

# Silvicultural Systems

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# SYLLABUS

- DEFINITION
- SCOPE
- OBJECTIVE AND CLASSIFICATION
- SYSTEMS-
  - CLEAR FELLING
  - SHELTER WOOD
  - SELECTION
  - COPPICE

# SYLLABUS

- INDIAN MODIFICATION AND APPLICATIONS
- CONVERSION FROM ONE SYSTEM TO OTHER
- SILVICULTURE SYSTEMS FOR BAMBOOS,
  - GREGARIOUS FLOWERING
  - MANAGEMENT
  - CONVERSION FROM PURE TO MIXED BAMBOO FORESTS

## **SILVICULTURE** - SILVA (*Latin*) + CULTURE (*French*)

- *SILVICULTURE IS THE ART & SCIENCE OF CONTROLLING THE ESTABLISHMENT, GROWTH, COMPOSITION, AND QUALITY OF FOREST VEGETATION*

## **SILVICULTURAL PRACTICE**

- *CONSISTS OF THE VARIOUS TREATMENTS APPLIED TO FOREST STANDS TO MAINTAIN AND ENHANCE THEIR UTILITY FOR ANY PURPOSE*

## **SILVICULTURAL SYSTEM**

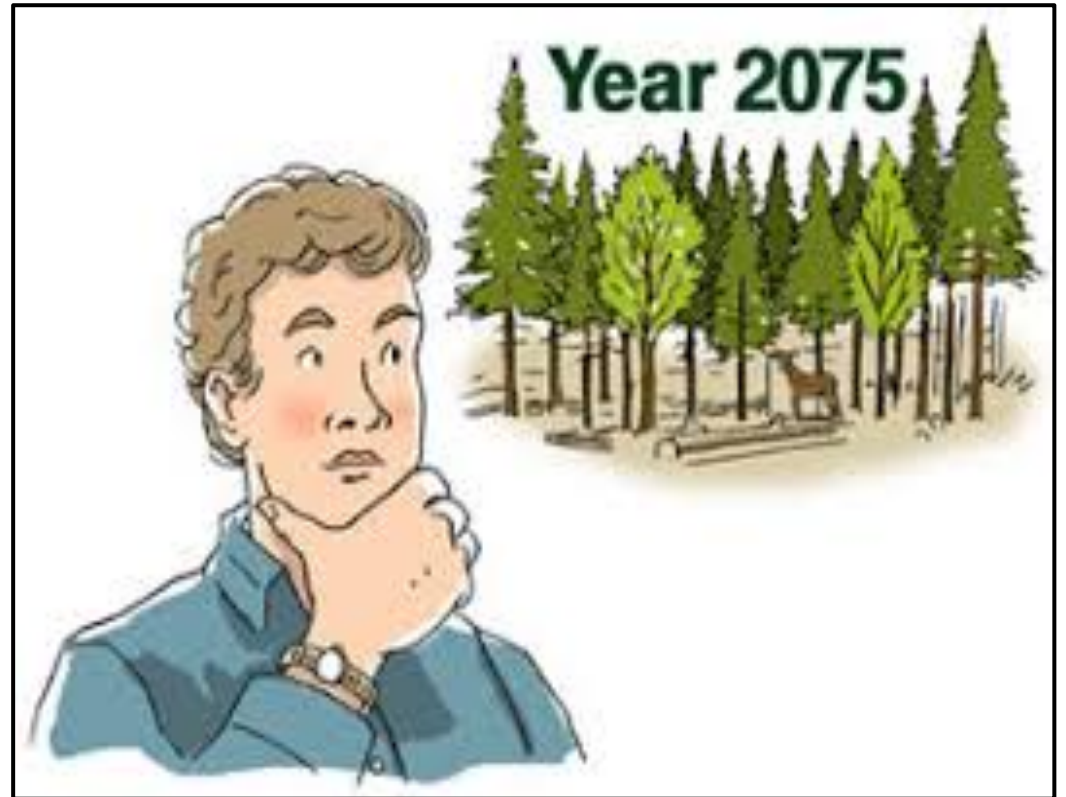
- *IS A long term PLANNED PROGRAM OF TREATMENTS DURING THE WHOLE LIFE OF A STAND DESIGNED TO ACHIEVE SPECIFIC STAND STRUCTURAL OBJECTIVES.*

