NRs. 39,67,342 and NRs. 49,87,433 respectively Table 20 and overall average annual income were found NRs. 49,780,47. Highest mean income was obtained from timber in all three years and this covered about 53% of the total annual average income in all three years. Other incomes, IGA, previous year balance, DFO support, fuelwood income and User's contribution including membership fee, new member fee, penalty, user's support, interest application followed the timber income as CFUG income source (Figure 15).

IGA contributed 26% of total annual income in average. It was found contributing in substantial amount of income sources. The income from timber, fuelwood, and IGAs appear fluctuating. There was very minimal support from local groups in fiscal year 2074/75 which seems discontinued in other fiscal years.

Table 21: Income sources of community forests in Hills

	FY 2074/75	**FY 2075/76**	**FY 2076/77**	
CFUG Income sources (Hills, N=6)	Average income	Average income	Average income	Three years average
Timber Income	3695787	1511480	2692506	2633258
Fuelwood income	2284	94273	6123	34227
User contribution	68539	3798	18270	30203
Support from Local groups	833	0	0	278
Support from DFO	155025	38888	26802	73572
IGA	961569	1158412	1822616	1314199
Other Incomes	267096	104958	112196	161417
Previous year balance	828234	1055533	308920	730896

Total	5979367	3967342	4987433	4978047

3.4.3. Income pattern of Collaborative forests

The Average annual ScFM implemented CFUG in fiscal years year 2074/75, 2075/76 and 2076/77 was found NRs. 6,96,89,028 NRs. 8,17,47,588 1 and NRs. 11,41,52,126 respectively (Table 21) and overall average annual income were found NRs. 8,85,29,581. Highest mean income was obtained from timber in all three years and this covered about 34% of the total annual average income in all three years. Support from DFO, fuelwood income, IGA, and User's contribution including membership fee, new member fee, penalty, user's support, interest application followed the timber income as CFUG income source (Figure 15).

Previous year balance contributed 43% of total income. This amount has substantially increased the total income figure of collaborative forests. As the amount of balance in this category shares substantial amount of income, the analysis of total average income of forests should be carried cautiously. Our attempt to segregate income only from forest products was constrained by the system of income recorded by the forest user groups. As a result, we followed the records maintained by the forest user groups and analysed accordingly.

We found no support from local groups in case of collaborative forests. The income from timber is found in increasing trend and fuelwood, IGAs and support from DFO appear fluctuating.

Table 22: Income sources of collaborative forests

	FY 2074/75	**FY 2075/76**	**FY 2076/77**	
Collaborative forests income sources	Average income	Average income	Average income	Three years average
Timber Income	18669579	33731580	36582968	29661376
Fuelwood income	2750172	2820239	3935757	3168722
User contribution	30000	130000	309000	156333
Support from Local groups	0	0	0	0
Support from DFO	6899955	8225000	13625000	9583318
IGA	1865486	1236597	5685187	2929090
Other Incomes	9930997	3236214	1319972	4829061
Previous year balance	29542840	32367959	52694243	38201681
Total	69689028	81747588	114152126	88529581

3.4.4. Key income sources and its variation in community forests (Average of three fiscal years)

The average three years income sources show timber as a key source of income in all scientifically managed forests. The income of community forests in Terai and Hills varies substantially. In case of community forest in Terai, the annual income is almost two-fold higher than the annual income of community forests in Hills. The income from fuelwood, user's contribution and local groups and DFO support is also higher in case of CFs in Terai than that of CFs in Hills. However, the income from IGA is four times greater in CFs in Hills than the CFs in Terai. This income includes revolving funds, its interest, income from rents etc.

The average total income of CFUGs is in decreasing trend in Hills while it is in increasing trend in Terai. In hills the average annual income in fiscal years 2074/75, 2075/76 and 2076/77 was found NRs. 59,79,367 NRs. 39,67,342 and NRs. 49,87,433 respectively. While in the same fiscal years the average annual income of Terai CFs was found NRs 73, 89,242 NRs. 1,01,08,997 and NRs. 1,18,68,290 respectively.

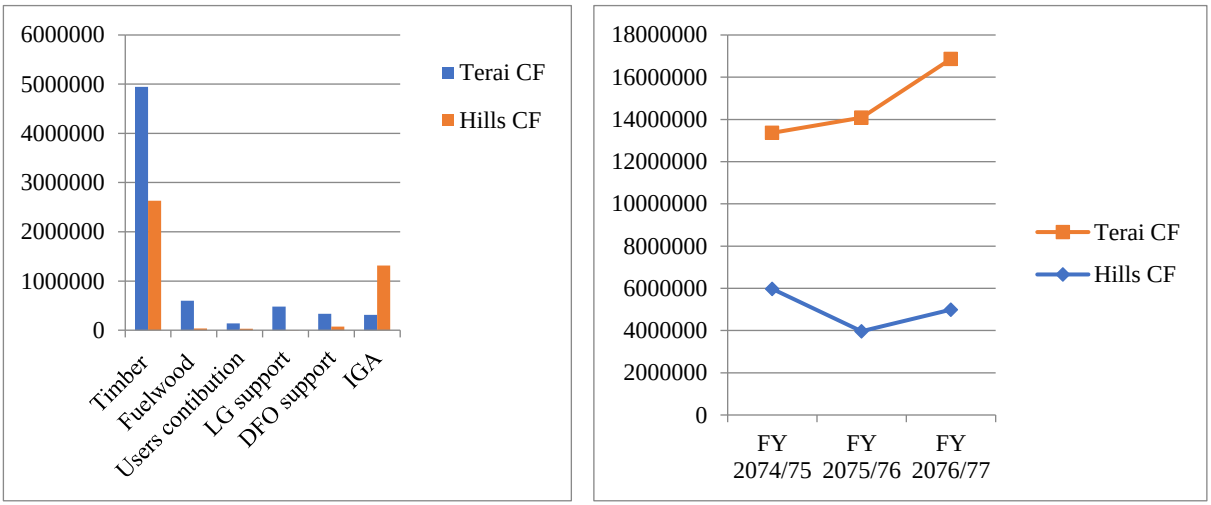


Figure 15: Income sources in CFs in Terai and Hills

3.4.5. Key income sources and its variation in collaborative forests (Average of three fiscal years)

In case of collaborative forest as well timber is found to be key source of annual income followed by DFO support, fuelwood income, IGAs and user's contribution. Timber has contributed almost 34% of total income. The average annual income in each of the fiscal years is in increasing trend in collaborative forests.

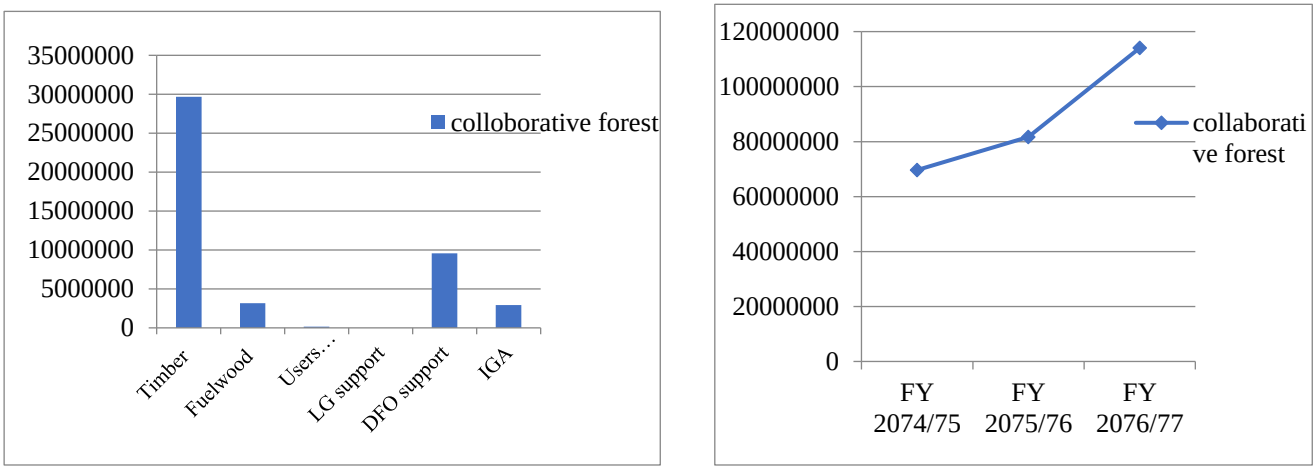


Figure 16: Average Income sources and trend in Collaborative forests

3.5.Expenditure pattern of community forests and collaborative forests from Terai and Hills

3.5.1. Average expenditure pattern of scientifically managed community forests in Terai and Hills

The result shows in average out of total income more than 75% has been invested by CFUGs in Terai and more than 85% has been invested by CFUG in Hill for different activities each year. The three years average shows the share of expenditure is more in forest development and community development activities, which accounts on average more than 70% of total expenditure (Table 22; Figure 17) in Terai and Hills CFs. In Terai CFs forest development expenditure was found highest (39%) followed by community development (32%), administrative expenses (24%), and training and capacity building (5%). However, in case of CFs in Hills, the expenditure in forest

development was found higher than Terai CFs with 44%, followed by community development (42%), administrative expenses (13%), and training and capacity building (1%).

In case of forest development activities, the expenditures were on forest Protection, forest harvesting, forest Management, fire line development, technical support from DFO and other stakeholders and other expenses occurring during forest development activities. Among the forest development forest expenses in Terai CFs forest harvesting, protection and forest management accounted for 82% of total expenses incurred in forest development. The expenses in forest harvesting are highest (45%) followed by forest protection (19%) and forest management (18%). The trend is bit different in case of CFs in Hills. The expenses in forest harvesting is highest with (37%) followed by forest management (32%) and forest protection (18%).

CFUG expenditure (Terai N=16)	**FY 2074/75**	**FY 2075/76**	**FY 2076/77**	
Forest development expenses	Average Exp.	Average Exp.	Average Exp.	Three years average
Protection	379921	609298	584761	524660
harvesting	951272	1544741	1337573	1277862
Forest Management	357118	537902	624727	506582
Fire line development	109760	76182	135135	107026
Technical support	79711	167093	91753	112852
Others	337430	281826	390586	336614
Sub- total	2215211	3217042	3164535	2865596
Community development				
Education support	35436	32241	41441	36373
Drinking Water	0	10459	53418	21292
Road/Trail	434060	86868	433000	317976
Irrigation	48350	188370	337937	191552
Community building	1065483	775438	1294454	1045125
IGA	563067	238974	470442	424161
Donation	142605	699321	239714	360547
Sub-total	2289001	2031671	2870406	2397026
Training and capacity building				
Sub-total Training and capacity building	382593	159480	492225	344766
Administrative expenses				0
Salary/Wages	409438	517098	591749	506095
Stationery	18074	14519	10118	14237
Communication	10444	26999	45267	27570
Travel and fuel	57193	53808	51321	54108

Meetings	111803	163492	158132	144476
Assembly	119621	114505	114507	116211
Maintenance of office	40014	105203	173913	106377
Donation and membership	82372	33719	45188	53760
Other expenses	446166	1088078	838539	790928
Sub-total	1295126	2117422	2028735	1813761
Grand Total	6181930	7525615	8555900	7421148

Table 23: Average annual CFUG expenditure in Terai

In case of community development activities, the expenditures were on education support, drinking water, road, irrigation, community building and IGAs and donation. Among the community development expenses in Terai CFs expenses in community building (43%) was highest followed by IGA (18%), donation (15%) and road (13%). However, the expenditure pattern is different in CFs in Hills. In Hills the expenses in IGA were found highest with 59% expenses in case of community development activities followed by irrigation (15%), community building (9%) and road (7%).

In case of training and capacity building activities the expenses are substantially different between Terai and Hills. The Terai CFs expense is twelve-fold higher than expense in Hills CFs.

In case of administrative expenses, the expenditures were on Salary and wages, stationary, communication, travel and fuel, meetings, assembly, office maintenance, donation and memberships and other expenses. Among these expenses, in Terai CFs the expenses were highest for other expenses (43%), followed by Salary and wages (28%), office maintenance (14%), meetings (8%) and assembly (6%). The expenses are found different in Hills CFs. In Hills CFs the expenses were found highest for other expenses (59%) followed by meetings (17%), Salary and wages (8%), and travel and fuel (7%).

Table 24: Average annual CFUG expenditure in Hills

CFUG expenditure (Hills =6)	**FY 2074/75**	**FY 2075/76**	**FY 2076/77**	
Forest development expenses	Average Exp.	Average Exp.	Average Exp.	Three years average
Protection	197948	270977	225789	231571
harvesting	809161	748684	520077	692641
Forest Management	805301	549391	455387	603360
Fire line development	229893	266541	95597	197344

Technical support	179828	64883	104450	116387
Others	46947	73849	0	40265
Sub- total	2269077	1974325	1401300	1881568
Community development				
Education support	42667	38333	67847	49616
Drinking Water	106180	37307	84107	75865
Road/Trail	165901	158040	40328	121423
Irrigation	712503	100559	9615	274226
Community building	101715	240205	123652	155191
IGA	1145793	1516154	506946	1056298
Donation	56566	114879	37129	69525
Sub-total	2331325	2205477	869624	1802142
Training and capacity building				
Sub-total Training and capacity building	23418	51702	0	25040
Administrative expenses				
Salary/Wages	67087	49933	591749	44100
Stationery	10889	0	10118	7407
Communication	37872	77850	45267	22820
Travel and fuel	31636	44730	51321	24960
Meetings	90919	123495	158132	90249
Assembly	33359	57607	114507	21763
Maintenance of office	7054	10765	173913	1600
Donation and membership	1667	8667	45188	10630
Other expenses	347943	97162	838539	327371
Sub-total	628425	470209	2028735	550900
Grand Total	5252245	4701713	4299659	4259650

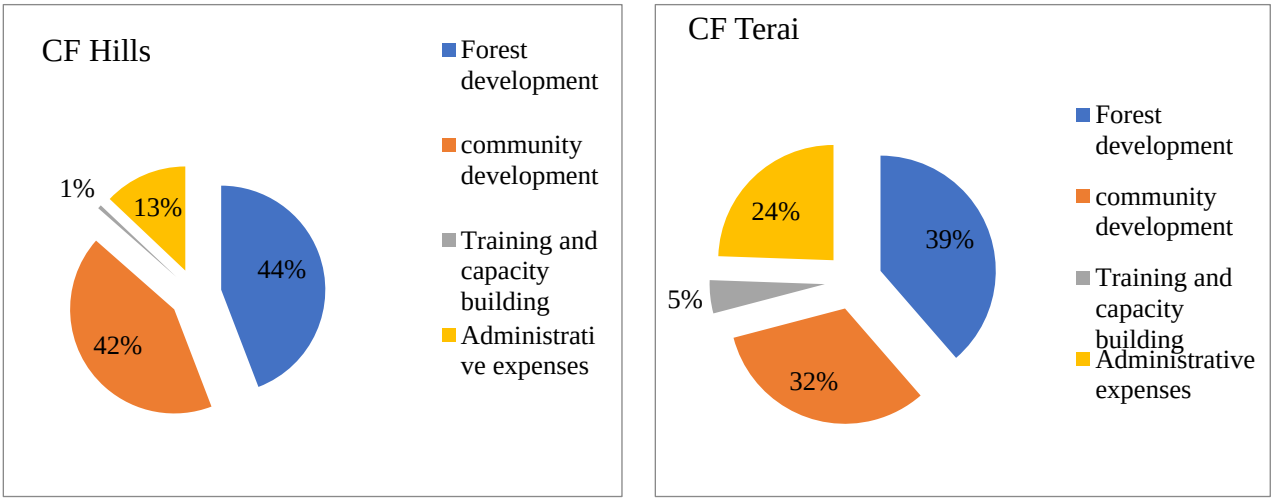


Figure 17: Three years average annual expenditure of CFs in Terai and Hill

3.5.2. Annual expenditure pattern in community and collaborative forests

In average out of total income more than 39% has been invested by collaborative forests for different activities each year. The three years average shows the share of expenditure is more in forest development activities, which accounts on average about 83% of total expenditure (Table 24; Figure 18). The other expenditure includes community development (13%), administrative expenses (2%), and training and capacity building (2%).

In case of forest development activities, the expenditures were on forest Protection, forest harvesting, forest Management, fire line development, technical support from DFO and other stakeholders and other expenses occurring during forest development activities. Among the forest development forest expenses in collaborative forests forest harvesting, protection and forest management accounted for 82% of total expenses in incurred in forest development. The expense in forest harvesting is highest (45%) followed by forest protection (19%) and forest management (18%). The trend is bit different in case of CFs in Hills. The expense in forest harvesting is highest with (37%) followed by forest management (32%) and forest protection (18%).

In case of community development activities, the expenditures were on education support, drinking water, road, irrigation, community building and IGAs and donation. Among the community development expenses in Terai CFs expenses in community building (43%) was highest followed by IGA (18%), donation (15%) and road (13%). However, the expenditure

pattern is different in CFs in Hills. In Hills the expense in IGA was found highest with 59% expenses in case of community development activities followed by irrigation (15%), community building (9%) and road (7%). In case of training and capacity building activities the expense is substantially different between Terai and Hills. The Terai CFs expense is twelve-fold higher than expense in Hills CFs.

In case of administrative expenses, the expenditures were on Salary and wages, stationary, communication, travel and fuel, meetings, assembly, office maintenance, donation and memberships and other expenses. Among these expenses, in Terai CFs the expense was highest for other expenses (43%), followed by Salary and wages (28%), office maintenance (14%), meetings (8%) and assembly (6%). The expenses are found different in Hills CFs. In Hills CFs the expense was found highest for other expenses (59%) followed by meetings (17%), Salary and wages (8%), and travel and fuel (7%).

Table 25: Average annual collaborative forest expenditure

Collaborative forests expenditure (N=2)	**FY 2074/75**	**FY 2075/76**	**FY 2076/77**	
Forest development expenses	Average Exp	Average Exp	Average Exp	3-year average
Protection	2005559	2757407	2279755	2347574
harvesting	11806024	18079016	12262724	14049255
Forest Management	4692227	7492903	11325013	7836714
Fire line development	4946520	4431577	1164325	3514141
Technical support	1124518	708016	206750	679761
Others	215935	349983	0	188639
Sub- total	24790782	33818901	27238567	28616083
Community development				
Education support	1735757	2292740	3996494	2674997
Drinking Water	0	1146370	0	382123
Road/Trail	0	0	0	0
Irrigation	126557	225870	523324	291917
Community building	1110111	1345223	596592	1017308
IGA	0	0	0	0
Donation	0	0	18000	6000
Sub-total	2972424	5010203	5134410	4372345
Training and capacity building				
Sub-total Training and capacity building	106897	1468349	911453	828900
Administrative expenses				
Salary/Wages	1498828	3304314	3791817	44100
Stationery	216658	356629	164174	7407

Communication	236336	227167	523907	22820
Travel and fuel	223986	242942	312454.5	24960
Meetings	531092	569926	474720	90249
Assembly	54650	0	0	21763
Maintenance of office	343041	503091	1235314	1600
Donation and membership	0	0	0	10630
Other expenses	3941541	4659662	6393796	327371
Sub-total	3941541	4659661.5	12896183	550900
Grand Total	31811643	44957114	46180612	34368228

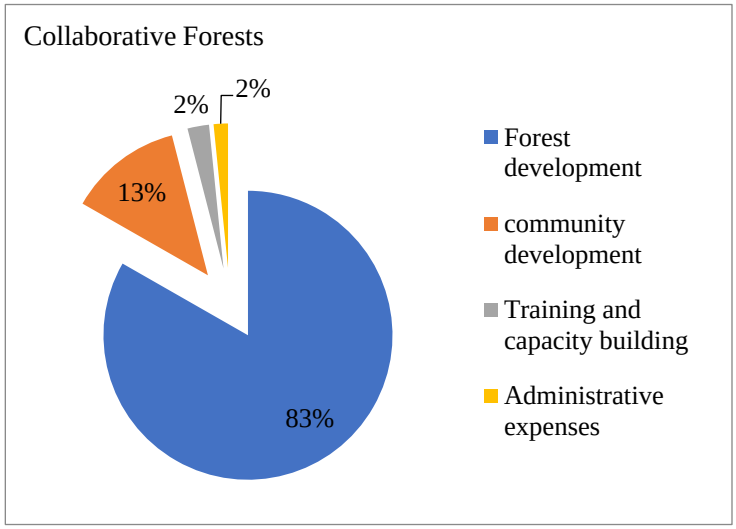


Figure 18: Three years average expenditure of collaborative forests

Chapter 4: Implementation and governance status

4.1 Data collection, analysis and presentation

We carried out structured questioner survey and interviews with the CFUGs executive committee members and leaders to generate the implementation status data. The survey was carried out in 29 CFUGs from five districts (Arghakhachi, Banke, Kapilvastu, Nawalparasi and Rupandehi) with three years of ScFM implementation. Among the 60 CFUGs with three years of ScFM implementation, 24 CFUGs in Terai and 5 CFUGs in Hills were surveyed. The three years of ScFM implementation and districts with higher number of ScFM implementation years were taken as a primary criterion for selection of survey sites. For implementation status of ScFM, we categorised implementation activities into forest management activities, community development activities, income generating activities and community empowerment activities. Based on the activities mention in forest operational plan, community forest development guideline 2014 and ScFM guideline 2071 the implementation activities were further sub-divided into several activities in each of the categories.

For all the activities in each criteria status of activities were recorded as completed, not completed, on-going and suspended or not in plan as per the present status of the activities. The data were recorded in systematically designed sheet. After survey with the CFUGs committee members, the CFUGs records minutes were reviewed to verify the data generated through survey. Equally, interviews with the committee members were also carried out. All together 31 interviews were done.

For data analysis, the data was first entered in excel, it was coded, cleaned and analysed based on the frequency on each activity under forest management, community development, income generating activities and community empowerment categories. Further the data is analysed and presented on the basis of ScFM implementation in Terai and Hills. The analysed data is presented in tabular form as discussed below.

4.2 Implementation status of ScFM in Terai

The result shows that among the different forest management activities implemented in ScFM in Terai majority (more than 95%) of the activities are either completed or is on-going. The key forest management activities that are being implemented are regeneration felling, mother tree selection,

regeneration promotion, tending operation, timber and firewood harvesting and post harvesting operation, fencing and patrolling.

In case of community development activities, road improvement, community building and school support activities is either completed or on-going. However, in most of the CFUGs in Terai the activities like electrification, drinking water, stove promotion and Biogas installation is not in implementation. Similarly, under income generating activities, forest-based employment generation, and revolving fund for poor and marginalised groups, skill development and goat farming activities is on-going in majority of CFUGs, while forest-based enterprises, vegetable and fruit farming activities are either suspended or not planned. Further, under community empowerment activities, representation in committee leadership is implemented in all the CFUGs. Equally, the implementation of students' scholarship, socio-cultural activities is on-going in more than 50% of CFUGs. However, the literacy programme is either completed or not in plan in majority of CFUGs.

Table 26: Implementation status of different forest activities (In %, N=24)

Forest Management Activities	**Completed**	**Not completed**	**Ongoing**	**Suspended/not in plan**
Regeneration felling	92	4	4	0
Mother tree selection	96	0	4	0
Regeneration promotion	16	8	76	0
Tending Operation	19	4	73	4
Timber and firewood harvesting	88	4	8	0
Post harvesting operations	30	4	67	0
Fencing	15	4	77	4
Patrolling	0	0	100	0
Grazing control	0	0	92	8
Fire line	19	4	74	4
Community development				
Road Improvement	19	4	63	15
Community building	15	12	31	42
Electricity	0	0	0	100
Water pond	0	0	12	88
Foot trail	0	0	27	73
School support	4	0	46	50
Stove promotion	4	0	4	92

Biogas installation	0	0	4	96
Drinking water	0	0	8	92
Income Generating Activities				
Goat farming support	4	0	58	38
Off-farm vegetable farming	0	4	35	62
Fruit tree plantation support	0	0	31	69
Skill development	30	12	52	6
Revolving fund for income generation	0	0	62	38
Employment generation	0	0	88	12
Forest based enterprises	0	0	15	85
Community Empowerment				
Literacy programme	0	0	4	96
Student scholarship	8	0	50	42
Awareness campaign	8	8	42	42
Sociocultural	4	0	54	42
Representation in committee leadership	0	0	100	0

4.3 Implementation status of ScFM in Hills

As discussed in the Terai forests, the result in the Hills forests also shows that among the different forest management activities implemented in ScFM majority (more than 95%) of the activities are either completed or is on-going. The key forest management activities that are being implemented are regeneration felling, mother tree selection, regeneration promotion, tending operation, timber and firewood harvesting and post harvesting operation, fencing and patrolling. However, in some CFUGs the grazing control is now suspended.

In case of community development activities, road improvement, community building and electrification activities are either completed or on-going. The school support, foot trail and drinking water are on-going in around 40% of CFUGs while in around 60% CFUGs it is not in plan. However, in most of the CFUGs in Hills the activities like stove promotion, biogas installation and water pond construction are not in implementation.

Similarly, under income generating activities, forest-based employment generation, revolving fund for poor and marginalised groups, skill development and goat farming activities is on-going in majority of CFUGs, while forest-based enterprises, vegetable and fruit farming activities are either suspended or not planned. Further, under community empowerment activities, representation in committee leadership is implemented in all the CFUGs. Equally, the implementation of students'

scholarship, socio-cultural activities is on-going in more than 50% of CFUGs. However, the literacy programme and student support are either suspended or not in plan in majority of CFUGs.

Table 27: Implementation status of different forest activities (In %, N=5)

Forest Management	**Completed**	**Not completed**	**Ongoing**	**Suspended**
Regeneration felling	100	0	0	0
Mother tree selection	100	0	0	0
Regeneration Promotion	40	40	20	0
Tending Operation	20	20	60	0
Timber and firewood harvesting	100	0	0	0
Post harvesting operations	0	0	100	0
Fencing	0	0	100	0
Patrolling	0	0	100	0
Grazing control	0	0	80	20
Fire line	40	0	60	0
Community development				
Road Improvement	20	0	80	0
Community building	20	0	40	40
Electricity	0	0	60	40
Water pond	0	0	0	100
Foot trail	0	0	40	60
School support	0	0	40	60
Stove promotion	0	0	0	100
Biogas installation	0	0	0	100
Drinking water	20	0	40	40
Income Generating Activities				
Goat farming support	0	0	60	40
Off-farm vegetable farming	0	0	40	60
Fruit tree plantation support	0	0	0	100
Skill development	10	10	0	80
Revolving fund for income generation	0	0	60	40
Employment generation	0	0	80	20
Forest based enterprises	0	0	0	100
Community Empowerment				
Literacy programme	0	0	0	100
Student scholarship	0	0	20	80
Awareness campaign	0	20	40	40
Sociocultural	0	0	75	25
Representation committee leadership	0	0	100	0

In Both Terai and Hills the study reflects that the ScFM implementation is particularly focused on forest management activities. Though there are several other activities on-going around community development, IGA and empowerment, the implantation of forest management activities is a major focus. The representation in committee leadership is one of the key community empowerment activities in both Terai and Hill forests. In case of community development, IGA, and community empowerment majority of CFUGs in Terai and Hills seems focused on some of the key activities like infrastructures, revolving funds, employment generation and socio-cultural activities. However, in both CFUGs the implementation of forest-based enterprises seems zero.

4.4. Forest and regeneration protection status and measures

The fire line construction and maintenance, fencing, regular patrolling and grazing control are the key forest and regeneration protection measures carried by CFUGs. It is either completed or on-going in majority of the CFUGs. The patrolling is on-going in 100% of CFUGs in hills followed by grazing control (92%), fencing (77%) and fire line construction (74%).

In case of Terai CFUGs also, the fire line construction and maintenance, fencing, regular patrolling and grazing control are the key forest and regeneration protection measures carried by CFUGs. It is either completed or on-going in majority of the CFUGs. The patrolling and fencing is on-going in 100% of CFUGs in hills followed by grazing control (80%) and fire line construction (60%). Equally, fire line construction is already completed in 40% of CFUGs in Terai. This, the results reflects that the forest and regeneration protection status is good while there are planned and on-going measures to enhance its protection.

4.5 Socioeconomic impacts and user group opinion

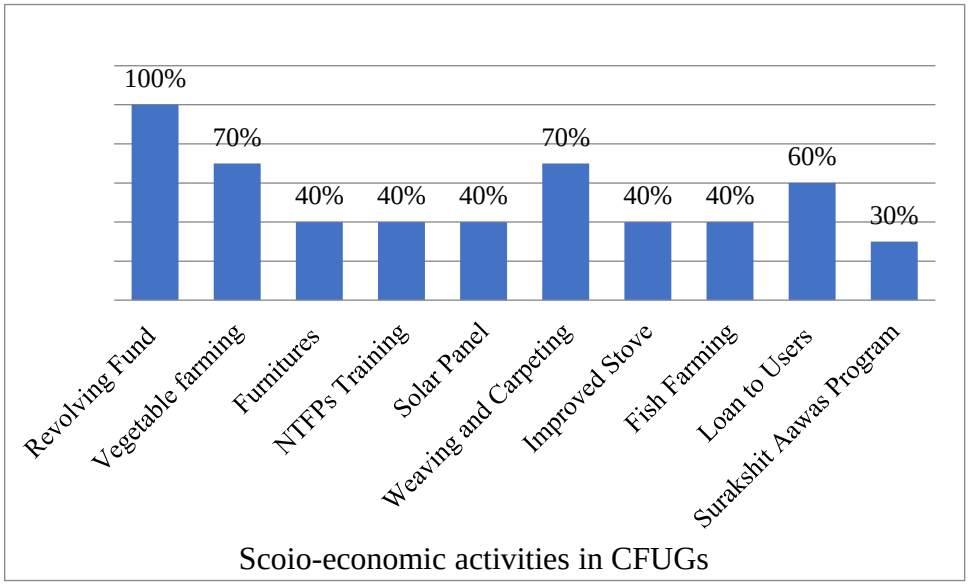
4.5.1 Data collection, analysis and presentation

The semi-structured questioner survey with the CFUGs committee's members and discussion with the committee members and CFUGs were carried to obtain socio-economic activities, its impact and CFUGs opinion on participation and decision making. In total 12 CFUGs with three years of ScFM implementation from five Districts including Nawalparasi, Rupandehi, Kapilvastu, Arghakhachi, and Pyuthan were consulted for the discussion. Similarly, 2 CFM were surveyed. The results are based on the opinion shared by the CFUGs EC members.

For socio-economic activities the list of activities implemented in last three in each CFUGs were generated and discussed on its impacts at user's level. Similarly, for CFUGs opinion the participation of users in different activities were measured as increasing, decreasing and same. The average number of decisions and its implementation relating to IGA, forest management, benefits sharing and community development were also measured. Equally, the women, Dalit and poor representation in decision making are assessed. The issues and concerns raised by the general users and committee members were discussed in narrative form. The opinion on ScFM in this section is analysed based on the ScFM program implementation in the province meaning that the opinion is the general opinion of all the forests implementing ScFM rather than the segregated opinion based on the region and forest management regimes.

4.5.2 Socioeconomic activities after ScFM and its impacts

The key socio-economic activities that were implemented by CFUGs in last three years were revolving fund, followed by vegetable farming, weaving and carpeting and loan to users. Revolving fund for goat, cattle and pig farming is being implemented in all surveyed CFUGs. Whereas vegetable farming is implemented in 70% of CFUGs, Weaving and carpeting in 70% CFUGs, loan to users in 60% of CFUGs, and other activities like furniture support, solar panel support, fish farming support, NTFPs trainings were implemented in 40% of CFUGs.



: Figure 19: Socio economic activities implemented by CFUGs

The revolving funds, weaving and carpentry, improved stoves support and Surakshit Aawas program were focused for poor and marginalised groups, whereas other activities were implemented for all the users' members. At the impact level, revolving fund, vegetable farming, fish farming has helped in income generation of users whereas carpentry, loan, NTFPs training has helped in employment generation. Other activities have helped as daily livelihood support.

In case of CFM, the socio-economic activities are focused on alternative energy promotion like bio gas, scholarship for poor and marginalised students, income generating and capacity development of women, poor and youths etc.

4.5.3 User group opinion on participation and decision making in CFUGs

We found increasing user's participation in forest management activities by 67%, followed by resources distribution activities (67%) particularly in timber distribution and also in EC meetings (42%). There is not much differentiation in general assembly meetings (Figure 20).

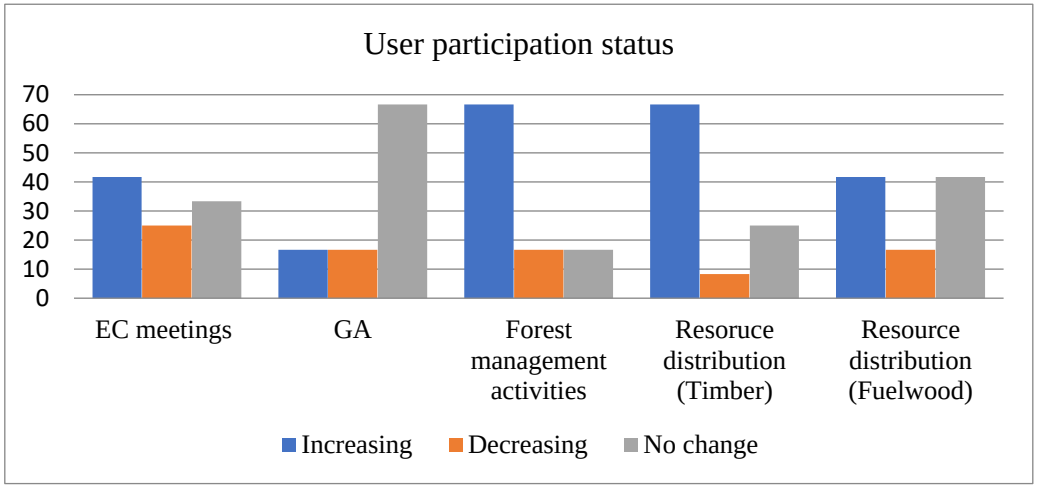


Figure 20: User's participation in different activities in CFUGs

The participation of women in forest management activities and EC meetings is found increasing in majority of CFUGs. In 92% of surveyed CFUGs women participation in forest management activities is found increasing particularly in thinning, pruning, weeding, cleaning, plantation, activities. The increasing women participation in EC meetings is observed in 60% of CFUGs. Interestingly we found no change in timber distribution activities with respect to women participation. Equally in terms of IGA we observed no substantial changes.

The Dalits and poor participation are also increasing in case of forest management and IGA in 80% and 85% CFUGs. While in almost 85% CFUGs there is no change in Dalit and poor user's participation in case of timber distribution and attending meetings and general assemblies.

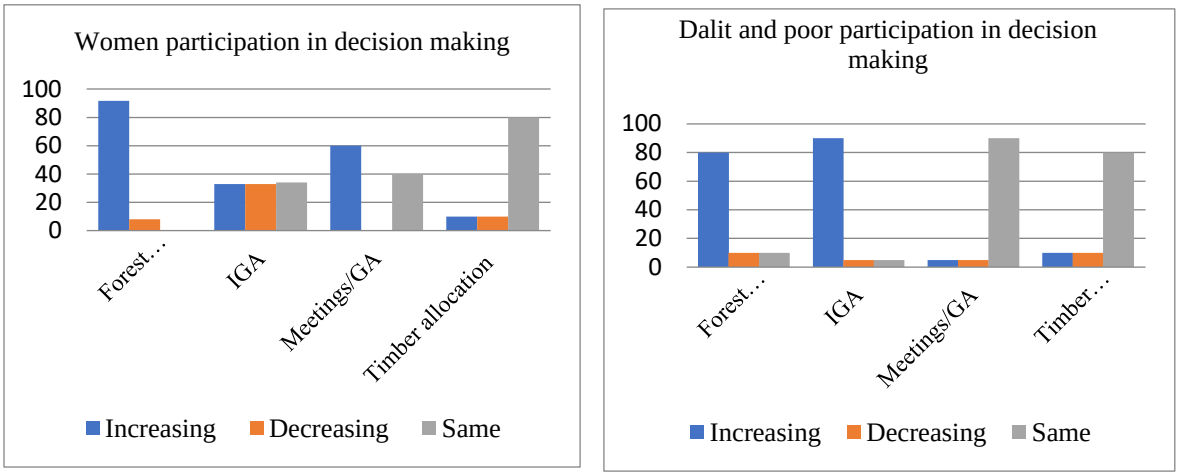


Figure 21: Women, Dalit and Poor participation in decision making activities in CFUGs

In case of opinion on implementation of decision-making activities, we found benefit sharing activities being implemented with 90% implementation followed by forest management activities (70%), community development (60%), and IGA (50%). The average number of decisions per year is found greater in forest management category followed by benefit sharing, IGA and community development (Figure 22).

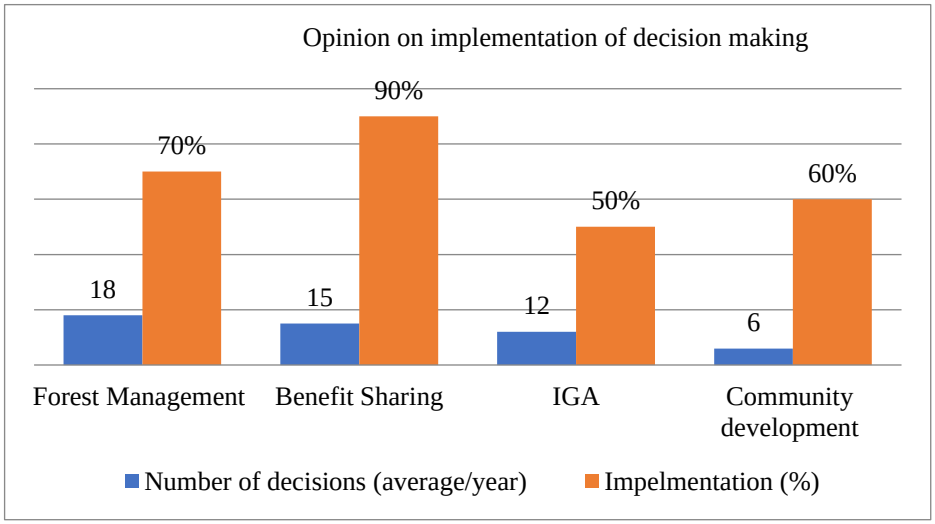


Figure 22: Users group opinion on implementation of decision making

We found some interesting sharing by the forest users on ScFM implementation. The CFUGs opinions in scientific forest management are highly skewed towards economic benefits. The overall understanding of the users shows that users see ScFM approach as an active forest management that increases forest product supply, generates employment, and increases the annual income of CFUGs. This consequently increases investment in social and community development activities. However, they seem less knowledgeable about the ecological and biodiversity concern. The concern on users getting less opportunity to involve in key bio-physical activities in ScFM like mother tree selection, tagging, harvesting etc. were also seems genuine as they shared the technical knowhow is important in such activities which is obviously dominated by forest technicians.

