

Better forestry, less poverty

A practitioner's guide



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Foreword

Heads of State as well as other politicians and decision-makers have succeeded in raising collective awareness of the unacceptably high levels of poverty in many parts of the world and of the need to address its root causes as a matter of priority. The struggle of poor people for survival and dignity has become the focus of national and international attention as governments, in collaboration with FAO and other partners, seek to eradicate hunger, malnutrition and food insecurity through better agricultural, forestry and fisheries practices.

FAO is dedicated to assisting countries to achieve the goals of the World Food Summit and those contained in the Millennium Declaration. Forestry can make significant contributions in this regard because many of the poorest people in the world live in and around forested areas, and therefore depend on these resources for subsistence and livelihoods.

In 2001, FAO organized an international expert meeting on reducing poverty through forestry-based interventions which produced a four-point agenda for action. *Better forestry, less poverty: a practitioner's guide* is a concrete example of FAO's commitment to that agenda. It aims to increase awareness of the ways poverty manifests itself in the rural environment so that forestry and development practitioners can make poverty reduction a focus of their work.

FAO hopes that the readers and users of this publication will gain a better understanding of how forests and trees outside forests are a key means to generate income, create employment and contribute to wider national development goals.



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Acronyms

CAMPFIRE	Community Area Management Programme for Indigenous Resources
CIFOR	Center for International Forestry Research
FOWECA	Forestry Outlook Study for West and Central Asia
IUCN	World Conservation Union
JFM	Joint Forest Management
MA&D	Market Analysis and Development
NGO	non-governmental organization
NWFP	non-wood forest product
ODI	Overseas Development Institute
PES	payment for environmental services
PROFOR	Program on Forests
WWF	World Wide Fund for Nature

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1. Introduction

More than 25 percent of the world's population – an estimated 1.6 billion people – rely on forest resources for their livelihoods, and of these almost 1.2 billion live in extreme poverty (World Bank, 2001). These people lack the basic necessities to maintain a decent standard of living: sufficient and nutritious food, adequate shelter, access to health services, energy sources, safe drinking-water, education and a healthy environment. When governments signed the Millennium Declaration in 2000 and committed themselves to achieving the Millennium Development Goals, they agreed to halve the number of people living in extreme poverty by 2015.

In addition to forests providing food, shelter, clothing and heating, a significant number of people living in poverty depend on forests and trees outside forests to generate income through employment and through the sale of surplus goods and services. However, the extent to which these resources can alleviate poverty and improve food security for vulnerable populations is not well documented or obvious to most policy-makers. Even less is known about ways to capitalize on the untapped potential of forestry to lift people out of poverty or at least mitigate its effects.

Action is not only the responsibility of governments. While appropriate changes at the national level both within and outside the forest sector can indeed bring about improvements, experience has shown that sweeping reforms to policies and legislation are not always a prerequisite to making a positive difference in the day-to-day lives of those who face difficulties. For example, foresters and others working with communities can assist poor people to increase their benefits from forest resources by helping them to access markets, acquire processing skills, obtain improved varieties of trees, combine trees and crops on their land, and form associations to jointly manage resources, strengthen negotiation power and market products.

This guide offers suggestions to practitioners and the rural communities they serve on ways to prevent, mitigate and reduce poverty through forest-based interventions. Those who may find it of interest include district forestry officials, forestry and rural development extension workers, local administrators and planners, and people involved in small-scale enterprises, including their partners.

The document highlights the importance of tailoring activities to local circumstances and of using participatory approaches to design and implement interventions. Emphasis is on making and responding to changes for the benefit of people living in or near forests, and on helping users gain a better understanding of:

- the forms of rural poverty and priorities for rural poverty reduction;
- how local decisions both inside and outside the forest sector affect segments of poor rural communities in different ways – women, children and the elderly being the most vulnerable;

- the vital roles that forestry and agroforestry systems play in sustaining livelihoods and preventing poverty;
- the ways in which changes in forest management can cause poverty or worsen it;
- how forestry practices can better contribute to poverty reduction and better protect the livelihood functions of forests.

The suggestions for practical actions draw on current literature on the subject, and from field studies and experiences.

2. Poverty, livelihoods and poverty reduction

This chapter describes the various dimensions of poverty so as to better understand how forestry can help to reduce it through both the creation of wealth and the protection of forest functions that support livelihoods. It provides a context for practitioners working with communities to deal with avoidable deprivations and social inequality through forest-based interventions.

RECOGNIZING AND ADDRESSING POVERTY

To be poor is to be deprived of the means for a decent life. Because poverty expresses itself in many ways, several approaches are used to assist those who are affected. Strategies focus, in varying degrees, on material and social deprivations such as those related to health, safety and living conditions, as it is easier to observe and measure these aspects than it is to observe and measure people's ability to achieve meaningful and dignified lives *vis-à-vis* other people. All forms of poverty are, in fact, relative and subjective because it is in relation to social contexts that they are judged unacceptable.

People who are involved or could be involved in forestry must consider the ways in which people's livelihoods might be affected, for better or worse, by any changes in the management and use of forests and trees outside forests.

Deprivations of poverty include:

- **income:** the lack of means to purchase basic goods and services;
- **consumption:** inadequate access to basic goods such as food and water;
- **capability:** insufficient knowledge, health or skills to fulfil normal livelihood functions;
- **living conditions:** poor housing, unhealthy or dangerous environment, and bad social relations.

The following are characteristics of poverty:

- **Multidimensional.** Deprivations are not only related to basic material resources such as food, shelter and medical treatment, but also to social resources such as access to education, information and respect.
- **Complex and dynamic.** The conditions of poverty are interconnected, shared among people experiencing similar hardships and difficult to overcome. For example, weak social institutions, poor education and gaps in information flows restrict livelihood opportunities, perpetuating inadequate access to income and food, which continues the cycle of collective poverty and transmits it to the next generation.

- **Avoidable.** The idea of poverty implies that measures can be taken to prevent it. It also suggests that, in general, poor people need help from non-poor people to escape from poverty.
- **Collective responsibility.** Society at all levels has a collective responsibility to reduce extreme poverty and to forge new kinds of social relationships between poor and non-poor people.
- **Contextually defined.** People are not poor in an absolute sense, but in relation to a particular socio-economic context. Diverse contexts create different shared expectations of the goods needed for a decent life. The meaning and relevance of key poverty indicators also vary according to the availability and costs of public goods such as shared food and grazing, transport facilities, water and information.

To assess the dimensions and magnitude of poverty, information is needed not only about the number of people who live below a given poverty line, but also how many of those people experience:

- severe and long periods of poverty (are destitute, with no assets or income);
- chronic poverty (are permanently destitute or suffer long periods of poverty);
- transient poverty (suffer seasonal or temporary deprivations because of illness or loss of employment);
- recent poverty arising from sudden shocks such as disasters, violent conflict or unexpected economic changes.

LIVELIHOOD ASSETS: FIVE CATEGORIES OF CAPITAL

Development workers draw on five categories of assets or capital to explore the various dimensions of well-being and the means for achieving it. They are:

- **Natural capital.** Access to land and to resources such as trees or animals allows people to invest in productive processes. Poor people living in or near forests often lack formal rights to access, manage and use the resources. In many instances, they rely on forests for subsistence because they not only lack secure tenure, but also lack the technology and market information that would enable them to add value to products through processing, thereby increasing their chances to move out of poverty.
- **Social capital.** Relations among people are shaped by histories of interactions which regulate further interaction. Reaching agreements on collective forest management and enforcing the terms require strong social capital. If the State or outside businesses are involved, local people also need good links with external and more powerful interest groups. For many people living in and around forests, the critical deficit related to social capital is the uncertainty surrounding rights over resources.
- **Human capital.** Forestry affects human capital to the extent that rural people's health is often linked to forest products used for nutrition and medicine. Moreover, sustainable forest management as well as enterprise development require skills and knowledge, which are in short supply when access to education and information is weak or non-existent.

- **Financial capital.** People need money to make long-term investments in forests, tree crops and equipment, but access to financing is often problematic for those who live in rural and remote areas. Where there are clear rights over forests and trees, these resources can serve as collateral for enterprise development.
- **Physical (built) capital.** Buildings, roads and tools provide the security, mobility and capability that allow people to produce, transform, exchange and consume goods. Although people living in remote forested areas have easy access to woodfuel and medicinal plants as well as timber for construction purposes, they often do not have access to markets because roads and transport facilities are lacking.

Livelihood flows

Even more vital than assets are the dynamic flows – processes that enable livelihoods to function. Poor people can survive without capital. For example, they can use cow dung and agricultural waste for cooking without owning cattle or fields, and they can eat fruit without owning trees. However, they cannot live without flows of energy, nutrients, water, information, motivation, income and social transactions. Box 1 illustrates ways in which deficient flows determine the nature of rural poverty.

Remoteness and poverty

Many of the world's poor live in rural areas, where poverty rates are significantly higher than those in urban areas. The kinds of poverty that people living in and around forests suffer from are diverse. However, patterns can be detected by examining assets, flows and other factors such as remoteness from towns and cities where most wealth and political influence reside. Remoteness can have advantages in that it is easier for people in rural areas to retain autonomy, avoid major civil conflicts and protect natural resources. At the same time, however, it restricts their access to markets and services and it limits their ability to influence government.

POVERTY INDICATORS AND CATEGORIES OF POOR PEOPLE

If assistance is to target those who have particular needs and different degrees of capability, a variety of indicators are required to draw such distinctions and to better understand the forms and causes of poverty and vulnerability.

Income, expenditure and consumption

The most common approach for measuring poverty is to monitor trends over time, or compare regions or countries. Typically, a poverty line based on income, expenditures or consumption is used to group people according to how far below or above the line they fall. However, income and expenditure measures are of limited use in remote rural areas because many important aspects of livelihoods are not expressed in monetary terms and because such information is largely unrecorded and unknown. Although measures of consumption avoid the first

BOX 1

Elements of livelihood flows

Energy	Rural people find it harder to access reliable supplies of electricity and fossil fuels. Fuelwood and animal traction may fill this gap for subsistence purposes, but the lack of energy constrains opportunities for new businesses that could lift people out of poverty.
Food	Availability of food may not be a key problem, but food security can be an issue in lean seasons and bad years, or when external markets for cash crops adversely affect local food production.
Water	Scarcity of water means that critical trade-offs must be made between using it for drinking and washing, for livestock or for irrigation. Because many poor people do not have access to safe drinking-water, they are more exposed to water-borne diseases.
Information	Inadequate flow of information is a major cause of rural poverty, especially when people can no longer rely on traditional knowledge to understand ecology and plant growth, disease and markets.
Motivation	Uncertain rights, expropriation of common resources, conflict and change often leave rural people indifferent about the fate of the natural resources on which they rely. This mind-set reduces their disposition to cooperate and their chances of escaping from poverty.
Social transaction	When rural institutions are strong, people are often able and willing to share labour, redistribute resources and pool risk. However, rapid changes in the use and management of forests, especially by States or external businesses, adversely affect traditional management and cooperative arrangements.
Income	Rural people usually have much lower incomes than urban dwellers. This may not matter for meeting subsistence needs, but matters when money is needed to purchase goods and services from the outside. While poverty can be alleviated without additional income, low income makes people unable to move out of poverty. It also leaves them vulnerable in times of crisis and when expropriation and commercialization for external markets deprive them of public goods such as forest products, food crops and water.

problem – since consumption remains important even when income is not – it is often difficult to observe. People may know what they and their neighbours consume, but may not give an accurate version to those outside the community, especially if they suspect that the information will be used to decrease assistance or restrict access to free goods.

Deprivation of assets and capability

Indicators for assessing deprivation of assets or capability are needed to help select beneficiaries for specific interventions. For instance, an agency specializing in food security or nutrition needs to identify the food-poor and monitor the times of the year when food is scarce; housing agencies need to identify those with inadequate housing; health agencies must monitor avoidable morbidity and mortality; and water and sanitation agencies must identify those without access to these services.

Although such deficiencies are more observable than income, expenditures or consumption, some require careful analysis to avoid misrepresentation. Medical records, for example, may show higher levels of illnesses among the middle class simply because poor people lack the time and money to visit doctors. In some instances, a good indicator of poverty is the state of roofs on dwellings. However, where poor people have benefited from subsidized or free roofing, durable roofs may conceal other housing inadequacies.

Living conditions

More broadly, poor people can be classified and monitored according to their living conditions. Areas may be unhealthy because of poor sanitation or nearby sources of pollution. They may be unsafe due to local environmental hazards, violent conflict or weak law enforcement. Poor areas are often remote, either in terms of distance from markets, jobs and services, or are poorly served by roads and transport services. It is important to understand whether substandard living conditions are a major cause of poverty or an outcome of some other dimension of poverty.

Poverty and personal or collective characteristics

The links between various dimensions of poverty and factors such as age, gender, ethnicity and occupational specialization need to be carefully monitored to understand the causes and experience of poverty. This information can then be used to target assistance to people who are prone to poverty.

Poor people frequently suffer the negative consequences of forest management decisions over which they have little opportunity or ability to influence. For example, new rules on forest protection may result in severe energy problems for women who are the primary gatherers of fuelwood and who often have a weak voice in local politics; planting fields with trees instead of annual crops may cause new incidences of poverty among agricultural labourers; and new restrictions on timber use may cripple the livelihoods of artisans.

POVERTY REDUCTION

In this document, poverty reduction is defined as collective responsibility to fight all avoidable forms of deprivation. It involves collaboration to:

- make poor people less poor (also referred to as poverty alleviation);
- enable poor people to escape from poverty;
- build institutions and societies that prevent people from becoming poor or from slipping further into poverty.

Pro-poor policies and strategies aim to address all three goals. Combined with the involvement of poor people in their implementation, they are important components in the fight against poverty. However, building poverty-free communities requires broader interventions because all segments of society must play a part in preventing its occurrence. It means building pathways out of poverty and protecting vulnerable people, both poor and non-poor – especially women, children and the elderly.

Poverty reduction refers to efforts ranging from the modest easing of some symptoms to the radical transformations that enable people to escape poverty altogether. Because the transition is seldom sudden, reducing poverty first means alleviating it by gradually addressing the severity of some components. This aspect of poverty reduction should not be confused with helping people to escape from poverty altogether or building a poverty-free society.

Distinctions are sometimes made between practical and strategic approaches to poverty reduction. Practical changes tend to involve poor people at local levels to address the material aspects of poverty – mostly those related to subsistence needs – by changing the relations between humans and the non-human environment. Strategic changes address the indirect causes of poverty at local levels and higher, involve non-poor as well as poor people, and focus on social reform. Activities include building the organizational capacity of forest user groups, strengthening the rights of poor people to access, manage, use and sell forest products, and changing attitudes, beliefs and institutions.

Forests and trees outside forests play a significant role in all aspects of poverty reduction as they make people less poor, enable them to escape from poverty and prevent those on the margins from becoming poor. Better forest management and processing of specific products can increase incomes or improve the health of poor people even if those goods do not lift them out of poverty. Improvements in forestry can also be central to a more ambitious strategy for helping people to move out of poverty. For example, clarification of tenure rights can be combined with improving skills and knowledge and strengthening market access for forest products.

Poverty reduction requires both practical and strategic changes at many levels and addresses direct and indirect causes of poverty. Escape routes from poverty are not built on technical forestry activities alone, but through multidimensional strategies that include social and institutional transformation. Poverty alleviation occurs primarily through practical and direct changes at the local level.

3. Preparing the way: incorporating poverty issues into forestry

KEY ELEMENTS IN FORESTRY THAT HELP TO REDUCE POVERTY

Provided that adequate resources are available, forest products can be harvested and growing stock can be renewed. Managing resources in a sustainable manner and planting trees where opportunities exist can generate much-needed income, especially through the establishment of community-based enterprises. Businesses that add value can further improve livelihoods. The forest also can act as a savings account for people who invest their labour and other assets. When times are hard or funds are needed, poor people can harvest trees and other products for their own use or to sell. Unlike arable crops but similar to livestock, the time it takes for trees to mature is not fixed. The crop can be partially harvested by thinning or pruning while it continues to increase in value.

For people to invest in forestry, however, they need the security that comes with clearly defined rights and tenure, including protection from outside interests, whose actions may not always be legally sanctioned. They must also have access to the skills and expertise required to manage the resource on which their investment depends. Without such conditions, people will tend to forgo greater returns in the long term in order to reap immediate benefits.

Secure tenure and access rights as well as good governance are often prerequisites to successful interventions to reduce poverty. Before deciding on any practical action, therefore, it is important for practitioners to assess the following three conditions: the extent to which forest owners and users have clear tenure and access rights; if good governance prevails in the community; and if residents understand the link between sustainable forestry and poverty alleviation and have the capacity to manage the resources accordingly.

Clear tenure and access rights

By its very nature, forestry requires medium- to long-term investment if returns are to be sustainable. It has been demonstrated time and again that people are reluctant to invest in sound forest management unless they have secure rights and control over the resources.

Questions to ask about tenure and access rights before developing actions:

- Do people have tenure rights over the forest area? If so, are these clear, legally recognized and protected?
- How long is the period of tenure? Is it longer than the time it takes to grow trees?

- What are the reasons behind investing or not investing in forest and tree management?

Even if people have secure tenure rights, lack of clear access and control to use the resources can be as much of a disincentive to investing in resource management.

- Do people have clear rights to access products from the forest? If not, is access hindered by costly and complex requirements for inventories, management plans or permits and licences, for example?
- Are there any conflicting rights or unresolved claims?
- Are there restrictions for selling forest products, including price restrictions?

Good governance

Even if tenure and access are grounded in law and policy, there is a need for information to be disseminated, for decision-making to be transparent and for individuals and institutions, including local forest user groups, to be accountable to the people they serve.

Questions to ask about governance before developing actions include:

- Are people aware of current laws and policies regarding their rights and access to forest and tree resources?
- Do local authorities respect and enforce these laws and policies?
- Are people outside the community who do not have such rights infringing on local people's rights? If so, what actions are the authorities taking?

Community capacity

Even if the conditions to invest in forests and trees are in place, people still need the skills to sustainably manage and use these resources. Institutions within the community require capacity to support such management as well as to ensure that poor and marginalized residents equitably share the benefits from forestry. It is also important for local user groups to be strong enough to resist attempts by individuals with special interests to control power. Similarly, village leaders must be able to represent and defend the interests of their constituents at higher decision-making levels.

Questions to ask about community capacity and the resource base before developing actions:

- What skills do local people have and what are the gaps, if any, for them to develop, manage, use and dispose of forest and tree resources?
- Who from within the community benefits most from forest and tree resources, and are those benefits in proportion to their investment in forest management?
- Are there clear roles, responsibilities and rules within the community regarding forest and tree management?
- What potential does the resource base have to deliver sustainable benefits? Have all options been explored with stakeholders?

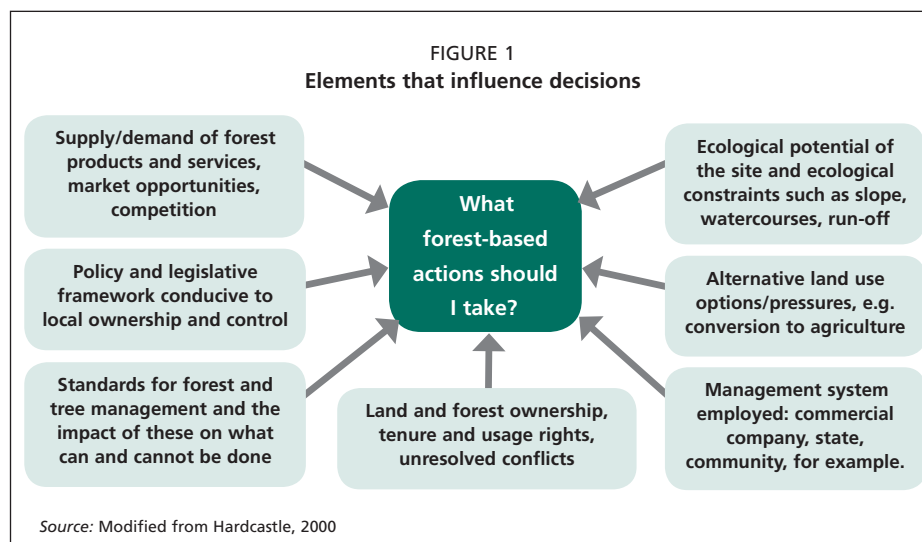
- If options were discarded because of lack of skills or finance, for example, how can these obstacles be overcome?
- Are communities satisfied that the benefits they reap compensate for their investment?
- Do community leaders adequately represent the interests of residents in decisions taken at higher levels? If not, what skills do they require and how can these be obtained?

WEIGHING RISKS IN DECISION-MAKING

Figure 1 outlines the complex and interlinked factors that need to be considered before forestry interventions for reducing poverty take place. For example, if policy and legislation restrict the sale of forest products (centre left box), local people may change to a more profitable land use such as agriculture (centre right box).

A key element in decision-making is weighing opportunities against risks, including risks associated with conflict that can arise when poor people engage in activities that threaten powerful elites or illegal operators; natural occurrences that damage or destroy resources; and uncertain or fluctuating market supply and demand.

Poor people usually do not have safeguards on which to fall back, so they often give up the chance of earning more income if they feel that the danger of failure is unacceptable. They might be reluctant, for example, to invest in equipment or buy an improved variety of tree seedlings if they are concerned about stiff competition or falling prices. They also may not venture into specialty products because consumer tastes for these items are difficult to predict. Perhaps a more serious concern, however, is the fact that many poor people do not have access to information on market trends and price fluctuations. This lack of knowledge restricts their chances to successfully participate in commercial enterprises, or prevents them from even considering this option.



AN AGENDA FOR ACTION

In 2001, policy-makers and practitioners from around the world identified ways in which forest policy, legislation and programmes alleviated poverty. Discussions at the Forum on the Role of Forestry in Poverty Alleviation (FAO, 2001a) resulted in a four-point agenda for action: strengthening rights, capabilities and governance; reducing vulnerability; capturing emerging opportunities; and working in partnership. The agenda provides a basis for practitioners to design interventions to reduce poverty. The following questions can help practitioners gather the information they need.

Action point 1: strengthening rights, capabilities and governance

- What are the current land-tenure arrangements?
- Do communities and residents have rights to manage their resources?
- Are incentives in place to promote responsible stewardship?
- Do people from outside the community control or influence decisions?
- Are governance structures transparent and effective?
- What is the capacity of local organizations and institutions? How can it be strengthened?
- Do poor people have a voice? If not, what needs to be done so they can be heard?
- Is the community facilitating poor people's access to services such as education and health?

Action point 2: reducing vulnerabilities

- What measures are in place to protect the most vulnerable against sudden crisis and hardship?
- Is the role of trees outside forests to fill subsistence needs and to generate income recognized?
- Is there sufficient support for tree-planting initiatives? If not, how can it be increased?
- Is poor people's access to forest resources over-regulated compared with more powerful interests?
- Are regulations governing poor people's use of forests excessive or inconsistent?
- Does regulation exceed the capacity of authorities to enforce?
- If regulations are overly complex, is there scope to simplify them?
- What are the requirements for management plans? Can small-scale forest entrepreneurs comply?

Action point 3: capturing emerging opportunities

- What barriers prevent small-scale producers of forest goods from entering the market?
- What constraints do poor people face regarding access to profitable opportunities such as secondary processing?

- What information is available on market supply, demand and competitive pricing?
- Are skills available to operate successful enterprises? If gaps exist, how can they be filled?
- Is there potential to develop markets that pay for environmental services such as watershed protection, carbon storage and biodiversity conservation?
- What financial support is available to poor people in terms of grants, loans and subsidies?
- Can current returns be increased by, for example, improving product quality, securing reliable supplies, removing intermediaries and selling seasonal products when prices are the highest?

Action point 4: working in partnership

- Do forest policies and programmes at the community level include strategies to reduce poverty?
- Do local poverty reduction strategies include forestry dimensions?
- Do agencies and stakeholders concerned with poverty reduction regularly exchange information and experiences?
- What mechanisms are in place to foster local collaboration and coordination across sectors, including joint financing, to address the many facets of poverty?
- What support is needed to establish or strengthen public-private partnerships and cooperatives?

ADAPTING INTERVENTIONS TO LOCAL CONTEXTS

Users of this guide will be working with local people who have different levels of dependency on forest and tree resources:

- hunters and gatherers and shifting cultivators living within or close to forests;
- settled poor landless people seeking employment and income opportunities;
- small farms that rely on outside resources for a substantial part of their livelihood needs;
- traders of materials collected from the forest;
- farms that are largely self-sufficient with regard to their tree resources.

Table 1 provides an overview of livelihood linkages, issues and possible intervention strategies in sample households. Practitioners are encouraged to adapt these examples to make them relevant to local conditions.

