

**Opportunities and Barriers for Small-scale and Community
Forestry Access to Carbon Markets: A Literature Review
*Synthesis***

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**Submitted November 1, 2009
Updated January 12, 2010**

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Purpose

This literature review explores the opportunities and barriers associated with small-scale forestry participation in carbon markets. It also provides a brief summary of the barriers to wood products and forest certification markets faced by small-scale forestry, and ways to overcome them, to gain insight relevant to the case of carbon markets. For the purposes of this review, small-scale forests can be owned either privately or publicly, and small-scale forestry activities can include community-based, urban and family forestry.

Barriers in Wood Products Markets

Small forestry enterprises face two main barriers to operational success in wood products markets: insufficient market power and underdeveloped marketing expertise and knowledge. Communities and small-scale landowners lack sufficient market power due to external forces such as globalization and industry consolidation, and internal factors such as low harvest volumes/infrequent harvests (sometimes following decades of no harvest) and low economies of scale. Globally, the lack of market power is related to increased competition from cheaper foreign imports, continued competition with illegal logging, volatile markets, and forest development policy that is macro-economically motivated, favoring an internationally competitive industrial plantation model over environmental or equity considerations. Communities and small-scale landowners also often lack essential managerial capacity, marketing expertise and knowledge. This lack can be linked to limited opportunities for building experience, time constraints, lack of capital and technical assistance, or simply a prioritization of other uses for forests (e.g., subsistence, recreation, or investment). In developing countries, inequitable power dynamics and lack of internal accountability also plague attempts to build capacity for community enterprises. All of the above forces shift market power to higher market chain players, such as

processors, the export industry or larger producers with more capital.

Attempts to overcome barriers include education and outreach, horizontal integration (e.g., cooperatives), vertical integration (e.g., purchasing portable sawmills or contract cutting), local suppliers partnering with larger private industry (though industry may not always be interested), and identifying and targeting new niches with sufficient buying power. Forest owner associations have played important roles such as negotiating sales and logistics on behalf of forest owners, centralizing purchasing, creating sort yards, or providing information and guidance. There is a need for business development, as well as a need for policy reform to secure local rights, reduce regulatory burden, involve producers in policy negotiations, and protect the poorest.

Barriers in Sustainable Forestry Certification Markets

In forest certification markets, the two overarching barriers encountered by small-scale and community forestry groups are cost as compared to scale (i.e., intermittent and low-volume harvests) and the lack of a guaranteed price premium to offset the costs of certification. Other barriers include steadily increasing requirements for management plans and recordkeeping, complex procedures, lack of national or regional institutional assistance, competition from cheaper plantation wood, reductions in protective tariffs in countries undergoing macroeconomic reforms, and an imposition of “community” on diverse and disconnected groups. Many communities and small-scale enterprises lack even the basic requirements for certification, and many find it difficult to generate missing data. For small-scale owners who are oriented toward other objectives, certification’s emphasis on sustainable forestry and timber harvesting may make it unattractive or uninteresting. With many supporters of certification promoting the establishment of certified wood as a global market standard (for example, through government procurement policies), certification is inadvertently serving to

erect an additional market barrier for low-income producers of wood products.

Attempts to overcome barriers have included outreach, education programs, flexible procedures adapted to small-scale and community needs (such as phased certification), labeling of FSC wood products, and group certification. Most countries with high levels of certified small-scale forestlands have very organized regional forest owner administrative structures or associations. Increasing local demand may create a stronger link to small-scale enterprises.

Barriers and Opportunities in Carbon Markets

Depending upon the period examined, land use change is estimated to have added 20-30% (Harmon 2009), some say as much as 45% (Malhi et al. 2003), of the increased carbon dioxide in the atmosphere since the dawn of the industrial revolution. Globally, changes in forest management could induce future carbon sequestration adequate to offset an additional 15-20% of CO₂ emissions (IPCC 2001). Though forests do not represent a permanent solution to climate change, managing for carbon could buy valuable time as work to find alternative sources of energy progresses, and play a critical role in adapting to climate change through active management.

Small-scale forestry represents a significant and growing piece of overall forestry both abroad and in the U.S. Thirty-five percent of all U.S. forest lands are family forests (Butler 2008). Metropolitan areas (or urban counties) support nearly one quarter of the nation's total tree-canopy cover, a figure that is growing (Dwyer et al. 2000). The last few decades have seen a dramatic growth in the acres owned and managed by forest communities (Agrawal, Chhatre & Hardin 2008; Molnar 2003). Focusing carbon sequestration management solely on national, state, or large-scale-industrial forests precludes a significant percentage of forestland, comprised of perhaps individually marginal but cumulatively significant holdings. Conversely, investing in

management by small-scale forest landowners and communities, including urban forests, improves the long-term sustainability of significant acreages of forests.