4.6. User groups' opinion on ScFM implementation

We found some interesting sharing by the forest users on ScFM implementation. The CFUGs opinions in scientific forest management are highly skewed towards economic benefits. The overall understanding of the users shows that users see ScFM approach as an active forest management that increases forest product supply, generates employment, and increases the annual income of CFUGs. This consequently increases investment in social and community development activities. However, they seem less knowledgeable about the ecological and biodiversity concern. The concern on users getting less opportunity to involve in key bio-physical activities in ScFM like mother tree selection, tagging, harvesting etc. were also seems genuine as they shared the technical knowhow is important in such activities which is obviously dominated by forest technicians.

The access on forest products like timber, fuelwood and income is increasing. However, it is largely going to the well-off groups. Majority of users shared that forest products and income is increasing by multi-folds. The increased benefits have increased the concern and interest of multiple stakeholders. Local government in some of the CFUGs has enquired on the income sources and its sharing mechanisms.

In case of forest management users shared a fear of resource adequacy to cover incremental cost of regeneration management, regeneration improvement and protection. It is likely to increase as the ScFM system is implemented in subsequent felling series and sub-compartments.

Chapter 5: Policy context of Scientific Forest Management

5.1 Data collection analysis and presentation

To understand the policy context of scientific forest management we intensively reviewed the content of scientific literature, policy documents, reports and media news. In addition, we also had a consultation with experts, stakeholders and communities to understand general reflection of policies in the practices.

Primarily, we reviewed National Forest Policy (2019), Forest Act (2019), ScFM Guideline (2014), Forestry Sector Strategy (2016-2025) and legal documents and directives, along with recent investigation reports by different committees formed by the parliament and government of Nepal.

5.2 Scientific Forest Management evolution context

Historically, Terai forest has been the source of revenue and means to hold power. The people loyal to Rana rulers were granted big chunks of forest as *Birta.* The *Rana regime exported Sal timber that was highly* demanded by India for construction of railways during the period of 1930s to 1950s. Government's emphasis was on revenue through forest clearance and expansion of agricultural land. In Terai, rapid increase in population started following the eradication of Malaria in 1960s and hence the needs for land and forest products are also increasing in the same proportions resulting accelerated forest encroachment, degradation & deforestation. The DoF as the state authority of forest came into being in 1980s with full capacity and equipped with restrictive legislations such as 1961 and 1967. Following undesirable outcomes of restrictive forest policies, the government of Nepal prepared and introduced comprehensive Master Plan for Forestry Sector in 1989 that emphasized people's participation in forest management including different approaches and modalities of forest management.

The organized forest management in Nepal commenced only after 1880s with establishment of forest inspection and timber offices throughout the country. Nepal's decision to nationalize the forests in 1957 has been a historical benchmark. The need of local people to be engaged in the protection and management of forest was first realized by the National Forest Master Plan 1976 and was translated to the Forest Act 1976 through handing over the management right of forests to village Panchayat as Panchayat or Panchayat Protected Forests. The MPFS- 1989 was the key

milestone to promote community forestry-CF one of its six primary programs. This was translated to the Forest Act of 1993 and Forest Regulation 1995.

In the mid-1990, government prepared operational forest management plan (OFMP) for almost all of the 17 Terai districts. The Sagarnath Forest Development Project began in 1977- a milestone of silviculture-based forest management- to satisfy the fuelwood demand of Kathmandu Valley. With several piloting in the Terai Sal forests, in 1990s, the GoN introduced the concept of scientific forestry to manage forests of terai region through Operational Forest Management Plans (OFMPs), but they were abolished before their implementation. The forest policy of 2002 envisioned the concept of managing large chunk of terai forests in blocks through collaborative approaches with local institution. Forest for prosperity is one of the major visions of Ministry of Forest and Soil Conservation for Scientific Forest Management. In budget announcement of fiscal year 2069/70 it was said that one lakh ha of forest will be managed scientifically. Along with this, it was mentioned that Forest Management Program will be extended to 75,000 ha within the running 3-year plan.

Consequently, recent forest policies like National Forest Policy 2015, Forest Act 2019, National Forestry Sectors Strategy 2015, and Forestry Sector Periodic Plans 2013-2015 & 2016-2018 have emphasized towards productive forest management through the application of silvicultural system.

5.3. Policy provisions

National Forest Policy, 2019 is the current forest sector policy of Nepal that guides the overall conservation, management and utilization of forest of the country. This policy has specified the working strategy, interrelationships and role of three-level government for the management of forest, flora, fauna, biodiversity and watershed of the country. The aim of this policy is to increase the forest, protected areas, watershed, biodiversity, flora and fauna and other forest products and services through sustainable and participatory management and equitable benefit sharing. The policy envisions to enhance national prosperity through green economy derived from improved production of forest-based goods and services in a sustainable manner.

Forest policy emphasized to promote and enhance private forest, afforestation in public lands, urban forest, agroforestry and family forest. Ensuring the 50% participation of women in decision making of all forestry sector government, community, collaborative and private organization is guided by forest policy. It also includes that while performing the forestry sector program

collaboration is done among central, provincial and local level government. Likewise, central government will demark the national level policy, law, criteria, implementation and monitoring; Provincial government manages forest that lies inside its territory by collaborating with central and local government. Role of local government for management of community-based forest, private forest, agro-forestry and for running enterprises related to forest are also included in forest policy.

Scientific Forest Management Guideline 2014 was the key guideline to managed forest as per criteria and indicator of sustainable forest management. This guideline mainly focuses on the silviculture-based forest management with the following steps.

- Selection of appropriate silvicultural system
- Division of the forest into compartments and sub-compartments
- Forest inventories
- Adoption of silvicultural operations on each sub compartment
- Yield regulation
- Marking and systematic harvesting of marked trees of sub-compartment:

However, due to the recommendation of parliamentarian committee, high level investigation committee form by the council of ministries has recommended to revise the guideline and it now being suspended by government by raising some issues on governance and management in the field level.

Following the expiration of the landmark Master Plan for the Forestry Sector or MPFS (1989–2010), Nepal's Ministry of Forest and Soil Conservation (MFSC) drafted a new Forestry Sector Strategy (FSS) for the decade (2015–2025) (MFSC, 2014). The draft FSS was developed by a team of forest policy and management experts over a period of 15 months during 2012–2014, with support from donors and in consultation with stakeholders, including civil society groups. The policy text also captures crosscutting social issues such as gender and inclusion, mainly as a response to the escalating demand for inclusive governance in Nepal over the past few years. FSS focuses on 50% of Terai/Siwalik and 25% of mid hills forest under Scientific Forest management/sustainable forest management. It also emphasizes to increase CFM under ScFM and increase timber production and employment generation in the country. It mainly focuses on the

intensive management of CF.

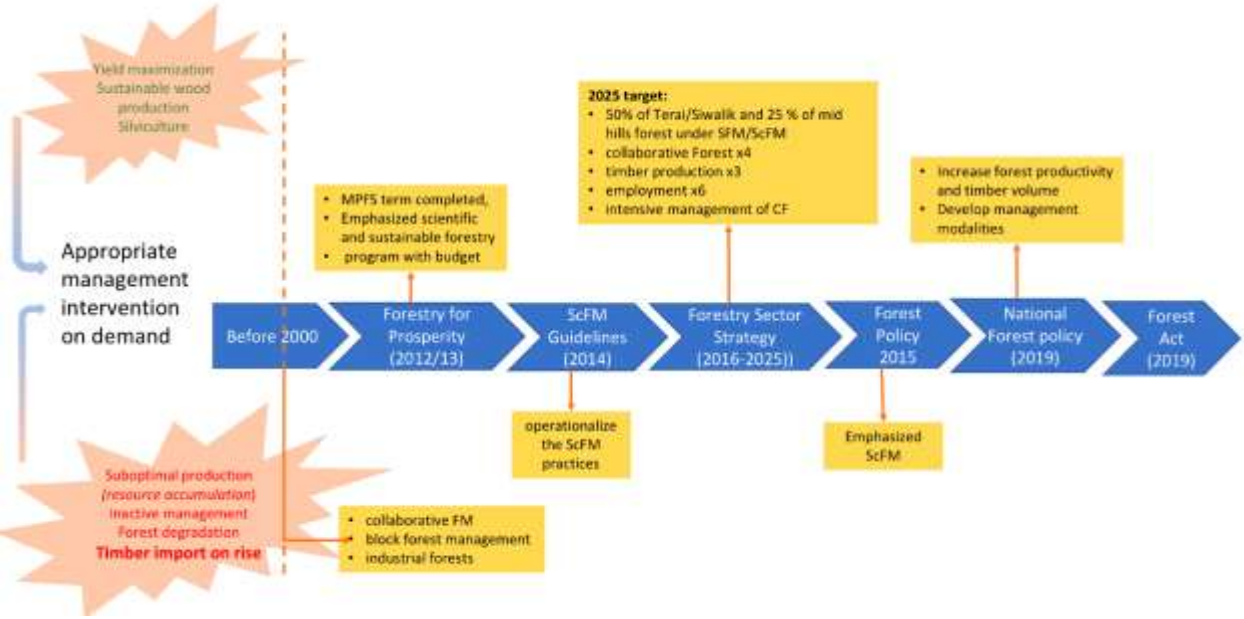


Figure 23: Genesis and evolution of scientific forest management

The Forestry Sector Strategy (FSS) was formulated to guide the development of Nepal's forestry sector for the coming ten years. It emphasized on scientific forest management/sustainable forest management of forest. It was based on the framework of the Forest Policy 2015, past learning from the implementation of the Master Plan for the Forestry Sector, which came to an end in 2011.

The FSS identifies eight strategic pillars which are integral to all seven key thematic areas. These pillars are:

- Sustainably managed resources and ecosystem services
- Conducive policy process and operational environment
- Responsive and transparent organisations and partnerships
- Improved governance and effective service delivery
- Security of resource use by the community
- Private sector engagement and economic development
- Gender equality, social inclusion and poverty reduction

- Climate change mitigation and resilience

The vision and goals of FSS is Sustainable management of forest ecosystems, biodiversity and watersheds fully optimized for national prosperity. And its forest, biodiversity, plant resources, wildlife, watersheds and other ecosystems are protected, sustainably managed and made climate-resilient through an inclusive, decentralized, competitive and well-governed forestry sector providing equitable employment, incomes and livelihoods opportunities. The FSS identifies seven key thematic areas which form the core area of the strategy.

National Forest Policy, 2019 mainly focuses to increase forest productivity and timber volume. It also focuses to develop different management modalities for the timber production and employment generation in the country. In order to implement National Forest Policy, 2019 it seems separate strategy for each policy should be made with working plan. Recently, there exist Forest Sector Strategy (2016-2025), National REDD Strategy (2018-2025), National Biodiversity Strategy and Working Plan (2014-2020) and Forestry Sector Gender and Social Inclusion Strategy, 2064. But since these all strategy were approved before National Forest Policy 2019 it seems urge to rewrite and amend these strategies based on new policy and for rest of the policy new strategy and working plan should be made and implemented. However, based on those previous policies we have now Forest Act 2019 for the effective management of forest.

5.4. Policy issues and gaps

The Forestry Sector Strategy (2016-2015) and the Forest Policy (2015) have clearly emphasized the promotion of SFM for maximization of both economic and environmental benefits from the forestry sector in Nepal. The DoF has also prepared the Scientific Forest Management Guideline (2014). However, the guideline has generalized SFM into a blanket approach irrespective of the ecological zone, forest conditions, and focused management objectives. This emphasis on one-glove-fits-all could potentially limit the expansion of ScFM to only a few districts in the Terai. Similarly, the current ScFM practices with extensive silvicultural operations are focused on the high value natural Sal (*Shorea robusta*) and planted Teak (Tectona grandis) forests. Detailed plans and guidelines for other types of forests with national standards are yet to be developed, but must be in the near future.

The Public Procurement Act and Regulations (2007) has mandated the hire of services costing more than NRs 200,000 through public tender. Since ScFM is labour intensive and costly, especially in the first few years, due to many preparatory works, including the initial costs of block and compartment establishment, funding required may exceeds prescribed ceiling, and the user groups s are forced to go through the public tendering process. This has not only added ambiguities to the process, but has significantly complicated and delayed the OP implementation.

Current policies and guidelines need amending to fill in the gaps and remove hurdles in order to encourage the expansion of ScFM to different types of forest and to higher eco-regions. New national standards are needed and users in support from the DFO need to prepare the management plan according to users' objectives and implement those plans for the periods of rotation age.

