

BUILDING CAPACITY FOR THE AGRICULTURE SECTOR'S RESPONSE TO AIDS

A TRAINING MANUAL FOR AGRICULTURE SECTOR WORKERS

7

MODULE

AIDS and the Forestry Sub-Sector



Building Capacity for the Agriculture Sector's Response to AIDS

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AIMS

The aims of this module are the following:

1. To highlight the importance of the forestry sub-sector in responding to AIDS.
2. To understand how and the epidemic aggravates other threats to sustainable livelihoods in forestry.
3. To identify possible strategies to develop community and household resilience to the impacts of HIV and AIDS on the forestry sub-sector.

OBJECTIVES

Upon completing the module, the learner should be able to:

1. Describe how AIDS influences the ways in which affected households and communities use forest resources, particularly through:
 - Increased demand for non-wood forest products (NWFP);
 - Increased clearing of trees for timber or for agricultural land.
2. Describe appropriate measures to strengthen the resilience of HIV-affected households and communities to the impact of the epidemic, including:
 - Agro-forestry;
 - Sustainable development of NWFPs.
3. Propose measures to strengthen forest management in an AIDS environment.
4. Identify appropriate partnerships with other sectors in order to bring HIV-related services to forest communities.

QUESTIONS FOR REFLECTION

1. What information do you have about the impacts of HIV and AIDS on:
 - The forestry service in the country where you work?
 - Communities living in or near forests?
2. Have there been notable changes in how communities living in or near forests in the country where you work use forest resources? If there are changes, how might this be related to the AIDS epidemic?
3. Think about the major NWFPs in the country where you work:
 - What medicinal products are derived from local forests?
 - What food products are derived from the forests?
 - What other products come from the forests?
 - What is the commercial value and potential of these products for forest communities?
4. Think about any specific interventions that have contributed to household or community resilience to HIV in the forestry sub-sector?

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5. Which organizations provide voluntary counselling and testing (VCT), antiretroviral treatment (ART), prevention of mother-to-child-transmission (PMTCT) and other HIV-related services in forest communities?
 - What do you know about the coverage and effectiveness of these services?
 - How do you think these services could be improved?
6. What agro-forestry initiatives are you aware of in your country (or in other countries) that could improve family and community food security and income in forest communities?
7. What development policies have had an unintended impact (positively or negatively) on HIV in the forestry sub-sector?

INTRODUCTORY REMARKS

This module provides a conceptual framework for studying the impact of the epidemic on the forestry sub-sector. While most of the discussion is centred on forest communities, who whose livelihoods are largely forest-based, there is also an analysis of how the epidemic affects commercial logging.

Why are AIDS impacts a concern for the forestry sector?

The unsustainable use of forest resources can lead in the short term to erosion and soil degradation and in the longer term to climate change. Unregulated logging and slash-and-burn agriculture are among the major drivers of depletion of forest resources. Against this background, other factors, such as those related to HIV, that aggravate the process need to be dealt with in order to ensure the sustainability of forests as complex ecosystems as well as of populations dependent on them for their livelihoods. For example, in countries where access to medicines is limited, even the urban population may be dependent on medicinal plants growing in forests¹. From this perspective, the unsustainable use of forest resources is not only an issue for forest communities, but also for people living elsewhere. It is estimated, for instance, that over 75 million people live within the miombo biome² in southern Africa – the woodlands support the livelihoods of over 40 million people in the area and 15 million urban dwellers depend on these woodlands for certain foods, fibres, fuel wood and charcoal.³ Although large populations live in tropical forests in Asia and Latin America, the few studies that exist have mostly concentrated on Africa.

It has been observed that areas with higher HIV prevalence are experiencing a more rapid decline in woodland quality than areas with lower HIV prevalence. While there is no direct causal relationship, it seems to be linked to various underlying stressors, as shown by Figure 1. The Xs refer to the possible common underlying factors – for example, drought leading to transactional sex to secure food or firewood and over-exploitation of woodlands to compensate for reduced agriculture yields.

¹ According to Lengkeek (2004) most so called 'herbal' medicines come from trees (e.g. leaves, bark, roots).

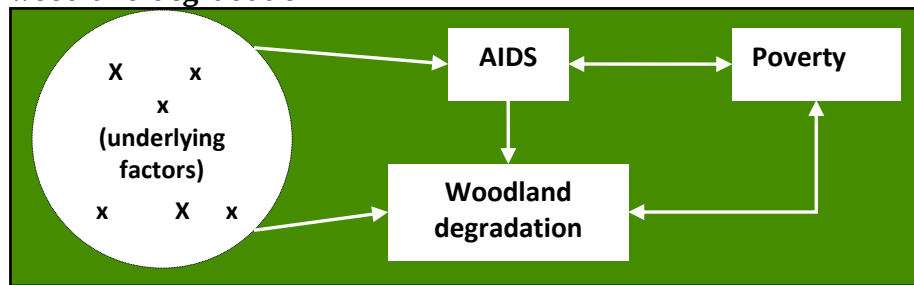
² 'Miombo' is a Swahili word adopted by ecologists to describe the dry deciduous woodland ecosystem. The miombo woodlands extend across about 2.7 million km² of the African sub-humid tropical zone (FAO, 2005).

³ FAO. 2005. *Miombo woodlands and HIV/AIDS interactions: Malawi country report*, by D. Kayambazinthu, M. Barany, R. Mumba & C. Holding Anyonge. Forestry Policy and Institutions Working Paper 6. Rome. (<http://www.fao.org/docrep/008/i6038e/J6038E00.htm#TopOfPage>)

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Figure 1. The relationship between poverty, AIDS, other stressors and accelerated woodland degradation



(Source: Barany et al., 2005)

The impact of AIDS is mediated by people and particularly their coping strategies in response to labour declines and reduced income. The epidemic also has a negative impact on other actors in the forestry sector, particularly the staff of forestry services.

The module will address the issues of mobility and competition for forest resources as major drivers in the spread of HIV among forestry service staff and staff of logging operations⁴, as well as among users of forest products (e.g. firewood).

⁴ Forestry service staff and staff of logging operations are mobile and come into contact with sex workers who frequent logging camps.

READINGS: AN OVERVIEW OF HIV ISSUES IN THE FORESTRY SUB-SECTOR

1. How HIV impacts the forestry sub-sector

HIV affects the forestry sub-sector primarily through its impact on three groups of actors:

1. Households in forest communities
2. Communities that derive their livelihoods from forests
3. Commercial timber enterprises, tree plantations and staff of forestry services and bee keeping

The epidemic also affects forest management by infecting and killing the technical staff of mobile forestry service staff.

Three major impacts of HIV on forests through the actions of forest communities:

i) Increase in the demand for medicinal plants:

This increase comes from HIV-related illnesses and opportunistic infections. This demand comes not only from the rural population, but also from people living with HIV in urban area, who cannot afford the cost of modern medical treatments. It is to be noted that even herbal medicine has to be paid for.

