

THE INTERNATIONAL STANDARD FOR SUSTAINABLE WILD COLLECTION
OF MEDICINAL AND AROMATIC PLANTS (ISSC-MAP)

Elements of ISSC-MAP Resource Assessment Guidance Relevant to CITES Non-detriment Findings



International Expert Workshop on CITES Non-Detriment Findings

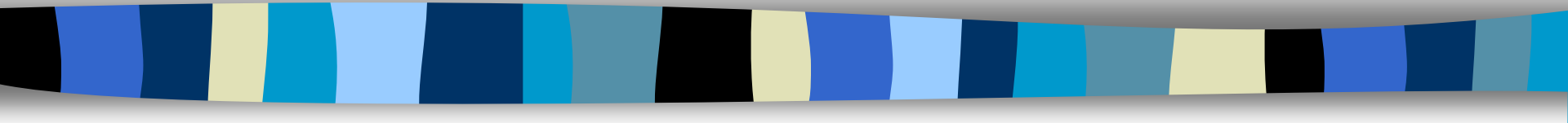
Cancun, Mexico, 17-22 November 2008

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Overview

- Background of ISSC-MAP
- Synergies between CITES NDF and ISSC-MAP
- Resource Assessment
 - 5 steps proposed and revised

Background of ISSC-MAP



International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP)

International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP)

Version 1.0

Medicinal Plant Specialist Group
Species Survival Commission
IUCN The World Conservation Union



Wild collection and conservation requirements:

Resource and habitat assessment and management

Legal and ethical requirements:

Resource tenure, access and benefit sharing

Responsible management and business practices

International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants

ISSC-MAP Version 1.0

6 Principles + Criteria and Indicators

Main focus

Maintaining Wild Map Resources

Preventing Negative Environmental Impacts

Wild collection and conservation requirements

Compliance with Laws, Regulations, and Agreements

Respecting Customary Rights

Legal and ethical requirements

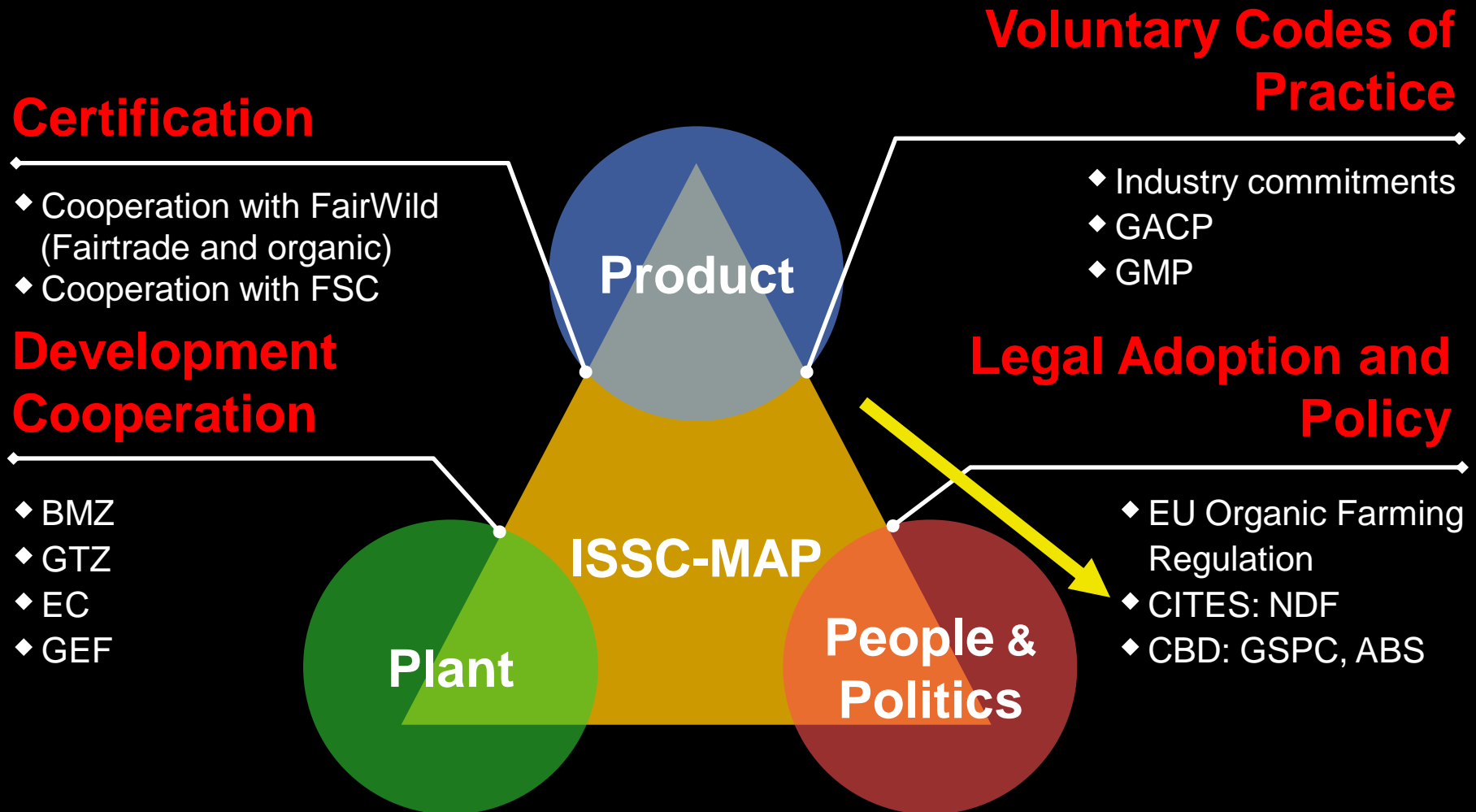
Applying Responsible Management Practices

Applying Responsible Business Practices

Management and business practices

	Criterion	Number	Indicator	Form of indicator / Method of control	Competence			Category ⁸
					Collection manager	Consultant	Certifier	
Section 1 Wild Collection and Conservation Requirements								
Principle 1	Maintaining Wild MAP Resources Wild collection of MAP resources shall be conducted at a scale and rate and in a manner that maintains populations and species over the long term.							
1.1	of target MAP species The conservation status of target MAP species and populations is assessed and regularly reviewed.	1.1.1	target MAP species is assessed according to the IUCN Red List categories and criteria (version 3.1, 2001) and regularly reviewed.	Red List database, and/or Red List Authority for medicinal plants + Conservation status reports	X	X		
		1.1.2	For species determined to be Data deficient (DD) or not evaluated (NE) according to the IUCN Red List categories and criteria, sufficient information is gathered to complete and / or review a previous conservation status assessment (according to 1.1.1).	Documents of gathered information Written field verification report on the species population Resource assessment Red List data required - checklist	X X X X	X X X		2→1
1.2	collection practices MAP collection and management practices are based on adequate identification, inventory, assessment, and monitoring of the target species and collection impacts.	1.2.1	Endangered or critically endangered species (according to the IUCN Red List) are not wild collected for commercial purposes.	List of collected plants	X			1
		1.2.2	Management strategies are defined and implemented to reduce identified threats to species considered "vulnerable" according to the IUCN Red List.	<ul style="list-style-type: none">List of collected plantsManagement plan	X X			1
		1.2.3	MAP species targeted for collection and their geographic sources are accurately and adequately identified with voucher specimens from the collection site.	<ul style="list-style-type: none">Handbooks, manuals, and other aids to species identificationVoucher specimens with taxonomic names, as well	X X	X		2→1

ISSC-MAP is intended for use in a wide range of scenarios



Current Implementation Projects

ISSC-MAP



Bosnia-Herzegovina
Implementation of the
ISSC-MAP in co-
operation with partners
from the local private
sector and government
authorities

Nepal
Use of ISSC-MAP in
conservation areas
and buffer zones
managed by local
communities



Brazil
Model implementation at
community level in Acre,
Amazon

India
Uttarakhand: ISSC-MAP
Implementation along the
mandi trade chain

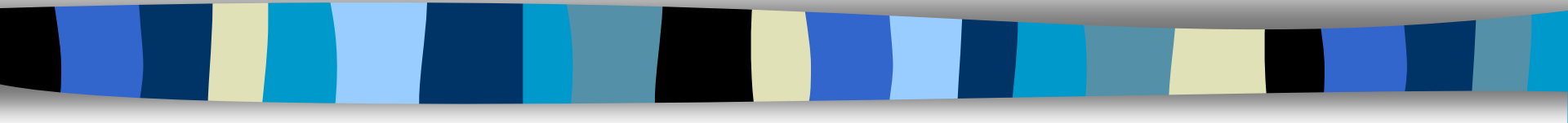
China
Inclusion of ISSC-
MAP into the
development of
regional resource
management

Lesotho
Development of a
regional management
plan for *Pelargonium*
sidoides together with
national authorities

Cambodia
Identification of priority
species and
development of a local
model implementation
project



Synergies between CITES NDF and ISSC-MAP





Medicinal and aromatic plants
can be found

- in all taxonomic groups
- in all habitats
- in all lifeforms

Qualitative and Quantitative Data

Assessing the sustained yield of medicinal plants

requires two levels of data:

Species specific

– Biological data

qualitative

Site specific

– Population data

quantitative

Resource Assessment Questions

Questions to be answered through a sound resource assessment in the collection area:

–How **many** are there?

Inventory

–How **old** are they?

–How **much** do they produce?

Yield

–How **quickly** do they regenerate?

Recovery

–How **many** do they reproduce?

Focus on Vulnerable Life Forms & Plant Parts

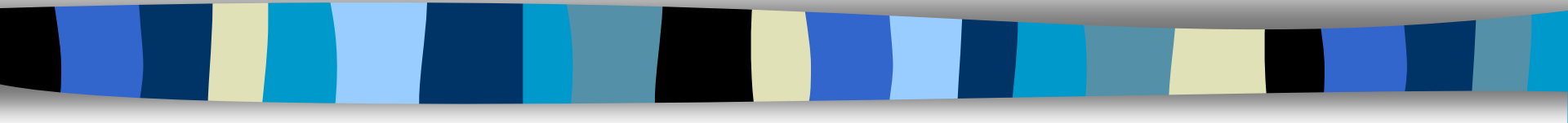
Trees	Wood, bark
Perennials	Live plants, roots
Succulents & cycads	Whole plants, live plants, bark, leaves, seeds
Geophytes & epiphytes	Live plants



Applications of ISSC-MAP Relevant to CITES

- Provide criteria & methods to identify and support wild collection where it is sustainable – for socio-economic and conservation values
- Provide criteria & methods to identify and limit wild collection where it is NOT sustainable
- Contribute to keeping sustainably harvested species in international trade off CITES appendices
- Prevent CITES Appendix II species from eligibility for App I

Resource assessment



Focus of ISSC-MAP Resource Assessment

Principle 1: Maintaining Wild MAP Resources

“Wild collection of MAP resources shall be conducted at a scale & rate and in a manner that maintains populations & species over the long term”

Criterion 1.1. Conservation status of target MAP resources

“The conservation status of target MAP species and populations is assessed and regularly reviewed”.

Criterion 1.2. Knowledge-based management practices

“MAP collection and management practices are based on adequate identification, inventory, assessment, and monitoring of the target species and collection practices”.

Criterion 1.3: Collection intensity and species regeneration

“The rate (intensity and frequency) of MAP collection does not exceed the target species’ ability to regenerate over the long term”.

Focus of ISSC-MAP Resource Assessment

Principle 5: Applying Responsible Management Practices

“Wild collection of MAP species shall be based on adaptive, practical, participatory, and transparent management practices”

Criterion 5.1. Species / area management plan

“A species / area management plan defines adaptive, practical management processes and good collection practices”.

Criterion 5.2. Inventory, assessment, and monitoring

“Management of MAP wild collection is supported by adequate and practical resource inventory, assessment, and monitoring of collection impacts”.

Step 1. Situation Analysis

Step 2. Resource Inventory

**Local
and
Collector
Knowledge**

Step 3.

**Yield and Regeneration
Studies**

Step 4.

