# Sustainable management of Non-Timber Forest Products (NTFPs)

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# Non-timber forest products (NTFP): Definition

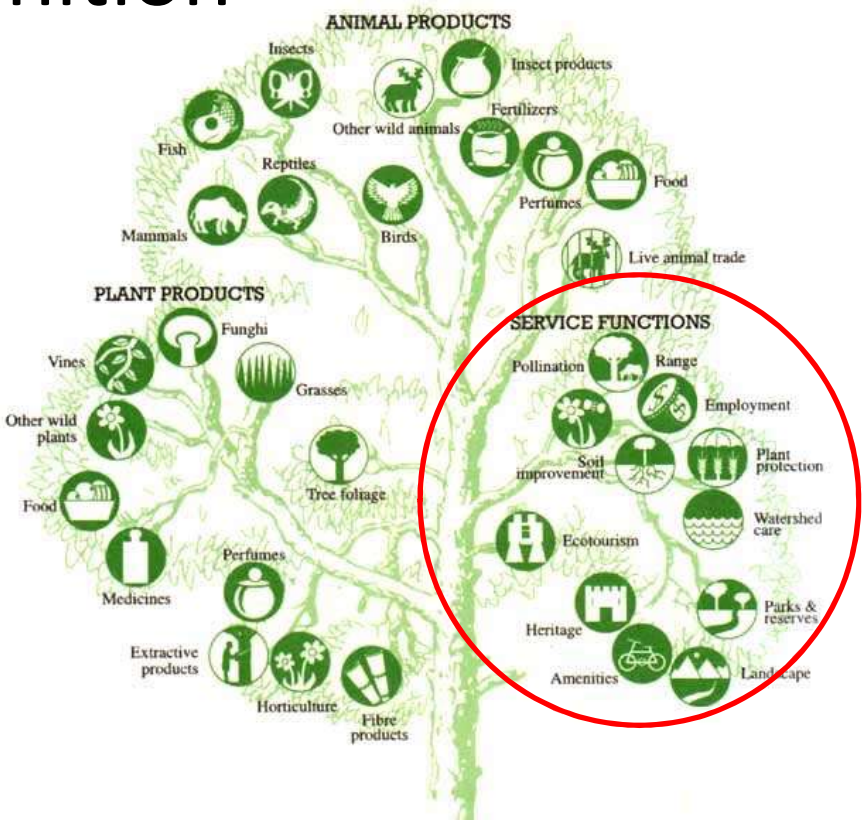
*"All biological materials other than timber which are extracted from forests for human use"*

*De Beer & Mc Dermott 1989*

Also known as:

- Non-timber tree & forest products (NTFPs)
- Non-wood forest products (NWFPs)
- Non-wood forest resources (NWFRs)
- Minor forest products
- Special forest products
- Minor forest products
- Alternative forest products
- Secondary forest products

# NTFPs: Definition

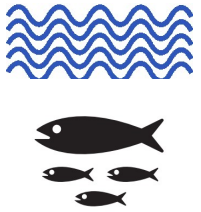



<u>Includes</u>

- Fuelwood, bushmeat & sometimes fish
- Products derived from both natural & planted forests

<u>Excludes</u>

- Services
- biological materials/wild products collected from *non-forest* areas such as rivers, ponds, grasslands, non-treed agricultural lands (e.g. frogs or snails from paddy rice land)



# NTFP types/categories

Plants:
Fruits, seeds, leaves, stems, bark, gums & resins, roots, flowers, branches etc.

Animals:
Meat, eggs, hides/skin, fur/hair, horns, hooves, feathers, & many other parts

