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Guidelines for Equitable and Sustainable Non-Timber Forest Product Management

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Good practices for Equitable and Sustainable Non-Timber Forest Product Management

Forests worldwide are under tremendous pressure – and so are the 1.6 billion forest dwellers who depend on these for their livelihoods. Forest and tree diversity are essential to sustain forest ecosystems and livelihoods. Yet, forest degradation, evidenced in the rapid and disconcerting loss of forest biodiversity, is propelled by many factors, including persistent poverty, growing international demand for timber and non-timber forest products (NTFPs) and climate change.

In parallel, and partly to address this concern, community-based or joint forest management approaches have been adopted in various countries to promote sustainable and inclusive forest management. However, many challenges persist related to poor governance, lack of transparency, gender inequality, social exclusion and lack of tangible livelihood benefits; all of which contribute to unsustainable practices and continued degradation.

How can we improve local livelihoods while maintaining forest biodiversity and strengthening sustainable forest management in a socially inclusive and just manner? These guidelines present practical strategies and field examples for the inclusive and sustainable extraction, sale and management of forest products, particularly NTFPs. They build upon the framework of the Community Biodiversity Management approach in which three outcomes are sought; (1) community empowerment and social equity, (2) biodiversity conservation and (3) livelihood development (Sthapit et al. 2016). The guidelines draw upon data from the project: ‘Innovations in Ecosystem Management and Conservation’ carried out between 2014 and 2017 in districts of two Indian states: Mandla District in Madhya Pradesh and Uttara Kannada District in Karnataka.

Photo credit: Nimi Sunilkumar

Setting the scene: Use and management of non-timber forest products in Mandla and Uttara Kannada Districts

Understanding the local context is crucial to make informed non-timber forest product management decisions. Hereby, an introduction is provided to the sites located in Madhya Pradesh and Karnataka.

- *Which NTFPs are collected most from the study sites and how does that impact the forests?*
- *What is the impact of commercial sales of non-timber forest products (NTFPs) on local livelihoods?*

Livelihoods, markets and forests in Mandla district, Madhya Pradesh

The tribal communities in Mandla district have an average monthly income of only US$25 (less than $USD 1 per day) and depend heavily on non-timber forest products (NTFP) for their food security, nutrition and income. Alongside farming and wage labour, NTFPs are an important source of cash. On average, households can earn between USD$75–150 annually through the sales of NTFPs, which amounts to about 30–60% of annual income. In addition, NTFP species help to fill the food and nutrition gap in the lean season (rainy season), just before rice and millet harvests. In the 1990s, the State Government introduced community-based forest management by establishing Joint Forest Management Committees (JFMCs), which mostly did not develop as the strong, representative forest governance institutions originally envisioned.

In Mandla district, the most important NTFP is the yellow flower of the mahua tree (*Madhuca longifolia*), which is widely collected and used to make alcohol, as a sweetener and for flavouring traditional dishes. Mahua flowers are sundried at home and sold to local traders at farm gate or the local market. Chakoda (*Cassia tora*) pods of a small shrub found surrounding farm fields and barren lands are also highly valued and are generally sundried and sold to be used as ingredients for animal feed or as an

alternative to coffee. Many households also collect, sun-dry and sell the fruit from the char tree (*Buchanania lanza*). The almond-flavoured seeds (chironji, a high-value product in mainstream markets) obtained by manual decortication, are eaten raw, roasted or ground, and used as an alternative to rice, millet or wheat flour. Additional NTFPs include: ban tulsi or wild basil (*Ocimum gratissimum*), harra (*Terminalia chebula*) and bhilwa or wild cashew (*Semecarpus anacardium*).

In Mandla, persistent poverty, natural population growth, and the high dependency of tribal communities on NTFPs and fuel wood, in conjunction with storms, forest fires or extreme drought, has resulted in widespread degradation of the dry deciduous to tropical moist forests located on steep hilltops in the landscape (ghats). As a result, the last two decades have seen a sharp decline in availability of NTFPs and a subsequent increase in the distance travelled to collect them. Mahua trees, protected by ancestral harvesting rights, are some of the only large trees remaining near villages, as most trees in close proximity are heavily harvested for fuel wood and pruned or even cut down to ground level. When the forest is left alone, shoots and small trees re-emerge from the old root system.

Livelihoods, markets and forests in Uttara Kannada district, Karnataka

Sirsi is the major town in Uttara Kannada district, which is located in the middle of the Western Ghats: an evergreen semi-tropical rain forest area with deciduous patches, considered an important biodiversity hotspot. Farmers have a mixed orchard system combined with rice fields. The cash crop areca nut (*Areca catechu*) is widely grown and intercropped with other crops, such as pepper, banana and cardamom. The larger and more affluent farmers have historical and ancestral harvesting rights to forest areas, locally referred to as ‘betta lands’, from which they collect green manure for their spice gardens and rice fields and NTFPs for home use. Over time, many poor households of Scheduled Castes and Tribes or Other Backward Classes have settled in the area to work as agricultural labourers or NTFP collectors for larger-scale landowners. This was initially characterized by forest encroachment, with many migrants eventually acquiring small but official landholdings.

NTFP harvesting rights over forest areas, with exception of the ‘betta lands’, are coordinated by the Forest Department, with concessions being granted to a few dominant NTFP traders. Village Forest Committees (VFCs), established in the 1990s by the State Government and supported by training from the Forest Department and local NGOs, hold management rights over agroforestry plantations and NTFP extraction.

NTFPs are used widely for home consumption and play an important role in traditional food culture. Landless or land-poor households, earning on average $USD 90 per month, tend to be highly dependent on NTFP as a source of cash income (20–50%), while large farmers only receive a minor share of their income (less than 15%) from selling NTFPs.