# Silvicultural Systems

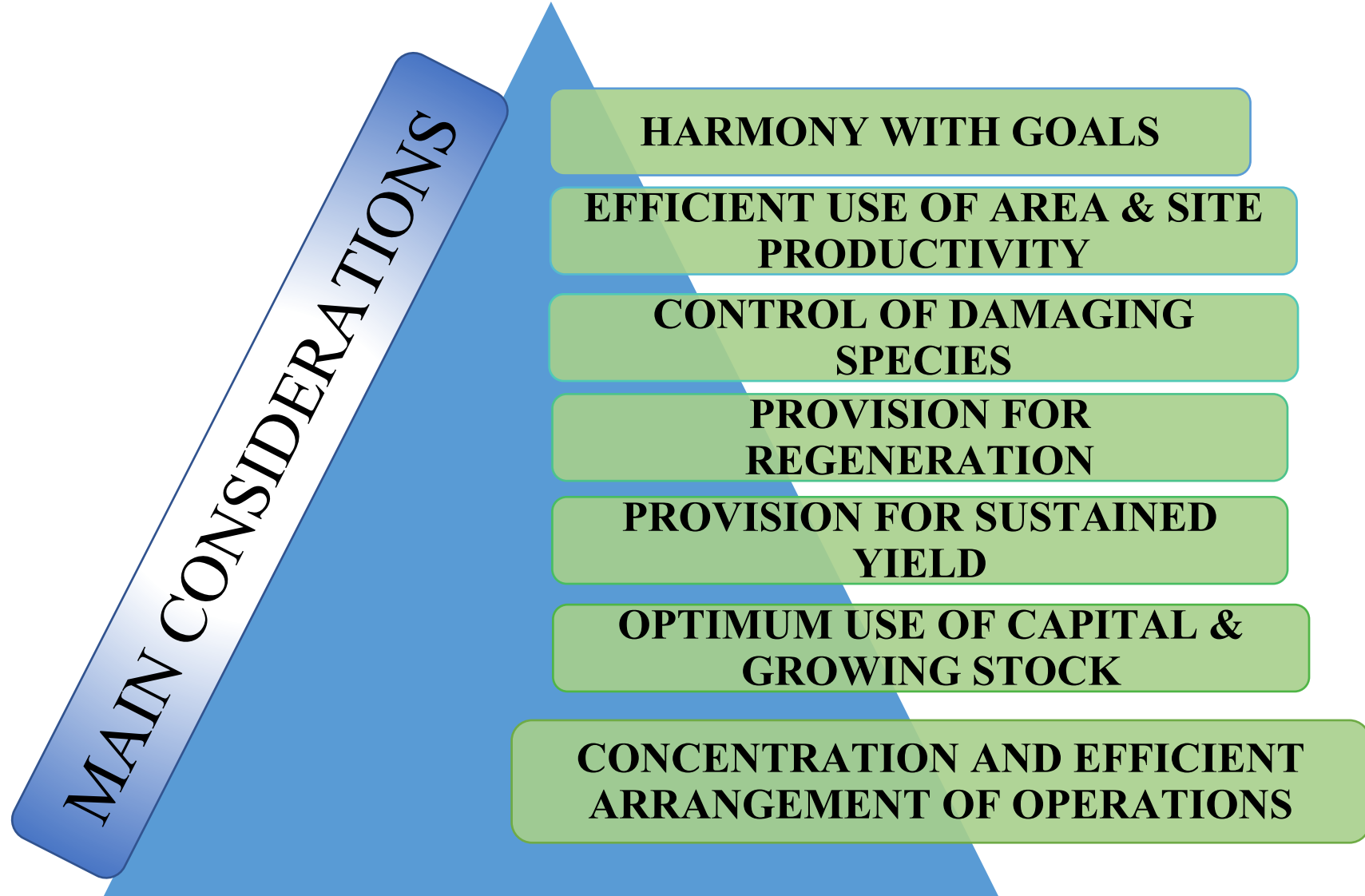
## What does it mean

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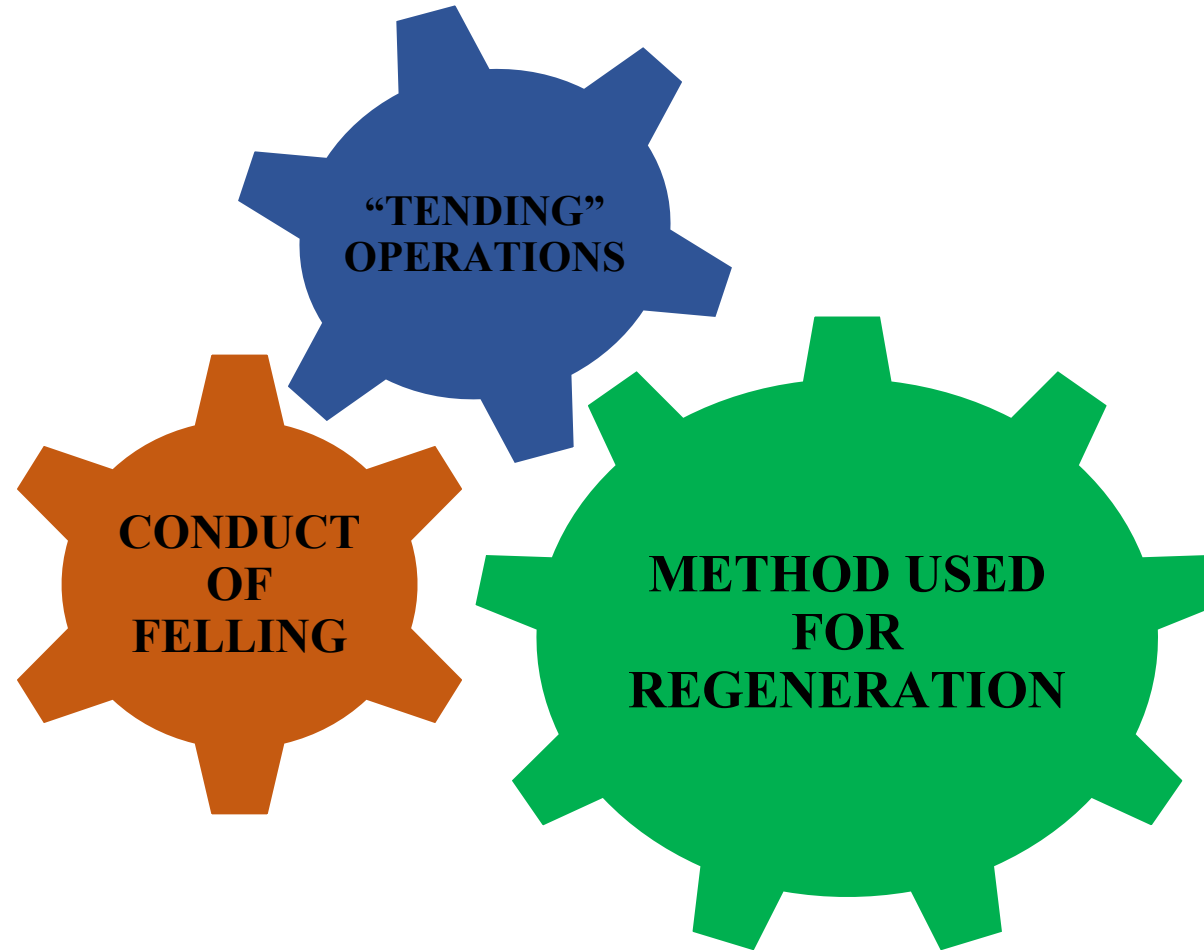
A set of silvicultural operations by which forest crops are tended, harvested and replaced by new crops which produces distinctive form of forest.



# APPLICATION OF SILVICULTURAL SYSTEMS



# APPLICATION OF SILVICULTURAL PRACTICES







# Forest Working in ANI Islands

FOREST TYPE : EVERGREEN AND SEMI-EVERGREEN TROPICAL RAIN FORESTS



WHY KNOWING FOREST TYPE IS IMP. IN AFFORESTATION?

# Forest Working in ANI Islands

*SYSTEM WHERE NATURAL FORESTS ARE WORKED, COMMERCIAL SPECIES EXTRACTED OUT, THE WORKED FORESTS REGENERATED AND MANAGED IN A MANNER SUCH THAT THERE IS A RESULTANT PREPONDERANCE OF COMMERCIAL SPECIES FOR FUTURE HARVESTING.*



WHY TEAK FOR  
FURNITURE AND NOT  
PADAUK?



# ANDAMAN & NICOBAR ISLANDS

2001 ONWARDS FELLING COMPLETELY STOPPED  
DUE TO BAN IMPOSED BY HON'BLE SUPREME  
COURT



CEC APPROVED WP (2004-2014) ON DEC 2005. FORESTS  
CONVERTED INTO ALMOST UNIFORM CROP DURING  
PREVIOUS WORKING PLANS UNDER CONVERSION  
WORKING CIRCLE ARE TO BE BROUGHT BACK TO THEIR  
NATURAL PROFILE.



# ANDAMAN & NICOBAR ISLANDS



**FOREST UNDER UNIFORM SYSTEM TO  
NATURAL PROFILE - ECO RESTORATION**

**WORKING CIRCLE**

**How to achieve this?**

**NATURAL**

**PROFILE - PLANTATION RECLAMATION  
WORKING CIRCLE**

# ANDAMAN & NICOBAR ISLANDS

- **Selective felling** in accordance with IVI of the species (nearby unworked forest and present area) and thereafter regenerating the area.



# ANDAMAN & NICOBAR ISLANDS

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What essentially  
has been done  
here ?

Conversion of  
Silvicultural System

# Concepts

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<https://www.youtube.com/watch?v=3DjfMLiuq0w>

# Concepts (1)

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What is  
Silviculture?

Art and science  
of managing the  
establishment,  
growth,  
composition  
and health of  
forests



## Concepts (2)

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Stands?

Portions of forest  
with similar  
characteristics  
designated by  
easily identifiable  
boundaries and  
managed as units

## Concepts (3)

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Forest  
(Mgt.  
point of  
view)?

Collection  
of Stands

# Concepts (4)

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Forest  
Management  
involves?

Management  
of different  
stands that  
make up the  
forests

# Concepts (5)

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Tolerance  
?

Tree's capacity  
to develop and  
grow when in  
competition  
with other  
trees

# Concepts (6)

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What do tree  
compete for  
with  
neighbouring  
trees?

1. Nutrients
2. Light
3. Water

# Concepts (7)

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Site  
quality?

Productive  
capacity of  
site

# Concepts (8)

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Site  
quality  
influenced  
by?

1. Soil nutrients
2. Moisture
3. Climate
4. Topography

# Concepts (9)

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Site  
Index?

Measure of  
Site quality



# Concepts (10)

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Importance  
of site  
quality?

Higher the  
site quality,  
higher the  
production

# Concepts (11)

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When does natural regeneration occur?

When seeds germinate, stumps or roots sprout or coppice following removal of hardwood tree

# Concepts (12)

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When do  
even aged  
stand  
occur?

After disturbance  
in stand that  
removes most or  
all of the over  
storey

# Concepts (13)

---

Well defined  
age classes  
does an  
uneven aged  
stand have ?

Three

# Concepts (14)

---

Parameters in which the uneven aged stand differ?

1. Age
2. Height
3. Diameter

# Concepts (15)

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When do  
uneven  
aged  
stand  
develop?

Favourable  
conditions for  
seeds to sprout  
but do not affect  
entire stand

# Concepts (16)

---

What is  
clear  
cutting?

Over storey  
is removed in  
one harvest

# Concepts (17)

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Why is  
clear  
cutting  
practiced?

To replace  
old stands  
with new  
vigorous  
stands



# Concepts (18)

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Seed  
tree  
method?

Same as clear cutting but  
for a designated time  
period small no. of  
mature trees per acre are  
left as seed trees for next  
generation of trees

# Concepts (18)

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Three  
harvesting  
steps  
involved in  
shelterwood  
method?

1. Preparatory  
cut – improves  
seed trees to  
produce healthy  
crown

# Concepts (18) (contd)

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Three  
harvesting  
steps  
involved in  
shelterwood  
method?

2. Establishment cut  
– growing space for  
regeneration and  
shelter for young  
growing seedlings

# Concepts (18) (contd)

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Three  
harvesting  
steps  
involved in  
shelterwood  
method?

3. Removal cut  
– Final  
harvest of  
seed trees

# Concepts (19)

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When do  
un even  
aged  
silvicultural  
methods  
occur?

When individual or  
small groups of  
trees is harvested  
over relatively  
short intervals

# Concepts (20)

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Time interval  
of harvesting  
in a uneven  
aged  
silvicultural  
method  
depend on?

Establishing  
regeneration  
and providing  
space to grow

# Concepts (21)

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Rotation?