Fungi: mushrooms

Soil, humus

Often classified according to their use

| Category | Important products (lists not exhaustive) |
|---|---|
| Food products | **Nuts.** Brazil nuts, pine nuts, malva nut, walnuts, chestnuts<br>**Fruits.** Jujube, sapodilla, ginkgo, bush mango<br>**Edible fungi.** Morels, truffles and other mushrooms<br>**Vegetables.** Bamboo shoots, reindeer moss, various "green" leaves, palm hearts, wild onions (ramps)<br>**Starches.** Sago<br>Birds' nests<br>**Oils.** Shea butter, babassu oil, illipe oil<br>**Sap and resin.** Maple syrup, Birch syrup |
| Spices, condiments and culinary herbs | Nutmeg and mace, cinnamon, cassia, cardamom, bay leaves, oregano, etc. |
| Industrial plant oils and waxes | Tung oil, neem oil, jojoba oil, kemiri oil, akar wangi, babassu, oiti cica and kapok oils. Carnauba wax. |
| Plant gums | **Gums for food uses.** Arabic, tragacanth, karaya and carob gums.<br>**Technological grade gums.** Talha and Combretum gums. |
| Natural plant pigments | Annatto seeds, logwood, indigo. |
| Oleoresins | Pine oleoresin<br>Copal, damar, gamboge, benzoin, dragon's blood, and copaiba oil.<br>Amber |
| Fibres and flosses | **Fibres.** Bamboo, rattan, xateattap, aren, osier, raffia, toquilla straw products, cork, esparto, Erica and other broom grasses.<br>**Flosses.** Kapok. |
| Floral greenery | **Beargrass, boughs, Club moss, Galax leaves, Grape vine, Lycopodium, Mistletoe, Rhododendron, Salal, White birch bark** |
| Vegetable tanning materials | Oak, mimosa, chestnut and catha/cutch. |
| Latex | Natural rubber, gutta percha, jelutong, sorva and chicle. |
| Insect products | Natural honey, beeswax, lac and lac-dye, mulberry and non-mulberry silks, cochineal, aleppo galls, kermes |
| Incense woods | Sandalwood, gaharu. |
| Essential oils | Eucalyptus, Canaga oil (ylang-ylang), Aniba, Sandal oil |
| Plant insecticides | Pyrethrum, Derris, Medang and Peuak Bong. |
| Medicinal plants | Around 5000 to 6000 botanical entering world market every year |
| Animals and animals' products | Ivory, trophies, bones, feathers, butterflies, live animals and birds, bushmeat, etc. |

[1] modified from Iqbal (1993) and Thomas and Schumann (1993).

*Source: SCBD 2001*

# NTFP’s in the global context

# ~96% of the value of forests are from NTFPs & ecosystem services

*The Millennium Ecosystem Assessment 2005*

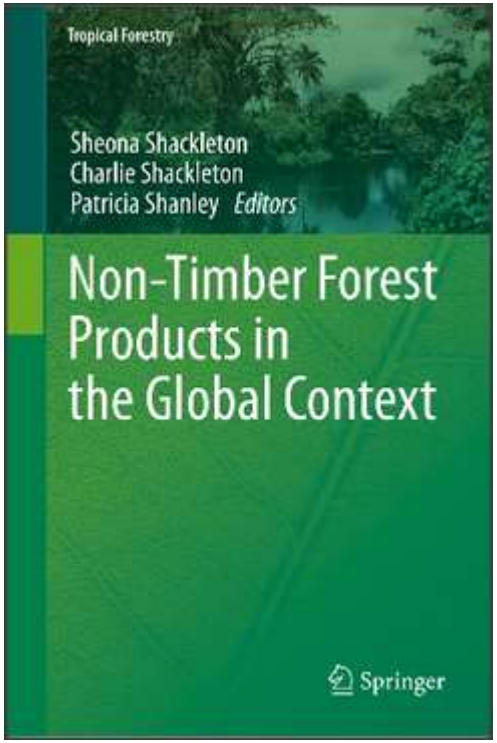
*>10,000 years after the agricultural revolution, hunting & gathering is still important throughout the world.*

Globally, 1.5 billion people use or trade NTFPs Shanley et al. 2016

Mostly from wild harvest, but increasingly from managed/cultivated sources Guijit et al. 1995

Usually informal market: "*hidden harvest*"

People from a wide range of socioeconomic, geographical, & cultural contexts harvest NTFPs



# NTFPs: Multiple roles

**1. Food security & nutrition**

- Important protein source & dietary supplement to staple diets

**2. Social & cultural values**

- Traditional knowledge, traditional medicine, ceremony etc.

