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2024

APPSC

FOREST RANGE OFFICER

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Module - 3

General Forestry – 2

[Unit – II] Forest Protection & Wildlife Biology

[Unit – III] Forest Utilization

[Unit – IV] Forest Economics & Forest Legislation

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To all our successful candidates in

MADHYA PRADESH FOREST SERVICE 2020

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GENERAL FORESTRY

MODULE – 3

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Module - 3

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PYQs

PAPER ANALYSIS

SYLLABUS

FOREST PROTECTION WILDLIFE BIOLOGY [GENERAL FORESTRY – II | UNIT – II]

- Injuries to forest - *abiotic and biotic destructive agencies*, insect — pests and disease, effects of air pollution on forests and forest dieback.
- Susceptibility of forests to damage, nature of damage, cause, prevention, protective measures and benefits due to chemical and biological control.
- General forest protection against fire, equipment and methods, controlled use of fire, *economic and environmental costs*;
- *Timber salvage operations* after natural disasters.
- Role of afforestation and forest regeneration in absorption of CO_2.
- Rotational and controlled grazing, different methods of control against grazing and browsing animals;
- Effect of wild animals on forest regeneration,
- Human impacts : Forest encroachment, poaching, grazing, live fencing, theft, shifting cultivation and control

FOREST UTILIZATION [GENERAL FORESTRY – II | UNIT – III]

- Traditional and improved/modern tools used in logging, wood seasoning, wood/timber preservation,
- Logging-transport methods,
- Physical properties of wood and their importance in the identification of timber species.
- Uses of important MFP/NTFP species available in the forests of A.P.
- List of plants known to be *antidotes of snake and scorpion poisoning*

FOREST ECONOMICS, FOREST LEGISLATION AND ADMINISTRATION [GENERAL FORESTRY – II | UNIT – VI]

- **Forest economics** – fundamental principles, cost-benefit analyses; estimation of demand and supply;
- **Forest economics** – investment planning, depreciation, working capital, types of costs viz., gross, fixed, variable, marginal & opportunity costs.,
- Methods employed for investment calculations such as Net surplus method, payoff time method, present value or capital value method, internal interest method, and capital cost method.
- **Forest Legislation**-History of forest development; the essence of Indian Forest Policy of 1894, 1952 and 1990. National Forest Policy -1988.
- **Forest laws**, necessity; general principles, AP Forest Act-1967; Forest Conservation Act-1980; Wildlife Protection Act-1972 and their amendments; Application of Indian Penal Code to Forestry.
- **Forest Administration** : Indian Forest Service, AP State Forest Service, AP State Forest Subordinate Services, AP Forest Department structure and activities

FOREST PROTECTION

PROTECTION AGAINST HUMAN

1. The term 'forest degradation' refers to [APPSC (RFO) 2022 General Forestry – II]
   (a) the process of natural forest recovery after disturbance
   (b) the reduction in forest area due to urbanisation
   (c) the decline in forest health and productivity over time
   (d) the intentional planting of fast-growing tree species
2. Alternation and destruction of natural habitats is the key human activity that leads to [APPSC (ACF) 2022 General Forestry – II]
   (a) Pollution of the environment
   (b) Hunting of valuable wildlife products
   (c) Introduction of alien species
   (d) The extinction of wildlife
3. Which of the following is NOT a man-made disaster in India? [APPSC (RFO) General Forestry Paper - II 2018]
   (a) Boat capsizing
   (b) Forest fire
   (c) Building collapse
   (d) Cyclones
4. The fragmentation of forest ecosystems due to human activities can lead to [APPSC (RFO) 2022 General Forestry – II]
   (a) Increased species diversity
   (b) Enhanced gene flow between fragmented areas
   (c) Decreased habitat quality and loss of biodiversity
   (d) Improved ecosystem resilience and stability
5. Shifting cultivation is locally called _____ in Malaysia [APPSC (ACF) 2022 General Forestry – I]
   (a) Hanumo
   (b) Ladang
   (c) Karen
   (d) Milpa
6. Which layer of the forest typically experiences the most intense burning during a fire? [APPSC (RFO) 2022 General Forestry – II]
   (a) Canopy
   (b) Understory
   (c) Tree roots
   (d) Forest floor
7. Forest fire spreading slowly over the ground with low flame is called …….fire. [APPSC (Forest Section Officers) 2019]
   (a) Ground
   (b) Crown
   (c) Creeping
   (d) Surface
8. Fire triangle consists of which of the following? [APPSC (RFO) General Forestry Paper - II 2018]
   (a) Biotic factor, ignition and temperature
   (b) Hazard, oxygen and biotic factor
   (c) Fuel, biotic factor and oxygen
   (d) Fuel, oxygen and temperature
9. In moist teak forests, adverse effect on natural regeneration of teak is due to …… [APPSC (ACF) 2022 General Forestry – I]
   (a) Indiscriminate use of weedicides
   (b) Poor management of trees
   (c) Indiscriminate tree felling
   (d) Indiscriminate fire protection
10. Which of the following is a natural method of preventing forest fires? [APPSC (RFO) 2022 General Forestry – II]
    (a) Controlled burning
    (b) Smokey bear campaigns
    (c) Fire-fighting helicopters
    (d) Fire-resistant tree species
11. Controlled burning in a forests is …… [APPSC (Forest Section Officers) 2019]
    (a) Integrated control
    (b) Biological control
    (c) Silvicultural operation
    (d) Chemical control
12. What is the most effective way to prevent human-caused forest fires? [APPSC (RFO) 2022 General Forestry – II]
    (a) Enforcing strict penalties for arson
    (b) Promoting fire safety education
    (c) Increasing forest patrols
    (d) Planting fire-resistant tree species
13. Which sensors are used by Forest Survey of India to identify forest fire in India? [APPSC (ACF) 2022 General Forestry – II]
    (a) High Resolution Infra-Red Radiation Sounder and Suomi-National Polar-orbiting

