

Beyond the second generation: towards adaptiveness in participatory forest management

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Received: 10 January 2007

Accepted: 24 April 2007

doi: 10.1079/PAVSNNR20072028

The electronic version of this article is the definitive one. It is located here: <http://www.cababstractsplus.org/cabreviews>

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Abstract

The concepts of adaptive management and participatory forest management (PFM) reflect an increasingly holistic relationship between society and its forests. Adaptiveness depends on learning processes. This review considers the ways in which PFM has been assessed in recent literature and focuses on the role of learning, through cross-cutting quantitative analyses, project monitoring and evaluation, and participatory research and experimentation. Such literature highlights the importance of policy, and the gap between legislation and implementation; social and institutional arrangements; appropriate silviculture and monitoring, and the participatory methods needed to develop it. Much of this is analysed at the local or national scale, but emerging discourses on forest governance highlight the need for partnership, organizational learning, and adaptiveness across a range of spatial scales and cultural perspectives. The review concludes that the common factors in adaptive PFM are context specificity, tenure and institutional security, reliable and relevant information, and learning processes, leading to adaptive technology, institutions and organisations, underpinned by close attention to ecology. This is summarized in an analysis proposing a broad evolutionary pattern from 'first generation' attention to structural factors such as tenure and formal roles and relationships, through 'second generation' concerns emerging from experience of diversity and inequity, to a more qualitative, actor-centred approach to learning and adaptation. The big challenges for PFM are adaptive technology, requiring participatory research in silviculture, sustainable harvesting and monitoring; and adaptive organizations and institutions.

Keywords: Adaptive collaborative management, Common property, Community forestry, Organizational learning, Participatory research, Policy, Silviculture, Social learning, Sustainability, Tenure

Review Methodology: Participatory forest management (PFM) is of both practical and theoretical interest, and consequently the focus of a large amount of academic and applied literature. While acknowledging earlier literature this review focuses on recent trends and draws substantially on literature published since 2000. The search for this review has included databases such as CAB Abstracts, BIDS, MIMAS, as well as Internet searches for online reports and manuals provided by reputable organizations including bilateral and multilateral donors, and non-governmental organizations (NGOs). The search snowballed to papers cited by, or citing, key publications.

The complexity of the subject requires a broad approach. As well as 'collaborative', 'participat*' and 'community', search terms included 'tenure', 'equity', 'common property' and 'institutional change'. The donor- and practitioner-oriented literature often focuses on case studies and 'lesson-learning', whereas the more academic literature usually attempts to analyse findings within social theory. The two complement each other and non-academic references are therefore included here where they summarize experience not yet accessible through the academic literature.

Some areas of experience have inevitably slipped through this wide net. The academic literature takes a keen interest in Asia, while the Americas (both North and South) and Africa may feel under-represented. Nevertheless the aim here is not so much to be comprehensive as to propose a broad underlying evolutionary trend, and identify current challenges.

To some extent PFM is an arbitrary label for the approach examined here, which includes collaborative forest management, joint forest management, community forestry, community-based natural resource management, and adaptive collaborative management. The nuances of definition are beyond the scope of this review, which can be taken to refer to any mode of forest management that involves stakeholders other than, or in addition to, foresters, and forms of knowledge other than, or in addition to, conventional forest science.

Introduction

Forests have always been attractive to both the richest and poorest sectors in society; they represent great wealth both material and non-material, as well as underpinning livelihood and environmental security. How they are managed is therefore of great interest to the planet's populations, having implications for our ecological support networks as well as our cultural and psychological health.

For the past few decades a revolution has been unfolding in society's relations with the world's forests. From South Asia to Africa, post-communist Europe to the USA, new partnerships and policies are being forged in the name of participatory, joint, collaborative or community forest management, all referred to as participatory forest management (PFM) here except in cases where one of these terms has a specific meaning (for example, joint forest management (JFM) as official policy in India). The discipline of forestry itself is changing in two ways: from a science with economic and resource conservation goals, to a pluralistic arena for environmental governance [1–6], and (sometimes separately, sometimes together with participation) a shift to adaptive management, whereby the management of a complex ecosystem is treated as a perpetual experiment [7–10].

In many cases, these arrangements are underpinned by radical changes in forest tenure. User-group rights in Nepal, indigenous territories in Bolivia, the overthrow of feudalism in Scotland and the restitution of pre-communist ownership in Romania – all contribute to real change in forest–people relations [11–14]. Early examples are documented from Korea [15] and more formally in Nepal, whose 1978 National Forestry Plan allowed land to be handed over to local users, with technical assistance provided by the forest department [16, 17]. According to recent estimates [18], 22% of all forested land in developing countries, and 11% worldwide, is under some form of community-based ownership.