The most collected NTFP is uppage (*Garcinia gummigatta*), which has substantially increased in price (from 15–30 rupees per kg in the early 90s up to 200–240 rupees in 2013) since its use as an ayurvedic and in weight-loss pills in the pharmaceutical industry. However, this year prices decreased to 50–70 rupees due to low quality and competitive prices from Sri Lanka and Malaysia. Traditionally, uppage fruit rinds are dried using fuel wood and consumed as a sourly food ingredient for fish or curries, while the butter from the seeds is widely used as cooking oil. Households also collect kokum

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(*Garcinia in*dica) fruit, which have similar medicinal properties but are consumed as a juice (kokum juice). The butter of kokum seeds derives high value as a skin moisturizer used in ayurvedic medicine and in the cosmetics industry.

Aromatic mangoes (*Mangifera indica*) named 'appe midi', predominantly used to make a popular traditional type of mango pickle, are collected unripe from trees found mostly along streams and rivers. Urbanization and women's greater entry into the labour force have led to the emergence of a market for this pickle, as women have less time to produce it at home. In addition, households collect wild pepper (*Piper nigrum*), wild nutmeg (*Myristica malabarica*) and honey (*Apis* spp.). Most households sell their NTFPs to collecting or local market traders who sell them to the few large traders granted NTFP concessions.

The forest is largely still in place but has gradually become degraded and less dense and diverse over the past few decades. However, some villagers have reported a reduction or even reversal of this degradation following the establishment of VFCs. The major drivers of degradation include: immigration, natural population growth, conversion of land to agriculture, and more frequent extraction of timber and NTFPs due to infrastructural improvements linking rural communities to markets. Increased prices and the emergence of international markets for several NTFPs and spices have also put pressure on populations of wild pepper, wild nutmeg and, to a lesser extent, uppage and kokum. Many villagers reported irregularity of yields over the last decade due to heat waves and increased rainfall variability.

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This site description was developed by Hugo Lamers as part of the project 'Innovations in Ecosystem Management and Conservation (IEMaC)', implemented in Karnataka and Madhya Pradesh, India, from 2014 to 2017. The project was supported by USAID India Mission, and is part of the CGIAR Research Program on Forests, Trees and Agroforestry, which is supported by CGIAR Trust Fund Donors (www.cgiar.org/funders/).

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Sustainable incomes from forests: Promoting collective sales of non-timber forest products

This guideline is the first in a series that explains good practices in community-based forest management. It can be used as a trainer's or facilitator's guide in community meetings to help participants identify non-timber forest products (NTFP) management options for their own contexts. The sub-headings can serve as guiding questions to foster discussion on current and alternative practices and motivating factors, while the text provides some common answers and implementation ideas.

In this guideline:

- *Why pursue sustainable value chain development and sales of non-timber forest products (NTFP)?*
- *How to generate sustainable incomes from NTFPs without damaging the resource base*
- *Which tools can help guide sustainable value chain development interventions for NTFPs?*

Why pursue sustainable value chain development and sale of non-timber forest products (NTFP)?

Persistent local poverty, poor forest management institutions and strong commercial interests in NTFPs have often resulted in a 'tragedy of the commons': free-rider attitudes reflected in overharvesting and destruction of the NTFP resource base for short-term gains.

Value chain development offers the opportunity to improve the economic benefits that local communities derive from NTFPs, thereby providing incentives to limit damage to the resource base. Using examples of best practices from Uttara Kannada district, Karnataka and Mandla district, Madhya Pradesh, this guideline discusses how to pursue sustainable value chain development by contributing to:

- Collective knowledge, awareness, regulations and conservation actions to monitor and ensure the long-term survival of the NTFP species
- Value chain development interventions that maximize profits and margins at village level in an equitable manner
- Individual premiums and benefits for NTFP traders who adopt sustainable practices.

How can we generate sustainable incomes from NTFPs without damaging the resource base?

The study, conducted in 50 villages across the two districts, provides useful insights into the institutional structures that support a sustainable increase in incomes from NTFPs:


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Form first-tier Self-Help Groups (SHGs) to facilitate and regulate NTFP harvesting campaigns. In total 30 SHGs, representing 341 households, were established in forest-dependent villages in Uttara Kannada district. Households that depend most on NTFP collection for their livelihoods, such as encroached and landless households of Scheduled Castes and Tribes or Other Backward Classes, were the main beneficiaries. One member per household could join the SHG, with encouraged participation of women (40% of the members are women), who collect, use and process many NTFPs. Each SHG collectively harvested NTFPs and held a communal bank account, into which revenues and profits were transferred.

Form second-tier organization to facilitate collective aggregation, processing and sales of NTFPs, such as a commercial-oriented farmer cooperatives, federations of self-help groups or Farmer Product Companies (FPC). In Uttara Kannada district, the 30 SHGs were grouped under a newly registered FPC. In Mandla we worked with the active FPC, composed of 50 farmer interest groups, amounting to 1,000 members (76% women), all of whom were also shareholders. The member-elected board hired a general manager and seasonal field staff to coordinate NTFP harvesting campaigns and collective storage, grading and sales to bigger and more distant traders or processors.

Introduce a harvesting license system for major NTFP species in collaboration with local forest authorities, such as Joint Forest Management Committees (JFMCs) or the Forest Department. In Uttara Kannada district, the Forest Department and NGOs delivered training to Village Forest Committees (VFCs) on sustainable harvesting practices. In order to ensure that NTFP harvesting is sustainable and beneficiaries hold a license, some VFCs appointed a monitoring group comprised of community members. Since 2014, the Forest Department granted a few VFCs a concession (licence), normally obtained by large traders, to directly trade and harvest uppage. Some VFCs started to organize village-level auctions over the harvest season to enable households to sell uppage to traders in an open upward-bidding process. In Mandla, the Forest Department restricted harvesting of mahua flowers to maximum 4kg per household in 2017, to curb the illegal alcohol industry.

