Who decides and how? Understanding the initiation and implementation dynamics of scientific forestry in community forests in the mid hills of Nepal

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ABSTRACT

Scientific forest management (SciFM) was in the initial phase of its implementation and practice in Nepal. However, it is discontinued due to the conflicting opinions among the forestry stakeholders. This study investigated the SciFM plan preparation process, and the involvement of different stakeholders in the planning, implementation, and capacity enhancement of community forest user groups (CFUGs)in two community forests of the Kaski District, Nepal. For this, we used a household survey (n = 101), key-informant interview (n = 15), and focus group discussion (n = 3). The study found that forest technicians were dominant over users during the SciFM plan preparation process as well as in decision-making. While in the case of implementation, it was CFUGs, who play a leading role to accomplish most of the activities. During the plan implementation, the higher percentage of involvement of users was in thinning, pruning and weeding activity (50%), followed by social development (20%) and timber-related activities (20%). However, themajority of the respondent considered that SciFM was highly technical and 90% of the respondents could not implement the plan. The forest authority (DFO), the executive committee, and the Federation of Community Forestry Users Nepal (FECOFUN) were involved in the capacity building of the users to some extent during the planning and implementation of SciFM. The results of this study could be the baseline information for the successful planning and implementation of silviculture-based forest management in other parts of the country.

Keywords: Capacity building, Kaski, scientific forest management, silviculture, user groups

INTRODUCTION

In Nepal, the National Forestry Plan (1976) first recognized the importance of people's participation in forest management activities (Kanel *et al., 2006*). Later, Master Plan for the Forestry Sector (1989) prioritized community forestry as a major forestry program (MPFS, 1989). After the enactment of the Forest Act (1993) and Forest Regulation (1995), the operational plan (OP) development and implementation of community forestry were initiated massively in Nepal (HMGN, 1993; 1995). Community forest (CF) is defined as a national forest handed over to

local user groups-called community forest user groups (CFUGs)-for the protection, management, and utilization of operational management plans approved by the Divisional Forest Office (DFO) (Forest Act, 1993). The CFUG is an autonomous and corporate institution with a bundle of rights (decision-making, OP preparation, defining and recognizing user rights and rules, forest protection, harvesting, distribution of benefits, and fund mobilization) (Acharya, 2002). The role of forest officials is to mobilize users and provide technical support as needed for the effective management of the CF (Bhattarai, 2006).

After the success of community forestry in Nepal, there had been an attempt to shift the conventional (protection-oriented) forest management practice to a productive forest management system through silviculture based Scientific Forest Management (SciFM). In 2014, the Government of Nepal endorsed SciFM in participatory forest management (MFSC, 2014) which is nowannulled by the Government due to conflicting arguments among the forestry stakeholders. In SciFM, the operations such as thinning, cleaning, regeneration felling, and other post-harvesting are executed under selected silvicultural systems to direct stand dynamics, patterns and growth of regeneration, species diversity, and forest productivity (Sapkota *et al., 2009*; Mandal & Joshi, 2014; Dieler *et al., 2017*; Ayer *et al., 2022*). Though scholars, forest dwellers, and politicians have doubted the SciFM for its technological, social, and biological difficulties and long-term uncertainty (Basnyat *et al., 2018*; Rutt & Wagner, 2019; Poudyal *et al., 2020*), tropical countries are practicing it to fulfill socio-economic and environmental goals (Abrams *et al., 2005*). It has been exercised in tropical forests using different silvicultural systems that evolved between 1900 and 1960 (Dawkins & Philip, 1998). SciFM aims to maintain a regular supply of forest products by retaining a stable forest stand (Lanz, 2000).

In Nepal, the conventional forest management practices are inclined toward the 4D (damaged, diseased, decayed, and dead) trees. Whereas, SciFM aimed to foster the sustainable yield of forest products by replacing the old and matured stocks with enhanced regeneration status and rising revenue for the nation (Awasthi *et al., 2015*; Khanal & Adhikari, 2018; Poudel & Bhusal, 2018; Subedi *et al., 2018*). It was mainly concentrated on the Shorearobusta (Sal) forest, applying an irregular shelterwood system (Awasthi *et al., 2020*). Irregular shelterwood systems provide the flexibility of generating spatial and vertical heterogeneity in forest stands by successive cutting, with a long or specified regeneration period (Mathews, 1991)

