Hornbill Classes

FORESTRY

TOOL KIT SERIES

APSC

Assam PSC

STATE FOREST SERVICE

2026

Detailed Syllabus Based study material + **Linkage of Concepts with PYQs** + **Infused with Infographics & Maps**

Module - 1

- General Forestry
- Assam State Special
- Silviculture
- Locality factors
- Tree crop morphology
- Forest Succession
- Forest types in India
- Forest Regeneration
- Forest Nursery
- Vegetative propagation
- Plantation & Maintenance works
- Tending operations
- Commercial Forestry
- Mangroves & Cold desert
- Important Indian tree species

MPPSC STATE FOREST SERVICE 2023


Rank – 1

Shashank Jain

Comprehensive Forestry Course + CIGP


Rank – 3

Jyoti Thakur

Comprehensive Forestry Course + CIGP


Rank – 4

Shivam Gautam

Comprehensive Interview Guidance Programme


Rank – 5

Nitin Patel

Comprehensive Forestry Course + CIGP


Rank – 6

Ravi Kumar

Comprehensive Interview Guidance Programme + Test Series


Rank – 7

Ankur Gupta

Comprehensive Forestry Course


Rank – 8

Deependra Lodhi

Comprehensive Interview Guidance Programme


Rank – 9

Kapil Chauhan

Comprehensive Forestry Course


Rank – 10

Alok Kumar Jhariya

Comprehensive Forestry Course + CIGP


Rank – 11

Tarun Chouhan

Comprehensive Interview Guidance Programme + Test Series


Rank - 12

Raghvendra Thakur

Comprehensive Forestry Course + Test S. + CIGP

11 Out of 12 Total Selections in

Assistant Conservator of Forest (ACF) 2023

108 Out of 126 Total Selections in

Range Forest Officer (RFO) 2023


Rank – 1

Arvind Ahirwar

Comprehensive Interview Guidance Programme + Test Series


Rank – 2

Pushpendra Singh Ahirwar

Comprehensive Forestry Course + CIGP


Rank – 3

Narendra Gunare

Comprehensive Interview Guidance Programme + Test Series


Rank – 4

Jitendra Kumar Verma

Comprehensive Forestry Course + CIGP


Rank – 5

Jaishrish Barethiya

Comprehensive Forestry Course + CIGP


Rank – 6

Bhavna Sehariya

Comprehensive Forestry Course + CIGP


Rank – 7

Pradeep Ahirwar

Comprehensive Forestry Course + CIGP


Rank – 8

Anil Kumar Gour

Comprehensive Forestry Course + CIGP


Rank – 9

Aakash Kumar Malviya

Comprehensive Forestry Course + CIGP


Rank - 11

Rajesh Kumar Jatav

Comprehensive Forestry Course + CIGP


Rank - 12

Veerendra Prajapati

Comprehensive Interview Guidance Programme + Test Series


Rank - 13

Dinesh Kumar

Test Series


Rank - 14

Niranjan Dehariya

Comprehensive Forestry Course + CIGP


Rank - 15

Abhinay Chouhan

Test Series


Rank - 18

Sher Singh Ahirwar

Comprehensive Forestry Course + CIGP


Rank - 19

Pradeep Jatav

Comprehensive Forestry Course + CIGP


Rank - 21

Amit Sisodiya

Comprehensive Interview Guidance Programme


Rank - 22

Abhishek Barodiya

Comprehensive Interview Guidance Programme


Rank - 24

Golu Goyal

Comprehensive Interview Guidance Programme + Test Series


Rank - 25

Pawan Raje

Comprehensive Interview Guidance Programme + Test Series

Assam PSC

Forest Ranger (FRO) / Soil Conservation Ranger (SCR)
Examination 2025-26

FORESTRY

MODULE – 1

EDITION : 2026

+91-72239 70423 **Hornbillclasses.com**

Gole ka mandir, Morar, Gwalior (MP) 474005

Module - 1

CONTENTS

Module 1

Previous Year Questions

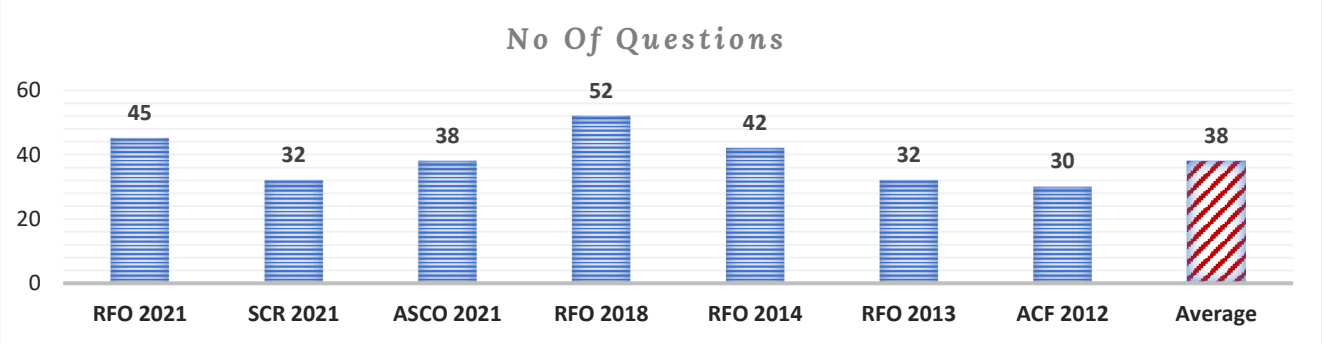
SYLLABUS

- ***General Forestry*** – History and background of forest and Forestry in India and Assam; Classification of forest, Trees Outside Forest (TOF), state wise forest distribution and growing stock. Various National & State level bodies/Institutions.
- ***Silviculture*** – Definitions, terminology, objective of forestry, role of forest (productive, protective and ameliorative), Locality factors, influence of forest on environment, Forest Succession, forest types of India and Assam, Regeneration, Choice of species, Seed Supply, Nursery operations, Tending operations.
- ***Mangroves*** – Introduction
- ***Important Indian tree Species*** – Important commercial tree species of India and Assam.

Degree level + PYQ Based

(In short)

PYQs Analysis



ASSAM PSC RANGE FOREST OFFICER (RFO) 2021 (DoE 10/01/2023)

General Forestry

1. The study of tree rings regarding the information about the growth and environment in the past is known as
(a) Dendrology
(b) Ecology
(c) Dendrochronology
(d) Archaeology

2. "***Van Mahotsav***" celebration in India was started in the year
(a) 1950
(b) 1953
(c) 1960
(d) 1968

3. The ***National Tiger Conservation Authority*** has been made a statutory authority by amending the Wildlife (Protection) Act, 1972 during the year
(a) 2004
(b) 2005
(c) 2006
(d) 2007

4. The branch of Zoology, concerned with the study of amphibians and reptiles, is known as
(a) Herpetology
(b) Anthrozoology
(c) Catology
(d) Entomology

5. ***World Wetland Day*** is celebrated on
(a) 2nd February
(b) 2nd April
(c) 2nd July

(d) 2nd October

6. CITES stands for
(a) Conservation of Internationally Threatened Endemic Species
(b) Convention on International Trade in Endangered Species
(c) Convention of Internationally Threatened Economic Species
(d) Conservation, Interpretation, Trade of Economically Sustainable Species

7. What is CITES?
(a) A treaty banning barrier in island development
(b) A treaty banning trade in endangered species
(c) A treaty banning dumping plastic in the ocean
(d) A treaty banning overfishing

8. Who is known as the father of Indian Forestry?
(a) O' Connolly
(b) Dietrich Brandis
(c) Voelcker
(d) Gadgil

9. The Centre for International Forestry Research (CIFOR) is in
(a) Nairobi, Kenya
(b) Vienna, Austria
(c) Bogor, Indonesia
(d) Ibadan, Nigeria

10. When is the ***Wildlife Week*** celebrated in India?
(a) First week of June
(b) First week of October
(c) First week of March
(d) First week of August

11. The Project Tiger scheme was launched in the year
(a) 1973
(b) 1974
(c) 1976
(d) 1972

12. The ***Forest Survey of India*** (FSI) conducts forest survey once in every
(a) Five years
(b) Two years
(c) Ten years
(d) None of the above

13. Forest and wildlife were brought under the concurrent list as per the
(a) 40th Amendment
(b) 42nd Amendment
(c) 44th Amendment
(d) 48th Amendment

14. The ***National Green Tribunal*** Act was enacted in the year
(a) 2004
(b) 2006
(c) 2008
(d) 2010

15. Among the following, which is known as a living fossil tree?
(a) *Ginkgo biloba*
(b) *Sequoia sempervirens*
(c) *Ficus spp.*
(d) *Pterocarpus santalinus*

16. The ***National Board for Wildlife*** (NBWL) has
(a) The Prime Minister as Chair person
(b) the Minister in-charge of Forest and Wildlife as Chairman
(c) the Director of Wildlife Institute of India as Chairman
(d) None of the above

State Based Questions

17. Which of the following are the two ***Biosphere Reserves*** in Assam?
(a) Kaziranga and Dibru-Saikhowa
(b) Manas and Dibru-Saikhowa
(c) Kaziranga and Manas
(d) Manas and Orang

18. Which one is the ***State animal of Meghalaya***?
(a) Tiger
(b) Serow
(c) Hoolock gibbon
(d) Clouded leopard

19. Which one of the following areas is a ***Ramsar Site***?
(a) Deepor Beel
(b) Joysagar Tank
(c) Maguri Beel
(d) Chandubi Lake

20. Which one of the following institutes is situated in Assam?
(a) Tropical Forest Research Institute
(b) Institute of Forest Productivity
(c) Rain Forest Research Institute
(d) Institute of Forest Biodiversity

21. Which of the following is the ***state tree of Assam***?
(a) Dipterocarpus retusus
(b) Gmelina arborea
(c) Alnus nepalensis
(d) Shorea robusts

22. Which one of the following is the ***State flower of Assam***?
(a) *Rhynchostylis retusa*
(b) *Dendrobium primulinum*
(c) *Lilium mackliniae*
(d) *Rhododendron arboreum*

SILVICULTURE

23. Which among the following is a strong coppicers?
(a) Casuarina equisetifolia
(b) Cedrus deodara
(c) Madhuca latifolia
(d) Tectona grandis

24. A group or cluster of flowers arranged on a stem that is composed of a main branch or a complicated arrangement of branches is known as
(a) Inflorescence
(b) Phyllotaxy
(c) Corolla
(d) Placentation

25. ***Chlorosis*** in plants occurs due too
(a) High sunlight intensity
(b) Low sunlight intensity
(c) Absorption of yellow pigment from soil
(d) Deficiency of mg and fe in the soil

26. The arrangement of leaves on the branches of plants is known as
(a) Phyllotaxy
(b) Vernation
(c) Venation
(d) Phytotaxy

+91 78802-71423
Hornbillclasses@gmail.com

27. Plants that grow in or on the rock are known as
(a) Hydrophytes
(b) Mesophytes
(c) Lithophytes
(d) parasites

28. Calculate the number of plants/ha when teak is planted at 2 m x 3 m spacing.
(a) 666
(b) 1666
(c) 2000
(d) 2666

29. A tree sprout arising from the root is called
(a) Slash
(b) Bole
(c) Sucker
(d) sapling

30. The gradual replacement of one plant community by another in the development of vegetation towards climax is referred to as
(a) Vegetation
(b) Succession
(c) Aggregation
(d) Regression

31. Which testing method is used as the quick method for determination of seed viability
(a) Iodine test
(b) Lactophenol test
(c) Tetrazolium test
(d) Potassium iodide test

32. The process of ***Cycling of Nutrients*** from soil to the plant and back to the soil is called as
(a) Nutrient cycle
(b) Nutrient enrichment
(c) Nitrogen pumping
(d) Biogas chemical cycling

33. The ***Succession*** beginning in water is called
(a) Xerarch
(b) Hydrarch
(c) Aggregation
(d) Regression

34. Who developed the idea and theory of plant succession?
(a) Thoreau
(b) Clements
(c) Cowles
(d) Dawson

35. Trees which are characterized by having flowers of both sexes on the same tree are called
(a) Coniferous
(b) Deciduous
(c) Dioecious
(d) Monoecious

36. ***Edaphic Factor*** is related to
(a) Temperature
(b) Wind
(c) Soil
(d) Rainfall

37. The **CVP** (Climate, Vegetation and Productivity) index was developed by
(a) Egler
(b) Shelford
(c) Clements
(d) Paterson

38. ***Miyawaki*** method of raising tree involves
(a) Planting superior exotic trees of different values
(b) Planting fast-growing trees
(c) Planting multipurpose tree species
(d) Close planting of native trees

39. Soil organic matter
(a) Increases water holding capacity
(b) Maintains soil temperature
(c) Increases nutrients in soil
(d) All of the above

40. In India, social forestry was first adopted successfully in
(a) Gujarat
(b) Tamil Nadu
(c) Kerala
(d) Rajasthan

41. The direction towards which the slope faces is known as
(a) Aspect
(b) Slope
(c) Exposure
(d) Albedo

Mangroves & Cold deserts

42. ***Vivipary germination*** is found in which kind of trees?
(a) Evergreen trees
(b) Mangroves
(c) Palms
(d) Gymnosperms

43. ***Pneumatophores***', specialized root structure, are commonly found in
(a) Dry deciduous forests
(b) Mangrove forests
(c) Open forests
(d) Shola forests

Important Tree Species

44. Sal (*Shorea robusta*) belongs to the family
(a) Verbenaceae
(b) Simaroubaceae
(c) Dipterocarpaceae
(d) Ebenaceae

45. Which one of the following is an ***Exotic Tree Species*** in India?
(a) Eucalyptus
(b) Sal
(c) Teak
(d) Deodar

ASSAM PSC Soil Conservation Ranger (SCR) 2021 (DoE 15/10/2022)

General Forestry

46. The ***Indian Board of Wildlife*** is headed by
(a) The President of India
(b) The Prime Minister of India

(c) The Minister of Environment, Forest and Climate Change
(d) PCCF

47. Who is known as the ***father*** of Indian Forestry?
(a) O'Conolly
(b) Dietrich Brandis
(c) Voelckar
(d) Gadgil

48. Who established the Botanical Survey of India in 1890?
(a) J. D. Hooker
(b) J. Long
(c) George King
(d) J. S. Gamble

49. According to the ISFR, 2015, the total forest cover of India is
(a) 21.30%
(b) 21.67%
(c) 22.50%
(d) 23.40%

50. The ***World Forestry Day*** is celebrated on
(a) 22nd April
(b) 22nd May
(c) 21st March
(d) 5th June

51. Who started '***Van Mahotsav***'?
(a) K. M. Dasmunshi
(b) K. M. Munshi
(c) G. D. King
(d) FAO

52. Who is the ***father*** of Soil Science?
(a) Dokuchaev
(b) Justus von Liebig
(c) J. W. Leather
(d) Marbut

53. The Convention on Biological Diversity was held in the year
(a) 1992
(b) 1993
(c) 1994
(d) 1998

54. MAB stands for
(a) Man and Biosphere
(b) Man, Antibiotics and Bacteria
(c) Man and Biotic Community
(d) Mayer, Anderson and Bisby