Collective collection, grading and storage of NTFPs to improve quality and profit margins. The FPC organized a meeting, open to all SHG leaders and members, to inform them of sustainable harvesting practices and discuss NTFP availability, quality requirements, location and timing of collection points before the harvesting season. Pictorial information sheets for each NTFP were distributed during the meeting to inform villagers about quality requirements and sustainable practices, sometimes supported by advice from traders. In Mandla, costs were minimized by using community buildings and private houses for storage and grading. The FPC in Mandla experienced a loss of 40% (10 instead of 14 rupees per kg) on 10 tonnes of chakoda (due to demonetization) but made a 60% margin (8 rupees instead of 5 rupees per kg) on the sale of 4 tonnes of harra, with a revenue of approximately USD$ 5,000 in the first year of collective sales. In Uttara Kannada, six SHGs (45 members) engaged in the successful sales of ripe jackfruit, which had not been marketed before.


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Engage collectively in primary processing of NTFPs to create added value and higher incomes. Strategic business plans for the establishment of three nurseries, to sell fruit tree saplings, vegetable plants and NTFP saplings, were developed based on rapid market appraisal interviews and meetings by an external facilitator. In Mandla, the tree nursery managed to sell the first batch of 2,641 saplings for USD$ 450 to the government-administered Narmada river basin tree planting program, and got several orders from JFMC presidents for small scale tree planting initiatives within their villages. A major bottleneck was to convince the Forest

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Department to allow JFMCs to purchase from local nurseries instead of the large Forest Department nurseries in Mandla town, which often distribute saplings for free. In addition, business plans were developed for a tailored decorticator for harra (*Terminalia chebula*) to increase value from 5–6 rupees to 20–25 rupees per kg. In Uttara Kannada district, the business plan for tailored decorticating and use of an oil expeller for *Garcinia* seeds generated a relatively low revenue of USD$ 90 within the first month in 2017, due to harvesting of immature (seedless) fruit and limited availability associated with climate change.

Monitor and pay premiums only to households and groups that follow agreed sustainable harvesting practices. The FPC members who were part of the harvesting campaign in Mandla were paid directly in cash upon delivery to keep competitive advantage over local traders. The premium was decided upon and paid after profits and margins were secured following the collective marketing of NTFP harvests. A committee was established to monitor adherence of households and harvesting groups to sustainable harvesting regulations. To simplify monitoring, peer pressure can be utilized to deter unsustainable harvesting methods by punishing the whole SHG (no premium paid) when one member violates regulations. In Uttara Kannada district, income from sales of fresh jackfruit was paid to the SHG bank accounts and distributed to group members by SHG leaders. Meanwhile, monitoring the adoption of sustainable harvesting practices was done by the Village Forest Committees.

Establish an agreement among FPC members to save a percentage of annual profits, such as 5% or 10% , to finance monitoring and conservation actions. In Mandla, the FPC board agreed to save some of the annual profit to purchase saplings of the most threatened and preferred tree species from the local SHG nursery. All members agreed to plant one tree per year near their houses during the rainy season. In order to improve the NTFP quality and ensure proper use of harvesting hooks and sticks, it was agreed to provide harvesting tools to households for a refundable deposit. A goal of the FPCs was to establish a system to monitor the resource stock of NTFPs in order to provide reliable estimates of yields to buyers to secure advanced agreements, improve the quality of harvest and ensure a viable NTFP tree population is maintained for future business interests.

Spread commercial risks and increase economic viability by trading multiple NTFPs combined with agricultural produce, farm inputs and other commercial activities. In Mandla, the FPC collectively purchased farm inputs such as fertilizers, as well as engaging in collective sale of NTFPs such as mahua flowers, chakoda, harra and char. The FPC also planned to invest into the decortication of char and chakoda and assisted the two SHGs that established a nursery with the sales of tree saplings and vegetable plants for a fixed fee. Estimates indicated that the FPC in Mandla requires a yearly turnover of approximately USD$ 40,000 and an average profit margin of 10–15% to cover the minimum annual costs of operation (USD$ 4,800 annually). According to the value chain assessments, processing gives higher margins (15–30%) than collective trading of raw materials (5–15%). In Uttara Kannada district, the SHG focused on the collection and sales of kokum, uppage, jackfruit and wild aromatic (appe midi) mangoes, and

developed a business model to install fuel-wood efficient water heaters and driers for a USD$ 10 fixed fee using building materials purchased by households.

Which tools can help guide value chain development interventions for NTFPs?

The FPCs and SHGs received on-the-job guidance from a full-time market development specialist. A sequence of several participatory methods and tools were used to guide FPCs and SHGs in the implementation of sustainable value chain development activities:

- **Score card** to evaluate the availability, status (ecological health) and market suitability of a wide range of available NTFP species and identify 10–15 most suitable NTFPs for sale.
- **Street theatre play 'the square mango'** to discuss value chain problems and explain the concept of a value chain to FPC and SHG members; to understand the chain from forest to end consumer, to listen to customer demands and to the importance of collaboration to make product and pricing improvements.
- **Rapid market appraisal** to collect market information about 10–15 suitable NTFPs and prioritize 3–4 NTFPs that provide best income and value chain development opportunities.
- **Value chain assessment** or **value chain mapping** to understand and identify market channels, bottlenecks, market or price trends and opportunities for 3–4 selected NTFPs.
- **Business plan development** to evaluate and understand investment requirements, marketing strategy, profitability and long-term viability of a particular commercial enterprise or activity.
- **Exposure visits** for the FPC board, general manager and staff or for SHG members to successful FPCs, NTFP processors, machinery manufacturers and to an NTFP auction and trade fair.
- **Training workshops** for FPC or SHG leaders and members on nursery management, FPC governance and financial administration, and sustainable NTFP harvesting practices.

More information about these tools is available on the Bioversity International website.