These institutional changes have had real impact. In India, for example, since the policy changes of 1991 more than 10 million hectares of forest are under JFM with 35 000 village groups in India [19]. But these numbers can hide low participation and little improvement in rural livelihoods [20–22]. Changes in tenure do not in themselves constitute more ecologically sustainable management, and changes in forest science do not in themselves guarantee socially inclusive management. While these sweeping changes can be enthusiastically gathered under the banner of PFM, they do not necessarily represent the same changes going on everywhere.

This review aims to examine how and what we have learnt from experiences in PFM over the last decade. I set the context by drawing out reasons for the rise in PFM, and relating them to the concept of participation and stakeholders. I then turn to the achievements of PFM, considering first the approaches that have been taken to evaluating or studying PFM in the practitioner and

academic literature, and then focusing on the key factors that emerge from that literature. Such an approach tends to separate out factors which are in fact systemically and dynamically linked, and PFM is increasingly linked to the other conceptual shift in forestry: adaptive management. I conclude by considering the implications of the growing trend to view PFM more holistically both in time and space.

Rationales for PFM

To some extent PFM is a reaction against perceptions of imperial agendas, the predominance of state ownership, and a European worldview-based on science and rational management [3, 23, 24]. To genuinely reverse such traits can require a radical shift of government rhetoric, which in many countries has long blamed forest users, including indigenous people, for forest degradations and loss [25–27]. There are a number of theoretical motives for PFM, for example that local planners experience the consequences of their plans, and are consequently more knowledgeable, more motivated, and more responsive [28]. In fact those who instigate PFM have a number of objectives: social, ecological, cultural, economic and political. These vary according to the different actors involved, may be implicitly rather than clearly stated, and do not necessarily imply a profound change of value system.

Six broad themes can be detected from the papers reviewed here:

1. Reaction to failure of state forest management to **maintain forest in good condition**. Put bluntly, PFM can 'solve the problem of how to regenerate a forest at low cost' [19]. This motive is emphasized in India and Nepal [29] and is a common basis for state-led PFM.
2. Desire for **historical justice**, translated into legitimization of ancestral land claims as in the Philippines [30], Bolivia [31] following a period of pressure from indigenous groups; or return to forms of land tenure existing before communism [32, 33] or before colonialism [34]. In India for example, despite strong central and state government leadership on JFM, the earliest cases resulted from community-led forest takeovers [35, 36].
3. Desire for **social justice**, or **poverty alleviation** [37, 38], translated into access for the forest-dependent poor. This shift was accompanied by a change in development thinking, to focus more on rural issues and in particular energy, which underpinned the drive for social forestry typified by the woodlot and village forestry projects of the late 1970s and 1980s. Practically, it is often difficult to disentangle these from more neoliberal goals, as both often result from donor-led pressure (e.g. [13]). The social justice element is

pushed strongly by non-governmental organizations (NGOs), which have in recent years become more broadly aligned with governmental interests. This goal is often combined with the forest condition goal, as for example in the Philippines, which in the mid-1990s adopted community-based forestry ‘as the national strategy to achieve “sustainable forestry” and “social justice”’ [39]. In industrialized countries it can be translated into job creation, as in Canada [28, 40].

4. Resolution of **conflict** resulting from such injustices [41], for example in southern Africa [34]. This is a separate issue from managing conflict that arises *through* the process of PFM. Prevailing wisdom sees conflict as potentially healthy and creative, if it leads to greater mutual awareness of knowledge, needs and goals, and processes are in place to balance those [1].
5. Neoliberal and donor-driven support for structural adjustment including **decentralization** of governance, in the 1980s. In industrialized countries PFM has been perceived as the outcome of neoliberal agendas in both North America and in post-socialist donor-funded contexts [42, 43]. Indeed donors and development think-tanks have portrayed forests as valuable laboratories for new forms of governance because they are seen to typify issues of multiple stakeholders, public interest, potential for high income and dependency of the poorest [44, 45].
6. Focus for **community regeneration or consciousness-building** in cultures adrift in post-industrial deprivation or post-modern meaninglessness. Examples include analyses of community forestry in Scotland, England and the USA [42, 46–49] although in all three countries there are demonstrable rural livelihood benefits also associated with community forestry in some contexts [49–51].