SciFM had been implemented in 285 CFs and 30 Collaborative Forests mostly in the Terai/ Siwalik and a few in the mid-hill region of Nepal (Baral & Dhakal, 2018). The Scientific Forest Management Guideline (2014) – formulated to incorporate and implement SciFM principles in participatory forestry – focused more on the technical management of these forests without a prior understanding of the knowledge and capacity of the major stakeholders including users managing the forests. The users had accepted the SciFM plan without having enough knowledge, experience, capacity and skills to implement it. While preparing the plan, there is the active involvement of forest technicians but the real users are either observers or passive participants (Bhattacharya & Basnyat, 2005). Besides, forest technicians have a lead role in implementation activities hence the plan is less likely to implement effectively by the uses themselves. SciFM has a short history in Nepal and very few studies have provided critical reflections about it. SciFM was initially implemented in the productive forest of the Terai region, and it is yet unknown whether the issues raised from the region would be valid for the implementation of SciFM in the community forests of the mid-hill of the country. Hence, this study was conducted in the Kaski district of mid-hill, Nepal, with the objectives: 1) to understand the SciFM planning process, implementation, and the role of different stakeholders, 2) to investigate the capacity of CFUGs in SciFM implementation, and 3) to know the role of different stakeholders in capacity building of CFUGs for SciFM. The SciFM is now replaced by sustainable forest management. Hence, the findings of our study will contribute to devise sustainable forest management planning in Nepal.

Materials and Methods

Study area

The study was conducted in the Chandi Devi CF and DharapaniMahila CF (Latitude: 28^0 06'N to 28^0 36'N and Longitude: 83^0 40'E to $84^0$12'E) of Pokhara Municipality, Ward No. 33, Kaski district, Nepal (Fig. 1). Both the CFs lie in the mid-hills with mixed Shorearobusta (Sal) forest along with Schima wallichi (Chilaune) and Castanopsis indica (Katus). Out of six CF under SciFM in the Kaski district, these two were purposeively selected based on forest area, accessibility, and the implementation duration (at least three years of SciFM implementation). Chandi Devi CF covers an area of 212.74 ha, extended from 3-52° of slope and has 143 households with a population of 944. While DharapaniMahila CF covers an area of 120.38 ha, extended from 2-54° of slope and has 60 households with a population of 311. The majority of inhabitants in the area were Brahmin, Chhetri, Dalit, and Janajati. The main

occupation was agriculture, foreign employment, and other services. In both the CFs, SciFM was implemented in 2015, applying an irregular shelterwood system. Both CFs had an equal number of the compartment (C = 1), sub-compartments (SC = 10), regeneration period (10 years), and rotation period (100 years) for forest management. Regeneration felling was assigned in C1S1 in both CFs. In Chandi Devi CF, 30 mother trees/ha were allocated, whereas it was 35 mother trees/ha in DharapaniMahila CF.

