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FORESTRY

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JPPSC
JHARKHAND

STATE FOREST SERVICE

2024 - 25

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Module - 6

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- Forest Utilization
- Forest Legislation
- Forest Economics
- Wildlife Biology

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JPSC FOREST SERVICE (MAIN) EXAM 2024–25

FORESTRY

MODULE - 6

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EDITION : 2024 – 25

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SYLLABUS

Indian Forest Service (IFoS) [Paper 2 | Section B] **Jharkhand PSC (ACF) 2024–25** [Paper 2 | Section B] **Jharkhand PSC State Forest Service (RFO) 2024–25** [Paper 2]	***Forest Protection & Wildlife Biology*** : ◈ ***Injuries To Forest*** – abiotic and biotic, destructive agencies, insect-pests and disease, effects of air pollution on forests and forest die back. ◈ ***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*** – encroachment, poaching, grazing, live fencing, theft, shifting cultivation and control. ***Forest Resources & