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Introduction

The intent of this standard is to outline certification requirements/indicators which pertain to non timber forest products (NTFP) and which complement the FSC®¹ certification requirements for forest management based on the FSC Principles and Criteria. Certified operations wishing to include NTFPs in the scope of their FSC forest management certificate shall demonstrate conformance to the NTFP indicators outlined in this document.

Public Comment

Organizations or individuals are encouraged to submit their concerns or comments regarding this standard to the Rainforest Alliance contact person noted above.

Note on the use of this standard

All aspects of this standard are considered to be normative, including the scope, standard effective date, references, terms and definitions, tables and annexes, unless otherwise stated.

The standard in this document consist of specific indicators organized under the relevant FSC criteria. In addition, for each FSC Principle an NTFP overview is provided. This standard is designed to complement FSC forest stewardship certification standard (either FSC accredited national/regional standards or Rainforest Alliance interim regional standards) and the Rainforest Alliance Chain of Custody Standard for FMEs. For NTFPs to be considered and sold with a FSC certified claim, they must originate in FSC certified forest which have demonstrated conformance with these additional NTFP indicators, in addition, to the requirements of the Rainforest Alliance Chain of Custody Standard for FMEs. For a complete picture of RA certification procedures for certifying NTFPs, please review this document with the RA Generic Guidelines for Assessing Forest Management or RA regional interim standards.

¹ Rainforest Alliance is an FSC accredited certifier FSC® A000520

Contents

- A Scope
- B Standard effective date
- C References
- D Terms and definitions
- E Standards and Requirements

Annexes

- Annex 1 General NTFP management considerations

A Scope

This standard/addendum shall be applicable on a global scale to the evaluation of forest management enterprises (FMEs) who require certification of NTFPs and where national or product specific NTFP standards have not been developed. This addendum shall be used in conjunction with FSC accredited regional standards or Rainforest Alliance interim regional or national standards.

B Standard effective date

This standard shall be effective from 1 January 2008. All NTFP certificate holders evaluated under the NTFP addendum, shall be required to comply with this standard by December 31, 2008.

C References

FSC-STD-01-001: FSC Principles and Criteria for Forest Stewardship.
FM-12: Rainforest Alliance Generic Standards for Forest Management
FM-35: Rainforest Alliance Chain of Custody standard for FMEs

D Terms and definitions

FM: Forest Management
FME: Forest Management Enterprise.
FSC: Forest Stewardship Council
NTFP: Non Timber Forest Product
RA: Rainforest Alliance

E Standards and Requirements

PRINCIPLE #1: COMPLIANCE WITH LAWS AND FSC PRINCIPLES

Forest management shall respect all applicable laws of the country in which they occur, and international treaties and agreements to which the country is a signatory, and comply with all FSC Principles and Criteria.

Overview: Non-timber forest product harvest shall take place within the ethical and legal framework of international environmental and human rights law and policy, and national, state/provincial, and local laws in the country where forest management takes place. NTFP harvest and processing may involve laws and regulations not normally covered under a typical Rainforest Alliance FSC FM assessment. Laws touching on NTFP harvest and use may fall under the Convention on Trade in Endangered Species (CITES), national tenure and usufruct rights laws, and national forest management legislation. Collection of some NTFPs requires legal permits or licenses. Furthermore, for comestible products, a variety of laws may govern quality control, transport, packaging and labeling requirements. Assessors must check with relevant government agencies and other stakeholders to verify that an operation is dealing with legal requirements for NTFP management, harvest, processing and sale in a responsible fashion.

1.1 Forest management shall respect all national and local laws and administrative requirements.

1.1.NTFP.1 The FME shall demonstrate a record of compliance with relevant federal, provincial/state, and local laws and regulations related to the collection/harvesting and processing of NTFPs.

1.2 All applicable and legally prescribed fees, royalties, taxes and other charges shall be paid.

1.2.NTFP.1 The FME or NTFP harvester(s) shall maintain up-to-date harvesting permits, collecting licenses, collecting contracts or cultivation permits and shall duly pay any related fees, leases, or royalties.

1.3 In signatory countries, the provisions of all binding international agreements such as CITES, ILO Conventions, ITTA, and Convention on Biological Diversity, shall be respected.