Because of the increase in demand, traditional herbalists who harvest the plants they use, have reported having to go much further into the forest to find plants and that some are becoming rare or are close to extinction in their area. This increased demand leads to untrained people overexploiting the resource with no regard for the consequences.

Woodlands not only play a very important role in providing medicinal plants for those who cannot access modern medicine, but they could, if harvested in a sustainable way, support the health sector by providing medicine to large sections of the populations of developing countries. Medicinal plants could be used for a wide range of conditions, including HIV-related infections.

ii) Forest resources as a food buffer:

Households unable to cultivate sufficient crops for food consumption may supplement their diets with forest foods that they collect. Again, this may be done in an unsustainable manner. Furthermore, because of loss of labour due to HIV-related illness and mortality (including out-migration of family members), households may resort to slash and burn agriculture. This process clears patches of forest using fire, which results in the destruction of resources in order to gain short-term harvests. It has also been observed that wildlife is at greater risk of poaching in these conditions.

iii) Exploitation of resources for income:

Here it is mainly a question of fuelwood or charcoal production for sale to compensate for the loss of agricultural income. Again, the issue is not fuelwood *per se*, but the increase in collection of it due to the need for income stemming from HIV-related medical costs and

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labour declines. HIV-affected households may collect wood for construction poles or food, such as mushrooms, which are then sold.

An important related impact often overlooked is the 'free services' provided by forests, such as clean drinking water. These are degraded through poor management and destruction resulting from increased household use.

It should be noted here that loss of personnel in already vulnerable forestry management organizations makes it difficult for them to protect the forests or replant where necessary. In Malawi, for example, an FAO study found that the loss of time for forestry activities was a result of time taken to look after the sick and attend funerals, reduced labour hours of production and low attendance at committee meetings. These, in turn, effectively resulted in loss of revenue, reduced or non-delivery of extension services, reduced monitoring of forestry practices and enforcement of forestry rules, which gave way to overexploitation of the forest resources⁵.

1.1 HIV impacts on households and forest communities

In HIV-affected communities in southern Africa, medicinal plant species used to treat opportunistic infections are becoming increasingly scarce. Commercial woodland activities help buffer against the immediate impacts of health-related expenses and productivity losses when pursued by medium to wealthy households as an income diversification strategy. However, those households that rely heavily on subsistence woodland activities or on commercial woodland activities as their primary source of income are likely to be the most vulnerable to the impacts of HIV because these households tend to be asset poor. The value of commercial and subsistence woodland activities as a safety net during periods of adult illness and mortality depends on prior livelihood strategies, the sex of the afflicted person and the type of woodland activity.

Except for collection of medicinal plants, subsistence woodland activities in general are not considered important for coping with the immediate impact of illness. Certain subsistence woodland activities are, for the most part, carried out by female household members who are coincidentally the primary caregivers. These activities typically need to be reallocated to allow women time for care giving. When male heads of household fall ill, labour-intensive commercial woodland activities (primarily wood-based) tend to decrease, while less laborious commercial activities (primarily non-wood, e.g. woven mats, brewing) remain a viable source of income. See Annex 2 for a list of traditional woodland activities and forest household responses to crises.

Prolonged illness and eventual death of a household head can lead to the erosion of household assets and increased vulnerability. This can increase dependence on both subsistence and commercial woodland activities for livelihood and coping strategies. The contribution these activities make in terms of household subsistence and income will partially be a function of the sex and age of the remaining household members. Female-headed households are the most vulnerable because of reduced income-generating activities. Widows often find quality of life diminish following the death of the husband. Having less money, they may not be able to pay for kerosene and may turn to using firewood for lighting. Many widows experience food

⁵ FAO. 2005. *Miombo woodlands and HIV/AIDS interactions: Malawi country report*. Forestry Policy and Institutions Working Paper 6. Rome. (<http://www.fao.org/docrep/008/j6038e/J6038E00.htm#TopOfPage>)

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insecurity and many look for paid work to increase their income. Insecure livelihoods may also lead widows to engage in transactional sex when they lack basic resources.

According to Barany et al.⁶, there are two phases at the household level in which HIV impacts on forests: morbidity and mortality. Findings of household surveys in selected African countries reveal the following impacts:

Morbidity – In woodland areas, household strategies when an adult falls sick can vary:

- Morbidity reduces ability to meet basic needs and regular harvesting of woodland products no longer serves to compensate for reduced agriculture outputs.
- The collection, sale and use of medicinal plants as a primary crisis response occurs in 60 percent of affected households.
- Seventeen percent of affected households increased forest product collection to cover health expenses and basic needs.
- Overall, subsistence activities decrease with adult illness.
- Commercial woodland strategies are relied upon to cope with adult morbidity.
- Fifty-four percent of affected households reduced collection of forest products during illness due to labour shortages.
- Thirty-six percent of households decreased collection of firewood due to labor shortages.

Mortality – Woodland strategies of households that experience the death of an adult household member show increased dependence on a variety of forest products:

- Such households were two times more likely than other households to make a major forest-product collection trip in the previous month.
- These households focus on obtaining firewood, thatch grass, fruits, mushrooms and materials for weaving mats and baskets. Alternatively, they may engage in activities that require firewood as an input, such as brewing and food vending.
- Twenty-three percent of households stated that the importance of forest product collection increased following the death in the household. Typically such trips focus on obtaining firewood, thatch grass, fruits, mushrooms, mats, baskets) and activities requiring firewood as an input (i.e., brewing, food vending).
- These households are five times more likely to increase collection of firewood than unaffected households.
- These households are less likely to reduce collection of forest products, even when labor requirements for collection increase.

These impacts are largely linked to loss of labour and increased poverty in households, as well as to increasing demand for medicinal plants, wood and so forth. Forests normally serve as a 'buffer' for low-income households and in times of crisis, as a source of medicine, food and income.

It has been observed⁷ that the impacts of HIV and AIDS on households vary, depending on which members are most affected. The epidemic impacts households in terms of increasing

⁶ Barany, M., Holdings-Anyonge, C., Kayambazinthu, D. & Siteo, A. 2005. Firewood, food and medicine: Interactions between forests, vulnerability and rural responses to HIV/AIDS. Proceedings from the IFPRI Conference: HIV/AIDS and Food and Nutrition Security, April 14-16. Durban, South Africa. (<http://www.fao.org/forestry/9718-1-0.pdf>)

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poverty and different degrees of labour constraints (moderate, severe or very severe), depending on the number of healthy adults and their financial circumstances. For example, households in which two or more adults are caring for either orphans or a sick relative, are only moderately affected by the epidemic. Households consisting of one adult caring for a sick relative or orphans, or households where the main bread-winner is suffering from HIV-related illness are severely affected by the epidemic. Very severely affected households are those in which an HIV-positive wife is caring for orphans and/or a sick relative (often her husband). Extreme situations are where children are caring for sick parents or relatives, or where orphans are left to fend for themselves. In the absence of a national welfare system or other social support networks, the situation of households that are moderately impacted by HIV can quickly deteriorate into one that is severe or very severe.