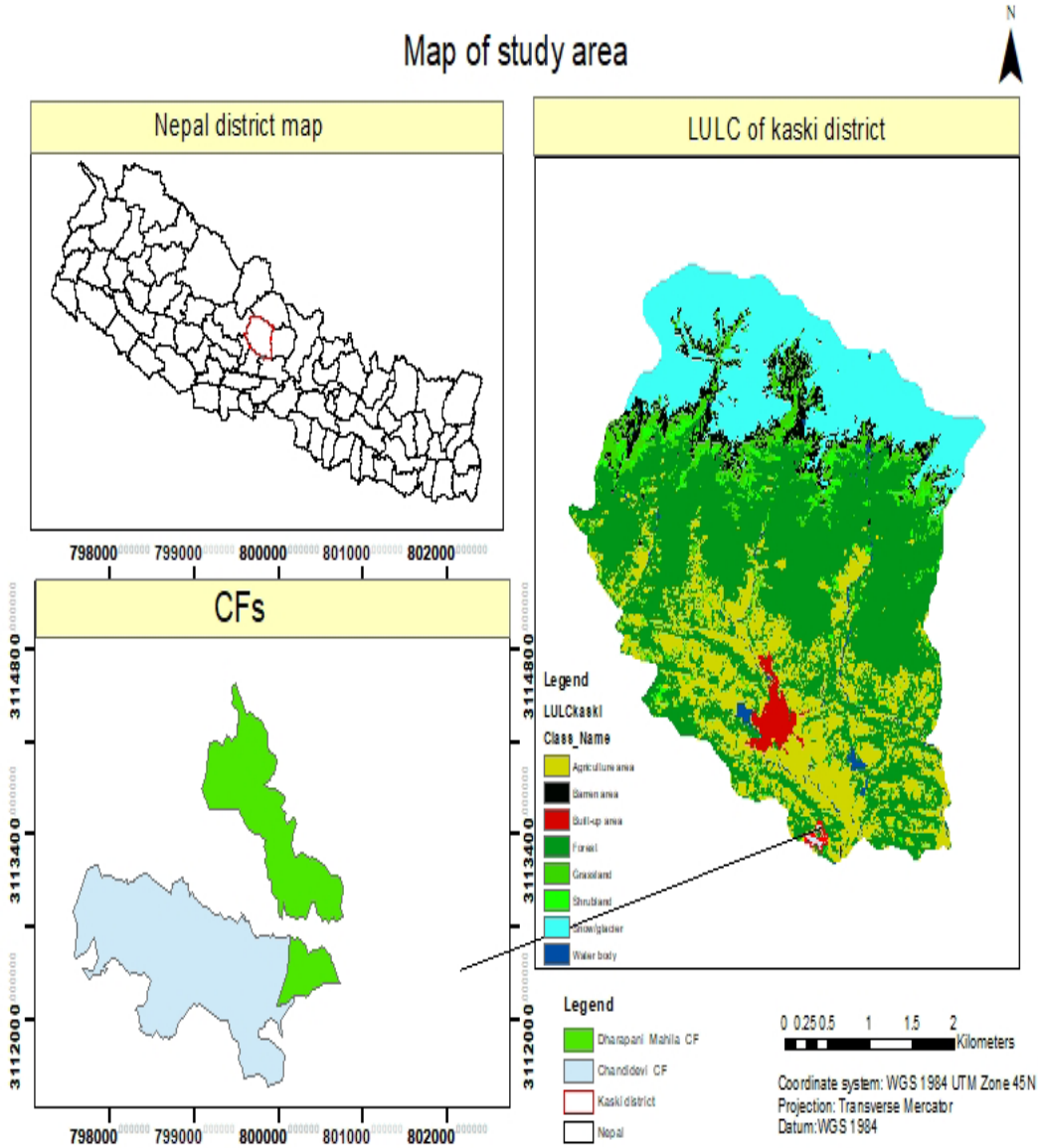

Figure 1: Study area map showing Chandi Devi CF and DharapaniMahila CF

Data collection

The data was collected in February and March of year 2018. The two CFs are close to each other, so we took them as a single unit for analysis and collected data from both CFs. We used household surveys, focus group discussions (FGD), and key-informant interviews (KII) for the study. We selected 101 households (about 50% of the population) randomly and administered structured and semi-structured questionnaires to obtain information about SciFM plan preparation and the involvement of CFUGs in implementation activities. Besides, three focus group discussions were conducted, including 10 to 12 persons in each. One FGD was conducted in Chandi Devi CF (including the executive committee (EC), another one in DharapaniMahila CF (including the executive committee), and the last one with users from both CFs (excluding the executive committee). In each FGD, the key points were recorded and lasted for about one and half hour. For FGD, we used 10 open-ended questions to gather information about plan preparation and the capacity of stakeholders in SciFM plan implementation and validate the information collected from the household's survey. We also identified key informants from FGDs. A total of 15 key informants were interviewed, which included five members from each group of executive committees, three from user groups, one assistant forest officer, and the Chairman of FECOFUN. These KIIs were for cross-checking the information gathered from household surveys and FGDs.

Data analysis

The collected data were entered into an MS excel sheet and analyzed. This study was based on a qualitative investigation. At first, plan preparation process with the key roles of stakeholders in preparing the plan was analyzed. Then, we analyzed the role of users in SciFM plan implementation activities and the capacity of stakeholders in implementation. The results are presented in percentages, tables, pie-chart, and bar graphs.

RESULTS

SciFM plan preparation processand roles of stakeholders

Our result showed that the forest technicians were dominant over users during the SciFM plan preparation process (Table 1). Though all of the respondents have heard about SciFM, only 35% have some knowledge about SciFM (such as management according to blocks, increased timber harvest, and cutting of tagged trees). Users were observed as passive participants which may be due to their low understanding of technicality of SciFM. (Table 1).