1.3. NTFP.1 NTFPs on CITES Appendix 1 shall not be harvested.

1.4 Conflicts between laws, regulations and the FSC Principles and Criteria shall be evaluated for the purposes of certification, on a case by case basis, by the certifiers and the involved or affected parties.

1.4. NTFP.1 Collection of forest resources (e.g. NTFPs, firewood, timber, game etc.) for commercial purposes by third party NTFP harvesters (e.g. local communities, individuals external to the FME) throughout the forest management area shall be monitored, and controlled.

PRINCIPLE #2: TENURE AND USE RIGHTS AND RESPONSIBILITIES

Long-term tenure and use rights to the land and forest resources shall be clearly defined, documented and legally established.

Overview: Non-timber forest products are important resources for rural, and even urban, populations worldwide. Forest managers shall demonstrate sensitivity to the dependence of

local individuals and communities on NTFPs, as long as such NTFP usage does not threaten forest integrity. Forest managers may take proactive steps to improve community relations by improving understanding of NTFP usage, permitting continued access to such resources and by being mindful of maintaining NTFP resources in management planning. However, increased market demand, higher prices for particular NTFPs or new settlement may increase pressures on NTFPs. In such instances, management may need to restrict NTFP access to those with traditional rights, or in drastic cases, temporarily curtail access to protect resources.

2.1 Clear evidence of long-term forest use rights to the land (e.g. land title, customary rights, or lease agreements) shall be demonstrated.

2.1. NTFP.1 Agreements shall exist between the FME and third party commercial NTFP harvesters and should be documented (e.g. a lease contract or other agreement outlining harvest area, species collected, estimated extracted volume, etc.).

2.2 Local communities with legal or customary tenure or use rights shall maintain control, to the extent necessary to protect their rights or resources, over forest operations unless they delegate control with free and informed consent to other agencies.

2.2. NTFP.1 Local communities shall receive fair and adequate benefits for any use of their name or image in marketing of NTFPs.

2.2. NTFP.2-When local knowledge is the basis of an NTFP-related patent, informed consent shall be obtained and the affected community shall receive fair and adequate benefits.

2.3 Appropriate mechanisms shall be employed to resolve disputes over tenure claims and use rights. The circumstances and status of any outstanding disputes will be explicitly considered in the certification evaluation. Disputes of substantial magnitude involving a significant number of interests will normally disqualify an operation from being certified.

2.3. NTFP.1 Large-scale harvesting and commercialization of NTFPs shall be described in advance to affected communities, by means which are appropriate to the local reality, when the harvest of such products has the potential to impact local subsistence use.

PRINCIPLE #3: INDIGENOUS PEOPLES' RIGHTS

The legal and customary rights of indigenous peoples to own, use and manage their lands, territories, and resources shall be recognised and respected.

Overview: The rights of indigenous peoples to use NTFPs for subsistence needs must be protected. NTFPs play central roles in cultural and religious ceremonies for indigenous communities and their protection may promote cultural survival and positive relations between stakeholders. Certification should seek to minimize any potentially negative impacts of market forces on traditional local use and management of forests and forest products. Certification should also avoid creating dependency relationships that may disrupt cultural balance, integrity, and belief systems, and that exploit indigenous-related knowledge and image.

3.3 Sites of special cultural, ecological, economic or religious significance to indigenous peoples shall be clearly identified in co-operation with such peoples, and recognised and protected by forest managers.

3.3.NTFP.1 Culturally and religiously significant sites, groves, plants and animals of cultural or religious importance shall be identified and protected from NTFP harvesting activities.

3.4 Indigenous peoples shall be compensated for the application of their traditional knowledge regarding the use of forest species or management systems in forest operations. This compensation shall be formally agreed upon with their free and informed consent before forest operations commence.

3.4.NTFP.1 Indigenous communities receive shall fair and adequate benefits for any use of their name or image in marketing of NTFPs.

3.4.NTFP.2 When indigenous knowledge is the basis of an NTFP-related patent, informed consent shall be obtained and the affected community shall receive fair and adequate benefits.

PRINCIPLE #4: COMMUNITY RELATIONS AND WORKER'S RIGHTS

Forest management operations shall maintain or enhance the long-term social and economic well being of forest workers and local communities.

