

## Silvicultural madness: a case from the “Scientific Forestry” initiative in the community forests of Nepal

B. Basnyat<sup>1&2</sup>, T. Treue<sup>2</sup> and R. K. Pokharel<sup>3</sup>

Following a case study approach, this paper explains how scientific forest management plans were developed and implemented in community forests of a mid-hill district in Nepal. Field observations were carried over a period of two years (December 2014 to December 2016) in two community forests. User group members, forest officials, forest technicians and executive committee members were consulted. The plans were prepared simply by compiling the administrative requirements where management prescriptions were defined either based on forest technicians’ knowledge or taken directly from the guidelines with little reference to the actual site quality, management objectives, and forest stand conditions. Apart from harvesting of trees, users hardly implemented the plans’ silvicultural prescriptions and forest restoration activities. Moreover, forest officials administratively reduced the number of trees that users could harvest to around half of what the plans allow. Accordingly, forest user groups face a paradoxical forest administration that promotes timber harvesting according to so-called scientific principles, which it then brushes aside to satisfy bureaucratic demands. The study concludes that the concept of scientific forestry is merely used as a “brand” or a seemingly sound “narrative” in community forestry, while it is of little practical relevance because administrative decisions are more powerful in guiding forest management decisions. Hence, the study suggests a replacement of the current schizophrenic mix of so-called “scientific forest management” and sweeping administrative orders with adaptive management practices in community forests.

**Key words:** Nepal, relevancy, scientific management, silviculture system,

Community forestry involves shifting of forest management authority from the central state to local communities while state ownership of the forest land continues (Ojha, 2014) and the state forest bureaucracy determines management requirements as per the principles of Scientific Forest management (SciFM) planning (Ribot, 2002). The plan is a precondition for transferring rights to communities and plays a central role in community forestry of Nepal (Nightingale, 2005). The legacy of scientific forestry still dominates community-based forests management across the world (Ribot, 2002) including Nepal. The forest bureaucracy in Nepal often attaches great value to scientific management because of dispositional (habitual), political (for fear of losing power), and knowledge-related reasons (Ojha *et al.*, 2007). As a result, SciFM is promoted in Nepal’s forestry sector for several more or less interrelated reasons.

In recent years, the Ministry of Forests and Soil Conservation (MFSC) has reoriented the priorities in SciFM, especially after the revised Forest Policy, 2000. Furthermore, recently released policies and strategies, such as the Forest Policy, 2014, the National Biodiversity Strategy and Action Plan, 2014, the Forests Sector Strategy, 2015, and the Thirteenth three Year Periodic Plan (2013—2015), including the Fourteenth Three Year Periodic Plan (2016—2018) and Forestry Decade, 2015 have given high priority to expand the concept of SciFM throughout the country, even within community-based forest management systems. As a result, the MFSC introduced a technically complex, silvicultural management system in community forestry in 2014, which is popularly known as “Scientific forest management”. Aiming to ensure a sustained yield of timber from the forests, it involves a

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<sup>1</sup> Institute of Forestry, Tribhuvan University, Nepal. Email: bbasnyat@yahoo.com

<sup>2</sup> Department of Food and Resource Economics, Copenhagen University, Denmark

<sup>3</sup> Tribhuvan University, Kirtipur, Kathmandu, Nepal

division of the forest into compartments and sub-compartments based on rotation age; adoption of a particular silvicultural system; systematic harvesting in sub-compartments, and marking and systematic harvesting of marked trees including detailed cost-benefit analysis (MFSC, 2014).