Partnership - Visible Infrared Imaging Radiometer Suite

(b) Moderate Resolution Imaging Spectro-radiometer and Suomi-National Polar orbiting Partnership - Visible Infrared Imaging Radiometer Suite

(c) High Resolution Optical Imager and Moderate Resolution Imaging Spectroradiometer

(d) High Resolution Optical Imager and High Resolution Infra-Red Radiation Sounder

14. What are the names of the satellite-based modules used for near real-time monitoring of forest fires by the Forest Survey of India? [APPSC (RFO) General Forestry Paper - II 2018]

(a) MODIS and SNPP-VIIRS
(b) MODIS and SNPV
(c) LISS III and MODIS
(d) LISS III and SNPV

15. What is the spatial resolution of LISS III sensor? [APPSC (ACF) 2022 General Forestry – II]

(a) 24 m
(b) 80 m
(c) 30 m
(d) 10 m

PROTECTION AGAINST ANIMALS

16. The animals dwelling in _____ ecosystem show gregariousness, keen sight and swift running. [APPSC (Forest Section Officers) 2019]

(a) Aquatic
(b) Grassland
(c) Desert
(d) Forest

17. Of succulent feeds, ……is the most convenient and economic method for maintaining larger livestock [APPSC (Forest Section Officers) 2019]

(a) pasture
(b) Cultivated fodder tree
(c) Cultivated fodder crops
(d) Silage

18. Which type of farming is used to restore soil fertility in India's drylands? [APPSC (Forest Section Officers) 2019]

(a) Co-operative farming
(b) Irrigation farming
(c) Ley farming
(d) Plantation farming

19. Dhadabgao and Sankarnarayan (1973) classified the grasslands of India broadly into [APPSC (ACF) 2022 General Forestry – I]

(a) 4 types
(b) 5 types
(c) 6 types
(d) 7 types

20. The anthropogenic activity that poses a threat to grassland ecosystems is [APPSC (RFO) 2022 General Forestry – II]

(a) Planting more trees to increase biodiversity
(b) Promoting controlled grazing by herbivores
(c) Overgrazing by livestock
(d) Implementing conservation measures

21. What is the primary factor responsible for the formation of grasslands? [APPSC (RFO) 2022 General Forestry – II]

(a) High annual precipitation
(b) Rich soil with high organic content
(c) Extreme temperature fluctuations
(d) Insufficient rainfall to support tree growth

22. What is the primary benefit of rotational grazing? [APPSC (RFO) 2022 General Forestry – II]

(a) Increased forage production
(b) Increased animal reproduction
(c) Reduced infectious disease in animals
(d) Improved soil texture

23. The primary purpose of controlled grazing is to [APPSC (RFO) 2022 General Forestry – II]

(a) Improve livestock socialisation
(b) Maximise forage utilisation
(c) Minimise the need for feed supplement
(d) Control invasive plant species

24. Which of the following statements is true about rotational grazing? [APPSC (RFO) 2022 General Forestry – II]

(a) It requires large amount of land.
(b) It leads to overgrazing of certain areas.
(c) It can help control parasites in livestock.
(d) It is not suitable for maximising forage utilisation

25. …… is called as 'alfalfa of the tropic' because of its nutritious fodder [APPSC (Forest Section Officers) 2019]

(a) *Leucaena leucocephala*
(b) *Erythrina variegate*
(c) None of the above

(d) *pithecelobium dulce*

26. Among the browsing animals,…….. is the most destructive animal destructing the forests. [APPSC (Forest Section Officers) 2019]
(a) Bullock
(b) Cow
(c) Buffalo
(d) Goat

27. ……is an micro-ingredient included in animal feed in relatively small amounts with specific physiological and nutritional value. [APPSC (Forest Section Officers) 2019]
(a) Prebiotics
(b) Anti oxidant
(c) Pronutrient
(d) Probiotics

28. The grasslands found in Argentina are called: [APPSC (RFO) General Forestry Paper - II 2018]
(a) Savannas
(b) Prairies
(c) Steppes
(d) Pampas

PROTECTION AGAINST INJURIOUS INSECTS

29. _____ is the scientific name of the teak defoliator [APPSC (ACF) 2022 General Forestry – I]
(a) *Lymantria mathura*
(b) *Hyblaea puera*
(c) *Eutectona machaeralis*
(d) *Trabala vishnou*