**Assessment of
Harvest Impacts**

Yes

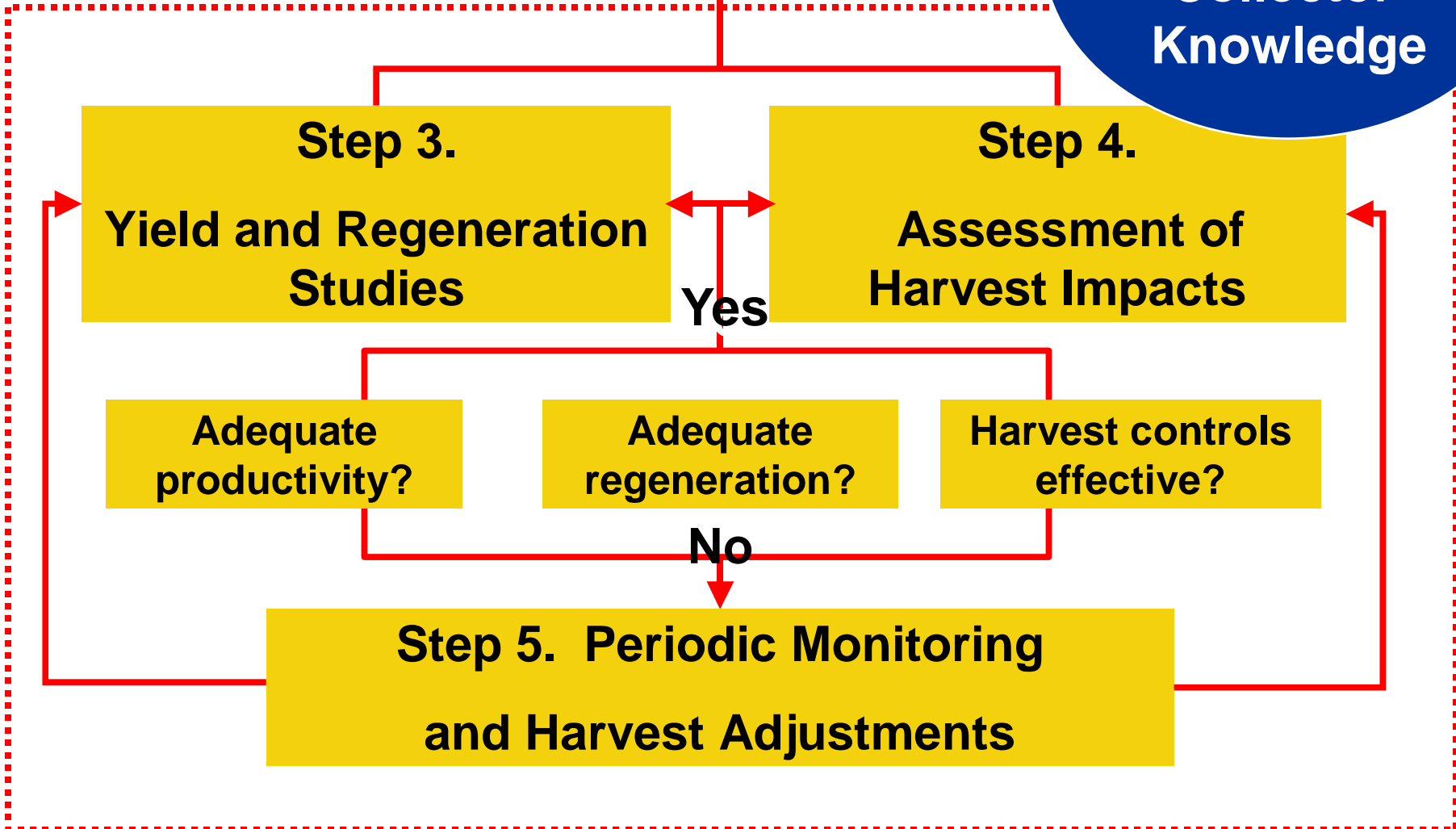
**Adequate
productivity?**

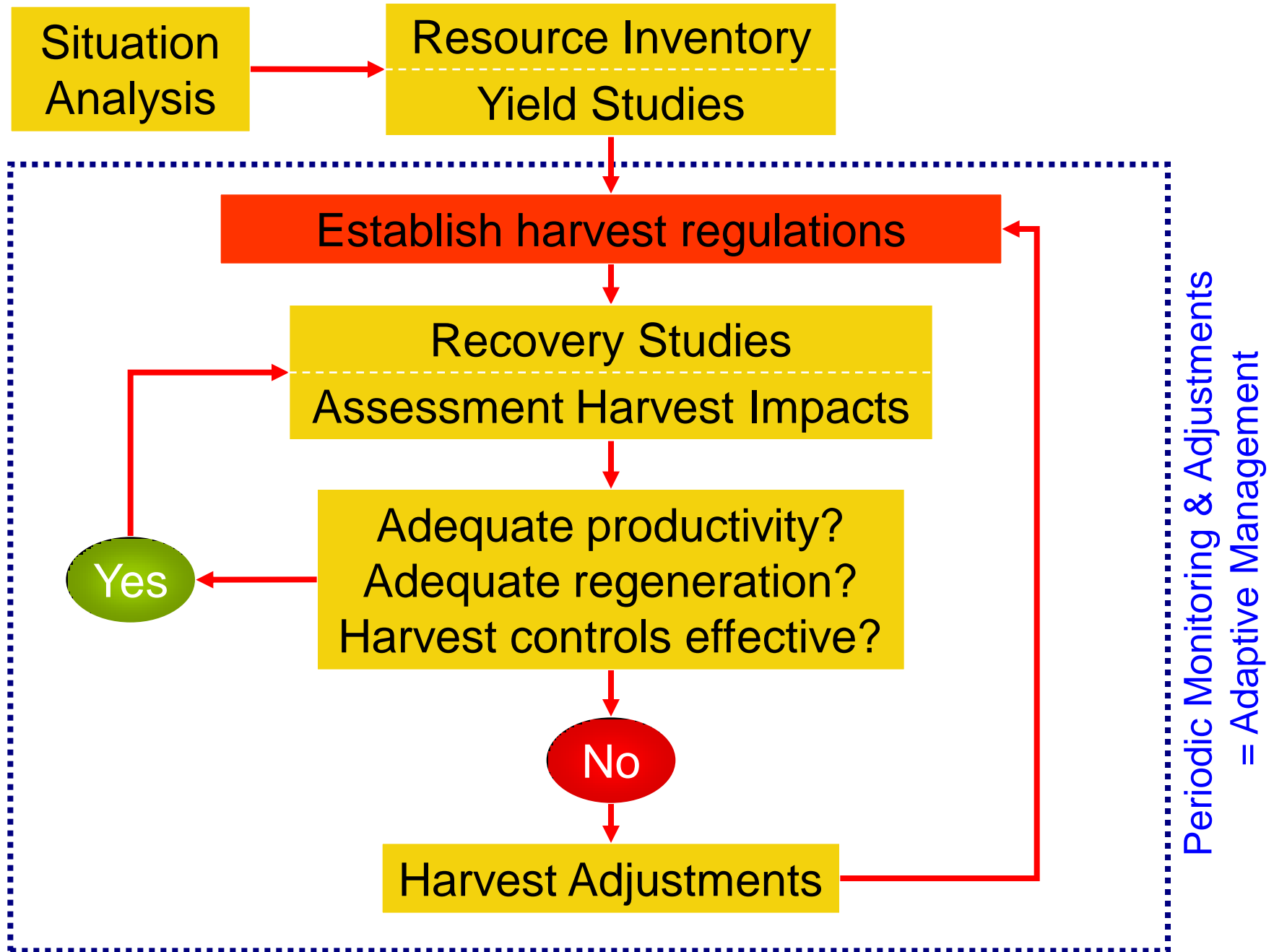
**Adequate
regeneration?**

**Harvest controls
effective?**

No

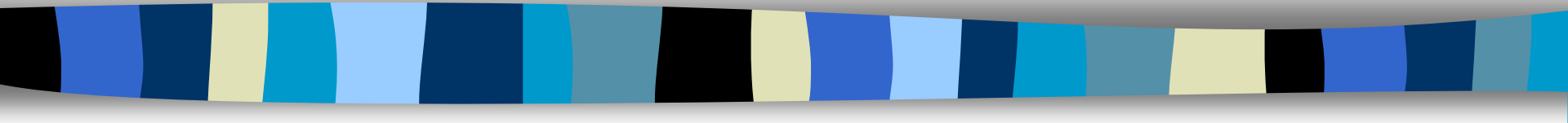
**Step 5. Periodic Monitoring
and Harvest Adjustments**





Step 1

Situation analysis



Situation Analysis

Select target species for ISSC-MAP
Correct species identification

**Trade
studies**

Gather information – species & collection site
Model questionnaire based on ISSC-MAP
Literature, field work/ interviews
Open-ended questionnaires / collectors' knowledge

**IF
TARGET SPECIES
NOT YET
SELECTED**

Assess conservation status & likelihood of sustainable harvest
IUCN Red List categories and criteria
Pre-assessment matrix

Prepare a situation report
Target species, collection area, maps
Objectives of the resource assessment
Plans to implement the resource assessment

Assess Conservation Status

IUCN Red List
Categories and Criteria
Version 3.1



IUCN
The World Conservation Union

Global status (species, over entire range)

- IUCN Red List
- Accepted global standard for categories and criteria
- Links importance of target populations / collection area to survival of the entire species

National or regional status

- National, provincial / state Red Lists, Threatened Species Lists
- Widely different standards for categories and criteria
- Unknown importance of target populations / collection area to survival of the entire species (for non-endemics)

Special considerations for conservation

- Endemic species
- Phylogenetic distinctiveness (monotypic family / genus / species; small genus (2-6 spp))
- Keystone species (ecological, cultural)

Make Strategic Choices for Management & Monitoring (M&M)

High potential for sustainable harvest

- resilient species
- abundant, high value
- lower input M&M

?

Low potential for sustainable harvest

- vulnerable species
- costly & complex M&M
- high precision required

Potential for sustainable use influences how much time and effort the collectors & other managers need to put into management

Factors that increase likelihood of sustainable wild collection

- **Low intensity & frequency of harvest**
 - Species abundance & resource / land tenure therefore important