The SciFM creates a need for specific expertise (Nightingale, 2005) and puts the forest bureaucracy in a superior position, redefining communities' participation in forest management (Nightingale, 2005; Nightingale and Ojha, 2013). Though the plan provided exclusive competence to manage forest resources according to 'scientific principles', it is often used for asserting the bureaucracy's control over forests (Ribot, 2002; Nightingale 2005) by claiming superior knowledge. The concept supports expanding state control over decentralised forest resources, blocks the transfer of power (Gauld, 2000; Ribot, 2002; Nightingale, 2005; Nightingale 2009; Hull *et al.*, 2010; Maryudi, 2012; Faye, 2015), and works against the interests of the forest users (Krott *et al.*, 2014). Furthermore, the plans have little consequence for forest management practices (Bhattacharya and Basnyat, 2003; Nightingale, 2005; Rutt *et al.*, 2015) and are often considered a series of superfluous and burdensome bureaucratic measures in participatory forestry (Rutt *et al.*, 2015).

Some scholars already (Rutt *et al.*, 2015; Toft *et al.*, 2015) questions on the practical relevance of the scientific management, considering poor use in management decisions. Despite this, the concept of SciFM is expanding in Nepal and being promoted in nearly one-third of the country's districts (DoF, 2015). Few scholars question the theoretical relevance of scientific knowledge in decentralised forest management and promotion of community participation, but a growing number of studies show its darker side of strengthening elite control of other groups' access to forest resources and revenues (Green and Lund, 2015; Ribot, 2002; Sunam *et al.*, 2013; Rutt *et al.*, 2015; Ojha, *et al.*, 2014). How the recently introduced concept of SciFM in the community forests of Nepal works and for whom,

however, remains elusive. This apparent begs the question of "How scientific forest management prescriptions were developed, how they are implemented in practice, and with what effects"?

Taking SciFM in community forests as a case, we explore (a) How SciFM plans were prepared ? (b) How forest management prescriptions in the plans were determined ? On what basis management treatments are proposed ? and (c) How plan/management prescriptions are implemented in practice ?

## Materials and methods

### The case – Scientific forest management

We followed a case study approach since it allowed for an in-depth study on knowledge-related challenges from the perspective of participants (Gerring, 2007; Collis and Hussey, 2009) and relied on multiple sources of evidence (Yin, 2014). Taking SciFM in community forestry as a case, we explored operational plan preparation and implementation processes in a randomly selected mid-hill district<sup>4</sup> of Nepal. Out of eight community forests with SciFM in the district, we conducted an intensive case study in two community forests<sup>4</sup>. Though the SciFM Guideline, 2014 has recommended implementing SciFM in forests of at least 100 ha in the hills, only one community forest in the district had an area of 100 ha (DFO-A, 2014). Hence, we selected the one above 100 ha and randomly selected another among the remaining seven. The first community forest (site I) is 45.92 ha with 61 dependent households (X-CF, 2014) while the second is 112.02 ha with 93 households (site II) (Y-CF, 2014). Both community forests had over-mature natural Sal (*Shorea robusta*) dominated forests with high commercial potential. It almost took three years to prepare and implement the SciFMs (Table 1). The plans were prepared in 2014 while tree stem mapping and harvesting plans (2015) were ready in the second year. Finally, harvesting of the tree was carried out in the third year (2016).

<sup>4</sup> For reasons of research ethics, the district and community forest identities are not disclosed as the political sensitivity of the study required that we had to promise our informants not to disclose their identity.

**Table 1: Scientific forest management practices in community forests**

Year	Phases	Key activities
2014	Planning	<ul style="list-style-type: none"> <li>• Selection of the community forest</li> <li>• Interaction with users</li> <li>• Scientific management plan preparation and approval</li> <li>• Exposure visits to users to observe scientific management</li> <li>• Establishment of revolving fund</li> </ul>
2015	Harvesting plan preparation	<ul style="list-style-type: none"> <li>• Tree stem mapping and harvesting plan preparation and approval</li> <li>• Interaction with CFUGs leader</li> </ul>
2016	Implementation of plan	<ul style="list-style-type: none"> <li>• Forest protection (similar to the past)</li> <li>• Harvesting of trees</li> </ul>