Overview: Workers involved in NTFP harvest operations may be linked to the FME (employees, forest owner/manager and relatives) or they may be third parties (local communities, enterprises, individuals). When the scope of the certification assessment covers the NTFP products harvested by these workers, compliance must be demonstrated with all criteria under Principle 4. Rainforest Alliance expects candidate operations to make every effort to ensure that working conditions are safe and well paid (compared to local norms). Workers from local communities are expected to be preferred in hiring. Where appropriate, worker access to living quarters and forest resources such as timber, fibers, game and subsistence NTFPs should be agreed upon with the FME.

4.1 The communities within, or adjacent to, the forest management area should be given opportunities for employment, training, and other services.

4.1.NTFP.1 Local communities shall be given preference to NTFP resources in the forest management area before other third parties.

4.2 Forest management should meet or exceed all applicable laws and/or regulations covering health and safety of employees and their families.

4.2.NTFP.1 Wages and other benefits (health, retirement, workers' compensation, housing, food) for workers involved in NTFP harvest operations shall be consistent with (not lower than) prevailing local standards.

4.2.NTFP.2 NTFP harvest and processing methods and facilities shall protect the safety and health of both workers and end consumers.

4.4 Management planning and operations shall incorporate the results of evaluations of social impact. Consultations shall be maintained with people and groups directly affected by management operations.

- 4.4. NTFP.1 Social impacts of NTFP harvest and commercialization by the FME or third parties on local communities shall be addressed and incorporated into management planning, particularly respecting subsistence NTFP users.
- 4.4. NTFP.2 Negative social and cultural impacts on local communities resulting from the influx of NTFP harvesters or commercialization of NTFPs shall be minimized.
- 4.4. NTFP.3 Social impact evaluations shall consider the perspective of NTFP harvesters and local users.

PRINCIPLE # 5: BENEFITS FROM THE FOREST

Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits.

Overview: NTFPs can provide a range of social and economic benefits at the local, regional and international levels and have the potential to diversify income sources for forest operations. The intent of NTFP certification is to optimize the socio-economic potential of certain marketable species, in order to provide a larger economic return from a given forest area for local communities and forest managers, without negatively impacting local use of these or other NTFP species. Some NTFPs may favorably compete with timber revenues on an acre per acre basis. Many other NTFPs do not compete well with timber revenues, but serve important local needs. Other NTFPs go through economic boom and bust cycles. Like timber extraction, NTFP commercialization should follow rational marketing plans and have sound financial investments to ensure long-term viability, forest conservation and stability of local communities.

5.1 Forest management should strive toward economic viability, while taking into account the full environmental, social, and operational costs of production, and ensuring the investments necessary to maintain the ecological productivity of the forest.

- 5.1. NTFP.1 Where NTFPs are being commercially harvested by third parties, compensation made to the FME (cash, services or products) shall be at or above the norm, and shall be perceived by the FME as an incentive to encourage long-term forest management.
- 5.1. NTFP.2 Efficient harvesting and processing equipment and methods should be used in order to minimize ecological impacts and maximize the economic viability of the NTFP harvest operation. FMEs balance the introduction of new technologies and practices with respect for traditional cultural practices.
- 5.1. NTFP.3 In the case of externally supported NTFP harvest operations, a plan shall exist to reduce the level of dependency on external support and to maximize levels of self-sufficiency and control.

5.2 Forest management and marketing operations should encourage the optimal use and local processing of the forest's diversity of products.

5.2. NTFP.1 Utilization of lesser-known species shall not compromise local NTFP needs (e.g. for fruits, medicines, game-attracting species, etc.) and shall not negatively impact forest diversity.

5.2. NTFP.2 When feasible and applicable, the FME should apply multiple certification systems (e.g. FSC, organic, fair trade) to NTFP resources.

5.3 Forest management should minimise waste associated with harvesting and on-site processing operations and avoid damage to other forest resources.

5.3.NTFP.1 The FME or NTFP harvester(s) should explore options to utilize or commercialize NTFP processing waste, when feasible and appropriate.

5.6 The rate of harvest of forest products shall not exceed levels which can be permanently sustained.

5.6. NTFP.1 The intensity, frequency and seasonality of NTFP harvest, by area and volume, shall be based on a combination of scientific study and/or long-term local experience and knowledge and shall not exceed sustainable levels.

5.6. NTFP.2 NTFP harvest rates, cultural techniques and harvest methods shall be appropriate for the particular plant part used (exudate, reproductive propagule, vegetative structure; See annex 1 for guidance) and management activities maintain viable populations of target NTFPs.