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Gender equity and social inclusion in joint forest management

This guideline is the second in a series that explains good practices in community -based forest management. It can be used as a trainer's or facilitator's guide in community meetings to help participants identify non-timber forest products (NTFP) management options for their own contexts. The sub-headings can serve as guiding questions to foster discussion on current and alternative practices and motivating factors, while the text provides some common answers and implementation ideas.

In this guideline:

- *Why foster gender equity and social inclusion in Joint Forest Management (JFM)?*
- *What constraints do women and marginalized groups face in JFM?*
- *How can we promote gender equity and social inclusion in JFM?*

Why foster gender equity and social inclusion in joint forest management (JFM)?

Gender equity and social inclusion refer to all people, regardless of gender, ethnicity or other factors, having equal opportunities to have their voices heard and respected, their opinions counted, and the ability to make important decisions in the community or beyond that affect their lives. In joint forest management (JFM), this can mean having the ability to participate as members in JFM committees (JFMCs), to join JFM boards, and to make decisions within those boards. It can also mean having a say in forest-related groups and initiatives, like Farmer Producer Companies. Equity may require measures that give particular chances to groups that have been historically marginalized, like women or Scheduled Tribes or Castes, to 'catch up' with other groups in this respect; for example, by having reserved seats for them in JFMCs. Having a 'critical mass' of women or marginalized members (at least 1/3 people) makes it easier for them to actively participate.

Gender equity and social inclusion are important because it is everyone's human right to participate in decisions that have important effects on their lives. They are also important because different groups in the community (e.g. women, different ethnic, age or socio-economic groups) have different sets of knowledge, perspectives and priorities to bring to the table.

Research in Sirsi, Western Ghats, has shown that elder women from the Siddhi (Scheduled Caste) ethnic group held more knowledge than women from other groups


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and men about the tree species found in their forests. Young men who had motorcycles and could visit the city were most knowledgeable about markets for non-timber forest products (Hegde et al. 2017). Specifics can vary across contexts, but differences in knowledge and priorities are usually present. This means that every group can bring something unique to the matter of JFM.

In other parts of India, **giving women the ability to actively participate in JFMCs has been shown to result in improved forest management outcomes** (Agarwal 2010). This is because they bring their knowledge to the table, but also because people tend to respect rules and regulations better when they were involved in their creation, and when these rules reflect their own needs and priorities. Women are often also better able to monitor and sanction other women who break those rules than men are, which means that the rules are enforced and abided by more people.

What constraints do women and marginalized groups face in JFM?

A common theme was that 'women are too busy' as they juggle family responsibilities and domestic work with work in the fields. Those who are landless or dependent on daily wages also face competing work schedules.

Meetings are held at inconvenient times for women, who cannot easily leave the house in the evenings when they are busiest with childcare, dinner preparations and milking cows.

Limited mobility among women and poorer socio-economic groups that don't have access to motorbikes or that live far from the village centre make it hard to travel to the meetings.

Lack of knowledge and awareness about JFM and forest conservation linked to limited mobility and poor circulation of information regarding JFM and JFMC meetings, especially among those who do not have cellular phones.

Lack of formal education, confidence and experience participating in public affairs. In Mandla, a male Gondh farmer explains that, "[women] don't speak a lot, they really don't speak. The women haven't gone to school, they can't read and write, they feel shy to go [to JFMC meetings]." The same applies to men from ethnic groups who have received less formal education.

Culturally, men of specific ethnic groups predominate in public affairs. "It is traditionally the role of men to attend such meetings" (female Havik Brahmin VFC member, Sirsi) and "Women feel like they are in the wrong place in a VFC meeting. If problems are there, then women trust that men will come up with some solutions" (female NGO staff, Sirsi). Women are often thought not to have important ideas to contribute. For example, "when the women speak, the men tell the women "Shut up, you don't know what you are talking about", and they say "don't speak in front of everyone"" (Pancha woman, Mandla). Speaking out at meetings, when women do attend, can be perceived as a sign of disrespect for their male counterparts. Attending meetings can itself be considered a sign of

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disobedience towards one's husband.

The same goes for men from politically marginalized groups that feel uncomfortable speaking in public. Some groups are also blamed by others for cutting down the forest, which makes them uncomfortable to speak up in public about this issue.

How can we promote gender equity and social inclusion in JFM?

Achieving a climate of inclusion depends on all people concerned with JFM (community members, JFMC members, forestry officials, NGOs).

Schedule meetings at times and places convenient for all or work out logistics to facilitate participation (e.g. arrange transportation for those who live far away).

Make an effort to **share information and encourage participation**, regardless of gender, ethnicity, age or socio-economic status, in JFM meetings and sustainable forest management initiatives.

When different groups interact in these meetings and events, listen to each other and **respect each other**'s different experiences and opinions.

Actively invite members of different groups to speak and allow those who are intimidated to speak first to have their opinions heard.

Maintain reserved seats in JFMCs for women and for marginalized groups.

Create rules that encourage their participation: e.g. there must be enough women at a meeting before it begins, or enough women involved in making important decisions.

Hold side-meetings for sub-groups (e.g. marginalized women and men) to discuss their priorities before and after the community-level JFM meetings. Once those priorities are established, they can be discussed with the larger group. **Linking up with existing groups** (e.g. women's self-help groups) is a good way to make that happen.

Increasing the number of Forest Department agents who are women and from marginalized groups can support social inclusion.

Local authorities should set the tone for such a climate of inclusion. **Role models** can encourage others to follow suit.

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Collecting ripe fruit for better income and forest regeneration

This guideline is the third in a series that explains good practices in community-based forest management. It can be used as a trainer's or facilitator's guide in community meetings to help participants identify non-timber forest products (NTFP) management options for their own contexts. The sub-headings can serve as guiding questions to foster discussion on current and alternative practices and motivating factors, while the text provides some common answers and implementation ideas.