## Methods

The first author conducted intensive field observation in the two study sites over a period of two years (December 2014 to December 2016). At the beginning of the field work in December 2014, the plans were just approved and harvesting plan preparation processes had not commenced. Hence, the first part of our data collection concentrated on plan preparation processes with the communities, technicians and other concerned persons. After understanding the plan preparation processes, the first author, along with users and local-level forest bureaucrats<sup>5</sup> were able to identify three crucial periods in a year where implementation of the plans had taken place. This includes annual planning (May – June); harvesting (December – February), and management (January to March). The first author observed implementation processes as a passive observant. Likewise, the first author also observed general assemblies and executive committee meetings of users along with a series of communications, especially among users and executive committee members; local-level forest bureaucrats and executive committee members. Our objective was to understand the underlying decision-making processes of the written plans.

We followed a content analysis method in reviewing the plans, records and minutes of the community forests. The reviews mostly focused on the expected role of actors in SciFM, the provisions mentioned in the plans regarding scientific management, forest product harvesting quantity, and decisions in the community forests. We conducted five focus group discussions with women, poor, and marginalised community members, executive committee members, and general users in each community forest to understand the plan preparation processes and its subsequent implementation. In addition to this, we conducted a semi-structured interview with local-level forest bureaucrats (12 persons), technicians involved in plan preparation (4 persons), executive committee members (17 persons), users involved in the plan preparation related work (11 persons) and other key informants (13 persons). Information was validated and triangulated through the interactions with different groups of stakeholders and often exploring the reasons for the findings to get an in-depth understanding of the context.

We also conducted a rapid survey of users in the two sites to understand their involvement in planning and plan implementation. Given the small number of user households in the study sites, we surveyed/interacted with 101 households (nearly two-thirds of all relevant households) using a structured questionnaire. The survey focused on exploring reasons for adopting SciFM, users' involvement in the plan preparation including plan preparation processes and users' perception of their capacity to implement the plan when taking their skills, finances, and human resources into consideration.

## Results and discussion

### Plan preparation process

Local-level forest bureaucrats had selected community forests with a commercial potential, good forest condition, accessibility, and tree species composition (preferring Sal) when promoting SciFM. The users did not know why their community forests were selected. But local-level forest bureaucrats organised meetings with the user group leaders and informed about likely benefits they would get from adopting SciFM. According to the chairpersons, they informed

<sup>5</sup> Local level forest bureaucrats include forest officials working at the District and Ilaka Forest Office. This includes Forest Officers, Rangers, Forester and Forest Guards.

users/executive committees on potential benefits, especially on timber harvest quantities, revolving fund contributions, employment opportunities, and proclaimed that it would ensure sustainable forest management. They also asked leaders to organise general assembly to decide about the scientific management along with the request letter to the district forest office for necessary support. Both users and executive committees decided to adopt scientific forest management, agreeing to the bureaucrats' proposal- either "now" or "never". According to the users, they got an 'offer they could not "refuse'. They got technicians for plan preparation at free of cost; payment of wage for user's involvement, especially on forest inventory work; material/financial support for plan implementation; exposure visits to nearby districts together with the permission for harvesting forest products, especially timber and firewood as per the plan. The first and second community forest user group received a revolving fund contribution of NRs 279,000 and NRs 114,000, respectively for implementation of the plan (DFO\_A, 2015). The user groups' trust in the local forest bureaucrats and the incentives they provided were the two main reasons for adopting the SciFM in both community forests.

The local forest bureaucrats recruited technicians to prepare both plans, quite contrary to the directions of the Community Forestry Development Guidelines, 2014, which require users to prepare their plan following participatory processes with support from the local-level forest bureaucrats (DoF, 2014). According to the executive members of both community forests, their roles were mostly confined to logistic arrangements such as organising meetings, arranging accommodation, and participation in forest inventory work as observers. The technicians prepared the plans following a "blueprint approach" complying with the technical parts of the SciFM Guideline, 2014 while local people's voices and concerns were largely ignored or undermined. Executive members in both the studied community forests reported that consultations during the plan preparation were hardly carried out and voices of users often ignored or unheard. According to users, the technicians divided compartments, designed and conducted the inventory, selected sub-compartments and prescribed management interventions. They were asked to participate in the inventory, but they were not consulted on