30. Which of the following pests feeds on the bark of Gmelina arborea and forms tunnels in the wood? [APPSC (ACF) 2022 General Forestry – I]
(a) *Alcidodes ludificator*
(b) *Indarbela quadrinotata*
(c) *Tingis beesomi*
(d) *Calopepla leayana*

31. Spike disease of sandalwood (Santalum album) is caused by [APPSC (ACF) 2022 General Forestry – I]
(a) Fusarium moniliformae
(b) Fusarium oxysporum
(c) Rhizoctonia solani
(d) Phytoplasma

32. _____ is a typical example of bark beetle causing defect in timber [APPSC (ACF) 2022 General Forestry – II]
(a) lyctus
(b) Xyleborus
(c) sinoxylon
(d) xylotrechus

33. Which insect is known to attack and damage the bark of trees, leading to tree decline? [APPSC (RFO) 2022 General Forestry – II]
(a) Leaf miners
(b) Sawflies
(c) Bark beetles
(d) Fire ants

34. …….. is popularly known as teak skeletonizer. [APPSC (Forest Section Officers) 2019]
(a) *Ectropis deodarae*
(b) *Hyblaea puera*
(c) *Eutectona machaeralis*
(d) *Ips longifolia*

35. Dying back phenomenon is not observed in one of the following species [APPSC (Forest Section Officers) 2019]
(a) *Shorea robusta*
(b) *Terminalia tomentosa*
(c) *Pterocarpus santalinus*
(d) *Tectona grandis*

36. …… are root feeders which kill the seedlings by destruction of rootlets or removal of bark of tap root. [APPSC (Forest Section Officers) 2019]
(a) Cock chafers
(b) Crickets
(c) Thrips
(d) Cutworms

37. _____ invades monoculture of *Ailanthus excels* causing defoliation. [APPSC (RFO) General Forestry Paper - II 2018]
(a) *Ascotis imparta*
(b) *Tonica niviferana*
(c) *Atteva fabriciella*
(d) *Plecoptera reflexa*

38. Which of the following is also called the teak skeletoniser? [APPSC (RFO) General Forestry Paper - II 2018]
(a) Hyblaea puera
(b) Mycosphaerella pini
(c) Eutectona machaeralis
(d) Plecoptera reflexa

(d) Prevention of cruelty to animals

150. Hazardous waste (Management & handling) rules came into existence in the year [APPSC (Forest Section Officers) 2019]

(a) 1988
(b) 1989
(c) 1987
(d) 1990

151. The first JFM guidelines was issued by MoEF in the year ……. [APPSC (Forest Section Officers) 2019]

(a) 1992
(b) 2000
(c) 1990
(d) 1996

152. ……. is not included in the definition of forest produce under section (2) of the Indian Forest Act, 1927 [APPSC (Forest Section Officers) 2019]

(a) Fish
(b) Resin
(c) Timber
(d) Honey

153. The protection of plant varieties and framers rights act was enacted by the parliament of India in [APPSC (FRO) 2018 General Forestry Paper - I]

(a) 2000
(b) 2001
(c) 2002
(d) 2003

154. The convention on biological diversity entered into force on: [APPSC (FRO) 2018 General Forestry Paper - I]

(a) 29 December 1992
(b) 28 December 1993
(c) 29 December 1993
(d) 28 December 1992

155. Which of the following is NOT a Protected Area in India constituted under the provisions of Wildlife (Protection) Act, 1972? [APPSC (FRO) 2018 General Forestry Paper - I]

(a) National parks
(b) Community reserves
(c) Conservation reserves
(d) Biosphere reserves

156. The policies and guidelines of the joint forest management are enunciated in [APPSC (FRO) 2018 General Forestry Paper - I]

(a) The national forest policy of 1952
(b) The national forest policy of 1988
(c) The forest (conservation) act, 1972
(d) The biodiversity act, 2002

157. _____ of Wildlife Protection Act (1972) deals with the National Tiger Conservation Authority [APPSC (RFO) General Forestry Paper - II 2018]

(a) Chapter IIIB
(b) Chapter VI B
(c) Chapter IV B
(d) Chapter VB

158. Which section of the Indian Forest Act,1927, deals with the following: 'Persons enjoying benefits out of forests are bound to take steps to extinguish any forest fire'? [APPSC (RFO) General Forestry Paper - II 2018]

(a) Section 33 (1) (d)
(b) Section 33 (2)
(c) Section 26 (1) (c)
(d) Section 79 (1)

159. According to the Wildlife Protection Act, 1972, which section deals with the 'declaration and management of a conservation reserve'? [APPSC (RFO) General Forestry Paper - II 2018]

(a) Section 38 B
(b) Section 12 A
(c) Section 36 A
(d) Section 34 A

160. Eco-sensitive zones are declared under which act? [APPSC (RFO) General Forestry Paper - II 2018]

(a) Wildlife (Protection) Act, 1972
(b) Environmental (Protection) Act, 1986
(c) Forest (Conservation) Act, 1980
(d) Indian Forest Act, 1927

161. The Central Board for Prevention and Control of Water Pollution was constituted in which year? [APPSC (RFO) General Forestry Paper - II 2018]

(a) 1974
(b) 1986
(c) 1981
(d) 1972

FOREST ADMINISTRATION

162. Which of the following statements is true about Girijan Cooperative Corporation? [APPSC (RFO) 2022 General Forestry – II]

(a) It is the marketing wing of Andhra Pradesh Forest Department

(b) It is the main purchaser of Bamboo from Andhra Pradesh Forest Department.