In this guideline:

- *How common is it to collect forest fruit unripe?*
- *What reasons do people have for collecting unripe fruit?*
- *How can we encourage collection of ripe fruit among forest-dependent non-timber forest product collectors?*

How common is it to collect forest fruit unripe?

Ripe forest fruit are better quality for processing and tend to garner a better price than unripe fruit. But collection of unripe fruit of non-timber forest products (NTFP) is a common practice in rural India.

In Mandla, Madhya Pradesh, villagers estimate that traders typically pay 10–50% less for unripe forest fruit than for ripe fruit because of their lower weight, smaller size, poor quality or different colour. In some cases, traders reject fruit lots because of a high proportion of unripe fruit.

When collection starts after most fruit are ripe, fruit is available for seed dispersing animals who help the tree species to spread and regenerate. Collecting unripe fruit will reduce the number of new plants in the forest, because less of the fruit develops to yield ripe seed. Over time, it reduces the number of fruit-bearing trees in the forest.

Yet, villagers in Indian districts of Sirsi (Karnataka) and Mandla (Madhya Pradesh) reported that the majority of fruit of several forest tree species are collected unripe, reducing both income opportunities and species regeneration. The species include:

- Chironji nut (*Buchanania lanzan*, locally: chironji): >90% fruit collected unripe
- Black myrobalan (*Terminalia chebula*, locally: harra): >70% fruit collected unripe
- Wild nutmeg (*Myristica malabarica*, locally: rampatre): >70% fruit collected unripe


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Seedlings of chironji are now completely absent in some forest areas in Mandla, according to ecological assessments conducted in 2015. Seedlings of harra in Mandla and seedlings of rampatre in Sirsi have both been reduced by 90% in the vicinity of the villages, compared to forest beyond 3km from the villages.

What are the reasons for collecting unripe fruit?

Forests across the tropics are often under collective ownership of forest user groups, or considered as common property with open access to anyone. If rules regulating forest use are insufficient or not effectively implemented, there is often intense competition for forest resources – the earlier a person starts to collect fruit, the more he or she can potentially collect before others come in, while the last persons to start are often left with little or no harvest.

In some cases, forestry authorities may have introduced rules on collection times. However, fruiting periods can vary even between nearby sites because of differences in site conditions. If collectors do not perceive existing rules as reasonable, they may ignore them. Changes in weather patterns due to changing climate make it increasingly difficult to fix collection times from year to year. These changes also affect locally set or traditional customs and rules.

Even if rules exist, they are not effective unless compliance is monitored, and offenders are systematically sanctioned. However, monitoring requires time and resources that are often not readily available. Even if community members observed their neighbours breaking rules, they might hesitate to address or report them in order not to harm relationships.

Unripe fruit are in demand for making specific products, for example mango pickles from young appe midi fruit or kappehuli from unripe fruit rinds of kokum (*Garcinia indica*) in Sirsi. In Mandla, unripe harra (bel harra) is valued for its medicinal properties and fetches a better price than the ripe fruit, although its collection has been banned.

Prices offered by traders for unripe and ripe fruit may not always differ so much that it would be strong enough incentive to postpone harvesting at the risk of losing in harvestable quantity. In Sirsi, many villagers felt that the price for unripe fruit was not significantly lower than for ripe fruit, unless the fruit were clearly of poorer quality. Yet, they considered regulating collection times as a priority action to improve sustainable harvesting because they felt it would benefit both the collectors and the forest.

How can we encourage collection of ripe fruit among forest-dependent NTFP collectors?

Reducing collection of unripe fruit requires strengthening both rules and market incentives.

What can collectors do together?

- **Monitor flowering and fruit development to identify appropriate collection time** in each season. Such monitoring is useful also because it gives information about future yields and helps to plan labour investment between collection and other livelihood activities.

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- **Agree on collection times and enforce a ban on collecting unripe fruit** through systematic sanctions. Collection permits that are distributed after the ripening of fruit can help reinforce rules. If there is demand for unripe fruit of certain species, quotas can be set on what proportion of fruit can be collected unripe.
- **Initiate collective marketing that helps to monitor product quality** and encourages good practice while also resulting in better income. Those who collect unripe fruit will not be able to participate in collective marketing schemes because unripe fruit is exposed for everyone to see.
- **Celebrate the onset of NTFP collection as a community** or invigorate traditional practices of linking the onset to cultural or religious festivals, to discourage collection of unripe fruit. For example, collection of chironji in Mandla is traditionally started after the Akshat Tritiya festival at the end of April, and honey harvesting in Sirsi is started after Ugaadi festival (Hindu New Year), also in April.

What can forestry authorities do:

- Support community-based initiatives to monitor fruiting and set collection times, including through resource mobilization.
- Encourage village forest committees to set up locally relevant systems of sanctions and implement them fairly and systematically.
- Collaborate with local traders to persuade them to reject unripe fruit in support of sustainable forest management.

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4

Avoiding damage to trees when collecting non-timber forest products

This guideline is the fourth in a series that explains good practices in community-based forest management. It can be used as a trainer's or facilitator's guide in community meetings to help participants identify non-timber forest products (NTFP) management options for their own contexts. The sub-headings can serve as guiding questions to foster discussion on current and alternative practices and motivating factors, while the text provides some common answers and implementation ideas.

In this guideline:

- *How common are destructive practices in the collection of non-timber forest products?*
- *What are the reasons for destructive collection practices?*
- *How can we encourage sustainable collection practices?*

Damaging trees while collecting non-timber forest products (NTFP) reduces future yields, forcing collectors to walk longer distances year by year to fill their baskets. Cutting branches or even entire trees to harvest NTFP is not allowed under India's Joint Forest Management rules. Nevertheless, these practices are not uncommon among NTFP collectors.