**3. Subsistence use, livelihoods**

- Shelter, construction, food, safety nets

**4. Commercialization, commodification**

- Trade, cash income, poverty alleviation

# NTFP's role in rural livelihoods

Important source of subsistence &/or cash income, particularly for low income households

➔ Subsistence value can be high

➔ Often provides only access to cash economy

Agriculture & wage income is generally more attractive than NTFPs alone

➔ Mainly supplementary role to main livelihood activities (but sometimes primary)

➔ Commercialization can provide pathways out of poverty

# NTFPs: Current global trade

- The majority of NTFP use & trade occurs at local scales.
- NTFPs also serve as raw materials for a wide range of industries, with many NTFP commodities part of the global trading system.
- Most of the >5,000 registered commercial forest products are NTFPs

# Globally traded NTFPs

| Products from NTFR | World's import (million US$) | Notes |
|---|---|---|
| Natural rubber | 4,221.8 | Tropical moist forest regions, from intensively managed plantations, agroforestry systems and natural stands (extractive reserves) of *Hevea brasiliensis* |
| Ginseng roots | 389.3 | Tropical or subtropical, both from wild and plantations |
| Essential oils | 319.4 | Various regions, both from wild and cultivated resources |
| Cork | 310.7 | Mediterranean regions from managed natural stands and plantations of *Quercus suber* |
| Honey | 268.2 | Worldwide product from intensively or extensively managed and wild resources |
| Walnut | 215.9 | Temperate from cultivated populations of *Juglans spp.* |
| Mushrooms | 206.5 | Temperate and sub-tropical both from wild and cultivated populations |
| Rattan | 119.0 | Tropical rainforests, mostly from natural stands, few plantations in Asia |
| Gum Arabic | 141.3 | Tropical arid regions, mostly from wild or extensively managed natural stands of *Acacia senegal* and *A. seyal* |
| Brazil nuts | 44.3 | Amazonian rainforests, from wild or semi-intensively managed natural stands of *Bertholetia excelsa* |
| TOTAL NTFR | 11,108.7 | |

[1] modified from FAO (1995b) – original data from UNCTAD database

*Source: SCBD 2001*

# Overview of NTFP's in Laos

# NTFPs in Laos

Estimated national value ~US$ 7–8 million a year

- Expanding small and medium-scale processing industries Bossiere et al. 2014

High dependency on natural resources & NTFPs

- Low population density
- High rate of forest cover
- Large rural population (65%)
- High rates of poverty (LDC)

NTFPs: important source of protein & calories, materials for house construction & handicrafts, traditional medicines, & cash income.

➔ >33% cash income of rural villages (national average)

➔ >50% cash income of rural villages in forest rich areas. Phounvisouk et al. 2013

Estimated value of NTFPs in rural households: ~US$ 320/year Martin et al. 2007

# NTFPs in Laos

Local subsistence use of NTFPs may account for 20-30% of the Gross National Product. Foppes & Ketphanh, 2000

Wild foods are consumed by 80% of the population daily Foppes & Ketphanh 2004

➔ Large variety of nutritious wild foods from forests; important micronutrients to supplement farmed food (rice)

➔ Can provide 'back up' foods for lean season; safety net, food security

# How market access affects NTFPs use in Laos

Table. The effect of market access on NTFP collection & management. Xieng Ngeun & Phonxay districts, Luang Prabang Province, Laos

| Remote areas | Accessible areas |
|---|---|
| Higher diversity of species collected | Lower diversity of species collected |
| Smaller quantity of NTFPs collected | Higher quantity of NTFPs collected |
| Mainly for subsistence use (poor market accessibility) | Mainly sold for cash on the market (good market accessibility) |
| Primarily collected in forests and old fallows | Primarily collected in in young fallows & agricultural land |

Market access influences local household management of NTFPs more than NTFP species diversity available in the landscape

➔ bigger volumes of few species collected in accessible areas for cash income

➔ limited volumes of more diverse species collected in remote areas for subsistence & food security

Nanthavong et al 2011

# NTFP policies & regulations in Laos

Most NTFP resources are 'open access', but there are restrictions at different levels:

Area based restrictions:

- National laws (protected areas)
- Village rules (informal): e.g. cant collect from cemetery/sacred forests
- TABI: participatory forest & land use planning, & management process (FALUPAM).

Species specific restrictions

- International & national laws (IUCN Red list, protected species)
- Village rules (informal): restrictions & quotas (e.g. In Nayang-tai bamboo shoots for own consumption, but no selling).
- Animal totems, sacred animals forbidden to eat (examples??)

Nanthavong et al 2011

# NTFPs in Laos
# A resource under decline?

General decline of NTFP resources in Laos

➔ Deforestation, forest degradation, population growth & over-harvesting

➔ Negative implications for livelihoods & biodiversity Foppes & Ketphanh, 2000

Commercialization of NTFPs: High demand from private contractors &/or corporations (e.g. Chinese traders).