5.6. NTFP.3 Appropriate NTFP harvest prescriptions shall be implemented in the field.

PRINCIPLE #6: ENVIRONMENTAL IMPACT

Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and, by so doing, maintain the ecological functions and the integrity of the forest.

Overview: NTFP management, if properly handled, may enhance overall forest integrity. However, NTFP management may result in forest simplification in some cases. Such simplification may be off-set by the temporal or operational scale of the NTFP management activity, or the relatively reduced destruction to forest integrity by NTFP harvest when compared to timber harvest. Still, harvest of many NTFPs can be destructive to forest resources due to poor technique, inadequate equipment or disregard for an individual plant's long-term survival (for example, felling a tree to collect its fruits). Proper harvest techniques, tailored to the individual target species and incorporating the impact of NTFPs removal on population structure, can insure long-term NTFP population viability. -Exudates, reproductive propagules and vegetative structures all entail differing harvest regimes and impacts, and management activities should reflect such differences.

6.1 Assessment of environmental impacts shall be completed -- appropriate to the scale, intensity of forest management and the uniqueness of the affected resources -- and adequately integrated into management systems. Assessments shall include landscape level considerations as well as the impacts of on-site processing facilities. Environmental impacts shall be assessed prior to commencement of site-disturbing operations.

6.1. NTFP.1 Environmental assessments shall include the impacts resulting from commercial harvesting of NTFPs.

6.2 Safeguards shall exist which protect rare, threatened and endangered species and their habitats (e.g., nesting and feeding areas). Conservation zones and protection areas shall be established, appropriate to the scale and intensity of forest management and the uniqueness of the affected resources. Inappropriate hunting, fishing, trapping and collecting shall be controlled.

6.2. NTFP.1 NTFPs on either local and/or international endangered or threatened species lists (e.g., CITES Appendix 1, "critically endangered" IUCN list, national lists, etc.) shall not be harvested.

6.3 Ecological functions and values shall be maintained intact, enhanced, or restored, including:

- a) Forest regeneration and succession.**
- b) Genetic, species, and ecosystem diversity.**
- c) Natural cycles that affect the productivity of the forest ecosystem.**

6.3. NTFP.1 NTFP harvest and management shall minimize impacts to forest composition and structure and soil structure and fertility.

6.3. NTFP.2 NTFP harvest and management shall take into account the ecological role and requirements of the target NTFP and other associated species, e.g. food for frugivorous birds and mammals, animal dispersal of seeds, maintenance of specific ecological interdependencies, etc.

6.3. NTFP.3 Measures shall be taken to maintain the natural composition and structure of NTFP populations (e.g management of natural regeneration, enrichment planting, selection and protection of seed trees.

6.3. NTFP.4 Severe forest simplification arising from NTFP management shall be allowed only when it: is temporally or spatially bound, provides a limited impact on the overall forest management unit, maintains high conservation value forest attributes or provides secure, outstanding conservation benefits to local communities or forest protection efforts.

6.5 Written guidelines shall be prepared and implemented to: control erosion; minimise forest damage during harvesting, road construction, and all other mechanical disturbances; and protect water resources.

6.5. NTFP.1 Impacts of NTFP harvest and management on soil and water resources, especially access trails and roads, shall be minimized.

6.6 Management systems shall promote the development and adoption of environmentally friendly non-chemical methods of pest management and strive to avoid the use of chemical pesticides. World Health Organisation Type 1A and 1B and chlorinated hydrocarbon pesticides; pesticides that are persistent, toxic or whose derivatives remain biologically active and accumulate in the food chain beyond their intended use; as well as any pesticides banned by international agreement, shall be prohibited. If chemicals are used, proper equipment and training shall be provided to minimise health and environmental risks.

6.6.NTFP.1 The FME or NTFP harvester(s) shall employ NTFP production and collection

systems, integrated pest management and vegetation control strategies that result in the least adverse environmental impact. Pesticides are used only when non-chemical management practices have been proven ineffective or cost prohibitive.

Note: All criterion 6.6 indicators from applicable FM standard apply to the production and/or collection of NTFPs

PRINCIPLE #7: MANAGEMENT PLAN

A management plan -- appropriate to the scale and intensity of the operations -- shall be written, implemented, and kept up to date. The long-term objectives of management, and the means of achieving them, shall be clearly stated.