1.2 HIV impacts on commercial forestry

A combination of mobility, isolation, economic power and gender roles in forest exploitation favours the spread of HIV in commercial forestry. The losses in terms of labour depletion and productivity declines have not been studied so far. What is presented here is an analysis of vulnerability and risk factors that must be dealt with in order to develop resilience to HIV infection in commercial forestry activities. In essence, fluctuation in the availability and location of forestry products determines the migration patterns of forest resource users from one area to another. Table 1 summarizes some of major factors that increase vulnerability to HIV by type of mobility.

Table 1. Vulnerability of mobile forest resource users to HIV

Type of migration		Type of migrant	Factors contributing to vulnerability
<i>National</i>	Short term	Women traders of food and firewood; female sex workers settling in camps or villages; crew members and pit-sawyers; charcoal producers and sellers.	• Mobility without spouses increases risky behaviour. • Transactional sex because resources are scarce and competition for them is high. • Availability of large amounts of cash, coupled with low literacy may lead to risky behaviour by men. • Mobility of workers and residence in rural areas makes targeting HIV services difficult.
	Long term	Owners of saw mills; women bar and restaurant operators.	• Migration without spouses; limited access to health facilities; • Availability of cash which may be used to entice women desperate to buy goods.
<i>International</i>	Short term	Timber cross-border traders; female sex workers who settle in camps or villages; timber transporters.	• Highly mobile - no residence, high income; difficult to target for interventions; lack of information about such migrants.

(Source: Ministry of Mines and Energy & Department of Forestry, 2007)

⁷ Page, S. 2003. Impact of HIV/AIDS on natural resource management in Malawi. Blantyre, Malawi, COMPASS. (http://www.sarpn.org/mitigation_of_HIV_AIDS/m0010/index.php)

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Forestry workers such as pit sawyers, traders and saw millers are mainly men. They migrate from depleted areas to where timber resources are more plentiful. Logging activity in these areas then increases, which attracts sex workers from around the country and across borders. Both migrants and their partners back home are exposed to HIV vulnerability associated with risky behaviour. Women spend most of their time in plantations to collect sufficient products in order to travel and market them for profit. Livelihood insecurity may force them to engage in sex in return for favours. The migration of forestry workers, including processors, traders and transporters and the networks within trading areas lead to the spread of HIV from pockets of high prevalence to areas of low prevalence.

A further analysis of HIV risk in relation to gender roles in commercial forestry is presented in Table 2. Although it is unknown exactly how many women work in the forestry sector compared with men, more men patrol forest reserves and plantations on behalf of the government in Africa and most traders and small-scale collectors are women. Men may take advantage of their power in this situation to oblige women to provide sex as a condition for gaining access to forest resources. Girls are at particular risk since they make up the majority of firewood collectors.

Table 2. Gender roles and vulnerability to HIV infection in commercial forestry

Actors	Perceived power position	Gender-related vulnerability
Professional forestry officers (mainly men)	Hold the legal power over resources. Have decision-making powers. Are educated and exposed.	Travel frequently without spouses. Issue licenses and may become involved in transactional sex. Condom use is unknown.
Forestry patrol officers (mainly men)	Control and police resource use. Educated and trained to operate in a military style.	Prone to bribes during the sawing season when issuing licenses. Condom use is unknown.
Sawmill owners (mainly men)	Powerful, rich and respected. Employers.	Finance informal micro loans. Can easily bribe officers and access rights to resources. Can buy sex. Condom use is unknown.
Crew members and pit sawyers (mainly men)	Young and energetic. High disposable income	Often hyperactive sexually. Serial marriages at each site or buy sex using cash or in exchange for access rights to resources.
Traders (mainly women)	Relatively powerless. Low education. Mostly single	Mobile with high incomes. Finance informal micro loans. Can sexually exploit producers to access scarce resources or operating capital.
Processors (mainly women)	Heterogeneous group in terms of access to capital.	Long-term migration. Often are at the mercy of producers and others who have access to the desired resources.
Food and firewood sellers (mainly women)	The weakest category. Easily accept sex.	Often static, small businesses with limited profit. Poor and vulnerable to sexual exploitation in order to access scarce resources or operating capital. Often have to please many men.
Transporters (mainly men)	Influential, canny and well organized. Have the "three Cs": cash, cell phone and car.	Affluent, with access to urban goods. Act as middlemen. Can pay women traders for sex.

(Source: Malawi Government Ministry of Mines and Energy, 2007)

The relative isolation of forests from urban areas means that health services are difficult to reach. HIV testing may therefore be scarce, and for workers who have HIV, they may face great difficulty in accessing ART and other medical services.

2. Strategic themes for AIDS and forestry programming

To mitigate the impacts of HIV and AIDS on forest communities, the fundamental goal of forest sector interventions should be to support the sustainability of forest resources, in particular those used by households and communities affected by HIV. This concerns the specific use of forests, for example, as a safety net and for medicinal plants to treat HIV-related illness, etc.). Forest sector interventions should also seek to alleviate factors that aggravate the impacts of HIV and AIDS on households (e.g. household labor reductions and scarcity of subsistence forest resources, in particular firewood).

At this stage, the priority of the forest sector is to identify and introduce strategies and programmes areas from which site-specific technical interventions can be designed and implemented. Originating from stakeholder participation in fieldwork conducted in Malawi and Mozambique, and in consultation with representatives of regional and national forest administrations, the following recommendations outline key strategies that may be carried out in the forest sector (in coordination with other sectors), as part of a multisectoral response to AIDS.

2.1 *The value of non-wood forest products*

Households and communities affected by HIV incur medical expenses and may lack adequate labour for traditional income-earning activities. Non-wood forest products (NWFPs) are a valuable means of providing needed income and/or medical support to such households. NWFPs include leaves, bark, roots or other forest products used in treating illnesses, including HIV-related secondary infections, in addition to products of commercial value. Examples of NWFPs include products used as food and food additives (e.g. edible nuts, mushrooms, fruits, herbs, spices and condiments, aromatic plants, game), fibres (used in construction, furniture, clothing or utensils), resins, gums, and plant and animal products used for medicinal, cosmetic or cultural purposes. Some NWFPs are also important export commodities. At present, at least 150 NWFP are significant in terms of international trade, including honey, gum arabic, rattan, bamboo, cork, nuts, mushrooms, resins, essential oils and plant and animal parts for pharmaceutical products.

Non-wood forest products are important to forest communities for a number of reasons. Several million households worldwide depend heavily on NWFPs for subsistence and/or income, while women from poor households are generally those who rely more on these products for household use and income. Some 80 percent of the population in developing countries use NWFP for health and nutritional needs, with medicinal plants playing an important role in rural health⁸..

