PAPERS

Forest product markets, forests and poverty reduction[1]

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SUMMARY

There is a new and increasing emphasis on poverty alleviation and livelihoods improvement in forestry, representing both a challenge and an opportunity. This paper briefly reviews the evolution of the 'livelihoods' issue, analyzes the concept of 'poverty alleviation' and discusses means by which forestry can contribute to livelihoods improvement. It focuses on the contributions of forest products and markets, questioning the typical timber vs non-timber dichotomy. The role and the potential of a forest product is determined more by the socio-economic and environmental context of the production, processing and marketing system than by the physical characteristics of the product itself. This is important as new opportunities arise through increased control of resources by local people and new markets for forest products. Helping achieve poverty alleviation through forestry requires protecting poverty mitigation functions, enhancing income and employment options, and taking advantage of opportunities to build and strengthen local institutions through policies and project-level interventions.

Keywords: poverty, livelihoods, forest products, markets, NTFP

INTRODUCTION

Forestry is being redefined, with a growing emphasis on poverty alleviation and livelihoods improvement. In many ways the issue is not new – social forestry, community forest management, joint forest management, non-timber forest products development, and a range of integrated conservation and development projects (ICDP) have been tried and analyzed in efforts to achieve both livelihoods and conservation objectives (Gutman 2001). However, it is an evolving issue and the emphasis has definitely shifted.

Since the late 1970s there has been increasing recognition and appreciation of the multiple roles of forests. As the resource base has diminished and the demands on the resource have increased, the environmental services, recreation and non-timber products of forests have come to be appreciated as being equal to or more important than industrial timber and fibre, particularly in developed countries. And many new stakeholders, from local forest users through to powerful international environmental NGOs, have gained a voice in the debate. Forest management has had to take these uses and these stakeholders into account for political and for instrumental reasons. Indeed, a main driving force in the development of social forestry has been the recognition that people living in forest areas have a major influence on the ecology and that they need to be involved if management is to succeed. One key element of the ICDP approach[2] and much of social forestry has been, implicitly or explicitly, that if the resource can be made sufficiently valuable to local people then they will have enough interest to conserve the resource.

Now, as the international community has becoming increasingly willing to face the enormous problems of poverty, poverty alleviation has become a primary objective. The adoption of the Millennium Development Goals has been remarkably effective at catalyzing interest and attention on poverty alleviation. The Poverty Reduction Strategy Papers (PRSPs) promoted by the World Bank and the IMF seek to organize development assistance around poverty alleviation objectives. Donors have shifted attention and resources to poverty alleviation objectives.

[1] This paper is an updated version of one presented at the XVII Commonwealth Forestry Conference, Sri Lanka, 2005.

[2] A second is what Sven Wunder calls 'conservation by distraction', where labor-absorbing income-generating activities shift production efforts out of the forest (Pers. com, e-mail 417/4/2005)

Forestry has had a somewhat ambiguous position in this changing landscape. The relevance of forestry in poverty alleviation seems obvious to some. Large numbers of rural poor people depend on forest resources to some degree, though the definitions used for 'dependence' and the resulting estimates are highly variable and their accuracy is questionable (Calibre 2000). WCFSD (1999) estimated 350 million "depend almost entirely for their subsistence and survival needs on forests" and that another 1 billion depend on forests and trees for fuelwood, food and fodder. The World Bank (2001) estimated that 1.6 billion depend to varying degrees on forests for their livelihoods, with 350 million living in or near dense forests depending on them "to a high degree". For our purposes it is sufficient to recognize that there are large numbers of poor people living in and around forests and using them to some degree. The same conditions that have helped to conserve forests – difficult access, steep topography and long distance to market, combined with poor soils and difficult climates, also limit the development opportunities for local people (Sunderlin *et al*.. forthcoming). Moreover, forest resources (and the land they stand on) are often the most important available resource base on which to base poverty alleviation strategies in these areas. Some authors point to the new opportunities for people in these areas. There are significant trends to decentralize and devolve natural resource management to local levels and new markets emerging for forest products (Scherr *et al*.. 2004). And yet, forestry and forest resources have received very little attention in most poverty reduction strategy papers (PRSPs), for example (Oksanen and Mersmann 2002). Critics point to forestry's bad track record and to inherent characteristics that seem to limit the potential of forestry for poverty alleviation (Wunder 2001).

