



The scientific framing of forestry decentralization in Nepal[☆]



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ABSTRACT

Technical forest management plans have become a precondition for transferring authority to local institutions in processes of participatory forest management. The plans are intended to safeguard environmental values and are justified by their relevance in daily forest management. To serve these functions, the plans must be informed by accurate information about the forest and be actively used by local communities. Based on studies in Nepal, this paper seeks to further our understanding of the role of so-called scientific planning in community-level management through time series analyses of remote sensing images, detailed forest inventories and interviews with community forest managers and public forest authorities. Results indicate that technical forest management plans have been elaborated haphazardly and that local communities base their management on other sources of knowledge. Further, community-level managers appear well-informed about forest condition and their practices contribute to sustainable forest development. We suggest the need to further scrutinize the regime of scientific management planning as its practical relevance appears questionable.

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1. Introduction

Participatory forestry entails decentralized governance approaches that involve local communities in the management of forests they live in and around, and is expected to improve forest conservation as well as forest users' livelihoods (Pokharel et al., 2007; Hobley, 1996). A global advancement of participatory forestry in 'developing' countries has characterized the past 20 years (Ribot et al., 2008; Sunderlin et al., 2008). However, this trend has not overturned the predominance of 'technocratic' values and practices in environmental decision-making especially in the Global South (Faye, 2015; Scheba and Mustalahti, 2015–this issue; Ojha, 2006; Ojha et al., 2005). Such centralized 'technical knowledge' is often at odds with the forms of knowledge situated at the level of rural communities, i.e. 'local/indigenous knowledge' (Hull et al., 2010) and ultimately appears to represent a stalling or reversal of trends toward greater autonomy and representation of rural people (Sunam et al., 2013; Ribot et al., 2006).

The rationale behind such actions may be a result of what Ojha et al. (2009) refer to as 'techno-bureaucratic doxa', that is, a generally

unchallenged worldview of technocrats, bureaucrats and scientists that tends to overlook the knowledge and practices of regular people. In other words, the continued reliance on scientific and technical (i.e. applied science) knowledge among e.g. forest bureaucracies may be explained by the self-understandings of forest bureaucrats whose worldview has been consciously as well as subconsciously shaped by the discourses and tools they adopt as part of their academic training and professional culture. Accordingly, the knowledge and power bases of techno-bureaucrats are closely interwoven in ways that are likely to blur boundaries between the two – even to the techno-bureaucrats themselves.

Along a more instrumental line of thinking, Heller (2001: 135) points out that handing over power to lower levels will 'shake up existing patterns of political control and patronage'. He notes that despite the best efforts by the international community to drive decentralization, the associated threat of a loss of control is a primary reason for state bureaucracies to resist in practice. Accordingly, Ribot and Oyono (2005) refer to the widespread use of 'scientific' arguments, or specious technical reasons, as a means of retaining central control despite de jure efforts toward the decentralization of natural resources.

A prevalent manifestation of technical knowledge in forestry is the concept of scientific forest management planning. Technical management plans based on traditional forestry science have broadly become a precondition for transferring rights to local institutions, and are justified by forest authorities' expressed concern over local communities' (lack

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of) forest management skills (Ribot et al., 2010; Springate-Baginsky and Blaikie, 2007). Essentially, scientific forestry prescribes that statistically sound forest inventories, which determine the size of the growing stock as well as its annual increment with sufficient accuracy, are needed to ensure that harvesting does not exceed re-growth over the longer term while maintaining environmental services (e.g. erosion control, water catchment, wind protection, species habitat and carbon storage). These management plans appear remarkably similar across national participatory forestry processes globally, and follow principles originating from present-day Germany in the early 19th century and have been adopted by forest training institutions and forest bureaucracies throughout the world (Mustalahti and Lund, 2010; Mathews, 2011; Kumar, 2002).

In addition to their claimed importance for facilitating a state understanding of nationally important resources (or rendering the forests 'legible' to the state through administrative technologies, a la Scott (1998)), the prevalence of required technical forest management plans suggests that forest bureaucracies perceive them to be necessary for day-to-day forest management. The quality of a management plan, however, depends on the quality of data informing it and plans are useless if forest inventories are done haphazardly or too infrequently. Forest inventories are very resource demanding, so resource strained forestry officials may face incentives to take shortcuts. This obviously threatens the quality of the 'science' underpinning such planning. In other words, knowledge that is produced through misapplication of the scientific *model* is likely to be faulty. Further, research indicates that local communities draw on other forms of knowledge to inform their management practices under participatory forestry, indicating that communities consider technical management plans as official prerequisites to gain recognized authority over forests rather than relevant support to practical forest management (Mathews, 2011: 53). This raises the question of whether the technical forest management plans are useful management tools, or rather represent superfluous and burdensome bureaucratic measures in participatory forestry. In the latter case, a new set of questions is raised regarding the political economy behind such requirements.