TABLE 1
How to help improve livelihoods of people who depend on forests

Dependence on forest	Livelihood linkages and issues	Possible intervention strategies
Forest-dwelling hunters/gatherers and shifting cultivators	<p>Forests are the main source of livelihoods.</p> <p>Forests are often managed collectively.</p> <p>Systems can be difficult to sustain when exposed to external change (logging, market pressures, etc.).</p> <p>Pathways out of poverty are more likely to be agriculturally based.</p>	<p>Assist in evolving more effective collaborative management systems.</p> <p>Assist with access to government services.</p> <p>Provide support in the shift away from unsustainable activities.</p> <p>Help exploit new or expanded opportunities for marketing agroforestry products.</p>
Settled landless poor households depending on forests for employment and collection/sale of forest products	<p>Forests provide a range of livelihood options and employment opportunities.</p> <p>Populations are often socially excluded with little representation of their interests.</p> <p>Pastoral populations without access to common pasture or forest grazing must purchase fodder or lease grazing land.</p>	<p>Employ mixed survival strategies to reduce risks.</p> <p>Consider impact of changes on labour requirements.</p> <p>Offer skills training and assist with access to finance to enable the move to established trading.</p> <p>Facilitate access to land for farming.</p>
Farm households dependent on adjacent forest resources	<p>Forests complement or supplement what can be produced on-farm or what can be supplied more efficiently from off-farm tree resources.</p> <p>Forests can be important in meeting both subsistence and income needs.</p> <p>As exposure to markets increases, conflicts are likely to arise between those depending on the resource for subsistence and income.</p>	<p>Assist communities to cope with internal conflicts over control and access to local forest resources and forest land.</p> <p>Help manage response to growing pressures from external users (including State forest services that are commercial producers of forest products).</p>
Households selling or trading forest outputs as a major source of income or employment	<p>Can include landless as well as farm households, and urban as well as rural.</p> <p>Many trades are characterized by low returns and stagnant or declining prospects.</p> <p>More remunerative trades often require inputs available only to the wealthier and more skilled.</p>	<p>Identify potentialities and constraints to make production and sale of forest products viable.</p> <p>Carry out supply chain analysis for selected trades capable of raising incomes.</p> <p>Link producers to sources of credit and other inputs.</p> <p>Help households to access market information and build alliances with local service providers.</p>
Farm households using on-farm tree resources for much of their forest-related needs	<p>Reduced access to forest resources and changing availability and allocation of land and farm labour can favour on-farm management of trees.</p> <p>This option is only available to those with access to land they can plant without jeopardizing household food supplies.</p> <p>Only available for those not subject to tenure constraints militating against investment in trees.</p>	<p>Promote appropriate tree choices and management practices.</p> <p>Help provide information that strengthens farmers' ability to assess market prospects more accurately.</p> <p>Clarify or modify tenure conditions that appear to put tree growing at risk.</p> <p>Help remove or revise regulations that unnecessarily restrict private production and sale of tree products.</p>

4. Facilitating local income generation

MICROFINANCE

Microfinance schemes provide small loans and usually require short repayment periods. They function on the basis of reasonable interest rates, and collateral is not always needed to obtain approval. When linked to other interventions such as training in technical and simple business skills, microfinance can be instrumental in establishing successful enterprises. Business plans must be viable and, in the case of forestry, may require securing rights and access to forest and tree products. Loans can then be used as working capital to accumulate stock, rent or buy transport to reduce dependency on intermediaries, and rent market outlets. Funds can also be used to purchase equipment. See Box 2 for more information.

Support to small-scale forest enterprises through microfinance can enable poor households to build material goods, increase income and reduce their vulnerability to economic stress and external shocks. Access to credit has often proven to be

BOX 2

Microfinance

How microfinance may be used

Microfinance can cover:

- capital costs to improve productivity and quality;
- working capital to purchase equipment and materials.

Microfinance should be linked to building the skills of borrowers to maximize use.

Terms and conditions need to identify use of funds, whether there is a need for a development phase and when cash flow is expected to improve.

Information required

- Size, timing and duration of financing needs
- Separation of capital items from working capital needs
- Level of financial management skills and expertise
- Impact of charges and security requirements of loans
- Methods of ensuring finance is spent on stated items
- Realistic projection of enterprise cash-flow, including interest charges and repayment terms, prior to financing
- Impact of lending to some poor people but not others

the first step out of poverty because it gives people an opportunity to break free from situations where they provide cheap labour for others to profit. However, borrowing money to establish an enterprise entails risks, so poor people must take into account the need to protect themselves against possible losses.

When in desperate need of money, some people borrow from private lenders at unreasonably high rates. Because they must then use all available revenue to pay interest charges, the capital portion of the loan is either never repaid or paid slowly. Microfinance services can provide a release from this vicious cycle because the amounts borrowed are often small.

Commercial financiers are seldom interested in lending poor people money because the amounts are modest, transaction costs are high and few people can offer collateral, especially if they do not have secure tenure and access rights. Operators of small-scale forest enterprises often fall into this category.

Increasing the chances for poor people to improve their livelihoods from forestry involves assisting them to secure finances for purchasing equipment and materials. If they are able to buy or hire a vehicle to take fuelwood to customers in other towns, for example, they might be able to charge more than local residents and commercial buyers are willing to pay. Making information available on the prices of certain products in nearby markets could also make the difference between a profitable and unprofitable enterprise. Local capacity to add value to forest products helps to increase revenue as well.

Practitioners can help minimize risks associated with microfinancing schemes by lobbying on behalf of poor people for reasonable interest rates and repayment schedules. In addition, they can bring together those who have used microfinance to share experiences with those who are interested in exploring it. Practitioners can also help microfinance lenders such as bankers, private entrepreneurs and development projects to better understand the dynamics of small-scale forestry enterprises, including the factors which contribute to their success.

PROCESSING TO ADD VALUE

With so many forest products on the market, processing adds value that often surpasses what the raw material is worth. More and better processing at the local level can increase the quantity, diversity and stability of income flows to people living in and near forests. Care must be taken, however, to identify those who are likely to assume the greatest share of the burden in terms of time and effort versus those who stand to gain the most from the extra revenue generated (Box 3).

Practitioners can assist poor people who want to engage in local processing of forest products by seeking information and advice on:

- the quantity of raw materials available and the potential for their sustainable harvesting;
- demand, competition and market prices;
- the scope to develop strategic alliances throughout the production chain;
- investments required for material and equipment;
- the type of skills and labour needed versus those that are available;

BOX 3

Adding value**Aspects to consider**

Adding value includes taking measures to prevent the degradation of products that, for example, can be caused by improperly storing fruits or incorrectly stacking sawn boards.

Entrepreneurs dealing in value-added products face greater competition and additional risk. They must be able to consistently meet higher standards and specifications that consumers in these markets demand. Supplies must also be reliable – a requirement that the poorest groups may find difficult to meet.

It is also important to assess realistically the additional inputs required to add value to products versus the expected increase in revenue.

Information required

- Current market opportunities, including potential niche markets and the players
- Capacity of markets to absorb new supply and pay good prices
- Constraints such as seasonality and transport losses
- Control down the supply chain – e.g. sales to intermediaries who provide transport on their terms
- Ability of groups to develop and service markets
- Negative impacts on some poor people when markets are developed
- Sustainability of resource base

- transportation costs to the market;
- the extent to which processing can add to current revenues;
- maintenance costs and availability of spare parts before purchasing equipment.

MARKET ANALYSIS AND DEVELOPMENT TO ASSIST SMALL-SCALE ENTERPRISES

One of the most promising practical tools for developing locally based forest enterprises is Market Analysis and Development (MA&D) – a participatory process that FAO designed to help communities and individuals start viable enterprises and secure markets through the sustainable use of natural resources and the equitable distribution of benefits. The approach is directed at people who use tree and forest products for generating income. It is not just for subsistence purposes.

By taking environmental, social, technological and commercial aspects into consideration, MA&D assists communities in linking participatory natural resource management and conservation with income generation (see Box 4). Because the

approach focuses not only on socio-economic aspects but also on ecological sustainability, it is especially applicable to enterprises that base their activities on resources that need to be protected or conserved. Its emphasis on strategic alliances and institutional development ensures that local enterprises become independent and sustainable. MA&D is a user-friendly and flexible methodology that provides guidelines for potential entrepreneurs, field practitioners and managers.

The MA&D approach supports four key aspects of sustainability:

- **Resource sustainability.** An integral part of identifying and planning potential enterprises is assessing the sustainability of local environments, avoiding overexploitation of resources.
- **Market sustainability.** Increased capacity of locally based forest enterprises will improve their chances to remain competitive, identify market chains, respond to market changes and increase bargaining power.
- **Social and institutional sustainability.** Local participation and capable institutions support the development of successful small enterprises. The process includes assistance to help identify potential areas of conflict; to ensure that activities do not harm disadvantaged members of the community; and to promote equitable sharing of responsibilities and benefits between men and women.
- **Technical sustainability.** Men and women will access information about adding value to their products and will select technologies that best fit their interests and capabilities while taking into account market needs and demands.

Building capacity through the MA&D process – how it works

Planning phase (before involving communities). The field practitioner assesses the local or national environment (natural resources and their potential, markets, stakeholders), identifies intervention sites and adapts tools to local or national circumstances.

Outcomes include:

- assessment and identification of possible products;
- overview of other activities and related sectors that offer potential such as tourism;
- better understanding of primary stakeholders' needs, following a livelihoods analysis;
- agreement on the roles and responsibilities of each partner in the process;
- identification of constraints and opportunities of projects/locations selected;
- formulation of strategies for the sustainable use of natural resources.

The MA&D process consists of three phases, all of which involve local people.

Phase 1: Assess the situation at the local level. Under the guidance of the field practitioner, the community identifies potential entrepreneurs; inventories resources and products, including those that are already providing income for local people; identifies constraints of the current market system; and eliminates the

BOX 4

Community-based forest enterprise development in the Gambia

In 2001, the Gambian Forestry Department piloted the MA&D approach to generate income from community forests, in line with its concept of forest management. Based on encouraging results, a project was established under the FAO Technical Cooperation Programme to train Forestry Department personnel in MA&D methodology so that they could facilitate the development of community-based enterprises using products, resources and services from community forests. Twenty-six villages in three divisions adopted the approach. National trainers helped villagers to collect information on technical and market issues and organized meetings that exposed them to potential alliances with traders, technical experts and credit providers. All villages have started production and marketing based on the MA&D process. Enterprises include those established to sell fuelwood and logs, arts and crafts, honey and other non-wood forest products (NWFPs), in addition to eco-tourism ventures. Activities have generated significant income and have had a positive impact on the way the communities manage their forest resources. The Forestry Department now wants to train staff throughout the country as well as to train additional trainers in the three divisions where the concept was introduced.

Examples of impacts during the pilot project:

- **Policy.** Constraints related to issuing and supervising forest utilization licences and permits were revealed and measures taken to address them, including strict enforcement of the law and better coordinated field supervision with the assistance of villagers.
- **Economic.** The MA&D approach has changed both the production and marketing strategies of groups. For instance, the average price villagers received for one truckload of fuelwood was almost ten times greater after studying the market in 2004, as opposed to before they started the study in 2003.
- **Social.** The experience gained during the market surveys helped to enhance the bargaining skills of entrepreneurs. Villagers now know the difference between marketing and selling. They also established federated groups as a platform to exchange information and improve sales.
- **Ecological.** MA&D has increased revenues local people receive from forest resources, and this has inspired them to protect this asset by preventing and fighting fires. Several villages have requested that community forest areas be extended.
- **Institutional.** An MA&D module was introduced into the forestry school's curriculum and is now being taught to students.

non-viable products. Local people interested in developing enterprises determine economic objectives.

Outcomes include:

- short list of products on which to base the next phase of MA&D;
- identification of local people interested in developing enterprises;
- understanding of the social, environmental, technical and institutional contexts of a range of products;
- establishment of a group to undertake the next phase.

Phase 2: Identify products, markets and means of marketing. Under the guidance of the field practitioner, the community selects the most promising products from the short list for further analysis and decides on the enterprises that are likely to be the most viable.

Outcomes include:

- potential products identified;
- data collected for designing a business plan;
- formation of interest groups around promising products;
- team assembled to undertake phase 3.

Phase 3: Plan enterprises for sustainable development. Under the guidance of the field practitioner, the community prepares the enterprise strategies and business plans. Entrepreneurs are guided through a pilot phase and receive skill development and entrepreneurial training. They learn to monitor progress of their enterprises and to adapt to changing markets.

Outcomes include:

- enterprise strategies for the selected products;
- marketing and management plans;
- action plans to ensure proper implementation;
- financing obtained as specified in the capital needs statement;
- establishment of pilot enterprise;
- training needs addressed.

5. Forestry interventions to reduce poverty

HOW NATURAL FORESTS CAN BETTER CONTRIBUTE TO LIVELIHOODS AND POVERTY REDUCTION

Because natural forests provide a variety of goods and services to different user groups, their importance to each must be clearly understood before making interventions. Natural forests not only act as a savings account for people living in and around them, but they also provide a range of products for subsistence. Before community leaders or other authorities decide to harvest valuable timber species, they should assess the potential of the resources that will remain as these resources provide food, medicines, and woodfuel to residents, especially poor people.

Practitioners and others must not simply consider natural forests in terms of the economic value of timber. It is important they draw on local knowledge to learn the full range of benefits and functions of these resources and how different groups use them. By facilitating discussion among the various stakeholders, practitioners can guide the development of collaborative strategies to achieve common goals. They can also help to assess the impact of interventions on livelihoods by studying and analysing the complex interactions between local people and forests (see Chapter 6). Information can then be used, for example, to lobby concessionaires in order to make them consider people's needs for local forest products and services in their harvesting plans. In addition, practitioners can play a role in convincing companies to hire local people and pay fair wages or to form partnerships.