5.5. High level investigation on ScFM and its implication

The Council of Ministers on Jestha 15, 2077 had decided to immediately impose a ban on felling trees and collection, transportation and sale of timber from forests, reasoning that tree were being felled illegally in the name of scientific forest management. However, stakeholder had urged the government to reconsider its decision, citing adverse impact on timber production. Subsequently, the ban on collection and supply of timber of other tree species except the Sal (*Shorea robusta*) was lifted on Jestha 28, 2077. The cabinet meeting formed the high-level committee on Jestha 29, 2077, for investigation of illegal logging, in the name of scientific forest management.

Similarly, parliamentary committees had also expressed concern about the issue after news related to illegal lumbering under scientific forest management scheme was reported by the media. The parliament formed the committee after the government initiated an investigation by forming its own probe committee.

The Agriculture and Natural Resources Committee under the House of Representative had received number of complaints regarding rampant deforestation and misappropriation of benefits. In view of these complaints and media reports, a sub-committee was formed to investigate on the complains through field study.

Likewise, the Public Accounts Committee under the House of Representatives constituted sub-committee. The committee has been given two months to study the destruction of forest and submit

a report with recommendations for forest conservation and legal action against the guilty in illegal felling of trees in the name of scientific forest management. Parliamentary committees also started investigating illegal felling of trees at several places in the country on the context of scientific forest management.

The major recommendations of the high-level committees were as mention below:

- The high-level committee recommended that there are already provisions of OP preparation in the Forest Act 2019 so no separate guideline is needed to manage CF and CFM in the name of ScFM as the users' group can prepare OP based on appropriate silviculture system. In addition, Nepal is moving with new federal system and forest are more managed by provincial and local government so it recommended to scrap the ScFM guideline 2014 which was prepared by the federal government.
- In coordination with forest officials the users can decided on the appropriate silviculture system in the forest.
- To prepare national standard and criteria of sustainable forest management in consultation with all relevant stakeholders.
- Some forest officials were lobbying to prepare ScFM OP in the CF and were negative towards the users who won't accept to go with ScFM and will not allow FUGs to collect forest product and this has increased conflict in users.
- Those FUGs whose income will be more than 1 crore need to do independent audit and submit the report in the GA. They also need to invest the annual income as per the Forest Act 2019.
- As several irregularities are found in terms of timber marketing need to make separate Forest authority for timber sell and Forest officials should be separated from this.
- The high-level committee has suggested adopting the model of sustainable forest management adopted by the United Nations and in vogue worldwide instead of scientific forest management.
- The report states that due to irregularities in a community or collaborative forest where this program has been implemented due to the scientific forest management guideline, the situation has to be investigated in the forests across the country time and again. It is also mentioned that the guidelines have been dragging into the circle of controversy rather than

facilitating the user's group or forest technical staff for forest management and therefore scientific forest management has become controversial.

High-level investigation committee has urged that the ScFM was promoting deforestation across the country. Committee claimed that stakeholders had also demanded an alternative model of forest management highlighting the inefficiency of on-going scientific forest management practices. The scientific forestry program was ultimately scrapped by the government of Nepal to move towards sustainable forest management.

The high-level committees' recommendation largely pointed out issues related to governance, focused on the timber management and benefit sharing modalities. The recent policy focus and government plans essentially demand active and intensive forest management. The ScFM was one of such models to achieve national goals and meet policies aspirations of economic prosperity through productive and sustainable forest management. In this context, this study indicates some positive results in terms of timber production, income generation, and regeneration promotion. Despite these outcomes, the contested views of major stakeholders, inadequate capacity of forest bureaucracy and forest users' groups to undertake such intensive forest management, the lack of participatory and co-learning practice in the inception phase of ScFM have resulted in its early demise.

6. Conclusions and Recommendations

6.1 Conclusions

Overall, the study found that ScFM is one of the major silviculture system-based forest management programs of the province which has resulted in increased timber production, enhanced forest regeneration, increased user's group's income and unfolded the discourses on silviculture system-based forest management in the province. Scientific forest management was accelerated at the beginning of its inception which later faced public contestation particularly in terms of sustainability of production and benefit sharing mechanisms. It is attributed to the skewed opinion and knowledge on biophysical and socioeconomic impacts. It is also resulted due to the lack of demonstrated experiences, capacity and skill to undertake scientific forestry by local communities managing the forests. In particular, the conclusions relating to the study objectives are summarised below.

- Scientific forest management have created its space in policies and strategies of the country.
- ScFM primarily conceived to managed large forest of Terai and Siwalik region has now expanded to community forestry, both in Terai and Hill region of the of the province
- The early phase of ScFM witnessed rapid expansion but stopped from 2077.
- Altogether, ScFM is expanded to 204 CFs (42787.5 ha), 8 CFMs (21973.2 ha) CFMs and 2 block forests (3123 ha) in the province
- The early response of the ScFM intervention has shown satisfactory response to regenerate native tree species.
- The regeneration status of CFs was found higher followed by CFMs and BFMs (in Terai)
- Regeneration (post felling) management is largely lacking, especially in CFs
- Timber production and incomes of CFs vary substantially. The internal consumption of timber was about 2.5 times higher in Terai compared to Hills
- Average annual income of CFs in the Hills (Nrs 49,78,047) was almost half of the Terai (Nrs. 97, 88, 843)
- Timber as the major source of incomes in CFs, CFMs and BFMs

- In both Hill and Terai, highest proportion of incomes was invested in forest management followed by community development. The administrative expenses in Terai (24%) were almost twice of the hill community forests (13%).
- In Hills, emphasis was on the activities related to infrastructure, revolving funds, employment generation and socio-culture
- Forest based enterprises were non-existent/not initiated in CFs
- User participation is on increasing trend, particularly in forest management and resource allocation, women participation in meetings reported increasing in majority of CFs

6.2 Recommendations

Based on the findings of the study and the observation and reflection of the study team following recommendations are made:

6.2.1 Operational recommendations

- Regeneration management need to undertake regularly in community and collaborative forests. Since regeneration quality at present influence the timber production in future, it should be emphasized as equally as regeneration felling.
- Regular monitoring of regeneration growth is required to ensure progress as planned.
- We suggest maintaining species composition of major species of the region for the overall integrity, stability and sustainability of forest ecosystem.
- Whereas ScFM have multiplied the production and income manyfold, the communities are not sufficiently capable to manage the fund for forest management, community development and institutional efficiency. Thus, it is important to prepare and implement financial plan at users' level to ensure transparency and accountability.
- The production, income and expenditure data maintained by forest user groups and DFOs is inconsistence, sparse and sporadic that has resulted ambiguities while generalizing the outcome. Thus, it is recommended to develop and institutionalize common data management portal governed by the province ministry and operated by respected Division Forest Offices. For example, the data base should accurately identify the product types, their origin and income sources and distributions (as envisaged in FSS 2016-25).

- The general users including women, Dalits and Marginalized groups are usually engaged in forests operations like tending, wedding activities only. To ensure collective ownership it is important to involve them in production and income decisions.

6.2.2 Policy recommendations

- The speed and management of ScFM implementation should commensurate with the institutional, technical, financial capacity of forest bureaucracy and local communities.
- For further expansion of silviculture-based forest management like scientific forest management it is recommended to undertake pilot studies with demonstrated results for policy intervention.
- Institutional encouragement, sense of security to the forestry professional is pivotal while shifting from well-established protection-oriented forest to more productive forest management and service delivery.
- It is hard to expect more critical and in-depth operational findings from general study of this type which included the objective relating to forest, production, income, expenditure, governance and socio-economic impacts. Thus, more focused and longitudinal study is needed to generate empirical evidence to inform policy and guide forest management operations.

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Annex 1: Data collection instruments

Instrument I: Basic Information of scientific forest

The preliminary profile of ScFM in the district and province is generated from this table. This information is collected for all district. The district progress report and other documents from divisional forest office is reviewed to complete this table. It is expected that basic information can be drawn from the division forest offices. This table is crucial for sampling of the ScFM as well as mapping spatial distribution of forests in the districts and province

Table 1:

Division Name:		Date: /	
Primary data source		Data collected: by:	

Table 2: Detail description of Forests implementing ScFM

SN	Forest Name	Address	Forest hand over [year]	Total Forest Area (ha)	Area under ScFM (ha)	ScFM start [Year]

Instrument II: Status of Forest products collection and distribution

It is carried out in the representative forests identified. The data is collected from FUG records and minutes including audit report. In the absence of data, general information is collected from discussion based on the memories of the FUG members. The forest products included here are Timber, fuelwood and NTFPs (if any). The data is segregated for each year of their collection

Division:

Forest name:

Forest Product	Collection [Year]	Forest product quantity and prices					
		Within community		Outside community		District FP supply committee	
		Quantity (cft)	Unit Price	Quantity (cft)	Unit price	Quantity (cft)	Unit price

Instrument III: Implementation status of ScFM in the selected Forests

2.1: Basic information of the forests

Division Name		Date:				
Forest Name[SN]		Collected By ……				
Contact person and mobile number						
Distance of forests to ….	Km	Walking time (minutes)				Remarks
Motorable Road:	…….	…….				
Prominent river	…….	…….				
GPS coordinates of the village centre	Easting:		Northing:			
Altitudes of the forests (m):			Aspects:		Slope	
Number of forest blocks:		Forest based enterprises (code):				
Forest boundary (from OP)	Easting (Min/Max):					
	Northing (Min/Max):					

Altitude, Aspects and slope will be collected from operational plans. If the information is missing, altitude will be measured with GPS but aspect and slope will be visually assessed. The

presence of forest based enterprises will be gathered from group discussions. Types will be coded as 1: Furniture, 2: NTFP Processing, 3: Charcoal making, 4: Wood crafts 5] Other: [Specify]

2.2: Details of planned activities and implementation status

Planned activities	Implementation status			
	Year 1	Year 2	Year3	Year 4
A. Forest management activities				
Regeneration felling				
Mother tree selection				
Regeneration promotion				
Tending operations (*thinning, pruning, weeding, cleaning*)				
Harvesting (timber, fuelwood)				
Post-harvest debris removal				
Forest protection				
Fencing				
Patrolling				
Grazing control				
Fireline construction/ maintenance				

Planned activities	Implementation status			
	Year 1	Year 2	Year3	Year 4
Others (specify)……				
B. Community development				
Road improvement				
Community building				
Electrification				
Water ponds conservation				
Trail improvement				
School improvement				
Improved stove				
Biogas plants (grants)				
Drinking water				
Apiculture/bee hives				
Culvert construction				
Others (Specify)……				
C. Income generation Activities				
Goat farming				
Off season vegetables				
Fruit planting				

Planned activities	Implementation status			
	Year 1	Year 2	Year3	Year 4
Skill enhancement training				
Revolving fund				
Employment generation				
Forest based enterprises				
Other (specify)				
Other (specify)				
D. Community empowerment				
Literacy programme				
Student scholarship				
Awareness campaign				
Socio-cultural promotion like temple, pati-pauwa, Chautari				
Skill development training				
Mandatory provision of representation				

Status Code: 1: Completed, 2: Not completed in the year, 3: On-going and Regular, 4: Suspended (elaborate why the activity was suspended)

Instrument IV: Assessment of socioeconomic impacts of ScFM

Key socioeconomic activities after ScFM implementation	How many and what category (Wellbeing, gender, ethnicity, leadership, occupational) HH benefits	Impacts on livelihoods (e.g. Employment, IGA generation, leadership)

Assessment of user opinions in participation and decision making

Participation	Trends (Increasing, decreasing, same)	Indicators		
		Year 1	Year 2	Year 3
Number of executive meeting each year				
Number of users' HH in general assembly per year,				
Number of users in Forest management activities				
Number of complains registered				
Number of applications for timber per year				
Number of applications for fuelwood per year				
Number of capacity building training for user				
Number of IGA initiated				

Users' opinion on decision making

Decision making	Activities in which it is increasing	Activities in which it is decreasing	Activities in which it is same
Representation of women			

Representation of Dalits			
Representation of Poor			
Representation of Indigenous			

Activities includes: Forest management (exclude wage paid labours), Training, IGA, meeting/assembly, committee, Price fixing, timber allocation,

Implementation status of decisions (recall methods)

Decisions related to	Number decision			Percentage of decisions implemented			Remarks
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	
Forest management							
Benefit sharing							
IGA activities							
Community development							

Instrument V: Regeneration Survey

Seedling and sampling form

Division:

Forest Name:

Plot No	Species	Average Height (cm)	Total count	Remarks

Pole inventory form

Division:

Forest Name:

Plot No	Species	DBH (cm)	Height	Remark

Instrument VI: Income and expenditure details

Division:

Forest Name:

Income sources	**FY 2074/75**	**FY 2075/76**	**FY 2076/77**	
	Average income	Average income	Average income	Three years average
Timber Income				
Fuelwood income				
User contribution				
Support from Local groups				
Support from DFO				
IGA				
Other Incomes				
Previous year balance				
Total				