State Based Questions

55. RFRI is located in
(a) Rajasthan
(b) Assam
(c) Andhra Pradesh
(d) Himachal Pradesh

SILVICULTURE

56. A tree which has a superior phenotype for growth, form, wood quality or other desirable character is called
(a) Plus Tree
(b) Elite Tree
(c) Candidate Tree
(d) Check Tree

57. ***Pollarding*** is a silvicultural activity to induce large number of
(a) Seedlings
(b) Roots
(c) Coppices
(d) Flowers

58. Association between two species in which they derive benefits from each other is
(a) Parasitism
(b) Mutualism
(c) Commensalism
(d) Predation

59. The word 'forest' is derived from
(a) Forays
(b) Fore's
(c) Foris
(d) Froste

60. Forests that are generated from seed are called
(a) Coppice forests
(b) Even-aged forests
(c) Pure forests
(d) High forests

61. The method of vegetative reproduction '***root sucker***' is extensively used for the regeneration of
(a) Diospyros melanoxylon
(b) Dalbergia sissoo
(c) Abies pindrow
(d) Cedrus deodara

62. The major ***forest types*** available in India are
(a) 14
(b) 16
(c) 19
(d) 18

63. The technique of obtaining a large number of plantlets by tissue culture method is called
(a) Plantlet culture
(b) Micropropagation
(c) Organ culture
(d) Micropropagation

64. Who coined the term '***social forestry***'?
(a) NCA
(b) P. K. R. Nair
(c) Jack Westoby
(d) John Bene

65. The standard width of a nursery bed is
(a) 1.2 m to 1.5 m
(b) 1.7 m to 2.8 m
(c) 10 m to 12 m
(d) 2.1 m to 2.2 m

66. Which type of soil is most suitable for nursery?
(a) Clay
(b) Sandy
(c) Sandy loam or loamy sand
(d) Red soil

67. The main purpose of hormonal treatment of seed is to
(a) Improve seed quality
(b) Break the dormancy
(c) Increase longevity
(d) Increase seed maturity

68. The final stable community in an ecological ***succession*** is called
(a) Climax community
(b) Seral community
(c) Final community
(d) Primary succession

69. ***Ordinary thinning*** is also called
(a) Free thinning
(b) German thinning

+91 78802-71423
Hornbillclasses@gmail.com

(c) Advance thinning
(d) Elite thinning

70. Which one of the following processes is involved in natural pruning?
(a) Removal of branches
(b) Manipulation of branches
(c) Killing of branches
(d) Knot-free timber

71. Which of the following is a light demander species?
(a) Syzygium cumini
(b) Dipterocarpus macrocarpus
(c) Quercus glauca
(d) Mallotus philippinensis

72. ***Seedless fruits*** are the result of
(a) Parthenogenesis
(b) Cross-pollination
(c) Self-pollination
(d) Parthenocarpy

73. The bacteria living in the module help in fixation of free nitrogen from the air in the form of
(a) Nitrite
(b) Nitrates
(c) Nitric
(d) Nitrogen

74. Which of the following tree species helps to increase soil fertility through N2-fixation?
(a) Dalbergia grandiflora
(b) Dipterocarpus macrocarpus
(c) Hevea brasiliensis
(d) Alnus nepalensis

Important Tree Species

75. Which of the following is an evergreen tree species?
(a) Abies pindrow
(b) Michelia champaca
(c) Mangifera indica
(d) All of the above

76. Which of the following species is called as ***flame of forest***?
(a) Butea monosperma
(b) Prosopis juliflora (
(c) Terminalia tomentosa
(d) Salmalia malabarica

77. ***Shorea robusta*** belongs to the family
(a) Lauraceae
(b) Dipterocarpaceae
(c) Verbanaceae
(d) Phyllanthaceae

ASSAM PSC Assi. Soil Conservation Officer (ASCO) 2021 (DoE 6/08/2022)

General Forestry

78. Institute of wood Science and Technology is located at
(a) Dehradun
(b) Jhansi
(c) Bhopal
(d) Bangalore

79. Man and Biosphere Programme was started in the year
(a) 1986
(b) 1990
(c) 1975
(d) 1971

80. The ***Project Tiger*** was launched in the year
(a) 1972
(b) 1995
(c) 1973
(d) 1980

81. India's first forest policy was enunciated during
(a) 1894
(b) 1927
(c) 1952
(d) 1988

82. Joint forest management was first implemented at
(a) Jabalpur
(b) Ayyalur
(c) Arabari
(d) Jhansi

83. In which of the following days '***World Forestry Day***' is celebrated?
(a) 21st March
(b) 22nd March
(c) 16th September
(d) 5th June

84. IIFM, Bhopal was established in
(a) 1972
(b) 1992
(c) 1982
(d) 2002

85. ***Project Elephant*** was launched in the year
(a) 1972
(b) 1982
(c) 1992
(d) 2002

86. Biosphere reserve programme was launched in 1971 by
(a) FAO
(b) UNESCO
(c) WWF
(d) UNDP

87. The largest and oldest botanical garden of India is in
(a) Kolkata
(b) Bangalore
(c) Chennai
(d) Dehradun

88. Who started the ***Van Mahotsav***, a festival of tree planting in 1950 /
(a) K. M. Munshi
(b) Jack Westoby
(c) Sunderlal Bahuguna
(d) D. N. Tiwari

89. ***Social Forestry*** Programme was launched in
(a) Fifth five-year plan
(b) Sixth five- year plan
(c) Seventh five-year plan
(d) Eight five-year plans

90. Who among the following was the first Inspector General of Forests in India?
(a) John Dawson
(b) Nagurunderi
(c) Dietrich Brandis
(d) None of them

SILVICULTURE

91. In forest, the standard color given for the regeneration status excellent (80-100%) is
(a) Green
(b) Red
(c) Black
(d) Yellow

92. Growth of the terminal end of the stem is called
(a) Auxiliary growth
(b) Terminal growth
(c) Shoot growth
(d) All of the above

93. ***Plus Trees*** are with superior
(a) Phenotype
(b) Genotype
(c) Phenotype-genotype
(d) All of the above

94. A non-grass like herbaceous plant is called a
(a) Herb
(b) Shrub
(c) Forb
(d) Hedge

95. Bamboo multiplies through
(a) Rhizome
(b) Suckers
(c) Forms
(d) Tubers

96. All range plants can be grouped in three, viz, decreases, increases and _____ as per quantitative climax approach
(a) Invaders
(b) Shrubs
(c) Herbs
(d) Climbers

97. _____ Is defined as a felling made in an immature stand for the purpose of improving the growth and form of the trees that remain, without permanently breaking the canopy.
(a) Pruning
(b) Thinning
(c) Climber cutting
(d) Cleaning

98. ***Anabaena*** is a
(a) Free living bacteria
(b) Blue green alga
(c) Symbiotic nodule bacteria
(d) Fungus

99. If a forest is composed of almost entirely of one species, usually to the extent of not less than 80% is called as
(a) Pure forest
(b) High forest
(c) Mixed forest
(d) Reserve forest

100. Vascular bundles in monocot stem are
(a) Open
(b) Closed
(c) Radial
(d) Concentric

101. ***Pollarding*** is a silvicultural activity to induce a large number of
(a) Seedlings
(b) Flowers
(c) Coppices
(d) Roots

102. The purpose of hormonal treatment of seeds is to
(a) Break the dormancy
(b) Improve seed quality
(c) Increase longevity
(d) Preserve seeds

103. Which of the following is an ***Obnoxious Weed***?
(a) Lantana
(b) Amaranthus
(c) Wisteria
(d) Sonchus

104. A plant grows from seed till it attains a height of about one meter is called as
(a) Tree
(b) Sapling
(c) Pole
(d) Seedling

105. ***High Forest*** refers to
(a) Forest regenerated through cutting
(b) Forest regenerated through seeds
(c) Forest regenerated through coppice
(d) Forest regenerated through tissue culture plant

106. Champion and Seth classified the Indian forest in major
(a) Six groups
(b) Sixteen groups
(c) Sixty groups
(d) None of the above

107. The process of water exudation through hydathodes is called
(a) Guttation
(b) Excretion
(c) Transpiration
(d) Hydrolysis

108. The method of ***Thinning*** in which inferior individuals of a crop are removed from suppressed class, then taking the dominated class and
(a) Mechanical thinning
(b) Free thinning
(c) Ordinary thinning
(d) Advance thinning

109. _____ is the main source of supply of moisture to forest trees.
(a) Gravitational water
(b) Rainwater
(c) Capillary water
(d) Hygroscopic water

110. Plant ***Succession*** occurring in sand dunes is known as
(a) Halosere
(b) Hydrosere
(c) Psammosere
(d) Xerosere

111. Which of the following is shade demander species in tropical wet evergreen forest?
(a) *Syzygium cumini*

+91 78802-71423
Hornbillclasses@gmail.com

(b) *Mesua ferrea*
(c) *Pinus roxburghii*
(d) *Pinus wallichiana*

112. How many numbers of plants are required for 10 hectares of plantation if the distance of plant in rows is 2 m and the distance between the rows is 4 m?
(a) 10000
(b) 25000
(c) 12500
(d) 2500

Important Tree Species

113. Which of the following tree species is planted in coastal sand dune areas in India for checking soil erosion?
(a) *Casuarina equisetifolia*
(b) *Acacia lebbeck*
(c) *Prosopis juliflora*
(d) *Erythrina indica*

114. Cyathium inflorescence is present in family
(a) Euphorbiaceae
(b) Solanaceae
(c) Malvaceae
(d) Verbenaceae

115. The scientific name of '***Blackboard***' tree is
(a) *Pinus Kesiya*
(b) *Spondias pinnata*
(c) *Alstonia scholaris*
(d) *Litsea cubeba*

ASSAM PSC RANGE FOREST OFFICER (RFO) 2018 (DoE 24/02/2019)

General Forestry

116. The ***National Tiger Conservation Authority*** was made a Statutory Authority during the year
(a) 2004
(b) 2005
(c) 2006
(d) 2007

117. The branch of Zoology concerned with the study of amphibians and reptiles is known as
(a) Herpetology
(b) Anthrozoology
(c) Cetology
(d) Entomology

118. The ***World Wetland Day*** is celebrated on
(a) 2nd February
(b) 2nd April
(c) 2nd July
(d) 2nd October

119. The ***Kyoto Protocol'*** is an international treaty adopted in 1997 to reduce
(a) Deforestation
(b) Desertification
(c) Greenhouse gas emission
(d) Industrialization

120. CITES stands for
(a) Conservation of Internationally Threatened Species
(b) Convention of International Trade in Endangered Species of wild fauna and flora
(c) Convention of Internationally Threatened Economic Species
(d) Conservation, Interpretation, Trade of Economically Sustainable Species

121. Arrangement of leaves on branches of plants is known as
(a) Phyllotaxy
(b) Vernation
(c) Venation
(d) Phytotaxy

122. ***National Board of Wildlife*** is headed by the
(a) Prime Minister of India
(b) Union Minister of EF & CC
(c) Secretary to Government of India, moef&CC
(d) None of the above

123. Which of the following plants is known as ***living fossil***?
(a) Kayea assamica
(b) Ginkgo biloba
(c) Magnolia griffithii
(d) Nepenthes khasiana

124. What is the proportion of recorded forests to geographical area of India?
(a) 33%
(b) 23-57%
(c) 30-33%
(d) None of the above

125. The International Day of Forests is observed every year on
(a) 1st January
(b) 21st March
(c) 5th June
(d) 22nd May

126. The worldwide movement Earth Hour' is organized by
(a) IUCN
(b) WWF
(c) WTI
(d) UNESCO

127. What is the main activity during Earth Hour Celebrations?
(a) Plantation
(b) Cleaning of surrounding areas
(c) Turning off of electrical lights from 8:30 p.m. To 9:30 p.m.
(d) None of the above

128. The Academy for Training of IFS Officers is named after
(a) Jawaharlal Nehru
(b) Indira Gandhi
(c) Rajiv Gandhi
(d) Atal Bihari Vajpayee

129. The Headquarters of Forest Survey of India is in
(a) Delhi
(b) Kolkata
(c) Mumbai
(d) Dehradun

130. The idea of celebrating ***Van Mahotsava*** every year was mooted by
(a) Jawaharlal Nehru
(b) Indira Gandhi
(c) K. M. Munshi
(d) None of them

131. In the Constitution of India, Forest and Forestry appear in
(a) State List
(b) Central List
(c) Concurrent List
(d) None of the above

132. ***Dietrich Brandis*** was
(a) First Governor of Assam
(b) First Inspector General of Forests of Assam
(c) First Inspector General of Forests of India
(d) None of the above

State Based Questions

133. The Rain Forest Research Institute is located at
(a) Shillong
(b) Dehradun
(c) Kolkata
(d) Jorhat

134. Which of the following forests are found in heavy rainfall areas of Upper Assam?
(a) Tropical Evergreen
(b) Tropical Deciduous
(c) Mountain Forests
(d) Tidal Forests

135. Which one of the following is State Animal of Meghalaya?
(a) Tiger
(b) Serow
(c) Hoolock Gibbon
(d) Clouded Leopard

136. The State Tree of Assam is
(a) Dipterocarpus macrocarpus
(b) Mangifera indica
(c) Kayea assamica
(d) Mesua ferrea

137. Which of the following protected areas of Assam has Golden Langur?
(a) Kaziranga National Park
(b) Hoollongapar Gibbon Wildlife Sanctuary
(c) Chakrashila Wildlife Sanctuary
(d) Dibru-Saikhowa National Park

138. The Centre for Wildlife Rehabilitation and Conservation in Assam is located at
(a) Bansbari, near Manas NP
(b) Panbari, near KNP
(c) Dhola, near Dibru-Saikhowa NP
(d) Gamani, near Nameri NP

139. The ***State Bird of Assam*** is
(a) Parrot
(b) White-winged Wood Duck
(c) Bengal Florican
(d) Hornbill

140. The ***State Flower of Assam*** is
(a) Rose
(b) Lotus
(c) Sonaru
(d) Fox-tailed Orchid

141. The number of National Parks in Assam is
(a) 3
(b) 4
(c) 5
(d) 6

142. The number of Tiger Reserves in Assam is
(a) 2
(b) 3
(c) 4
(d) 5

143. The population of elephants, as per the Elephant Census, 2017, in Assam is
(a) 5353
(b) 4927
(c) 5719
(d) 5900

144. Bornadi Wildlife Sanctuary in Assam is located in the district of
(a) Darrang
(b) Baksa
(c) Udalguri
(d) Sonitpur

145. Which one of the following is a Biosphere Reserve?
(a) Kaziranga
(b) Nameri
(c) Dehing Patkai
(d) Dibru-Saikhowa

146. Which one of the following primates is found in Assam?
(a) Nilgiri Langur
(b) Bonnet Macaque
(c) Phayre's Leaf Monkey
(d) Slender Loris

147. Which of the following is a ***Ramsar site***?
(a) Deepor Beel
(b) Joysagar
(c) Maguri Beel
(d) Chand Dubi

148. The only vulture breeding centre in Assam is located at
(a) Amsoi
(b) Rani
(c) Kaziranga
(d) Guwahati

149. The ***Rhino population*** in Assam is estimated by
(a) Sample count method
(b) Total direct count method
(c) Dung count method
(d) Camera trapping method