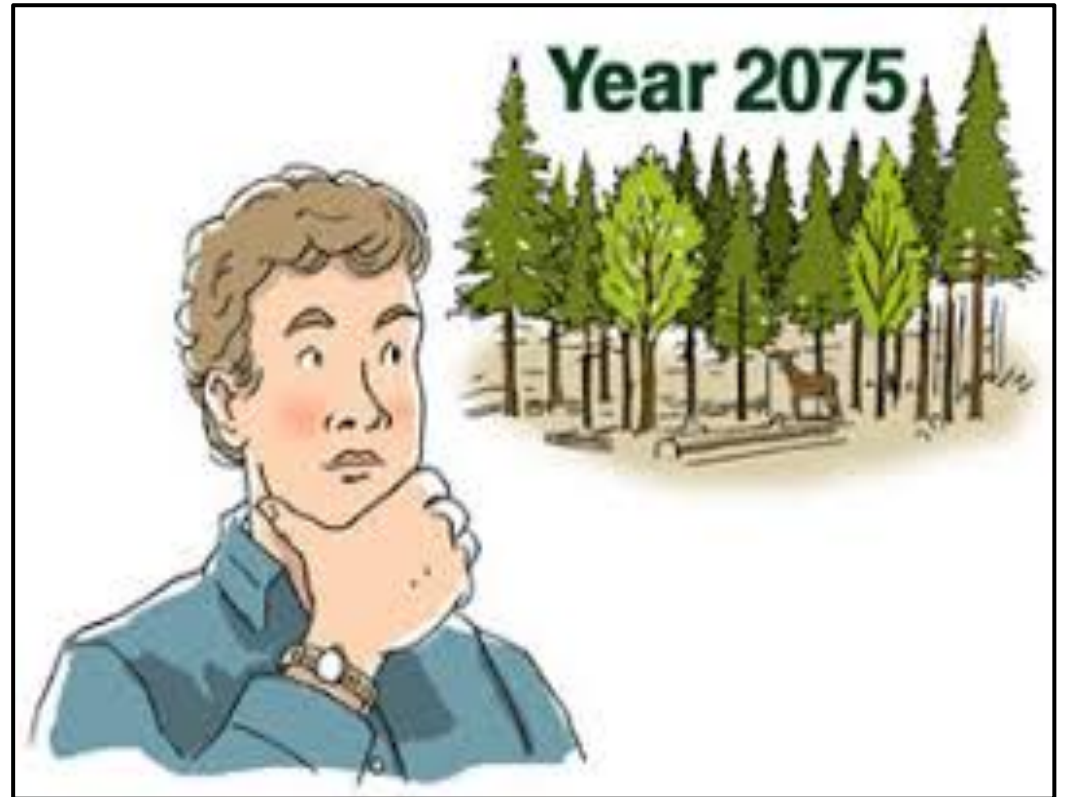
The period which a **forest** crop takes between its formation and final felling is known as **rotation** or production period.

# Silvicultural Systems

## What does it mean

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A set of silvicultural operations by which forest crops are tended, harvested and replaced by new crops which produces distinctive form of forest.



