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Developing markets for forest environmental services: an opportunity for promoting equity while securing efficiency?

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Market-based approaches to environmental management are all the rage. Claims that market mechanisms can encourage environmental protection and promote greater economic efficiency while saving taxpayers' money are tantalizing. In the forestry sector, policy makers are widely heeding this advice and shrinking command-and-control systems in favour of incentive mechanisms that seek to align private enthusiasm with the public good. In some cases, governments are even promoting the creation of markets where none existed before. In others, markets are evolving of their own accord. In such times of change, it is difficult to stand back and take stock. Yet, it is during such times that guidance is most needed. In the rush to introduce market-based solutions to environmental problems, a particular concern is how markets are impacting on the poor.

In this paper an effort is made to draw on a recent review of markets for four forest environmental services (biodiversity conservation, carbon sequestration, watershed protection and landscape beauty) to draw out preliminary insights into how markets are performing with respect to their impacts on the poor. The evidence suggests a need for caution. While the potential benefits are significant, the poor face an uphill battle in realizing them. Key constraints facing the poor include a lack of property rights over forest resources and their environmental services; inadequate skills and education; poor market information; lack of market contacts; inadequate communication infrastructure; inappropriate contract design; and lack of access to financial resources. To tackle these, four potential ways forward are highlighted:

- (1) assign property rights to forest assets and their related environmental services in ways that respect customary arrangements and poor people's tenure;
- (2) strengthen capacity for market participation, e.g. through training and education;
- (3) invest in the provision of market information, advice and, essentially, a contact point for buyers and sellers, perhaps through the establishment of a 'market support centre'; and

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- (4) improve access to finance so that poor individuals can make necessary up-front investments in market participation.

Keywords: market creation; market-based approaches; institutional development; poverty alleviation; equity; environmental services

1. Setting the scene

In May 2001, Sustainable Forestry Management Ltd, a London-based private-investment fund, purchased 48 000 t of carbon dioxide from native American Confederated Salish and Kootenai tribes generated through the reforestation of 100 ha of their Montana reservation. In 1999, Botanical Garden Trading Company Ltd, a start-up company aiming to compete for worldwide flower delivery, offered to return 2.5% of its turnover to conservation initiatives in biodiversity 'hotspots' of horticultural interest and to pay for access to these areas. In the Philippines, the Makiling Forest Reserve is negotiating with major local water users for the implementation of a watershed protection and conservation fee to pay for watershed services received.

All over the world, similar stories of path-breaking deals involving payments for forest environmental services are emerging. Free-market economists are quick to point to such stories as evidence that markets can offer effective solutions to environmental problems. Cash-strapped governments looking for innovative mechanisms for transferring responsibilities for forest protection to the private sector are increasingly interested in what markets have to offer.

Yet, despite spreading enthusiasm, there is a surprising lack of knowledge as to why such markets are emerging where none existed before, the process through which they evolve and whether markets are always desirable. For governments charged with ensuring equity as well as economic efficiency and environmental sustainability, a critical question that needs to be asked is how the rise of markets for environmental services impacts on the poor? Do markets for environmental services involve equity trade-offs? Or can markets be crafted to promote poverty reduction as well as improved efficiency in environmental service provision?

In this paper, an effort is made to draw on a recent review of markets for forest environmental services undertaken by the International Institute for Environment and Development (IIED) in 2000/2001 to explore the specific question of what markets might mean for the poor. The aim is not to be negative about what markets have to offer, but to heighten awareness of possible trade-offs and the need for greater attention to how markets may be shaped to maximize efficiency and equity gains. The paper ends with some preliminary thoughts on how governments might begin to level the playing field and increase market benefits for the poor.

2. Commercializing forest environmental services: a diversity of experience

Forests provide an array of environmental services. The critical role of trees in soaking up carbon and helping to reduce the build-up of greenhouse gases in the Earth's atmosphere is well recorded and a major focus of this issue. Forest ecosystems are also widely recognized as harbouring a significant share of the world's biodiversity, critical for maintaining ecosystem balance, evolutionary processes and natural

resilience to shocks. At the local level, forests are credited with maintaining a wide range of watershed services, from soil-erosion control, stream-flow regulation to flood prevention and the maintenance of aquatic productivity. From a distance forests are appreciated by millions of people for what they add to landscape beauty.

While forest environmental services are important, and often essential, to human welfare, they tend to be undervalued. This is because they often fall outside the market system and have no price. Consequently, 'producers' of forest environmental services rarely get paid, and 'consumers' are rarely asked to pay. The result is underinvestment in forest protection. Governments have traditionally responded to the problem of 'missing markets' for environmental services by taking responsibility for the provision of these services, often through public ownership of forests.