Opportunities for small-scale forestry to participate in carbon markets include a growing market, the marketability of forest offsets, the significant acreage represented by small-scale forestry, the untapped potential of land-based climate change mitigation, the need for payment for ecosystem services, the importance of co-benefits from the existing forest base, and the potential for urban forestry to play a role. Many of the barriers to carbon market participation by small-scale forestry are similar to those experienced in other markets. They are detailed below.

Scale and Costs

The biggest barrier for small-scale forestry is the cost of participating, as compared to scale. Small-scale sellers are forced out of the market because of high per unit production and transaction costs. Transaction costs per unit of carbon are higher for forestry offset projects than clean energy technology projects (Ruddell et al. 2007; Malmshemer 2008). Furthermore, they are higher for small-scale and community projects or multiple-use forest management than for large-scale plantation or strict forest protection projects (Smith & Scherr 2003). Many estimates of the cost of forestry projects do not take transaction costs into account. The differences among the various protocols currently under development demonstrate a tradeoff between precision and flexibility that could raise or lower barriers for small-scale projects, as well as affect profitability for the landowner.

The opportunity costs of losing management flexibility to fulfill requirements for permanence may be too high for small-scale or community participants. In Costa Rica, for example, research shows that many smallholder peasant farmers dropped out of a program—in spite of the penalties—to regain access to their land for other uses that would provide returns in the shorter term (Boyd et al 2007).

Market Potential vs. Market Risk

The current approach to carbon trading is effectively the permanent transfer of a carbon asset that restricts the use of that asset indefinitely. The price of carbon is uncertain; current prices may not reflect true value for carbon, which creates a risk that future liability for forest losses will be higher than what the carbon was sold for. While the issues of uncertainty and risk in the market, high opportunity costs, and loss of management flexibility are common to a range of forest owners, they may be amplified for small-scale forest owners, who simply may not have the acreage to buffer the risk. Given the expected low price for temporary carbon credits and the high transaction and opportunity costs, carbon sequestration is not likely to be the main goal of land ownership, so must be considered in the context of a wider set of ownership goals. New methods and institutions would need to be developed to minimize risk for small-scale landowners.

Lack of Technical Expertise

Improving carbon sequestration to its full capacity (for both adaptation to and mitigation of climate change) depends on active forest management. Because the impacts of climate change are poorly understood and because past silvicultural research has focused on timber production without complete accounting for the carbon cycle and other forest ecosystem services, existing experiments and analyses are inadequate for informing land managers about best management practices for carbon. Furthermore, landowner and community capacity for implementing forestry projects can be hampered by the complexity of protocol requirements, definitions and methods; land and climate characteristics; what type of forestry is being employed; and other considerations related to the geographic scope and political context of the project.

Methodological Concerns

Methodological concerns such as leakage, additionality, permanence, and the fungibility of credits from different markets are all ongoing concerns for forestry in general. The underlying concern is that land-use offsets could offer a cheaper but impermanent alternative to changing energy consumption patterns, reducing pressure to invest in energy conservation and renewable energy. Another concern is the fear that avoided deforestation and forest management might lead to the replacement of existing, older growth forests by faster growing, easier to manage, more profitable plantation forests. Methodological issues that plague forestry in general apply to community and small-scale forestry as well, in many cases more so. Establishing a baseline and determining what growth is additional to the baseline is not as cut and dry for existing forests, such as urban ecosystems and community forests, as it is for new or replacement forests. What's more, small landowners in particular will be susceptible to a "boom and bust" carbon cycle, which could affect the desirability of their credits on the market (Harmon 2009).

Payment for Ecosystem Services and Social Equity Concerns

Lack of payment for ecosystem services can be seen as a major reason why communities and landowners allow their forests to degrade. As policy tools such as a cap-and-trade program work to incentivize low-carbon production, the resulting higher cost of living and increasing pressure for oil substitutes will impact small land-holdings and urban forests most, making them even more susceptible to mismanagement or conversion. Carbon markets, in theory, could compensate landowners and communities for using their forests (or tree canopy, in the case of urban forestry) for the global good, as well as help alleviate the cost of mitigation for the community.

Despite the opportunity for income from carbon markets to replace revenue from forest conversion, the international literature contains some of the strongest cautions regarding potential

social inequities of forestry participation in carbon markets. Because many carbon sequestration projects occur where the majority of poor people are concentrated, where conflicts over land and resources are not uncommon, and where livelihood conditions are complex and subject to instability, issues of market efficiency and effectiveness cannot be separated from those of equity (Brown & Corbera 2003; Corbera et al. 2007; Boyd et al. 2007). On the one hand, carbon projects from agriculture, forestry, and other land uses represent one of the few means by which many of the world's poorest people will be able to participate in and benefit from the global carbon market. On the other hand, concerns have been voiced about large-scale plantations or pristinely preserved wilderness taking livelihoods away from those without voice or power.