As with any participatory approach, a key factor underlying these motives is power [52, 53]. They range from attempts to maintain the status quo to radical inversions of power, and can be loosely associated with top-down and bottom-up forms of participation. One trend (supporting forest condition and decentralization) is motivated by the powers at the centre, and has a real challenge in addressing the potential changes in power relations that will follow. A contrasting trend (supporting social justice, traditional identity and rights, and community consciousness) can be seen as originating *in situ* and favouring the changes in power relations that result. Somewhere in between are those motivations such as social or historical justice that appear to originate with the powers that be (state and donors) but are in response to perceived or anticipated pressure from the less fortunate.

This examination of motives illustrates one of the problems with the word ‘participatory’ which has come to mean so many things to so many people, and around which such an involved discourse has arisen [53–55]. It is important to note that the term is problematic and

politicized, and can refer to sharing of intention, action or impact. Furthermore, even ‘top-down’ forms of participation (state- or donor-led) can have radical and empowering effects on individuals and communities [55]. Without re-examining that discourse here, this paper is nevertheless informed by it and pays attention to issues of decision-making, action and outcome.

Stakeholders in PFM

Even this brief summary of motives for PFM implies the existence of many stakeholders. Much of the literature focuses on community members as stakeholders, while less attention is given to government and bureaucratic interests, and very little to donors, industry and the wider public.

The notion of a geographically and socially defined community, happily homogeneous and cooperative, is naïve [56], but a notion which nevertheless is still often implicit in community forestry policy [57, 58]. The consequences of overlooking gender, ethnic, wealth and caste differences have been scrutinized through studies of equity aspects, particularly in Nepal and India where the longer experience of PFM and the relatively strong social stratification of rural communities facilitates such inquiry. But even in industrialized, or post-industrial, countries there is a need for a ‘more nuanced perspective’ on diversity within the community [40].

Most models of PFM require a partnership between forest users and forester. The latter are often responsible for formalizing the PFM process, for example by preparing or approving a management plan [9, 59, 60]. The relationship of villagers to forest is also of great interest to local government and local administrators who, like foresters, are usually accountable to the centre not to the local forest users [61], or may even be bypassed by forest policy [62].

Moving outwards in scale, NGOs have in many cases taken the lead in PFM, before it becomes a government interest [63, 64], and donors have been strong drivers throughout the 1990s [2, 13, 65, 66] though their support is perceived to be declining [14, 20]. The state itself is often a key stakeholder, overlooked but often setting the agenda [67]. Finally, in timber-rich areas the development of PFM can be of keen interest to logging companies, but only rare or passing reference is made to them in the PFM literature (e.g. [3, 68]).

The ways in which these different stakeholders are involved affect both outcomes and the assessment of those outcomes, as discussed in the next section.

Approaches to Assessing PFM

The Many Versus The Few

In assessing the achievements of all these PFM activities, we can use various literatures, including project and

programme evaluations, individual case studies and cross-cutting meta-analyses, all of which vary in the identity and motives of the analyst, the methodology, and the intended user of the results. In the academic literature these range from large-scale post hoc meta-analyses [69, 70] to quantitative comparisons based on data collected for the purpose (e.g. [71]), collections of qualitative and contextualized individual cases [72, 73] and geographically focused reviews [74, 75]. Overviews in the donor and NGO literature tend to shun overgeneralization, and favour thematic and geographical analyses of conditions for success [11–14, 19, 24, 76, 77].

This wealth of approaches comes in for mutual criticism at times. In the view of some social researchers, 'the coherence of social science has been replaced with anecdotal pragmatism' [3]. However, what constitutes anecdotal pragmatism is a matter of subjective construction in itself. The literature is lacking in grounded, experiential accounts of personal and cultural change through PFM (with notable exceptions from the adaptive collaborative management (ACM) programme managed by the International Centre for Forest Research (CIFOR)) [72, 78].

A more common approach is the cross-cutting analysis, and this too has its successes and failures. Reductionist attempts to find the common denominator often run into difficulties [72]. An attempted meta-analysis of 69 case studies from around the world encounters methodological problems of quantification and researchers' perceptions [69]. Reassessing such approaches, a leading analyst argues that

the enterprise of generating lists of conditions under which commons are governed sustainably is a flawed and impossibly costly research task

and recommends carefully designed multiple case studies, which can be subject to statistical analysis [79], although elsewhere he also argues for research with 'greater historical depth' [80].