NWFPs are integral to the livelihoods of forest communities as they fulfill basic requirements, provide gainful employment during lean periods and supplement incomes from agriculture and wage labour. For example, in parts of West Bengal, communities derive as much as 17

⁸ Prasad, R. and Bhatnagar, P. 1991. Wild edible products in the forestst fo Madhya Pradesh. *Journal of Tropical Forestry*, 7(3): 210-218.

percent of their annual household income from NWFP collection and sale⁹. Small-scale forest-based enterprises, many of which rely on NWFPs, provide up to 50 percent of the income for about 25 percent of India's rural labour force¹⁰.

NWFPs also have a decided advantage over timber in terms of the time needed to achieve significant volumes of commercially valuable production. Timber production is a long-term endeavour, and in many areas timber harvesting may not be ecologically desirable. Moreover, many NWFPs become available even in the earliest stages of rehabilitation of degraded forest areas. Finally, at the national level over 50 percent of forest revenue and about 70 percent of forest export revenue comes from non-wood forest products, mostly from unprocessed and raw forms.¹¹

As there is a tendency to intensify the exploitation of forest resources in times of family or community crisis (such as HIV-related illness and death), community involvement in managing forests is important for both economic and environmental reasons. The experience of India presents some important lessons in this area, because one of the major challenges in the marketing of NWFPs is how to ensure that the collectors of these forest products can derive adequate benefits from their sale.

2.2 Issues in community involvement in forest management

Under joint forest management (JFM), Indian village communities are entrusted with the protection and management of nearby forests. The areas concerned are usually degraded or even deforested areas. However, in Andhra Pradesh and Madhya Pradesh States, all village fringe forests can come under JFM. The communities are required to organize forest protection committees, village forest committees, village forest conservation and development societies, etc. Each of these bodies has an executive committee that manages its day-to-day affairs, including prevention of forest fires, monitoring of tree cutting and, in some areas, shifting slash-and-burn agriculture. Community involvement in forest management is important in ensuring sustainable use of forest resources, particularly in light of added pressure on these resources within the context of HIV.

While JFM is a participatory approach, its design and functioning have proved to be problematic in different parts of India. This is because in many states, there are separate village committees for forest management and collection of forest produce. In addition, the marketing of many NWFPs is often a monopoly assigned to public or private companies who pay very low wages for collection work or low fixed prices for quantities of products provided.

An analysis of the situation in India reveals certain challenges that must be resolved for the various stakeholders involved in the conservation of forests and collection and marketing of NWFPs to share equitably in the benefits. In areas with high HIV prevalence, particular

⁹ Malhotra, K.C., Deb, D., Dutta, M., Vasulu, T.S., Yadav, G. and Adhikari, M. 1991. Role of Non-Timber Forest Produce in Village economy. Calcutta, Indian Institute of bio-Social Research & Development.

¹⁰ Tewari, D.D and Campbell, J.Y. 1995. Developing and sustaining non-timber forest products: Some policy issues and concerns with special reference to India. *Journal of Sustainable Forestry*, 3(1): 53-77.

¹¹ Tewari, D.D. and J.Y. Campbell. 1997. Economics of non-timber forest products. In J.M. Kerr, D.K. Marothia, K. Singh, C. Ramaswamy and W.B. Bentley, eds. *Natural resource economics - theory and application*. New Delhi, Oxford and IBH.

consideration needs to be taken for the needs and situation of HIV-affected households and communities.

Thus, effective and equitable NWFP management has clear ecological, social and economic benefits. Managing forests for multiple products (including NWFPs) and adding value to them at the local level is an important challenge. In trying to optimize the production of multiple products to meet the objectives of the various stakeholders, effort should also be made for the sustainable production of NWFPs in forest management efforts in order to also support people's needs.

3. The role of forestry services in strengthening household and community resilience to HIV

The role of forest extension workers is vital to strengthening household and community resilience to the impacts of HIV and AIDS¹². They can contribute to resilience by:

- Supporting and enhancing the capacity of traditional village institutions;
- Acting as an interface between local agriculture and forest institutions and NGOs to ensure that they respond effectively to community needs arising from the epidemic;
- Providing specialist advice regarding the contribution of trees and woodlands to rural livelihoods.

3.1 The training needs of forest extension workers in an AIDS environment

In order for forestry services to play a role in enhancing household and community resilience to the impacts of HIV and AIDS, the staff of these services must receive technical training and sensitization. This should involve the design of training courses and curricula for technical and tertiary education institutions that include models of HIV and forest sector linkages (see Annex 1 for more information about key themes for training forestry service workers.). Without this capacity, the implementation of programs at the community level will remain limited. These training modules can be integrated into the social forestry curriculum of institutions and can also be introduced to extension service providers through in-service training programmes. The forestry sector should also coordinate with agricultural extension services and the health sector in responding to the AIDS epidemic.

3.2 Agro-forestry in responses to AIDS

Once prepared to promote appropriate forestry management practices, forestry staff can help households find ways to strengthen their food security through solutions tailored to their constraints and opportunities. They should work in collaboration with local organizations, such as NGOs and CBOs involved in income generation, health, nutrition and food security.

In meetings with community members and visits to nearby forests, forestry staff can highlight the importance of conserving and enhancing forest resources to build resilience to the impacts of HIV. Staff can point out issues and suggest ways of strengthening community involvement in implementing them. In some cases, there may be a need to show why exempting trees and

¹² FAO. Contribution of trees and forests to the livelihoods of HIV/AIDS affected households. *HIV/AIDS extension fact sheets*. Rome, (<http://ftp.fao.org/docrep/FAO/007/ae502e/ae502e05.pdf>)

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plants from certain uses like firewood, roofing and drying is needed in order to protect their food value.

Low-income and HIV-affected households often rely on tree and forest products (e.g. wild food plants, bush meat, nuts, leaves and roots) to complement their diets more than other households in rural areas. Forest foods are often good sources of micronutrients (e.g. vitamins and minerals that are essential for good nutrition and health), which become essential for HIV-affected households.

Besides timber, forests and trees also provide fibre, fodder and mushrooms which can reduce expenditure and generate revenue for low-income and HIV-affected households. Certain types of trees and non-wood products may be used as a source of livelihoods through the production of handicrafts, furniture-making or beekeeping.

In the context of longer-term rural livelihood development, forestry and agro-forestry can contribute to addressing the problem of insufficient labour and capital resources in the agricultural sector in the following ways:

- Strengthening land tenure: Trees are traditionally regarded as an indicator of tenure and can assist in securing land. Access to and ownership of land are determining factors for the viability of HIV-affected households. Widows and orphans may lose their access to land through land grabbing after the death of their husbands or fathers.
- Supporting traditional agro-forestry systems: Traditional systems of integrating tree and crop production enable the productive capacity of the soil to be stabilized. These measures help to maintain production even if households face labour shortages in meeting multiple household needs for items like food, fodder and fuelwood.
- Promoting the production of natural medicines: Wild plants are a principal source of traditional medicines. Often derived from leaves and roots, they may help to treat many of the symptoms of opportunistic infections associated with HIV. Indigenous medicinal plants (including cultivated tree nuts and wild fruits) may also boost the immune system of PLHIV.