There is a strong moral argument to pay more attention to poverty alleviation in rural areas. There is a strong professional argument for foresters as societies demand more from their public forests and the public servants that manage them. There is a strong instrumental argument, that people are there, living in and around forests and using them to meet their needs - foresters and forest management simply must take them into account in more effective ways. And, in case these arguments are not sufficient, there is also a strong strategic argument. Government and donor budgets are increasingly targeted to poverty alleviation. For forestry to be left out of poverty alleviation strategies (PRSPs and other national strategies) is to miss a great opportunity to engage fully in an important mission.

Forestry and foresters need to respond to this evolving situation by recognizing the opportunities and the constraints and acting accordingly. This paper contributes to that objective by first analyzing the concept of 'poverty alleviation' and the different roles that forests and forest resources can and do play in poverty alleviation. It then focuses on forest products and markets considering different classes of products and the socio-economic systems in which they are managed. New research and improved understanding of the role of forest products in household economies helps to give a more nuanced view of forest products and their potential, beyond the typical timber-non-timber breakdown. Environmental services, though important and with interesting potential for the creation and capture of financial value, are beyond the scope of the current discussion, for a full discussion see (Wunder forthcoming). This kind of analysis is needed as new opportunities emerge through new and growing markets for forest products and governance changes that give 'local people' more rights and responsibilities for natural resources management. On that basis, the article concludes with recommendations for action to help achieve forest based poverty alleviation.

ANALYZING POVERTY ALLEVIATION

The concept of poverty has been defined in many ways, from materialistic definitions focusing on income and wealth (welfare), to extended definitions that emphasize capabilities and empowerment in addition to the monetary aspects of livelihoods (Carney 1998, Bebbington 1999). Angelsen and Wunder (2003) review the definitions as they relate to the forest-poverty link, recognizing the conceptual value of the extended definitions but favouring a more restricted definition for measurement and comparison.

In income and consumption terms, there are three main components to the overall role of forests and forestry in poverty alleviation. First, resources are used to meet current consumption needs, as a regular part of subsistence -level livelihoods. There is extensive documentation of the many products that are used for food, fibre, medicine and other purposes (Neumann and Hirsch 2000), and increasing effort to quantify that use in both absolute and relative income terms (Vedeld *et al*.. 2004, PEN Website, Narain unpublished).

Secondly, forests are used as 'safety nets', where people draw on available resources to meet emergency shortfalls and to keep from getting worse off in times of need. This kind of use is common and is mentioned anecdotally in many papers (Neumann and Hirsch 2000). Some recent work has focused on the role of forests as insurance (McSweeney 2004).

Together, the 'current consumption' and 'safety net' roles serve to reduce the severity of deprivation and keep people from getting worse off. This can be termed the 'poverty mitigation' component of poverty alleviation. In both of these roles, forest products may be consumed directly or they may be sold or bartered. In increasingly cash-based economies, even in remote areas, people need some cash to meet their basic needs and it is no longer correct (if it ever was) to equate subsistence with purely non-cash based activities.

The third component of poverty alleviation is 'poverty reduction' in the sense that the number of households below the poverty line is reduced. This is the actual lifting

of people out of poverty where income earned through the sale of forest products or employment in the forest product production or processing sector raises total income above the poverty level. Surplus income that can be used for savings (in cash or, commonly, in livestock, jewelry or land) or invested in productive assets or enterprises to further increase income. In the ideal development model, improved wealth and capabilities facilitates further increases in income, in a virtuous cycle.

These different components of poverty alleviation imply very different approaches for research, project and policy level interventions. For poverty mitigation, poor forest users need to have their access to resources protected. In practical terms, that means recognizing the many and varied stakeholders in any forest management case, and finding ways to avoid loss of access to resources or to compensate people who will lose access to resources as a result of forest management decisions. The capacity of forests to mitigate poverty may also be improved through management that increases the quality and the quantity of the resource available to poor people. Many joint forest management (JFM) activities in India, for example, focus on reducing the pressure on forests to encourage natural regeneration, sometimes in combination with planting activities (Poffenberger and McGean 1998). The primary focus is on improving the resource base for domestic consumption by local stakeholders at least in the short term, with longer term objectives of improved timber production for commercial purposes.

