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The use and usefulness of inventory-based management planning to forest management: Evidence from community forestry in Nepal☆

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ABSTRACT

This paper examines the use and usefulness of inventory-based management planning to practical forest management in processes of community forestry in Nepal. The paper is based on case studies in four Community-Forestry User Groups (CFUG) in the mid-Hills of Nepal and draws upon semi-structured interviews, participatory rural appraisal exercises and analyses of aerial photographs. First, we find that the operational plans supposed to guide community-level management are based on sub-standard forest inventories, which limits their potential role in practical forest management. Second, we find that community-level managers do not rely on the operational plans in their practical forest management. Finally, we find that community-level forest managers in these four cases have managed to conserve their community forests over time and appear knowledgeable about the developments in the condition of their forests in the sense that their impressions of past and current forest condition are mirrored in what we can observe from analysis of change in forest condition based on aerial photographs. Based on these results we question the usefulness of inventory-based management planning in the context of community forestry.

1. Introduction

Approaches to forest management that involve people living in and around forests are widespread. These approaches are legislated and implemented under a number of policy designations, including decentralized forest management, participatory forest management, joint forest management, community-based forest management, indigenous forestry, and social forestry and vary with regard to the degree power sharing with forest-adjacent people. The share of the World's forests managed by participatory approaches has been growing over the past three decades, and today the area of forest land in lower and middle income countries under legal community ownership or control is around 30% (RRI, 2013).

While participatory approaches to forest management vary with regard to the extent of power sharing, they invariably involve an inventory-based approach to forest management planning. Thus, the power sharing arrangements between the State, usually represented by forest administrations, and forest-adjacent people rest on the elaboration of a management plan that is based on a structured forest inventory and which sets out the goals and prescriptions for the forest management (Klooster, 2002; FAO, 2004; Larson and Ribot, 2007; Saito-Jensen and Jensen, 2010; Mathews, 2011; Movuh, 2012; Green and Lund, 2015–in this issue; Rutt et al., 2015–in this issue). The inventory-based approach to forest planning and management has its roots in central Europe in the late eighteenth century and comprises principles and methods aimed at ensuring a permanent forest estate and a sustainable supply of forest products, mainly timber. It assumes that the forest that is planned for is measured and its growth rate modeled to yield predictions about how it responds to management, which would allow forest managers to predict and steer the development of the forest to yield the desired products. In the context of participatory forestry, the application of the inventory-based forest management planning approach has been promoted as a means to ensure the ecological sustainability of the management by conditioning the devolution of power on the elaboration of an inventory-based management plan and adherence to its prescriptions.

However, the reliance on inventory-based management planning in participatory forest management approaches has been shown to have a number of more or less unwanted or unintended effects. Concerns have been raised that inventory-based management serves to strengthen the control of forest administrations, rather than facilitating participation by forest-adjacent communities (Ojha, 2002; Hull et al., 2010). This is linked to evidence that a lack of resources to implement inventories and elaborate or update management plans have led to decade long

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delays in devolution processes (Scheba and Mustalahti, 2015–in this issue) and to large backlogs or expired management plans (Ojha, 2002, 2006; Rutt et al., 2015–in this issue). Further, the technical framing of forest management implied in inventory-based planning has been observed to lend itself to elite capture in forest-adjacent communities, as people who are educated or have received training in the management procedures use their superior knowledge to garner authority (Nightingale, 2005; Green and Lund, 2015–in this issue). Finally, there are concerns about the quality and relevance of the plans. Mathews (2011) describes how lower level forest officers were compelled to sign off on plans of poor quality as there were no resources to do rigorous forest inventories. Similarly, Rutt et al. (2015–in this issue) found that management plans were flawed due to a lack of rigor in the implementation of forest inventories, which the authors linked to a lack of resources.

Thus, it appears that inventory-based management planning in many respects constitutes a burden on processes of participatory forest management. Yet, we know less of the virtues of inventory-based management planning, i.e. whether it serves an important function in supporting forest-adjacent communities in managing their forests. This study seeks to fill this knowledge gap by exploring the role of inventory-based management plans, called operational plans (OP), in forest management by four communities each managing their forest under the community forestry program in Nepal. Specifically, the study sought to answer the following three questions:

(Q1) Are the OPs informed by recent and rigorous forest inventories?
(Q2) Do community-level managers rely on the OPs in their management?
(Q3) Do community-level forest managers appear knowledgeable about the condition of their forest?