In collaboration with agriculture extension workers, forest extension workers can improve household livelihood systems. Some relevant measures include the following:

- Encourage better management of trees so that farmers can:
 - Maintain land productivity and enhance soil fertility
 - Reduce wind and water erosion
 - Support other farm enterprises – e.g. fodder for livestock, shade for tea, coffee or other plants
 - Diversify production
 - Provide an emergency source of food
 - Reduce the burden of household work on women
- Improving fallows by planting trees and shrubs within local farming systems so that farmers can:
 - Improve soil fertility and food production

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- Reinforce soil conservation
- Provide a source of fodder and fuelwood in proximity of the homestead
- Assist in securing land tenure of abandoned farmlands
- Harvest products after two to eight years, depending on the species planted
- Introduce agro-forestry so that farmers can:
 - Reduce the amount of required labour by maximizing the productivity of biological systems
 - Improve the efficiency of labour through positive interaction of trees and farm enterprises
 - Increase the efficiency of wood energy through the introduction of fuel-efficient cooking stoves

LEARNING REINFORCEMENT ACTIVITIES

Activity 1: Studying household and community responses to AIDS in forest communities

It appears that woodlands are an essential safety net for HIV-affected households. It has been observed that these households seem to rely more and more on forest resources as their capacity to farm the land or do other productive tasks declines. Households not able to crop also rely more on gathering from woodlands for their daily subsistence needs and for income. In addition, in many villages, households have no access to pharmaceutical drugs and thus rely entirely on the plants and trees growing on their farms and in woodlands to treat opportunistic infections.

Read and answer the following questions. If you are in a workshop you may work together with one or more people who are familiar with a given country. It is suggested that you (or your group) develop a case study on household and community responses to AIDS and then present it to the rest of the group using flip chart pages or a PowerPoint presentation.

The use of plants in treating illness:

1. Are medicinal plants used in your country to treat HIV-related opportunistic infections?
2. How effective are these plants in treating infections?
3. Who normally gathers these plants?
4. To what degree do the gatherers benefit from the commercial value of these medicinal plants?
5. Is it possible to cultivate any of these medicinal plants? If so, what type of environment and care do they require?
6. Are there any problems or issues to be raised concerning the use of wild medicinal plants (e.g. toxic side effects, mistaking one plant for another, unsustainable collection, etc.)?

Gathering wild foods and game:

Make a list of fruits, mushrooms, honey or other edible items, including animals and insects that can be gathered or hunted in forests.

1. To what degree do people living in or near forests rely on wild plants and animals for their own nutrition and to what degree do they sell this produce for income?
2. Is there evidence that these fruits and edible items are becoming scarcer? If so, what measures can you propose to protect them?
3. Is this perceived scarcity related to over-harvesting to meet the needs of households affected by chronic illnesses such as HIV?

Activity 2: Promoting community forest management in an AIDS environment

Community forest management has increased in recent years with political decentralization and the recognition of historic land tenure rights in several countries. Such efforts, however, must address issues of bureaucratic complications, competition from big business and lack of concern on the part of government. In Brazil, for example, local forest communities are often displaced by loggers, farmers and miners, and many lack the infrastructure to bring products to the market.

Read and answer the following questions. If you are in a workshop you may work together with one or more people who are familiar with a given country. It is suggested that you (or your group) develop a case study or the outline of a position paper on community forestry and AIDS in your country of choice and present it to the rest of the group using flip chart pages or a PowerPoint presentation.

The organization of community forestry in your country of service:

What are the main features of community forestry practice in your country of service (or another country that you know well)?

1. Draw an organizational chart showing the relationship of the forestry services and local CBOs or management committees.
2. What are the main advantages and disadvantages of this arrangement?
3. How does your country of service reconcile the interests of commercial plantations and concessions with the needs of forest communities?
4. What policy, management or other reforms would you recommend to improve community management of forests in your country of service?

Involving forestry services and communities in responding to AIDS:

1. Have the forest services provided support to communities in protecting, collecting or marketing medicinal plants?
2. How have the staff of the forestry services been affected by the epidemic (illness, absenteeism, reduced activities, death, etc.)? Has there been a visible change in the activities of the forestry services as a result of AIDS?
3. What measures (if any) have been taken to improve household and community food security and poverty in communities affected by HIV? Which organizations have been involved?

Activity 3: Preparing forest extension workers to support responses to AIDS in forest communities

Read and answer the following questions. If you are in a workshop you may work together with one or more people who are familiar with a given country. It is suggested that you (or your group) develop a case study or the outline of a position paper on preparing forest extension workers to support responses to AIDS in your country of choice and present it to the rest of the group using flip chart pages or a PowerPoint presentation.

1. What knowledge and skills do forestry extension workers need to support forest households and communities affected by AIDS? Some aspects to consider include:
 - Basic knowledge about the virus and the epidemic (refer to Module 2 – “HIV and AIDS: Some basic facts” if necessary);
 - Knowledge about the role of the health and other sectors in responding to the epidemic;
 - Knowledge of how households and communities cope with impacts of the epidemic (knowledge from direct observation and discussions; knowledge from studies and documents);
 - Knowledge about vulnerabilities of people to HIV;
 - Knowledge about how the forestry sector can intervene to reduce vulnerabilities to HIV and its impacts.
2. What partnerships would be necessary to respond to the needs of HIV-affected households and communities in forest communities of your country of service? Mention the roles of the following actors:
 - The health sector;
 - NGOs and CBOs;
 - Village forest management committees;
 - Credit and marketing organizations;
 - Other organizations;
3. Has the forestry sub-sector in your country of service developed a policy or strategy for integrating HIV issues into the objectives and programmes of the sector? If so, what are some key elements of this policy or strategy? If not, what key elements should be included if a policy or strategy were developed in your country?¹³

¹³ You may wish to refer to the Malawi Forestry Sector HIV and AIDS Strategy 2007-2011 for an example: <http://www.cabi.org/GARA/FullTextPDF/2010/20103040805.pdf>

SUMMARY REMARKS AND LESSONS LEARNED

It has been noted that in times of crisis in a forest community, such as when an epidemic strikes, the community will respond by more intensive (and often unsustainable) use of forest resources. Vulnerability of forest households to food and livelihood insecurity typically increases when adult male members of the household become sick and die and females must take time away from other activities to care for the sick. For this reason, labour-saving practices and technologies (such as fuel-efficient stoves) are important measures to bolster the resilience of forest households in an AIDS environment.

Responses should be considered at national (strategic policy and planning), institutional (forestry department staff and workers, tertiary education, research and extension services) and local (villages and households) levels.