To achieve poverty reduction based on forest products, there is a need to increase the creation of wealth through forest product production, processing and marketing, and for mechanisms to ensure that some of that wealth is captured by the intended beneficiaries. As discussed later, that can only be done when there is real demand for the products and the necessary physical and institutional structures are in place.

Forestry also has an important role in 'poverty alleviation' in the broader definition, pertaining to capabilities, empowerment and rights. Increased attention to both conservation and livelihoods issues at international and national levels has translated into substantial changes in governance worldwide, with increased subsidiarity (the principle that decisions should be taken at the most appropriate level) and participation by relevant stakeholders in natural resources management (Brown *et al.*. unpublished). In practice, this has meant more emphasis on, and considerable actual achievement in devolving decision making about forest management to the people living in an around forests (White and Martin 2002). While the actual outcomes of devolution policies have been disappointing to local forest users in many cases, with a need for more emphasis on pluralism and democratic accountability (Edmunds and Wollenberg 2003), the trend is promising and seems to offer good potential for improved livelihoods. Moreover, at local levels, efforts to protect and manage forests have resulted in increased coordination among and exercise of power by local communities. Some of these have been locally initiated, while others have had external support through a variety of means. Improved local organization and capacity can represent both an improvement in livelihood in and of itself and provide a means to improve the income and welfare aspects of livelihoods (Angelsen and Wunder 2003).

FOREST PRODUCTS FOR POVERTY ALLEVIATION

Forest products have typically been divided into two main categories - timber and non-timber forest products or 'NTFPs'. The timber category usually includes sawn wood, pulp, panel boards and other industrial uses. The NTFP category includes everything else, from roots, fruits and (sometimes) fish and game or 'bushmeat' used for foods, through a range of medicinal plants, resins and essential oils valuable for their chemical components, to fibres such as bamboos, rattans and other palms used for weaving and structural applications (Belcher 2003). Depending on the definition used, fuelwood and carving wood may fall in one category or the other.

NTFPs

NTFPs have been a main focus in discussions of livelihoods and rural development for more than two decades, for several reasons (Neumann and Hirsch 2000). First and most importantly, there is a high level of actual use of NTFPs by the rural poor. Many studies record that rural households use a wide range of forest products, and some have attempted to measure the quantities in absolute and relative terms. In an overview of case studies, Vedeld *et al*. (2004) found that forest products contribute between 20% and 40% of total income of households in forest areas, and that poor households tend to be disproportionately dependent on forest resources (especially fuelwood and fodder). These high use levels are often cited as a rational for investing in NTFPs as a way to achieve poverty reduction. At a minimum, the widespread use of forest products by the poor reflects that they are both useful and accessible in the prevailing circumstances. Many forest products are treated as open-access resources, meaning that they are freely available even to resource poor people. Many can be processed simply and at low cost using traditional technologies. Some have market demand, so they offer an opportunity to earn cash income in cash -constrained economies. But current use does not necessarily indicate that there is good development potential.

There has also been an argument that NTFP harvesting has a relatively low impact on the environment. This idea generated strong support for NTFP development in the conservation community. A big part of the strong interest in NTFPs has come from this combination of ideas: that NTFPs are important to poor people, that NTFP production has low environmental impact, and so, it was argued, NTFPs could be developed as a means to improve livelihoods in an environmentally sound way (Arnold and

Ruiz-Pérez 2001).

While this argument may hold in some cases, there are also some inherent limitations. Many NTFPs have very low (often zero) market value. They are accessible to poor people precisely because no one else wants them. In economic terms, many are inferior goods which are substituted by superior products when incomes rise (Arnold 2002), and/or domesticated (Homma 1992' Ruiz-Pérez *et al*. 2004). And, as Dove (1993) discusses, and as the institutional economics literature explains (Bardhan 1987), if and when a particular resource increases in value, it will attract more powerful actors to try to control the resource and/or the market. In the context of contemporary definitions of poverty that recognize powerlessness as well as low income and wealth, it is easy to realize that the poor are at a major disadvantage in these processes.