- **Single use rather than multiple use**
 - Less complex to assess, monitor, manage sustainable collection
- **Part harvested**
 - Leaves, flowers, seeds, fruits ...not bark, roots, bulbs or whole plants
- **Growth & reproduction**
 - Fast growing species
 - Resilience to harvest (eg: vigorous resprouters, no disease when damaged)
 - Produce many offspring & locally abundant
- **Distribution & habitat preferences**
 - Ecological generalists, tolerate a wide range of conditions (common, wide distribution, rather than habitat specific)

Factors that make a species vulnerable to over-collection

- High demand
- Multiple-use species (more than one use, more than one part used...eg: highly palatable plant parts)
- **Destructive harvest** (roots & bulbs, bark, whole plant ...)
- **Commercial trade**: high value, long-shelf life, easily transportable
- Slow growing (& parasitic)
- Obligate re-seeder (does not reproduce vegetatively)
- Disperser: large (edible) animal
- Pollinator: highly specific mutualism
- Dioecious (separate male & female plants)
- Susceptible to disease when damaged (eg: *phytophthora* – root-rot fungus)
- Habitat specific: high diversity, low density; unusual soil type (eg: serpentine, nickel) (habitat: “globally outstanding”)
- Land-use: higher rainfall, highly arable soils, flat land, arid/semi-arid
- Accessible: road, riverine & alluvial areas

Use and trade

Species biology

Habitat

Step 2

Resource inventory

Yield studies



How much of the target species is present within the collection area?

How much of the desired raw material (quality & quantity) does the target species produce under natural conditions? $\sim K$, carrying capacity

Resource Inventory

Planning

Focus and scope

Define sampling methods

- random or systematic
- plots, transects, how many, where, size-classes

**Local
and
Collector
Knowledge**

Information gathering – Field work

Count / estimate # of individuals in each plot / transect

Determine age (usually by measuring height, diameter)

Different methods for different plant life-forms

Analysis and reporting

Estimate target species abundance and density

Prepare an inventory report

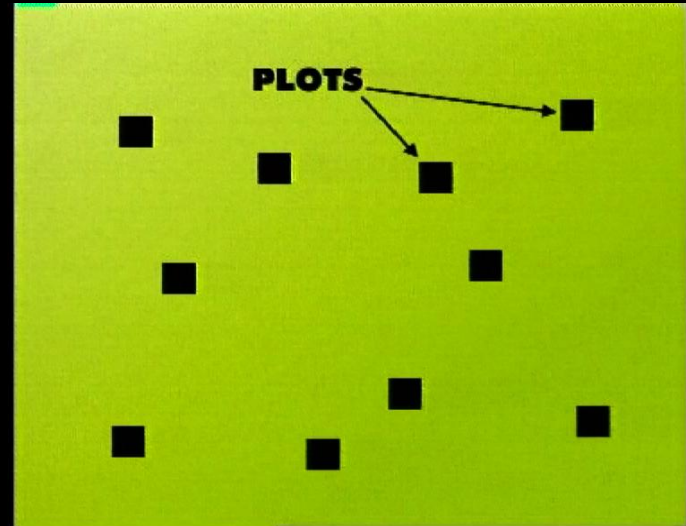
Plot data as a histogram to show:

- population structure
- size-class distribution

Use appropriate precision

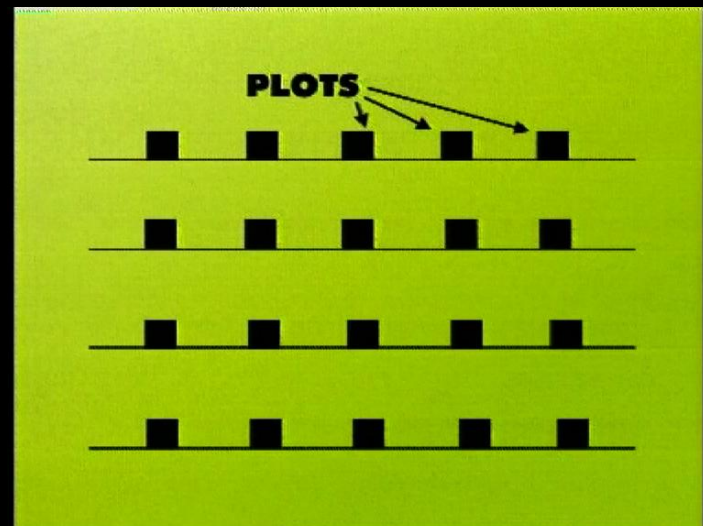
Random plots

- preferred by statisticians
- eliminate bias



Systematic sampling

- preferred by collectors & communities
- eliminates bias



Replication (minimum 3-5 samples per treatment)

- improves precision
- reduces chance effects

Yield Studies

Planning

Focus and scope:

- harvested age / size-classes
- vegetation types

Standard harvesting method

Actual or potential yield

**Local
and
Collector
Knowledge**

Information gathering – Field work

Measure / estimate yield

- amount of resource harvested
- amount of resource possible to harvest

Analysis and reporting

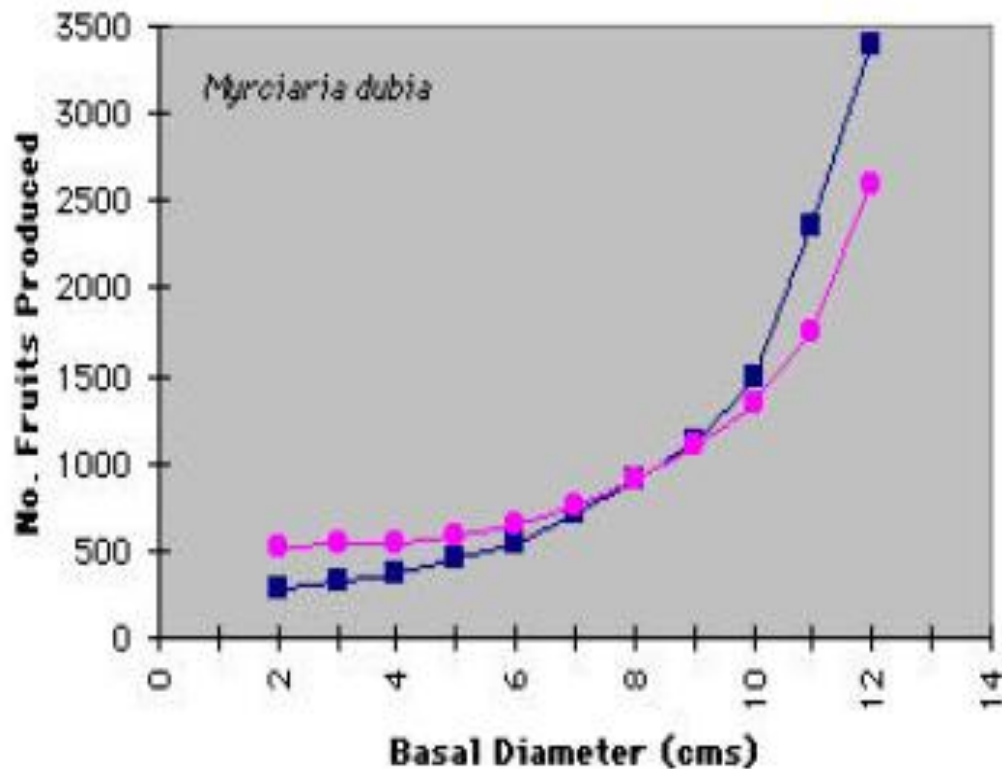
Calculate total resource yield, e.g.

- per sample plot
- per unit area (e.g., hectare)
 - per age / size-class
 - per vegetation type

Calculate the “standing stock”



Yields vary from season to season



Yield curves showing annual fruit production as related to tree size for *Myrciaria dubia* plants growing in the lowlands of Peruvian Amazonia.

Two years of fruit production data are shown.

(Source: Peters, 1994)

Step 3

Harvest regulations



New!

Harvest regulations (thinking about plants...)

- Estimate current harvest volumes and define current harvest practices
 - Estimate unmanaged harvest volumes and define unmanaged harvest practices
 - Compare current harvest levels with estimated sustainable yield
 - Compare current harvest practices with “best practice”
- Define precautionary / potentially sustainable harvest regulations. These become the working hypothesis for monitoring.

Harvest regulations (thinking about plants...)

- Constant number / volume = quota
- Constant effort: e.g., collection season
- Constant proportion of population / proportion of collected part per individual plant
- Other plant collection protocols (e.g., bark and tuber removal, season and age-class restrictions)