any forest management decisions. They could not understand what the technicians were doing. Another user said, the technicians' work was mostly confined to inventory works and did not bother much for other aspects. They wrote in the plan whatever they think right. When interviewed about the plan preparation processes in both the studied community forests, the technicians responded: "We followed guidelines and suggested management prescription accordingly. The Guidelines are of a very prescriptive nature and provide little room for consultations. We involved users and their leaders during the inventory. They do not have knowledge on the scientific management, but we worked closely with the local-level forest bureaucrats.

Users and executive committee members were passive participants in the processes and often involved as labourers. More than two-thirds of users responded that forest technicians prepared their plan and they were simply involved in endorsing the plan at the general assembly. Nearly three-fourth of the users reported that the plan was not even discussed at the general assembly. Bhattacharya and Basnyat (2003) made a similar observation in community forests of Nepal where the forests technicians prepared a plan, and the real users were either observers or passive participants. Hence, "a forest-centric or forester knows best about forest" approach was institutionalised in our case community forests while people's voices and concerns were ignored.

Knowledge, skills and experience of the users and executive committee during the plan preparation were largely ignored. The chairperson of one of the groups said they [the user group members] performed all the necessary rituals necessary to endorse the plan, such as organising a general assembly, participating in inventory work, providing information sought by the technicians and endorsement of the plan without knowing what is written in the plan. The plan was prepared without consulting with the users, not only on technical forest management issues but also on the governance issues, such as fees, fines and penalties and forest product fee and forest product distribution mechanisms. Both the users and executive members could hardly recall whether any such consultations had taken place. Nevertheless, forest bureaucrats sent the draft plan to the committee and asked for endorsement by the general assembly. According to one of

the chairpersons, they endorsed the plan without caring to read it since it was highly technical and written by the “expert”. They endorsed the plans in a hurry since the government fiscal year was about to end and they would lose the contribution to their revolving fund if they could not do in time. Hence, the plan preparations were like rituals performed only to comply procedural and legal requirements. Ribot (2002), makes a similar observation and mentions that scientific plans circumscribe rural populations’ opportunities and obligations with a lack of new rights, but rather provide them with an opportunity to participate in a project, not of their design.

### Silvicultural prescription

The silvicultural prescription should be defined considering the management objectives, forest stand conditions including estimated growth rates, and topography (Gilmour, 2017). However, users reported that the technicians simply referred the SciFM Guidelines, 2014 while deciding on management prescriptions. The technicians designed and carried out forest inventories with a predefined objective of “timber production”. Neither users’ priority nor participatory forest assessment was carried out before deciding the management objectives. One of the chairpersons said, “when decisions are made by the heart, it’s hard to use the brain. The guidelines appeared like a religion to the technician and dreaded to questions, whether they trust or not”. Whenever the user raised the concerns, the technicians simply referred the guidelines and responded that their plan should be done similarly. As a result, users stopped to question the technician’s work and became rather submissive. When the first author enquired with one of the technicians about the basis of deciding management prescriptions, the response was “Mr X is the father of the scientific forestry in Nepal, who recommended this practice. The government has already approved this concept, and our plan should be prepared similarly. We cannot go beyond that approach”.

The technician simply followed whatever was written in the guidelines, whether or not this made sense in the local context. For example, the SciFM guidelines, 2014 require a fire line of 6 m and 4 m width for compartments and sub-compartments, respectively. The technician proposed this for both community forests even