How commonly are destructive practices used in NTFP collection?

Villagers in Uttara Kannada, Karnataka reported that 30–50% of wild nutmeg, locally known as rampatre (*Myristica malabarica*), is **collected by cutting branches**. Cutting branches has long-term impacts on the species productivity. According to the NTFP collectors, it reduces fruit production in rampatre and cinnamon trees for at least two to three years because the tree has to invest in regrowth instead of fruiting.

In Mandla, Madhya Pradesh, typically more than 50% – and in some cases more than 90% – of the fruit of valuable species such as chironji (*Buchanania lanzan*) and aonla (*Phyllanthus emblica*) are collected by cutting branches, according to villagers themselves. In five of ten focus groups, participants mentioned that entire trees are being cut to collect NTFP. As a result, these species are now disappearing from Mandla's forest landscape.

The **densities of NTFP species** in Mandla, including aonla, jamun (*Syzygium cuminii*), imli (*Tamarindus indica*) and bael (*Aegle marmelos*) **have reduced** to approximately just one tree per hectare within 3km from the villages. This is less than 5% of the current density of tendu (*Diospyros melanoxylon*), the

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collection of which is tightly regulated by the Forestry Department. Although relatively many chironji trees remain in the vicinity of villages (8 trees per hectare within 1 km from the villages), chironji is very difficult to find beyond 1km into the forest from the villages (≤1 trees per hectare).

NTFP collectors in Mandla report that they now have to walk 5–7km to collect fruit, compared to 1–2 km previously. In some villages people have stopped collecting chironji because of its low availability.

If collection methods are not improved, the disappearance of many valuable NTFP species is imminent which would put even more pressure on the already precarious livelihoods.

What are the reasons for destructive collection practices?

Collection methods depend on the value of the tree's products, tree tenure, species biology and available technology.

Valuable trees with secure ownership are generally well maintained. In Sirsi, many villagers opined that trees on *bettaland* (district forest where exclusive access rights are given to individual households) produce more fruit than forest trees because their owners are motivated to take care of the trees. In Mandla, the cultural and economic importance of mahua (*Madhuca longifolia*) has over time resulted in a practice where trees are owned by individual families. However, not all families own mahua trees and ownership rights are not always respected.

When NTFPs are highly priced but trees are under collective ownership or common property with open access to anyone, there is often **intense competition** and NTFP are collected using destructive methods to save time. Collectors perceive that they do not directly benefit from saving the trees because anyone else may still come and cut the tree after them. Destructive collection methods further intensify competition in subsequent seasons as collectors have to continuously expand their collection areas to look for fruiting trees. Villagers both in Uttara Kannada and Mandla commonly opined that destructive harvesting in the village forest was mostly done by outsiders rather than the villagers themselves.

Some species are more difficult to collect than others because of their biological characteristics. In particular, very tall trees such as rampatre, chironji or bhelwa (*Semecarpus anacardium*) are often collected by cutting branches because they are difficult and dangerous to climb and fruit cannot be reached from the ground using sticks. Some species tend to attract ants which makes climbing even more difficult. Fruit of some species such as chironji spoil easily if they fall on the ground, reducing their value.

Lack of suitable tools or technology can result in destructive harvesting, especially for trees that are difficult to collect from. Carrying long sticks as harvesting tools in dense forests is difficult. Yet, improved techniques are not always used even when they are available. For example, in Mandla, bamboo sticks are used for collecting mangoes but rarely for NTFPs. In Uttara Kannada, women use shade nets to gather falling fruit only for making value-added products such as jams or juice concentrate.
This suggests that the value of the products and tree tenure are more important reasons for choosing collection methods than the availability of technology as such.

How can we encourage the use of sustainable collection practices?

What can collectors do together?

- **Have a community meeting to agree on collection rules**, including a ban on cutting branches and trees, and sanctions for rule-breaking. In Mandla, participants in five of ten focus groups in five villages called for enforcing a complete ban on cutting NTFP trees.
- **Develop a register of collectors** of each species and give out harvesting permissions with the condition that collectors commit to existing rules. Training on good practices can be given at the same occasion.
- **Take turns patrolling and monitoring forest in groups**.
- **Organize regular meetings during collection season to discuss yields** and report any untoward activities. This helps make offences public and creates

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social motivation towards good practice.

- **Allocate collection areas or individual trees to individual families**, aiming for equitability and considering the families most in need. Sanctions are needed to encourage people to respect such tree tenure rights.

What can forestry authorities do?

- **Strengthen the role of the Village Forest Committees** (VFC) by creating incentives that are channelled to villagers through the VFCs. Incentives considered effective by male villagers in Uttara Kannada included providing rights to harvest dead and fallen trees for construction wood, and reducing taxation of NTFPs sold through VFCs so that the VFCs could offer better price to collectors.
- **Establish VFCs in villages that do not yet have those.** In Uttara Kannada, villagers commonly opined that VFC establishment had a significant positive impact on forest use practices.
- **Support villagers in experimenting with different collection techniques and tools** and to identify those that are effective and locally relevant. Encourage local manufacturing of best-evaluated tools.
- **Support the efforts of the VFCs in enforcing village forest boundaries**, to move from open access to collective access rights by the village's inhabitants.

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5

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Monitoring the forest and its uses to improve management

This guideline is the fifth in a series that explains good practices in community-based forest management. It can be used as a trainer's or facilitator's guide in community meetings to help participants identify non-timber forest products (NTFP) management options for their own contexts. The sub-headings can serve as guiding questions to foster discussion on current and alternative practices and motivating factors, while the text provides some common answers and implementation ideas.

In this guideline:

- *What are some of the key characteristics of forest monitoring?*
- *What types of monitoring do people in rural Indian communities consider relevant and why?*
- *How can we encourage community-based forest monitoring?*

What are some of the key characteristics of forest monitoring?