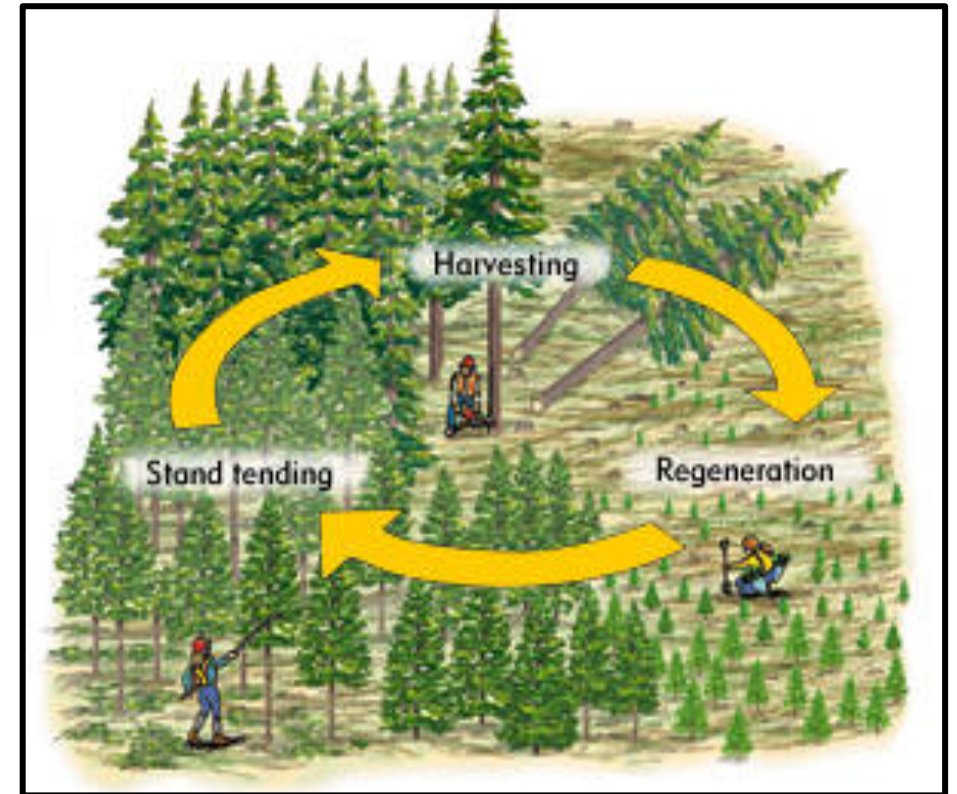


# Silvicultural Systems

## Components

### Four components of a silvicultural system

- Regeneration
- Tending
- Harvesting
- [Stands of distinctive form]



# Silvicultural Systems

## Components

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- **Regeneration** – seeds, coppice, other vegetative method
- **Harvesting** – clear felling, single trees here and there, even or uneven aged
- **Form** – single or two storeys, even and uneven aged,

# Silvicultural Systems

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## High Forest

from seed – tall and large trees



## Low Forest

from coppice- not so tall and large trees



# Silvicultural Systems

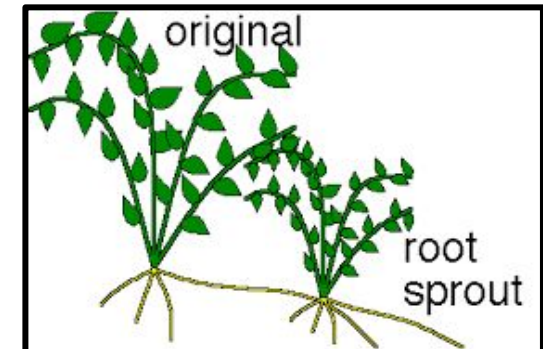
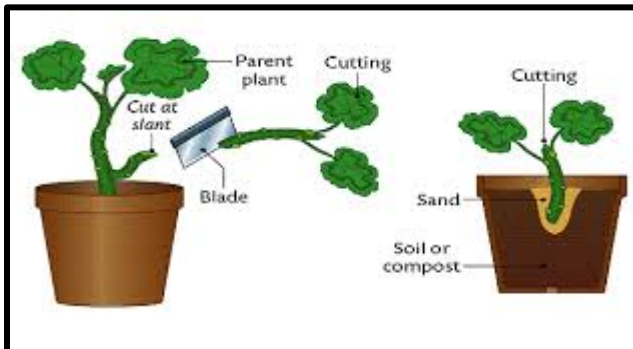
High Forest Systems – Crops of Seedling origin

I



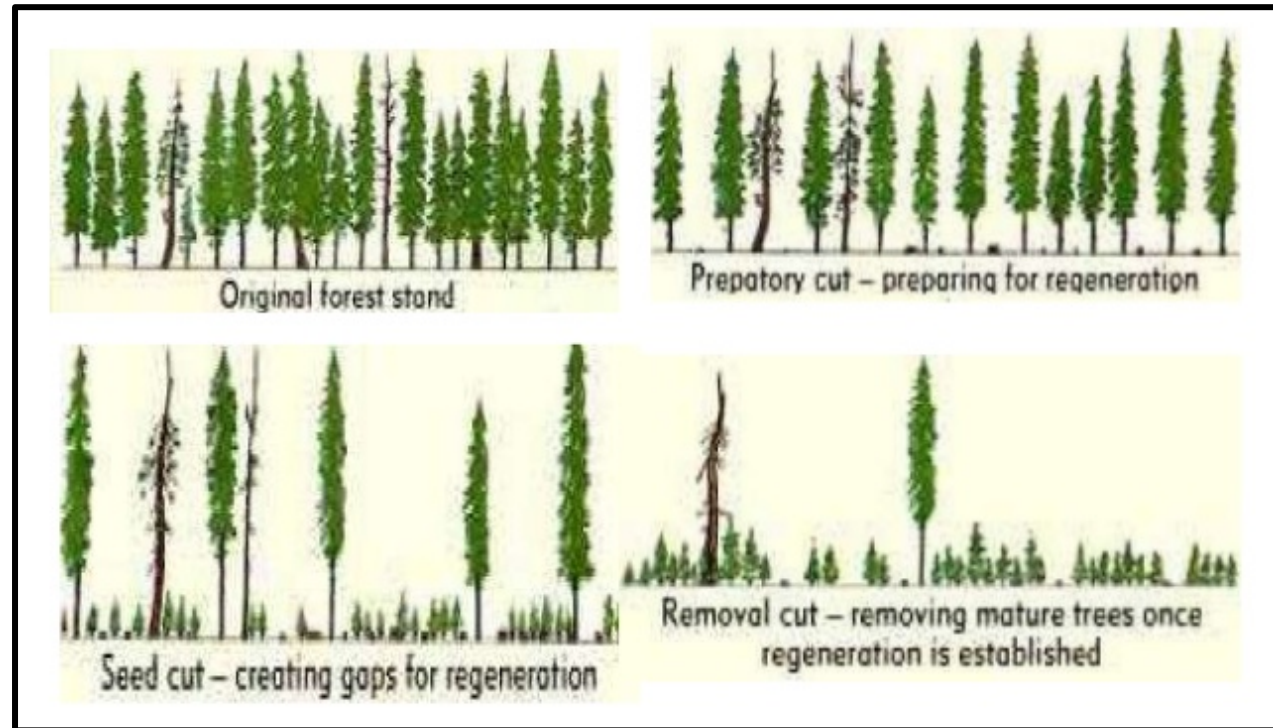
Coppice Systems – Crops, in part, of vegetative origin