➔ No long-term stake in conservation/sustainability of the resource, unlike local communities

➔ Can lead to harvesting Nanthavong et al 2011

Recent research in Nambak district in 12 villages: all report overall decline in NTFP availability due to population increase & overharvesting

➔ Consistent with global trend Hermans-Neumann et al. 2016 Hogarth et al. unpublished

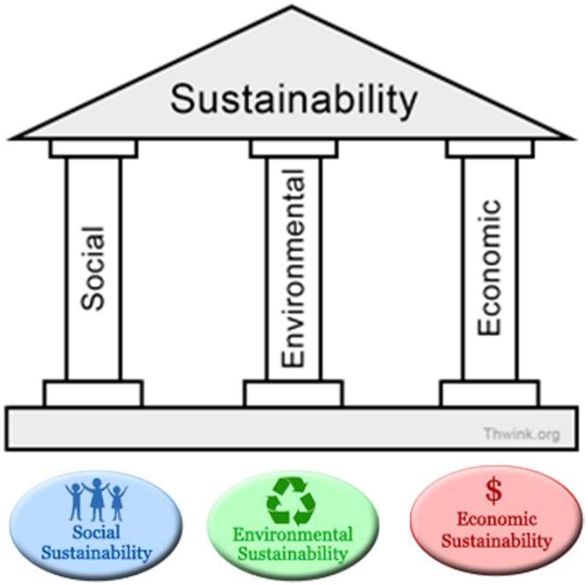
# NTFPs
# Sustainable Management

# What is sustainability?

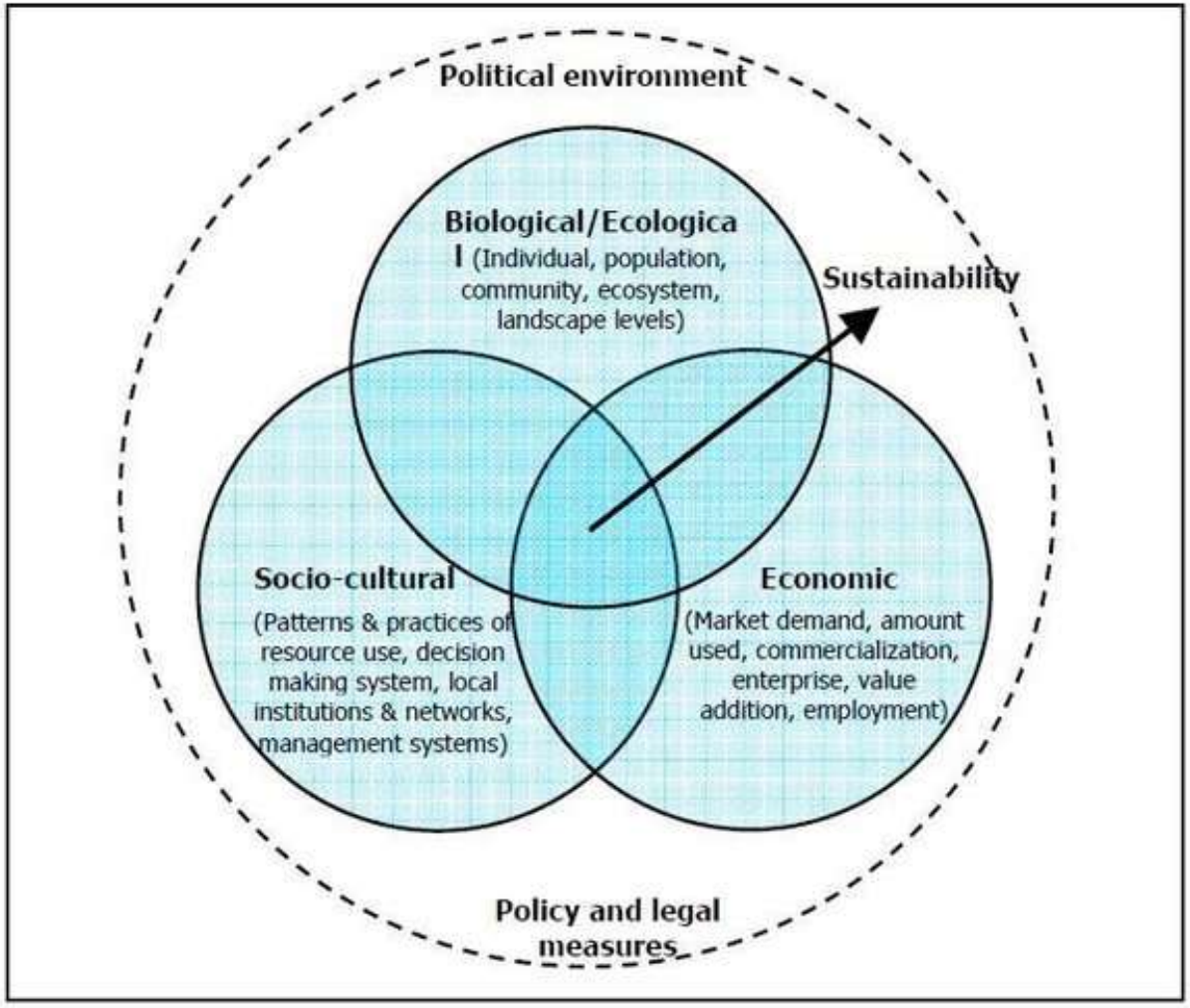
The ability to meet current needs without compromising the ability of future generations to meet their needs.

Three pillars:

1. Environmental (*planet*)
2. Social (*people*)
3. Economic (*profits*)



# Is NTFP harvesting sustainable?




Achieving sustainable use of NTFPs requires consideration of the interlinked dimensions of environmental/biological, socio-cultural, and economic, all within a supportive political (and policy) environment *(after Cunningham 2001)*

Source: Parajuli 2016

# NTFPs: from subsistence to commercialization

In the past, under subsistence demand, harvesting of NTFPs rarely resulted in species-specific overexploitation.

But as people shift from subsistence to a cash economy, frequency & intensity of harvesting or hunting changes rapidly
➔ Increased commercial demand stimulated by improved access (e.g. road construction) & new markets (e.g. Chinese)

The primary collectors of NTFPs have a direct stake in sustainable management of these resources to protect their livelihoods.
➔ They are rarely involved in decisions related to their management (higher level)
➔ They are often the ones overharvesting & undermining the sustainability of the resource from which they benefit or depend

# Limited knowledge about sustainability of NTFP harvest

Scientific knowledge: In general, little is known about the population biology, standing stocks or sustainable harvest intensity/yields of most NTFPs that are harvested from the wild for commercial trade.

Indigenous knowledge & traditional skills: while very important, their application is usually limited to subsistence-level use:
➔ not applicable to commercial harvesting of high demand species.

Integration of traditional & scientific knowledge needed: Not either or

Forest Stewardship Council (FSC) states that NTFP harvesting methods & levels must be appropriate to the species, & should reflect scientific, local, & indigenous knowledge.

# Is NTFP harvesting sustainable?

Sustainability of NTFP harvesting is linked to the vulnerability & resilience of the specific species & ecosystem from which they come.

Influenced by four main factors:

1) **Ecosystem health (deforestation, degradation, disturbance)**

2) **Quantity, frequency, & intensity of harvest**

3) **Biological characteristics**

4) **What, when, & how it is harvested (i.e. harvest practices)**

# Factor 2: Quantity, frequency, & intensity of harvest

The traditional need-based subsistence harvesting of NTFPs is less harmful than the newer commercial/NTFP cash business

Commercialization => Increased quantity, frequency, & intensity

➔ Often harvested without any basic understanding of the impacts (i.e. no sustainable management plan)

The impact of harvest intensity depends on the biological characteristics

➔ Every species is different

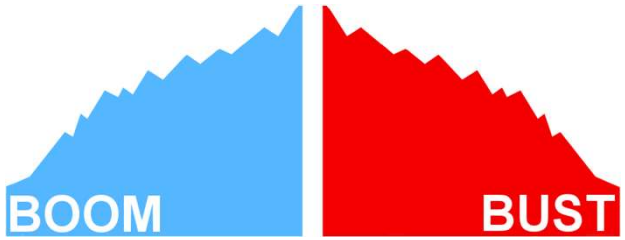
# Factor 3: Biological characteristics

- Life form (plants) or body size (animals)
- Growth rate
- Reproductive biology/fecundity
- Range/geographic distribution
- Habitat specificity
- Abundance, population density, etc.
- Response to disturbance

High intensity harvesting of a species with limited range & small population:
➔ Overexploitation, resource depletion