Moreover, the harvesting regime and the impact of that harvesting depend very much on demand. Low-impact harvesting that prevails under low-demand conditions can quickly be replaced by much more damaging harvesting practices and/or intensities. For many commercially valuable NTFPs, over-harvesting of the target species is common (Ruiz-Pérez *et al*. 2004). Intensified management stimulated by increased demand can also lead to forest clearing for planting high value forest products (e.g. oil palm).

Timber

Timber, on the other hand, has typically been out of reach of poor rural people for several reasons. First, the costs of entry are typically very high. There are high economies of scale in roundwood, sawn timber, panel boards and pulp operations (Wunder 2001). Harvesting, transportation and processing activities are highly mechanized and they require large capital investments that are beyond the capacity of the poor. This is not to say that it is impossible for poor people to be involved in timber harvesting – there are many small-scale (often illegal) logging outfits in operation which can operate with a single chainsaw, a corduroy skid track, and a lot of hard work - but it is difficult for these small operators to capture much more than the value of their labour.

Second, the poor lack legal forest resource ownership and control. Throughout the world, forests have been claimed by the state, and the rights to exploit those resources have been assigned to large companies. The exceptions prove the rule; in Mexico, with strong community ownership through the Ejido system, there are good examples of successful community owned and managed timber enterprises. Elsewhere, most timber harvesting is done by medium- to large-scale companies. As discussed, there is now a trend toward devolving rights and responsibilities, but tenure remains insecure or incomplete. Many of the cases included by White and Martin (2002) do not include rights over timber.

Thirdly, the political economy of forest exploitation favours large-scale, politically-connected operators. Good quality forests have high economic rents – there is a lot of value standing on-the stump. They are highly coveted and useful as political tools. Forest concessions are often traded by the government of the day in return for political support and used to generate private wealth. Corruption in the forest sector has been a major problem. But even in the absence of corrupt practices it is still reasonable for the state to prefer to deal with fewer large-scale operators than with a large number of small-scale operators simply because it is easier to administer and easier to capture revenues through concession payments, taxes and other means.

Fourthly, forest planting has been considered to often be unattractive to resource-poor managers because the rotation times are too long, and/or because their insecure land rights make long-term, physically immobile investments risky (Wunder 2001).

These factors help explain the poor record that forestry has had in poverty alleviation. Poor rural people, including people with traditional claims on the forest, have not benefited much from forestry, and have very often been made much worse off by having their resources depleted to the point of destroying traditional livelihoods, or by being displaced from their traditional lands.

RATIONALIZING FOREST PRODUCTS CLASSIFICATION

In combination, the tendency to focus NTFP discussions and many development projects on low-value open-access resources, combined with the historical inaccessibility of the timber sector to poor rural people, has led to a dichotomous and incomplete treatment of forest products for poverty alleviation. To put it bluntly, there has been a widely accepted assumption that NTFPs are for the poor and timber is for the rich (Dove 1993). This idea has been common (albeit implicit) in the literature, with emphasis on NTFPs and very little attention to small-scale timber production for livelihoods purposes. It has also been common in practical applications such as in JFM in India and many other community based natural resources management programmes and projects. People living in forest areas are given increased rights over NTFPs, but rarely gain control or even revenues from timber.

Research and reflection on the role and potential of NTFPs for both conservation and poverty alleviation has yielded a more sober and realistic assessment in the academic literature (Lawrence 2003). However, recent discussions with NGOs, foresters, and government officials in various countries reveal that many still have high (and probably unrealistic) expectations for NTFPs that mirror those in the academic literature of more than a decade ago. It is still common to hear proposals with exaggerated expectations of the potential of NTFPs to simultaneously meet conservation and development objectives.

A recent comparative analysis of 61 cases of commercial forest products (mainly 'NTFPs') systems provides lessons to help understand the role and potential