Forest monitoring helps to assess how effectively forests are managed to yield benefits to their users and where there are needs for improvements. Monitoring makes the use of collectively owned or managed forests more transparent by giving detailed information about forest uses and users. Forest monitoring can help demonstrate commitment towards sustainable forest management and negotiate use rights with forest authorities or other stakeholders. Monitoring can also help predict future yields and thereby plan livelihood activities.

Ideally, **monitoring is a process to assess progress towards a set of goals.** It involves gathering information on specific issues or concerns to understand change, and is done through multiple measurements in different locations or at different times. To be effective, the results of monitoring must be communicated to forest users to guide or correct management or enforcement of rules.

Forest monitoring should not be seen as a stand-alone activity but as an integral part of forest management. For example, if the goal is to reduce destructive practices in the collection of non-timber forest products (NTFP), it is important to first establish rules to ban poor practices and sanctions for those who break the rules. Monitoring will then help enforce the rules.

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Four different aspects of forest condition and use can be monitored:

1. *Status* of the forest itself – for example, the number of big trees and seedlings of key species
2. *Threats* to the forest – for example, the proportion of NTFP collectors who do not use tools to aid sustainable collection
3. *Benefits* from the forest – for example, the quantity and quality of fruit collected
4. Actions taken towards sustainable forest management – for example, the number and type of forest-related activities that are regulated, or the number of people trained on sustainable collection practices

How time-consuming monitoring is and how accurate information it gives about forest status depend on which aspects of forest use are monitored. Some aspects indicate direct and immediate changes in forest condition, for example, when more people give up destructive practices and start to use tools in NTFP collection (*threats*). The number of people trained on sustainable harvesting (*actions*) is quick to calculate but does not always mean that forest status is improving, because people may not adopt the practices they were taught. Number of seedlings (*status*) is a good indicator of the forest status but time-consuming to monitor, because many sample plots in across the forest are needed to get a good picture of it.


Credit: Bioversity International/E. Hermanowicz

What types of monitoring do people in rural Indian communities consider relevant and why?

A study conducted in 50 villages in the relatively forested area of Sirsi, Karnataka, and heavily deforested area of Mandla, Madhya Pradesh, gives insights of opportunities and challenges in community-based forest monitoring:

Trespassing and collection of forest produce by outsiders emerged as priority for monitoring among villagers in both Sirsi (8 of 25 villages) and Mandla (17 of 25 villages). Outsiders are often perceived to collect NTFP using poor practices such as cutting trees or branches. Restricting the number of collectors would help to reduce pressure on the forest. Depending on accessibility to the forest, such monitoring can be easy or difficult. In Mandla and in some villages in Sirsi, people felt that establishing checkpoints along the main roads or paths to the forest would help reduce collection by outsiders. In contrast, people in the more remote and forested villages in Sirsi considered monitoring difficult because of their village forests were large and directly bordered by neighbouring villages.

Monitoring NTFP collection practices, for example collection of unripe fruit or cutting of trees or branches, was the second most popular topic for monitoring in both Sirsi (7 villages) and Mandla (9 villages). Villagers called for complete bans and sanctions on specific poor practices, and felt that monitoring was important for enforcing the rules. Such monitoring was already successfully done in some villages in Sirsi.

However, people explained how they found it difficult to address or report fellow villagers using poor practices, because it affects their relationships. Having a strong Village Forest Committee through which offences can be addressed helps enforce rules. In Mandla these committees did generally not function as well as in Sirsi and people suggested establishing new committees specifically for monitoring purposes.

Villagers showed little interest for direct monitoring of forest condition (mentioned only in 3 villages in Sirsi), possibly because of time demand and lack of concrete benefits. **People were mainly interested in monitoring specific, socio-economically valuable species groups**, namely medicinal plants and dead timber trees which could be used as construction wood. However, it was obvious that **villagers made regular and specific observations about forest and could often quantify impacts on specific species**. Although monitoring forest status seems low priority as a community-driven activity, there can be potential to involve villagers as paid workers in forest inventories.

How can we encourage community-based forest monitoring?

What can villagers do together?

- Set specific monitoring goals and plan ahead how the generated knowledge will be used.
- Prioritize monitoring goals and needs, to keep them manageable and motivating. Monitoring could be started with a couple of indicators and expanded with positive experience.
- Identify market opportunities related

to monitoring as an indicator of sustainably harvested products. For example, to get organic certification, NTFP collectors must be able to show that the products are collected using sustainable practices.

- Identify non-cash incentives to encourage villagers to participate in monitoring, for example, allocating NTFP trees to individual families who are actively involved in monitoring.
- Identify ways to link monitoring activities to daily routines or other topics of interests. For example, monitoring could be done using transect walks while collecting forest products. If there is interest to monitor medicinal plants, regeneration of NTFP species could be monitored at the same time.
- Organize regular meetings to discuss monitoring experiences and ways to improve

What can forestry authorities do?

- Support villagers' efforts to monitor and control trespassing of village forest boundaries, for example by establishing checkpoints or demarcating boundaries.
- Train villagers in monitoring techniques, documentation and record-keeping.
- Identify opportunities to train and hire villagers to contribute to forest inventories. It could serve as an alternative income source that can help reduce pressure on forests.

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6


Photo Credit: IORA Ecological Solutions Ltd.

Bringing back valuable trees to degraded landscapes

This guideline is the sixth in a series that explains good practices in community-based forest management. It can be used as a trainer's or facilitator's guide in community meetings to help participants identify non-timber forest products (NTFP) management options for their own contexts. The sub-headings can serve as guiding questions to foster discussion on current and alternative practices and motivating factors, while the text provides some common answers and implementation ideas.

In this guideline:

- *What are the trends for forest trees in rural Indian villages?*
- *What motivates people to plant and care for trees?*
- *How can we encourage more people to plant and care for trees?*

What are the trends for forest trees in rural Indian villages?