Box 5 illustrates how people in Ixtlan de Juarez, Mexico, established enterprises to generate income from the natural forest. The example shows that when rights and standards are in place higher revenues promote sustainable resource management.

Experience has shown that certification schemes increase the cost of forest management but, so far, most consumers are reluctant to pay a premium for certified products. This situation may change in the future as schemes become less costly and more feasible for poor people to implement. Ecotourism, in some cases, has given local people an incentive to invest in forest protection and management because they can be hired as guides, including to wildlife trophy hunters. However, when contemplating ecotourism ventures, practitioners and communities need to recognize that tourist demand fluctuates and people coming in from the outside can have potential negative effects on the local culture and environment.

BOX 5

Making the most of natural forests: timber processing and ecotourism in Ixtlan de Juarez, Mexico

Ixtlan de Juarez, a community rich in forests and biodiversity, is located in the highlands of the Sierra Norte of Oaxaca in Central Mexico. Before the State-owned paper mill (Papelería Tuxtepec) granted the village forest access rights in 1972, it employed residents in low-skill and low-paying jobs, giving them few direct benefits from the resource.

After securing rights, the Ixtlenos established enterprises to manufacture planks and other value-added products such as tables, chairs and doors, which were sold mainly in central Mexico. Located in one of the poorest states in Mexico, Ixtlan now enjoys an income per capita that is twice the state average.

Ixtlan's operations are managed communally and members share in the responsibilities and benefits. Ecotourism programmes, with an emphasis on bird-watching activities, complement their other ventures. At the end of the year, excess revenue is reinvested in businesses or helps to pay for public services such as schooling, road works and sewage treatment.

Ixtlan is now setting up a new furniture factory, which is expected to increase production tenfold. To any visitor, the welfare of the Ixtlenos is obvious – the economic benefits from the sustainable use of natural forests have improved livelihoods.

Although Ixtlan's operations have been certified as sustainable from an environmental, social and economic perspective, the community is selling their timber without the certification label because their market does not demand it. Its timber products are in fierce competition with cheaper products from unsustainable sources, but the benefits of being certified have given the enterprises easier access to the government's programme on payments for environmental services.

HOW PLANTED FORESTS CAN BETTER CONTRIBUTE TO LIVELIHOODS AND POVERTY REDUCTION

Planted forests can be used for the industrial production of wood, fibre or NWFPs. Non-industrial production, on the other hand, is mostly for producing fuelwood and charcoal, restoring landscapes, rehabilitating degraded lands, combating desertification and protecting soil and water.

Industrial-scale planted forests sometimes replace natural forests on which local people relied for their livelihoods. When private firms offer sustainable options and incorporate the views of residents at the planning stages of operations, communities can provide a valuable source of labour. If well planned and managed, industrial planted forests can decrease the vulnerability of poor people by introducing outgrower schemes, for example (see Boxes 6 and 7).

BOX 6

Outgrower schemes: key design features

- Both parties have balanced power in negotiating the partnership agreement.
- The deal is flexible and there is room for renegotiation under a long-term contract, for example in terms of salary rates and pricing to cover inflation.
- Mechanisms such as regular meetings are in place to enhance transparency and accountability among and within stakeholder groups.
- A clear reinvestment strategy is in place, which covers industrial aspects as well as capacity building within stakeholder groups.

What makes outgrower schemes work?

- Responsibilities and benefits are clear to both parties and have been agreed on a fair basis through a reasonable deal.
- The design and implementation of cost- and benefit-sharing mechanisms consider livelihood flows. Management systems reflect awareness of the responsibility for forest protection, fair pricing and sustainable livelihoods.
- Appropriate government policy is in place and regulations are enforced by both public and private enterprises, for example through equitable benefit-sharing schemes.
- Corporate social responsibility is evident in the workplace through regulations that govern health and safety standards, for example. Good social responsibility can also entail providing basic services such as access to water and sanitation, health, education and labour rights.

Source: Howard et al., 2005

In some instances, local people are involved in planting and maintaining trees in large-scale planted forests so that they can access the land between the trees to grow crops until the tree canopy closes. This system is known as *taungya* and, for poor landless people, it is an important alternative to leasing land. However, the plantation owners and those using the forest land in this way need to agree beforehand on the types of crops that will be grown and the period of intercropping.

On a smaller scale, woodlots at the village, farm or cooperative level can be established as an investment or as a safety net. However, the right to harvest and sell trees is important, as is the need to conduct a thorough cost/benefit analysis before making any decision to proceed.

Practitioners can help to maximize the contributions of planted forests to improve livelihoods and reduce poverty in numerous ways: sourcing good planting stock and providing information on seed treatment or advising on seedling care, for example. Given that planted forests are a medium- to long-term investment, species selection is key – perhaps choosing fast-growing species that

BOX 7

Sappi Forests Outgrower Scheme

Sappi Forest Products, headquartered in South Africa, owns and manages about 540 000 ha of plantations to produce bleached and unbleached paper pulp, newsprint and kraft packaging paper. It launched the Sappi Forests Outgrower Scheme in 1983 to increase its source of timber supply, create jobs in impoverished communities and promote socio-economic development. Within a period of nearly 20 years, the project grew from three farmers managing 12 ha to more than 8 600 growers managing 13 000 ha in rural KwaZulu-Natal.

The company provides small farmers with free seedlings, technical advice, a guaranteed market for their products, interest-free loans to establish trees and cash advances while crops mature. In return, growers contract to sell their trees to Sappi when they are ready to be harvested. The company's nurseries supply the best genetic material available, seedlings that are suited to the area. Extension officers then assist growers to select appropriate sites, prepare and fertilize the land and carry out planting. They return frequently to support activities related to weed control and the preparation of firebreaks. If requested, Sappi staff also assists growers in negotiating fair market prices with harvesting and transport contractors.

In addition to creating employment for growers participating in the scheme, contractors have hired an estimated 1 120 people to assist with planting and harvesting. The project has encouraged other businesses in the area to open, creating about 750 extra jobs.

Source: Kirsten and Sartorius, 2002

can be harvested for light construction material within few years, together with higher quality timber species that take longer to mature. Practitioners can play a key role in assisting local people to negotiate benefit-sharing mechanisms with outside firms or among themselves when the trees are planted. They can also help to keep expectations reasonable by pointing out potential bottlenecks, such as high transportation costs to markets and the complex procedures for obtaining licences to harvest and sell trees (Box 8).

Practitioners can broker fair deals among forest dwellers, forest managers, company executives, employees and unions. They can also help to secure government support to ensure due process and to raise awareness of company officials of the social benefits that responsible forest management brings to local communities and residents. Once understood, this aspect can be included in any partnership agreement before it is signed.

In some cases, government corporations may fund the establishment of small-scale planted forests for non-industrial woodfuel production and environmental purposes. Farmers and smallholders may invest in these ventures with in-kind resources such as labour or capital, in partnership with public and private entities.

BOX 8

Land cooperatives in Viet Nam

In 1982, the government of Viet Nam began allocating land to cooperatives, households and individuals for tree planting and forest establishment. Under Decision 184, tens of thousands of farmers in north and north-central Viet Nam were each given 0.5 to 1 ha of non-forest land to cultivate. In 1994, Decree 02/CP granted land for forestry for up to 50 years (with possibility to extend), waived land-use taxes and instituted policies to support investment.

Most owners of newly established farms prefer to invest in activities that bring quick returns such as agricultural production and animal husbandry, but they will engage in forestry if the government provides support. A typical farm in the Luc Nam district of Bac Giang province, established in the early 1990s, consists of 4.5 ha of forest land for afforestation, 6 ha of fruit trees and 0.5 ha for the residence and rice field. Of the total capital invested (Viet Nam dong 84.5 million, the equivalent of about US\$5 400), more than half was devoted to fruit trees. The family provided about US\$4 400 in cash and labour and a bank loan of less than US\$100 helped buy seedlings. Support from various donors consisted of about US\$900, which was spent to level the land and purchase seedlings, fertilizer and pesticides.

From 1991 to 1995, the family invested in animal husbandry, agricultural production and forest planting. In the next five years, the family opened a fish pond and cleared land to grow fruit trees, which were then planted in a third phase. Production costs in 2002 amounted to the equivalent of about US\$2 100, of which about US\$85 was spent on forestry. The sale of timber and fuelwood, however, generated income of more than US\$500 over the same period and was expected to yield the equivalent of US\$950 in 2005.

The study on farm forest development in Viet Nam concluded that farm forest owners are better off than in the past but still face obstacles, including lack of education, training and information on markets. In addition, licensing procedures for timber harvesting and selling are complicated and transportation costs are high. Farmers also find it difficult to sell their product to small wood-processing units and industries because of the limited quantities and poor quality. Selling to private traders has worked well but this practice consumes a large portion of the price at the mill gate. Findings from the study also show that further progress can be made when government procedures are streamlined and anti-corruption measures are stepped up.

Source: Ministry of Agriculture and Rural Development, Government of Viet Nam and FAO, 2003

However, the rights and responsibilities of the partnership ought to be clear so that farmers and smallholders can assess the risks to determine whether they should choose another type of enterprise or employment.

Corporations and communities are increasingly forming partnerships that better take livelihood issues into account in commercial operations. One example

is outgrower schemes, where companies contract communities or individual landowners to plant trees and supply them with a specified amount of timber at an agreed price. In cases where prices are set prior to delivery, suppliers bear the risks of market fluctuations. In other instances, landowners are allowed to sell to a third party.

The benefits of partnerships should be clear and measurable to all parties, and parameters for monitoring quality and effectiveness need to be established as well. Reaching agreement on management plans, roles and responsibilities before implementation facilitates the assessment process.

AGROFORESTRY

Agroforestry is a dynamic and ecologically based natural resources management system that integrates trees on farms, ranches and in other agricultural landscapes for diversifying and increasing production. For hundreds of years, small farmers have nurtured trees for the social, economic and environmental benefits they provide. Agroforestry systems have the potential to generate cash income and to provide poor households with a more reliable supply of food, home-grown medicines and substitutes for products they cannot afford to buy – for example, nitrogen-fixing tree plants instead of mineral fertilizers; fodder shrubs instead of dairy meal; timber for the construction of buildings; and fuelwood for energy (FAO, 2005).

Main agroforestry practices include improved fallows, home gardens, alley cropping, combining trees and crops in multi-storeys, boundary planting, agroforests, woodlots, orchards, windbreaks and other types of shelterbelts, hedges and live fences, fodder banks, trees on pasture, and *taungya* systems. Farmers usually adopt and adapt tree-growing patterns that complement their crops, or use land that cannot be used agriculturally because of site characteristics or labour shortages.

A major challenge in agroforestry is to adapt existing systems to local ecological, economic, social and cultural conditions because doing so is often more effective than imposing new ones. A particular constraint for poor people is that they do not always have access to the intensive labour that some agroforestry systems demand, such as fodder production or maintenance of intercropping. Moreover, incentives are often inadequate to cover the risks and costs of changing from annual agricultural crops to agriculture/tree-based systems. Another limitation is the cross-sectoral nature of agroforestry, which makes collaboration among institutions difficult since it requires the interaction of a variety of technical, policy and legislative specialists.

On the positive side, agroforestry systems allow product diversification which, with sound marketing strategies, can generate profits throughout the year from the sale of trees, NWFPs and surplus crops. They provide short- and long-term opportunities to generate income as the example from Kenya shows (Box 9). In addition to tangible livelihood benefits, agroforestry systems offer important environmental benefits that affect livelihood capital and flows – windbreaks

protect soil from erosion and improve production by sheltering crops, and selected tree planting increases biodiversity.

Practitioners should consider the following suggestions when working with households, small farmers and communities on issues related to agroforestry development.

Agroforestry as part of good farming and agricultural practices

- Because agroforestry is one option among other farming production systems, help small farmers to assess their risks and determine ways to optimize the integration of trees into their operations – with crops, farm animals, herds, wildlife, aquaculture, as fruit orchards or in commercial forestry.
- Identify factors that will influence a farmer's decision to practice or expand agroforestry – exchanges, site visits and workshops offer good opportunities to share information and promote wider adoption of successful agricultural practices.
- Encourage small farmers to combine agroforestry with other good practices such as conservation agriculture (zero tillage, minimum integrated pest management) and biological agriculture.

BOX 9

The use of fodder in central Kenya

Farmers and pastoralists have long used tree fodder to feed their livestock but traditional practices tend to be extensive, with farmers lopping off branches or allowing their animals to graze. One of the challenges is to develop systems where trees can be planted close to each other and pruned or grazed intensively.

In the highlands of central Kenya, about 70 percent of farmers own stall-fed dairy cows, averaging 1.7 cows per household on farms 1 to 2 ha in size. Feed shortage is a critical problem. Since the mid-1990s, more than 30 000 Kenyan farmers have used fodder shrubs, especially *Calliandra calothyrsus* and *Leucaena trichandra*, as feed to increase milk production. They grow the seedlings in communal nurseries and plant the trees in hedges on their farms, around the homestead, along field boundaries and along contours to curb soil erosion. Between 1996 and 2001, farmers earned as little as US\$54 per cow per year, or as high as US\$98, depending on whether they used the fodder as supplements to increase milk production or as a substitute for purchased dairy meal which they found expensive and of unreliable quality.

Rather than cash, farmers only need small amounts of land and labour to plant fodder shrubs. The shrubs also conserve the soil, supply fuelwood and provide bee forage for honey production. Some farmers also earn money by selling seeds. When used as a supplement, fodder leaves may also improve animal health and reduce the calving interval.

Source: Franzel, Wambugu and Tuwei, 2003

- Raise awareness of the importance of agroforestry in meeting nutrition and health needs.

Land and tree management

- Assist small farmers and communities in choosing appropriate agroforestry production systems by taking into account the spatial distribution of trees; the choice of tree species; how farms are linked to surrounding ecological environments (i.e. landscape, watershed and ecosystems); access to incentives such as free seedlings or government subsidies for tree-based production systems; and training needs.
- In production systems that mix trees and crops, assist farmers in selecting tree species according to their capacity to:
 - be grown together with crops;
 - improve soil fertility;
 - serve as shelter against wind, sun, sand and rain;
 - protect against encroachment of livestock and wildlife;
 - serve as boundary markers;
 - act as a transition from annual crop into tree-based systems (e.g. *taungya*; multi-storey of banana-coffee-trees for roundwood);
 - provide fodder and a variety of other products such as gum (e.g. *Acacia senegal* and *Acacia seyal*);
 - be part of an integrated pest management system (e.g. neem – *Azadirachta indica*).
- Encourage diversification within agroforestry systems and distribution of trees on the farm in such a way that they produce a variety of products that can be harvested year round:
 - fruit production from the orchard, the agroforest and the home garden;
 - fuelwood and charcoal production from woodlots and from trees and tree parts recuperated from the pruning of orchards, windbreaks and living fences;
 - wood products such as poles and roundwood.
- Help establish seed stands and nurseries to provide small farmers with better access to quality planting material.
- If the goal is to increase cash income, help to choose tree species that yield products that are valued in the market.

WOODFUEL

FAO defines woodfuel as all types of biofuels from trees and shrubs grown in forest and nonforest lands, including on farms. The term includes fuelwood and charcoal derived from silviculture activities such as thinning, pruning and harvesting – tops, roots and branches, for example; industrial by-products from primary and secondary forest industries; and recovered wood such as construction materials and pallets that are used as fuel. The definition also encompasses woodfuels from forest energy plantations (FAO, 2004).

Most consumers of woodfuel in rural areas harvest fuelwood freely from scattered trees on farms, fallows or as a by-product of timber production. Open access can lead to unregulated cutting, resource depletion, land degradation and desertification. Similarly, unsustainable charcoal production can degrade or exhaust the supply of certain species. Shortages can also occur when agricultural expansion, uncontrolled fires and overgrazing reduce forest areas. At the other extreme, restricted or inequitable access and over-regulation can lead to illegal cutting.

The difficulties associated with collecting scarce woodfuels increase the vulnerability of women because they have little or no time to engage in productive activities. Children are also adversely affected because the hours they must spend searching for fuelwood may prevent them from attending school. Substitute fuels such as gas, oil and electricity are either not available to poor families or not affordable.

In addition, smoke in the home from cooking on open fires with wood, dung, crop waste and coal is one of the major causes of an estimated 1.5 million deaths every year, 1 million of whom are children (ITDG, 2006).

The extent to which the forest area is maintained and made accessible to poor people directly affects their well-being and livelihoods. It is estimated that more than one-third of the world's population – 2.4 billion people – relies on biomass energy (wood, crop residues, charcoal and dung) to prepare meals, boil water and heat and light homes. Of this figure, about 1 billion face shortages as supplies dwindle (M. Trossero, personal communication).

Charcoal and fuelwood are a main source of cash for poor people living in and around forests. Although the informal and unregulated nature of woodfuel harvesting, transportation and commerce mean that supply is often unreliable, this situation makes it easier for them to participate in the sector.

How to maximize the contributions of woodfuel to livelihoods and poverty reduction

Before practitioners can identify ways to assist rural poor people to address issues related to woodfuel, they need to gather information on:

- all current and potential sources of woodfuels, including farms, fallows and forests;
- where rural people collect fuelwood and charcoal;
- what they use fuelwood and charcoal for;
- how much fuelwood and charcoal they consume and how much they sell;
- the problems poor people face in relation to woodfuel and whether these can be solved locally;
- if they have a surplus of fuelwood and charcoal to sell to urban markets, the extent of demand, the capacity to fill shortages and the ability to develop new markets;
- the difficulties that women face in collecting, storing and using fuels;
- how energy, agriculture and forestry regulations affect them.

BOX 10

Natural forest management and woodfuels in Burkina Faso

Burkina Faso's overuse of forest resources led to the deterioration of areas around the capital, Ouagadougou, because of the uncontrolled fuelwood harvesting and charcoal production to meet the needs of the urban population. At the government's request, the United Nations Development Programme financed a project, which FAO supported, to develop a national programme for the management of natural forests with a view to achieving the sustainable production of wood and non-wood forest products, particularly fuelwood and charcoal.

Contrary to previous practices, the government of Burkina Faso developed management plans in the late 1990s for 80 000 ha of forests surrounding Ouagadougou with the active participation of residents. The initial phase consisted of compiling an inventory of resources and conducting a study on wood consumption. Based on findings that demonstrated unfulfilled market demand, stakeholders decided to set aside certain forest areas for the exclusive production of woodfuels. The project offered technical advice on silvicultural practices, including appropriate site-specific interventions, and on the most suitable species for reforestation. Not only did the supply of fuelwood and charcoal increase to better meet urban needs but the additional sales also generated 50 percent more income for villagers. Implementation of the management plan also resulted in the designation of more forest area for conservation and protection purposes. Moreover, some of the revenues have been used to cover operational costs such as administration, the maintenance of trails and the prevention of wildfires. Economic returns, therefore, have provided villagers with the incentive to use forest resources in a sustainable manner.

Plans are under way to manage a further 570 000 ha in Burkina Faso, using Ouagadougou as a model. In addition, other Sahelian countries have expressed interest in adopting a similar programme.

Once informed, practitioners can help communities to develop sustainable forest management plans that consider energy aspects, including charcoal production, based on the availability of suitable species and on market needs and prices. They can also encourage tree planting specifically for woodfuel production and provide technical advice on the appropriate tree species to use (Box 10).

NON-WOOD FOREST PRODUCTS

Non-wood forest products (NWFPs) consist of goods of biological origin other than wood that are derived from forests, other wooded land and trees outside forests – edible nuts, mushrooms, fruits, herbs, spices and condiments, aromatic plants, game, fibres, resins, gums, and other plant and animal products (FAO, 1999). Although these products are gathered mainly from the wild and from

natural forests, some planted forests established for the purpose of supplying wood also provide grass and leaves, both of which are important to livelihoods.

NWFPs play a crucial role in meeting the subsistence needs of a large part of the world's population who live in or near forests. They provide shelter, food and medicines on a daily basis as well as in times of crisis. For poor households, NWFPs are rarely the primary source of revenue, but can supplement income or lessen unexpected hardships such as the loss of crops. As long as people rely on these products for their basic survival and nutrition, care must be taken to prevent the resource from shrinking or being degraded.

NWFPs are also important in terms of their potential to improve livelihoods through the sale of surplus products (Box 11). In these instances, increasing forest areas or processing raw materials to add value could significantly enhance returns – making plant-based essential oils or manufacturing lotions and creams from shea butter, for example. Fair trade organizations can increase the amount of income that poor people earn as well, for example, by encouraging producer cooperatives to offer reasonable prices to suppliers, by providing good working conditions and by reducing the number of intermediaries in market transactions.

BOX 11

Pine nut production in the Kozac region of Turkey

Some 27 percent of Stone Pine (*Pinus pinea*) forests in Turkey are located in the 16 villages of the Kozac region. They produce about 1 000 of the 1 300 tonnes of the country's annual yield of pine nuts, 80 percent of which are exported. Of the 18 600 ha of Stone Pines in the area, 16 500 ha are on private land, 1 400 ha belong to villages and 700 ha are private plantations in State forests.

Rising revenues from pine nuts encouraged people to convert vineyards, fruit gardens and degraded coppice lands into Stone Pine stands. Higher income allowed them to invest in agriculture, horticulture and animal husbandry, thereby diversifying their economic base as well as that of the region. Because Stone Pine forests make good grazing lands, integrated land use became more common. Manure fertilizes the soil, and the trees' large canopy protects grass from the sun so that it stays green longer and develops better. The areas are opened to animals only when trees reach a certain age so that no damage occurs.

Because selling pine nuts increased incomes and employment levels, the Kozac region has experienced significant changes in socio-economic conditions: health services and infrastructure have improved, the use of modern devices has risen, education has increased, and families routinely take holidays – normally a rare practice in rural communities. These benefits have created a unity not seen in other parts of the country and fostered the development of business cooperatives that not only increased bargaining power but also created jobs (Sülüoğlu, 2004).

How NWFPs can better contribute to livelihoods and poverty reduction

In order for practitioners to assist poor people to overcome obstacles to collect, consume and sell NWFPs, they need to:

- discuss the importance of NWFPs with users and identify the type of contributions that they make to livelihoods, recognizing that households rely on these products to varying degrees, depending on the extent of their poverty and vulnerability;
- find out which groups gather which NWFPs, how they access them, and whether they use them for personal consumption, trade or both;
- be aware of traditional practices regarding harvesting and collection, including traditional norms of access;
- determine which households can afford to invest in commercial activities and whether this option is more appropriate than other potential sources of income for vulnerable groups;
- identify opportunities and constraints related to access, collection and trade of NWFPs.

Once practitioners obtain this information, they can start working with community leaders, users and other stakeholders to:

- compile an inventory as a first step in formulating or revising management plans and practices that reflect local needs and promote sustainable use;
- form local associations/cooperatives and develop cottage industries or community-based enterprises if commercialization of particular products appears viable;
- choose sites that have the potential to yield maximum benefits such as those where plants that are used for medicinal purposes could be grown in home gardens for households to consume or sell;
- document knowledge on and experiences with cultivating medicinal plants and disseminate this information in local languages to inform village residents which ones to use for what illnesses and how to set up this type of home garden;
- lobby authorities to give priority to local residents or communities when issuing permits to collect NWFPs, based on management agreements that regulate, monitor and control harvesting levels.

How wildlife can better contribute to livelihoods and poverty reduction

Wild animals historically have been a major source of food, clothing, weapons, medicine and rituals, although intensive use is declining because wildlife populations are decreasing. As an important component of forests, the sustainable management of wildlife requires a range of integrated approaches if lasting solutions to the supply crisis in many poor rural areas are to be found (Box 12).

Although gaps in information make it difficult to determine the extent to which bushmeat can alleviate poverty and improve livelihoods, evidence shows that poor people obtain a significant portion of their protein from this source, particularly in lean seasons. They also earn income from the sale of any surplus catch. While

BOX 12

Creating incentives for conservation

The World Wide Fund for Nature (WWF) is working with a village on the edge of the rainforest in southeast Cameroon to regulate the commercial hunting of bushmeat. With new roads opened for logging, local hunters and outside poachers were selling their catch to passing trucks for more money than they could earn from other activities. Collaborative efforts with the Ministry of Environment and Forests to stop such trading failed because it was impossible to patrol the large number of trucks travelling on the numerous roads.

Given the incentive to keep wildlife abundant for foreign hunters who pay large sums of money for trophies, villagers and WWF worked out a scheme by which residents hunted only for their own needs in return for the community receiving a portion of the licence fees that foreigners were charged. These revenues paid for improvements such as equipment for the school. The logging concessionaire also agreed to improve operations, provide jobs to local people and allow them to access forest products for their own consumption. To help restrict hunting, company trucks bring frozen meat back from the cities to feed workers.

Source: WWF, 2004

hunting wild animals is unlikely to be a major route out of poverty, if regulated and sustainable it can diversify livelihood options and provide a stepping stone for landless people to start a small business or money to invest elsewhere.

Open access. Despite the value of bushmeat as a source of high-quality protein and income, access is not tightly controlled in most cases. Individuals or entities generally do not own the resource *per se* so that local use or management rights are not well defined, especially over large areas that encompass several villages. As a result, hunters generally do not feel a sense of stewardship, preferring instead to capture as many animals as possible before others deplete the stocks. In addition, the equipment is simple (bows and arrows, guns and traps), hunting fits well with the farming cycle in terms of labour needs, and dried meat is easy to transport to market because it is light.