Division:

Forest Name:

Expenditure sources	FY 2074/75	FY 2075/76	FY 2076/77	
Forest development expenses	Average Exp.	Average Exp.	Average Exp.	Three years average
Protection				
harvesting				
Forest Management				
Fire line development				
Technical support				
Others				
Sub- total				

Community development				
Education support				
Drinking Water				
Road/Trail				
Irrigation				
Community building				
IGA				
Donation				
Sub-total				
Training and capacity building				
Sub-total Training and capacity building				
Administrative expenses				
Salary/Wages				
Stationery				
Communication				
Travel and fuel				
Meetings				
Assembly				
Maintenance of office				
Donation and membership				
Other expenses				
Sub-total				
Grand Total				

Annex 2: Status of scientific forests in the Lumbini Province

Status of ScFM implemented in Lumbini Province

District/Divison	Region	CF Name	Local Units	ScFM Area(ha)	ScFM Year	Harvesting Years	User Size (HH)	Forest Mgt Regime
Dang	Terai	Swargadwari Hariyali	Lamahi	230.92	2075	1	125	CF
Dang	Terai	Karribanghusri	Lamahi	464.85	2074	2	182	CF
Dang	Terai	Naba Shanti	Lamahi	368.7	2074	1	176	CF
Dang	Terai	Tikuli Gadh	Lamahi	342.79	2075	1	365	CF
Dang	Terai	Karri (Chailahi)	Lamahi	465.2	2076	1	1147	CF
Dang	Terai	Shivasakti	Lamahi	494.16	2076	1	69	CF
Dang	Terai	Kunta Mahila	Lamahi	124.44	2076	1	60	CF
Dang	Terai	Gupti	Lamahi	491.5	2075	1	72	CF
Dang	Terai	Amiliya	Lamahi	497.4	2076	1	110	CF
Dang	Terai	Chuirighat	Gadhawa	257.04	2075	1	113	CF
Dang	Terai	Surya	Gadhawa	464.63	2075	1	493	CF
Dang	Terai	Bhayarthan	Rajpur	497.09	2076	1	140	CF
Dang	Terai	Siddhababa	Rajpur	487	2075	1	115	CF
Dang	Terai	Chisapani	Rajpur	327.9	2076	1	124	CF
Dang	Terai	Devisthan	Rajpur	439	2075	1	325	CF
Dang	Terai	Shivasakti	Rajpur	497.25	2076	1	256	CF
Dang	Terai	Trishakti	Rajpur	417.37	2076	1	245	CF
Dang	Terai	Janakalyan	Rajpur	471.21	2075	1	226	CF
Dang	Terai	Mainihwa	Rajpur	445.1	2075	1	155	CF
Dang	Terai	Ramjanaki	Rajpur	422.24	2075	1	238	CF
Kapilvastu (Gautam Buddha)	Terai	Jodhmahuwa	Bijayanagar	291.78	2075	1	343	CF
Kapilvastu (Gautam Buddha)	Terai	Indreni	Bijayanagar	377.29	2075	2	432	CF
Kapilvastu (Gautam Buddha)	Terai	Ram laxman	Buddhabhumi	399.5	2074	3	185	CF

Kapilvastu (Gautam Buddha)	Terai	Janjagriti	Buddhabhumi	495.79	2074	3	194	CF
Kapilvastu (Gautam Buddha)	Terai	Buddha Yasodhara	Buddhabhumi	498.66	2073	3	143	CF
Kapilvastu (Gautam Buddha)	Terai	Hariyali	Buddhabhumi	384.11	2076	0	45	CF
Kapilvastu (Gautam Buddha)	Terai	Kanchan	Buddhabhumi	278.35	2076	0	111	CF
Kapilvastu (Gautam Buddha)	Terai	Shankhar Jyoti	Buddhabhumi	330.38	2076	0	142	CF
Kapilvastu (Gautam Buddha)	Terai	Gauri Shakhar	Buddhabhumi	387.78	2074	3	126	CF
Kapilvastu (Gautam Buddha)	Terai	Janchetana	Shivaraj	397.21	2074	2	399	CF
Kapilvastu (Gautam Buddha)	Terai	Manakamana	Shivaraj	495.39	2075	2	279	CF
Kapilvastu (Gautam Buddha)	Terai	Chetansil	Shivaraj	399.3	2075	2	154	CF
Kapilvastu (Gautam Buddha)	Terai	Shivashakti	Shivaraj	397.52	2075	2	400	CF
Rupendhi	Terai	Shivanagar	Butwal	472.77	2077	0	1979	CF
Rupendhi	Terai	Ramnagar	Butwal	71.86	2071	6	486	CF
Rupendhi	Terai	Buddha	Devdaha	497.52	2071	6	753	CF
Rupendhi	Terai	Palpali	Devdaha	188.31	2071	6	125	CF
Rupendhi	Terai	Shivalaya	Devdaha	183	2076	1	941	CF
Rupendhi	Terai	Smriti	Devdaha	305.55	2072	5	1058	CF
Rupendhi	Terai	Buddhamawali	Devdaha	63.05	2071	6	910	CF
Rupendhi	Terai	Buddhanagar	Devdaha	98.21	2073	4	202	CF
Rupendhi	Terai	Milan	Devdaha	145.21	2072	5	339	CF
Rupendhi	Terai	Janapriya	Devdaha	237.17	2071	6	480	CF
Rupendhi	Terai	Rohini	Devdaha	207.41	2071	6	433	CF
Rupendhi	Terai	Alki	Devdaha	367.5	2075	1	184	CF
Rupendhi	Terai	Pragati	Devdaha	284.73	2071	6	400	CF
Rupendhi	Terai	Navadurga	Gaidahawa	193.33	2076	1	550	CF
Rupendhi	Terai	Rudrapur Dhaminatal	Kanchan	131.87	2077	0	1482	CF
Rupendhi	Terai	Rudrapur	Kanchan	446.1	2077	0	2900	CF
Rupendhi	Terai	Piprichapa Mahila	Kanchan	185.82	2071	6	364	CF
Rupendhi	Terai	Saljhandi	Sainamaina	149.07	2071	6	172	CF
Rupendhi	Terai	Singhdarja	Sainamaina	75.22	2070	6	161	CF

Rupendhi	Terai	Shanti	Sainamaina	164.97	2070	6	535	CF
Rupendhi	Terai	Jhimjhimiya	Sainamaina	350.53	2071	5	459	CF
Rupendhi	Terai	Bhulkepaani	Sainamaina	390.9	2071	5	459	CF
Rupendhi	Terai	Kanchan	Sainamaina	131.55	2071	6	219	CF
Rupendhi	Terai	Rajapani	Sainamaina	270.55	2071	6	372	CF
Rupendhi	Terai	Shankharnagar	Tillotama	584.6	2073	4	3756	CF
Rupendhi	Terai	Karhiya	Tillotama	269	2075	2	3285	CF
Rupendhi	Terai	Baunnakoti	Tillotama	154.75	2069	8	5582	CF
Agrakhachi	Hill	Dhauba Mahila	Sitganga	275.62	2074	0	77	CF
Agrakhachi	Hill	Pragatisil	Sitganga	176.37	2075	0	43	CF
Agrakhachi	Hill	Lahari	Sitganga	54.74	2074	3	64	CF
Agrakhachi	Hill	Dhirikhola	Sitganga	126.29	2073	4	32	CF
Agrakhachi	Hill	Pawar	Sitganga	111.07	2073	5	71	CF
Agrakhachi	Hill	Belghari	Sitganga	54.9	2074	3	97	CF
Agrakhachi	Hill	Majure Dada	Sitganga	84.09	2074	3	122	CF
Agrakhachi	Hill	Dohote	Sitganga	49.26	2075	2	65	CF
Agrakhachi	Hill	Gaude	Sitganga	159.64	2075	2	823	CF
Agrakhachi	Hill	Laxmi Mahila	Sitganga	107.26	2077	0	36	CF
Agrakhachi	Hill	Maikot Dada	Sitganga	159.58	2077	0	29	CF
Agrakhachi	Hill	Barah Daha	Sitganga	154.24	2077	0	40	CF
Agrakhachi	Hill	Lamchi	Bhumekasthan	134.54	2072	2	186	CF
Agrakhachi	Hill	Kereni Kuin Dada	Bhumekasthan	43.24	2072	2	111	CF
Agrakhachi	Hill	Ripahpahar	Sandhikharka	106.91	2072	3	78	CF
Agrakhachi	Hill	Bhagwati	Panini	76.09	2072	3	302	CF
Agrakhachi	Hill	Madendada	Bhumekasthan	53.19	2073	2	125	CF
Agrakhachi	Hill	Belpokhari	Bhumekasthan	111.44	2072	2	162	CF
Agrakhachi	Hill	Mahakali	Chhatradev	59.35	2076	1	162	CF
Agrakhachi	Hill	Aapkhola Sallendhara	Sandhikharka	44.41	2076	1	121	CF
Agrakhachi	Hill	Belbot	Bhumekasthan	62.29	2072	3	129	CF

Agrakhachi	Hill	Ghorakhori	Bhumekasthan	239.81	2072	3	119	CF
Agrakhachi	Hill	Jukhudidaha Sallendhara	Panini	107.28	2077	1	57	CF
Agrakhachi	Hill	Gopalsiddha	Panini	50.59	2077	1	80	CF
Agrakhachi	Hill	Simalghat	Bhumekasthan	52.66	2077	1	145	CF
Bardiya	Terai	Majhi	Bansagadhi	495.3	2076	1	1700	CF
Bardiya	Terai	Jaljala	Barbardiya	120.77	2073	3	160	CF
Bardiya	Terai	Janchetana	Barbardiya	334.65	2073	2	199	CF
Bardiya	Terai	Janakalyan	Barbardiya	370.78	2073	3	310	CF
Bardiya	Terai	Shivashakti	Barbardiya	178.9	2075	2	331	CF
Bardiya	Terai	Garib Kalyan	Barbardiya	113.94	2075	2	223	CF
Bardiya	Terai	Kalika	Barbardiya	140.29	2075	2	241	CF
Bardiya	Terai	Sahamati	Barbardiya	394.43	2076	1	526	CF
Bardiya	Terai	Bhairabh	Barbardiya	164.19	2076	1	310	CF
Bardiya	Terai	Pashupati	Barbardiya	97.4	2076	1	280	CF
Bardiya	Terai	Phardanga	Barbardiya	302.77	2076	1	185	CF
Bardiya	Terai	Kalika	Barbardiya	139.75	2076	1	140	CF
Bardiya	Terai	Jayadurga	Barbardiya	264.53	2076	1	712	CF
Bardiya	Terai	Deurani Fulbari	Madhuwan	301.71	2073	3	275	CF
Bardiya	Terai	Shanti Mahila	Madhuwan	121.69	2075	2	128	CF
Bardiya	Terai	Amarmahila	Madhuwan	194.2	2075	2	159	CF
Bardiya	Terai	Kisaan	Madhuwan	104.5	2075	2	166	CF
Bardiya	Terai	Somalpur	Madhuwan	112.29	2076	1	246	CF
Bardiya	Terai	Shivashakti	Madhuwan	100.51	2076	1	89	CF
Bardiya	Terai	Sagun	Madhuwan	165.04	2077	1	88	CF
Bardiya	Terai	Jharsaluwa	Thakurbaba	145.47	2074	3	334	CF
Bardiya	Terai	Pairohuwa Chatiya	Thakurbaba	96.89	2075	2	157	CF
Bardiya	Terai	Khodau	Thakurbaba	183.89	2075	2	304	CF
Bardiya	Terai	Kopila	Thakurbaba	123.66	2075	2	190	CF
Bardiya	Terai	Chandakchatiya	Thakurbaba	233.15	2076	1	230	CF