Step 4

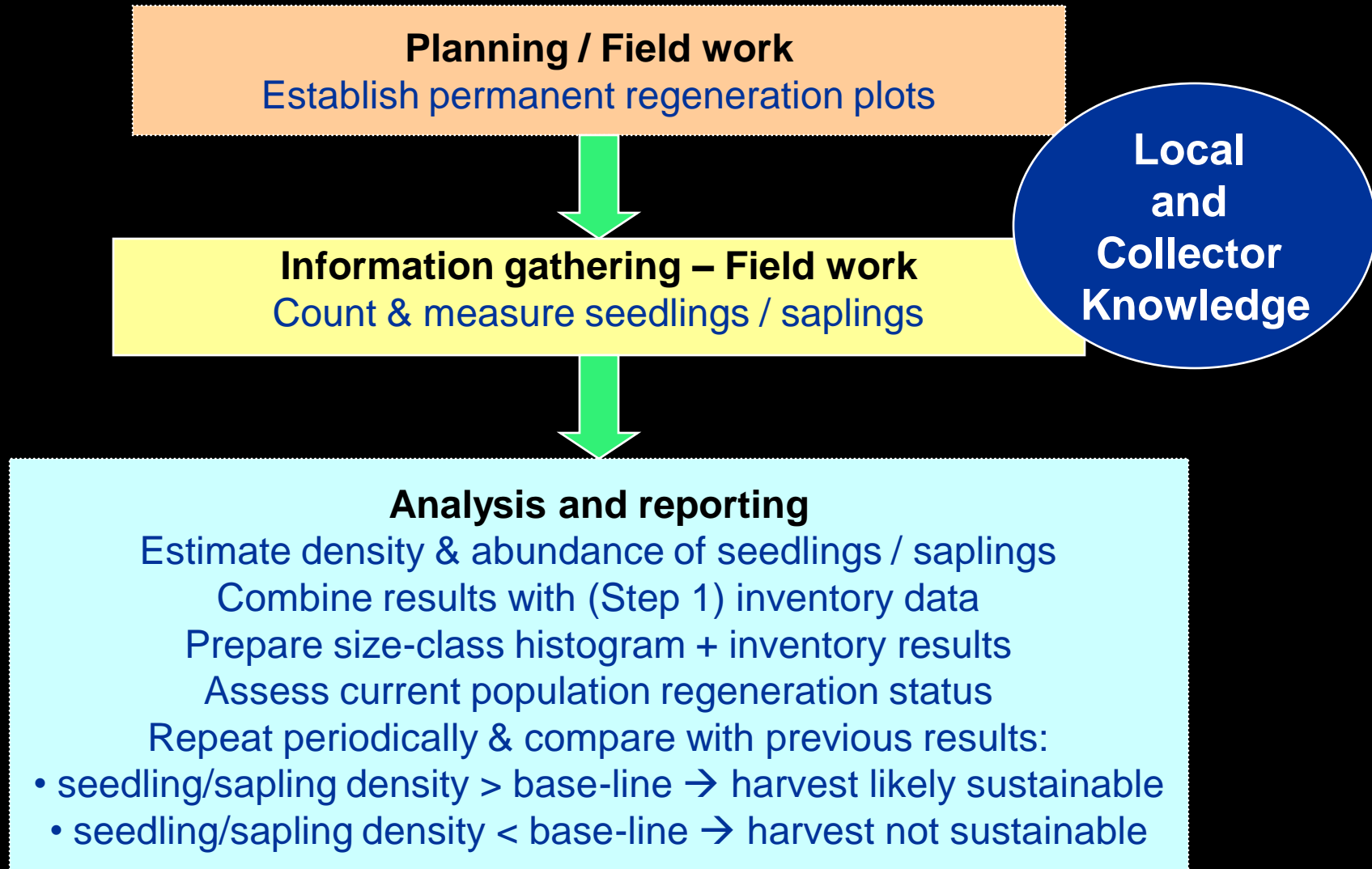
Periodic monitoring



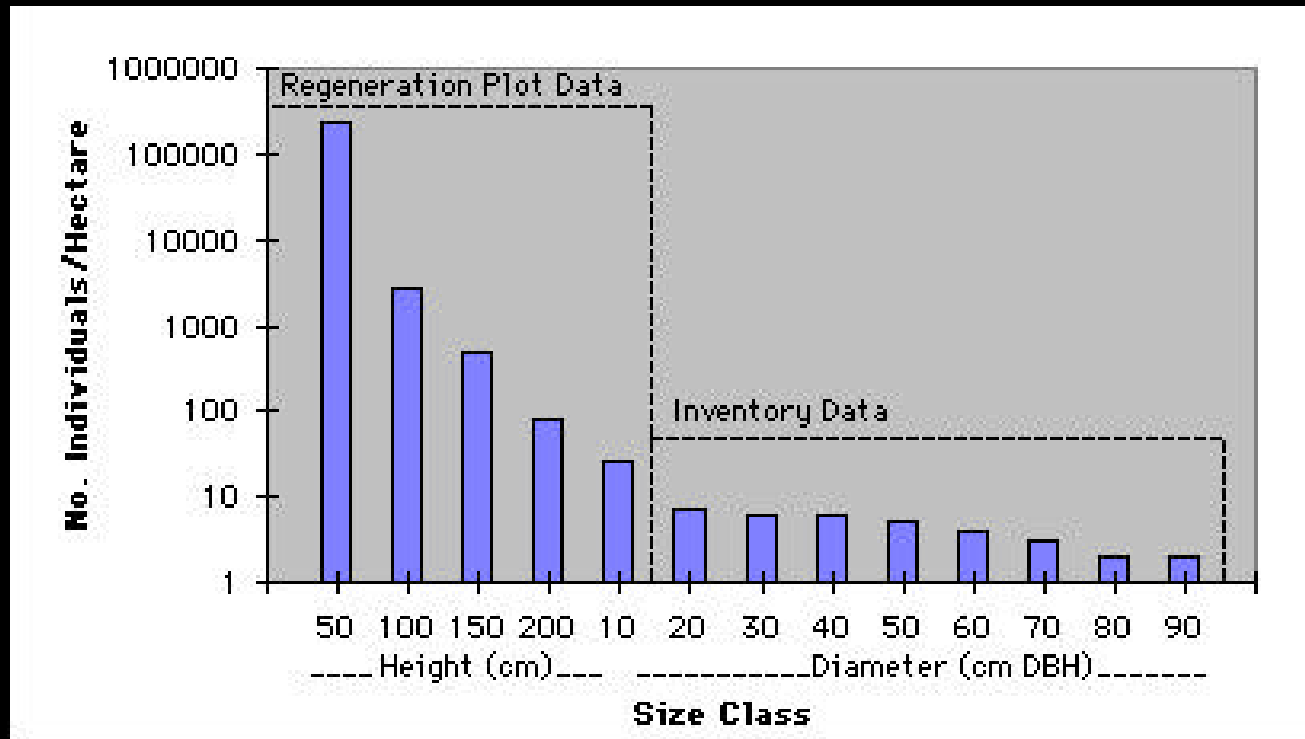
Recovery studies: What is the regeneration rate of harvested populations & individuals?

Assessment of harvest impacts: What is the impact of the current harvest protocol on the target population and ecosystem?

Recovery / Regeneration Studies



Inventory + Regeneration Data



Size-class histogram for *Shorea atrinervosa* population illustrating the use of both height and diameter classes. Data from regeneration plots have been grouped into four 50 cm height classes and one 1.0 - 10.0 cm diameter (DBH) class. Inventory results are divided into eight 10 cm (DBH) diameter classes. Numbers shown along x-axis represent the upper size limit of each class. Note compressed, logarithmic scaling of y-axis due to the large range in values (e.g. from 3 to 250,000). (Source: Peters, 1994)

Reseeders vs Resprouters



- Regenerate from seed, seed-banks
 - Abundant seedlings
 - Single-stemmed
 - Self-pollinated or diverse pollinators
 - Fast-growing, short-lived
 - Habitat specialists
- Regeneration surveys likely useful & important



- Regenerate from buds, bud-banks
 - Few seedlings
 - Multi-stemmed
 - Pollinator-limited
 - Underground storage organs
 - Slow-growing, long-lived
 - Habitat generalists
- Regeneration surveys may not be very useful