(c) It pays royalty to Andhra Pradesh Forest Department for collection and sale of non-timber forest product.

(d) It has full right to collect and sale non-timber forest products in Andhra Pradesh.

ANSWER KEY

1. c	2. d	3. d	4. c	5. b	6.	7. c	8. d	9. d	10. a	11. c	12. b
13. b	14. a	15. a	16. b	17. a	18. c	19. b	20. c	21. d	22. a	23. b	24. c
25. a	26. d	27. c	28. d	29. b	30. b	31. d	32. b	33. c	34. c	35. d	36. a
37. c	38. c	39. a	40. d	41. c	42. c	43. a	44. b	45. c	46. c	47. b	48.a,b
49. b	50. c	51. d	52. c	53. a	54. c	55. a	56. b	57. a	58. a	59. a	60. b
61. d	62. d	63. b	64. a	65. c	66. b	67. b	68. d	69. c	70. d	71. c	72. c
73. c	74. d	75. a	76. c	77. d	78. a	79. a	80. a	81. c	82. b	83. d	84. a
85. c	86. c	87. c	88. a	89. b	90. b	91. d	92. d	93. a	94. a	95. a	96. d
97. a	98. c	99. a	100. c	101. b	102. a	103. b	104. c	105. c	106. b	107. d	108. c
109. b	110. c	111. a	112. b	113. a	114. c	115. b	116. b	117. c	118. d	119. d	120. a
121. b	122. c	123. b	124. d	125. c	126. d	127. a	128. c	129. c	130. c	131. c	132. b
133. b	134. c	135. b	136. b	137. a	138. b	139. c	140. b	141. a	142. b	143. b	144. c
145. b	146. c	147. c	148. a	149. c	150. b	151. c	152. a	153. b	154. c	155. d	156. b
157. c	158. d	159. c	160. b	161. a	162. c						

CHAPTER 1

FOREST PROTECTION
INTRODUCTION

1.1 FOREST DISASTERS

HAZARD : A dangerous event, natural or man-induced, that could cause injuries, loss of life, damage of property, livelihood, or environment in a definite area. Events may be –

- **Natural**, e.g., Tsunami, Volcanic eruption, Earthquake, etc.
- **Man-induced**, e.g., Pollution, Flood, Drought, etc.

DISASTER : When a *natural* or *human-induced event* causes *widespread human loss*, accompanied by loss of livelihood, property, and the environment *in a definite area*.

- Means that an event becomes a disaster only when it happens at such a wide scale that the forest ecosystem is unable to cope with it, causing complete disruption of the normal functioning of the forest ecosystem.

[A **forest disaster** is a large-scale event that causes significant damage to a forest ecosystem]

Mt. Merapi volcano erupts, Indonesia, March 2023

Bhopal gas tragedy

The U.S. military used **Agent Orange**, a herbicide and defoliant, during the Vietnam War from 1962 to 1971.

TYPES OF FOREST DISASTERS

Based on speed

- Slow onset : Takes months/Years – Drought, Environmental / Forest degradation.
- Rapid onset : Triggered instantaneous – Cyclone, Landslide, Forest fire, etc.

Based on the agency

- Natural : Tsunami, Cyclones
- Man-induced : Forest fire

Based on the area of damage

- Climatic disasters : Drought, Flood in the Low lying area, Cyclone, Hail storm, Heatwave
- Geological disasters : Landslides, Volcanic eruptions, etc.
- Hydrological disasters : Tsunami, Limnic eruptions, etc.
- Man-induced : Forest fire, Heavy metal poisoning, etc.

CHAPTER 2

PROTECTION AGAINST INJURIES BY MAN

On the one hand, man is responsible for the establishment and cultivation of new forests, as well as the regeneration and sustainable management of natural forests in a scientific manner. However, on the other hand, man is also the primary cause of damage and destruction to these forests. Due to human activities, numerous forests around the world have already vanished, and some continue to be destroyed even today

KINDS OF DAMAGES BY MAN (ANTHROPOGENIC)

- Deforestation
- Shifting cultivation
- Illicit felling and illicit removal of forest produce
- Forest fire
- Encroachment
- Defective management
- Other damages, such as *lopping*, *removal of leaf litter*, *removal of flowers* and fruits, *poaching*, *environmental pollution*, etc.

10.1 | DEFORESTATION

DEFINITION : Deforestation is defined as the *removal of tree crops* from a piece of land *without the intention of reforesting*. The damaging or removal of forest vegetation to such an extent that it failed to support its natural flora and fauna.