Table 1: Activities conducted during SciFM plan preparation process and key roles of stakeholders

SN	Plan preparation process	DFO/Forest technicians	Executive committee	Forest users
1	Initiation of SciFM (idea generation and convince for SciFM)	Led the process and made decision	Participated	Participated
2	Meeting between general members of EC on SciFM objectives and scopes	Provided suggestions	Led the meeting and make decision	Participated
3	Organization of tour on SciFM learning (field visit and learning on tour)	Leading role	Participated	Participated
4	Meeting between EC and CFUGs on SciFM initiation decision	Provided Suggestions	Led the meeting and made decision	Participated
5	General assembly and make decision to start SciFM	Participated	Led the meeting and made decision	Participated
6	EC approached DFO with required documents to register and initiate SciFM	Leading role to make decision on SciFM	Put proposal of SciFM	No role
7	DFO hired technician for preparing operational plan for SciFM	Lead and did necessary decisions for technical issues	Facilitated OP preparation	Silent observer in most of the cases
	Steps in preparing OP of SciFM			
	i) Identification of forest	Lead by DFO hired technician	Some key leaders facilitated the process	No role
	ii) Consultation with stakeholder	Lead by DFO hired technician	Some key leaders facilitated the process	Participate
	iii) Forest survey (boundary survey, block division, preparation of digital map)	Lead by DFO hired technician	Some key leaders facilitated the process	Observer-few users
	iv) Forest inventory (conduction of regeneration survey)	Lead by DFO hired technician	Some key leaders facilitated the process	Participate
	v) Forest management planning and documentation	Lead by DFO hired technician	Some key leaders facilitated the process	No role
8	Plan approval by DFO	Leading rolein preparation and approval	No role	No role

SciFM plan implementation and role of stakeholders

The result found that the CFUGs (respondents) were involved in all kinds of implementation activities in different forms. A higher percentage of involvement was in thinning/ pruning/weeding activity (50%). While for social development and timber-related activities, participation was 20% for each. Further, there was 10% of involvement in forest protection activities (Fig. 2).