II



# Shelterwood System

Harvest in two or more cuts to obtain regeneration under shelter of the residual trees - System of successive regeneration felling



# Silvicultural Systems ?

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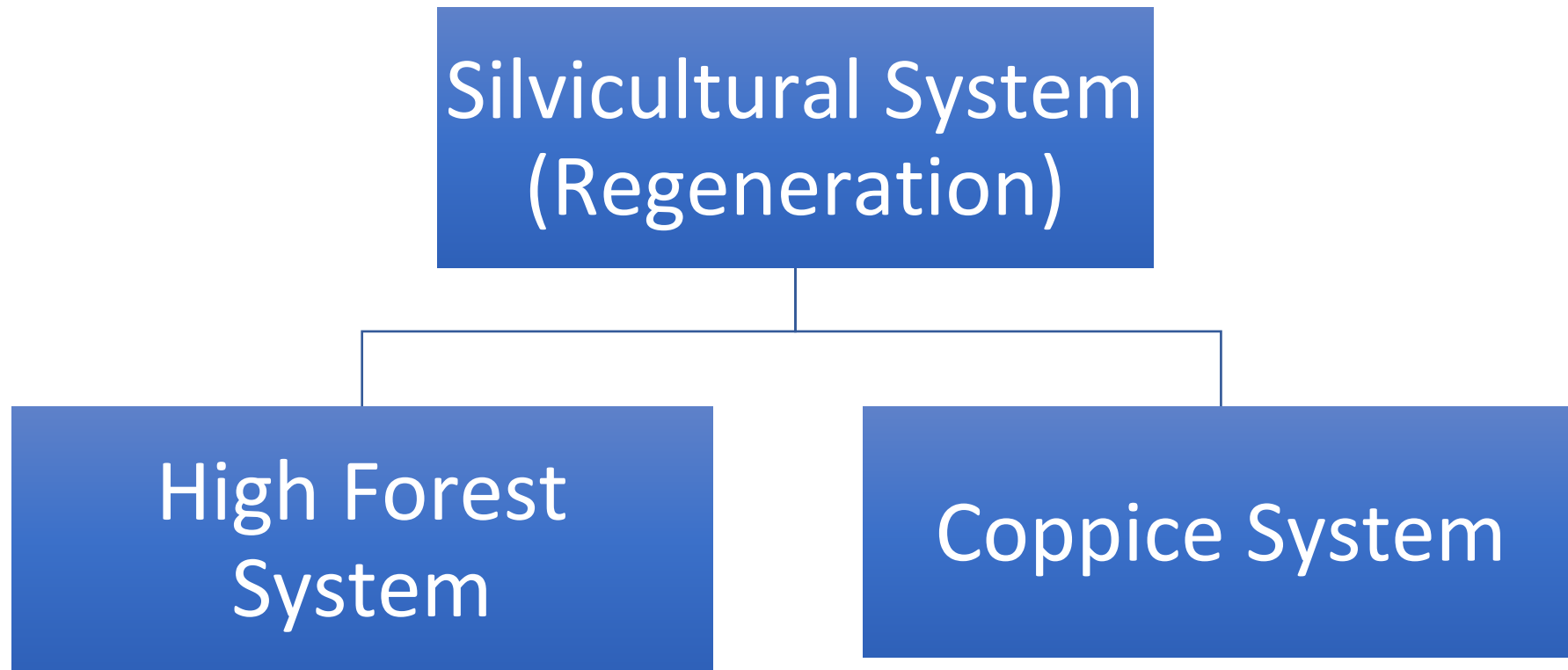
**Silvicultural  
system  
(Regeneration  
System???)**