The difficulty underlying these debates is that success accompanies factors that can be difficult to quantify. Both approaches have value, at different scales and at different stages. What this review attempts to do is to find the underlying evolutionary patterns of PFM, and the place of different learning approaches within those.

Constructions of Success

On such a broad palette, what constitutes 'success' is highly variable. Large claims are made, for example, that PFM can 'reduce conflict, reduce costs, yield robust solutions, and lead to constituent support' [81], while others conclude that such approaches have 'frequently failed to fulfil their promise and have generated unexpected conflicts' [2].

An analysis of 200 evaluation reports from across India found that they largely focused on donor concerns [20].

Furthermore, they all focused on evaluation rather than monitoring [66], on assessing outcomes rather than processes towards those outcomes. While monitoring can be perceived as a routine management task, it has an alternative use as a powerful tool for learning and adaptation, and participatory monitoring can be a key factor contributing to success [1, 82, 83].

Other studies agree that assessments are made through eyes of outsiders rather than of the forest users themselves [84]. By the end of the 1990s, however, some donors were concerned that PFM was failing to achieve accountability, power and benefit sharing [85]. Since then there has been a wealth of studies contributing to understanding of social and institutional impacts [86–89], including a few attempts to evaluate from the forest users' perspective [83, 84].

The next section examines the findings of these evaluations and studies, bearing in mind the shifting motives and perspectives of stakeholders described above, and the scales over which those stakeholders are asking questions about PFM. This will help us to pull together the diversity of approaches, in the final section, and examine the broader patterns of development that underlie PFM. Ultimately, monitoring and evaluation becomes a part of PFM itself, not a split between donor and doer, and learning contributes directly to the adaptiveness of forest management by enabling reflection and communication among the stakeholders.

Factors Affecting the Outcomes of PFM

Policy

Changes in policy can facilitate PFM, through

- (a) changes in tenure (both ownership or access and management rights) and
- (b) arrangements for decision-making, monitoring and benefit sharing.

Governments have paid much more attention to the former [19] as the section on organizational culture indicates below. Furthermore, the efficacy of policy is challenged by two factors: the distinction between policy, legislation and implementation; and the dissonance between national policy and local or traditional resource management.

The policy-implementation gap is frequently pointed to in India [21, 90] and the Philippines [24, 39, 77], both places where exemplary policy has placed a challenge for large forestry bureaucracies. In contrast, in Thailand a draft community forestry bill has waited years for approval, but thousands of communities manage their forests in practice [91]. Elsewhere, donor-supported pilot projects have provided models in the absence of policy, for example in Pakistan and Laos [13, 92].

Simultaneously, policy has a tendency to overlook diversity, within and between countries. In some cases a wealth of different approaches to tenure, organization and decision-making models has arisen within the diverse historical and governance frameworks found within one country, for example Canada [75] and India [20]. But in other contexts, inappropriate policy copied from other countries and continents [57, 93] reflects a tendency to overlook local realities, particularly the informal rules and customs of traditional or indigenous forest management (IFM) [74, 90, 94–96]. The latter is susceptible to romantic idealization, but to date lacks analysis except for a handful of cases (e.g. [97]). To understand the contribution of IFM we must ask whether the management practices are consciously oriented around a goal of sustainability, and how they are adapting to the pressures of population, modernization and economic growth of the societies in which they are situated [98]. As discussed below, these approaches are helped by attempts to learn both within and between projects. More commonly, attempts to standardize and control participatory resource management often lead to rigid legal frameworks, which can exclude local ecologies and institutions [58, 90].

PFM policy (or lack of it) of course exists in the context of a wider policy system, which can support or undermine the intentions of PFM [62, 63]. The donor-supported move towards decentralization is a case in point. A study from Guatemala concluded that decentralized forest management can 'actually increase state power at the local level, putting at risk and even weakening successful village-level forest governance structures and local livelihoods' [99], while in Canada this approach has been critiqued as 'simply download(ing) authority and responsibilities with nothing offered but the fanfare of 'empowering communities' [28]. In fact, the success of policy lies in the local implementation, and may indeed follow a period of experimentation with local arrangements before being enshrined in national policy [12, 13].

Institutions and Organizations

In contrast to the donor focus on policy, one practitioner review concludes that forest tenure security depends on a number of conditions of which the only necessary one is the effective internal institution, i.e. where the rules are devised, monitored and enforced by a defined user group [19]. The importance of local forest institutions (formalized rules) and organizations (formalized groups) is emphasized by many authors [100–102]. In Nepal, for example, it was not until the role and structure of Forest User Groups was formally defined that community forestry really took off [16].