Recently, however, there has been growing evidence that in the right conditions consumers of environmental services are willing to pay for the benefits they experience. Several factors have conspired to make payments more feasible. Increased awareness amongst consumers of the economic importance of environmental services as well as a growing awareness of threats to supply have been critical drivers. At the same time, improved methods for monitoring the status, impact and consumption of environmental services has made it possible to link payments to consumption and reduced the costs of controlling non-payment and 'free-riding'.

While evidence that markets for environmental services are gaining ground is widespread, understanding of these markets is hazy. To gain a clearer idea of the types of markets that are emerging, IIED undertook a global review of markets for four forest environmental services—biodiversity protection, carbon sequestration, watershed protection and landscape beauty—between February 2000 and July 2001 (Landell-Mills & Porras 2002). A total of 287 cases were reviewed from a range of developed and developing countries. In what follows some of the broad insights of this review are highlighted.

(a) *Markets are diverse phenomena*

Apart from emphasizing the considerable number of initiatives underway around the world, the review offers critical insights into the variety of experience. Markets differ not just in terms of the commodities being bought and sold (and these differ even for the same environmental service; see table 1), but they differ with respect to the character of their participants, geographical extent, payment mechanism employed, drivers, maturity, the process through which they evolve and their impacts. The sheer diversity of experiences makes any attempt to generalize extremely difficult and simple arguments in favour of markets for forest environmental services are misleading. The challenge is to identify the market structure that is optimal for a given situation.

(b) *Markets are intertwined in broader institutional landscapes*

In addition to highlighting the considerable diversity between different market forms, the review points to the fallacy of simplistic debates around whether regulatory or market approaches are more desirable when dealing with forest environmental problems. Markets do not evolve in a void, but are intimately tied up with the regulatory environment in which they exist. Far from being competing arrangements, markets and regulatory approaches are often mutually reinforcing. In many instances,

Table 1. *Commercializing forest environmental services*
(source: Landell-Mills & Porras (2002))

environmental service	commodity
watershed protection (e.g. reduced flooding, increased dry-season flows, improved water quality, maintained aquatic habitat, soil-contaminant control, reduced downstream sedimentation)	watershed management contracts, water-quality credits, water rights, land acquisition/lease, salinity credits, transpiration credits, conservation easements, certified watershed-friendly products, stream-flow-reduction licenses, salmon habitat credits, reforestation contracts, protected areas
landscape beauty (i.e. protection of scenic 'view-scapes' for recreation or local residents)	entrance rights, long-term-access permits, package-tourism services, natural-resource management agreements, ecotourism concessions, photographic permits, land acquisition, land lease
biodiversity conservation (e.g. role in maintaining ecosystem functioning, maintaining options for future use, insurance against shocks, improved choice, existence values)	protected areas, bioprospecting rights, biodiversity-friendly products, biodiversity company shares, debt-for-nature swaps, biodiversity credits, conservation concession, land acquisition, biodiversity-management contracts, logging-rights acquisition, tradeable development rights, conservation easements
carbon sequestration (i.e. absorption and storage of carbon in forest vegetation and soils)	assigned-amount units, certified emission reductions, emission-reduction units, carbon offsets/credits, tradeable development rights, conservation easements

the establishment of new regulations and associated property rights spurs market creation. The emerging international market for carbon offsets, water-quality-permit trading in the US and pilots in salinity credit trading in Australia, for instance, are all rooted in new government regulations.

Markets are also closely intertwined with informal cooperative arrangements. In many situations, cooperation is strengthened by benefit-sharing mechanisms that ensure broad-based support. Payment systems, for instance, have played a key role in shoring up cooperative arrangements for watershed protection in India by offering a new tool for sharing benefits with disadvantaged groups. The successful operation of markets may itself depend on the strength of informal systems of monitoring and enforcement that minimize requirements for costly formal alternatives.

(c) *Market development and operation is costly*

Markets are expensive to establish and run. Proponents of market approaches have often overlooked this fact, yet costs of setting up and managing markets may be significant enough to outweigh their benefits. Costs of market creation are associated with defining property rights, setting up exchange systems, educating market participants, establishing monitoring and enforcement mechanisms, etc. Market operation involves costs of information gathering, negotiation, contract formation, monitoring and enforcement, and renegotiating contracts where they prove unsatisfactory. Any judgement as to the desirability of markets must account for these market-creation and transaction costs.