Overview: Management plans should specifically incorporate NTFPs destined for commercial sale and enumerate management objectives, and harvest areas, rates and techniques for target NTFPs, whether these are harvested by FMEs or third parties. Harvest levels and methods should be rationalized through published literature, site-specific data and/or local knowledge. Poorly trained NTFP harvesters can cause great damage to forest resources. Forest worker training is central to realizing good management planning and implementation of proper harvesting techniques in the field.

7.1 The management plan and supporting documents shall provide:

- a) **Management objectives.**
- b) **Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and a profile of adjacent lands.**
- c) **Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories.**
- d) **Rationale for rate of annual harvest and species selection.**
- e) **Provisions for monitoring of forest growth and dynamics.**
- f) **Environmental safeguards based on environmental assessments.**
- g) **Plans for the identification and protection of rare, threatened and endangered species.**
- h) **Maps describing the forest resource base including protected areas, planned management activities and land ownership.**
- i) **Description and justification of harvesting techniques and equipment to be used.**

7.1. NTFP.1 The management plan, or appendices to the plan, shall specifically address and incorporate commercially-managed NTFPs, including:

- NTFP Management objectives,
- Resource use rights and socio-economic conditions of harvesters;
- Harvest areas (described in a map, if possible);
- Rate, timing, and quantity of NTFPs to be harvested, based upon plant part used (exudate, reproductive propagule, vegetative structure) and established best management practices for each NTFP;
- Description of and justification for the amount of each NTFP harvested, the implemented harvesting technique and the equipment used;
- Sources of information that sustain the rationale behind NTFP management activities, (i.e., based on site-specific field data, local knowledge or published regional forest research and government requirements).

7.3 Forest workers shall receive adequate training and supervision to ensure proper implementation of the management plan.

7.3. NTFP.1 NTFP harvesters shall receive information, training and/or supervision to ensure the management plan is implemented in the field.

PRINCIPLE #8: MONITORING AND ASSESSMENT

Monitoring shall be conducted -- appropriate to the scale and intensity of forest management -- to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts.

Overview: Internal monitoring systems are crucial in order to provide quality control for forest management operations, identify social, ecological, economic and operational challenges, and report on the success or failure of management interventions to resolve problems. In some NTFP management operations, monitoring may be adequate but extremely informal. Assessors may need to move some operations toward more formal and documented monitoring systems, which in the end can serve to improve management quality and effectiveness.

8.2 Forest management should include the research and data collection needed to monitor, at a minimum, the following indicators:

- a) **Yield of all forest products harvested.**
- b) **Growth rates, regeneration and condition of the forest.**
- c) **Composition and observed changes in the flora and fauna.**
- d) **Environmental and social impacts of harvesting and other operations.**
- e) **Costs, productivity, and efficiency of forest management.**

8.2. NTFP.1 The monitoring plan shall include the observed changes in conditions related to:

- NTFP populations (impact of harvest, growth rates, loss or vigor or decline, recruitment);
- Any outstanding environmental changes from NTFP management affecting flora, fauna, soil and water resources.
- Socioeconomic aspects of NTFP use and harvest (changes in community and worker relations or conditions, changes in NTFP use or demand, etc.)

8.3 Documentation shall be provided by the forest manager to enable monitoring and certifying organisations to trace each forest product from its origin, a process known as the "chain of custody."

8.3. NTFP.1 Volume and source data on loads of NTFPs shall be available in the forest, in transport, and at processing and distribution centers controlled by the FME or NTFP harvester(s).

PRINCIPLE 9: MAINTENANCE OF HIGH CONSERVATION VALUE FORESTS

Management activities in high conservation value forests shall maintain or enhance the attributes, which define such forests. Decisions regarding high conservation value forests shall always be considered in the context of a precautionary approach.

Overview: NTFP management may contribute to the maintenance of high conservation value forests (HCVF). FSC definitions require consultation to determine the status of HCVFs, including social consultations. Current definitions allow forests to be considered HCVFs if they provide basic needs for local communities, either for subsistence use or for maintenance of cultural identity. In such cases, NTFPs may play a large role in determining if forests are to be considered HCVFs from a social perspective.

9.1 Assessment to determine the presence of the attributes consistent with High Conservation Value Forests will be completed, appropriate to scale and intensity of forest management.

9.1. NTFP.1 Consultations to determine the status of a HCVF shall specifically include NTFPs as an element of the social analysis section covering forest importance to local communities (as per definition “d” of HCVF provided by FSC).