though the sizes of the sub-compartments were very small (0.5 ha and 1.4 ha, respectively). Nearly one-tenth of the forests within the sub-compartments should be clear-felled if fire lines to be constructed. The construction of fire lines in very steep terrain might also cause severe soil erosion, but these obvious factors were not taken into account during the preparation of the plans. However, the fire lines were never established, and nobody seemed to have pushed for that to happen. Hence, the fire line instructions of the Guidelines were, in practice, ignored -mainly because it would lead to a permanent removal of trees from a conspicuously large part of the forests, which could create trouble for the local-level forest bureaucrats. As local forest bureaucrat explained: Harvesting more trees is more trouble. We would have to go to the field to comply with all procedural requirements which are quite demanding. Further, local media would write unnecessarily that we clear felled the forests for our benefits. We would have to give justification everywhere despite our good faith. But if we do not work, our life is easy. The user groups leaders were not aware of the fire line prescriptions within their plans. The chairperson of one group said: “We have much more jobs to do apart from the community forests. We hardly find time to read the plan and follow it as prescribed. We simply do what the forest bureaucrats ask us to do. Mercifully, the combination of users’ ignorance about ‘required’ fire line constructions and local-level forest bureaucrats’ active resistance to this part of the Guidelines prevented devastation of the forests. Scott (1998) provides many examples of how local people, who know their environment, manage to save themselves and prevent the most damaging effects of centrally-ordered, well-intended, but incredibly ill-considered plans and procedures by NOT following these to the letter while relying on local knowledge and common sense. Our study suggests that we might add local-level forest bureaucrats to the ranks of every-day heroes, who prevent top-down orders from laying waste to the land and their own as well as ordinary people’s livelihoods.

Management prescriptions are “text book science” rather than “research generated knowledge”. The rotation age, regeneration period, silvicultural system, number of seed trees to be retained was prescribed based on the “Guidelines”. However, the origin of this knowledge was not explored. In fact, they are based on lessons from the

Terai but virtually replicated in the hills, which differ regarding climatic conditions, forest age, topography and species composition. When we discussed this with forest bureaucrats and technicians, the common answer was either (i) the prescription was obtained from the Guidelines or (ii) similar prescriptions were proposed in another comparable community forest.

The SciFM Guidelines, 2014 recommend that a community forest should be considered as a single block and then divided into compartments and sub-compartments. It suggested to implement SciFM at-least forests with 100 ha, but 200 ha are preferable. It further assumed that compartments and sub-compartments within the forest are generally homogenous stands, especially regarding species composition, size classes and age of the forests. However, the guidelines remained silent on different forest types which can be found within the small block or in the compartments. For example, the forest type and vegetation composition differ by aspect and altitude (cf above), such issues were not taken into account, while proposing silvicultural operations. In our two case study sites, the consultant simply divided the forests into eight compartments considering the rotation of the Sal tree, despite north and south aspects had two different vegetation types with two distinct rotation ages. Forests in the mid hills generally consist of *S. robusta* dominated stands on south facing slopes and Schima/Castanopsis on north facing slopes. Of the eight compartments in site I, two compartments are dominated by Schima/Castanopsis forests while this forest type only dominated in one compartment in site II. However, such obvious differences in vegetation composition did not result in proposing two different silvicultural prescriptions in the plans. Rather the plans' management interventions were exclusively based on, *S. robusta*. The rotation period for the final harvesting was fixed at 80 years which makes sense for the Sal dominated compartments but seems less relevant for the Schima/Castanopsis dominated stands, which is likely to reach maturity earlier (when the commercial value of growing stands begin to decrease as a result of increasing rot and defects). The forest technicians imitated the "principle of the compartment and sub-compartment division, but ignored on forest type in deciding on the layout of compartments or sub-compartments in the community forests. In fact, there should

be at-least two blocks in the community forests, given the two-distinct forest types (*S. robusta* and Schima/Castanopsis forest) in each community forest with different rotation age. Similarly, single species were considered in defining the forest management system though the species composition varies by aspect. This situation had appeared partly because of the technical flaws within the SciFM guideline, 2014 itself, which is silent on the division of the compartments and sub-compartments considering the vegetation type and partly because of the technicians' application of the Guidelines, without considering the-ground reality. Accordingly, we are concerned about the technical and scientific quality of the Guidelines as well as the technical soundness of how technical 'experts' apply the Guidelines in practice.