The forestry sub-sector can have a role in mitigating the impacts of AIDS in the following ways:

- By enhancing short and longer-term forest and agro-forest productivity;
- By enhancing education and human resource development strategies in extension and forest services (forestry training and education);
- By carrying out outlook studies on the impacts of HIV and AIDS on the forestry sector and developing appropriate policy and decision support tools.

The potential of forestry to contribute to reducing vulnerabilities to HIV and mitigating its impacts in rural communities is high. The information provided in the previous sections shows that local communities may get income from selling forest products and increase their food diet by incorporating wild foods (e.g. honey, mushrooms and fruits) rich in protein and vitamins. The use of medicinal plants to treat HIV-related illnesses provides opportunities for local communities in terms of their own use and for sale in towns, thereby improving health outcomes in addition to earning income.

Income-generating forestry activities, such as charcoal-making, carpentry, bamboo cutting and woodcarving, are important to supporting livelihoods. These activities tend to be labour intensive and are often practised by men in the community. People who are ill, or young people and the elderly, may face difficulties in using these activities as a coping strategy. Other potential activities, such as basket weaving and beekeeping, require lower labour input and can be carried out easily by women and children (including widows and orphans) or people who may be weaker due to illness. Within this context, the type of work promoted by the extension service is of great importance in terms of promoting labour-saving technologies and practices that can improve production efficiency and reduce vulnerability of affected households.

The unsustainable use of forest resources in areas with a high HIV prevalence may deter the promotion of forest products as a coping strategy in the long term, particularly because access to forest products is decreasing and there will be fewer opportunities for local communities to find alternatives for mitigation. In the medium term, the high accessibility to forests in areas with high HIV prevalence may, however, represent market opportunities for forest products such as charcoal and bamboo. These observations suggest the need for a management plan,

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particularly for in areas experiencing unsustainable use of forest resources. This can reduce the risk of resource depletion and at the same time secure forest product markets.

Considering the aspects presented in this module, the following recommendations should be considered:

1. Community natural resource management organizations must be strengthened with a view to improving the local management of woodland resources as well as the capacity of community members to help households affected by illness or death.
2. Inter-institutional and inter-sectoral coordination should be improved to link up different initiatives, including agriculture and agro-forestry programmes, as well as with the private sector.
3. Activities, products and markets suitable for HIV-affected households need to be identified.
4. The identification, cultivation and management of medicinal plants and energy-rich wild foods should be promoted to help with the treatment and food supplement of people living with HIV.

Implementing these recommendations requires that several key factors are addressed:

- How households and communities use forest resources differently depending on gender roles and depending on which family members are infected or affected by HIV.
- The need to look at the development and uses of non-wood forest products (NWFPs) depending on whether they have an immediate medicinal or nutritional use or whether they have income-generating potential.
- Control of resources in concessions and community forests can increase vulnerability to infection as women or girls may be obliged to provide sexual favors in return for access to firewood or other forest products.
- Mobility and isolation makes forest service workers more vulnerable to risk of exposure to HIV.
- Logging concessions attract young male workers who may frequent sex workers.
- Special training for forest extension workers is needed in order to enable them to play a catalytic role in working with community organizations to strengthen resilience to HIV and its impacts.

ACRONYMS AND ABBREVIATIONS

AIDS	Acquired immunodeficiency syndrome
ART	Antiretroviral treatment (or therapy)
ARV	Antiretroviral (medicines)
CBO	Community-based organization
FAO	Food and Agriculture Organization of the United Nations
FPC	Forest protection committee
HIV	Human immunodeficiency virus
JFM	Joint forest management
MA&D	Market analysis and development (FAO)
MoA	Ministry of Agriculture
NGO	Non-governmental organization
NWFP	Non-wood forest product
PFPC	Primary forest produce collector
PLWHA	People living with HIV
PMTCT	Prevention of mother-to-child transmission
STI	Sexually transmitted infection
VCT	Voluntary counselling and testing
VFC	Village forest committee

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ANNEX 1 – Priority themes for training forestry workers to support households and community resilience in an AIDS environment¹⁴

1. Management of medicinal plants used to treat HIV-related illnesses

Training is needed on medicinal plants, particularly those used in the treatment of HIV-related illnesses. Efforts also need to be made to sustain supplies of medicinal plants used for these purposes. The benefits of this include ensuring the availability, affordability and quality of herbal therapy for PLHIV. These interventions can be grouped into those based on the management of natural woodlands and those based on the domestication of species for cultivation.

Training must provide guidelines and techniques to support the management of medicinal plants in natural woodlands (e.g. management plans, sustainable harvesting methods, organization of user rights/associations), which is an important precursor to domestication. Due to the wide range of species used in treating HIV-related illnesses, the first step in the development of these interventions is to identify priority species. This will involve coordinating with healers associations, particularly where they are involved in collaborative arrangements with the biomedical sector, to identify species popularly used in the treatment of opportunistic infections and management of HIV-related symptoms. These include medicinal plants used in treating: tuberculosis, mouth and throat sores/rashes, skin rashes, diarrhea, fevers, and other sexually transmitted infections (STIs). Emphasis should be given to those species that are being evaluated in trials. Following the identification of priority species, indicators of species scarcity will need to be evaluated and monitored.

2. Identification and advocacy of nutritional non-wood forest products

Forest extension workers need to know basic information about the nutritional value of non-wood forest products (NWFPs), as collection of wild foods can provide a food diversification strategy for achieving adequate nutrition prior for people, in particular those living with HIV. Training must present country-specific information. For example, research in three sites in Malawi showed that 79 percent of households collected fruits from local forest resources for consumption and 34 percent of households collected fruits on a weekly basis. Across each of the three study sites, communities identified an average of 16 different tree species producing fruits or other foods. Certain non-wood forest products and other wild foods are high in some of the key nutrients required by PLHIV, in particular protein, fat, vitamins A and C, iron and zinc¹⁵. For example, 100g of *Annona senegalensis* fruits (collected and consumed in all study site communities) contain 103 percent of the daily recommended nutrient intake of vitamin A, compared to 34 percent and 24 percent for mango and papaya respectively.

Related training is needed in the techniques of participatory appraisals. Such appraisals are needed to determine the role that NWFPs play in local livelihood strategies and can be valuable inputs for those in the health sector conducting nutrition assessments and developing

¹⁴ Barany, M., Holdings-Anyonge, C., Kayambazinthu, D. & Siteo, A. 2005. *Firewood, food and medicine: Interactions between forests, vulnerability and rural responses to HIV/AIDS*. Proceedings from the IFPRI Conference: HIV/AIDS and Food and Nutrition Security, April 14-16. Durban, South Africa. (<http://www.fao.org/forestry/9718-1-0.pdf>)

¹⁵ Barany, M., Hammett, L., Stadler, K. and Kengni, E. 2004. Non-timber forest products in the food security and nutrition of smallholders afflicted by HIV/AIDS in sub-Saharan Africa. *Forests, Trees and Livelihoods*, 14: 3-18.

community-based nutrition interventions. Departments of Forestry can coordinate with communities and natural resource committees to carry out such appraisals to identify commonly consumed species in a given area.