150. ***Manas*** is
(a) A National Park and Tiger Reserve only
(b) Wildlife Sanctuary and Biosphere Reserve only
(c) World Natural Heritage Site
(d) All of the above

151. Chakrashila Wildlife Sanctuary is located in the district of
(a) Kokrajhar
(b) Bongaigaon
(c) Dhubri
(d) None of the above

152. ***Orang Tiger Reserve*** is spread across
(a) Udalguri
(b) Darrang

(c) Sonitpur
(d) Darrang and Sonitpur

153. The Regional Office of the moef&CC for North-East Region is located at
(a) Guwahati
(b) Shillong
(c) Itanagar
(d) Kohima

154. The only ape found in Assam is
(a) Assamese Macaque
(b) Slow Loris
(c) Malayan Sun Bear
(d) Hoolock Gibbon

SILVICULTURE

155. The bamboos are a member of group of
(a) Trees
(b) Climbers
(c) Grasses
(d) None of the above

156. The type of ***germination of seeds*** that takes place before detachment from the parent plant, is called as
(a) Epigeal germination
(b) Hypogeal germination
(c) Viviparous germination
(d) Pseudogermination

157. The process of change in the structure of various species of an ecological community over a period of time is called as
(a) Evolutionary ecology
(b) Ecological succession
(c) Ecosystem diversity
(d) Ecologically sustainable development

158. As per the Forest Survey of India, an area is classified as 'Moderately Dense Forest', when the canopy density is found to be
(a) 50-70%
(b) 40-60%
(c) 40-50%
(d) 40-70%

159. In Forestry, ***Thinning*** means
(a) Felling of trees
(b) Planting of seedlings
(c) Removal of weeds
(d) Removal of weak poles for giving enough space for remaining poles of better quality

160. What would be the length of boundary fencing for a rectangular plantation plot of 200 meters long and 150 meters wide?
(a) 350 m
(b) 400 m
(c) 600 m
(d) 700 m

161. The area of a plot of rectangular shape, 200 m long and 150 m wide would be
(a) 2 ha
(b) 3 ha
(c) 4 ha
(d) None of the above

Important Tree Species

162. Gmelina arborea belongs to the family
(a) Dipterocarpaceae
(b) Papilionaceae
(c) Lauraceae
(d) Verbenaceae

163. Which one of the following is an exotic species?
(a) Michelia champaca
(b) Dalbergia sisso
(c) Dipterocarpus macrocarpus
(d) Tectona grandis

164. Which one of the following is a winter flowering species?
(a) Shorea robusta
(b) Acacia catechu
(c) Gmelina arborea
(d) Jacaranda mimosifolia

165. The plant which blooms at night is
(a) *Nyctanthes arbor-tristis*
(b) *Butea monosperma*
(c) *Tectona grandis*
(d) *Mangifera indica*

166. Which of the following pairs does not match?
(a) Citrus maxima – Rutaceae
(b) Hibiscus rosa-sinensis – Verbenaceae
(c) Gmelina arborea – Verbenaceae
(d) Tectona grandis – Verbenaceae

167. Which one of the following is evergreen species?
(a) *Bombax ceiba*
(b) *Acacia catechu*
(c) *Michelia champaca*
(d) *Terminalia bellirica*

ASSAM PSC RANGE FOREST OFFICER (RFO) 2014

General Forestry

168. ***Vana Mahotsava*** week is celebrated in the
(a) 1st week of June
(b) 1st week of July
(c) 1st week of October
(d) None of the above

169. Study of freshwater ecosystem is known as
(a) Lithology
(b) Limnology
(c) Hydrology
(d) Littoralogy

170. NBA stands for
(a) National bamboo agency
(b) National biodiversity agency
(c) National biodiversity Authority
(d) None of the above

171. In matters relating to Forest Research institutes and colleges, the powers of the state govt. are exercised by
(a) Ministry of Environment and forest, govt. of India
(b) Secretary of Environment and forest of the state govt.
(c) Inspector General of Forests
(d) Principal chief conservation of forests of the state

172. In 1878, Imperial forest school was established by the British which was later in 1906 renamed as
(a) Indian forest college, Dehradun
(b) Forest Research institute, Dehradun
(c) Central Academy for State forest officers, Dehradun
(d) Indira Gandhi national forest academy, Dehradun

173. ICFRE stands for
(a) Indian council for food research and education
(b) Indian council for forestry research and education
(c) Indian council for forest research and experiments
(d) Indian council for forest restructure and evaluation

174. The Chipko movement in India is related to
(a) Wildlife protection
(b) Management of forests
(c) Management of National parks
(d) Saving of trees from felling

175. Which year was declared as the international year of biodiversity ?
(a) 2002
(b) 2010
(c) 2020
(d) 1972

176. World environment day is observed on
(a) 22nd April
(b) 5th June
(c) 5th may
(d) 22nd June

177. World Earth Day is observed on
(a) 22nd April
(b) 5th April
(c) 24th April
(d) None of the above

178. Vanamahotsava in India was under the initiative of
(a) Dr S N Bahuguna
(b) Dr Swaminathan
(c) Shri K M Dasmunshi
(d) Mrs Maneka Gandhi

179. Forestry in India is a
(a) State and central subject
(b) State object
(c) Central subject
(d) Reginal subject

180. National animal of India is
(a) Rhinoceros unicornis
(b) Panthera pardus
(c) Panthera tigris
(d) Elephus maximus

181. The ***Forest Research Institute*** of India is at
(a) Bhopal
(b) Dehradun
(c) Jorhat
(d) Darjeeling

182. The world Earth Day is celebrated on the 22nd of
(a) April
(b) July
(c) August
(d) October

State Based Questions

183. There are national parks and sanctuaries in Assam. How many bird sanctuaries are in Assam?
(a) 1
(b) 2
(c) 3
(d) None

184. The state animal of Assam is
(a) Elephus maximus
(b) Rhinoceros unicornis
(c) Panthera pardus
(d) Panthera tigris

185. Kaziranga is
(a) Only a national park
(b) Only a sanctuary
(c) A national park and a Tiger reserve
(d) A national park and a Sanctuary

186. The state tree of Assam is
(a) Mesua ferrea
(b) Michelia champaca
(c) Dalbergia sissoo
(d) Dipterocarpus retusus

187. Assam bio-Diversity board was established under section 22 of Bio-Diversity Act 2022. The chairperson of the board shall hold his office for a term of
(a) 1 year
(b) 2 years
(c) 3 years
(d) 4 years

188. Which is not a tiger reserve?
(a) Nameri Tiger Reserve
(b) Manas Tiger Reserve
(c) Kaziranga Tiger Reserve
(d) Pabitora Tiger Reserve

189. Dibru saikhowa national park is in
(a) Tinsukia district of Assam
(b) Jorhat district of Assam
(c) Nagaon district of Assam
(d) Sonitpur district of Assam

190. The state flower of Assam is
(a) Rosa alba
(b) Rosa chinensis
(c) Mesua ferrea
(d) Rhynchostylis retusa

191. The only ape found in the forest of assam is
(a) Assamese macaque
(b) Hoolock gibbon
(c) Malayan sun bear
(d) None of the above

SILVICULTURE

192. A forest can be termed as Rain Forest if
(a) The leaves of trees release water drops throughout the year
(b) Rainfall takes place throughout the year in the area.
(c) Minimum annual rainfall is 1750-2000 mm
(d) Maximum normal annual rainfall is 1750-2000 mm

193. Formation of a forest depends on
(a) Edaphic factors
(b) Biotic factors
(c) Climatic factors
(d) Edaphic, biotic and Climatic factors

194. According to world health organisation about ..... People in the world use herbs for primary health care.
(a) 60%
(b) 70%

+91 78802-71423
Hornbillclasses@gmail.com

(c) 80%
(d) 90%

195. Which of the following trees is not an evergreen species?
(a) Mesua ferrea
(b) Michelia champaca
(c) Embelica officinalis
(d) Garcinia cowa

196. Dendrology is the study of
(a) Woody plants
(b) Medicinal plants
(c) Medicinal and Aromatic plants
(d) Woody medicinal climbers

197. The supreme Court of India in WP(C) NO202/95 (T N Godavarman-vs-Union of India and 0rs) had passed orders in respect of
(a) Ban on felling of trees
(b) De-reservation of forest areas
(c) Transportation of timber logs outside the state
(d) All of the above

198. Primary objective(s) of the social forestry is/are
(a) Supply of fuel and fodder
(b) Supply of timbers to households for day-to-day use
(c) Aesthetic value
(d) All of the above

199. Which of the following falls under the category of tropical forests?
(a) Deciduous forests
(b) Wet evergreen forests
(c) Dry deciduous forests
(d) Semi-evergreen forests

200. The species of plant which establishes in the primary succession of forests is
(a) Shorea robusta
(b) Tectona grandis
(c) Albizzia procera
(d) Saccharum spontanum

201. Biotic factors in forests include
(a) Grazing
(b) Encroachment
(c) Grazing and encroachment
(d) None of the above

202. What would be the surface area of the plantation measuring 75m x 75m ?
(a) 300 sqm
(b) 150 sqm
(c) 5625 sqm
(d) 1750 sqm

203. Pruning is a silvicultured practice. This refers to
(a) Removal of top branches
(b) Removal of lower branches
(c) Removal of big branches
(d) Removal of dead branches

Mangroves & Cold deserts

204. The state/UT having highest coverage of Mangroves is
(a) Assam
(b) Andamans and Nicobar
(c) West Bengal
(d) Odisha

205. Mangroves are found in
(a) Bihar and Uttar Pradesh
(b) Rajasthan and Madhya Pradesh
(c) Delhi and Haryana
(d) Andamans and West Bengal

Important Tree Species

206. Shorea robusta and Tectona grandis are common in
(a) Deciduous forests
(b) Semi-evergreen forests
(c) Tropical rain forests
(d) Moist-deciduous forests

207. The species of tree which is/are found in Assam is
(a) Shorea robusta
(b) Tectona grandis
(c) Both (a) and (b)
(d) Only a

208. Which one of the following is a mis-match?

(a) *Tectona grandis*	Verbenaceae
(b) *Shorea robusta*	Dipterocarpaceae
(c) *Embelica officinales*	Malvaceae
(d) *Azadirachta Indica*	Meliaceae

209. It is believed that when lord shiva was in deep meditation a drop of tear fell from his eye which grew in to a divine fruit known as
(a) Haritaki or hilikha
(b) Mango
(c) Rudrakhya
(d) None of the above

ASSAM PSC RANGE FOREST OFFICER (RFO) 2013

General Forestry

210. Which of the following statements incorrect?
(a) 1990-Launch of Joint Fore Management to involve local communities
(b) 1981-Setting up of Forest Survey of India at Dehra Dun
(c) 1980-Launch of Massive Social Forestry Programme
(d) 1985-Enactment of Environmental (Protection) Act for control of pollution, et

211. The FSI had estimated the area of 16 major type groups of forests as published in the SFR, 1995. The maximum of the forest area has been found under
(a) Tropical moist deciduous forests
(b) Tropical dry deciduous forests
(c) Tropical wet evergreen forests
(d) Tropical thorn forests

212. ICFRE stands for
(a) Indian Council for Food Research and Education
(b) Indian Council for Forestry Research and Education
(c) Indian Council for Forest Research and Experiments

(d) Indian. Council for Forest Restructure and Evaluation

213. In the Constitution of India, forests and protection of wild animals and birds', is the subject matter listed in these
(a) Concurrent List
(b) Union List
(c) State List
(d) All of the above

214. Van-mahotsav is observed in the 1st week of
(a) October
(b) August
(c) July
(d) May

State Based Questions

215. Which of the following statements is incorrect?
(a) Peacock is the national bird of India
(b) Elephant is the national animal of India
(c) Lotus is the national flower of India
(d) Rhinoceros is the State animal of Assam

216. Identify the important event which does not match the date.
(a) World Forestry Day-21st March
(b) Wildlife Week-Ist week of October
(c) World Earth Day-5th June
(d) Vana Mahotsava-1st week of July

217. The only ape found in the forest of Assam is
(a) Assamese macaque
(b) Hoolock gibbon
(c) Malayan sun bear
(d) None of the above

218. Which one of these is not is not a Tiger Reserve?
(a) Manas Tiger Reserve
(b) Kaziranga. Tiger Reserve
(c) Nameri Tiger Reserve
(d) Pobitora Tiger Reserve

219. The State tree and State flower of Assam are respectively...
(a) Shorea robusta and. Nelumbo
(b) Shorea assamica and Hibiscus rosa-sinensis
(c) Dipterocarpus macrocarpus and Rhynchostylis retusa
(d) Tectona grandis and Rósa alba

SILVICULTURE

220. Green paints can use nitrogen in which of the following forms?
(a) Nitrates (NO_2)
(b) Ammonia (NH_3)
(c) Both of the above
(d) None of the above

221. Factors of. Locality are classified into which of the following broad categories?
(a) Climatic factors, edaphic factors topographic factors and biotic factors
(b) Topographic factors, biotic factors and edaphic factors
(c) Climatic factors;edaphic factors and topographic factors
(d) Biotic factors, topographic factors and climatic factors

222. Influence of biotic factors can be described under which of the following headings?
(a) Influence of plants
(b) Influence of insects.
(c) Influence of man and animals
(d) All of the above

223. Which of the following do not fall in the category of tropical forests?
(a) Semievergreen forests
(b) Pine forests
(c) Moist deciduous forests
(d) Dry evergreen forests.