Our examination of (Q1) concerns the degree to which OPs are based on updated and situated knowledge, i.e. whether they are based on recent and rigorous forest inventories of the forests in question. As such, the answer to Q1 will be revealing as regards the *potential* role of the OPs as useful tools in guiding forest management. Our examination of (Q2) concerns the degree to which this *potential* role is mirrored by *actual* use of the OPs in the planning and implementation of forest management by community-level forest managers. Through interviews with community-level forest managers we will explore the role of the OPs in practical forest management and decision making. Finally, our examination of Q3 seeks to explore whether community-level forest managers' knowledge of the forest condition – be it based on OPs or not – resonates with analyses of forest condition as represented by aerial photography. The answers to this final question may be indicative of whether the management decisions of community-level forest managers are based on situated and relevant information about the development of the forest in question. Thus, in sum the answers to the three questions will be telling as to the actual importance of the OPs in community-level forest management, whether community-level forest managers – irrespective of their actual use of the OPs – appear to have knowledge about their forest that enables informed management decisions and finally whether some of the reasons for the use (or not) may be found in the OPs themselves. Taken together, it is thus our hope that this study may provide insights that can be valuable to the development of forestry planning approaches that are well suited to participatory forestry processes.

The empirical context of our study is the Community Forestry (CF) program in Nepal, which has long been considered a leading example of forest decentralization among developing countries (Agrawal and Ostrom, 2001; Ojha, 2006; Ojha et al., 2009; Hull et al., 2010; Pokharel, 2012). Under CF in Nepal, powers are devolved to Community Forestry User Groups (CFUG) to manage forests in accordance with a constitution and management plan – the latter is known as the OP – and the CFUGs can authorize utilization of the community forest and collect, retain and redistribute forest revenue from such uses (Lund et al., 2014). While the constitution defines the social arrangements in the CFUG, the OP is based on a forest inventory and specifies objectives for the forest development, activities to be undertaken, and rules regulating forest product utilization (Ojha, 2002; Ojha et al., 2009; Chhetri et al., 2012; Pokharel, 2012). Every five to ten years the OPs must be renewed in order for the CFUGs to sustain their rights over the forests (Hull et al., 2010; Pokharel, 2012; Rutt et al., 2015–in this issue).

The CFUGs are self-formed associations with a membership consisting of people with an interest in the management and use of the particular forest. CFUGs elect executive committees for the management and administration of the forest. The process of devolving responsibilities and rights to manage forests in Nepal dates back to the 1970s. The current community forestry process was initiated in the early 1990s with legal reforms and a nationwide effort at implementation. However, detailed forest inventories providing a basis for determination of annual allowable harvest level first became a requirement for management planning in 2000, where it was introduced by the Ministry for Forest and Soil Conservation (Ojha, 2002; Hull et al., 2010). The officially stated intention with these requirements is to safeguard forests by regulating extraction so that it does not exceed increment (Ojha, 2002; Rutt et al., 2015–in this issue).

Our study exemplifies recent developments in the interface between political ecology and science and technology studies (STS). The focus on knowledge claims as part of the negotiation over rural peoples' access to natural resources – in our case by the need for inventory-based management plans – places our study at the heart of traditional political ecological debates (Robbins, 2004). Yet, our interest in discussing claims and their power-effects through examining the character and production of knowledge takes inspiration from STS and responds to recent calls for studies that seek to draw on both literatures to provide new ways of questioning power relations and struggles over resource access by scrutinizing all knowledge claims (in our case among community-level managers and forestry technicians) on equal terms (e.g. Forsyth, 2003; Goldman et al., 2011). Our study can be seen as adding to this emerging literature.

1.1. Study area and methods

1.1.1. Study area

The study was carried out in four CFUGs in the Tanahun District located in the mid-hills of Western Nepal. With the majority of the population being dependent on agriculture and forest resources for their livelihood sustenance, Tanahun represents a typical forest-dependent mid-hill district (Pokharel, 2012; Oli, 2015). With regards to CF, Tanahun is considered a pioneer district, initiating the CF program only a few years after the launch in the mid-1970s (Pokharel, 2012).

The four CFUGs were selected among ten CFUGs for which information on development in forest condition over time based on analyses of time series of remote sensing imagery existed (Oli, 2015). These ten CFUGs, in turn, were selected among older and larger (in terms of forest size and CFUG membership) CFUGs with access to markets for forest products (Oli, 2015). All the ten forests managed by the CFUGs feature the common commercial species Sal (*Shorea robusta*). Thus, in terms of representativeness, these ten CFUGs represent management bodies that we expect to be more knowledgeable, independent, and actively managing and receiving more attention from the district forest office, due to their experience, resources, and accessibility.

The four CFUGs for this study were selected among the more actively managing CFUGs to enable an evaluation of actual forest management practices. Some basic characteristics of the four CFUGs, as well as the development in forest cover, are listed in Table 1.