

**The Costs and Benefits of Forest Protected Areas for Local
Livelihoods: a review of the current literature**

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Prepared by

Lauren Coad, Alison Campbell, Lera Miles and Katherine Humphries



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Abstract

Protected areas could play a significant role in the implementation of schemes to reduce emissions from deforestation and degradation (REDD) in developing countries, through either the strengthening of the existing protected area network, or designation of new areas. Many rural poor people rely on forest resources, and may experience positive or negative changes to their livelihoods as a result of REDD. This review aims to assess the livelihood implications of the existing protected area network in order to inform future REDD policy.

The costs and benefits of individual protected areas for community livelihoods have been well documented. Costs can range from displacement of local communities to crop damage by wildlife, and sometimes include restricted access to resources and changes in land tenure. Benefits can include direct revenue from environmental protection, and the maintenance of ecosystem services such as watershed protection. The nature of these costs and benefits depends largely upon the protected area's status and governance, as well as its history of use.

The net livelihood impacts of protected areas are less easy to discern, as there is a lack of standardised assessment methodologies. The effect on livelihoods of differing governance types within and between IUCN protected area management categories is rarely assessed in the literature, and requires further research. However, general patterns can be observed. The livelihood impacts of protected areas vary with protected area status, management strategies and community involvement in governance. Strictly protected areas with top-down management structures (generally associated with IUCN management categories I-II) can result in major livelihood costs and cause conflict between local communities and protected area management. Community management schemes, and protected area management allowing sustainable use of forest resources (more often associated with IUCN management categories V-VI), can provide tangible benefits. However, significant costs can still be incurred by communities if management and institutional capacity is lacking, and issues of governance and tenure are not resolved.

Inequitable distribution of livelihood costs and benefits is an obvious problem that is often yet to be adequately addressed in protected area management. These issues need careful consideration as REDD policy develops. An analysis of livelihood costs and benefits in existing forest carbon markets has identified issues similar to those for protected areas; including lack of established tenure and the inequitable distribution of resources, particularly affecting the landless members of society. Involving local communities in the planning and implementation of REDD, and ensuring that financial or other benefits are shared, is likely to result in a more sustainable solution to deforestation than are less participative strategies.

1. Introduction

The effectiveness of protected areas has long been discussed in terms of their ability to reduce deforestation and conserve biodiversity. It is only relatively recently that the social impacts of such conservation measures have come under scrutiny. The establishment of forested protected areas can place restrictions on the use of resources within large areas of forest that had been freely available to local and indigenous communities. Whilst these areas provide important ecosystem services at the global, national and local scale (Table 1), there is concern that the costs are mostly incurred by the local people who rely on forest resources for their livelihoods.

Table 1: The ecosystem services provided by forests (Millennium Ecosystem Assessment, 2005)

Provisioning	Supporting	Regulating	Cultural
Food	Nutrient cycling	Climate regulation	Aesthetic
Fresh Water	Soil formation	Flood regulation	Spiritual
Fuelwood and fibre	Primary production	Disease regulation	Educational
		Water purification	Recreational

It has been suggested that carefully managed protected areas could help to alleviate poverty; conserving biological resources whilst providing developmental benefits to marginalised communities (WWF, in press). However, it has also been suggested that protecting areas of forest can increase poverty and marginalisation, resulting in lost livelihoods and dislocation of communities (Pimbert & Pretty, 1995), raising ethical moral, and practical questions regarding protected area management (Kaimowitz, 2003; Salafsky & Wollenberg, 2000). One ethical position is that as a minimum, protected areas should be managed such that their creation 'does no harm' to those living within and around them.

In the context of the targets to extend the protected area network, set by the Convention on Biological Diversity (CBD), and of the current discussions on reduced emissions from deforestation and degradation (REDD) in developing countries as a climate change mitigation option, the potential positive and negative impacts on livelihoods and poverty take on added importance. This paper reviews the current state of knowledge on the impact of protected area management on local communities with the aim of informing future protected area and REDD policy.