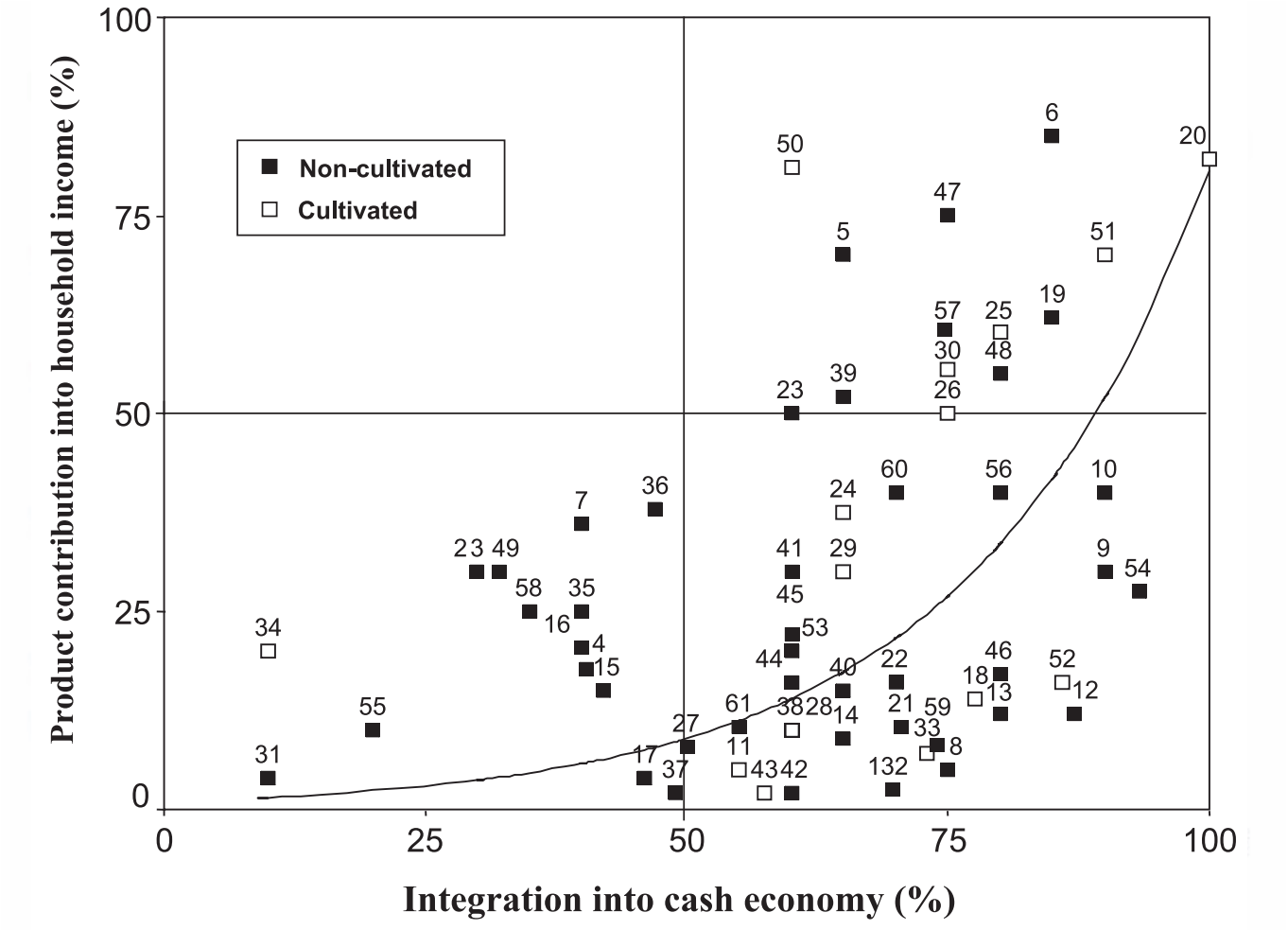
of forest products to contribute to livelihoods improvement (Ruiz-Pérez *et al*. 2004, Belcher, Ruiz-Pérez, and Achdiawan forthcoming). The study compared a standardized set of descriptors of the characteristics of the forest product, the raw material production system, the market system, and the socio-economic, ecological and geographic environments for each case. It found a strong relationship among cases according to the degree to which the producer household is integrated into the cash economy (defined in terms of the proportion of total household income earned in cash) and the proportion of total household income contributed by the forest product (Figure 1). A primary classification yielded three main clusters of cases[3], corresponding to:

1. 'Subsistence strategy' in which the producer household was weakly integrated into the cash economy (<50% of total income earned in cash) and in which the forest product contributed less than half of total household income
2. 'Diversified strategy' with high integration into the cash economy and low contribution from the forest product
3. 'Specialized strategy' with high integration and high contribution of the forest product

The cases in each of these categories have many common features that relate much more strongly to the social and economic context of the case than to the particular properties of the forest product itself. For example, a system in which rattan (*Calamus* spp.) is cultivated in fallow forest in Indonesia behaves much more like a benzoin (*Styrax paralleloneurum* Perkins) system in Sumatra than like a wild harvested rattan in the Philippines or Cameroon. The most important 'context variables' concerned the nature of property rights, the size and accessibility of markets for the product, and the opportunity costs of labour and land. With sufficient control over the resource and a strong market, people are able to specialize in the production and marketing of forest products, provided of course that this is the most rewarding use of their time.