224. The species which cannot be regenerated through coppice is
(a) *Tectona grandis*
(b) *Shorea robusta*
(c) *Pinus roxburghii*
(d) *Syzygium cumini*

225. Plantation journal is an important document of a plantation, which is maintained to
(a) Record the inspection note of an officer
(b) Record the details of works carried out
(c) Record the mortality percent of plants
(d) Record the number of weeding. Carried out

226. Selection thinning is carried out in all canopy classes removing.
(a) Only inferior trees
(b) Only sound trees
(c) Only dead, dying and diseased trees
(d) Dead, dying, diseased and inferior trees

227. Improvement felling does not include
(a) Felling of sound trees
(b) Felling of dead, dying and diseased trees
(c) Climber cutting
(d) Removal of undesirable undergrowth

228. A forest can be termed as rain forest': if
(a) Rainfall takes place throughout the year in the area
(b) The leaves of trees release water drops throughout the year
(c) The minimum annual pinfall is 1750-2000 mm
(d) The maximum normal annual rainfall is 1750-2000 mm

229. Silviculture is
(a) The art and science of cultivating forest crops.
(b) The management of forests"
(c) The synonym of working plans
(d) None of the above

230. In the roadside avenue plantation, the most preferred species of plants in Assam will be
(a) *Tectona grandis, Shorea assamica, Bombax ceiba*

+91 78802-71423 Hornbillclasses@gmail.com

(b) *Shorea robusta, Acacia catechu, Psidium guajava*
(c) *Lagerstroemia speciosa, Cassia fistula, Mimusops elengi.*
(d) *Dalbergia sissoo, Melia Azadirachta, Pongamia pinnata*

231. Identify the incorrect statement..... The National Commission on Agriculture, 1976 defined social forestry to include
(a) Joint forest management
(b) Farm forestry
(c) Recreation forestry
(d) Reforestation in degraded, forests

232. Plantation is raised in a rectangular plot of barren land having measurements 1500 m and 50 m. The area covered under the plantation is
(a) 7-5 Ha
(b) 75 Ha
(c) 750 Hà
(d) None of the above

233. The total annual rainfall in wet evergreen forest is
(a) 2500 mm or more
(b) Between 900 mm and 2500 mm
(c) <900 mm
(d) All of the above

234. The main source of supply of moisture to forest trees is
(a) Hygroscopic water
(b) Capillary water
(c) Gravitational water
(d) None of the above

235. Afforestation means
(a) Raising of forest artificially which had vegetation before
(b) Raising of forest artificially where vegetation has long been absent
(c) Filling up vacancies in natural forest by planting
(d) None of the above

236. The selection of seed production areas is made on the basis of
(a) Phenotypic character of tree
(b) Genotypic character of tree
(c) Age of trees
(d) Locality of seed producing tree

237. The best quality of seeds can be obtained from
(a) Clonal seed orchard
(b) Seedling seed orchard
(c) Seed production areas
(d) Middle-aged trees

238. All trees which form uppermost leaf canopy are
(a) Dominated trees
(b) Dominant trees
(c) Suppressed trees
(d) Dead and diseased Trees

Important Tree Species

239. Identify the mismatch.
(a) *Shorea robusta* – Dipterocarpaceae
(b) *Mangifera indica* – Rubiaceae
(c) *Citrus reticulato* – Rutaceae
(d) *Tectona grandis* – Verbenaceae

240. Sal (*Shorea robusta*) grows best in soil with pH value
(a) 3 to 4
(b) 4-5 to 5-5
(c) 6-5 to 7-5
(d) 7-6 to 8

241. The species of tree which is not found in Assam is
(a) *Santalum album*
(b) *Taxus baccata*
(c) *Ailanthus grandis*
(d) *Garcinia cowa*

ASSAM PSC (ACF) 2012

General Forestry

242. State of Forest Report contains
(a) State and extent of forest types
(b) Area under forest
(c) Different types of forest
(d) Forest cover

243. Forestry was listed in the Concurrent List in
(a) 1952
(b) 1972
(c) 1976
(d) 1978

244. How many biodiversity hotspots are there in India?
(a) 2
(b) 4
(c) 6
(d) 8

General Forestry

245. How many broad forest types are found in Assam?
(a) 21
(b) 32
(c) 42
(d) 52

246. ***State flower*** of Assam is
(a) *Venda roxburghii*
(b) *Cymbidium aloifolium*
(c) *Rhynchostylis retusa*
(d) *Dendrobium nathaniel*

247. Presently how many national parks are there in Assam?
(a) 3
(b) 4
(c) 5
(d) 6

248. Presently how many wildlife sanctuaries are there in Assam?
(a) 11
(b) 14
(c) 17
(d) 20

249. ***Manas*** is a/an
(a) National Park
(b) World heritage site
(c) Elephant reserve
(d) None of the above

250. Assam Forest School was established in [Assam PSC ACF 2012 Forestry]
(a) 1945
(b) 1948

(c) 1951
(d) 1953

SILVICULTURE

251. ***Pollination*** of Simul tree is done by
(a) Insect
(b) Wind
(c) Water
(d) Bird

252. Irregular growth of the base of a matured teak tree is called
(a) Buttress
(b) Conical Shape
(c) Fluting
(d) Irregular Shape

253. ***Silviculture*** deals with
(a) Exploitation of forest produce
(b) Regeneration of forest
(c) Protection of forests
(d) All of the above

254. ***Forest type*** is classified on the basis of
(a) Climate
(b) Soil
(c) Abundance of dominant species
(d) Geographical location

255. '***Cultural operation***' includes
(a) Weeding,
(b) Thinning
(c) Climber cutting
(d) All of the above

256. ***Pruning*** in forest trees is done to get
(a) Clear bole
(b) Bushy tree
(c) More volume
(d) Not done at all

257. ***Gregarious bamboo flowering*** is due to
(a) Soil condition
(b) Drought
(c) Genetics
(d) Mismanagement

258. **Balsam** (*Phoebe goalparensis*) is a species
(a) Of light demander
(b) Of shade bearer
(c) Initially of shade bearer
(d) Initially of light demander

259. In a ***Climax Forest***, are the niches of all organisms strictly defined?
(a) Yes
(b) No
(c) Not always
(d) No at all

260. Relation between Pine tree and ***Mycorrhiza*** is
(a) Protocooperation
(b) Mutualism
(c) Symbiosis
(d) None of the above

261. Are grasslands ***climatically Climax ecosystem***?
(a) Yes
(b) No
(c) Partially yes
(d) Not at all

262. ***Plant succession*** comprises of many
(a) Seres
(b) Plants
(c) Trees
(d) Ecosystems

263. Removal of tall mature tree from a wet evergreen forest enriches the ecosystem by encouraging better growth of other species. Do you agree?
(a) No
(b) Yes
(c) Partly does
(d) No effect

264. ***In vitro storage***' means
(a) Conservation of plant in laboratory
(b) Conservation of plant root for future propagation.
(c) Long-time storage of seeds
(d) Planting of plant in well-protected area

265. '***Endemic tree***' means
(a) Tree in the verse of extinction
(b) Rarely found tree
(c) Commonly available tree
(d) Tree found in restricted location

266. Complete clearance of forestland
(a) Enriches the soil quality
(b) Degrades the soil
(c) Has no effect
(d) Remains the same

Important Tree Species

267. The scientific name of ***Siya Nahar*** is
(a) Shorea robusta
(b) Keyea assamica
(c) Mesua ferrea
(d) Gmelina arborea

268. ***Rain tree*** (P. saman) is an exotic and was brought from
(a) Sri Lanka
(b) Africa
(c) South America
(d) Madagascar

269. Krishnachura (D. regia) is an exotic and was brought from
(a) Sri Lanka
(b) Africa
(c) South America
(d) Madagascar

270. Ranga Jaba (*H. rosa-sinensis*) is an exotic and was brought from
(a) China
(b) Japan
(c) Europe
(d) the USA

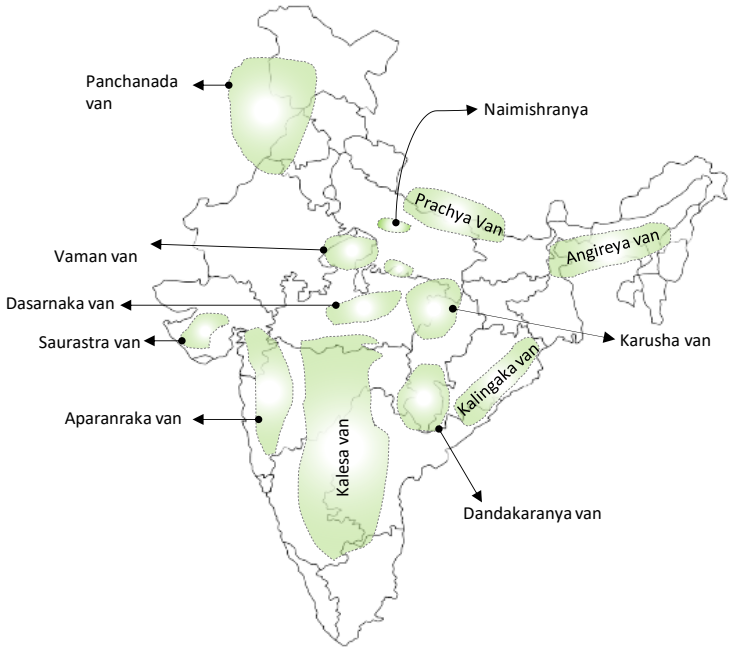
271. Alu (*Solanum tuberosum*) is an exotic and was brought from
(a) Australia
(b) Europe
(c) Central Africa
(d) Tropical America

CHAPTER 1

GENERAL FORESTRY

1.1 HISTORICAL BACKGROUND

Our religious texts such as Vedas, Aranyakas (*Aranya* in *Sanskrit* means Forest), Upanishad, and Smritis contain many descriptions of the uses and management of forests and highlight sustainability as an implicit theme. According to Vedic traditions, every village would be complete only when certain categories of forest vegetation or trees (*i.e.*, *Mahavan*, *Shrivan*, and *Tapovan*) are preserved in and around its territory.



- In *Vishnu Puran* (one of the eighteen Maharana's), there is a description of 13 types of forest occurring in different parts of the country, few of them are - *Angireya Vana* (Bengal and Assam), *Prachya Vana* (Bihar, UP, Nepal), *Naimisharanya* (central UP), *Panchanada vana* (Punjab + J & K), *Aparantaka Vana* (MH), *Dandkarandya* ***van***, *Kalinga* Van, *Saurashtra* Vana, *Kalesha van* (south of river Narmada), *Vaman vana* (near Gwalior), ***Dasarnaka*** vana (around Bhopal, Sagar, Damoh), ***Mahakantara*** van and ***Karush*** van (Baghel & Bundelkhand).

Chapter Outline

Mahavan : Great natural forest; Equivalent of modern-day 'Protected forest'

Shrivan : Forest of prosperity; Production forest / Planted forest for the production of fuel, fodder, Timber, etc.

Tapovan : Home of sages; Being sacred, no animal or tree could be harmed in these forests

CHAPTER 1

FOREST FORESTRY & SILVICULTURE

1.1 INTRODUCTION

The term *Forest* has its roots in early medieval European society. The increasing population and the rise of new kingdoms and serfdoms, based on the heavy exploitation of natural resources, caused a severe loss of natural vegetation (that we called in India - *Jungles*) to meet their growing demands for food, fodder, fuel, and timber. The shrinking areas of natural vegetation created a shortage of fuelwood and timber in their ruling regions. As a result, they began designating parts of the land, usually unproductive and located at the boundaries of village territories, for growing tree crops, which became known as *Woodlands* or *Forests*, to produce the required resources.

✍ *Forest* term derived from a *Latin**** word *Foris**** which means *outside of village boundary****.

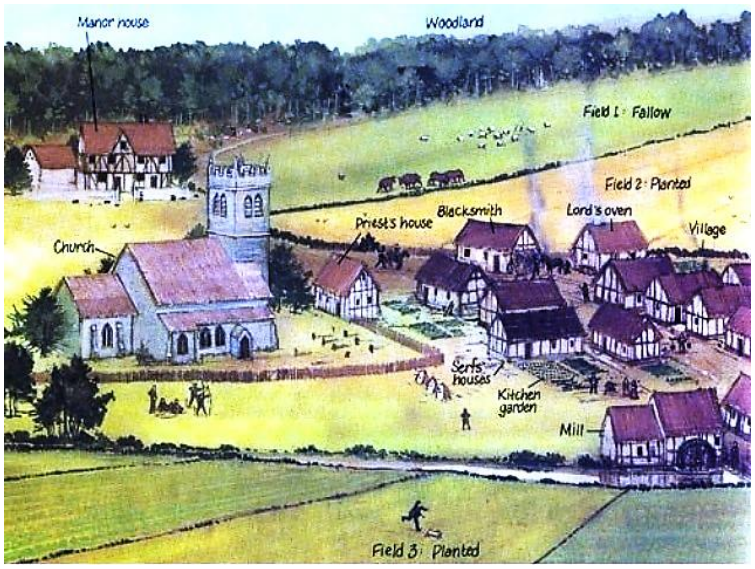


Figure 1.1 : A medieval European village

► DEFINITION

– Forest is an *area set aside* for the *production of timber* and other forest produce or to get other *indirect benefits* from it [Technical definition].

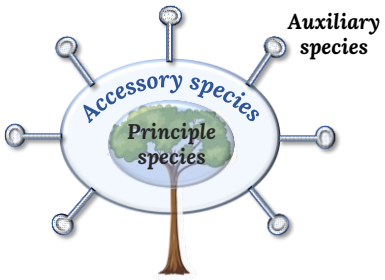
Chapter Outline

It can also be classified as

- **Natural Forest** : When regeneration is obtained by natural means, *i.e.*, *virgin Forest*
- **Man-Made Forest** or **Plantation** : When regeneration is obtained by Artificial means, *i.e.*, Miyawaki forest.

► COMPOSITION OF FOREST VEGETATION (FLORISTIC COMPOSITION)

- **Pure Forest** : A forest predominantly composed of a single species, or at least *not less than 80 %*. It is also called a "*Pure Crop*"
- **Mixed Forest** : A forest composed of trees of two or more species intermingled within the same canopy. Mixed forests may be further divided into –



  - ***Principal species*** – (a) The species ***first in importance*** in a mixed stand, either by *Frequency*, *Volume*, or *Silvicultural value*; (b) ***Dominant*** and ***most commercially valuable*** species in a forest stand; (c) The species to which the silviculture of a mixed forest is primarily directed.
  - ***Accessory species*** – a useful species of ***less value*** than the principal species, which assists in the growth of later.
  - ***Auxiliary species*** – A species of ***inferior quality*** or ***size***, with relatively ***little silvicultural value*** or ***importance*** [*syn.* **Secondary species**, **Subsidiary species**]. These species *play a supportive role in the forest ecosystem*—such as aiding regeneration, providing shade, or improving soil conditions—but are not the primary focus of forest management.

Virgin Forest

A natural forest in its natural state (without any human intervention)

► CLASSIFICATION BASED ON *Ownership*

- ***Govt Owned Forest*** : Forests owned and managed *by the state*, accounting for 96% of India's total forest area.
- ***Private Forest*** : Forests owned and managed *by private entities*, such as industries (*e.g.*, BILT paper mill).
- ***Communal Forest*** : Forests owned and managed *by a community*, such as a village, tribal authority, or local government, for the benefit of their well-being (*Synonym* : **Community Forest**) *e.g.*, *Lalwan community reserve*, Punjab.
- ***Contractual forest*** : A forest management system in which the government allocates public forest lands to *private companies* through contracts—such as leases, concessions, licenses, or permits—for their management and use, with the goal of ensuring sustainability and supporting diverse land-use objectives.

The ***Madhya Pradesh government*** recently introduced a draft policy aimed at restoring degraded forest areas by encouraging private investments through ***Corporate Social Responsibility (CSR)***, ***Corporate Environment Responsibility (CER)***, and ***non-governmental funds***. The policy proposed leasing degraded

CHAPTER 2

LOCALITY FACTORS

2.1 LOCALITY FACTORS

SITE or **LOCATION** is an area where you want to carry out plantation or management work.

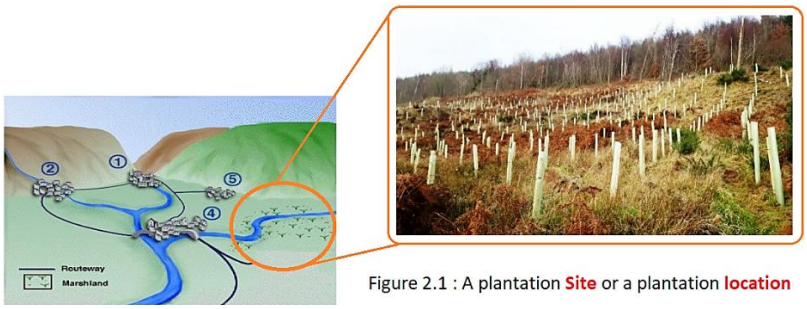


Figure 2.1 : A plantation **Site** or a plantation **location**

SITE FACTORS

The sum of all effective climatic, edaphic, topographic, and biotic conditions of a particular area under which a plant community lives. This means, Site factors are all biotic and abiotic factors of an area that interact and influence vegetation occurrence, distribution, and growth.