Illegal harvest and trade. Bushmeat is often harvested for meat, as well as for trophies, by using explosives, wire traps and other unlawful methods. Drivers of logging trucks then illicitly move carcasses to urban markets. These activities involve thousands of people and are spread over immense areas, many of which are remote and inaccessible. Efforts to regulate hunting and trade with the intention of benefiting poor people can have quite the opposite effect.

Given clear indications that current levels of wildlife harvesting are unsustainable in many places, finding solutions requires building national and local capacity,

clarifying rights, adopting participatory approaches to decision-making, using local knowledge and skills, and integrating bushmeat issues into broader strategies to improve livelihoods.

Field practitioners can address issues related to the sustainable use of wildlife by first learning about the local hunters, the trade in bushmeat and the links to livelihoods:

- which members of the village hunt;
- who decides and how decisions are made about where, when and what to hunt;
- traditional regulations, including taboos on certain species;
- the hunting methods used;
- the animals hunted;
- what is done with the meat;
- the problems hunters face;
- how they would improve the situation;
- how they spend their income;
- the relationship between hunters and urban traders;
- the changes occurring over time, if any.

On the basis of this information, practitioners can then suggest to village leaders and other authorities ways to maintain sustainable hunting levels, such as:

- combining indigenous and scientific knowledge to make rules, establishing closed seasons, setting quotas and monitoring populations;
- banning unsustainable hunting techniques such as night torching, long-line wire snaring, hunting with semi-automatic weapons, use of explosives;
- exploring collaborative management options with agencies and logging companies that are willing to undertake joint monitoring and research activities;
- giving exclusive rights or permits to villages based on simple management agreements that regulate, monitor and control hunting;
- establishing village conservation areas in which residents get paid to enforce hunting laws and regulations;
- designing programmes to control the transportation of meat on logging trucks and using the media to publicize abuses;
- identifying and promoting alternative sources of protein and income.

FIRE MANAGEMENT

Farmers in developing countries worldwide use fire to clear land for agriculture, renew pasture or burn crop residues to increase soil fertility. Fires set early in the growing season can reduce fuel build up and thus decrease the risk of incidences later (Box 13). However, hundreds of millions of hectares of forests, woodlands and savannah are lost each year when fires that are set for agricultural purposes burn out of control. Many rural communities do not have the capacity to extinguish these fires nor do they have the means to assess the root causes of the problem. Wildfires are especially devastating to poor people, because the forest resources on which they depend may suffer irreparable damage, leaving poor people even more destitute.

BOX 13

Controlled burning as a poverty reduction tool

If fire is excluded from African savannahs, the ecology moves towards closed forest. If fires are uncontrolled, especially late in the dry season, the tree component is degraded and in some cases destroyed. Early burning does not damage regeneration, most of which is by suckering or coppice rather than seed, and prevents tough perennial grasses from dominating. A flush of new grass immediately follows burning so that graziers engage in this practice late in the season when grass is scarce and they can use fire as a hunting tool. In time, however, late fires damage woody vegetation and reduce grazing capacity.

Controlled burning at the start of the dry period should be carried out in early morning when ground vegetation is covered with dew. Skills to perform this task can be readily learned, but it is labour intensive because strict controls need to be in place, usually in the form of fire lines to start the burn and additional lines to prevent excess spread. Therefore, the period that controlled burns are undertaken must not conflict with arable cropping. If timed properly, the practice is a source of income when alternative demand for labour is low or nil.

In addition to employment, woodland productivity increases because younger stems are untouched and can be harvested to use as poles and coppice. Grass also contains more nutrients and this, in turn, enhances livestock productivity. In northern Namibia, for example, the economic value of increased livestock productivity rose substantially over a three-year period.

Source: FAO, 2002

Some authorities view fire management only in terms of suppression, ignoring the use of this tool to meet specific goals. In countries that outlaw burning, communities are often denied help to manage the risk of uncontrolled fires, local people are refused access to forest resources, and conflicts arise between farmers and officials who do not understand the importance of fire in traditional agricultural practices.

For poor people, fire is a cheap and effective tool to grow crops, manage pests and diseases, increase honey production and drive wild animals into the open during a hunt. However, without proper control, these fires can potentially endanger people's lives and livelihoods, burning homes, fields and forests.

How fire management can contribute to livelihoods and poverty reduction

The high proportion of forest fires caused by agricultural fires that burn out of control provides a strong incentive for communities to protect the resource as long as they own or have user rights (Box 14). Under these conditions, practitioners can better help local people to prevent wildfires by:

- learning the causes and functions of various types of fires and their effects on the livelihoods of groups within and outside the community, noting that fires that benefit one segment of the population may negatively affect another;
- identifying the different uses of fire by men and women and helping to develop programmes that establish prevention measures, in addition to detection and suppression;
- finding out the role of traditional leaders in fire management and whether the views of poor people are considered along with those who are better off;
- making community leaders aware of the correlation between lack of access rights and the incidence of forest fires;
- determining how the community manages the risk of wildfires, makes decisions to burn, and overcomes constraints to better control fires, including costs;

BOX 14**Community forest fire management in Wenyime Village, Yunnan Province, China**

Since the devastating effects of a 1987 forest fire in Daxinganling, China, government and civil society have undertaken joint fire management, which have significantly reduced the number of incidences.

Wenyime in Sanchahe township is one of 14 villages participating in the township committee. Its 200 residents earn income from agriculture, tobacco, animal husbandry and forestry. Under a 1985 policy, the land belongs to the village but households own the forests and trees – an arrangement that provides an incentive to manage the resources and control fires.

The first and last big forest fire in Wenyime occurred in March 1965. Since then, every household has been involved in fire management and voluntary teams have been assigned specific areas to control. Village leaders oversee the conduct of residents; teachers oversee the behaviour of students; shepherds guard pastures; and forestry officers watch over forest land.

The community identified both traditional and modern practices that posed fire risks and discontinued them – burning firecrackers at graves of relatives and in pastures to promote the growth of grass, among others. In addition, herding times were changed so that shepherds no longer had to cook their lunch in the hills. One month prior to the dry period, the village holds meetings to ensure that control measures and emergency response systems are in place.

The study in Wenyime village has shown that farmers are at the core of fire prevention and control activities. Their commitment is based on three factors: clear forest tenure, government regulation and healthy forest resources that provide goods and services that enhance their living standards.

Source: FAO and Project FireFight Southeast Asia, 2003

- working with communities, neighbouring villages, non-governmental organizations (NGOs) and government authorities to reconcile conflicting views and build consensus on ways to place tighter controls on how fire is used, without excluding this tool from the lives of people and the landscapes they inhabit;
- helping communities to develop a protection plan for the use of fire and the inevitable occurrences of wildfires, incorporating elements such as:
 - the reduction of fuels through mechanical or physical means, or through the use of prescribed burning;
 - an early warning system and risk identification;
 - suppression response that reflects the threat, the safety of firefighters and the public, and the impact on the environment and costs;
 - the use of simple tools to suppress fires when possible.

6. Linking national policies and programmes to local needs

Experience has shown that small but calculated changes at the local level can make significant positive differences in the lives of poor people in forested areas. However, it would be naïve to ignore the importance of having a national framework in place to fight poverty and its devastating effects, one that is built on the premise that the cornerstone for future action is clear tenure and access rights. In this regard, politicians and other decision-makers need to develop comprehensive and coordinated policies, legislation, strategies and programmes through participatory processes and partnerships across sectors.

Although practitioners are not generally called upon to take part in political discussions, they can influence outcomes by providing valuable information and advice to senior officials through networks that feed into national decision-making processes. Understanding the wider realities associated with bringing about change will increase their effectiveness on the ground.

Greater attention to the plight of poor people is translating into national strategies to achieve social and economic development. As a result, forestry policies, programmes and legislation are becoming more closely linked to broader goals. However, despite some progress, many national strategies still do not include a forestry component. This gap illustrates how important it is for practitioners who understand realities on the ground to share their knowledge with authorities. By the same token, they should not operate in isolation and need to be aware of national priorities to bring this perspective to local implementation.

Practitioners can influence the design and delivery of programmes and policies so that they respond to the needs of poor people by:

- having a clear understanding of the dimensions of poverty and how the needs of poor people vary according to their level of vulnerability;
- acting as their advocate and, when warranted, drawing public attention to issues;
- being involved in the implementation, monitoring and review processes of relevant programmes and policies;
- providing advice to decision-makers on changes required;
- building networks and partnerships to collectively pressure for action.

NATIONAL FOREST PROGRAMMES

National forest programmes, which are based on a set of guiding principles, encompass many different approaches to achieve sustainable forest management. They provide a framework for participatory processes by which the needs of

poor people can be prioritized and addressed. This mechanism also facilitates the implementation of commitments, including financial, from both public and private interests. National forest programmes require collaboration across sectors to formulate, implement, monitor and evaluate related policies, strategies and actions. Such partnerships increase the likelihood of aligning forestry objectives with wider national development goals, including those contained in poverty reduction strategies.

POVERTY REDUCTION STRATEGIES

Poverty reduction strategies describe a country's macroeconomic, structural and social policies and programmes that promote growth and reduce poverty. They also identify external financing needs to achieve goals. Since July 2002, countries must have poverty reduction strategies in place to receive concessional lending from the World Bank and the International Monetary Fund.

When preparing these documents, governments are expected to involve civil society and development partners; explain poverty and its causes; analyse constraints to faster growth and poverty reduction; set goals and targets; and establish indicators to measure progress. The process is intended to be country driven and results oriented, based on partnerships and a long-term perspective to poverty reduction.

Experience so far highlights some of the difficulties with formulating approaches to address the complex dimensions of poverty. In some instances, there was little correlation between national priorities and budget allocations; local and district priorities were not always reflected in national priorities; and a large proportion of resources to reduce poverty were directed to government ministries at headquarters rather than to investments and services in rural communities.

More effort is needed to foster the sector's more active engagement in poverty reduction processes by addressing forestry issues from a broad perspective. Practitioners can play a vital role in assembling multidisciplinary teams to do precisely that.

FOREST LAW ENFORCEMENT

Lack of forest law compliance and enforcement contributes to forest degradation and deforestation, habitat and biodiversity loss, soil degradation and disturbance of forest ecosystem services. The World Bank estimates that illegal logging alone accounts for losses to governments of US\$10 to \$15 billion per year from public lands (World Bank, 2004).

The underlying causes of illegal activities in the forest sector include flawed policy and legal frameworks; lack of government enforcement capacity; insufficient data and information about the forest resource and illegal operations; and corruption in the private sector and in government.

Illegal activities adversely affect poor people in two ways. First, they cause forest degradation, damaging the resources that sustain the livelihoods of rural populations, particularly the poorest forest-dependent communities. Second,

legal frameworks make it difficult for poor people to access, use and harvest forest resources legally in many cases. Laws and regulations governing forest management are often made for large concessions and are too complicated and costly for smallholders and communities that may not have legal tenure to comply.

Secure tenure is therefore a prerequisite to ensuring accountability and control of forestry operations at the local level. Rights associated with tenure need to be supported by adequate capacity and a legal framework that empowers local people. Unless local people have a significant stake in the management of local forest resources, the efforts of understaffed and poorly financed forest officials to patrol and protect forests will often be futile. The absence of such an involvement reduces the incentives of local people to comply with the law and promotes their indifference with regard to compliance by those who live outside the community, including government officials.

Ways to achieve community or indigenous ownership or permanent tenure over forest land include:

- transferring management of selected State forest areas to local user groups;
- joint management or co-management of State forest land;
- limited rights of access and use permitted in State-owned protected areas or buffer zones;
- community concessions.

Simplifying forest rules and regulations for smallholders, including those pertaining to management plans, will increase law compliance and reduce opportunities for discretionary decisions and subjective interpretations of the law by government officials and forest operators (Box 15). Less stringent criteria and requirements for planning, harvest and resource assessments facilitate compliance as well as enforcement and monitoring by forest guards.

While practitioners cannot change the legal framework, they can draw on their experience in working with user groups to provide inputs to the development of management systems that give more rights to communities and smallholders. They are also in a good position to suggest ways to adapt the requirements for forest management plans to the particular conditions and capabilities of communities and small-scale operators and to act as facilitators, technicians and communicators to enhance their forest-management capacity.

Further information on forest law enforcement is available at: www.fao.org/forestry/site/18447/en

FORESTRY OUTLOOK STUDIES

National and international programmes are often based on assessments of future trends in forestry, notably outlook studies. Traditionally, these studies have focused on markets for forest products out of concern about meeting future demand for wood, mostly in commercial markets. More recently, socio-economic aspects such as population growth, urbanization and changing incomes have gained the attention of forecasters (Box 16).

BOX 15

Legislation in the Gambia for small-scale forest operators

In the Gambia, the Forest Bill (1998) defines the procedures and legal requirements for establishing community forests and designating community-controlled State forests. Simplified planning requirements for community forests and streamlined procedures for harvesting, resource assessment and management agreements are summarized below.

Harvest guidelines

Harvest guidelines are based on the percentage of canopy cover instead of an annual allowable cut for which an inventory would be needed. With a canopy cover of less than 30 percent, live tree harvesting is not allowed. If the cover is more than 30 percent and if the trees are non-valuable, species exploitation can take place providing canopy closure remains above 30 percent. For valuable species, exploitation is possible but has to follow a diameter limit for felling, regeneration and density of standing trees.

Resource assessment

Community-forest committees must develop three-year and five-year management plans but, in order to reduce the burden in terms of labour, costs and technical skills, inventories are not required. As an alternative, a map must be drawn that shows such information as location of the community forest, the road network, land use distribution and planned forest management activities. Mapping includes transect walks and is done in a participatory manner.

Management agreement

As a first step, the Forestry Department enters into a three-year probationary forest management agreement with a community before giving it permanent ownership rights over forest resources. This period serves to build institutional capacity for both government officials as well as local committees, including for planning. It is then followed by a five-year agreement, which describes anticipated forest operations over the time frame, responsibility for each activity and information about committee members. Local by-laws are established as legal instruments for implementing the simpler management plans and the traditional importance of oral regulations is recognized.

Source: FAO, 2004

To strengthen the focus on poverty in outlook studies and long-term planning, several improvements can be made to methodologies and approaches. Although the suggestions below mainly concern national authorities, they give practitioners insights into the wider context in which they must operate and identify potential areas they might influence.

BOX 16

Three recent outlook studies

The Latin American Forestry Sector Outlook Study attracted the participation of 20 countries and some of the most important institutions in the region. Reports describe the current situation in the sector, the driving forces that are likely to affect it until 2020, and possible future scenarios. On the basis of a detailed analysis on whether current trends will continue, the study proposes priorities and strategies to develop the sector. Its objectives are to assist countries to formulate national policies within a regional and global context, drawing on a long-term vision; increase knowledge and understanding of market trends, including environmental services; and inform countries and international institutions on the outlook, priorities and strategies for the sustainable development of forests in the region as an input into the global forest policy dialogue.

The Forestry Outlook Study for West and Central Asia (FOWECA) covers 23 countries, including three in the Caucasus. The aim is to provide a long-term perspective of forest sector developments, taking into account wider economic, social, institutional and technological changes. Using 2020 as a reference year, FOWECA analyses factors that will shape the sector during this period. Based on findings, the study identifies policies, programmes and investment options to enhance the sector's contribution to sustainable development. In addition to country outlook papers, other reports have been written on key issues in the region: forestry and poverty alleviation, wildlife management, watershed management, environmental aspects of forests and trees, wood energy and trends in wood consumption.

The Forestry Outlook Study for Africa, which was released in 2003, analysed the status, trends and driving forces both within and outside the sector that were shaping forestry on the continent. The study's 20-year perspective provides the means for countries to develop responses that will enhance the contribution of forests to society, giving priority to the needs of poor people, including taking action to arrest environmental degradation. Specifically, findings highlighted the need to sustainably produce goods and services that poor people require, reduce their vulnerability to environmental and economic changes, and enhance income and employment opportunities.

- ***Trends and outlook for income and employment generation.*** Employment, particularly in rural areas where jobs can alleviate poverty and stimulate local economies, is one of forestry's most important benefits. Outlook studies could convert future market projections into projections for income and employment to support broader rural development strategies. More sophisticated analyses could look at the income and employment effects

of options to meet future demands for wood products. For example, recycling wood products can provide raw materials, have less impact on the environment and generate more employment than forest harvesting.

- **Non-wood forest products, woodfuel and forest services.** The traditional focus of outlook studies and long-term planning neglects the importance of NWFPs, woodfuel and forest services to rural communities, especially poor people. Examining the future of these goods and services can highlight their importance, identify challenges and opportunities, and assist with developing policies that reduce poverty.
- **Participation.** Because of their technical nature, forestry outlook studies and planning exercises mostly involve experts in statistics, forest management, economics and planning. If specialists with social science backgrounds were part of the team, the scope could be broadened to include gender issues, for example. Although such studies are complex and outcomes often difficult to explain, greater participation of NGOs, local residents – especially women – and civil society in the analysis and development of scenarios would more fully incorporate the perspectives of poor people in future policies.

Further information about outlook studies is available at: www.fao.org/forestry/site/5606/en, and information about long-term planning at: www.fao.org/forestry/site/3489/en

FOREST FINANCING

Forest finance refers to how forest owners obtain revenues from the resource and about how they fund future investment. Forest management involves costs and benefits, some of which are financial (the cost of planting trees and the revenue from timber sales, for example) and some non-financial (environmental impacts of forest management practices, for example). Because some of the benefits are in the form of public goods, including at the global level, it could be argued that some financing for forestry should come from the national government and international aid.

While development in the sector can benefit national economies, costs to poor people living in and around forests can be high. For example, industrial harvesting generates employment and income and improves the national balance of payments. However, it may also lead to environmental degradation, and the loss of wildlife and NWFPs on which poor people rely. Planted forest development and the establishment of protected areas can also result in significant losses in livelihood opportunities if they are not well planned and managed (see Chapter 5).

To make forest financing more advantageous to poor people, practitioners can help government authorities, forest companies and community leaders gather and analyse information on the impacts of various policy and management options on the livelihoods of people living in and around the forest, in terms of:

- the value of fuelwood and NWFPs lost if a degraded forest area were to be converted to planted forest;

- the ways in which industrial forest harvesting affects the availability of wildlife and NWFPs;
- the establishment of a protected area and a ban on hunting or collection of NWFPs;
- the beneficiaries of financial incentives with regard to planted forest development.

In addition to the financial costs and benefits to forest owners and other stakeholders, it is important to consider the non-financial aspects. Many of these are local in nature and can be detrimental to poor people, including degradation of soil and water resources, loss of access, and degradation or loss of forests that have cultural or spiritual value.

A project that appears profitable at the national level may have negative effects on poor communities if they bear the burden of some costs but do not share the benefits. Thus, once a policy or project has been analysed – and before it is implemented – practitioners could use the information to lobby for equitable benefit-sharing arrangements (Box 17); for financial incentives to support local participation; and for regulations to minimize negative impacts on communities.

It should not be assumed that commercial investment always hurts poor people. Companies that are socially responsible bring capital, infrastructure, trade opportunities and employment. The interests and responsibilities of public and private sectors as well as poor people are diverse – governments serve their citizens, businesses answer to shareholders, and poor people focus on survival and improving their livelihoods. By understanding the range of interests and assessing the cost and benefits of proposed investments and changes, it is possible to find acceptable trade-offs that respond to concerns. However, because poor people are often under-represented and overlooked, practitioners have a duty to engage in policy debates to make sure their voices are heard.

PAYMENT FOR ENVIRONMENTAL SERVICES

Environmental services can be defined as the benefits that people obtain from ecosystems, including those that supply food, water, timber and fibre; regulate climate, flood, disease, wastes and water quality; provide recreational, aesthetic and spiritual amenities; and support the formation of soil, photosynthesis and nutrient cycling (IISD, 2005).

As noted in the previous section, people historically have enjoyed but not paid for many forest services despite the fact that in most cases these benefits either incur costs or represent foregone opportunities. Payment for environmental services (PES) schemes have therefore been designed to have users compensate those who must bear costs or are prevented from developing the resource (Box 18). For example, a hotel that profits from tourists who visit areas of high aesthetic value needs to ensure that the surrounding landscape remains unspoiled. By paying a tax that is then shared among local people, the establishment offsets lost income to them as a result of restrictions imposed on forest harvesting.

BOX 17

Approaches to benefit sharing

A recent study of forest revenue collection in Africa (FAO, 2001b) showed that many countries have adopted a range of benefit-sharing mechanisms with local people, including:

- placing a proportion of revenues into local village trust funds;
- empowering forest communities to collect some or all of the revenues themselves;
- placing some into national trust funds to support community development;
- sharing with local administrations.

In the Pacific Islands, revenue sharing between national government and local forest communities is a tradition. In many countries, villages own the forests but national authorities manage them. For example in Fiji, local communities receive more than 90 percent of revenue from timber harvesting either from collection by government or direct charges to forest operators (Whiteman, 2004).

Increasingly, protected areas are earning revenues from ecotourism, and managers are introducing benefit sharing to compensate communities for losses arising from restrictions on harvesting within reserves and from damage that wildlife inflicts on crops. Perhaps the most well-known scheme is the Community Area Management Programme for Indigenous Resources (CAMPFIRE) in Zimbabwe, where government and communities share the fees from ecotourism companies, providing an incentive for local people to protect wildlife.

Joint Forest Management (JFM) is common in India and other countries in South Asia, and similar arrangements are being implemented elsewhere. Typically, JFM involves establishing local forest user groups to take on the management of forest areas from the State, including the right to share the benefits from forest harvesting and to make investment decisions. Contrary to benefit-sharing arrangements, JFM involves more local participation and is strongly supported by forestry extension services, subsidies, grants and free seedlings. Although there are exceptions, JFM has increased outputs and reduced poverty in communities. Such schemes have also had positive effects on surrounding forests (Poffenberger, 1996).

In Nepal, under leasehold forestry, families are assigned small areas of degraded State forests to manage, rehabilitate and harvest. As with JFM, the scheme is supported by extension, subsidies, microcredit facilities and policy measures that protect the rights of leaseholders and give them secure tenure. The practice of allocating areas to the poorest households is an innovative feature that contributes to reducing poverty and supports their wealth creation (FAO and IFAD, 1998).

Poor people can benefit from PES in many ways, but clear arrangements must be in place to foster equitable sharing. They can reap rewards, for example, if their communities or the conservation areas where they live receive government

BOX 18

Successful community PES schemes**Water quality**

Downstream users pay to maintain water quality regulation systems in key upstream forest areas. Partners can include local governments and firms willing to offset the pollution generated by their factories.

Carbon sequestration

Individuals and companies wanting to offset their carbon emissions pay to establish agroforestry systems that are geared towards carbon sequestration. NGOs and private firms interested in the voluntary market for such services could be potential partners.

Ecotourism

Nature enthusiasts who have an interest in maintaining biodiversity pay for conservation efforts in highly valued areas. Potential partners include tour operators and conservation NGOs.

subsidies so that elements that are critical to their livelihoods are preserved. As active participants in the development of partnerships or grassroot initiatives, they can diversify their sources of income by providing ecotourism services or conserving a forest area, for instance.

Developing PES schemes is complex, time consuming and costly because most require designing and implementing new management systems – conservation plans to increase water quality or agroforestry systems to sequester carbon, for example. In the poorest countries, it is difficult to generate markets for PES because other needs such as adequate housing and schooling are more pressing and likely to attract public finance. Involving communities in PES is easier when government policies and legislation support such approaches and funding sources exist, as is the case in Costa Rica (Box 19).

With growing awareness of the threat of climate change, governments, industries and organizations are seeking ways of creating market-led solutions to environmental problems. An example of a carbon sequestration initiative that has a strong livelihoods component is described in Box 20.

Practitioners can play an important role in assisting poor people and communities access resources made available through PES schemes by providing information, helping them to comply with administrative and technical requirements, and making authorities aware of the challenges and opportunities that local people face if they are to benefit. Before considering PES as an option to reduce poverty, however, practitioners should seek answers to the following questions:

- Is there a government PES programme in place that communities can tap?
- Are there other PES programmes in the country, for example ones that are led by NGOs, private-sector companies or international and bilateral organizations?
- Are water companies or electricity firms (in the case of hydroenergy) willing to compensate forest owners or communities that conserve forests in order to protect watersheds?
- If communities have access to PES schemes, how will the benefits be shared among participants and what effect will the schemes have on the most vulnerable residents?
- Are there opportunities to add a PES component to sustainable forest management plans to diversify income?

BOX 19

Support for producers of environmental services in Costa Rica

Costa Rica's public policy has evolved to consider how to tap into markets that can help pay for environmental services. The first contract for watershed protection dates back to 1888 when a decree was passed in Barva-Volcano stating that a 2-km-wide strip of land was State owned because of its importance as a source of potable water.

During the 1980s and 1990s, a system of protected areas was established to preserve biodiversity. In 1994, the government raised entrance fees to national parks for foreigners from US\$1 to 15 and created markets for environmental services by supporting the principle of user pays. Around the same time, subsidies and incentives were developed to manage or conserve natural forests on private lands, including the sustainable extraction of timber.

Because of international pressure to eliminate subsidies to the productive sectors, the new Forestry Law (1996) created a financial mechanism and institutional structure that considers the services that forests provide as land use and compensates private forest owners accordingly. The law recognizes that forests offer benefits beyond traditionally traded products such as timber. It specifically recognizes four services: watershed protection, scenic beauty, carbon fixation or sequestration and biodiversity conservation.