Community managed forests are a form of what has become known as 'common property regime'. Ostrom and co-workers [71, 73, 103–107] are pre-eminent in the study of factors influencing the successful management of

such resources. They summarize attributes of the resource, and users, that enhance the likelihood of deriving the benefits that users want from their common property resource. These relate to the quality, predictability, and accessibility of the resource that make management activities economically worthwhile, and the trust, reciprocity, autonomy and organizational experience of the users that enable them to plan, implement and defend their management [73]. In relation to the central theme of adaptiveness, it is interesting that a study comparing community-initiated with externally-initiated PFM found that social identity, organizational pride, and participation were significantly higher in the community-led version, and linked this to greater satisfaction with institutional rules and leadership [102].

These criteria have been interpreted as 'design principles' [105], but their prescriptive use can lead to a top-down approach which may stifle adaptiveness [71, 105, 106, 108]. Forests are more complex, both ecologically and socially, than the water, rangeland and fishery resources for which earlier common property models had been developed ([73], M. Arnold, personal communication, 2007).

Local Livelihood Benefits and Social Equity

Success in PFM is most often weighed in terms of the benefits for the participating communities. The evidence is mixed, and depends to a great extent on definitions of poverty and who does the measuring; few studies are based on the directly-reported perceptions of the community members themselves [109–113]. Closer attention to these issues has brought a focus on the distribution of material benefits, and since 2000 the word 'equity' has become increasingly associated with the PFM literature, together with a rapidly growing discourse on social diversity in natural resource management. The concept refers to fairness or justice, in contrast with 'equality' [114]. It has received particular attention from the academic community, because it both requires detailed collection and analysis of data and provides excellent opportunities to test social theory.

This academic literature focuses on differential access to forest, its benefits and the decision-making processes of people of different wealth, ethnicity, occupation, caste and sex. Among the less surprising findings are that women and the poor are less empowered through PFM, and that the socially, economically and educationally advantaged benefit proportionately more [88, 115]. Work in India (coining the now celebrated phrase 'participatory exclusions') shows how PFM becomes a front for reinforcing male villagers' prejudices about women's knowledge and consequently excluding them from forums for making decisions [116]. One of the mechanisms by which the powerful reinforce their advantage is through 'elite capture' where the best-connected members of a forest

user community use their preferential access to information and decision-making to exclude others by default, a process reported from places as diverse as Burkina Faso, Nepal and Canada [40, 61, 117]. This work is not susceptible to generalization however; in some (rare) cases, the poor are found to be the *least* dependent on the forest [118], or livelihood diversity among villagers is such that clear links cannot be demonstrated between social and economic status, and forest dependence or access [119].

The topic is still lacking in a comprehensive analysis of both practical and ethical implications of different cultural constructions of well-being and equity, and the connection between equity and ecological sustainability [71, 114]. While the increasingly sophisticated understanding of social diversity and dynamics is essential to successful PFM, these are areas where strong political and emotional value is attached to particular assumptions, and where closer inspection of the tension between donor-perceived moral imperative for equity, and inherent inequity of local societies (in any country) promises to be a delicate issue.

Silviculture and Forest Sustainability

Perhaps the most conspicuous absence from the PFM literature is a thorough analysis of forestry itself, the technology of intervention in a forest ecosystem to provide a reliable supply of the products and benefits required by the users [14, 120]. A 'new silviculture' [37, 121] is sorely needed in view of two factors:

1. Much PFM relies on the production of non-timber forest products (NTFPs) and grazing management, which have generally been overlooked by conventional forest science, with the result that silviculture guidelines are absent [121–123].
2. Governments are often more willing to hand over degraded forest than good quality [124]. Consequently in many countries forest user communities are challenged to manage and make productive low quality forest for which existing silvicultural guidelines are inappropriate.

In the absence of appropriate knowledge, however, foresters are likely to follow standard silvicultural practices that are inappropriate to the species most required by locals [28, 40, 90].

The knowledge gap is expressed differently by different stakeholders. A survey of perceived research needs amongst forest users, project managements and donors/consultants in PFM found that communication and extension issues were ranked as the top priority by all stakeholder groups, while silviculture was perceived as a high priority by *local* stakeholders but not by international respondents [125]. This disparity is supported by some foresters' assumptions that 'users have little prior

knowledge of forest management and need to be taught modern silviculture' [60], or that 'local people cannot acquire the skills and technical knowledge to manage the forest' [61]. In the context of the new 'adaptive management' paradigm, sustainability is in any case recognized as a moving goal that requires constant monitoring and adjustment of management practices [9].