CAUSES OF DEFORESTATION

- *Diversion of forest land for non-forestry purposes* – like river valley projects, *Dams*, *Roads*, *Communication Lines*, *Railway Tracks*, *Mining*, etc. which have done a lot of damage to the forests. Since independence about. [*Major causes = Expansion of Agriculture land*]

  Example : Establishment of fruit belts in hills, *i.e.*, Chamba-Mussoorie fruit belt of UP govt during the 1960s clear large area of deodar-oak forest of Shivalik and lesser.

  About 7.5 million hectares of forest land has been diverted for non-forestry uses since independence, of which approximately *4.5 million ha* was diverted between 1950-1980 and *2.8 million hectares* from 1980 to 2000. The central government admitted that *in 2019, 11500 hectares of forest land had been diverted in 22 states*.

- *Forest Fire* : both natural and accidental. In 2016, about a 4500-hectare area was burnt in Uttarakhand due to a forest fire. The fire in Australia (2020) destroyed 18.6 million hectares of land and killed nearly three billion terrestrial vertebrates.

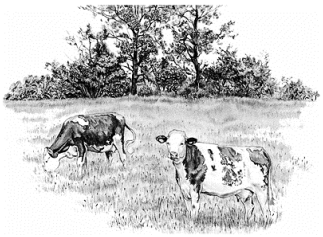
CHAPTER 3

PROTECTION AGAINST INJURIES BY ANIMALS

Animals cause damage to forests through grazing, browsing, debarking, trampling of plantations, and new growth.

Domestic animals often enter the forest to graze, which can have significant negative impacts on both the forest and its wild inhabitants. One major concern is the potential spread of diseases from domestic animals to wild animals. Additionally, domestic animals can inadvertently introduce new weed species by carrying the seeds on their bodies.

3.1 GRAZING



Grazing

Grazing refers to feeding leaves and twigs of plants such as grasses and herbs.

SIGNIFICANCE

- The backbone of the rural economy by providing milk, food, meat, and workforce.
- Contribute 6 % of GDP and 25 % of agricultural GDP.

Browsing

GRAZING PATTERN

(1) **Migratory grazing** : In this grazing, animals move from a higher to a lower altitude in winter seasons to avoid cool weather conditions uphill and go back to hills in summer (*i.e.*, Bakarwals in HP, Van Gujjar in JK).

- *Kharak* system in Uttarakhand, *Gol* system in Rajasthan,

(2) **24 hour grazing** : In this, livestock remains inside the forest throughout the day. After the end of the designated period, animals are captured again for domestic use.

(3) **Day grazing** : Here, animals are allowed inside the forest in the daytime for grazing. In the nighttime, livestock is returned back to cattle sheds located near the human settlements.

(4) **Penning and stall feeding** : In this kind, fodder is collected from the forest and fed to the cattle in the cattle shed itself. Animals are not allowed to go out of the cattle shed.

► **GRAZING SYSTEM**

(1) **Continuous grazing** : In this grazing, the area subjected is *allowed for grazing throughout the year* without any control or regulation measures. This is not advisable because *continuous grazing*

CHAPTER 4

PROTECTION AGAINST INJURIES BY AINSECTS

Insects are a significant threat to forests as they cause a lot of damage. They can harm plants at any stage of growth, from the time the seeds are planted until the final product is ready. Some insects like weevils and moths can even attack the seeds before they are collected. The deterioration of seeds due to insect infestation can continue during storage as well.

4.1 HARPFUL POLYPHAGOUS INSECTS

- **Termites (White ant)** : Species - *Odontotermis* obesus & *Microtermis* mycophagus
  - Order : *Isoptera*
  - Harmful stage : ~~Larvae~~ / ~~Pupae~~ / **Adult only** / ~~All~~
  - Caste responsible for all types of damages : ~~Larvae~~ / **Workers** / ~~Queen~~ / ~~Soldiers~~.
  - Termite problems are more serious in *Arid and Semi-arid* conditions/Sandy and Sandy loam soil.
  - Positive Role of Termite in *Nutrient Recycling*
  - Chemical control can be achieved by spraying *Aldrin* and *Chloropyriphos*.

Termite

White grub

- **White Grub** or **Chaffer Beetle** or **June Beetle** or **Cock Chaffer** : It is a ***soil-dwelling*** *root feeder polyphagous* larva.
  - Order : Coleoptera
  - Example : *Holotrichia Consanquinea****
  - Serious Nursery paste of ***Teak, Sal, Deodar***, *Babool*, *Ber* and *Khejari*.
  - Attackers stage : Grub (Root feeder, attack on seedlings), Adult (Leaf feeder).

Cut-worm

- **Cut-worm** (*Agrotis ipsilon*) : The *caterpillar* is mainly active *during the night* and *cut young shoots near the base* to suck sap.
  - It attacks primarily on - Acacia, Albizzia, Prosopis (AAP), and Eucalyptus.