Studies of carbon sequestration projects started in Mexico under the Activities Implemented Jointly pilot phase of the United Nation's Framework Convention on Climate Change (UNFCCC) suggest that equity achievements have been disappointing. Imposed institutional arrangements did not fully take into account local contexts, such as social power relationships between community members and long-established traditional management and property rights regimes, both customary and de facto. These studies show that bilateral projects are most successful where existing institutions are strong, such as local forest associations or institutions protecting access rights (Brown & Corbera 2003; Smith & Scherr 2003; Boyd et al. 2007; Corbera et al. 2007; Minang et al. 2007).

Tradeoffs may often exist between the social co-benefits of projects and their attractiveness to investors. The limited data available so far indicate that large-scale industrial plantations and strict forest protection are more economically viable in carbon markets than most community-based projects, primarily due to the higher transaction costs of projects involving local communities (Smith & Scherr 2003). Experience so far indicates that afforestation and reforestation projects tend to be low-labor input schemes, owned by a single organization, involving monocultures of fast growing species, and providing little in the way of community or

ecological co-benefits (Skutsch 2005; Klooster & Masera 2000). Although they are cheap and efficient in the short term, small-scale, community afforestation/reforestation projects mixed with other land uses (such as agroforestry or forest regeneration), as well as avoided deforestation through multiple-use forest management, possess the greatest potential to provide local benefits, and as such could be a much more cost-effective means of reducing atmospheric carbon in the long run. Outside of the dual opportunity for reducing emissions and sequestering carbon and the relative low cost of land and labor found in most forestry projects, well-designed community-based forestry projects can provide biodiversity protection, hydrological services, soil formation, community development, subsistence food and timber, social cohesion and identity, economic alternatives to converting forests to pastures and field crops, resistance to extreme weather conditions, and tourism. Many of these co-benefits can be viewed as ecosystem services (of which carbon is but one) that would be better conserved if the community were reimbursed for their protection.

The Case of Urban Forestry

In addition to sequestering carbon and providing renewable biomass fuel, urban trees can help reduce the use of fossil fuel-based energy through shading, blocking wind, and leveling out micro-climate variations within cities (i.e., energy savings effects). However, the literature disagrees on how much carbon emissions can be avoided through the energy savings effect (Nowak & Crane 2002; McPherson, Simpson, Peper, Maco & Xiao 2005; McHale et al. 2007).

Due to its distinctive aspects, urban forestry as a method of carbon capture requires understanding and additional measurement for which the carbon marketplace is not prepared. Though protocols are currently being drafted for documenting urban forestry's ability to offset greenhouse gas emissions (e.g., the Forest Service's Center for Urban Forestry Research, the Climate Action Registry), the institutional challenges of market access have not yet been

addressed. Research has shown that it may not be cost-effective for urban forestry to participate in current markets except in very specific cases (McHale et al. 2007).

Concluding Remarks

The most significant barrier highlighted by the literature is the fact that transaction and opportunity costs tend to outweigh the economic benefits derived from socially and ecologically responsible projects. The social benefits of existing forests have traditionally far outweighed the private benefits. There exists a need to rethink existing institutional arrangements so as to allow livelihoods from forests to continue while compensating forest owners and users for the ecosystem services under their care and minimizing market risk. Below, a number of strategies for overcoming barriers to market participation are summarized from the literature.

- Collaborative technical and business management training for the preparation, implementation and monitoring of carbon sequestration projects is important. Carefully consider existing community capacities. Further cost analyses and research regarding forest carbon management programs would help practitioners make better decisions.
- Carbon sequestration might work best as an additional non-timber forest product bundled with other marketed products, tipping the economic balance to make overall carbon management worthwhile. It will be important to apply methods that allow for flexibility in local land use decisions while still meeting contracted project responsibilities.
- Horizontal integration and creating new financial instruments can help alleviate high transaction costs. Look for complementarity and compatibility with existing institutions in a region that have standards for sustainability or conservation, such as forest certification programs, state or federal conservation programs with cost-sharing, or tax incentive programs.
- Marketing credits locally could harness public interest in economic development and

social benefits. By developing local funding streams, offsets benefit the local community through investment in a sustainable future and local jobs.

- Carbon policies favorable to small-scale forestry would look at whole forests over time, not single plots or stands at one point in time; and distinguish between short-term, relatively minor variations in forest carbon and those caused by changes in policy, general practice, or long-term changes in climate. Aggregate tree cover and levels of carbon sequestration may remain stable even if there are changes in land use (Smith & Scher 2003; Boyd et al 2007). Modeling specific to local conditions might cut down on the scope of, and therefore the transaction costs for, monitoring and verification.
- To support the welfare of poor forest communities, there is a need for strong governing institutions, property rights, legal and regulatory frameworks, monitoring and enforcement, and consideration of equity. Before setting up these institutions, there is a need to understand the local context, to overcome the assumption that “community” automatically means just and democratic, and to recognize that carbon management may or may not be compatible with the other goals of small-scale forestry.

The assumption behind free market economics is often that markets create themselves in the private domain, and government intervenes only in the event of a problem. Carbon markets illuminate the reality and necessity of “making a market” that is equitable. The rules of the game will determine if future carbon markets operate efficiently and equitably. There is a role for government in developing these rules.

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