So PFM creates both new needs and new sources of knowledge relevant to management, and adaptive management requires innovation rather than rigid rules. Both imply the need for participatory monitoring and experimentation in PFM, and the need for data in credible (relevant, reliable and usable) forms [126]. Experiences with participatory technology development show that forest users both want and can use silvicultural research skills, and that the solutions may not be 'modern silviculture' but something more situated in social and ecological context combining local and more standardized knowledge [126–128]. Progress has been made with participatory monitoring, an important step in understanding the resource and the impact of harvesting [84, 129–131], although forest users may need continued external support if such activities are to be sustainable [132]. Methods still need to be based on much more reliable and rigorously collected data, and appropriate knowledge still needs to be developed experimentally [123, 128, 133–143].

Markets

Market access by communities was highlighted as early as 1993 as 'an ignored dimension of community forestry' [144]. Donors and international NGOs often see market access and certification as the path to democracy [145, 146], while others express concern about subsistence needs and the dangers of overharvesting [147–150]. The subject of markets and PFM is complicated by political ideology and clandestine/sub-legal activities that obscure evaluation and participatory monitoring [38] and would benefit from a systematic study of its own.

Access to timber markets is increasing and significant in some contexts, particularly those with longer experience in PFM [141, 151]. In a few countries timber is the main product of community forests and Mexico is notable for the emergence of Community Forest Enterprises that may provide models elsewhere [152, 153]. Commodification of NTFPs is also prominent in the literature [123, 154, 155] although an overemphasis can lead to overharvesting [135]. However, income generation through PFM has not met expectations. Reviews cite poor access to market information, inefficient production and marketing, high transaction costs and poor stocking of forests transferred to participatory management [20, 37, 38, 149, 156].

The situation is complex and changing faster than other aspects of PFM: new markets are opening in forest

management and some perceive potential rewards for PFM in payments for ecosystem services and carbon sequestration [37]. Even within one country, huge variations can be found in market use and access. In Romania some communities derive only firewood and mushrooms, while others receive the equivalent of 25–33% of their annual income from timber sales [157]. Forest certification has held out promise for more sustainable forest management, and has been tried in PFM contexts particularly in South America [158]. There are substantial costs involved however for the producer, and the process has proved more difficult than anticipated [159–162].

Organizational Culture

Much of the focus of this review so far has been on behaviour and change at the scale of forest user communities, a focus which reflects the bulk of the PFM literature. A fascinating area merits far more attention than it receives, that of the values and goals of foresters and their institutional culture and behaviour in the context of a shift to PFM [24, 67, 157]. This culture has a profound influence on PFM, being often strongly traditional, bureaucratic, hierarchical and inflexible [163–165], and valuing rational scientific principles of timber management [39, 157]. These attitudes are not exclusive to developing or post-socialist countries. A study from Canada found district staff unwilling to accept community forestry [28]. Another from the USA found a significant proportion of stakeholders taking the view that 'the Forest Service, the collaborative process, and other stakeholders are not to be trusted' or simply that the way to forest management is through science not participation [166].

It sometimes seems that foresters are the dinosaurs in the story. However studies from Asia, Africa and Europe point out that foresters are often located in under-funded state departments [165], and perceive PFM as a threat both to their job security and to the forest itself [61, 157, 167–170]. Officials are being asked to behave in participatory ways that they do not experience within their own organizations [171], and it is these internal transformations that are needed to make PFM work beyond isolated success stories [4, 172]. They also need training in social skills and extension methods that are still largely lacking from the education of forest officers [125, 173].

Experience of a more open and participatory organization will in turn enable foresters to work with more stakeholders, increase mutual support and manage conflict [81, 167, 174]. Recent privatization of forest technical services in some countries may change many of these factors, including training, transparency and responsiveness [157, 175].

Approaches to organizational learning that can have a role in more conscious change include the recent emphasis in donor and practitioner literature on

networks [24, 176–178] and 'writeshops' organized by the Regional Centre for Training in Community Forestry, to help practitioners analyse experience and present it in written format for sharing (e.g. [114]).

Governance and Conflict Management

For PFM to work on an efficient scale, the stakeholders need to work together in making and carrying out decisions. The understanding of such processes and relationships is increasing through the literature on 'forest governance', a term growing in use since 1999 [104, 179]. PFM has particular challenges, in the 'reconciliation of multiple and sometimes conflicting interests, as well as careful blending of formal and informal institutions on diverse social scales' [172].

Here we return to a more academic and socially theorized body of literature, which emphasizes interests, micro- and macro-level institutions, power relations, and uncertainties; and suggests that it is counter-productive to view all of this as a static or predefined situation which will only work in one way. Instead, it recognizes the role of historical change, dynamic processes and adaptation [2, 58, 175, 180].

This process will both create and emerge from conflict, a situation that can prove alarming to those rooted in conventional forest management roles based on planning and control of outcomes. Foresters cannot be expected to manage this alone, and acceptance of conflict as inherent is needed throughout the governance system [181] in ways that are themselves culturally dependent [182].

However, there is an underlying source of conflict which is not usually addressed consciously, because of the discourse of 'empowerment' in PFM [183] and the assumption that if forest users are to gain power, foresters must lose power [167–170]. To address this we need to look at PFM from within the new paradigm of interactive and adaptive governance, as a socio-ecological system [10, 184]. From this perspective, power refers not so much to the structural differences between actors, but to the agency of each actor in relating consciously to his or her environment [55].

The Adaptive Paradigm

In a much-cited paper, Berkes identifies a conceptual shift toward understanding ecosystems as complex adaptive systems in which humans are an integral part, and highlights three emerging themes: a systems view; the inclusion of humans in the ecosystem; and participatory approaches to ecosystem management [185]. PFM epitomizes this. In the language of social researchers, it is applied in 'settings that are more socially, institutionally and ecologically differentiated and dynamic than is often

assumed'. For foresters, it has developed through the language of 'adaptive management' [7, 9, 186–188] and more recently the phrase 'adaptive collaborative management' (ACM) promoted through CIFOR's multi-country research programme [78, 189].

All this might lead a planner or practitioner to question how the multitude of factors can be arranged to ensure success. One approach proposes that intervention is at best a waste of resources, that it is better to participate consciously and conscientiously *within* the system than to attempt to control it from *without* and concludes that 'policy should take a passive role (which) should be to protect the conditions for emergence (of ACM), or to remove barriers to emergence' [190]. This is a radical suggestion but fits well with the experience reviewed above, if we are able to identify those barriers and understand the conditions for emergence.

'Successful CFM must be "home grown"' [14]. 'The present "one size fits all" approach of community forest handover policy in Nepal needs rethinking to accommodate biophysical and socioeconomic variations across the country' [65]. One case after another finds that different policies and technologies work in different areas even within one country [24, 75, 90, 117], paralleled by the failure of 'blue-print regulatory enforcement' [24] that characterizes conventional forestry.

But this inability to generalise seems to leave participants in a vacuum. Without rules or even clear guidance, how are communities and bureaucracies to proceed? All the evidence examined here suggests that the first priority is to establish some security: confidence in tenure systems that allow forest users to benefit from management efforts, and mutually respectful partnerships with technical and organizational support. This security can then provide the experiential conditions for forest user communities to build organizations and institutions, and test out silvicultural options.

Adaptive institutions and partnerships depend on reflexivity, or reflection on experience and response to that reflection. This approach goes by many names in relation to PFM: 'social learning' [1, 191, 192]; 'learning-by-doing' [3, 193]; 'collaborative learning' [142] and 'participatory action research' [194], in countries ranging from the UK to Brazil and Madagascar.

While differing in detail of definition and application these terms refer to a challenging process which deliberately attempts to bring out and share assumptions, tacit knowledge and experience. It benefits from skilled facilitation to help participants recognize their own subjective experiences, and to achieve a balance between reflection and action [24]. Even where learning is not deliberately facilitated, experience over time of the benefits (funds, community development and forest improvement) can change attitudes towards community forestry and levels of participation in it [151]. A project in Nepal found that participatory monitoring is more conceptually challenging than is usually recognized, being an unfamiliar and

potentially threatening concept to villagers. After experimenting with it, however, forest users found that it helped to make their values and knowledge explicit, precipitated proposals for silvicultural experimentation and social inquiry into the diversity of users' needs, and provoked questioning of forest management decisions and benefit sharing among community forest users, leading in turn to more democratic forest management [84].

This language of adaptiveness and learning implies change. This change is not random or chaotic; on the contrary there is a broad evolutionary trend detectable throughout the cases reviewed here. In the next section I examine the underlying pattern of change as a way of understanding how the parts and stages fit together. This helps us to answer the question of intervention, by seeing how the thinking and actions behind each stage move from a structural and controlling philosophy to an experiential, dynamic one.

