Collaboration for Environmental Evidence

Systematic Review No. 48

The Evidence Base for Community Forest Management as a Mechanism for Supplying Global Environmental Benefits and Improving Local Welfare

Review Summary

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Cover Sheet

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Summary

Background

Rates of deforestation and forest degradation are high in many countries, leading to concern about the loss of ecosystem services such as carbon storage, biodiversity conservation, water and food security. Sustainable forest management (SFM) aims to "*maintain and enhance the economic, social and environmental values of forests for the benefit of present and future generations*". In pursuit of SFM, many developing nations have devolved full or partial forest management authority to local communities. This devolution is expected to result in more effective forest management, conserving biodiversity while also contributing to poverty reduction and economic development. Approaches to such community forest management (CFM) have in common the involvement of people who live in and around the forest in the management decisions that affect forest use and conservation. In the context of this review, we define community forest management as '*de-jure*' government-approved forms of forest management by local communities, with the following characteristics: 1. a core objective of providing local communities with social and economic benefits whilst promoting the sustainable management of community- or state-owned forests and/or 2. some degree of control and decision-making power vested in the community by the government (or other designated authority). The evidence base for effectiveness of CFM approaches is not well documented. This review characterizes the empirical evidence that CFM can generate global as well as local and regional/national environmental benefits.

Objectives

The primary review question is 'Does Community Forest Management supply global environmental and local welfare benefits in less developed countries?'

Methods

Multiple electronic databases, internet engines, and the websites of specialist organisations were searched to identify published and unpublished literature relevant to the review question. A range of keywords in English, Spanish and French were used. Bibliography checks were performed to complement the main search.

Predefined inclusion criteria were applied to each article in order to identify the subset to be included in the review:

Relevant subject(s): Any forest ecosystem or human population associated with a CFM programme in less developed countries.

Types of intervention: CFM programmes in less developed countries.

Types of outcome: a. changes to: biodiversity (surrogate measures of), forest cover or forest condition, fuel wood availability, carbon sequestration (any measure), land degradation or conversion, forest loss, desertification, forest productivity (wood and non-wood), water supply; b. changes in the following local welfare indicators: income, employment, food security, social equity, income equality, health.

Types of study: Studies providing empirical data, qualitative or quantitative. Only those studies making explicit comparisons between CFM and 'no CFM' were included in the analysis.

Relevant articles were grouped by outcome into three pools: those examining the impact of community forest management on forest cover and condition; resource extraction; and livelihoods. Information on methodology, study characteristics and results were extracted from each study and recorded. Due to the diversity of studies, meta-analysis was not appropriate for the majority of outcome types: this was therefore conducted on a subset of studies when possible, and a qualitative synthesis conducted for those remaining.

Main results

In total, 42 articles were included in the review, of which 34 reported data on forest condition or cover, eight on resource extraction (fuelwood collection and number of cut stems) and 13 on livelihoods.

Four studies that compared percentage forest cover before and after CFM, obtained with satellite data, show a range of effect sizes (including one negative). Three studies that compared percentage cover with a similar area of forest under alternative management suggest only moderate differences in forest cover between the different management systems.

More data were available on measures of forest condition (tree stem density, basal area, tree/plant diversity or richness) and these were synthesized in a meta-analysis. Based on data from eight studies, basal area and tree stem density were greater in forests, which in some cases included plantations, with CFM than those under either state management or no management. However, there was no consistent effect of CFM on species richness (seven articles) or diversity (five articles) compared with other types of management. There were insufficient data to investigate the relative effects of different types of management.

Meta-analysis of data from four studies indicated that incidence of cut stems was lower in forests with CFM but this trend was not consistent across studies. Only three articles presented data on fuelwood collection and two of these suggested greater collection amounts with CFM.

Articles investigating the impact on livelihoods were variable in the type of data they collected and presented, which prevented quantitative synthesis. Data types were grouped into financial capital (sources and levels of income), social, human, physical and political capital.

Conclusions

The available evidence suggests that some benefits of CFM might be achieved in terms of forest condition. This could potentially indicate a global benefit through an increase in carbon sequestration. However, the reliability of the measured variables as robust indicators of broader aspects of forest condition needs to be verified. Other causes of the reported increases in variables such as tree density and basal area cannot be ruled out, such as differences in forest condition between sites that are selected, or

not selected, for CFM. Most studies do not collect the necessary baseline data or other relevant information to be able to investigate this potential selection bias. There is no evidence of benefit to biodiversity conservation based on analysis of data on plant species richness or diversity. However, these findings should be considered in the context of the timescales of measurement, specifically how long the management had been in place before measurements were taken, and timescales over which these biological variables could be expected to respond. Various 'livelihood outcomes' have been measured. However, there is insufficient evidence to conclude what effect CFM has on local livelihoods, which is in part due to the absence of consensual indicators of CFM success in improving livelihoods.

Within the *a-priori* defined limits of this review, synthesis and interpretation of data from the current evidence base is hampered by the methodological design and diverse outcomes used to measure the effects of CFM. Whilst one must be aware of the difficulties of conducting high quality studies, a minimum quality of study design, which will contribute useful data to inform the evaluation of CFM initiatives, whilst also being realistically feasible, should be provided for guidance to practitioners and proponents of CFM projects. Standard outcome measures that are recognised indicators of the success of a particular management should be agreed so that they are common across projects. This would allow quantitative synthesis of data to make more general inferences of the effects of CFM rather than just accumulating disconnected case studies of specific sites. Higher standards of reporting within articles on study context, and other factors that may explain differences between CFM and non-CFM sites are essential to attempt any meaningful analysis of the effect of CFM and investigation of factors driving variation in effectiveness of CFM among different sites. If research is better integrated into CFM project activities this should result in higher quality evidence about the actual direct effects of the project interventions.