2. Forest resources and local livelihoods

2.1. Definitions of poverty and livelihoods

Whilst natural resource management decisions are increasingly discussed in relation to poverty and livelihoods, the definitions of these terms are not always clearly stated. 'Livelihoods' represent the means of living, and 'poverty' is typically an outcome-based measure of livelihood performance (Sunderlin *et al.*, 2005). Traditionally, poverty has often been measured in terms of absolute income, with a common indicator defining the 'poor' as those who earn less than US\$1 per day (Angelsen & Wunder, 2003). The Human Development Index (HDI), developed by the United Nations Development Programme (UNDP), also includes health and education parameters. There are now various poverty assessment frameworks, which like the HDI recognise that poverty is not a matter of income alone. These tend to incorporate natural, human, social and physical capital, using indicators ranging from income, access to resources and basic infrastructure, to the vulnerability of populations to shock, and level of community organisation.

The Organisation for Economic Co-operation and Development (OECD, 2001) and World Health Organisation (WHO, 1997) have developed similar indicators. UNEP has taken this concept even further to identify indicators of 'well being' (UNEP, 2004), incorporating traditional, cultural and spiritual practices and the ability to make decisions on the sustainable management of resources. It has also been suggested that political capital should be added to the framework (Baumann, 2002), stressing the relevance of governance to livelihood and poverty issues. The widely accepted 'asset-based indicators of poverty' include measures for each type of capital (Table 2).

Table 2: Asset-based indicators of poverty (adapted from the sustainable livelihoods framework reported in Dubois, 2002)

Natural capital:	Land, forests, water, wildlife
Physical capital:	(a) privately-owned assets (e.g. farm, animals) (b) publicly-owned economic infrastructure (e.g. roads) (c) social infrastructure (e.g. schools, hospitals).
Financial capital:	Cash (income and savings) and readily convertible liquid capital.
Human capital:	Health, nutritional levels, education
Social capital:	Social relationships, cultural/spiritual
Political capital:	Empowerment, access rights and tenure, governance

The term 'livelihood' often refers to the access of individuals to these various types of capital, opportunities and services (Ellis, 2000), but has also been defined as comprising the capabilities, assets and activities required for a means of living (Carney, 1998; Sunderlin *et al.*, 2005). Livelihoods can be improved, for example, if natural capital is managed sustainably, and vulnerability to changes in the environment or market is lowered (Kaimowitz, 2003).

All these factors are considered in the following investigation of the social and economic impacts of protected areas under different forms of management and governance.

2.2. Forests and poverty

'Forest' is also defined differently by different actors. The Food and Agriculture Organization of the United Nations (FAO) considers forest to be land with a tree canopy cover of more than 10%, which has a larger area than 0.5 ha and is not specifically under a non-forest land use (FAO, 2001). Moreover, it includes clear-felled land that is destined for re-planting. Other classification systems have used higher canopy cover thresholds, for example defining coverage of 10-30% as 'sparse trees and parkland' (UNEP-WCMC, 2000). In reporting to the UN Framework Convention on Climate Change (UNFCCC), countries use their own national forest classification system within the thresholds set by guidance from the Intergovernmental Panel on Climate Change (IPCC) (Penman *et al.*, 2003). This is the guidance agreed by the UNFCCC for use in the 'demonstration' (pilot) phase of REDD.

Forests can be simultaneously recognised as a 'poverty trap' and a 'safety net' for the rural dwellers who use their resources (Angelsen & Wunder, 2003). There is a distinction to be made here between poverty reduction and mitigation, often bundled together as 'poverty alleviation'. Poverty reduction refers to a successful improvement of livelihoods, whereas poverty mitigation refers to prevention of increased deprivation (Sunderlin *et al.*, 2003).