Many important non-timber forest species are quickly declining in rural Indian villages because of poor harvesting practices, forest conversion, grazing, adverse weather and other threats.

Of the 40 tree species found in the vicinity of villages in Mandla, Madhya Predesh, half are completely lacking regeneration within 3–5 km from the villages. This includes important NTFP species such as aonla (*Phyllanthus emblica*), mahua (*Madhuca longfolia*) and bael (*Aegle marmelos*). In the more forested area of Sirsi, Karnataka, 37% of the 126 tree species still lack regeneration within 3–5 km from the villages, including valued species such as dalchini (*Cinnamomum malabatricum*), antuval (*Sapindus laurifolius*), hole (*Terminalia arjuna*) and geru (*Anacardium occidentale*).

Male and female villagers in both Sirsi and Mandla commonly list tree planting as one of their priority activities for improving both forest condition and livelihoods.

Forest Department and non-governmental organizations provide tree seedlings for planting, often free of charge or even paying villagers for planted seedlings that survive. As collectors of forest fruit, most villagers routinely handle tree seed, part of which could be used for propagating seedlings.

However, despite of the perceived restoration needs and the availability of seed and seedlings, villagers estimated


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that only 20–30% of them plant trees. Only few species are regularly planted, including mahua in Mandla, and kokum (*Garcinia indica*) and uppage (*Garcinia gummi-gutta*) in Sirsi.

Survival rates of planted trees are unknown. However, in Mandla villagers cited stories of plantings that had failed and mentioned uncertainty of plant survival as one reason why they had not planted trees.

What motivates people to plant and care for trees?

In the heavily deforested Mandla landscape, the lack of many tree products such as fruit, fuel wood and construction wood is the main motivator for tree planting. But it is no solution to the immediate livelihood needs, and it involves risk because survival of seedlings is not guaranteed. Time invested in tending agricultural crops or livestock gives quicker and more certain returns. This can make it difficult to motivate people to start planting trees.

Tenure security, or the lack of it, is another important factor behind tree planting. In Sirsi, villagers spoke enthusiastically about planting trees near their homesteads because it would help ensure that they themselves could harvest the fruit. Others cited the lack of private land as a reason for not planting trees. In one village in Mandla, women said they had planted trees because they were banned access to the forest – an extreme motivator in areas where alternative sources of livelihood are scarce.

In Sirsi, villagers showed interest for improved, more productive varieties but explained that they lacked knowledge on and land for domestication. They opined that relevant government schemes in agriculture and horticulture exist but do not currently support villagers' domestication efforts. This suggests that villagers may have limited interest for planting forest tree seedlings but may respond actively if provided seedlings of improved or grafted varieties which are perceived to be more productive or of better quality.

Other positive incentives for planting trees may include source of income, market demand for the species, availability of tree products for home consumption, saving time in harvesting when planting trees near housing, reducing pressure on forest resources and conserving them for future generations, and receiving seedlings from the Forest Department. These incentives were mentioned only in individual villages in Sirsi and are probably alone not very strong motivators for tree planting in the area. However, it is worth identifying and encouraging such incentives: they help to reduce pressure on forests before deforestation and degradation advance so far that restoration becomes difficult. In Mandla, water shortage and invasive species associated with deforestation already severely limit opportunities for tree planting and natural regeneration.

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How can we encourage more people to plant and care for trees?

What can villagers do together?

- **Protect existing trees and seedlings** – it is easier and quicker than planting and tending new trees. Do not cut down or otherwise damage trees, collect only ripe fruit, and leave some fruit behind in each tree for natural regeneration to take its course. Protect seedlings from grazing animals, for example by trenching or natural fencing. Allocating harvesting rights of individual trees to individual households is a powerful incentive for them to protect the trees and their seedlings.
- **Select planting areas carefully** to reduce effort needed for tending seedlings: for example near homesteads or fields, and with easy access to water sources. Some trees can be cultivated with crops or fodder grasses to yield benefits when the trees are still young. It is better to plant few trees and properly take care of them than to plant many trees but not maintain them after planting.

- **Document and share knowledge and experiences** on choosing right species for right sites, tree propagation and management techniques, and suitable species combinations for intercropping.
- **Mark some trees as seed trees** where fruit collection is allowed only for seedling production. Superior trees can be selected to help enhance productivity and resistance over time. The trees can give income from seed or seedling sales.
- **Collect seed from large forests and at least 15–20 trees per species to obtain quality seed for raising seedlings**. Seed collectors can agree on collection areas and then mix the seed together to help collect such diverse seed.
- **Develop planting and taking care of trees as part of the community culture**, for example by celebrating the onset of tree planting as part of the monsoon celebrations, recognizing or rewarding villagers who actively plant trees and organizing friendly competitions about who has achieved best seedling survival rates and tallest or healthiest saplings.

What can forestry authorities do:

- **If tree planting or seedling distribution programmes already exist,** assess their success regularly to use resources effectively and help reach results. Villagers have a key role in planting and caring for seedlings, so it is important to consult them to understand what works well and what improvements are needed from their perspective, to motivate their involvement. It can also be helpful to share experiences with other districts or other organizations who have tree planting programmes.
- **Seek to understand and meet villagers' preferences for species and varieties** because species choice importantly affects the interest for planting and caring for seedlings. Men and women may prefer different species, so it is important to consult both. Distributed seedlings must be of good quality and genetically diverse to meet villagers' expectations for survival and productivity.
- **Encourage the establishment of village nurseries** to extend the supply of seedlings, generate livelihood opportunities and foster a culture of tree cultivation.
- **Create incentives for taking care of seedlings** (rather than for planting only), such as pay-back arrangements for each year that young seedlings survive.
- **Collaborate with other departments** to tap to existing government schemes that can support tree planting and domestication.

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