Consequently, silvicultural prescriptions were proposed without considering forest types and management objectives. Our case also illustrates that management interventions were decided giving preference to the species, Sal for producing the timber. This finding is similar to Gauld (2000), who found that the new policy discourse of community-based forestry policy in the Philippines was shaped by efforts to maintain centralised control over forest management and a political economy orientated towards commercial timber production using the principles of 'scientific' management.

Further, the "Irregular Shelterwood System" proposed in the plans did not consider the local context. More than one-fourth of forest area in both sites is located on steep slopes (above 30°). Intensive harvesting should, therefore, be discouraged in these areas (FAO n.d). However, the plans still prescribe the removal of all trees above 30 cm diameter at breast height, except mother trees. As a result, local-level forest bureaucrats introduced their preferences considering the geographical sensitivity of the area, especially the risk of soil erosion and landslides and also to limit the harvesting volume. The SciFM guideline, 2014 recommend 15 to 25 mother trees per ha, but local-level forest bureaucrats increased the number of mother trees to 27 to 29 trees per ha in the harvesting plan. Hence, in practice, silvicultural management prescriptions, quite sensibly override the rigid SciFM prescriptions, but why then go through the trouble of developing plans that even the forest

bureaucrats, who promote the underlying concept of SciFM, do not dare to implement in practice? It is indeed a paradox that SciFM in Nepal promotes a “one size fit all” silvicultural system (c.f. Gelo and Koch, 2012) after which local-level forest bureaucrats must ‘save’ the forests, the down hill environment, and ultimately their careers by rejecting to implement the concept in practice.

The technicians divided each of the community forests into eight compartments, conducted a forest inventory in each compartment, and proposed harvesting within one compartment while prescribing forest protection activities in the remaining seven compartments. Of the total forest, only a very small area (1/80th) is harvested every year, only 0.5 ha in site I and 1.4 ha in site II per year. Furthermore, the forest was very intensively harvested in small sub-compartments, even though mature and overmature trees were plentiful in compartments that should not be harvested in the coming 40-50 years according to the plans. Further, of the total marked trees in the two case study sites, nearly two-thirds (64.3%) were either of medium quality, at cull stage, or of poor quality (DFO-A, 2015). The economic madness of leaving currently valuable trees to rot because a forestry ‘expert’ has devised a ‘scientific’ management is obvious. The fundamental flaw is that the approach ignores the initial distribution of species and diameter classes across the entire forest.

An analogy might clarify our point: Like forest compartments, the tables in Mr Kafle’s restaurant have numbers to facilitate clear communication between the waiters and cooks. The customers, however, choose tables according to their preferences among the ones that happen to be free when they arrive. During opening hours, the guests are, therefore, scattered all over the restaurant. Some are eating dessert; some are having drinks and snacks while others are just getting ready to order their meals. The restaurant is successful, and most customers pay tips in appreciation of the good food, excellent service, and reasonable price-level. Suddenly, a government decree orders the certification of all restaurants according to official standards, or else the authorities will close them down. Coincidentally, a donor-funded hotel and restaurant development project happens to offer free-of-charge assistance by ‘experts’ who will help streamline the restaurants’ operational procedures after which they can get certified,

so Mr Kafle is ever so thankful when the government inspector, whom he has known for many years, facilitates an ‘expert’ to assist with the certification process. Unfortunately, however, a fundamental certification criterion is that guests at tables 2-30 cannot be served before the guests at table 1 have finalised their entire meal irrespective of who came first and which courses they had completed. Unless this principle becomes part of the restaurant’s written operational procedures, which only the management ‘experts’ know how to fill out correctly, it cannot get certified. What will Mr Kafle do? Close down, implement the new procedure to the letter (and then close down), or pretend to follow the new procedure, get certified, and continue his business as before? What will the government inspector do when he comes to verify whether Mr Kafle’s restaurant follows the certification criteria ?