Three Generations and Beyond

The attention paid to socio-economic issues above (gender, power and equity) reflects growing experience with PFM. In the donor and practitioner literature (although not apparently in the academic literature) these are often termed 'second generation' issues [14, 19, 37]. This terminology invites speculation about the nature of (undefined) '**first generation** issues'. We can infer these to be the basic groundwork, particularly with attention to tenure, protection and regulation, and the preparation of a management plan. At this stage the socio-ecological system is assumed to be unproblematic and a cognitive rational approach is used to address its management.

In the **second generation**, social aspects of diversity begin to make themselves known and aspects of the socio-ecological system are seen to be socially constructed. As well as the strong focus on equitable decision-making and benefit-sharing, this stage may include concerns about moving beyond subsistence to managing for commercial products; building organizations and partnerships, e.g. between communities and foresters, and conflict resolution.

Under this analysis, a '**third generation**' might be construed as the complex adaptive systemic view. The socio-ecological system is unknowable in its entirety, but instead dynamic and participatory. Furthermore, it is only after passing through these earlier generations that communities, their members and their partners are able to address sustainability through the participatory research and monitoring which underpins adaptive management. A more instrumentalist way of phrasing this recognizes that PFM 'is a knowledge-intensive process, and as communities move from the allocation to the exploitation stage, the technical demands increase.' [195]. But the production and application of appropriate knowledge is part of adaptiveness. Appropriate

management decisions need information that can be understood by the forest managers and is relevant to them in their context. They also require an institutional response – the information has to be interpreted and applied, transformed into plans, rules and actions, and its effect again monitored [126].

Conclusions

This review of hundreds of cases of PFM shows that it can and does make real improvements to rural livelihoods, governance and forest condition. None of those can be guaranteed, however, by predetermined conditions. PFM requires context specificity; security; information; reflexivity; adaptive technology; adaptive institutions and partnership; and underpinning all of these, close attention to ecology.

Policy context, including tenure security and a supportive administration, is essential if PFM is to work beyond isolated cases. Defined user groups and institutions are also needed, as is accurate information about the forest and its products. But over and above all of these, there is a need for a more interconnected and interactive approach, which links social, cultural and political factors with the ecology of the system, and is able to respond to changes in that ecology. This more holistic approach recognizes the complexity of the socio-ecological system, and contains adaptive organizations and partnerships. In order to support this, stakeholders also need relevant and reliable knowledge, the ability to test out that knowledge and to act on it.

This implies a focus on learning. While there is clearly much scope for learning mechanisms to be enhanced within individual projects, how can a review of experience help? One approach is the large meta-analysis of case studies, which has value in indicating factors that *might* make a difference, but suffers from reductionism and decontextualization. Although solutions cannot be designed in a failsafe way, this approach is most helpful in the early stages of PFM. It tells us that tenure and reliable working roles and relationships are essential. At later stages, there is no replacement for contextualized reflection on, and sharing of, experience. While a significant part of the literature reports that this does happen, those reflections are not themselves often published, and so it is difficult for others to benefit from them. Furthermore, networking among communities, NGOs and forestry professionals takes place below the radar of formal publication.

PFM is not static. The evolutionary path follows a trend from reductionist to systemic, from simple to complex and from planned to adaptive. On the way it passes through what can be termed the 'first generation' of structural factors, establishment of rights, roles and plans; the 'second generation' of concerns about diversity, social equity and organization; and later generations concerned

with learning, silvicultural experimentation and adaptive management, towards the eternally elusive goal of sustainable systemic and adaptive relations between humans and our environment. It is ironic, but borne out by the experience reviewed here, that ecological sustainability underpins other facets of sustainability, but humans are only able to turn their attention to this core aspect once they have sorted out their security, organizations and relationships.

This evolution presents clear indications for those wanting to help the process along. Too much flexibility and openness at the early stages undermines confidence in getting started; too much control towards the later stages inhibits the dynamic move towards a balanced, knowledge-rich relationship between people and forests. These later stages are as yet rare, and most examples exhibit the need to find structure and processes for socially acceptable decision-making. Even rarer is attention to the kind of organizational change that is needed to support PFM. These are the big challenges of PFM: adaptive technology (silviculture, harvesting and monitoring); and adaptive organizations and institutions.

Acknowledgements

I am especially grateful to Mike Arnold for a thorough and helpful review of an earlier version of this paper. My thanks to Bill Buffum and John Parkins for comments and to Margot Lyne for help with searching bibliographic databases.

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