Assessing Harvest Impacts

Planning / Field work

Define sample population (harvested age / size-classes)
Define current (standard) and test (alternative) harvesting method
Establish permanent plots or permanently marked individuals



Information gathering – Field work

Apply standard and test harvesting methods
Record observed impacts (changes from base-line):
• Survival and vigour, reproduction, yield, growth, regeneration

**Local
and
Collector
Knowledge**



Analysis and reporting

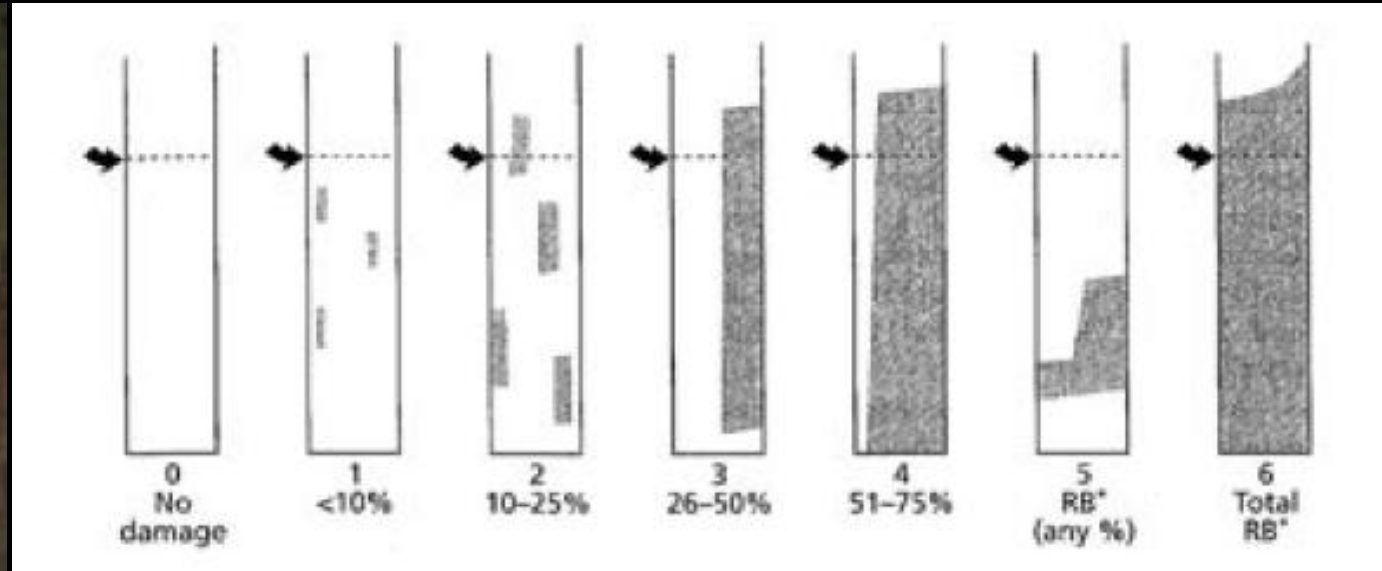
Estimate sustainability of current level & method of harvest
• vigour, yield, etc. declining → unsustainable
• vigour, yield, etc. stable or increasing → likely sustainable*

*But beware of short-term „growth-spurt“ response to over-harvest!
→ Carry out long-term studies & monitoring

Effects of Harvest Vary



Assessing Bark Damage



Cunningham, 2001

0 = no damage

1 = small patches removed (<10% of trunk bark)

2 = larger patches removed (10-25% of trunk bark)

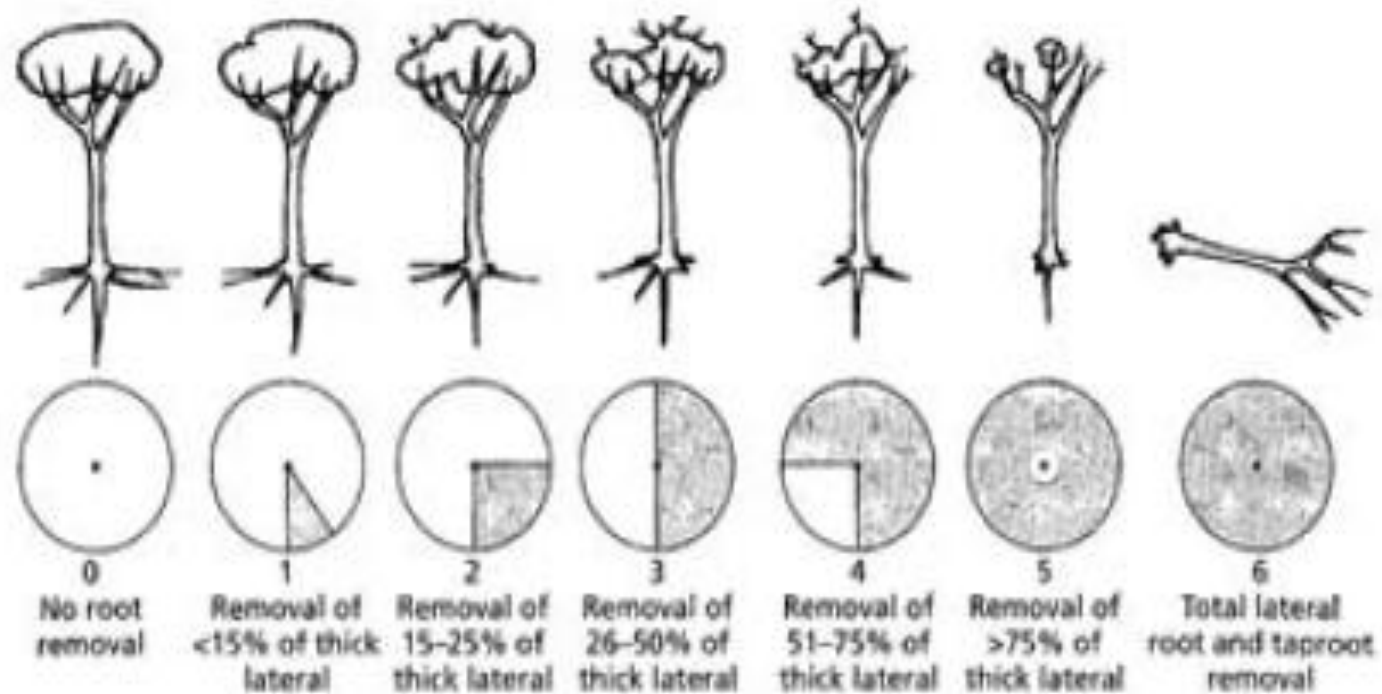
3 = large strips removed (26-50% of trunk bark)