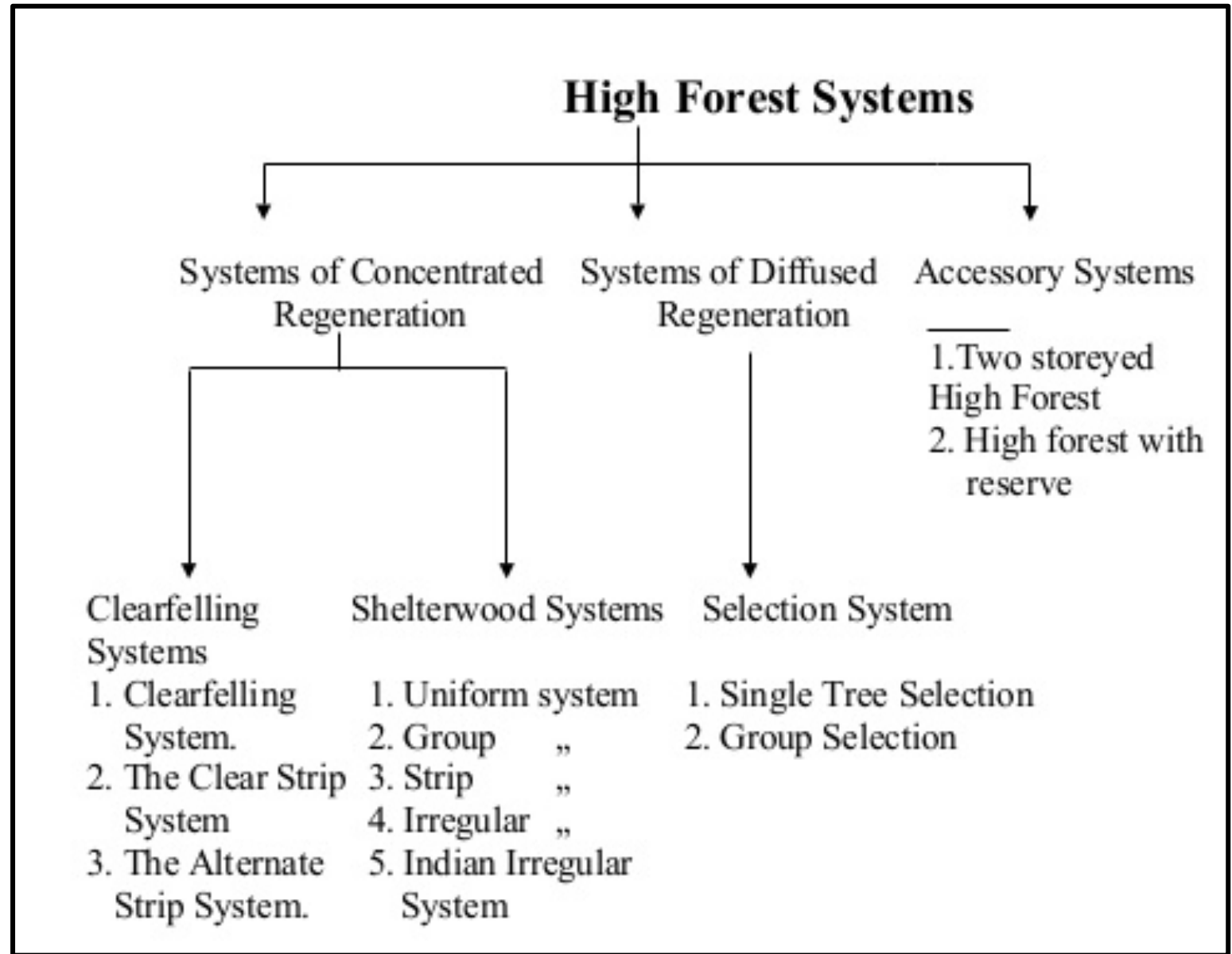
**Silvicultural  
system  
(Harvesting  
System???)**

# Silvicultural Systems

## Classification

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### **Coppice System (Low Forest System)**

- a. Simple Coppice System.
- b. The Coppice of Two Rotation System.
- c. The Shelterwood Coppice System.
- d. The Coppice with Standards System.
- e. The Coppice with Reserves System.
- f. The Coppice Selection System.



**Thank You**