# Factor 4: What, when & how NTFPs are harvested

- Whole plant/animal: Destructive
- Partial harvest: leaves, flowers, fruits, eggs, seeds, bark nuts etc.
- Timing of harvest: maximize production, reduce harm; e.g. not harvesting a plant until flowering or fruiting is complete
- Harvesting technique: techniques that minimize harm and maximize regrowth; e.g. not taking all




# Boom & bust

High intensity harvesting of high-value NTFPs that have limited supply

**=>** “Boom & bust”

➔ Overexploitation, resource depletion

➔ Cultivation/domestication, &/or substitution

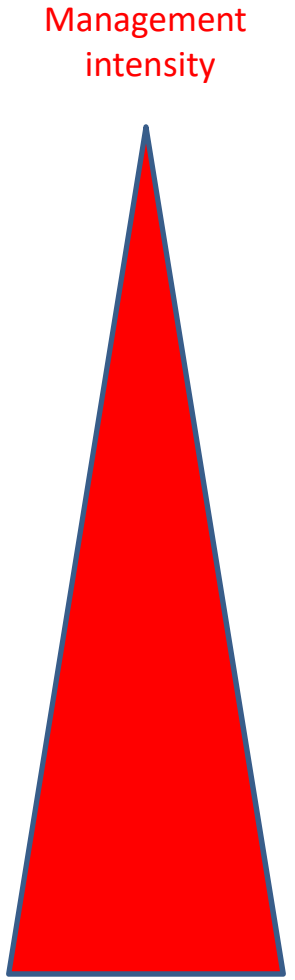
Lao examples of high-value NTFPs that have ‘boomed & busted’?

1.
2.
3.
4.
5.

# NTFP management: Transition from wild to domestication

| | |
|---|---|
| Natural forest | No management |
| Natural forest | Rules, quotas, territory |
| Natural forests | Selective protection & enrichment |
| Fallows/regrowth forest | Selective protection & enrichment |
| Forest gardens/agroforestry | Intercropping, grazing |
| Domestication/plantation agriculture | Monoculture, industrial production |

Agroforestry tree propucts (AFTPs)




Source: Modified figure based on Emerton 2003

# Cultivation & domestication

Lao examples of NTFPs in the process of cultivation & domestication:

| English name | Lao name | Scientific name |
|---|---|---|
| pigeon pea | | *Cajanus cajan* |
| broomgrass | | *Thysanolaema maxima* |
| peuak meuak | | *Boehmeria malabarica* |
| paper mulberry | | *Broussonetia papyrifera* |
| ? | | |
| ? | | |
| ? | | |

# Sustainable management of NTFPs

Three components:

1. Resource assessment & monitoring

2. Sustainable management plan

3. Business plan

# 1. Resource assessment & monitoring

1. Identify the resource supply areas of the product(s). Estimate the supply volume based on current harvesting and trade/use.

2. Identify current or potential threats to the resource base. Conduct group meetings and inquire where and how the products have been collected in the last three years.

3. Conduct field inventories to assess the growing stock & condition of target products & the ecosystem. Conduct interviews with collectors to learn their perceptions of the product availability & quality.

4. Use results of first three steps to design and implement participatory monitoring plan (community led)

5. Make a preliminary estimate of a sustainable harvest regiment. Monitor the harvest rate and make adjustments (as necessary) in the biological monitoring plan.

Examples of NTFPs in Laos that have this sort of monitoring and assessment?