Inderbela quadrinotata

- **Bark-eating caterpillar (*Xyleborous*)** : Caterpillars such as the *Inderbela quadrinotata* consume the bark of many species and form shelters around it.
  - Attacks on Acacia, Albizzia, Prosopis (AAP), and Ziziphus.

CHAPTER 1

WOOD SCIENCE & TECHNOLOGY

INTRODUCTION

Forest utilization is defined as the *process of harvesting, conversion, transportation and disposal of forest produce. It includes the market and manufacturing of various usable commodities*[***] from it.

1.2 HISTORICAL BACKGROUND

Upto 1860s

Until this time, Forest clearing was common, and timber extraction was common for fuel and construction purposes. It was largely unorganized and merchants only had to pay a nominal fee for timber extraction. The extraction itself was limited to a few specific species such as Teak, Sal, Sandalwood, and Rosewood (*Dalbergia latifolia*). Axes served as the primary tools for cutting, resulting in significant wastage.

From 1860s to 2nd World War

During this time, *forest departments were established* in all states to ensure systematic working and conservation efforts. The period witnessed a *significant increase in the demand for timber, driven by both infrastructural needs such as railway sleepers and domestic requirements*. Additionally, advancements in forest engineering allowed for logging in previously inaccessible areas.

The *introduction of modern tools for timber extraction greatly improved efficiency in the process*. Furthermore, the demand for timber escalated during the World Wars, leading to an increase in its price. This shift in the market dynamics brought attention to wood-based industries. As the cost of timber rose, efforts were made to *explore alternative materials in order to reduce production costs* for end products.

CHAPTER 4 WOOD PROPERTIES

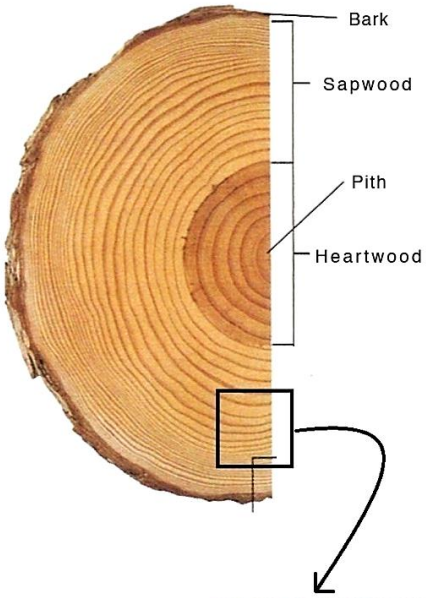
WOOD PROPERTIES

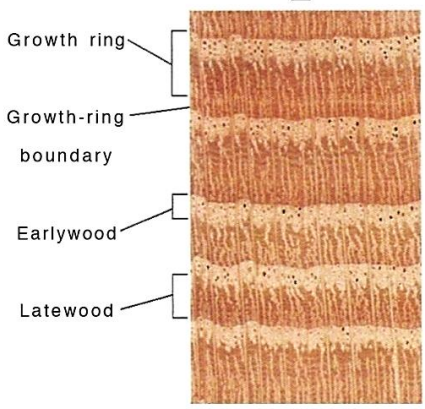
Gross structural	Minute structural	Gross physical	Mechanical	Chemical properties

GROSS STRUCTURAL

Gross structural means what we can easily identify when we see a timber (log) through the naked eyes

- Bark
- Pith
- Sapwood & heartwood
- Growth rings or Annual rings
- Spring and Autumn wood
- Grains & Textures





- **Bark** : the *outermost part* of the timber. The outer part is usually dead and has diagnostic value (Species identification).
- **Pith** : *Small soft mass of tissue in the central portion*** of tissue, usually lighter in colour. It neither has any specific function nor any diagnostic value.
- **Sapwood & Heartwood** : *Sapwood (Alburnum)* is the *Lighter, younger outer portion* of a tree trunk. Composed mostly of living cells and, as its name implies, is for the conduction of sap (liquids), and storing food.

  Heartwood (Duramen) is the *central dark part* of the wood that has become heavier and darker due to the deposition of gum, resin, oil, and chemicals.

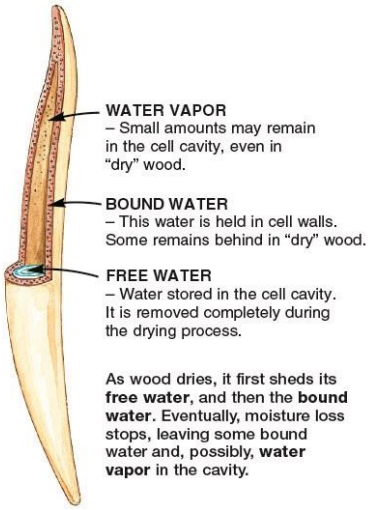
Sapwood (Alburnum)	*Heartwood (Duramen)*
It forms the outer wood part	It forms the central wood part
It is light–coloured	It is dark–coloured
Lighter in weight	Heavier /Denser
It contains living cells	Dead cells

CHAPTER 5 WOOD SEASONING

Seasoning refers to the process of *removing excess moisture*[***] that is presented in timber in its green state. Green timber typically contains moisture content ranging from *50 to 200%.* In well-seasoned timber, *10 to 12 % (as per ISI code)*. [For doors and windows, the recommended moisture content for wood is between *10 – 20%.*]