The study also noted that commercial forest-product production is commonly integrated with other economic activities at the household level. In all of the cases studied, the producer household had some other economic activities

FIGURE 1 *Relationship between Household integration in the cash economy and product contribution to total household income (Source: Ruiz-Pérez et al. 2004). Numbered points correspond to individual cases.*



[3] A secondary classification based on whether or not a product is actively cultivated yielded more detail (Belcher *et al*. forthcoming)

and in most cases the commercial forest product contributed less than half of total household income. Households with higher incomes achieved this either through intensified production of higher value forest products or from off-farm income (a very important means of poverty alleviation!).

It should not come as a surprise that the conditions that favour effective commercialization are not met in many poor areas. Property rights are often poorly defined and local people may not have legal rights to use the forest. Markets, transportation links and other conditions favouring trade are often poorly developed. And, importantly, poor people lack the human and social capital – the skills and the connections – to engage productively in the market. So, without careful safeguards, the process of forest product commercialization may have an anti-poor bias.

This perspective, combined with many new developments in forestry, argues for a different approach to forest products development. This assessment is not intended to be pessimistic, but to promote a realistic approach that considers actual use and needs and genuine potential as constrained by current local conditions.

EMERGING OPPORTUNITIES IN FOREST PRODUCT MARKETS

The cautionary tone above does not mean that there are no opportunities to use forest products for poverty reduction. On the contrary, there are good and improving prospects in many areas. Scherr *et al.* (2004) identify a series of trends in the forest sector that are creating new openings for small-scale producers of forest products to benefit from commercial trade. These include: increased local ownership /control of forest resources, growing demand for forest products, technical and market developments that permit the use of smaller-diameter and lower quality wood, with faster rotations; increasing scarcity, especially of large-diameter tropical hardwoods; increased demand for environmental services; conditions that favour intensification of forest management and farm-based production; opportunities for niche markets in a globalized world; more democratic governance. Other authors (e.g. Sunderlin *et al.* forthcoming) also note that with increased attention to, and possible reduction in corruption in the forest sector, there may be improved prospects for better distribution of forest revenues.

There are growing markets for a wide range of products – medicinal and cosmetic products, essential oils and resins, fruits, and flavours as well as industrial woods. Scherr, White and Kaimowitz (2004) provide a useful classification of the main products and markets. Some are specialized 'niche' markets for particular types of products (i.e. high value woods; specialty oils or flavours). Total demand may be relatively low, but prices can be attractive for small numbers of producers. There are also niche markets for particular types of production and marketing arrangements. New green markets and fair trade enterprises sell positive images of the ecological and/or social impacts of their products along with the inherent characteristics of the products themselves. And there are growing opportunities for small–scale suppliers of large-volume industrial feedstock. As processing capacity in pulp and paper continues to expand and as natural forest supplies are depleted and access becomes more constrained, industry needs to turn more to planted supplies. In Southern China, for example, the processing capacity for pulp and paper is expanding at a tremendous rate (Cossalter and Barr 2004, Sun *et al.* 2004). Local farmers, with forest land allocated to them and with policies favouring tree growing on sloping lands, would seem to be well placed to supply this growing market. Yet, as Cossalter (2004) finds, their costs of production may still not be competitive with timber from the forests of Indonesia or even Brazil! This is because the opportunity costs of land are high in highly populated areas and because the competition still has access to under-priced natural timber.