### Implementation

More than two-third (70%) of the users were unaware of the plan. For them, it simply means as a tool to access “harvesting of the marked trees every year”. They considered the plan “a bureaucratic requirement and of little relevance”. As a result, forest management operations, such as forest protection, silviculture and tending operations were largely ignored and rarely implemented. Neither users nor local-level forest bureaucrats pay much attention to this part of the plans. Though the SciFM plan emphasises active involvement of forest technicians in management decisions, they neither supported nor referred the plan. When users mostly request local-level forest bureaucrats to support during plan implementation, the indifference was either lack of technical competency or inadequate financial support. One of the local-level forest bureaucrats said, “we graduated from the forestry school almost 30 years ago, we have almost forgotten what we were taught there. Therefore, what we do is simply to regulate harvest rather than guiding them in other matters. If we were competent enough, we could have guided them”. Another responded “they did not have the adequate budget or programme to facilitate implementation. The implementation responsibilities lie with the users since the “plan was prepared by them, for them, and to them”. These findings resonate those of Toft *et al.* (2017) who reported that the operational plan was of little consequence in practical forest management, but more important to users as a

source of “legitimacy around forest management decisions”.

The users and local forest bureaucrats blamed each other for the poor implementation of the plans. Users perceived that they received poor implementation support while forest bureaucrats perceived that communities should mobilise their fund to implement the plans. Consequently, the plans often remained on the “shelf” and were only referred to at the time of harvesting, especially to identify the marked trees. Neither the users nor the local-level forest bureaucrats could recall when they had referred to the plans other than during harvesting of trees. As a result, the silvicultural prescriptions of the plans were hardly implemented. The user committees organized annual weeding operations for two days to clean the harvested block in both the study sites and did not bother to implement other management prescriptions in the block. The users simply carried out protection measures which include deployment of a forest watcher; monitoring forests based on a rotational basis by users; permission to collect dead firewood, grasses and fodder at free of cost. No specific activities prescribed in the plan were implemented apart from the removal of debris/cleaning of harvested compartments. This is similar to the findings of the Rutt *et al.* (2015) who found that technical forest management plans in Nepal were haphazardly elaborated and that local communities base their management on other sources of knowledge.

The plans emphasised the involvement of the local-level forest bureaucrats and mentioned that users should strictly follow their advice. Likewise, they recommended to recruit or hire a forestry graduate to implement the plan and allocate part of the budget for the use of technical support. However, the users and executive members in both sites seemed unaware of these plan details. The plans were prepared ambitiously without considering the capacity of the local community and forest bureaucrats. Likewise, users felt that they were not competent enough to implement the plan. Of the 161 users from two community forests, only three have received training on SciFM while six users have observed SciFM practices in neighbouring districts. In addition, the plans predicted annual investment requirements in each forest, but the user groups do not have sufficient funds to implement the plans. They had already utilised their revolving fund for paying wages to

users that were involved in plan preparation and service fees to the technicians. For example, in one of the study sites, the executive committee paid the wage of NRs 41,000 for involvement in tree stem mapping. A large majority of users (above 90%) expressed their unwillingness to contribute financially, though very few were willing to contribute voluntary labour of two days a year as in the past. Hence, future implementation of the plan remained in question.

The SciFM plans of both study sites were prepared in 2015, but local-level forest bureaucrats did not allow for harvesting of timber until harvesting plans were approved in 2016. Furthermore, the users can also collect fallen trees from all compartments of the forests after obtaining written consent of local-level forest bureaucrats. However, the local-level forest bureaucrats betrayed and deferred from the promises which they made in the plan. They do not allow users to collect fallen trees as well as to harvest trees according to the plan (Fig. 1) As a result, harvesting quantity is almost half of what the plans ‘allow’. This further raised the concerns on the need and use of SciFM if harvesting rules are, in any case, grounded on administrative rationalities and common sense, c.f. above.