- Site factors are also known as ***Locality Factors*** or ***Habitat Factors***.

These factors are –

1. Climatic factors : Solar radiation, rainfall, Wind speed, air temperature, etc.
2. Edaphic factors : Soil organic matter, soil texture, soil structure, mycorrhiza, waterlogging, salinity, etc.
3. Topographic or Physiographic factors : Mountains arrangement, Altitude, latitude, slope, aspects, exposure, etc.
4. Biotic factors : insects/pests attacks, invasion of exotics, grazing and browsing by wild and domestic animals, Human interference.

2.2 WHY ARE THESE FACTORS IMPORTANT?

Locality factors are very important in silvicultural operations because they directly affect the growth, health, and success of a forest or

Chapter Outline

CHAPTER 3

CLIMATIC FACTORS

Climate is the average weather prevalent in any locality that influences our forest vegetation, *i.e.*, light, atmospheric temperature, pressure & humidity, wind, etc.

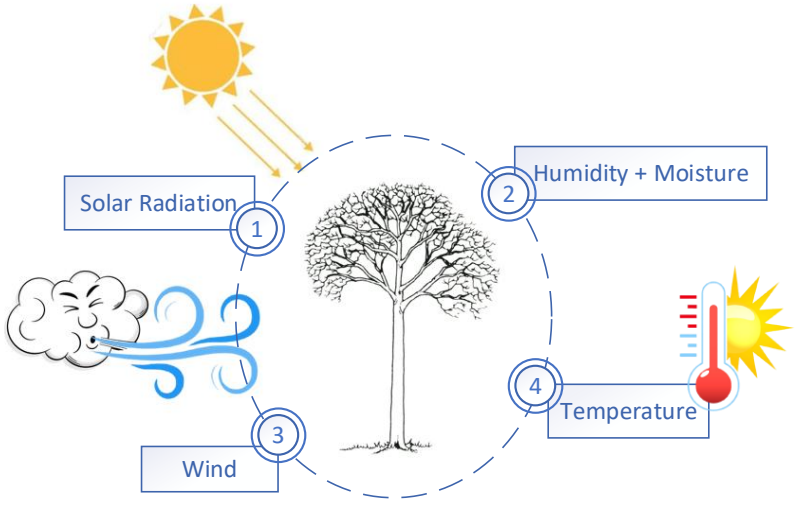


Figure 3.1 : Climatic factors

3.1 SOLAR RADIATION

Solar radiation is the primary source of energy for photosynthesis. Factors such as ***Quality***, ***Intensity***, and ***Duration*** of light affect the vegetation or indirectly the entire forest ecosystem.

IMPORTANCE OF SOLAR RADIATION

Plants depend upon solar radiation not only to synthesize food but also to regulate many other metabolic reactions. Such as –

- *Essential for* ***basic metabolic activities*** like photosynthesis, transpiration, and the opening and closing of photoactive stomata.
- Light is crucial for the ***synthesis of chlorophyll molecules***. A prolonged absence of light results in the degeneration of chlorophyll, turning the leaves yellow—a phenomenon known as ***Etiolation***.
- Intense ***light increases the rate of transpiration***, leading to

Chapter Outline

► TEMPERATURE ZONES IN INDIA

Zone	Mean Annual Temperature	Mean January Temperature	Remarks
1. Tropical	Over 24°c	Over 18°c	Cold season short or none. No frost and snow.
2. Sub-tropical	17°c to 24°c	10°c to 18°c	The cold season is definite but not severe. Frost rare.
3. Temperate	7°c to 17°c	-1°c to 10°c	Winter is pronounced with frost and some snow.
4. Alpine	Under 7°c	Under 1°c	Winter is long and severe, much snow.

IMPORTANCE OF TEMPERATURE

AIR TEMPERATURE : A favourable temperature supports plant growth by influencing key physiological processes such as photosynthesis, transpiration, and cambial activity involved in secondary growth.

Climate Connection

- ***Cardinal temperature*** : Seeds require an optimal temperature for germination, usually **20°C to 35°C***. In recent years, due to *global warming*, these cardinal temperatures are becoming *less available* in *native forest areas*, hindering natural regeneration. As a result, *forests are gradually shifting towards higher altitudes or polar regions* where more favourable temperatures exist.
- **Photosynthesis Rate** : The rate of photosynthesis increases with rising air temperature up to **25–30°C***. Beyond this range, the rate begins to decline. At around 50°C, plant enzymes begin to denature, ultimately leading to plant death. This critical threshold is known as the ***Thermal Death Point*** (Also refer, ***Light Compensation point***).
- ***Transpiration rate*** : High temperatures increase the rate of transpiration in plants.
- ***Enzymatic and microbial activity*** : Higher temperatures enhance microbial activity, leading to faster decomposition and the release of nutrients through the conversion of organic matter into humus. In contrast, temperate forests often have high organic matter accumulation due to low microbial activity.

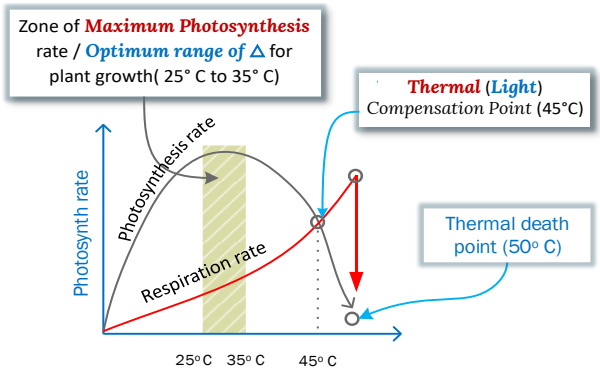


Figure 4.6 : effect of temperature on photosynthesis as well as on plant respiration rate.

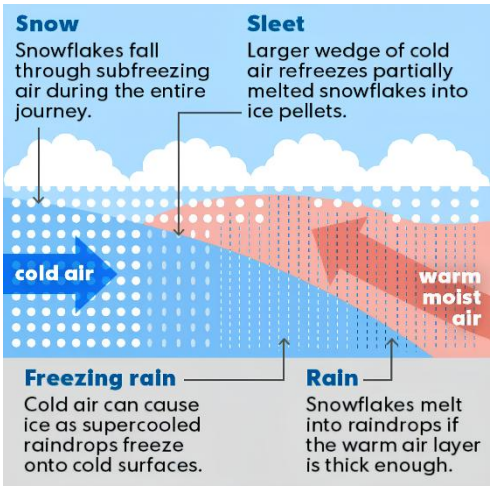
For instance, in Uttarakhand, the ***Chir pine*** (***Pinus roxburghii***)—locally known as ***Pirul***—which decompose slowly and are highly flammable, significantly contributing to forest fires. To address this, the Uttarakhand government launched the '***Pirul Lao-Paise Pao***' initiative, purchasing collected pine needles at ₹50 per kg to reduce fire risk.

- ***Pollen grains*** : Both the quality and quantity of pollen grains decline under high temperatures, leading to reproductive challenges in plants.

SOIL TEMPERATURE : ◈ Soil temperature influences ***water absorption***, which generally increases with rising temperature up to an optimal range (**27–35 °C**). Beyond 35 °C, absorption declines as the permeability of the plasma membrane are affecting adversely. ◈ Soil temperature also affects ***cambial activity***, which is essential

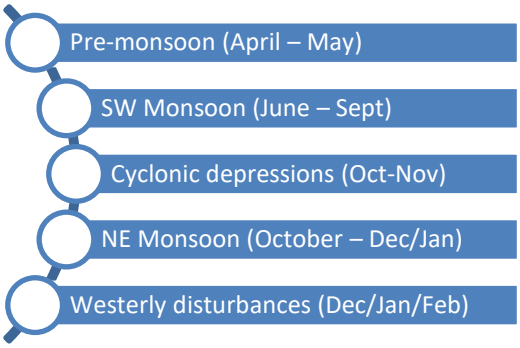
- ***Rain*** : Precipitation with droplet sizes ***larger than 0.5 mm****, usually ranging up to 6 mm in diameter. Rainfall intensity varies: light rain falls at 2.5 mm/hr or less, moderate rain between 2.5–7.5 mm/hr, and heavy rain exceeds 7.5 mm/hr.
- ***Sleet*** : Occurs when snowflakes partially melt as they pass through a warm atmospheric layer and then refreeze into ***ice pellets*** before reaching the ground. These pellets often bounce upon impact.

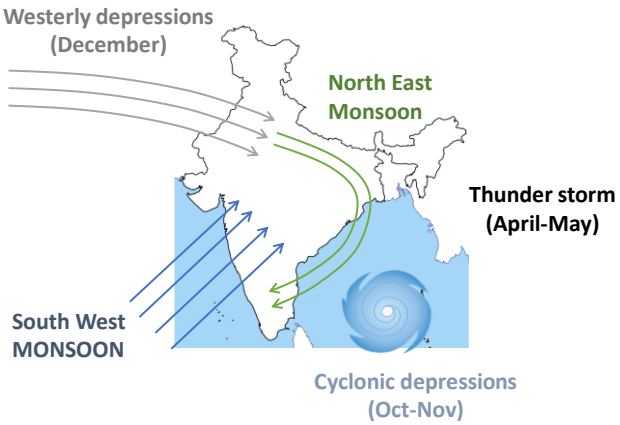
  Sleet = Frozen raindrops*
- ***Snow*** : ice crystals that form in clouds when the atmospheric temperature is at or below freezing.
- ***Glaze*** : A smooth, transparent coating of ice formed by the freezing of supercooled rain or drizzle upon contact with cold surfaces.



- ***Hail*** : Balls or ***Small irregular lumps of ice****, that formed by alternate freezing and melting (Resulting formation of layers)
- ***Frost*** : *Due to chilling of air below freezing point****
- ***Fog*** : Forms when the air becomes saturated, and water vapor condenses. ***Visibility is reduced to below 1 km****

► SOURCES OF MOISTURE



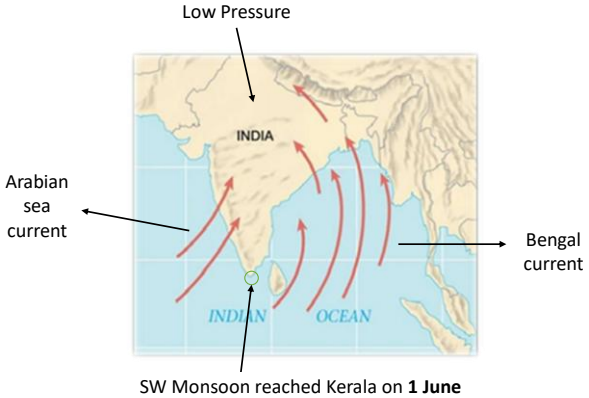


❑ PRE-MONSOON RAINFALL

- During April-May
- Intense rainfall with dark, furious clouds known as ***Kal-Vaishakhi*** (*Nor wester*) in North India, Bengal, and ***Tea Shower*** or ***Bardoli Chheerha*** in Assam region.
- ***Mango Shower*** – in Karnataka region; ***Cherry Blossom*** In Kerala

❑ SW MONSOON

- Kerala = **1 June** (Normal date), Covered the entire country by **8 July**.

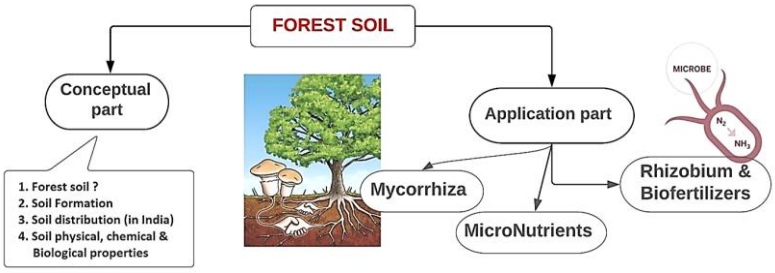


+91 78802-71423 Hornbillclasses@gmail.com

CHAPTER 4

EDAPHIC FACTORS

Edaphic factors are the ecologically influenced characteristics of the soil brought about by its physical and chemical characteristics. These include soil texture, structure, soil water, temperature, porosity, salinity, pH, Electrical conductivity, etc.



4.1 CONCEPTUAL PART

- **Soil** : the uppermost weathered layer of the earth's crust.
- **Forest Soil** : A portion of the earth's surface serves as a medium for the growth and sustenance of forest vegetation.

  [Remaining parts such as soil formation, type, distribution, classification, properties, and conservation practices are a part of Soil Science, and, are required to be studied separately at a superficial level under different Sub-head 'Forest Soil'].

4.2 MYCORRHIZA

Mycorrhiza is the ***Symbiotic**** relationship between ***Fungi*** *and* ***Higher Plants*** (**Myco** = ***Fungi*** + ***Rhiza*** = ***Rhizome*** = **Roots**). Mycorrhizal fungi are composed of fine, tubular filaments called ***Hyphae*** (singular *Hypha*). The mass of hyphae that forms the fungus body is called ***Mycelium*** (plural *Mycelia*).

- ***Mycorrhiza*** term was given by – A. B. ***Frank****
- ***Symbiosis*** term was given by – Anton De ***Bary****
- The term ***Rhizosphere*** was first time coined by – Lorenz ***Hiltner****

TYPES OF MYCORRHIZAE

- **ECTO-MYCORRHIZA** : Under this, fungal mycelium forms a thick ***Mantle Sheath*** around the lateral roots, and some *mycelia*

Chapter Outline

CHAPTER 5

PHYSIOGRAPHIC FACTORS

The factors concerned with topography or physical features of an area are called **topographic** or **Physiographic** factors, including height, the direction of slope, and slopes' steepness. The topographic factors are also called ***indirect factors*** as they influence the growth and development of forest vegetation by bringing variations in climatic factors.

These factors are -

- Configuration or arrangement of the land surface, *i.e.,* hills & valleys
- Altitude
- Latitude
- Slopes
- Aspect & Exposure

5.1 CONFIGURATION OF LAND SURFACE

The arrangement of hills and valleys affects the local climate by influencing ***rainfall patterns***, ***temperature***, ***solar radiation***, and ***soil profile depth***. It also impacts ***wind direction***, which is essential for pollination and seed dispersal in conifers. Himalayan valleys are cooler in winter, and ***Pool frost*** is common; whereas in summer, the surrounding hills make the valleys extremely hot. The soil in valleys is deeper, more fertile and productive, and supports dense vegetation.