Bardiya	Terai	Badka	Thakurbaba	109.5	2076	1	576	CF
Bardiya	Terai	Kailash	Thakurbaba	219.61	2077	1	245	CF
Pyuthan	Hill	Yerabati	Sarumarani	177.36	2073	3		CF
Pyuthan	Hill	Jaspur	Sarumarani	262.25	2071	5		CF
Pyuthan	Hill	Kalidhunga	Sarumarani	435.36	2071	5		CF
Pyuthan	Hill	Rangbang	Sarumarani	406.42	2072	4		CF
Pyuthan	Hill	Jhiliwang	Sarumarani	252.75	2075	1		CF
Pyuthan	Hill	Jhatridamar	Sarumarani	218.23	2075	1		CF
Pyuthan	Hill	Bagale	Sarumarani	276.7	2076	0		CF
Pyuthan	Hill	Kharkholi	Sarumarani	243.62	2076	0		CF
Pyuthan	Hill	Basendimar	Sarumarani	242.69	2076	0		CF
Banke	Terai	Ashok	Rapti Sonari	393.7	2074	2	120	CF
Banke	Terai	Madhu	Rapti Sonari	210.94	2075	2	212	CF
Banke	Terai	Janmukhi	Rapti Sonari	434.64	2074	2	165	CF
Banke	Terai	Jaya Durga Bhawani	Rapti Sonari	488.9	2074	3	111	CF
Banke	Terai	Kothidevi Yuba Pragati	Rapti Sonari	446.9	2075	1	310	CF
Banke	Terai	Hariyali	Rapti Sonari	234.87	2074	1	200	CF
Banke	Terai	Siddhasai Kumari	Rapti Sonari	167.78	2075	1	145	CF
Banke	Terai	Jankalyan	Rapti Sonari	221.13	2075	1	185	CF
Banke	Terai	Haralafata	Rapti Sonari	103.74	2074	1	85	CF
Banke	Terai	Laligurans	Rapti Sonari	222.17	2075	1	223	CF
Banke	Terai	Trishakti	Rapti Sonari	177.27	2074	1	149	CF
Banke	Terai	Sunsari	Rapti Sonari	87.68	2076	1	46	CF
Banke	Terai	Ashworthma	Rapti Sonari	107.7	2076	0	101	CF
Banke	Terai	Sati Bhawani	Rapti Sonari	149.95	2075	0	171	CF
Banke	Terai	Hariyali	Rapti Sonari	161.39	2076	0	129	CF
Banke	Terai	Gauri	Rapti Sonari	359.14	2076	0	301	CF
Banke	Terai	Babukuwa	Duduwa	203.86	2076	1	443	CF
Kapilvastu (Taulihwa)	Terai	Madhauliya	Banganga	125.65	2076	1	969	CF

Kapilvastu (Taulihwa)	Terai	Shringighat	Banganga	499.5	2071	6	1887	CF
Kapilvastu (Taulihwa)	Terai	Buddha	Banganga	167.72	2074	3	322	CF
Kapilvastu (Taulihwa)	Terai	Piparakothi	Banganga	126.32	2074	2	619	CF
Kapilvastu (Taulihwa)	Terai	Manakamana	Banganga	459.23	2075	1	1049	CF
Kapilvastu (Taulihwa)	Terai	Nabajagriti	Banganga	110.68	2071	6	619	CF
Kapilvastu (Taulihwa)	Terai	Muna	Banganga	81.34	2076	1	109	CF
Kapilvastu (Taulihwa)	Terai	Lal Matiya	Banganga	194.32	2076	1	304	CF
Kapilvastu (Taulihwa)	Terai	Pratibha	Banganga	138.69	2076	1	215	CF
Kapilvastu (Taulihwa)	Terai	Baijalpur	Banganga	263.43	2074	3	528	CF
Kapilvastu (Taulihwa)	Terai	Rajapani	Banganga	452.94	2073	4	2307	CF
Kapilvastu (Taulihwa)	Terai	Phulbaari	Banganga	363.46	2075	1	515	CF
Kapilvastu (Taulihwa)	Terai	Pragati	Banganga	143.44	2076	1	913	CF
Kapilvastu (Taulihwa)	Terai	Madhuban	Banganga	396.04	2075	1	871	CF
Kapilvastu (Taulihwa)	Terai	Trishakti	Banganga	499.47	2075	1	1062	CF
Kapilvastu (Taulihwa)	Terai	Nabaprabhat	Banganga	377.63	2077	0	745	CF
Kapilvastu (Taulihwa)	Terai	Namuna	Banganga	228.33	2075	1	396	CF
Kapilvastu (Taulihwa)	Terai	Janjagaran	Banganga	80.46	2076	1	136	CF
Kapilvastu (Taulihwa)	Terai	Khutkhute	Banganga	253.5	2075	1	207	CF
Kapilvastu (Taulihwa)	Terai	Amrite	Banganga	326.37	2076	1	261	CF
Kapilvastu (Taulihwa)	Terai	Sarepani	Banganga	175.41	2076	1	368	CF
Kapilvastu (Taulihwa)	Terai	Koilichaur	Banganga	218	2076	1	437	CF
Kapilvastu (Taulihwa)	Terai	Khojipur	Banganga	276.71	2076	1	496	CF
Kapilvastu (Taulihwa)	Terai	Kothihwa	Banganga	179	2076	1	373	CF
Kapilvastu (Taulihwa)	Terai	Kalika	Banganga	148.43	2074	3	250	CF
Kapilvastu (Taulihwa)	Terai	Jaya Ban Shakti	Buddhabhumi	71.84	2076	1	173	CF
Kapilvastu (Taulihwa)	Terai	Hariomkhola	Buddhabhumi	129.73	2074	3	162	CF
Kapilvastu (Taulihwa)	Terai	Rajkuda	Buddhabhumi	264.44	2074	3	594	CF
Kapilvastu (Taulihwa)	Terai	Kundra	Buddhabhumi	165.6	2074	3	145	CF
Kapilvastu (Taulihwa)	Terai	Basantpur	Buddhabhumi	89.3	2074	3	191	CF

Kapilvastu (Taulihwa)	Terai	Bhrikuti	Buddhabhumi	80.44	2075	1	162	CF
Kapilvastu (Taulihwa)	Terai	Kapilmuni	Buddhabhumi	112.49	2075	2	175	CF
Kapilvastu (Taulihwa)	Terai	Birpur	Buddhabhumi	294.63	2074	4	506	CF
Kapilvastu (Taulihwa)	Terai	Adarash	Buddhabhumi	128.73	2074	3	147	CF
Kapilvastu (Taulihwa)	Terai	Jurpani	Buddhabhumi	77.16	2074	3	108	CF
Kapilvastu (Taulihwa)	Terai	Samaithan	Buddhabhumi	264.48	2076	1	243	CF
Kapilvastu (Taulihwa)	Terai	Kotiyadevi	Buddhabhumi	144.25	2076	1	200	CF
Kapilvastu (Taulihwa)	Terai	Bandevi	Buddhabhumi	287.71	2076	1	270	CF
Kapilvastu (Taulihwa)	Terai	Gautam Budhha	Buddhabhumi	244.71	2075	1	516	CF
Kapilvastu (Taulihwa)	Terai	Shanti	Buddhabhumi	156.76	2074	3	160	CF
Kapilvastu (Taulihwa)	Terai	Vakderia	Buddhabhumi	102.98	2076	1	189	CF
Nawalparasi	Terai	Mulpani	Sunwal	325.52	2074	3	541	CF
Nawalparasi	Terai	Janudhaya	Sunwal	277.73	2073	4	1226	CF
Nawalparasi	Terai	Bhagwati	Sunwal	300.26	2074	3	1211	CF
Nawalparasi	Terai	Badera	Sunwal	398.28	2075	2	2500	CF
Nawalparasi	Terai	Sansarkot Hariyali	Bardaghat	475.63	2073	4	2323	CF
Nawalparasi	Terai	Chisapani	Bardaghat	374.25	2071	6	3350	CF
Nawalparasi	Terai	Parijaat	Bardaghat	386.84	2074	3	3681	CF
Nawalparasi	Terai	Shristi	Sarawal	193.22	2074	2	520	CF
Nawalparasi	Terai	Jyamire	Sunwal	444.98	2076	1	1178	CF
Nawalparasi	Terai	Lokeshwor	Sunwal	151.56	2076	1	1154	CF
Nawalparasi	Terai	Kharkatti	Sunwal	50.33	2076	1	141	CF
Nawalparasi	Terai	Madhuban	Sunwal	112.7	2076	1	547	CF
Nawalparasi	Terai	Damarbhar	Sunwal	335.53	2076	1	1187	CF
Nawalparasi	Terai	Hariyali	Sarawal	277.76	2076	1	1032	CF
Palpa	Hill	Chhatpecherdi Nepte	Rainadevi Chhahara	65.18	2072	2		CF
Palpa	Hill	Salleri Thulo Raniban	Rainadevi Chhahara	157.5	2075	1		CF
Palpa	Hill	Pakhure	Rainadevi Chhahara	132.73	2076	1		CF
Palpa	Hill	Darlam	Ribdikot	85	2076	0		CF

Palpa	Hill	Deurali Bhanjyang	Mathagadhi	75.8	2075	1		CF
Palpa	Hill	Budikot	Nisdi	77.31	2071	2		CF
Palpa	Hill	Thulo Saalghari	Tinau	74.9	2071	2		CF
Palpa	Hill	Sangaha Thulitar	Rambha	42.59	2073	0		CF
Palpa	Hill	Chyapte Dhunga	Rambha	115.6	2075	0		CF
Rolpa	Hill	Mahaprabhu Janmasthal	Runtigadi	206.66	2074	0	36	CF
Rolpa	Hill	Lamputali	Tribeni	103.35	2073	0	153	CF
Dang	Terai	Padampur	Babai	562.8	2073	3	468	CF
Dang	Terai	Purba Hapure	Babai	465	2073	3	302	CF
Dang	Terai	Sadabahaar	Shantinagar	256.54	2073	3	416	CF
Dang	Terai	Saraswati	Shantinagar	167.88	2074	2	450	CF
Dang	Terai	Sundar	Shantinagar	175.33	2074	2	260	CF
Dang	Terai	Baghdail	Babai	254.4	2074	2	551	CF
Dang	Terai	Laxmi Baniya	Shantinagar	359.93	2074	2	140	CF
Dang	Terai	Baghmare Bishnupur	Shantinagar	409.2	2075	2	550	CF
Dang	Terai	Sunpur	Ghorahi	201.45	2075	2	676	CF
Dang	Terai	Khayarbhatti	Babai	300.23	2075	1	173	CF
Dang	Terai	Devidanda	Babai	495.4	2075	1	170	CF
Dang	Terai	Ambikeshwari	Shantinagar	174.98	2075	1	125	CF
Palpa	Hill	Mahajir salleri	Ribdikot	94.96	2071	0		CF
Palpa	Hill	Ramche	Rampur	97.09	2076	0		CF
Palpa	Hill	Serabas Khole	Rampur	98.6	2073	0		CF
Palpa	Hill	Putrung raniban	Mathagadhi	77.09	2073	0		CF
Palpa	Hill	Thumaspyardanda	Mathagadhi	285.63	2072	0		CF
Palpa	Hill	Chhiskundada Hasure	Mathagadhi	97.8	2071	0		CF
Palpa	Hill	Nishanidevi	Nisdi	148.61	2072	0		CF
Palpa	Hill	Deradanda	Nisdi	103.39	2072	0		CF
Palpa	Hill	Bhologahira	Nisdi	81.4	2072	0		CF
Palpa	Hill	Pospakha	Tansen	139.96	2071	0		CF

Palpa	Hill	Srinagar paryaparyatan	Tansen	99.58	2071	0		CF
Palpa	Hill	Hungi Amiltar	Rambha	77.5	2071	0		CF
Collaborative forests								
Kapilvastu (Gautam Buddha)	Terai	Gautam Budhha	Gugauli	3743.42	2067	7	8919	CFM
Kapilvastu (Gautam Buddha)	Terai	Kapilvastu	Maharajgunj	5087	2068	6	15940	CFM
Kapilvastu (Gautam Buddha)	Terai	Shivaraj	Shivagadi	1509.5	2073	3	8652	CFM
Rupendhi	Terai	Lumbini	Bhaisahi Fireline	1321	2066	10	25934	CFM
Rupendhi	Terai	Devdaha	Tilottama MU-16	764.24	2073	4	24522	CFM
Kapilvastu (Taulihwa)	Terai	Mayadevi	Banganga MU-03,10	1731	2072	6		CFM
Kapilvastu (Taulihwa)	Terai	Tilaurakot	Buddhabhumi MU-01,10	6613	2068	8		CFM
Nawalparasi	Terai	Buddhashanti	Ramgram-18	1204		1	11442	CFM
Government management block forest								
Dang	Terai	Kalakhola	Tulsipur	545				BFM
Banke	Terai	Shamshergunj-mathewash	Raptisonari-2, 8	2578	2074	4		BFM

Annex 3: List of the stakeholders interacted in the field

SN	List of Stakeholder interacted	Designation	Organisation/Office
1	Dipak Gyawali	Spokesperson/under secretary	Ministry of Industry, Tourism, Forest and Environment, Lumbini Province
2	Sawang Basnet	AFO	Ministry of Industry, Tourism, Forest and Environment, Lumbini Province
3	Narayan Bhattarai	AFO	Ministry of Industry, Tourism, Forest and Environment, Lumbini Province
4	Bodh Raj Subedi	Divisional Forest Officer	Division Forest Office, Rupandehi
5	Pragya Paudel	Forest officer	DFO Nawalparasi
6	Sanjaya Tiwari	Under Secretary	Provincial Forest Directorate
7	Jaya Prakash Pandey	Chair	Tilaurakot CFM
8	Parvati Acharya	Journalist	Mechi Kali Weekly
9	Renu Sen	President	Scientific Forest Management Users National Federation
10	Ishwari Paudel	Divisional Forest Officer	Division Forest Office, Kapilvastu, Tilaurakot
11	Rajbendra Chaudhary	AFO	Division Forest Office, Kapilvastu, Tilaurakot
12	Durga B Karki	Divisional Forest Officer	Division Forest Office, Kapilvastu, Gautambuddha
13	Besendra Raj Subedi	Divisional Forest Officer	Division Forest Office, Dang, Deukhuri
14	Ramgopal chaudhary	AFO	Division Forest Office, Dang, Deukhuri
15	Raju chhetri	Divisional Forest Officer	Division Forest Office, Banke
16	Chandra Nepali	Ranger	Division Forest Office, Banke
17	Pankaj Jha	AFO	Division Forest Office, Bardiya
18	Thakur Bhnadari	Secretary	FECOFUN Central committee
19	Kamal Pariyar	Chair	FECOFUN Nawalparasi
20	Ghyanshyam Pandey	Mayer/Former FECOFUN chair	Tulsipur Sub metropolitan
21	Vijaya Subedi	Divisional Forest Officer	Division Forest Office, Dang, Ghorahi
22	Khem KC	AFO	Division Forest Office, Dang, Ghorahi