Table 3: Forest resource use and livelihood benefits. Adapted from Kaimowitz (2003)

Forest Resource	Livelihood benefits	User groups
<i>Direct use</i>		
Timber	Direct consumption (subsistence*):	Indigenous peoples and forest communities
NTFPs: fuelwood, resins, fibre, bushmeat, fish, fodder, berries, roots, medicines	Construction, food, medicine, fuel Income source (commercial): Large forest industry employment	Rural poor on forest margins Smallholder farmers
Source of new agricultural land (slash/burn/swidden cultivation)	Employment and income from small scale informal forestry markets (can be seasonal and supplementary) Inputs for non-forest income generating activities Indirect benefits: Third party involvement – improved infrastructure, health benefit, skill development	Artisans and employees of small or large scale forestry
<i>Indirect use</i>		
Capital asset: Opportunity to alter land use for financial gain/subsistence needs	Diversified resource/asset base Security	Indigenous peoples and forest communities Rural poor on forest margins
Watershed protection (e.g. reduced soil erosion)	Improved agricultural, fisheries productivity. Adaptation to climate change. Improved water quality	Smallholder farmers
Carbon storage	Reduced climate change impacts**	
Existence	Cultural/spiritual values Religious values Ecotourism	

* Economies are increasingly cash based, so that 'subsistence' often involves some cash element.

**Whilst 'climate change mitigation' can also be construed as a global benefit, the 'safety net' function of forests is likely to become more important to local communities as agriculture in some climate zones becomes marginalised. Forest retention may therefore be viewed also as a means of adaptation to the impacts of climate change, such as an increasing uncertainty in agricultural yields, on the rural poor.

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In providing a diversified income stream and resource base that can be relied upon in times of stress, forests can contribute to poverty reduction. However, an abundance of natural resources has long been associated with limited economic growth and development, with marginalised communities having little access to markets or other income streams, and often suffering growing restrictions on the use of their natural capital. Whilst the potential for forests to contribute to poverty reduction is often doubted (Angelsen & Wunder, 2003; USAID, 2006), forest resources have traditionally supported the subsistence of indigenous peoples. Forests can also contribute to well-being through ecosystem services such as flood and erosion control. Finally, where there is local control over forests, the option remains to clear them for other uses, such as farmland (Anderson *et al.*, 2006).

2.3. Livelihoods and forest resource use

It is estimated that 90% of the world's poor depend on forests for at least a portion of their income (World Bank, 2000; Scherl *et al.*, 2004; USAID, 2006). In Africa, 600 million people have been estimated to rely on forests and woodlands for their livelihoods (Anderson *et al.*, 2006), and in India, 50 million people are estimated to directly depend on forests for subsistence alone. Kaimowitz (2003) reviews the importance of forest resources to local communities. The benefits derived from forests are outlined in Table 3.

The users of forest products include forest dwellers, nearby farmers, commercial users (including small traders, producers and employees) and the urban poor. Timber, non-timber forest products (NTFPs) and animal protein are all used by the rural poor for subsistence, and also as a source of income and employment (Angelsen & Wunder, 2003). Depending on circumstances, forest products may offer both a 'daily net' and a 'safety net'. The 'daily net' describes everyday use, with products meeting current household needs, offering a reliable source of income to purchase agricultural inputs (Shackleton & Shackleton, 2004), or fodder for livestock herds. A 'safety net' comes into play when other sources of household income (e.g. plantations) fail to meet dietary shortfalls, or whenever a quick cash option is required (McSweeney, 2003). In Brazil, for example, the sale of one palm species supports over two million people and is most important during agricultural difficulties (WWF, unpublished).

NTFPs are a key resource for many poor communities (Sunderlin *et al.*, 2005). In West Africa, for example, bushmeat provides 25% of protein requirements, and can be the principal source for some indigenous groups (Bennett, 2000). NTFPs are often open-access resources, and require little processing or the use of low cost (often traditional) techniques. An overview of case studies indicates that forest products contribute between 20% and 40% of total household income in forest areas, and that poor households tend to be disproportionately dependent on forest resources (especially fuel wood and fodder) (Vedeld *et al.*, 2007). Based on this type of finding, investment in NTFP use has often been proposed as a method of poverty alleviation (Brown & Williams, 2003). Although NTFP sales often supplement income, it has been suggested that the same open-access characteristics that make them

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