Using funds from a tax on gasoline consumption, the official PES scheme, which is administered by the National Forestry Financing Fund, pays forest owners for producing these four environmental services. The scheme has encouraged a series of grassroots and community initiatives that has sparked a trend towards experimentation, including ways to develop new markets and payments for environmental services.

Source: Rojas and Aylward, 2003

BOX 20

Emerging markets for carbon trading: Uganda enters the carbon market

When the Minister of Finance launched the Uganda Forest Policy in 2001, he highlighted the potential for the forest sector to tap the emerging global market in carbon trading. Taking lessons from Mexico's successful pilot project (Plan Vivo), small farmers in Uganda planted exotic and native tree species on their land for the purpose of selling carbon credits on the voluntary market. By developing technical specifications and sound administrative procedures, the project established farmer confidence and market credibility.

A national NGO entered into an agreement with each participating farmer. Terms cover a ten-year period and specify the amount of carbon to be sold, the price per tonne to be paid, targets to be met within each of five established monitoring periods and the schedule of payments. Disbursement of funds is conditional on the farmer meeting the targets in the specified time. In addition, farmers must set aside 10 percent of their total carbon offset potential to cover shortfalls in the event they fail to meet objectives.

The pilot received a significant boost when a respected international packaging company bought the first 11 200 tonnes of CO₂ in December 2003, and bought an additional 9 000 tonnes the following year. A second customer purchased 10 000 tonnes in May 2005.

7. Monitoring and assessing progress in reducing poverty through forestry interventions

While it is fairly straightforward to count the number of poor people living on the equivalent of US\$1 per day, it is more difficult to determine the nature and extent of their poverty. It is also difficult to assess the degree to which forestry interventions help to reduce or avoid poverty. Through research, however, tools are being developed to shed light on these questions (Box 21).

MEASURING POVERTY USING DIET AND NUTRITIONAL DATA

Indicators to capture poverty and livelihood dimensions are not as well developed as others but field practitioners nonetheless may wish to draw on work done to date. Doing so will enable them to establish data that capture the current situation

BOX 21

Poverty-forests linkages toolkit

In partnership with the World Conservation Union (IUCN), the Overseas Development Institute (ODI), the Center for International Forestry Research (CIFOR) and Winrock International, the Program on Forests (PROFOR) is attempting to show how sustainable forest management can enhance rural livelihoods, conserve biological diversity and achieve the Millennium Development Goals. In addition to conducting case studies, a poverty-forests linkages toolkit is being developed, which includes:

- methods to gather information on economic and other contributions from forests to households, especially poor people;
- ways to analyse field data to determine how forests can reduce poverty and vulnerability;
- suggestions on how to package results so as to be relevant to local and national planners, governments, institutions and organizations;
- a description of poverty reduction strategy processes, including potential entry points for forestry, and an indication of the skills required to influence outcomes;
- case studies that illustrate the contributions of forest resources to households and an analysis of the impact of forestry policies and programmes.

Source: PROFOR, 2003

so they can assess change in the future. Diet and nutritional data would be important components of any information collection on poverty, and one popular approach is to combine three methodologies: a survey of food consumption, body measurements using internationally agreed indicators and a record of people's daily activities. The Center for International Forestry Research (CIFOR) is using this approach to assess, among other things, how NWFPs contribute to the diet and health of forest dwellers (E. Dounias, personal communication).

CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT

Many organizations and international processes have developed criteria and indicators for the sustainable management of forests. For example, CIFOR published a set for tropical natural forests for commercial purposes, which can be tailored to the forest management unit level, including in other forest types. Because these criteria are designed specifically for adapting to local conditions, those related to social aspects may be of special interest to practitioners who are working on poverty reduction and food security issues.

Criteria to help measure social dimensions of forestry (CIFOR, 1999, 2000a,b,c) include:

- local management is effective in controlling maintenance of and access to resources and economic benefits;
- forest stakeholders have a reasonable share in the economic benefits derived from forest use;
- people link their future and their children's with management of forest resources;
- effective mechanisms exist for two-way communication among stakeholders with regard to forest management;
- local stakeholders have detailed reciprocal knowledge pertaining to forest resource use (including user groups and gender roles) as well as forest management plans prior to implementation;
- agreement exists on rights and responsibilities of relevant stakeholders;
- there is a recognizable balance between human activities and environmental conditions;
- the relationship between forest management and human health is recognized;
- the relationship between forest maintenance and human culture is acknowledged as important.

Indicators are being developed as well. For example, a project in the state of Jharkhand (India) has been proposed which will invest in community forest management to improve rural livelihoods, especially for the people living adjacent to forests. CIFOR is developing and testing an indicators-based livelihoods monitoring tool for use by the forest department, communities and civil society to assess livelihood changes that occur as a result of investments, some of which take into account inequity among and within households. The intention is to gather consistent and comparable information about livelihoods and livelihood

changes using low-cost and easily accessible data. Forest guards who have a close association and a good knowledge of the village in which they work and community members will collect information once a year. While still in the preliminary stage of development, Table 2 lists possible indicators of livelihoods and livelihood changes at the village level.

MONITORING PROGRESS

In addition to specifying forestry interventions that need to be undertaken, action plans describe estimated inputs required and outputs expected. To determine whether they are realistic and interventions are effective, progress in implementation needs to be assessed. Findings can then be used to design future action. Information is required on physical aspects such as areas treated and trees planted as well as on inputs made, both in cash and in kind. Information will also be required on which groups are engaged, the nature of their involvement and the extent to which their views are incorporated into revisions. The poorest and most vulnerable segments of the population, who often are the least visible, may continue to be excluded from consideration unless specific data are collected about them.

Although it is important to know how many people are poor in a given area or community, practitioners also need to find out if they feel that any changes made or benefits accrued are worth the cost they had to pay. One technique to capture this information is to ask them to specify how interventions had an impact on their lives. Discussions can then uncover a range of views to guide decision-making.

Different groups will benefit from different types of information. Villagers might already understand their livelihoods but could learn more about the effects of external factors such as markets and administrative or economic policies. Policy-makers might need to learn more about local livelihoods. Foresters might understand forest productivity but not institutional and socio-economic processes. Conversely, non-foresters might need to learn about forest productivity. For these reasons, the purpose of assessments must be clear so that those designing them include the right kind and level of information, involve all relevant stakeholders and appreciate the potential value of such exercises.

It makes sense to aim for adequate rather than flawless results. In most rural situations, it will not be possible to gather information on all aspects of livelihoods and outcomes. Practitioners will need to select a few observable indicators of change, taking care that even if the information is only approximate, it is not distorted. Box 22 recommends ways to avoid systematic bias.

Sometimes it is necessary to confirm common knowledge, but in general it is better to focus efforts on filling information gaps. Since monitoring and assessment are tools to improve policy and programme delivery, the time and money devoted to these activities should be sufficient to yield desired results.

TABLE 2
Indicators of livelihoods and livelihood changes at village level

Capital	Indicators	Source of information
Financial assets	Forest Department wages/capita (3-year rolling average)	Forest Department records
	Forest revenue/capita (3-year rolling average)	Forest Department records
	Number of kiosks selling consumer goods	Survey of kiosks
	Average price of five most expensive items	Survey of kiosks
Physical assets	Number of <i>pukka</i> houses/capita	Observation/key informants
	Number of houses with electrical service/capita	Observation/key informants
	Number of motorcycles/capita	Observation/key informants
	Number of functioning wells/capita	Observation/key informants
	Average travel time (or cost?) to nearest market	Observation/key informants
	Area of irrigated land/capita	Records/key informants
	Number of functioning tractors/capita	Observation/key informants
Natural assets	Number of functioning water pumps/capita	Observation/key informants
	Standing volume of timber/capita	Forest Department estimate
	Area of productive fruit tree plantation/capita	Forest Department estimate/key informants
	Area of key NWFP/capita	Forest Department estimate/key informants
	Number of livestock (in cattle equivalents)/capita	Observation/key informants
	Average time to collect fuelwood per household per month	Key informants
	Average time to collect water per household per month	Key informants
	Value of annual timber production (3-year rolling average)/capita	Forest Department records
Value of annual fuelwood production/capita	Forest Department records/key informants	
Human capital	Value of annual NWFP production/capita	Official buyer records
	Annual rice production (kg)/capita	Key informants/village records
	Infant mortality/capita	Village records/key informants
	Number of deaths during dry season/capita	Village records/key informants
	Percentage of school age children attending school	School records
	Average age of leaving school	School records
	Number of people working outside village daily/capita	Observation/key informants
Number of people leaving village to work outside for extended periods/capita	Observation/key informants	
Social capital	Proportion of adult population participating in the village forest management committee	Secretary of committee
	Proportion of committee members that are women	Secretary of committee
	Number of committee meetings and attendance	Secretary of committee
	Number of other citizens' groups active in the village	Observation/key informants
	Collective selling of agricultural or forest products results in improved prices (yes/no)	Key informants/focus group

BOX 22

Strategies to avoid biases in monitoring

- **Multiple indicators:** using several indicators that point to quite different dimensions of the change being assessed, e.g. complementing income and consumption indicators with health indicators and expressed views on poverty and well-being.
- **Multiple sources:** ensuring that information and opinions are sought from a range of stakeholder categories, e.g. from women and men, young and old, rich and poor, foresters and non-foresters, and workers in both formal and informal sectors.
- **Good and bad outcomes:** recognizing that good intentions may bring adverse outcomes and that mistakes provide valuable lessons, e.g. that growing trees on wasteland may interfere with other uses of that land.
- **Intended and unintended outcomes:** being alert to the possibility of unexpected changes (beneficial or harmful), e.g. that a cooperative set up for one purpose might be more effective for something else.
- **Qualitative and quantitative:** balancing quantitative measurement with qualitative analysis, e.g. assessing the substance and effectiveness of village meetings, not only the number held.
- **Aggregation and distribution:** balancing assessment of the total benefits produced, with assessment of how benefits are shared and how useful they are to the diverse people who are sharing.
- **Honesty:** making explicit any doubts about the quality or coverage of information or the uncertainties as to what lessons can be learned from the information gathered.

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POVERTY REDUCTION STRATEGIES

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Selected Web resources

AGROFORESTRY

www.fao.org/forestry/tof

www.agroforestry.net/overstory/ovbook.html (*The Overstory* agroforestry ejournal)

www.fao.org/prods/GAP/gapindex_en.asp (good agricultural practices)

www.worldagroforestry.org (World Agroforestry Centre [ICRAF])

www.iisd.ca/sd/sdflr (forest landscape restoration)

FIRE MANAGEMENT

www.fao.org/forestry/fire

www.fire.uni-freiburg.de (Global Fire Monitoring Centre and Regional Wildland Fire Networks)

www.iucn.org/themes/fcp/publications/firefight.htm (IUCN and WWF FireFight Series)

FOREST LAW ENFORCEMENT

www.fao.org/forestry/site/18447/en

www.illegal-logging.info

FUELWOOD

www.fao.org/forestry/energy

www.itdg.org

www.worldenergy.org

www.practicalaction.org

www.sparknet.info

MICROFINANCE AND SMALL-SCALE ENTERPRISES

www.fao.org/forestry/site/25491/en (community-based tree and forest enterprises)

www.ruralfinance.org

www.iied.org/pubs/display.php?o=13523IIED

www.microfinancegateway.org

MONITORING AND ASSESSMENT

www.gdnet.org/rapnet (Global Development Network)

www.iucn.org/themes/eval/methods.htm

www.mande.co.uk (*MandE News*)

www.worldbank.org/poverty/strategies (poverty monitoring/impact evaluation)

www.odi.org.uk

NATIONAL FOREST PROGRAMMES

www.fao.org/forestry/nfp

www.nfp-facility.org

NON-WOOD FOREST PRODUCTS

www.fao.org/forestry/nwfp

www.odi-bushmeat.org

PAYMENT FOR ENVIRONMENTAL SERVICES

www.iucn.org/themes/fcp/forestissues/envservices_value.htm

www.cifor.cgiar.org/docs/_ref/research/environment/th_ecosystem.htm

PLANTED FORESTS

www.fao.org/forestry/planted-forest

www.fao.org/forestry/extension

www.fsc.org/plantations

POVERTY

www.worldbank.org/poverty

siteresources.worldbank.org/PGLP/Resources/PovertyManual.pdf

www.fao.org/forestry/site/20189/en (forestry and poverty reduction)

www.profor.info/livelihoods.html

www.undp.org/poverty/publications/pov_red

www.ifad.org/poverty/index.htm

www.unep.org/dpdl/poverty_environment

www.dfid.gov.uk/pubs/files/poverty-bridggap-guidance.pdf

povlibrary.worldbank.org/files/5312_chap15.pdf

www.cifor.cgiar.org/docs/_ref/research/livelihoods/index.htm

POVERTY REDUCTION STRATEGIES

www.worldbank.org/prsp

www.iied.org/NR/forestry/projects/guide.html