► **HOW WATER IS HELD IN WOOD**

- **Free water**[***] : held by capillary action inside the free space in the cells and fibres
- **Bound water** : Absorbed by the chemical substance of cell walls.
- **Water vapours**



► **DETERMINATION OF MOISTURE CONTENT IN WOOD**

$$\text{Moisture Content} = \frac{wet\ weight - oven\ dry\ weight}{oven\ dry\ weight} \times 100$$

► **OBJECTS OF SEASONING** (Advantages)

- To reduce the risk of fungal and insect attacks
- To reduce weight = ↓ transportation cost
- To avoid seasoning defects like shakes, splits, and cracks = *More dimensional stability*[***]
- To secure proper penetration of preservatives.
- To make timber fit to receive painting and
- Controlling the drying rate and regulating it within limits so that the wood seasons with the least possible damage.

► **FACTORS AFFECTING THE SEASONING PROCESS**

- Temperature, Humidity, and Air Circulation
- Nature of woods and its staking pattern
- Adopted Seasoning methods
- Market/Industrial requirements & Size
- Availability of required infrastructure

5.2 SEASONING DEFECTS

➢ **Shrinking & Swelling** : Occur as the wood changes its moisture content in response to both daily and seasonal fluctuations in the relative humidity of the atmosphere, *i.e.*, when the air is humid, wood absorbs moisture and swells; when the air is dry, wood loses moisture and shrinks.

CHAPTER 2

FOREST MARKET

SYLLABUS : Analysis of trends in the national and international market and changes in production and consumption patterns. Assessment and projection of market structures.

- MARKET : an area or place where buying and selling of various goods and commodities taken place.
- MARKET STRUCTURE : The term *structure* refers to something that has organization and dimension (*i.e.*, shape, size and design), and which is evolved for the purpose of performing a function. By the term *market structure*, we refer to *the organizational characteristics of a market including its size, design and manner of operation that affect the nature of competition and pricing, and the operations of business firms*.

COMPONENTS OF MARKET STRUCTURE

1. Concentration of Market Power – means, the element that determining the nature of competition, Conduct & performance of the market. This is measured by the number and size of firms existing in the market. A high degree of market concentration restricts the movement of goods between buyers and sellers at fair and competitive prices, and creates an *oligopoly**** or *oligopsony**** situation in the market.
2. Degree of Product Differentiation - Homogeneous or other nature of the product affects the market structure. If products are homogeneous, the price variations in the market will not be wide. When products are heterogeneous, firms have the tendency to charge different prices for their products.
3. Conditions for entry of Firms in the Market - Sometimes, a few big firms do not allow new firms to enter the market or make their entry difficult by their dominance in the market.
4. Flow of Market Information - A well-organized market intelligence information system helps all the buyers and sellers to freely interact with one another in arriving at prices and striking deals.
5. Degree of Integration - The behavior of an integrated market will be different from that of a market where there is no or less integration either among the firms or of their activities. Firms plan their strategies in respect to the methods to be employed

Monopoly (mono = Single + Poly = Supplier) : a market situation where a specific person or enterprise is the only supplier of a particular commodity.

Oligopoly (some suppliers) - a market situation when there are only a few suppliers (sellers) for the supply of goods or services

Monopsony (Single buyer) - a market situation where a specific person or enterprise is the only buyers of a particular commodity

Oligopsony = few buyer

Perfect (Open) market : a market structure, where a large number of small firms compete against each other. In this scenario, a single firm does not have any significant market power.

CHAPTER 1 FOREST POLICIES

SYLLABUS : History of forest development**;** Essene of Indian Forest Policy of 1894, 1952 and 1988. National Forest Policy 1988.

1.1 HISTORY OF FOREST ADMINISTRATION

- *Chandragupta Maurya* was the first king who made an effort to look after the forest of his kingdom by appointing Kupyadhyaksha.

  Kautilya *Arthashastra* : head of forest dept "Kupyadhyaksha" assisted by several *vanpalas* (Forest guards). They classified forest into four parts (1) forest reserve for the king, (2) reserve forest for the state, (3) forest donated to the Brahmins, and (4) forest for the public.

- **GUPTA PERIOD** (4^{th} – 5^{th} Century AD)

- **DURING ISLAMIC RULE**

- **BRITISH RULE** : The destruction of forests began during colonial rule, fuelled by the Industrial Revolution, politics, religion, and greed.

  In 1890, the colonial government appointed Dr. Volker to study Indian agriculture. This was due to the rise of Congress and nationalism. Dr. Volker presented his report "Reforms in Indian Agriculture" in 1893. The report included a separate chapter on forests (Chapter 8), which laid the foundation for the forest policy of 1894. The report aimed to suggest ways to improve Indian agriculture.

1.2 FOREST POLICY 1894***

► **BACKGROUND** : Dr. Voelker's report (1893) on Indian agriculture.