**Fig. 1: Planned versus officially allowed harvesting quantity of growing stock**

At the time of tree felling, the local-level forest bureaucrats increased the diameter of trees eligible for harvest from 30 cm to 40 cm with the intention to reduce the harvest of standing trees. While local-level forest bureaucrats gave justifications like conserving forests, reducing soil erosion risks, user committees silently accepted the decisions since they had not been getting timber for last two years due to the lengthy planning process. One ex-chair of the community forests responded “we were getting pressure from both sides, users and local-level forest bureaucrats. The users wanted timber immediately while local-level forest bureaucrats were imposing

several restrictions verbally. We agreed because we wanted to harvest and distribute trees as early as possible”. Another executive member said “forest bureaucrats would do no wrong in forests. They are more knowledgeable than us. Instead of resisting their decision, we cooperated with them since we need their support, especially on the harvesting of trees”. Users generally followed the instructions given by forest bureaucrats without questioning whether or not it made sense. This parallels the findings of Pulhin and Dressler (2009), who find that real transfer of management and use rights and decision-making power from the state to local communities have not occurred. Likewise, the powerful actors exert significant influence over the processes and outcomes of community forestry (Schusser *et al.*, 2015).

## Conclusion

The SciFM plans were prepared simply by compiling the guidelines and other administrative requirements with little consideration of the actual site quality, management objectives, and forest stand conditions. Users appeared as passive participants or beneficiaries in the processes where users’ local knowledge were largely ignored and undermined. The trust in the local-level forest bureaucrats and the incentives they provided were the two main reasons for adopting SciFM in both community forests. It is very unclear, however, for whom the plans were prepared as both the users as well the local-level forest bureaucrats were reluctant to implement them. Users often consider the plan as a bureaucratic requirement, because of which the silvicultural prescriptions and forest restoration activities were hardly implemented. However, adoption of SciFM by the users have facilitated and supported techno-bureaucratic domination in the community forests. The plans simply guide the harvesting of the trees, yet the users are not allowed to harvest the volumes prescribed in the plans. What is the need and use of scientific forest management if harvesting rules are grounded on administrative rather than scientifically documented silvicultural rationalities? It appears that the local-level forest bureaucrats are using the SciFM narrative to regain power in the community forest. Users accepted the resulting patron-clients’ relationship with the local-level forest bureaucrats and agreed on the “rules of game” without understanding technical complexities and their own competencies might bring community forest gradually under the

control of the forest bureaucracy. Our analysis shows that local-level forest bureaucrats have used the SciFM narratives to hold both de-jure and defacto forest management rights in the community despite that Forest Act 1993 devolve authority to the users in forest management decisions.

Our findings further illustrate that forest bureaucrats in some instances undermined the silvicultural prescriptions of the so called “SciFM Guidelines, 2014” by devising their own rules of thumb, wherever they thought the prescriptions did not fit the local conditions. These thumb rules included (i) increasing the number of mother trees to be retained after timber harvesting and (ii) ignoring the prescriptions for establishing fire lines between sub- compartments. Accordingly, the local-level forest bureaucrats used their common silvicultural senses and ‘saved’ the forests by not implementing the plans to the letter. They ignored written prescription of the plan where they did not allow to fell the marked tree in the sloppy area or construction of fire line of 4-6 width in small sub-compartments of 0.5 to 1.4 ha. In fact, this probably prevented otherwise likely adverse environmental consequences such as landslides and soil erosion. However, this raised the concern on requirement and relevancy of such expensive scientific plan, prepared by the forestry experts, which are not situated with the ground reality. It eventually did not come under enforcement within a year of preparation. Apparently, study concludes that SciFM is merely used as a “brand” or a seemingly sound “narrative” in community forestry, but, it has little practical relevance. The administrative decisions which are either formal or verbal appeared more powerful in guiding forest management decisions rather than the plans. The study argues for promoting the adaptive forest management practices while considering the selection of appropriate management operations depending on the ecological and socio-economic contexts in community forests rather than the current mix of so-called “scientific forest management” and sweeping administrative decisions.

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