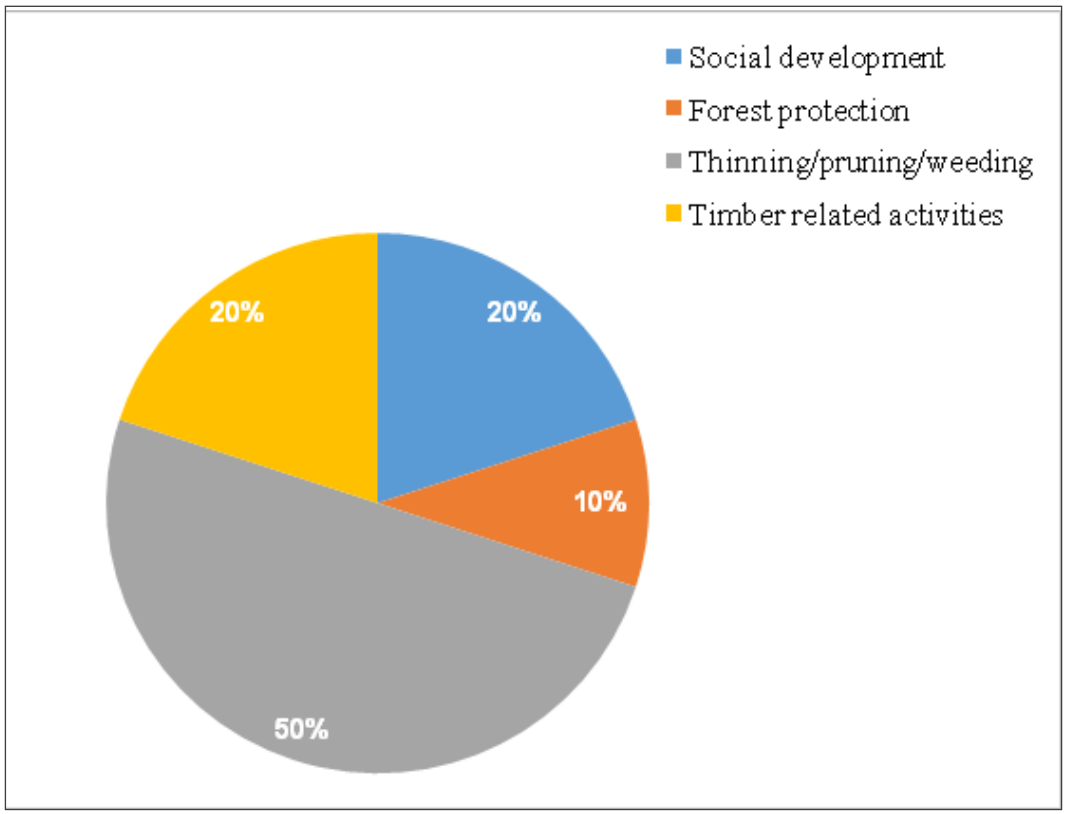

Figure 2: Users involvement in SciFM implementation activities

It was observed that, during decision-making, the involvement of forest officials was 85%, while it was 55% for CFUGs. Whereas, in the case of implementation, the involvement of forest officials was 55%, while it was 100% for CFUGs. But in the activities like forest protection and timber selling outside CFUG both forest officials and CFUGs have made the decision collectively (Table 2).

Table 2: Role of forest technicians and CFUGs in SciFM implementation activities

SN	Key activities under SciFM	Who decides?	Who implements?
1	Regeneration felling	Forest technician	Forest technician and CFUG based on the OP
2	Mother tree selection	Forest technician	CFUG based on OP
3	Forest protection activities	Forest technician and CFUG	CFUG based on OP
4	Timber harvesting and selling inside CFUG	Need to take harvesting permission from DFO	CFUG based on OP
5	Timber selling outside CFUG	Forest technician and CFUG	CFUG based on OP
6	Regeneration promotion and thinning	Forest technician	CFUG based on OP
7	Social Development	CFUG	CFUG based on OP

Capacity of CFUGs in implementation of the SciFM plan

About 89% of the respondents mentioned that SciFM was highly technical, though some of them (10%) did not consider it asthat much technical beyond their understanding. Only 15% of the respondents were able to understand the SciFM OP. Majority (60%) of trespondents stated the OP SciFM operational plans were users friendly. Further, 90% of the respondents do not have the capacity to implement the plan, while 10% have a medium capacity to implement it (Fig.3).

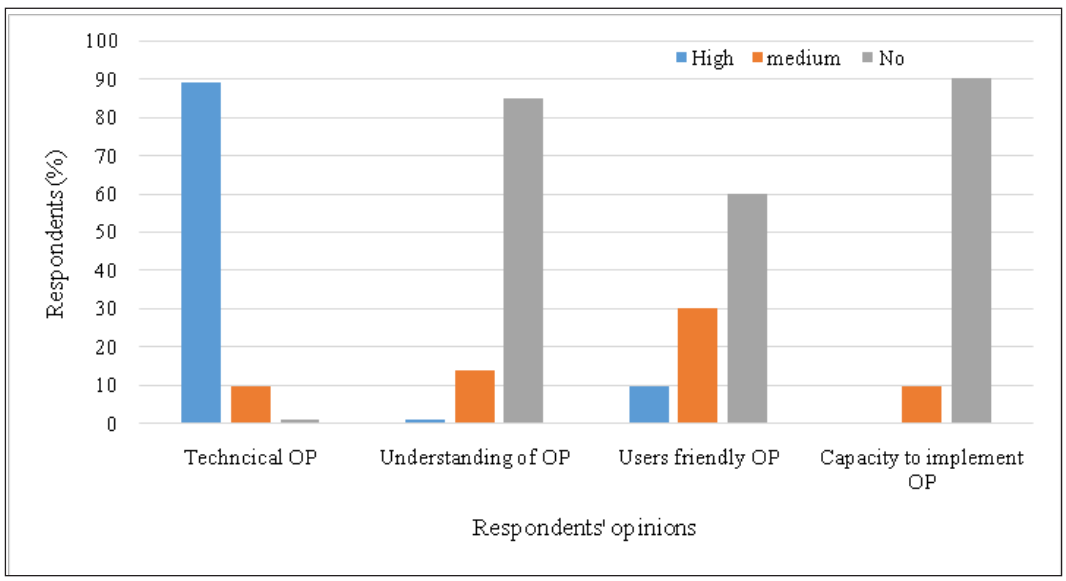

Figure 3: Users opinion on SciFM implementation

Roles of different stakeholders in capacity enhancement of CFUGs

The DFO, EC, and FECOFUN conducted different activities for the capacity building of CFUGs. Before SciFM implementation activities like tours, seminars, and training were conducted. While during the time of our study, only EC conducted forest management training. It was found that only FECOFUN has planned to conduct livelihood enhancement training in the future (Table 3).