► **SALIENT FEATURES**

- The main object of forest management is – to promote the general well-being of the country.
- The maintenance of adequate forests is dictated primarily for the preservation of the climatic and physical conditions of the country and also for meeting the basic requirements of the people.
- The government-owned forests have been classified in this forest policy as -
- Preservation of the climatic and physical conditions of the country

Function

(1) *Forests whose preservation is required* on climatic and physical grounds.
(2) *Forests for supplying* valuable timber for commercial purposes.
(3) *Minor forests*.
(4) *Pasture lands*.

	notification.
Chapter 7 : Control of timber and other forest produce in transit	Section 41 : Control over all river and land transportation
Chapter 8 : **Collection of Drift and standard timber*****	
Chapter 9 : Penalty and procedure***	**Section 52*** : Seize any property *i.e.* tools, boats, cattle. **Section 63** : Penalty for counterfeiting or defacing marks on trees and timber and for altering boundary marks
Chapter 10 : **Cattle trespass*****	**Section 70** : Cattle-trespass Act, 1871, to apply
Chapter 11 : **Forest officers*****	**Section 74** : Indemnity for acts done in good faith — No suit shall lie against any public servant for anything done by him in good faith under this Act
Chapter 12 : Subsidiary rules	Section 76 : state govt may make rules
Chapter 13 : Miscellaneous : **Section 79***** : Persons bound to assist Forest-officers and Police-officers — who exercises any right in a reserved or protected forest ➢ Extinguish forest fire in the vicinity of such forest + spread information + Assist the Forest-officer or Police-officer demanding his aid. ➢ Preventing any forest-offence	

2.2 FOREST CONSERVATION ACT (1980)

Preamble

(1) Conservation of forests and, (2) matters connected therewith

(2) Enable achievement of national targets of **Net Zero Emission by 2070** and maintain or enhance the forest carbon stocks through ecologically balanced sustainable development.

(3) Nationality Determined Contribution targets of the country envisage creating a carbon sink of additional 2.5 to 3.0 billion tons of CO_2 equivalent by 2030

(4) Increase in the forest and tree cover to one-third of its land area

Forest (Conservation) Amendment Act 2023 | 4th August 2023

1. **SHORT TITLE, EXTENT, AND COMMENCEMENT** -

(1) This Act may be called the "~~Forest (Conservation) Act, 1980~~" [Now, Van (Sanrakshan Evam Samvardhan) Adhiniyam 1980]

(2) It extends to the *whole of India* ~~except the State of Jammu and Kashmir~~.

(3) It shall be deemed to have come into force on the **25th day of October 1980*****.

CHAPTER 3

OTHER RELATED LAWS

Before the enactment of the IPC, the criminal laws in India were not uniform and followed the European, Mohammedan, and Local laws. It was thus decided that a uniform criminal law should be framed. *Macaulay* was entrusted with this task, and the IPC came into operation from 1862. It is now the substantive criminal law of the country.

[Indian penal code – enacted on 6 October 1860. However, commenced by 1 January 1862]

The Cr. PC is primarily an adjective law of procedure that provides the mechanism for the punishment of offenders by -

* Creating different grades/levels of courts and defining their powers.
* Laying down the duties of the police in the investigation of offenses, arresting offenders, and producing them before the court of law.
* Framing rules of procedure for the production of documents and other matters.

Indian penal code (IPC)

It was drafted by *Macaulay,* who presided over the *first Indian law commission*. The IPC is considered to be one of the most detailed criminal laws in the world. Its coverage includes –

1. Criminal conspiracy
2. False evidence
3. Criminal tress passing
4. Murder, attempt to murder
5. Mischief
6. Counterfeiting
7. Abetment
8. Wrong confinement
9. Theft
10. Unlawful assembly and many more

Applicability of IPC in forest laws/offenses: The Indian Forest Act and Wildlife (Protection) Acts are fairly comprehensive and cover most types of offenses in connection with forests and wildlife, the IPC is also applicable both directly and indirectly to forest offenses/laws and forest administration. This includes the following offenses where the provisions of the IPC are attracted –

- Theft of timber from government sale depots outside the limits of a forest.

Aman Patidar

Devesh Trivedi

Arvind Singh Thakur

Sachin Bhondele

Jaikishan Sharma

Gaurav Trivedi

Durgesh Jee Pandey

Sourabhn Kumar Chourasiya

Anita Surwayamshi

Rohit Sharma

Pooja Baghel

Ravikant SIrvaiya

Pushparaj Singh Sikarwar

Shubham Kulhade

Ashish Singh Sikarwar

Anupam Mishra

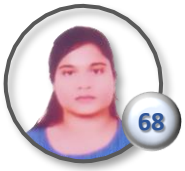
Amar Singh Bhadoriya

Somesh Sharma

Keshav Meena

Sunil Singh Jadon

Atul Kumar Patel



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Neeraj Amb

Rohit Nagar

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Deepak Bhadrasen

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Abhijeet Sankla

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Sachin Dodwe

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Vipin Verma

Tushar Shinde

Ashutosh Raj

Jeena Sri Jaswanth Chandra

Ashitosh Gupta

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