PRINCIPLE # 10: PLANTATIONS

Plantations shall be planned and managed in accordance with Principles and Criteria 1 - 9, and Principle 10 and its Criteria. While plantations can provide an array of social and economic benefits, and can contribute to satisfying the world's needs for forest products, they should complement the management of, reduce pressures on, and promote the restoration and conservation of natural forests.

Overview: The production of NTFPs in plantations may range from purely agricultural settings to forestry settings. Regional forest standards and consultations with experts will help in determining when to treat certain NTFPs as forest or agricultural products.

NTFPs plantations in forestry settings may be created through sowing, planting, intensive silvicultural treatments or intensive understory clearing in natural forests or timber plantations. NTFP plantations that exhibit few or none of the characteristics and key elements of native ecosystems, and are not established on lands committed to long-term forest cover, will normally be disqualified from certification. In addition, extensive cultivation of exotic understory plants not found in local ecosystems will normally be excluded from certification. Such crops may be better addressed by agroforestry, organic or fair trade initiatives that primarily focus on pesticide use, fair wages and working conditions and actions that seek to mitigate biodiversity losses due to intensive agricultural production. In the case of forest gardens that retain some of the characteristics and key elements of native forests, Rainforest Alliance may work in tandem with other initiatives to provide certification on a case by case basis.

NTFP production can balance management objectives and outputs for some plantation systems, and as such should be encouraged, particularly if production of the NTFP in question from natural forests is endangered or otherwise controversial. NTFPs provide potentially additional challenges to the plantation principle because many products are understory plants that are not well covered by existing FSC criteria.

10.2 The design and layout of plantations should promote the protection, restoration and conservation of natural forests, and not increase pressures on natural forests. Wildlife corridors, streamside zones and a mosaic of stands of different ages and rotation periods, shall be used in the layout of the plantation, consistent with the scale of the operation. The scale and layout of plantation blocs shall be consistent with the patterns of forest stands found within the natural landscape.

10.2. NTFP.1 Intensive management, enrichment planting, or cultivation of understory NTFPs in natural forests shall not adversely impact the overstory or understory diversity across the forest landscape.

10.6 Measures shall be taken to maintain or improve soil structure, fertility, and biological activity. The techniques and rate of harvesting, road and trail construction and maintenance, and the choice of species shall not result in long-term soil degradation or adverse impacts on water quality, quantity or substantial deviation from stream course drainage patterns.

10.6. NTFP.1 Intensive management or cultivation of understory NTFPs in natural forests shall not cause erosion, reduce water quality or adversely impact soil structure or fertility.

10.8 Appropriate to the scale and diversity of the operation, monitoring of plantations shall include regular assessment of potential on-site and off-site ecological and social impacts, (e.g. natural regeneration, effects on water resources and soil fertility, and impacts on local welfare and social well-being), in addition to those elements addressed in principles 8, 6 and 4. No species should be planted on a large scale until local trials and/or experience have shown that they are ecologically well-adapted to the site, are not invasive, and do not have significant negative ecological impacts on other ecosystems. Special attention will be paid to social issues of land acquisition for plantations, especially the protection of local rights of ownership, use or access.

10.8. NTFP.1 Establishment of NTFP plantations shall not adversely impact resources or rights of local communities or local people.

10.8. NTFP.2 NTFP plantations shall not contribute to reducing the value of the environmental, social and economic functions of similar NTFPs in natural forests.

Annex 1: General NTFP Management Considerations

Exudates

Plants produce many useful exudates including, latex, resin, oleoresin and gums. Exudates are commonly employed as sealants, medicines, foods and in industrial applications. Harvest of exudates may entail tapping the tree or the creation of incisions within a tree's bark. The impact of this type of harvest is determined by the maturity of the plant and the frequency and intensity of harvest. If properly conducted, tapping will not kill the exploited tree. However, in addition to felling a tree to collect exudates, excessive tapping can result in the death of the individual. Moderate tapping of a tree may weaken its vigor by diverting energy needed to produce seeds to be used in the production of latex. When extracting exudates, the physiological demands on the tree to produce additional latex or oleoresin compete with the tree's ecological necessity to produce seeds (Peters, 1994).

Vegetative Structures: Apical bud, Bark, Root, Leaves

Vegetative structures signify a variety of different plant parts such as stem, leaf, root, bark and apical bud (the primary growing point at the tip of the stem). This vast array of NTFP products is regularly harvested for use as food, medicine, crafts, and building materials. The impact of harvesting plant tissues will depend upon the type of growth of the plant and the technique and intensity of harvest. Intense and uncontrollable harvest of vegetative structures may result in the death of the plant. However, with proper harvesting techniques, plants may recover from damage due to harvesting of leaves, sprouts and branches as they develop compensatory growth. This can result in a net higher biomass production compared to an undisturbed plant. The ability to produce a higher net biomass or to remain stable depends upon: a) harvesting techniques; b) harvesting intensity, and c) type of growth of the plant (Tropenbos, 1995; Peters, 1994).

Reproductive Propagules: Fruit, Seed

The reproductive propagules of a plant, its fruits, nuts and oil seeds, are frequently harvested for use as food, oil, crafts and medicines. Harvest of fruits and seeds may, in the short term, represent the least amount of direct damage to any NTFP as a population produces more offspring (seeds) and immature individuals (seedlings, saplings, juveniles) than is necessary to maintain its number of reproducing adults. The surplus of seeds is necessary to compensate for the extremely high risk of mortality in the juvenile phase.

However, the continual removal of significant quantities of offspring can directly affect the ability of a plant to reproduce. Over the long term mortality may exceed recruitment. A shortfall in recruitment can cause a notable change in population structure, resulting in decreased plant densities and modified size-class structure. Continued harvest can also affect the genetic composition of the tree population being exploited. In addition, in areas where commercial collectors diminish the quantities of fruits and seeds, frugivores which play a critical role in germination and seed dispersal and may migrate to more isolated forests (Peters, 1994).

Note: The following paragraphs present generic guidance for management of all NTFPs and their plant structures; whenever applicable, specific indicators and verifiers for “Exudates, Apical Buds, Bark, Roots, Leaves and Reproductive Propagules” are identified by showing in bold face the plant structure under consideration in the respective text box.

The following management guidance are applicable to all NTFPs, except where reference is made to a specific plant part.

1. Species selection

Multi-stemmed species that have the ability to coppice are harvested preferentially.

Apical bud

- In areas where numerous species produce a similar product, multi-stemmed species and those with the ability to re-sprout are preferentially harvested (e.g. palm heart *Euterpe oleracea* in lieu of *Euterpe precatoria*), or provisions are made to enhance the preferred species.

2. Knowledge

Rates of harvesting intensity, frequency, and seasonality are defined based on a combination of scientific study and/or long-term local experience and knowledge.

- Scientific information is available;
- Local management/use of selected species exists;
- Harvest rates are documented in writing;
- Analysis of implications of different harvest rates is available.

3. Diameter and/or age

Minimum diameter at breast height (DBH), age, or height at which plant part may be harvested has been determined in a manner which explicitly aims to reduce negative impacts on long-term vigor and production and on species population.

- Minimum age, DBH or height for first harvest is specified;
- Individuals are harvested at or above the minimum age/DBH/height.

Roots

- Individuals are harvested following reproductive maturity.

4. Quantity

The quantity of material removed (e.g.: bark, leaves) that minimizes any negative impacts on long-term vigor and production has been determined.

- Volumes extracted are documented;
- Volumes extracted do not exceed stipulated volumes;
- Data (or visual observations) on the relationships between volume extracted and plant growth, development and reproductive biology are available.

Root

- Mortality does not exceed recruitment.

Leaves

- The appropriate proportion of healthy leaves needed for photosynthesis is determined;
- A sufficient proportion of healthy leaves remain on each individual to allow for photosynthesis.

Reproductive propagules

- The productive capacity of the species has been determined through weighing, counting, or measuring the quantity of the resource produced by different sample trees during the harvest season;

- No more than a determined percentage of the harvestable yield is extracted.

5. Frequency

The frequency of harvest from a population or individual in a given time period has been determined and is conducted in a way that reduces negative impacts on vigor and production.

- Frequency of harvest does not exceed stipulated frequency;
- Frequencies are adjusted according to the DBH, age, size or height of the harvestable tree;
- Records of harvest frequency are documented;
- Information on frequency is based on the observations of a number of different sources.

Root

- Frequencies are adjusted according to recruitment rate of the population.