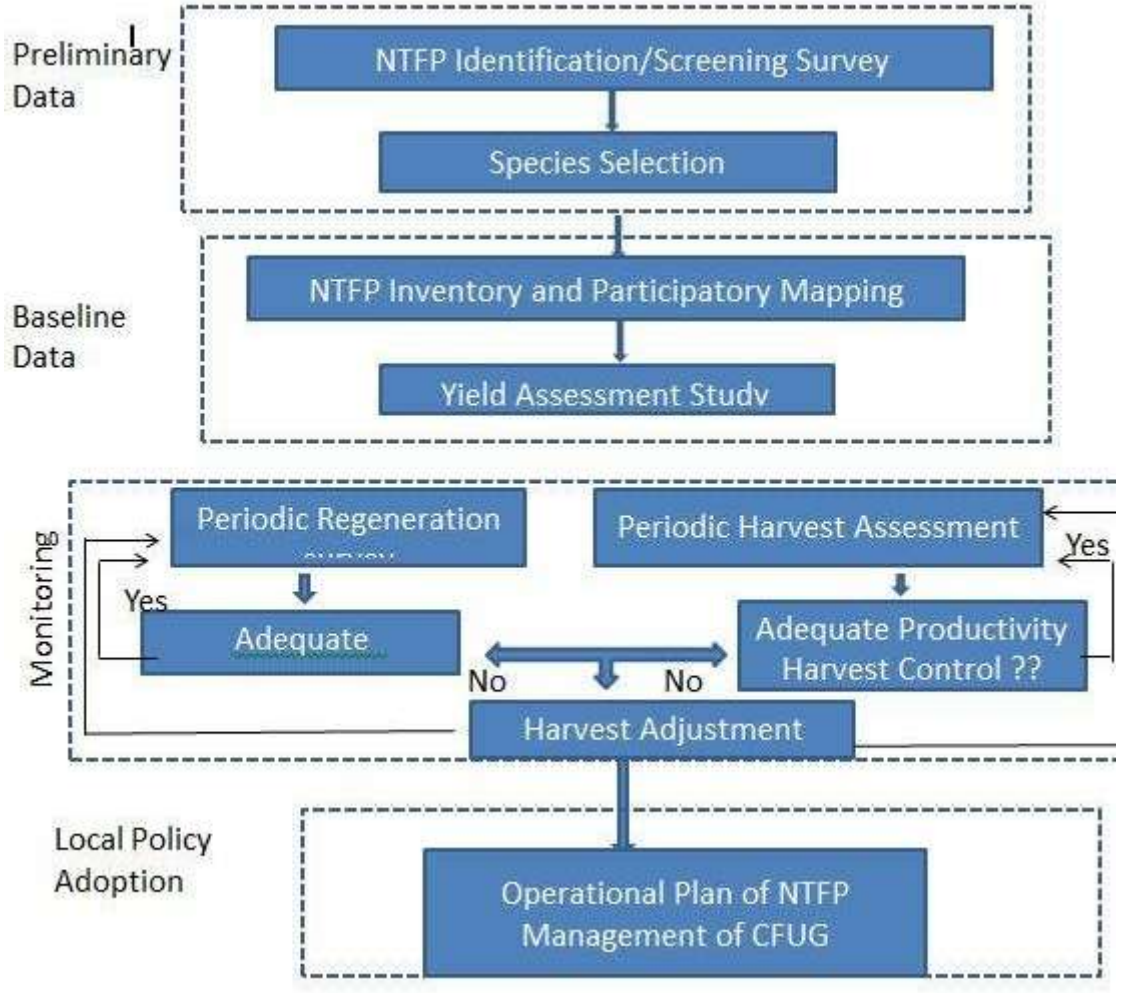
# 1. Resource assessment & monitoring

Checklist to assess harvesting sustainability

- Knowledge of the natural distribution of the species
- Frequency of occurrence or abundance
- Population structure (age/size/class distribution)
- Dynamics of the species (growth and reproduction rates)
- Variation among habitats
- Role within the ecosystem

Parajuli 2016

# Resource assessment & monitoring




Source: Parajuli 2016

# 2. Sustainable management plans

Community-based institutions that engage with relevant stakeholders are needed to develop and administer sustainable management plans for NTFP resources

Management plans should focus on the following major aspects:

A) Resource conservation

B) Enrichment & intensification

C) Sustainable harvesting approaches

D) Value adding & marketing

# A. Resource conservation

Areas requiring any special conservation measures should be:

- identified
- specific conservation measures listed
- Clear demarcation of land areas (maps) where collection/ harvesting restrictions apply (e.g. 'no-harvest' areas) (e.g. TABI)

➔ Must be implementable by the community members with minimal outside support

➔ simple and low-cost management, resulting in reduced human disturbance

➔ helps to promote natural regeneration

# B. Enrichment & intensification

Interventions such as assisted natural regeneration and cultivation/domestication.

As far as possible, these interventions should build on indigenous traditional knowledge and practices

# C. Sustainable harvesting approaches

This should focus on aspects such as:

- Understanding the underlying causes of unsustainable practices.
- Quantity being extracted (quotas)
- Age/maturity or size limits
- Seasonal limits, timing etc.
- Sustainable harvest protocols/best practice ➔ training
- Licenses/permission/membership/certification/collector passes needed to harvest (ccoperatives/user-groups)

# D. Value adding and marketing


Thank you for your attention
Any questions?

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