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(d) *Power relations are key*

A central message from the IIED's review is that power relations are critical. As highlighted above, markets are a product of their environment. Power relations are a key facet of that environment and impact on the development of legal and regulatory systems, cooperative arrangements and markets. Drivers behind market establishment inevitably have their own interests and will make efforts to shape markets that fit these. Where weaker parties wish to influence market development, their success will depend heavily on gaining the support of more powerful entities.

Taken together, the points highlighted above emphasize the dangers of excessive faith in the optimality of markets. Markets are diverse phenomenon which need to be unpacked. Their ability to raise welfare will depend on the institutional context in which they evolve, power relations and associated transaction costs. Moreover, market performance will vary depending on whether we consider economic efficiency, social equity or environmental sustainability. In this chapter we are particularly concerned with market implications for the poor. This is not only of concern for ethical reasons, but because marginalization of the poor from the market-development process could have critical implications for the sustainability of market systems and undermine their effectiveness in achieving environmental objectives.

3. Markets and the poor

In evaluating the impacts of markets for the poor, it is useful to frame the evaluation in terms of how markets impact on the assets on which the poor depend. A number of asset-based approaches to evaluating welfare have been developed (Carney *et al.* (1999) provide a useful overview). For the purposes of this paper we will consider impacts for six assets: natural, physical (infrastructure and other man-made capital), financial, social (informal cooperative, family- or community-based support structures), human (educational and skill base), and political (access to and influence over policy-making structures). Opportunities offered by markets in building up the poor's asset base are set against risks that markets will devalue key assets. Table 2 provides a summary of the key potential impacts.

Table 2 highlights a number of channels through which markets may benefit the poor. It also identifies significant risks. Whether the poor realize the potential, or fall victim to the risks, depends on a number of factors. Seven stand out as follows.

- (1) **Security of tenure.** A clear prerequisite for the poor to benefit is that they have property rights over forests, and rights to income generated by environmental-service sales. Where the poor lack secure tenure, a critical concern is that markets raise competition for control over forest assets and lead to exclusion and further marginalization of the poor.
- (2) **Skills and education.** Where the poor have clear property rights, the extent to which they benefit from market opportunities depends on their ability to participate and compete for business. This in turn requires, amongst other things, managerial skills for organizing supply—especially when a large number of landholders is involved—negotiation and contracting skills for structuring deals, and technical skills relating to the delivery of environmental services. Low levels of education and inadequate marketing skills will place a serious handicap on participation.

Table 2. *Potential opportunities and risks of markets for assets of the poor*

opportunities	risks
<i>natural assets</i>	
increased forest value associated with new market opportunities	new markets are inaccessible by the poor due to unclear property rights, insufficient marketing skills and education, inadequate information, lack of contacts, lacking communication infrastructure, inappropriate commodity design, e.g. long-term contracts inappropriate to livelihood strategies that require short-term flexibility
positive spin-offs for timber and NTFPs where sustainable forest exploitation permitted	
positive impacts for other natural assets:	
(i) soil fertility and agriculture (ii) water flows and quality (iii) air quality due to reduced forest fires	
<i>social assets</i>	
market may spur the formalization of resource tenure and clarification of property rights over environmental services	increased competition for control over forests and loss of rights by the poor
increased organizational and management capacity of community-based organizations through collaboration in delivery of, or payment for, environmental service	erosion of community cohesiveness due to increased divisions between those who gain and lose from markets
protection of forest-based cultural heritage	threats to local culture as environmental services become commercial assets
<i>human assets</i>	
improved education and skill base relating to forest management for environmental services, cooperation, project management, marketing, negotiation, enterprise development, etc.	the poor are excluded from market or given only menial jobs, while necessary skills are brought in
improved health due to more varied diets, improved water supply (quantity and quality), improved air quality, increased disposable income for medical treatment	reduced health due to lost access to NTFPs and associated nutrition and reduced disposable income
<i>physical assets</i>	
investment in improved communication links to remote forest areas	investment in improved communication links are targeted at certain market participants with few spin-offs for the wider community, leading to increased inequality

(3) Market information. Access to information on potential buyers and current prices being paid for environmental services is key for sellers to be in a position to negotiate a fair deal.

(4) Market contacts. At present, environmental-service markets tend to be seg-

Table 2. (Cont.)

opportunities	risks
<i>financial assets</i>	
more diversified income base increases security and helps to build up financial assets	where markets lead to exclusion of the poor from forest areas, they will have negative repercussions for financial assets poor buyers of services (e.g. downstream communities paying for watershed services) will have unsustainable demands on their limited financial resources
<i>political assets</i>	
improved community-based organization provides a firmer basis for gaining political representation and voice	where markets lead to further marginalization, the poor have even fewer channels for influencing policy decision-making

mented, largely unregulated and highly dependent on directly negotiated deals. Knowing where to go to initiate a trade and where to find support and advice is critical. Finding an intermediary that can be trusted is essential. Market contacts take time to develop and are most easily made and solidified through regular communication. This may prove difficult to achieve for poor rural communities.