Important advances have been made into the social and environmental outcomes of scientific management planning in participatory forestry. These studies in various ways reflect the instrumental and/or technocratic doxa rationales discussed above. Mustalahti and Lund (2010) noted that the requirement of costly inventories in Tanzania acted as a brake on the transfer of rights and thus the actual enactment of participatory forest management. Ojha (2002) noted weaknesses in the policy prescription for forest inventories within participatory forestry in Nepal. These included the sidelining of local knowledge, subversion of community authority, lack of demand for the extensive data that was compiled, and that the obligation for inventories was issued within an institutional context of resource deficiencies (Ojha, 2002). Nightingale (2005) in Nepal and Green and Lund (2015–this issue) in Tanzania have documented how the procedural, numerical, and literacy-demanding knowledge standards implied in scientific management planning tend to exclude the vast majority of community members from decision-making. This implies that the ostensible aim of participatory forestry (i.e. engaging forest users) is bypassed. Further, this exclusion also highlights how technical demands on forest management planning can influence intra-community equity and power relations and thus facilitate local 'elite-capture' (see Lund and Saito-Jensen, 2013 and Green and Lund (2015–this issue)).

Despite the valuable existing scholarship on the occurrence and outcomes of the convergence of technical and participatory forms of forestry, little research has attempted to examine the actual application of the science that is upheld in many participatory management regimes. This is the aim of this paper. Specifically, we question the validity and uses of technical forest management plans in Nepalese participatory forestry. We seek to establish whether they represent (i) a sound application of science and (ii) provide the expected outcomes. By doing so, we wish to make an empirical contribution to the

'epistemological break[s]' of 'hegemonic forms of knowledge nurtured through the institutions and practice of forest science' which have been promoted and widely accepted as 'superior science' for development and resource sustainability (Ojha, 2013: 250).

This paper draws on detailed studies of conservation impact and the underlying management processes and rationales behind this impact in two locally-managed forests in Nepal. It looks at:

- (i) environmental outcomes of participatory management, assessed by: (a) repeated forest inventories, and (b) crown cover change matrix analyses based on time series aerial and satellite photos;
- (ii) perceptions of community forest managers, ascertained through interviews, on forest condition over time;
- (iii) management plans in terms of their prescriptions and forest resource assessment as compared to our own inventories;
- (iv) perceptions of community forest managers and government authorities, ascertained through interviews, on the technical quality and relevance of the management plans; and
- (v) actual practices, ascertained through interviews and document analysis: (a) use of management plans, (b) other ways if any employed by local users to understand forest condition and determine silvicultural activities, and (c) documented practices (e.g. forest product harvest records) as compared to prescriptions within the management plans and our own inventories.

The paper is organized as follows. Section 2 summarizes the state of existing legislation and institutional issues surrounding participatory forestry in Nepal. Section 3 outlines the methods employed. Section 4 presents the results of the two sites based upon environmental outcomes, prescriptions within the plans and our own inventories, and informants' perceptions and practices. In Section 5, we discuss the results of our empirical cases in light of the literature on the subjective uses of science in natural resource management and the national level policy debates within Nepal.

2. Legislative and institutional context of participatory forestry in Nepal

In recognition of the failure of centralized forestry to conserve forests, Nepal introduced participatory forestry in the 1980s and has become a global model of success (Sunam et al., 2013). The story is similar for participatory conservation area management, which emerged in light of persistent park/people conflicts during the early 1990s in the country (Heinen and Mehta, 1999). Research indicates that successes from participatory approaches in Nepal include not only resource conservation but improved local livelihoods, income generation (Chhetri et al., 2010; Nagendra et al., 2008) and public goods such as infrastructure (Lund et al., 2014; Chhetri et al., 2012). Nevertheless, national and local quarrels over rights as provided for in national policy and more broadly over access to deliberative governance have persisted over recent decades, among communities, civil society, subnational and national government and even international actors (Ojha, 2006; Sunam et al., 2013). Some of these arguments have emerged from increasing technical demands placed upon communities (e.g. Hull et al., 2010), and in reaction to the role of politico-economic interests in the promotion of scientific forestry (Ojha et al., 2007). This section outlines the expansion of scientific and technical forestry over the past few decades in tandem with the expansion of participatory forestry.

There are several varieties of participatory forestry in Nepal. This article examines two (and the legislation relevant to these, described below), which are exemplified in our Mid-Hills and Highland sites (Fig. 1). The first entails the Community Forestry Program involving local Community Forestry User Groups (CFUGs) and District Forest Officers (DFOs) and their rangers. The forest offices at the district level are de-concentrated arms of the Department of Forests within the Ministry of Forestry and Soil Conservation (MoFSC). The second type is found within conservation areas, and in this case entails

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