Leaves

- Sufficient time is allowed between successive harvests for plants to produce new leaves (new leaves must be present on previously harvested individuals).

6. Timing / Seasonality

Harvesting is explicitly timed and designed to reduce stress during reproductive periods and minimize impacts on reproductive capacity.

- Harvesting takes place according to specified timing/seasonality;
- Information is available on the reproductive cycles;
- Instructions on periods to avoid and concentrate harvesting exist;
- Harvesting minimizes a negative impact on the plant's reproductive capacity.

Bark

- Harvesting occurs after the fruits/seeds of the plant are mature.

7. Density / abundance

The percentage of individuals harvested from the entire population will allow for the retention of mature, reproducing individuals.

- The portion and/or number of mature, reproducing individuals to retain is specified.
- The number of mature, reproducing individuals specified is retained.
- The number of individuals harvested is in agreement with a pre-established density (trees per hectare).

8. Genetic diversity and population structure

The management system obtains technical information from different sources that guarantees in the long term that a minimum number of mature, reproducing individuals are retained and that the population will reflect natural diversity in composition and structure.

- Structural and genetic diversity is specified;
- Structural and genetic diversity is maintained.

9. Harvest techniques

Harvest techniques are applied according to defined best management practices.

- Plants are not felled or destroyed during harvest, unless part of approved silvicultural system (e.g. coppicing);
- Negative, indirect impacts of harvesting are minimized;

- Harvesting takes place according to specified techniques.

Exudates

- Appropriate heights for taps/incisions are determined;
- Taps/incisions are located at specified height;
- Appropriate depth of tap is determined;
- Tap does not exceed specified depth.

Bark

- Trees are not girdled;
- Bark can be collected from trees felled as part of approved silvicultural operations;
- Appropriate heights for bark harvest are determined;
- Bark is harvested only at specified heights;
- Bark is harvested only from a specified percentage of the diameter;
- Stemwood is not damaged.

Root

- The correct portion of the root, bulb or rootbark to be harvested is determined;
- Only the specified portion of the root, bulb or rootbark is harvested;
- Harvest techniques will be in accordance with the species' ability to sprout or to spread by root and/or seed;
- If the plant is capable of recovery, only a portion of the root is harvested and a viable portion left to re-sprout;
- Seed collected from a mature plant prior to harvest will be planted in the vicinity to the harvested individual in a habitat that is preferential to germination (e.g.: ginseng).

Leaves

- Reproductive structures and apical buds remain intact and do not show signs of post-harvest damage;
- Branches are not removed for picking of leaves;
- Leaves are not to be collected from felled trees unless part of approved silvicultural operations.

Reproductive propagules

- Fruits, seeds and nuts are harvested from the tree itself or directly from the ground after falling from the tree;
- Trees are not damaged to induce premature fruiting;
- A determined portion of fruits remains in the forest for wildlife (disperser) populations.

10. Growth and regeneration rates

Growth rates and regeneration are regularly monitored using a well-designed inventory system that is appropriate to the complexity, scale and intensity of the management system.

- Frequency of monitoring is specified;
- Periodic regeneration surveys are conducted as specified;
- Size class distribution includes seedlings to large adults;
- Seeding or sapling densities as recorded in a vegetation or regeneration survey remain equal to or above baseline values;
- If over time seedling or sapling densities significantly decline, harvest adjustments are made by:
 - a) Limiting the total area from which the resource can be harvested;
 - b) Regulating the number or size of the plants being harvested;
 - c) Regulating the number of fruits or seeds being harvested; and/or
 - d) Enrichment planting of harvested species.

11. Visual appraisal of health and vigor

Regular visual appraisals of the behavior and condition of harvestable plants/trees are conducted pre- and post-harvest.

- Over a specified period of time, harvestable plants/trees do not display loss of vigor, disease, aborted fruit/leaves or stunted growth;
- If harvested individuals display a weakened condition, harvest volumes are reduced to allow for individual and population recovery;
- If visual assessments and inventories indicate a decline in the density of non-targeted species in the area of harvest, adjustments are made in the management regime to recover density.

12. Wildlife / dispersers

Periodic assessments are conducted in order to evaluate populations of animals that disperse seeds and fruits.

- Within the harvest area, populations of animals that disperse seeds remain stable;
- If populations of animals that disperse seeds decline, harvest adjustments are made in the frequency, quantity, seasonality and techniques of the harvest.