- (5) **Communication infrastructure.** Linked to the above, an important determinant of costs of negotiating and concluding deals will relate to how accessible sellers are to buyers. Transportation and communication infrastructure is important in bringing parties together.
- (6) **Contract design.** In general the provision of environmental services is a long-term commitment (e.g. carbon offset deals tend to span decades rather than months or years). However, poor communities rely on livelihood strategies that are flexible and able to cope with unexpected shocks. Thus, even where new markets offer opportunities for increasing income, if they require extended commitments they are unlikely to attract participation of the poor. Where the poor accept long-term contracts, there are serious risks that by locking them into a single land use for extended periods these contracts will decrease the poor's ability to respond to shocks and thereby damage welfare.
- (7) **Financial resources.** Participating in markets for forest environmental services is expensive. Transaction costs will tend to be even higher for the poor. Not only will the poor tend to require greater investment in skill development, but they are also more likely to suffer from inadequate communication, information, market contacts, and insecure property rights. In addition, because the poor tend to have only small plots they will generally need to join forces to attract business.† Collaboration requires time and effort.

† Threshold effects associated with the delivery of certain environmental services (e.g. biodiversity or watershed protection) often require that a minimum area is protected.

4. Concluding thoughts: making markets work for the poor

From the above it is clear that, while the potential rewards from market development are significant, poor people are likely to face an uphill battle in realizing these. Governments are critical in establishing the legal underpinnings to monitoring and enforcement mechanisms for markets. They thus have a key role to play in making markets work for poor groups. Following on from the above assessment of constraints, four key ways in which governments may help to shape more equitable and inclusive markets are set out below.

- (1) **Assign forest service property rights.** For poor forest-based communities to be able to participate in a market for environmental services they need to be able to offer credible commitments for supply. Secure property rights are key.
- (2) **Strengthen capacity for market participation, e.g. through training and education.** While requirements will vary depending on the context, general training programmes in marketing, negotiation, management, financial accounting, contract formulation and conflict resolution will tend to be important. Technical skills relating to forest management for environmental services will also be needed. In some instances it may be most cost effective for government to support the emergence of specialized ancillary service providers and intermediaries who can offer necessary services to poor communities. A key consideration will be how to ensure service providers do not exploit their position and retain the trust of poor communities.
- (3) **Market support centre.** Information is power. To improve poor people's ability to participate in emerging markets, a central market support centre could offer a number of key services:
 - (i) free access to information on recent prices and transactions;
 - (ii) a contact point for potential buyers, sellers and intermediaries;
 - (iii) an advice bureau to support the design and implementation of contracts; and
 - (iv) research which draws together emerging best practice with respect to contract design and implementation and feeds this back through its advice bureau. This could be particularly important in the development of flexible contracts which are suitable to poor communities' needs.
- (4) **Access to finance.** Where finance is needed to negotiate and conclude environmental service deals, the government may have a role to play in supporting access to funds. This is especially true where banks and other formal lending institutions are failing to provide loan facilities due to their lack of expertise in emerging markets, inflexible collateral laws and/or the non-existence of reliable credit registries. The government has a key role to play in providing supportive legislation and stimulating competition amongst private financial intermediaries, which can result in significant increases in lending to the poor. To the extent that markets for forest environmental services increases the value of poor people's asset base, financial institutions should be encouraged to take these assets as collateral in securing loans.

Markets for forest environmental services are emerging throughout the world and the trend is set to continue. As markets evolve, governments have a critical role to play in crafting the legislative and regulatory environment to guide this process. Equity must be a key consideration; not just for moral reasons, but also to ensure markets work efficiently and are sustainable. The poor control vast areas of forests, which offer valuable environmental services to both local and global communities. Finding mechanisms to ensure that the poor have access to and participate in evolving market systems is key.

This paper draws heavily on a global review of markets for forest environmental services and their impacts on the poor undertaken by the IIED between February 2000 and July 2001 (Landell-Mills & Porras 2002). Support for this research was provided by the UK Department for International Development, the European Commission, the Danish Ministry of Foreign Affairs and the Swiss Agency for Development and Cooperation. The opinions expressed here are those of the author and do not represent the views of the sponsoring agencies.

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