4 = extensive bark removed (51-75% of trunk bark)

5 = ring-barking or girdling (leads to death in many species)

6 = complete girdling, all bark removed (certain death)

Assessing Root Harvest

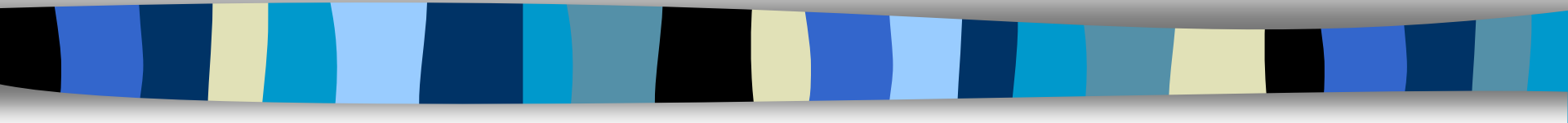


Cunningham, 2001

Direct evidence of root damage is often buried, but it is sometimes possible to evaluate the extent of damage.

Step 5

Harvest adjustments



Is the management action successful?

What adjustments can / should be made to allowed harvest protocols to maintain resource quality & quantity for future collection cycles & to avoid undesired impacts?

Periodic Monitoring & Harvest Adjustments

Planning / Field work

Define monitoring objectives
Select monitoring indicators and methods
Develop a plan

**Local
and
Collector
Knowledge**



Information gathering – Field work

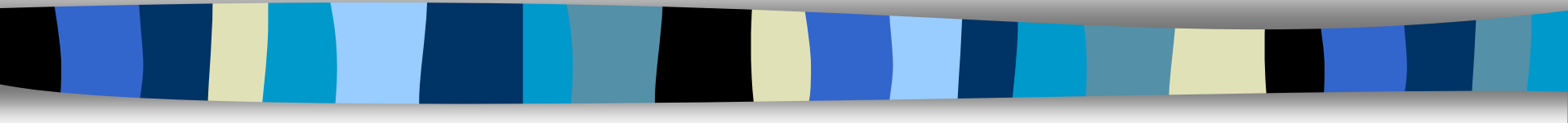
Focus on target resources included in normal harvest activity
Add samples (plots, individuals) to answer relevant questions
Keep good records

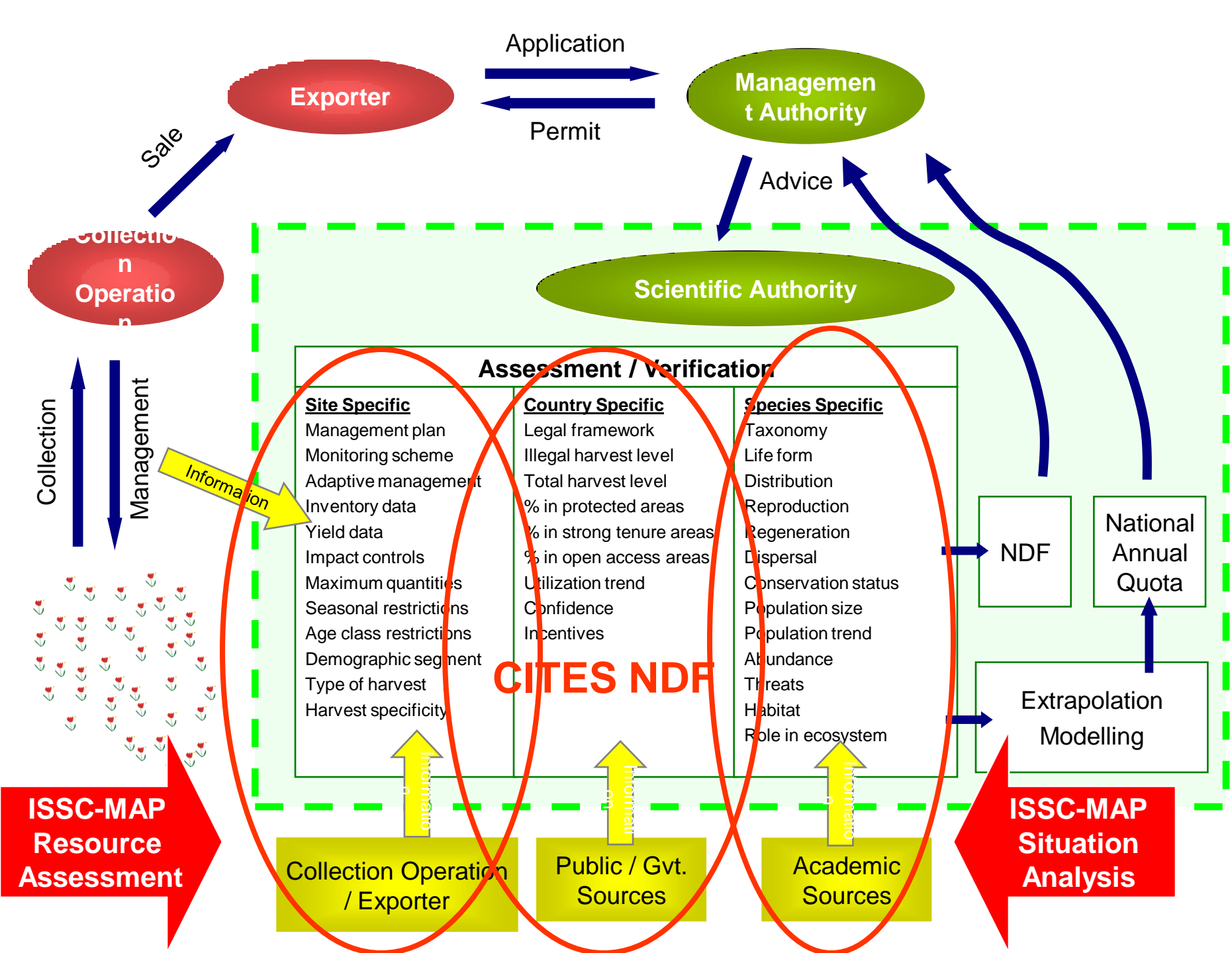


Analysis and reporting

Estimate current harvest level
Monitor impacts on yield, regeneration, vigour, productivity, etc.
Adjust harvest levels, methods if needed:
intensity, frequency, timing, management methods

Quick Summary: ISSC-MAP & CITES NDF





ISSC-MAP Project website:

www.floraweb.de/map-pro

Decision Board:

Danna J. Leaman (IUCN-SSC Medicinal Plant Specialist Group) (MPSG)

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Secretariat:

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International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants



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