23	Dadi lal Kadel	Divisional Forest Officer	Division Forest Office, Rolpa
24	Deepak KC	AFO	Division Forest Office, Pythan
25	Mohan P Shrestha	Divisional Forest Officer	Division Forest Office, Arghakhachi
26	Motiram Paudel	AFO	Division Forest Office, Arghakhachi
27	Yadev Sapkota	AFO	Division Forest Office, Arghakhachi
28	Prabhat Sapkota	Divisional Forest Officer	Division Forest Office, Gulmi
29	Muna Sharma	AFO	Division Forest Office, Gulmi
30	Mohan Paudel	Divisional Forest Officer	Division Forest Office, Palpa
31	Anupa Silwal	AFO	Division Forest Office, Palpa

Annex 4: Media coverage

८ २०७७ चैत्र २२ गते आइतबार
4 April- 2021 Sunday
रू.जि.प्र.शा.का. द.नं. ५६-०५७/०५८

वैज्ञानिक वन व्यवस्थापन कार्यान्वयनतर्फ

■ पार्वती आचार्य

कपिलवस्तु चैत २१ । नेपालको कुल क्षेत्रफलको करिब ४० प्रतिशत भाग महत्वपूर्ण प्राकृतिक स्रोत वन क्षेत्रले ओगटेको छ । वन क्षेत्रको उचित संरक्षण र व्यवस्थापनमार्फत वन पैदावारको आपूर्ति बढाउनुका साथै रोजगारीको अवसर सिर्जना गरी देशको समृद्धिमा समेत टेवा पुऱ्याउन सकिन्छ । लुम्बिनी प्रदेशका वैज्ञानिक वन व्यवस्थापनको कार्यान्वयनको अवस्थाबारे जानकारी लिनका लागि बिज टोलीले अध्ययन सुरु गरेको छ ।

टोलीले यही चैत १७ गते देखि लुम्बिनी प्रदेशमा अध्ययन सुरु गरेको हो । यस क्षेत्रमा भएका सामूदायिक वैज्ञानिक वन व्यवस्थापन लागू भएका वनहरुको सेक्टिभ वितरण कार्यान्वयनको अवस्था र उत्पादन भएका काठ दाउराको बिक्री वितरणको अवस्था कस्तो छ भन्ने विषयमा जानकारी लिनका लागि कार्यान्वयनकर्ता सुस्तान गाँएको वन बिज तथा अनुसन्धान कर्ता डा. लिला पुरीले जानकारी दिए ।

यसै नेपाल सरकारको ०७७ जेठ १५ गते देखि स्व कटान सकलन, ढुवानी तथा ओसार पसार कडार्न्ने गरि गरेको निर्णयले सबै थप भएको छ । सो निर्णयले लुम्बिनी प्रदेशमा कस्तो प्रभाव पारेको छ ? सम्भावना के छ ? प्राविधिक अवस्था के छ ? सुशासनको पालना कस्तो छ र आर्थिक , सामाजिक र वातावरणीय अवस्था के छ भन्ने विषयमा अध्ययन गर्न थालिएको वन विज्ञान अध्ययन संस्थान पोखराका उपाध्यक्ष तथा अनुसन्धान कर्ता विकास अधिकारीले बताए ।

यसरी वैज्ञानिक वन व्यवस्थापन लागू भएका सम्पूर्ण जङ्गलको अवस्थाको औंकलन गरी दस्तावेजीकरण गर्ने कार्यको थालनी शुरुमा गाँएको उपाध्यक्षक तथा अनुसन्धानकर्ता प्रविण भुषालले बताए । सम्पूर्ण वैज्ञानिक जङ्गलको पुनरउत्पादनको अवस्थाको अध्ययन गर्ने, वैज्ञानिक बनले पर्ने आर्थिक , सामाजिक प्रभाव र सुशासनको अवस्थाको मूल्यांकन गर्ने र सबै नेपालमा वैज्ञानिक बनको कार्यान्वयनको अवस्थालाई झल्क्ने गरी प्रस्तुत गर्ने छ भने विषय अनुसन्धानकर्ता फुछुलले जनाए ।

सो अध्ययनको कार्यले वन व्यवस्थापनको नितीगत अन्तोलाई सिर्दै अठारौंटिनको कार्य टिझालाई तय गर्न सहयोग गर्ने छ। अध्ययनकर्ता वन संवर्द्धन प्रणाली गाछो देखिएको छ, काठ उत्पादन धेरै गर्नुपर्ने देखिएको छ भने सरकारले सुशासन र नितीगत रुपमा ध्यान पठिएको पाइएको अध्ययन टोलिले जानकारी दिएको छ। एकातिर वैज्ञानिक बनको पाटो सबल हुँदै गएको छ।

उक्त कार्यक्रम उद्योग पर्यटन वन तथा वातावरण मन्त्रालयको आर्थिक सहयोगमा स्लोवल सर्भटेक्नल सिर्भ्स र डेभलपमेन्ट सेन्टर कुटवलको व्यवस्थापन तथा समन्वयमा भेलेको छ । लुम्बिनी प्रदेशको २ वर्षको वैज्ञानिक वन व्यवस्थापनको अवस्थाको अध्ययन विज्ञहरुको संयुक्त टोलीद्वारा गाँएकेको स्लोवल सर्भटेक्नल कुटवलका कार्यकारी निर्देशक माधव काफ्लेले जानकारी दिए ।

बसैगरी हालसम्म कार्य गर्दा बनबाट के फाइदा भयो र काम गर्दा के कस्ता समस्याहरु आए भन्ने विषयमा अध्ययनका लागि लुम्बिनी प्रदेशले रिपोर्ट माग गरेको हुँदा बिज टोलीहरुद्वारा अध्ययन भैरहेको वैज्ञानिक वन व्यवस्थापनका अभिभावना उस प्रकाश पण्डेले बताए ।

बता सकालले जेठ १५ गते गरेको निर्णयले वन संवर्द्धन प्रणालीलाई हानीहुने सम्भावना उच्च हुँदै गएको छ । सम्पूर्ण काम ठप्प हुँदा वन संरक्षणमा जोखिम देखिएको छ। प्रत्यक्ष रुपमा देशभरी वन डढेलो त्यापक रुपमा लागि सेको हुँदा वन क्षेत्रमा उच्च जोखिम बढेको छ।

कनप्रति लगत्तारको प्रतिकनले काठ दाउरा बिक्रि वितरण गर्ने नकाँडा आर्थिक अवस्थाकमजोर हुँदै गएको छ भने लाखौं रोजगारकालाई पाइरहेको रोजगारी गुमेको वैज्ञानिक वन व्यवस्थापन राष्ट्रिय महासंघको अध्यक्ष रेनु सेनले जानकारी दिइन् ।

बश्याल समाज नेपालमा नयाँ नेतृत्व

बुटवल, चैत २१ (मेसस) । बश्याल समाज नेपालको रजत जयन्ती तथा नवौं अधिवेशन शनिवार रूपन्देहीमा सम्पन्न भएको छ। अधिवेशनले रामप्रसाद बश्यालको अध्यक्षतामा २१ सदस्यीय नयाँ नेतृत्व चयन गरेको छ । जसको परिच्छ हुनुपर्ने बताए । कार्यक्रममा उपाध्यक्षमा दोगाल बश्याल, उपाध्यक्षमा चन्द्रकान्त बश्याल, महासचिवमा विष्णुप्रसाद बस्नेत, कोषाध्यक्षमा होमकान्त बश्याल, सांचेमा जीवलाल बश्याल रहेका छन् । त्यसैगरी सदस्यहरुमा डीलाराज बश्याल, घनानन्द बश्याल, चेतप्रसाद बश्याल, टिकीराज बश्याल, मणिप्रसाद बश्याल, टीकाराम बश्याल, भीमप्रसाद बश्याल, लोचनाकान्त बश्याल, कृष्णकुमार बश्याल, हरिदत्त बश्याल, हुलप्रसाद बश्याल र सुन बस्नेत रहेका छन् ।

समाजका कार्यवाहक अध्यक्ष रामप्रसाद बश्यालले अध्यक्ष तथा पैतान्य कृष्ण महाजनको प्रमुख आतिथ्यतामा कार्यक्रम भएको थियो । कार्यक्रम स्थलदीको तिलोत्तमा-२१ पर्सेवामा भएको थियो । सो अवसरमा बौद्ध महागालले आफ्नो पंचायतीको र राष्ट्रभाइहरुको एकता दुढुपर्ने बताए । कार्यक्रममा कार्यवाहक अध्यक्ष बश्यालले पुर्खाका आदेश र वंशजहरुको धानसहित सुवर्द्धताका साथ अनुसरण गरेर जानुपर्ने बताए। २५ औं खासदीमा नेपालको पश्चिमी भूभागबाट चल्पाको गोर्खेकोट, नारायणडाँडा, बाराहदी र सम्म हुँदै देशका २५ जिल्लामा बस्नालहरुको बसोबास रहेको छ। बश्यालहरुले आफ्नो वंशावलीसमेत प्रकाशित गरेको छ। रजत जयन्तीको अवसरमा ८० वर्ष उमेर पुगेका २० जना र ८ जना विद्यावारिधि गरेकालाई सम्मान गरिएको थियो। रामप्रसाद बश्यालले समाजको भवन बनाउने आफू तुटने बताए।

वैज्ञानिक वन व्यवस्थापनको कार्यान्वयनको अवस्थाबारे अध्ययन सुरु

छिट्टै ...

मधेसी अधिकारको पहिचान विशेषगैरी बनाईहरुको के खासमुख भइरहेको छ ? यसले मधेसी जनताको अपमान हुन्छ। त्यसैले मधेसी जनताको आत्मसम्मानको मोर्चामा आउनुस् ।'

पूर्वप्रधानमन्त्री तथा नेकपा माओवादी केन्द्रका अध्यक्ष प्रचण्डले भने कपिलवस्तुमा आज हिन्दीमा भाषण गरे । जिल्लास्तरीय कार्यकर्ता प्रशिक्षण तथा गाटी प्रवेश कार्यक्रममा भाषण गर्दा उनले मुख्मा नेपाली नै बोलेका थिए । तर, पाँच दुईवटा कारण देखाएर उनले हिन्दी बोल्न थाले । प्रचण्डले भने, पैले सुनें, यो कार्यक्रमा सहभागी करिब सबैले नेपाली/पहाडीमा भाषा बुझ्नु नै हुन्छ तर उहिल्लाई मातृभाषा र हिन्दी सोजिलो लाग्छ।

प्रचण्डको अर्को तर्क पार्टि रोयक थिएन । 'यो कार्यक्रममा म आउने कुरा नेपालमा मात्रै होइन, हिउँबाघा पनि काकी प्रचार भएको रहेछ । (प्रचण्ड) तीलिहवा आउँदैछ, उसले के-के भन्ने हो भन्ने थर्खा बढी नै भयो रे पारीतिर पनि भन्ने सुनें । त्यसो हुनाले बाँकी कुरा हिन्दीमा भन्छु । तपाईहरुलाई सोजिलो होस् र, भारतबाट कोही पत्रकार आउनुभएको भए उहिल्लाई पनि सोजिलो होस् ।'

त्यसपछि उनले टुटेफुटेको हिन्दीमा भाषण दिन थाले । भाषणका विषयबस्तु पनि केही नयाँ थिए । उनले आफ्नो नेतृत्वमा १३ मधेसीले मुर्दाबादी गरेको गौरवका साथ सुनाए ।

प्रधानमन्त्री केपी शर्मा ओलीलाई मधेसीविरोधीको भंज्ञा मात्रै दिएनन्, ओलीले मधेसको पानी सुन्न नचाहने आरोप लगाए । उनले अब बन्न लाग्नेको सरकारमा आफ्नो प्रधानमन्त्रीभन्दा बाधिको भूमिकामा हुने पनि दावी गरे ।

Annex 5: Field photos

Some photos taken during field activities


डिभिजन वन कार्यालय, गुल्मी


REDMI NOTE 9
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डिभिजन वन कार्यालय स्थापना


डिविजन वन कार्यालय, अर्धाखांची


डिविजनवन कार्यालय दाड (दाड)


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