In addition, extension training needs to cover storage and processing skills, which can help increase the seasonal availability of forest foods. Availability of these foods can also be increased through the inclusion of these species in agroforestry systems.

3. Reduced labor requirements for subsistence woodland firewood collection

Interventions that reduce the labor requirements for firewood collection can help mitigate the impacts of HIV and AIDS on household labor. Reducing labor requirements associated with the subsistence use of firewood can provide households with the following benefits:

- Increased labor availability for other household activities;
- Reduced labor burden on children;
- Avoids adverse strategies such as reducing firewood consumption (with potential nutritional consequences);
- Reduced vulnerability of women to exposure to HIV.

There are a variety of interventions that can be carried out within the forestry sector to improve the accessibility and availability of firewood. Training is needed on methods of:

- Improving access through the creation of tenure niches within forests.
- Creating limited benefit streams to those currently excluded from co-management arrangements.
- Supporting the roles of women and children in decision making and planning of resource management, which in the case of firewood collection is typically handled by women and children.

Related training must cover strategies to increase production of firewood resources, including improved management of customary woodlands, reforestation of degraded areas on customary lands with fast growing woody species and nursery stock distribution of species with high firewood quality to households and communities.

Finally, extension workers must become familiar with labor-saving technologies such as fuel efficient stoves that can help reduce household consumption of firewood and lower the volume of wood a household needs to collect.

4. Development of woodland-based income generating activities

Forest extension workers need to have basic information about the income-generating potential of artisan utilization of forest resources. Training needs to cover the current and potential products that can be made from forest materials. It must be noted, however, that partnerships with organizations specialized in marketing such products are required.

Where communities have access to markets, woodland-based income generating activities can increase a household's economic access to healthcare and improve food security. While certain woodland activities, such as the collection and sale of firewood do not require

advanced skills, others activities do. These include (but are not limited to) products for which value can be added through home-based work such as reed mats, baskets and processing of food. These activities can be carried out when time and labor permit, while attending to other duties in the household such as care-giving. Support for the development of these activities can be channeled through village marketing associations and may require transfer of skills related to market information (e.g. prices, products, quality preferences, seasonal price fluctuations). FAO's Market Analysis and Development (MA&D) training methodology for community-based tree and forest enterprises¹⁶ would be particularly useful in this regard. In addition to marketing assistance, additional efforts could include support for value-added processing and post-harvest loss reduction.

5. Forest revenue sharing for community members affected by HIV

Specialized training is needed for extension workers on the principles of community-based management of forest revenues. In order to avoid the imbalances in revenues derived from NWFPs through a monopoly model like the one in India, it is important to devise equitable plans to share the proceeds from the sale of NWFPs.

Woodland resources and forestry interventions have various uses:

- Forestry revenues can indirectly support groups affected by HIV through revenue sharing and employment. Social safety nets and the reliance on neighbours and community members for in-kind and financial assistance is a common coping strategy in some communities.
- Revenue generated from the licensing and sale of forest products from private forest concessions, co-management arrangements, and community management of customary lands can be a source of funds to finance systems in communities that support households affected by HIV. A portion of these funds could go into a community savings to be used to support affected households. These funds could also be used to provide loans to people who care for abandoned or terminally ill members of their community. This will require institutional support for communities to regulate and enforce licensing and mechanisms for revenue sharing.
- Community members affected by HIV, such as orphans, could be employed in the implementation of forestry interventions such as nursery management and tree planting. This could be accompanied by training of orphans in seed collection, tree propagation, and nursery management.

Training for forest extension workers should cover the principles and methods of the various resource management options. Actual program development and supervision would need support from appropriate cooperative networks and financing agencies.

6. Management of natural woodlands

More intensive forest management to increase productivity and accessibility of natural capital is in itself a mitigation strategy. Within communities, there is a need to improve management of natural woodlands for multiple purposes. Efforts need to be made to organize these user groups and to identify the opportunities and threats in regards to specific uses of woodlands.

¹⁶ Market analysis and development training materials can be accessed through the following link:
<http://www.fao.org/forestry/enterprises/25499/en/>.

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Extension workers could benefit from training on techniques that have been used successfully in different countries where forest management committees have been created.

Management plans and training in proper harvesting skills can help sustain the productivity of specific resource within natural woodlands. Organizing user groups, creating tenure niches, developing management plans, and regulating resource use will require capacity building of community-based organizations and institutions. This includes building technical skills for planning and management, but also facilitating processes of woodland governance that take into account the needs of vulnerable and affected households. The continued promotion of gender equality within decision making and planning is essential.

Support for local institutions to manage natural woodlands is particularly important given the impacts of HIV and AIDS on natural resource management institutions at the national and local levels.

ANNEX 2 – Non-wood forest products and coping strategies in times of crisis

The following sections from research in Mozambique¹⁷ highlight typical non-wood forest products (NWFPs) that can provide cash or nutritional support to households facing challenges, such as from the impacts of HIV and AIDS. The following sections also refer to activities that local residents can take up (part-time or full-time) to support their families, especially in times of crisis.

Agricultural products

Agriculture is the most important activity in many rural areas for subsistence as well as for income. The sale of agricultural products and the use of wage labour in agricultural activities are among the most important sources of income in times of crisis. In good years, the surplus is sold for cash to solve household problems. Families with large production capacity (generally polygamous families) use the surplus to hire extra labour in difficult periods in order to complete land preparation, sowing and harvesting tasks. Asking other households to help with land preparation or harvesting and paying them with goods is one way to cope with crises, but, on the other hand, households that help are often also in crisis (and may be more vulnerable) and benefit from the communal labour as well.

Charcoal making

Because it takes a long time (3-5 months) to complete the charcoal production cycle (from tree cutting to charcoal burning), it is not used as a quick response in times of crisis stemming from illness or death. It is however a response for general crises such as droughts and floods, which affect the whole community. This activity is labour-intensive and the elderly, women and children generally do not participate.

Fisheries

Many forests contain rivers and lakes where forest communities catch fish. Fishing provides food and cash, particularly for families with high potential for fishing. While most families collect fish for their own consumption, there are others that use fishing nets and canoes more intensively and can catch large quantities of fish to sell within and outside the community. Sawmills and forest lumber camps provide a market for fish. Families with fishing capacity are particularly stable and may encounter less difficulty when a crisis occurs.

Poles and bamboo

Poles are an important building material used within forest community and are sometimes one of the most important sources of income from forest products¹⁸. Bamboo is cut and sold on the edge of roads that cut through forests. Men are usually involved in this activity and it is among the easiest ways to get cash in crisis conditions. Cutting and carrying bamboo stems, however, is labour-intensive and households headed by women and the elderly may not be able to use this option.