Chapter Outline

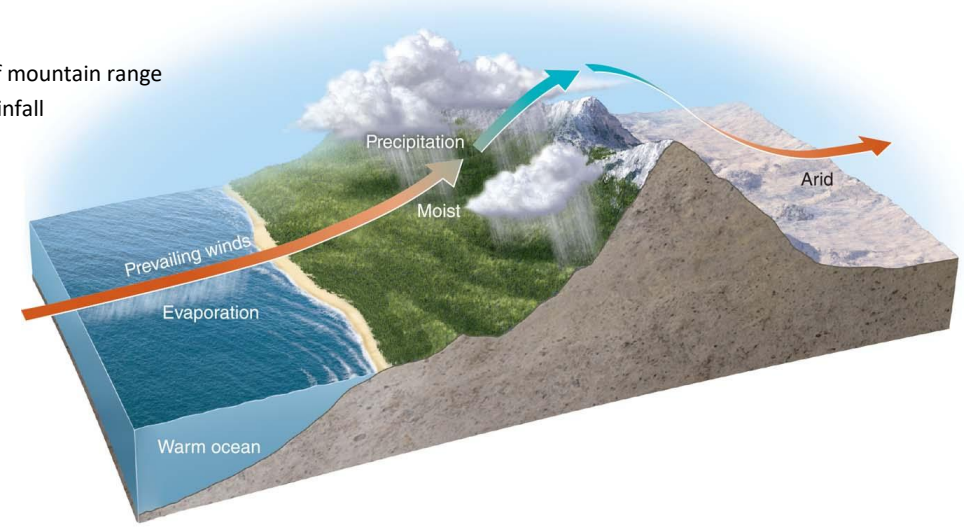


Figure 5.1 : Effect of mountain range on the pattern of rainfall

Concept : CLOUD FORESTS

Cloud forests are a special ***type of rainforest*** found at high altitudes, typically between **1,000** and **2,500** ***meters*** above sea level (≈ 1500 m). These forests are characterized by a ***constant mist*** *or* ***cloud cover at the canopy level***, which provide constant moisture through a process called ***Lateral Cloud Filtration***—where moist ocean air rises over mountains, cools, and condenses.

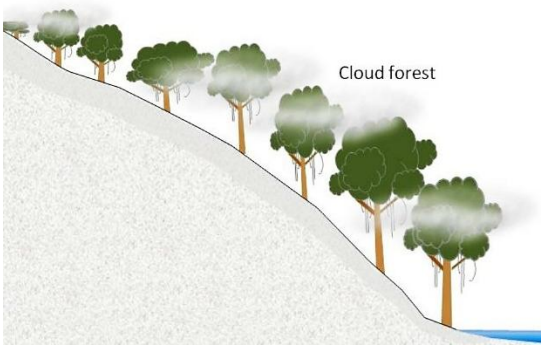


Figure 5.2 : ***Cloud Forest*** — A ***shorter***, ***denser***, and ***gnarled evergreen forest*** shrouded in cloud cover at the canopy level, giving it a ***misty appearance*** with abundant ***epiphytes***. Typically found between ***1,000 to 2,500-meters altitude***.

Cloud forests are home to unique wildlife and lush vegetation, especially ***Epiphytes*** like mosses, ferns, and orchids. Unlike tropical rainforests, cloud forests have ***Shorter***, ***Twisted trees***, ***Cooler temperatures***, ***Less sunlight***, and ***Nutrient-poor***, ***Acidic soils***. In India, they can be found in regions like the ***Western Ghats***, the ***Nilgiris***, ***Palani Hills***, and the ***hilly areas of the Northeast***.

Instrument used for altitude measurement = ***Altimeter***.

5.2 ALTITUDE

Altitude refers to the height of a place above mean sea level. As we ascend mountains, we observe a gradual ***Decrease*** in ***Temperature***, ***Atmospheric Pressure***, ***Rainfall***, and ***Soil Fertility***, while ***Wind Velocity*** and ***Solar Radiation*** tend to ***Increase***. Thus, vegetation at different altitudes is different, showing distinct zonation. Generally, ***Xerophytic*** vegetation (adapted to dry conditions) is more common at lower latitudes, whereas ***Chamaephytic*** plants (low-growing perennials) are more common at higher altitudes.

EFFECTS OF ALTITUDE ON VEGETATION

- *Reduction in tree size* : With increasing altitude, there is a noticeable decrease in *tree diameter*, *height*, and *leaf thickness* and *size*. Above the timberline, tree growth ceases, and only low-growing *scrub vegetation* is found, similar to what is seen in semi-arid regions.
- *Flag tree formation* : Strong, persistent winds near mountain edges deform tree growth, resulting in *flag-shaped trees*.
- *Prolonged maturity period* : Cold temperatures

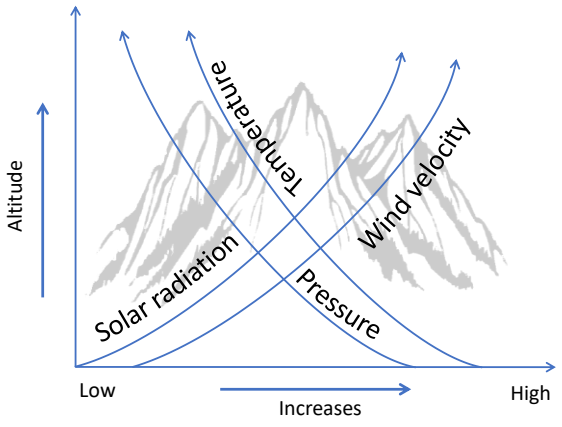


Figure 5.3 : Effect of altitude over climatic factors

CHAPTER 8

TREE'S STRUCTURE & GROWTH FORMS

8.1 WHAT IS A TREE?

Trees are woody plants having one *erect perennial stem or trunk* at least three inches (7.5 cm) in diameter at breast height, a more or less *defined formed crown* of foliage, and a *height of at least 12 ft* (4 m).

CROWN

The crown encompasses all the above-ground parts of a tree, including branches, leaves, and reproductive structures.

FORMS OF TREE CROWN

A crown is an upper branchy part of a tree above the bole. It is the result of branching behaviour in the bole. In some trees, *i.e.*, *Phoenix*, *Cocos*, *Borassas*, etc., there is no branching behaviour in the stem and the crown is formed by larger leaves which come out from the top of the unbranched stems. In other trees crown may be – ◈ ***Conical*** as in the case of *Pines*, and *Deodar*, ◈ ***Cylindrical*** as in *silver fir*, *Eucalyptus*, *Ashoka*, etc. ◈ ***Spherical*** in *mango*, *neem*, *Imli*, *Mahua*, etc., ◈ ***Broad & Flat topped*** in *Acacia planifrons*, *Albizzia spp.*, ◈ ***Broom shape*** as in *Acacia nilotica* (*Babool*), and ◈ ***Frondose crown*** as in *Prosopis juliflora*.

Chapter Outline

Phoenix, Coconut, Borassus

Unbranched stem of Coconut

Conical shape

Abies pindrow (Silver Fir), Eucalyptus, Ashoka

Cylindrical shape

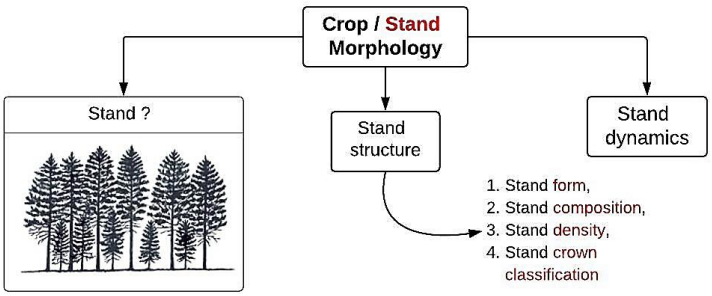
Mango, Neem, Imli, Mahua, etc.

Spherical shape

CHAPTER 9

TREE CROP MORPHOLOGY

Morphology means the science of form, especially studying the outer form (structure), inner structure, and development of their parts. *Crop morphology* means studying the outer form of forest crops and their development.



9.1 STAND ?

The **stand** concept has long been central to the practice of Silviculture and has traditionally been defined as *a group of trees that are relatively homogenous in composition, age-class distribution, and structure growing on a site of uniform quality*. Stands, as defined in this context, have served as the primary unit of forest management around the globe with the stand-by-stand application of silvicultural treatments for achieving a sustainable yield of produce.

Stand *v/s* Forest

A forest is a collection of stands. Remember that a stand is a unit of silvicultural interest. Forester's practice silvicultural operations on stands, but not on forests. It is not an ecological management unit.

9.2 STAND STRUCTURE

Stand Structure refers to the *overall look* of a forest stand. It is the *horizontal and vertical distribution of components* of a stand, including the height, diameter, crown layers and stems of trees,

Chapter Outline

CHAPTER 10

FORESR SUCCESSION

Succession is the process by which ***one set of biotic communities*** is ***gradually replaced*** by ***another, more advanced*** and ***distinct nature*** biotic community.

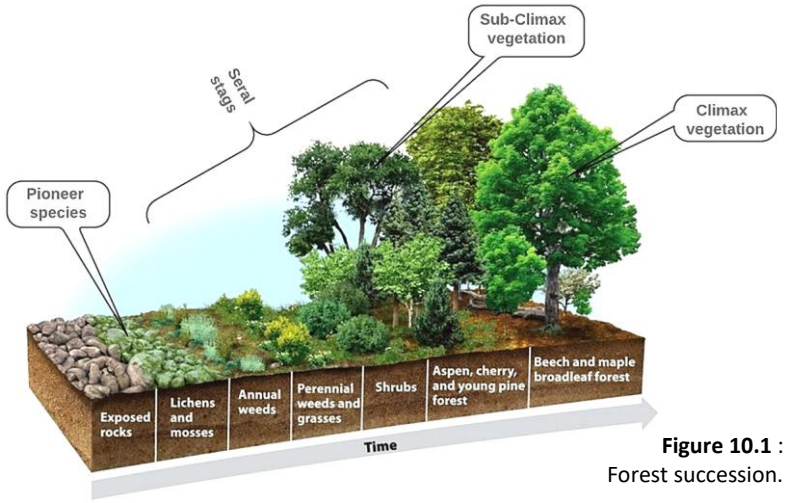


Figure 10.1 : Forest succession.

The 1st species that encroach upon and begin to grow (establish themselves) in a new area are called ***Colonizer**** or ***Pioneer**** species. ***Sere*** or ***Seral Stages*** (sometimes referred to as the ***Consolidation Phases***) are the intermediate stages during which plant communities develop, improve soil conditions, and gradually transform into more advanced and stable communities.

- **Climax Stage** – This is the final, mature, and stable community that can sustain itself over a long period while remaining in balance with the existing environmental conditions.
- **Succession** – The process of development and transition of vegetation from one stage to another (e.g., from grassland to woodland) is called **succession**.
- With each stage of succession, ***Complexity*** and ***Biodiversity Increase***.
- When a **colonizer** species begins to grow on barren land where there is **no trace of previous organic matter**, it is called ***Primary Succession***.

Chapter Outline

Succession term was given by "*Hault*".

CHAPTER 12

NATURAL REGENERATION

WHAT IS REGENERATION ?

Regeneration or **reproduction** is an act of *replacing the old crop* with *younger ones*, either naturally or artificially is called regeneration or reproduction.

TYPES ?

- Natural regeneration : by nature.
- Artificial regeneration : when humans were involved in its propagation.

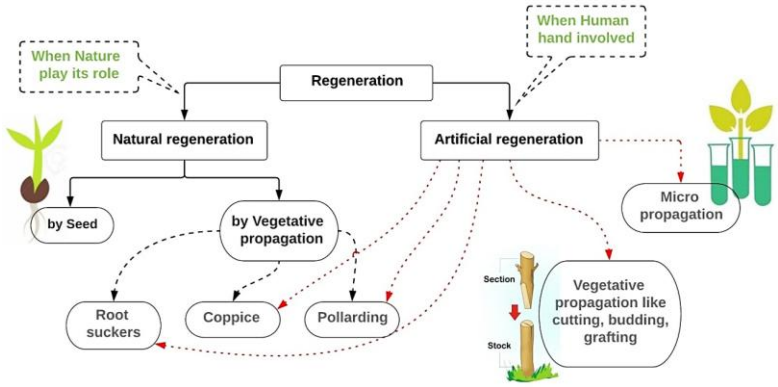


Figure 12.1 : Types of natural regeneration.

NATURAL REGENERATION

Definition : Natural regeneration is the renewal of a forest crop by means of the natural process of seed sowing, germination, and establishment or by coppice shoots or root suckers.

However, the new crop derived by natural regeneration also required some suitable conditions of soil, climate, host plants, and topography. Natural regeneration is often not left to nature, but it is induced by creating a suitable environment. The various measures taken to *induce natural regeneration* may be - (a) cutting some matured trees to allow more light to penetrate, (b) coppicing of seedlings or trees, (c) Closing the area to prevent fire and biotic interference and (d) trenching for getting root suckers, etc.

Chapter Outline

What is Regeneration?

- NR
- AR

Natural regeneration by

- Seed
- Coppice
- Root Sucker
- Pollarding

CHAPTER 13

ARTIFICIAL REGENERATION

The renewal of a forest crop by sowing, planting or other artificial means is called *artificial regeneration* (synonyms = plantation). It includes both (i) reforestation and (ii) afforestation. *Reforestation* is the restocking of a felled or cleared forest by artificial means. *Afforestation* is the establishment of a forest by artificial means on a non-forest area (the area from which forest vegetation has been absent).

13.1 OBJECTIVES OF ARTIFICIAL REGENERATION

- **Supplement natural regeneration** : Natural regeneration is a slow and challenging process, and often it does not give adequate and uniform stocking over the area. We cannot rely only upon it; we have to supplement it by artificial means. The natural regeneration in Sal-bearing moist deciduous forests in Uttar Pradesh has always been a problem; fir and spruce forests in Himachal Pradesh are also facing the same issue.
- **Replacing Natural Regeneration** by artificial means : Due to an increase in the biotic pressure, natural regeneration in several areas is lacking, slow, and uncertain. Therefore, it is necessary to regenerate that area with the help of artificial means to speed up the regeneration process (Remember, here we do not just supplement the natural regeneration process. We actually remove the majority of natural seedlings and replace them with plantation).
- **Restocking** & **revegetate** (Reforestation) our degraded and overexploited forest. That was damaged due to heavy biotic pressure. We already have a target of *26 million hectares* of degraded land that should be reforested by 2030.
- **Reclamation** & **Afforestation of Wastelands**, abandoned mining areas, and industrial dumping grounds.
- **Increasing Proportion of Valuable Species** : called - *Forest enrichment****, it also helps in making forest fire-resistant by planting evergreen trees.

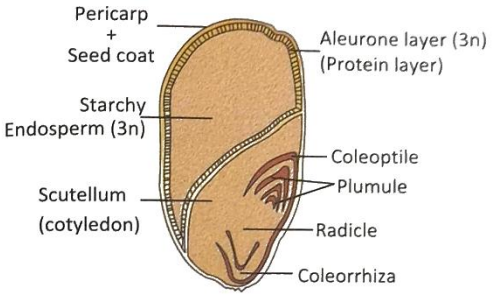
Chapter Outline

15.2 SEED

Seeds are the ***Mature Ovule*** with contain an ***Embryo Axis***, ***Seed Coat*** and ***Cotyledon*** (food reserve) in the form of cotyledons. The seed coat consists of two layers, the ***Testa*** (coloured outer layer) and the ***Tegmen*** (white inner layer), which are hardened by ***Sclerenchymus*** cells.

MONOCOT SEED

Monocotyledonous seeds are typically ***Endospermic***, meaning they retain a significant amount of endosperm to nourish the developing embryo. However, certain exceptions exist, such as in orchids, where the endosperm is absent.



In cereals like maize, the seed coat, *derived from the ovule's integuments*, is membranous and often *fused with the pericarp—the fruit wall*—resulting in a ***Caryopsis***. This fusion creates a protective outer layer that encases the seed, safeguarding the internal structures from mechanical damage and desiccation.