Table 3: Activities of DFO/FECOFUN/EC in capacity enhancement of CFUGs

Institutions	Activities before SciFM implementation	Ongoing activities	Plan for capacity building (for 5 to 10 years)
DFO	1) Six days tour to CFs in the Terai, where SciFM is implemented. 2) Five seminars for EC members (within two years).	1) Forest management training to EC and users. 2) Fire equipment distribution.	-
EC	1)One meeting carried out among the EC members on the issues and potentialities of SciFM implementation.	-	1)Informal discussion among EC on SciFM, training for EC and users (but not mentioned anywhere in OP and CF decisions).
FECOFUN	1)Leadership training, audit training, and forest management training to EC.	-	1)Forest-based enterprise program for livelihood enhancement.

DISCUSSION

SciFM plan preparation processand roles of stakeholders

According to SciFM guidelines, the plan should be made and implemented by CFUGs in the technical support of the forest officials in the process. However, our study found that forest technicians had a dominant role during the plan preparation process. Our result is similar to the finding of Basnyat *et al. (2018a)*, who found forest technicians dominating the SciFM plan preparation in mid-hills Nepal.

SciFM plan implementation and role of stakeholders

In our study, SciFM implementation was led by users. CFUGs were involved in all kinds of implementation activities in different forms and capacity. Most of the respondents were involved in tending operations such as thinning, pruning and weeding activity. While the participation of forest user group in social development and timber-related activities was only 25 percent. However, forest officials have a leading role in the decision-making process. This result coincides

with Basnyat *et al. (2018a)*, who have reported that forest officials play a leading role in deciding the activities to be implemented. Bhusal *et al. (2020)* also noted decreased users' participation in the decision-making process in SciFM in the Nawalparasi District. Bureaucratic capture in plan implementation was also reported in SciFM in western hills, Nepal (Basnyat, 2020). Paudel *et al. (2018)* also claimed that the SciFM implementation needs more technical knowledge, which will decrease the users' participation in decision-making. Active community participation is necessary for the sustainable management of forest resources (Joshi *et al., 2014*).

Capacity of CFUGs in implementing the SciFM plan

The majority of the respondents found SciFM highly technical. Besides, less than one-fourth of the respondents understood the SciFM OP. More than half of them stated the OP as users friendly. Almost all of the respondents do not have the capacity to implement the plan, while some of the respondents had a medium capacity to implement it. Basnyat *et al. (2018a)* also found that 70% of the respondents in their study were unaware of the SciFM plan. Likewise, Poudyal *et al. (2020)* mentioned that the majority of the respondents felt the technical complexity of SciFM. Moreover, many scholars argue that SciFM is a techno-bureaucratic dominant scheme imposed on users (Sunam *et al., 2013*; Rutt *et al., 2015*; Basnyat *et al., 2018b*). SciFM is highly technical and requires advanced knowledge of modern technology such as GIS and GPS for the survey and inventory, stem mapping, and silvicultural operation (Bhattacharya & Basnyat, 2003), which are beyond the capacity of CFUGs and this made clear that well-trained technician is necessary for the implementation of SciFM.

Roles of different stakeholders in capacity enhancement of CFUGs

It was noted that DFO, EC, and FECOFUN had conducted different activities for the capacity enhancement of CFUGs. However, the findings suggest that the capacity building trainings were not enough to increase the active participation of users in the SciFM planning and implementation process. Bhusal Bas (2020) reported that if the users are trained well on technical activities, they could carry out all these SciFM activities.

CONCLUSION

This study concluded that forest technicians were dominant over users during the SciFM plan preparation process and in decision-making. The main role of CFUGs was in the implementation of operational plans. A higher percentage of user involvement was in thinning, pruning and weeding activities during implementation period.

However, the majority of the respondents could not implement the plan. Besides, most of them considered that SciFM was highly technical. Some stakeholders (DFO, EC and FECOFUN) were involved in the capacity building of the users to some extent but it was not enough to enhance all the user's capacity. The study suggests to enhance users' technical capacity and knowledge to carryout sustainable forest management as envisioned in the policies. The findings of our study could be useful information for the sustainable management of forests in other parts of the country. Further research related to failure of SciFM should be conducted to learn a lesson for sustainable management of forests.

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