Honey

Honey collection is man's activity. Some people may collect honey in the wild, while others use traditional or modern beehives to produce honey. Honey is used for consumption or to sell within the community, however, due to its seasonality, it may not be available as a safety

¹⁷ FAO. 2005. Miombo woodlands and HIV/AIDS interactions – Mozambique country report. Forestry Policy and Institutions Working Paper 2. Rome, FAO. (<http://www.fao.org/docrep/008/j5251e/j5251e00.htm>)

¹⁸ After charcoal.

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strategy when needed. Households with modern beehives may yield up to 40-60 litres of honey per year, which is sold locally or sent to urban markets.

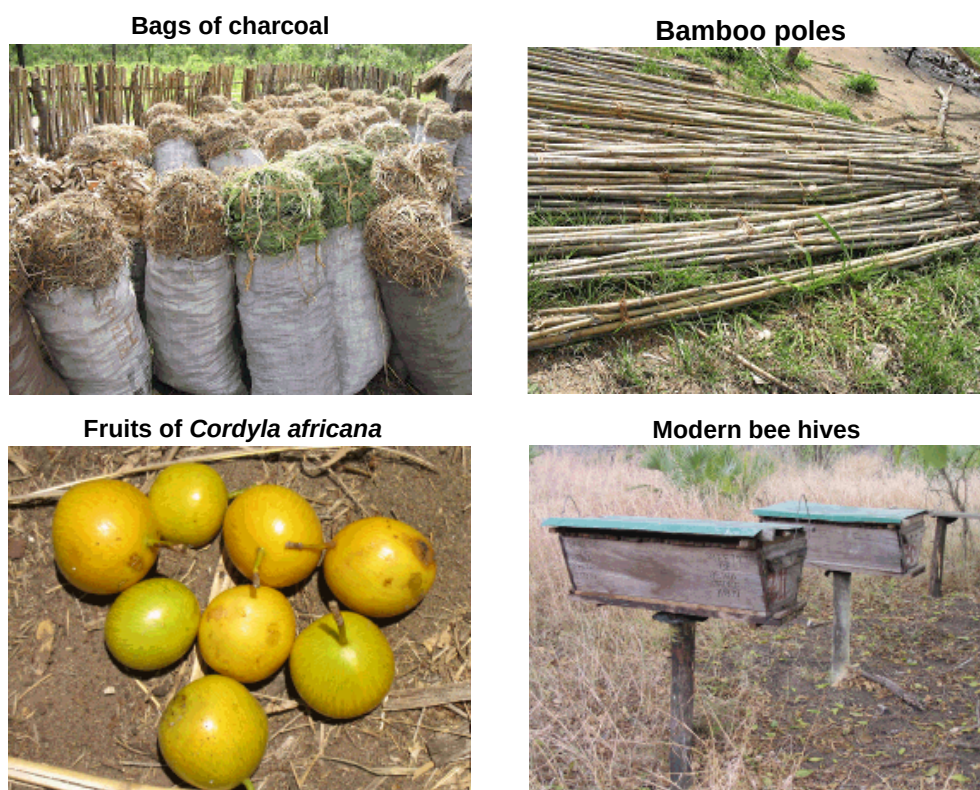
Medicinal plants

Medicinal plants are generally collected by traditional healers to prescribe to their patients. However, there are some common medicinal plants, such as the root of *Cassia occidentalis* (used for stomach aches), which are known by most community members. Minor illnesses may be treated with medicinal plants, while more severe illnesses may require medical attention.

Wild food plants

Roots of wild plants such as *Boscia salicifolia* and fruits of the palm *Borassus aethiopum* are used as food supplements during normal years, but amounts collected increase during years of food insecurity, particularly those caused by drought. Food insecurity associated with floods usually brings good opportunities for fishing, which becomes the most important survival strategy in some communities. In general, the most vulnerable households will be the first to turn to wild foods when food reserves become limited.

Figure 2. Examples of non-wood forest products



(Source: FAO, 2005)

Wild animal food

The collection of rodents and worms is common for all households when they are in season. This is one of the most important sources of animal protein, together with domestic animals. Among domesticated animals is the guinea fowl, which is caught in local forests. Larger animals, such as duikers and other antelopes, are now scarce and not only demand more time and energy to hunt but are protected by forest regulations.

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During the dry season, rats may be collected – one species from agricultural fields (by women) and another in the grasslands (by men). Households with reduced ability to collect these animals may buy them from other families, thus providing income that can be used in the event of crisis.

Chickens and goats

Almost all households have chickens, but only some have goats. Selling chickens and goats is one of the quickest ways to get cash in times of crisis. This strategy ranked high among those adopted by households in cases of illness. Animals may be sold locally or on the roadside. This strategy is quick and effective, but may need to be complemented by other measures in the event of prolonged illness.

Wage labour

This is the main income-generating activity in times of crisis, particularly when the crisis is at the household level (e.g. due to illness and death). When a family member is ill for a long time and the available cash is exhausted (e.g. due to medical expenses), the other family members will often engage in wage labour. Payment is generally in kind (food) or cash. Households within the community with food stocks provide work opportunities. There are mutual benefits for both the service providers (by having additional labour to carry out activities) and for the labourer (by getting cash or food to cope with the crisis). The latter is undertaken particularly by the most vulnerable families (those that are unable to produce agricultural surplus, charcoal, bamboo, fish or other products to sell). Households headed by women and the elderly are the most vulnerable and are likely to engage in wage labour activities.

Carpentry

Carpenters are particularly well positioned within the community because they can get continuous income throughout the year and may have disposable cash when a crisis occurs. Carpenters often collect the sawmill waste without cost to use in their carpentry to produce small-sized furniture. Logging within concessions is conditioned by permission of the concessionaire but in other areas logging and sawing are done by the carpenters themselves. In Mozambique, carpenters may not use chain saws in community forests in order to reduce the depletion of valuable tree species.

Work at forestry concessions

Work within forestry concessions is usually the only formal work available for forest community members. Most young men strive to get a position in these concessions to sustain their families. Those who work at the concession often maintain their traditional activities, such as rat hunting, basket weaving or honey collection, for subsistence and income. The stability of households with a member working at a concession is high because they get a salary, in addition to supplementary income or food from other activities.

Mushroom collection

Mushrooms are an important food supplement. They are collected during the rainy season, before harvesting of agricultural products and after the rat season. Mushrooms are collected by men in the forest and can be sold to families without the capacity to collect them.

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Common reed

Common reed (*Phragmitis australis*) is used for buildings and for weaving mats. Some households cut reeds to sell them within the community to get cash. In some communities men cut reeds from local rivers.

Palm wine

Palm wine is tapped by men from *Hyphaene natalensis* and *Phoenix reclinata* in the grasslands. It is also an important source of income during the beginning of the growing season.

Woven baskets

Baskets are woven using *Hyphaene natalensis* and *Phoenix reclinata*. Baskets can be sold locally within the community or in neighbouring towns.