The *endosperm occupies the majority of the seed's volume and functions as the primary storage tissue*, rich in carbohydrates, proteins, and lipids. Surrounding the endosperm is the ***Aleurone Layer***, a single layer of living cells that plays a crucial role during germination. Upon activation by ***Gibberellins*** released from the embryo, the aleurone layer synthesizes and secretes hydrolytic enzymes, such as ***α-amylase***, which degrade the stored macromolecules in the endosperm into simpler forms. These nutrients are then mobilized to support the growth of the embryo.

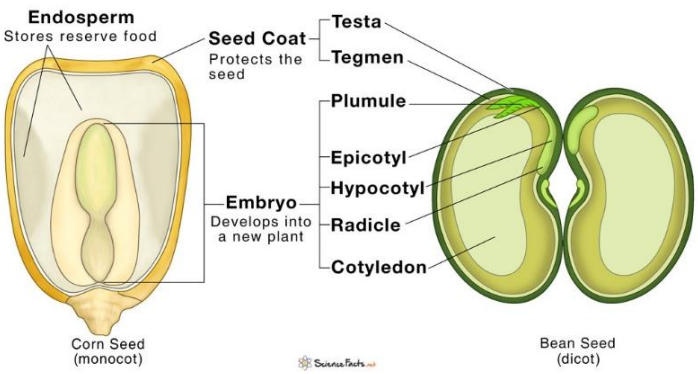
Embryo Structure

The embryo is relatively small and is situated in a groove at one end of the endosperm. It comprises:

- **Scutellum** : A large, shield-shaped ***Cotyledon*** unique to monocots, the scutellum is positioned laterally to the embryonic axis. It serves as an *absorptive organ*, facilitating the *transfer of nutrients from the endosperm to the embryo* during germination.
- **Embryonic Axis** : This includes the ***Plumule*** and ***Radicle***. The plumule, destined to develop into the shoot system, is enclosed within a protective sheath called the ***Coleoptile***. The radicle, which will form the root system, is similarly protected by the ***Coleorhiza***. These sheaths safeguard the delicate meristematic tissues during germination and aid in their emergence through the soil.

DICOT SEED

Unlike monocot seeds, most dicot seeds are ***Non-Endospermic*** (*Ex-albuminous*), meaning the endosperm is consumed during embryonic development and food is stored in the ***Cotyledons***. However, a few dicots (e.g., castor) retain some endosperm and are



+91 78802-71423

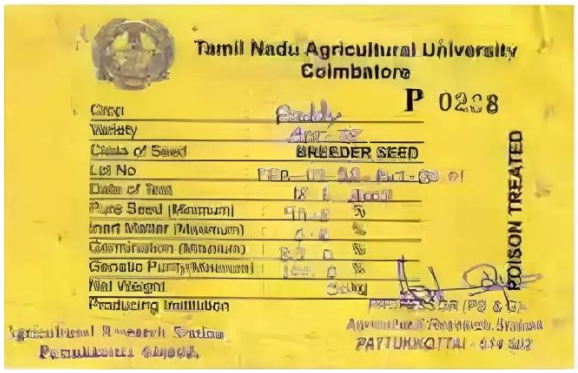
Hornbillclasses@gmail.com

Registered seed : This is the offspring of Foundation seed and is produced under agency regulations to maintain varietal purity and identity.

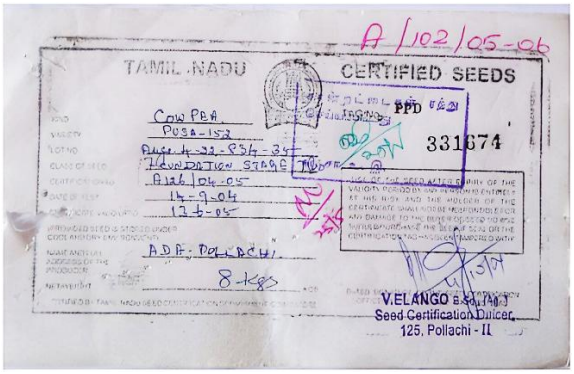
- Used primarily to produce certified seeds.
- In India registered seed is not practiced
- Tog color : **Purple***** Certificate.

⊳ **Certified Seed** :

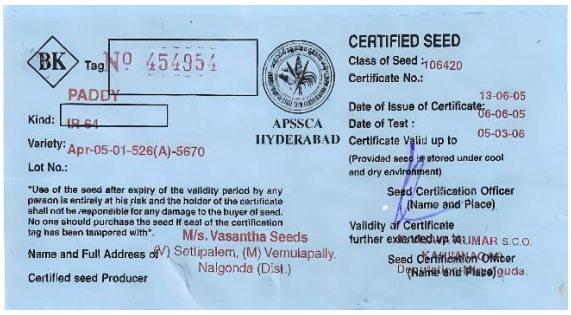
- Derived from foundation seeds ***by officially registered growers***.
- ***Supervised*** rigorously by seed certification agencies.
- ***Meets minimum certification standards*** for quality.
- Must maintain genetic purity of ***at least 99%.***
- Commercially available to farmers.
- Certificate Tag color : **Azure-Blue*****.



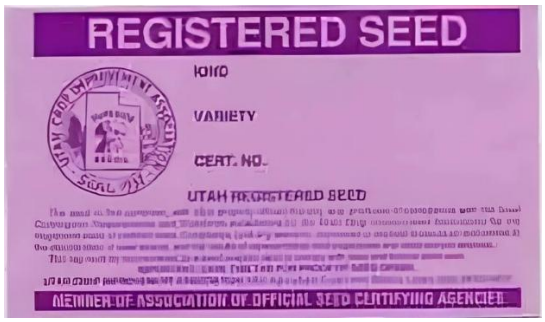
Breeder Seed = Golden-Yellow** Tag*



Foundation Seed = White** Tag*



Certified Seed = Azure-Blue***



Registered seed = Purple

According to Ewart's classification (1908), **seeds** are classified based on their viability lifespan under optimal storage conditions. seeds are divided into three categories,

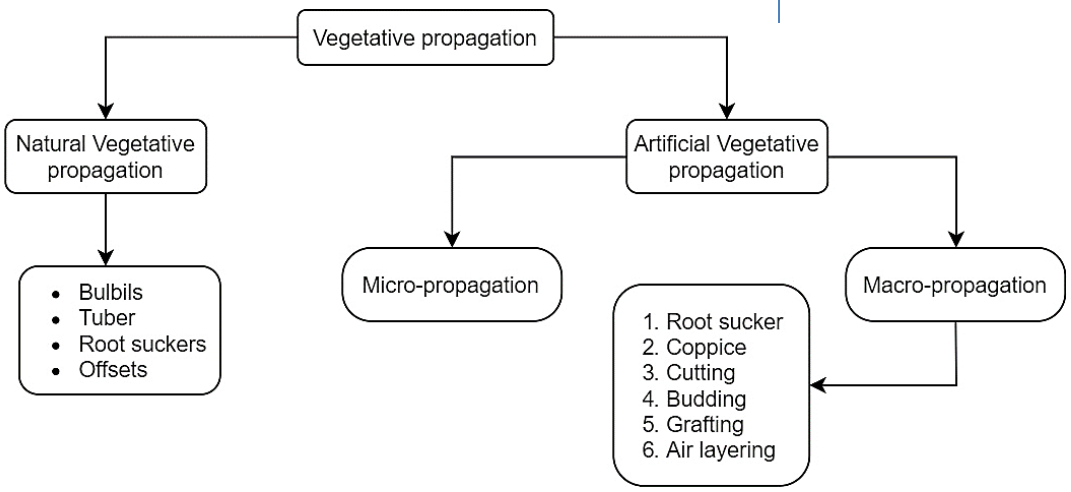
- **Microbiotic**: Seeds with a lifespan of less than 3 years.
- **Mesobiotic**: Seeds with a lifespan ranging from 3 to 15 years.
- **Macrobiotic**: Seeds with a lifespan exceeding 15 years.

CHAPTER 17

VEGETATIVE PROPAGATION

A Forest nursery is an area where plants are growing for transplanting for use as stocks for vegetative reproduction (*i.e.*, budding, grafting).

- **Objective of plant propagation ?**
  - Increase the number of plants of the same species
  - Preserving the essential characteristics of the plants
  - Way to introduce exotics
- **Methods of plant propagation**?
  - Sexual : by seeds
  - Asexual : by vegetative parts like cutting, Root suckers, etc.
- **Vegetative propagation**?
  - *The method to regenerate the new independent plant from the body tissue of the parent plant*.
  - Also known as *asexual propagation*.
- **Methods of vegetative propagation** ?



Advantages of vegetative propagation

- Vegetative propagation helps to produce genetically identical plants.
- This method eliminates variability and maintains clonal fidelity.

Chapter Outline

CHAPTER 18

SOWING & PLANTING

18.1 SITE SELECTION

The selection of a site is one of the vital considerations in the success of the plantation program. If the plantation is raised in a regeneration area or under a CAMPA plantation, the area is generally known.

Plantation sites are usually of four types - (a) degraded forest areas, where soil conditions are generally poor, and soil erosion is rampant, (b) wastelands where sites have one or several limiting factors, (c) forest area where the plantation is to be established either due to absence of natural regeneration or replacement of existing crop and (iv) plantation work along the rail, road, canal sides and agroforestry plantation in agricultural lands.

In most cases, the following points must be taken into consideration in the selection of a site :

- The sites for the plantation, as far as possible, should be easily approachable. If the site is not approachable, there are problems in the transport of planting stock, plantation work, weeding, and other operations. There is a problem in the disposal of produce also.
- There must be enough area for undertaking plantation for several years. It facilitates supervision and protection.
- The site selected should be such that it is easy to obtain participation and involvement of the local population.

Chapter Outline

Site Selection

Site allotted by the Govt.

Green Highway Corridor

CAMPA Forest

CHAPTER 19

MAINTENANCE OF PLANTATION

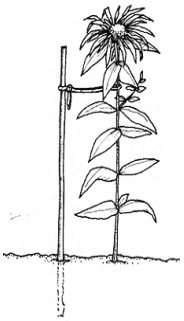
After plantation work is over, several planted seedlings have died due to –

- Defective & carelessness in planting work, *i.e.*, root coiling, shallow planting, unfirm soil, etc.
- Poor soil conditions, *i.e.*, waterlogged, presence of injurious salt concentration, Sub-surface hardpan formation etc.
- Adverse post-planting weather, *i.e.*, Frost, drought
- Insect & pest attacks; Competitive weed growth; Grazing, browsing and trampling – by both domestic as well as wild animals.

SOLUTIONS

- ***Replace Of Casualties*** : 'Refilling' process is also known as – Beating-up, Blanking, and In-felling.
- ***Weeding*** : removing the weeds. Types – Complete weeding, Line weeding, Spot weeding, Inter row weeding.
- ***Soil Working*** : : to improve infiltration rate, remove sub-surface **hardpan** and improve soil aeration.
- ***Watering*** : : During the dry season or in case of monsoon failure. Light soil requires more water than heavy soil.
- ***Abnormal Slow Growth*** –> Casualties replacement
- ***Staking*** : providing support to the plantation so it can withstand against a strong wind.
- ***Singling*** or ***Re-Spacing*** : carried out usually after 2/3 years of plantation.

  Singling involves selecting the most vigorous and well-formed shoot from a coppice stool and removing the others. This practice ensures that the selected shoot can grow into a strong, single-stemmed tree, optimizing the quality and uniformity of the stand. The operation is typically performed when the shoots have reached a height of approximately 1 to 2 meters. At this stage, the shoots are sufficiently developed to assess their form and vigor, yet still young enough that removal of the undesired shoots causes minimal damage to the stool and the selected shoot.

  
  Stacking of a plant

  After harvesting apply **Wax** on the open part to ***prevent fungal infection***.

  Re-Spacing : Competing plants of the same or similar species are removed to provide proper spacing and remove unnecessary competition.
- ***Bud Pruning*** /***Debudding***

CHAPTER

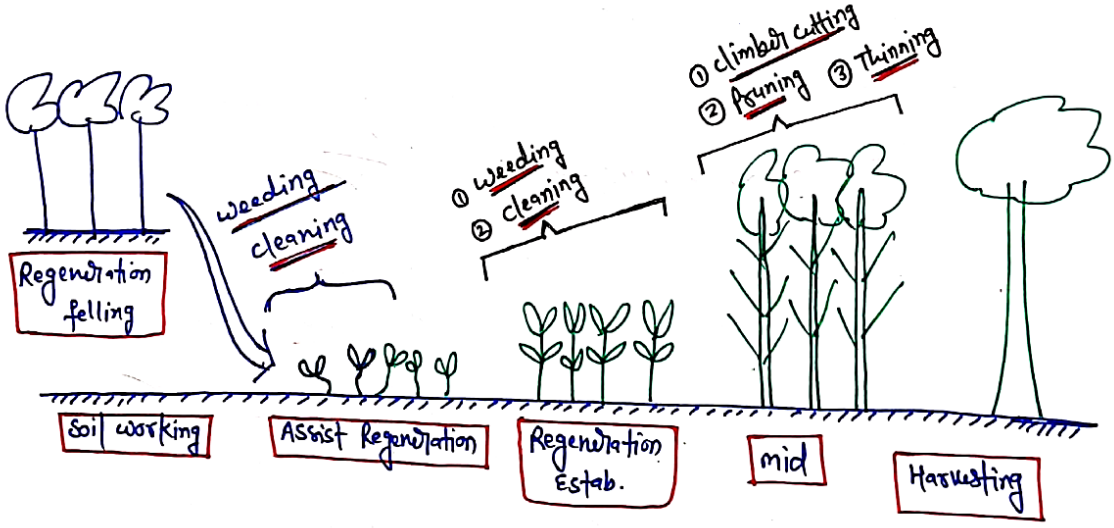
20

TENDING OPERATION

WHAT DO YOU MEAN BY TENDING OR TENDING OPERATION?

From the establishment of the regeneration and subsequent growth to the harvesting, several operations are carried out at different stages of growth in order to provide a healthy environment for their growth. These operations are called tending operations –

- Weeding,
- Cleaning,
- Thinning & improvement felling
- Climber cutting
- Pruning
- Girdling of unwanted growths.



CULTURAL OPERATION ?

The operation, as a rule not directly remunerative, undertaken to assist or complete existing regeneration, to promote the proper development of the crop or to minimize the after-effects of felling damage. It, therefore, includes subsidiary felling, weeding, cleaning, unremunerative improvement fellings, and thinning in groups of advance growth, girdling or poisoning of unwanted growth, climber cutting and even piling of felling debris, and controlled-burning but usually not other ground operations nor pruning. It is generally associated with silvicultural systems relying primarily on natural regeneration.

CHAPTER 21

PLANTATION FORESTRY

A forest plantation is an area of land of not less than one hectare owned by the govt. or private sector, upon which the owner proposes to develop and maintain a forest crop of usually even-aged and single species.

Plantation forestry, based on the successful breeding of superior tree genotypes, is becoming more widely used by international forestry companies since it offers the possibility to grow and manage forests of high economic value and superior quality. However, a number of highly desirable traits are not readily available in the breeding population and may be introduced using desirable genes from other organisms.