As discussed above, there is no guarantee that any of these markets will be accessible to poor people, even if the original products originate and grow wild in their forests and even if the markets are small and green. There is need for support at different levels, including in the market itself, but also outside the forest product market per se, in general infrastructure, agricultural support and institutions building. Poverty alleviation really needs a concerted effort with improved links with other sectors

CONCLUSIONS

What does this overview of current contributions of forest products to poverty alleviation and the identification of new opportunities indicate for future investments in forest based poverty alleviation? How can foresters, governments, and conservation and development agencies target their efforts in the forest sector?

There is widespread use of forest products by poor rural people, at least in part because they are accessible at low cost. This role in poverty mitigation should not be underestimated, and there is a need for more research on forest use and how it changes in changing socio-economic circumstances. The poverty mitigation function of forests needs to be better understood, recognized and acknowledged by policy makers and, in some cases, actively protected, for example when creating protected areas or allocating timber concessions. Efforts to rehabilitate degraded forest and afforest in deforested areas can be effective ways of increasing access to poverty-mitigating forest products, provided that people who need to use the resources have the rights to do so. Multiple-use options, managing for and giving more access to local people to use a range of resources in commercial timber concessions should be explored. This must be balanced with considerations about productivity and sustainability of the resource. There is still considerable need for more and stronger efforts to

improve access and control by target groups to forest resources.

Both poverty mitigation and poverty reduction can be served by efforts to increase the value created from forest resources and captured by the intended beneficiaries. This may mean increased raw material production and/or improved quality. It is a fact that research and development in forestry, as in agriculture, has been primarily focused on large-scale commercial models, and for the benefit of well-resourced stakeholders. There is a need for research and extension appropriate for small-scale producers, especially those operating in mixed systems.

That said, the bottlenecks to successful commercialization often occur downstream. Technical assistance is needed in post-harvest processing (to reduce spoilage and improve quality) and support is need to improve access to information (including market information), technology, and credit. Small-scale producers dealing with small volumes of product in areas with poor transportation access typically have very weak bargaining positions (especially if they lack property rights for the resource and if the product is perishable). More research is needed to assess the role of local institutions, such as property rights regimes, market structure and organization, cooperatives, and others in forest-based poverty alleviation, and learn how to better facilitate and support successful models in appropriate ways. This is an important area with high potential for impact.

The usual NTFP vs. timber distinction is, for poverty alleviation purposes, a false dichotomy. Realizing the market potential of any natural resource depends on a range of social and economic conditions being met. At a minimum, the producers need property rights over the resource, there needs to be a significant and accessible (both physically and socially) market and a cost-effective means to get the product to market. Current use by local people does not necessarily indicate development potential and may it indeed signal that the current market opportunities are poor. And, if the conditions change to make a product more valuable, special efforts may be needed to help the intended beneficiaries to capture the benefits. All kinds of well-intentioned efforts to, for example, domesticate wild resources or otherwise increase productivity, to encourage local processing industries, to develop new markets, or to otherwise increase the profitability and attractiveness of forest product production, run the risk of attracting new and more powerful competitors such that could displace the current producers. So, efforts will also be needed to help build skills and capabilities by the poor to engage competitively in markets. Based on our research and experience, there is a need for more attention to: linking small-scale producers to markets; improving the efficiency of post-harvest processing; capacity building, and; improving access to micro-credit.

Investment in building institutions and capacity within forest communities, and facilitating the devolution of rights and responsibilities for local resource management, can be a direct pathway to poverty alleviation, in the broader definition of the term, providing opportunities for empowerment and improved capabilities. It can also serve as a critically important means to improving income and employment through improved resource management and better skills to engage in the market.

Finally, we must keep in mind that forestry is unlikely to serve as the only, or even as the main avenue, to poverty reduction in many circumstances. Other kinds of investments and support will be needed to improve health, education, and infrastructure in rural areas. In many areas agriculture is currently the main employer and the main source of income, and there is scope for productive investment in research and extension to support small-scale farmers. Forestry needs to be considered as part of the overall package, tacking advantage of opportunities where they exist. To facilitate this we need better analysis of where poverty exists and how does it change with other key variables. Poverty mapping has become a popular tool, though to date, the main emphasis has been to identify high concentrations of poverty (with various definitions) and to look for coincidence of poverty and other spatial features. There is a need for more analysis of the relationships and causalities between livelihoods status and quantity and quality of forests, transportation networks, market access, and so on, the conditions under which poverty is reduced and under which it persists.

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