21.1 OBJECTIVES or NEEDS OF PLANTATION FORESTRY

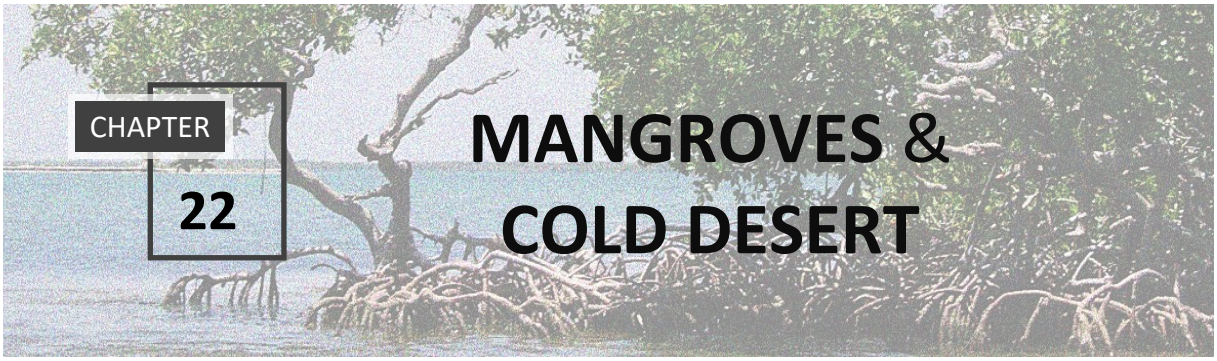
- *Production* purpose : for production of Timber, Fuel wood, fodder, Fibres, pulpwood, etc. to fulfil population demands with depressurized Forest resources.
- *Protection* against adverse weather, *i.e.*, Windbreak, planting a shade tree in Tea gardens (Usually *Albizzia* spp.), Soil and water *conservation* in a given watershed area.
- Forest enrichment and mixing species to control epidemics like the Sal heartwood borer attack in 1998 in central India.
- Climate change and global warming forced many species unsuitable for germinating naturally or sustained after germination, so they required human intervention.
- Our industrial and domestic demands are changing with time in quality, quantity, and requirement specific. We required the introduction of fast-growing species as well as new species.
- To create employment and investment opportunities.
- Environmental concern & Carbon storage purpose : Compensatory afforestation under CAMPA, fulfills our INDC obligations under the *Paris Agreement* by creating an additional carbon sink of **2.5 to 3 billion** tonnes of CO_2 equivalent till 2030. Our PM recently announced, "India will restore **26 m hac**. of degraded land by 2030" at the 14th CoP of UNCCD at Greater Noida.

21.2 PRODUCTIVITY OF INDIAN FOREST

Against the global average productivity of 2.1 million m^3/hectare/ year, the productivity of the Indian Forest is only 0.7 million m^3/hectare/ year.

Causes of Poor Productivity

- Unregulated grazing
- Uncontrolled fuelwood collection : Nearly 50% of the demand for fuel in rural India is being met from the adjoining forests. The annual demand for fuel wood is estimated nearly 250-300 million m^3. The recorded supply of firewood from Indian forests is only 17 million m^3 and there is a huge gap of approximately 260-



CHAPTER 22

MANGROVES & COLD DESERT

Mangroves form the coastal and estuarine wetland ecosystems in the tropical and subtropical regions of the world. This unique intertidal ecosystem acts as a safeguard to the coastlines from the disastrous effects of storm surges, erosion, and floods. Some mangroves occur along open coasts, subject to moderate wave processes, while most of them grow in sheltered, muddy tracts that are either regularly or occasionally immersed by tides

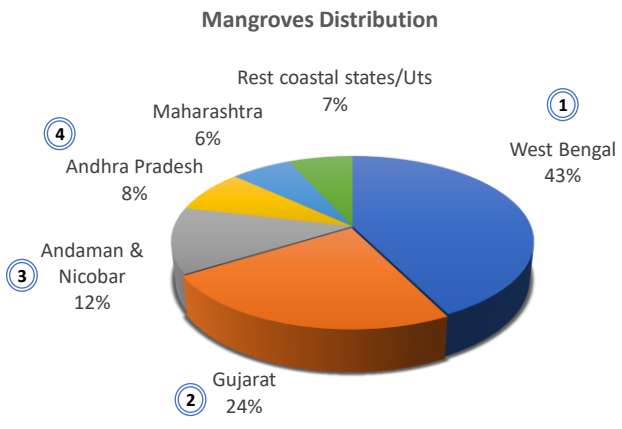
Definition : Mangroves are a diverse group of *salt-tolerant plant communities* found in the *tropical and subtropical coastal* and *intertidal zone* of the world, occurring mainly between *latitudes* 24^0 N *and* 38^0 S.

22.1 HABITAT

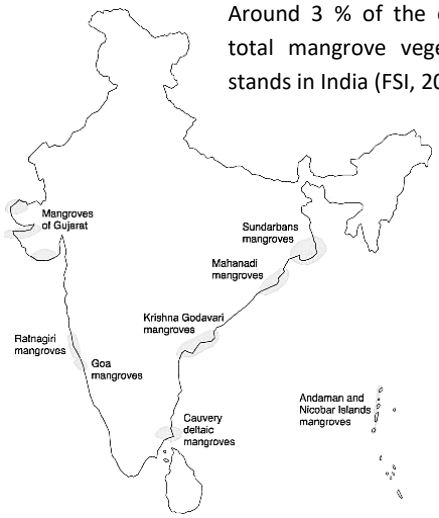
- The *intertidal zone* of coastal and estuarine mudflats.
- *Diurnal tidal inundation* of marine water, making the soil loose, very wet, salty, and low in oxygen.
- The *soil lacks minerals* like nitrogen (N), phosphorus (P), potassium (K), iron (Fe), and sulfur (S).
- Area *experiences strong winds* from cyclones and tsunamis.
- The temperature ranges from 25-35°C, and there is *100 to 300 cm of rainfall* annually
- *Rich biodiversity* because of the edge effect.

Figure 22.1 : Mangroves habitat

22.2 DISTRIBUTION



Around 3 % of the earth's total mangrove vegetation stands in India (FSI, 2021)



- Frost hardy species
- Extremely sensitive to drought conditions.
- Nodular bacteria – *Frankia**** has a symbiotic relationship with it.

- **Natural regeneration :** (1) by seed, (2) Coppice, but poor coppicing power, and (3) Root suckers.
- **Uses/importance** : (1) Afforestation of barren coastal land & shifting sand dunes, (2) Timber for boat and house construction.

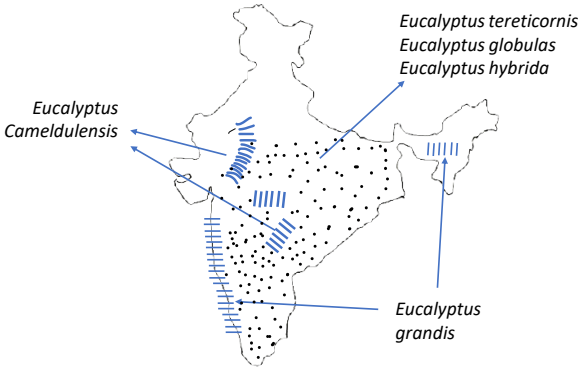
23.5 DALBERGIA SISSOO [SHISHAM, SISSOO]

- **Family :** *Papilionaceae**** (Leguminosae) = *Nitrogen**** fixation ✓
- Shisham is a large (20 to 30 m) *Deciduous* tree with a *Dimorphous Root* system (both horizontal and vertical roots).
- **Distribution :** It is widely distributed over the Sub-Himalayan tract and north Indian plane. Form gregarious patches over the newly formed alluvial deposits.
  - **Climate** : Max - 25° C to 35° C, Minimum - 5° C to 10° C.
  - **Rainfall** : 80 to 300 cm.
  - **Altitude** : upto 1500 mts
- **Phenology** :
  - **Leaf fall** : November/December to January
  - **Leaf renewable** : February
  - **Flowering** : March - April.
  - **Fruiting** : young pods start from the end of April to July. They ripen by November / December / January.
- Uses : Furniture, wheels, agricultural implements, gun carriages, etc.

Dalbergia latifolia = **Rosewood*****

23.6 EMBLICA OFFICINALIS (AONLA)

- *Syn*. *Phyllanthus emblica*
- Also known as *Indian Gooseberry****
- Family : *Euphorbiaceae****
- They are commercially cultivated in UP and Tamil Nadu.
- **Uses** :
  - *Richest Source of Vitamin C* after Barbados cherry.
  - Medicinal value : Dried fruits are helpful in haemorrhages, diarrhoea, dysentery, anaemia, jaundice, dyspepsia, and cough.
  - Aonla is used in the indigenous medicines (Ayurvedic system) viz. *Trifla* and *Chavanprash*.
  - Fruits are commonly used for preservation (murabba), candy, etc.



23.7 EUCALYPTUS SPECIES (SAFEDA, NILGIRI)

07223970423 Hornbillclasses@gmail.com

*Prosopis cineraria***		Khejari	Mimosaceae
*Prosopis juliflora***	Mesquit bean	Vilayati babul	Mimosaceae
*Pterocarpus marsupium***	Indian Kino	Bija, Bijasal	Fabaceae
Pterocarpus santalinus	Red sandalwood	Rakt chandan	Fabaceae
Quercus semicarpifolia	Brown oak	Moru, Ban Oak	Fagaceae*
Quercus incana	Grey oak		Fagaceae
*Rhizophora mangle***	Red mangrove		Rhizophoraceae***
*Ricinus communis****	Castor	Arand	Euphorbiaceae***
*Salix alba****	White willow	Bhusban	Salicaceae***
*Samania saman****	Rain tree, Monkey bread tree	Rain tree	Leguminosae
*Santalum album****	Sandal wood	Chandan	Santalaceae
*Sapindus indica****	Soap nut	Ritha	Sapindaceae*
*Saraca indica****	Ashoka tree	Ashoka	Caesalpiniaceae*
*Schleichera oleosa****	Lac tree	Kusum	Sapindaceae
*Semecarpus anacardium****	Marking nut	Bhilwa	Anacardiaceae
*Shorea robusta****	Sal	Sal, Saku	Dipterocarpaceae
*Swietenia mahoganii***	Mahogany		Meliaceae
*Syzygium cumini**	Java plum	Jamun	Myrtaceae
*Syzygium aromaticum****	clove	Laung	Myrtaceae***
*Tamarindus indica**	Tamarind	Chinch, Imli	Caesalpiniaceae
Taxus baccata	Indian yew	Yew (for Bow making)	Taxaceae
*Tectona grandis***	Teak	Sagwan, sag	Verbenaceae
*Terminalia arjuna**	Arjun	Arjun	Combretaceae
*Terminalia bellerica****	Bellerica myrobalam	Baheda, Harra	Combretaceae***
*Terminalia chebula****	Yellow myrobalam	Hirda, harar	Combretaceae
Toona ciliata	Cedrela tree, Indian Mahogany	toon	Meliaceae
*Vateria indica****	White dammar		Dipterocarpaceae
*Xylia xylocarpa****	Irul wood	Suria	Mimosaceae
*Ziziphus mauritiana****		Ber	Rhamnaceae

INDIAN FOREST SERVICE (IFOS) 2023

Ritvika Pandey

Forestry Comprehensive Course

Swastic Yaduvanshi

Forestry Comprehensive Course

Vidyanshu Shekhar Jha

Forestry Comprehensive Course + Test Series

Rohan Tiwari

Forestry Comprehensive Course

Shashank Bhardwaj

Forestry Comprehensive Course + Test Series

Ankan Bohra

Forestry Comprehensive Course

Prachi Gupta

Forestry Comprehensive Course

Raj Patoliya

Forestry Comprehensive Course + Test Series

Vineet Kumar

Forestry Comprehensive Course

Jatin Babu S

Forestry Comprehensive Course

Gaurav Saharan

Test Series

Yash Singhal

Forestry Comprehensive Course

Nitish Pratik

Forestry Comprehensive Course

Vaasanthi P.

Test Series

Sourabh Kumar Jat

Forestry Comprehensive Course

Ekam Singh

Forestry Comprehensive Course + Test Series

Kunal Mishra

Forestry Comprehensive Course

Atul Tiwari

Forestry Comprehensive Course

Aman Gupta

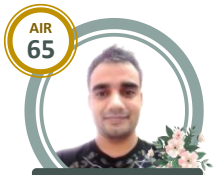
Forestry Comprehensive Course + Test Series

Sanket Adhao

Forestry Comprehensive Course

Preeti Yadav

Forestry Comprehensive Course



Nihal Chand

Forestry Comprehensive Course + Test Series

Shashikumar S. L.

Forestry Comprehensive Course

Dhino Purushothaman

Forestry Comprehensive Course

Diwakar Swaroop

Forestry Comprehensive Course

Rajesh Kumar

Forestry Comprehensive Course

Krishna Chaitanya

Forestry Comprehensive Course

Harveer Singh Jagarwar

Forestry Comprehensive Course

Akash Dhanaji Kadam

Forestry Comprehensive Course

Himanshu Dwivedi

Forestry Comprehensive Course

Sumit Dhayal

Forestry Comprehensive Course

Priyadarshini

Forestry Comprehensive Course + Test Series

64 Out of 147 Total Selections in

Indian Forest Service (IFoS) 2023

Congratulations

To all our successful candidates in

Kanika Anabh

Forestry Comprehensive Course | Test Series

Anubhav Singh

Forestry Comprehensive Course

Sanskar Vijay

Forestry Comprehensive Course

Satya Prakash

Test Series

Chada Nikhil Reddy

Forestry Comprehensive Course

Bipul Gupta

Forestry Comprehensive Course

Yeduguri Aiswarya Reddy

Forestry Comprehensive Course

Namratha N

Forestry Comprehensive Course

Divyanshu Pal Nagar

Forestry Comprehensive Course

Akanksha Puwar

Forestry Comprehensive Course

Yogesh Rajoriya

Forestry Comprehensive Course

G Prashanth

Forestry Comprehensive Course | Test Series

Kanishak Aggarwal

Forestry Comprehensive Course

Shashi Shekhar

Forestry Comprehensive Course

Vinay Budanur

Forestry Comprehensive Course

Shraddhesh Chandra

Forestry Comprehensive Course | Test Series

Kaore Shreerang Deepak

Forestry Comprehensive Course | Test Series

Javed Ahmad Khan

Forestry Comprehensive Course

Shruti Chaudhary

Forestry Comprehensive Course

Aravindkumar R

Forestry Comprehensive Course

Kishlay Jha

Forestry Comprehensive Course

Prabhutoshan Mishra

Forestry Comprehensive Course

Abhigyan Khaund

Forestry Comprehensive Course

52 Out of **143** Total Selections in

Indian Forest Service (IFoS) 2024

Online / Offline Batches

Comprehensive syllabus coverage and detailed analysis of PYQs

- Both online / Offline batches
- 2 years of validity with unlimited access.

Study Material

- PYQs and syllabus-based
- Color printed
- Generous use of visual Graphics
- Align with the latest trends and requirements of the exam

Test Series

Personalized feedback with detailed solutions and suggestions for each candidate, ensuring targeted improvement and success in exams.

Leader In Forest Services

A premier institute specializing in forest service exams, including IFoS, ACF, RFO, and ICFRE / ICAR–(ASRB) ARS/NET Examinations.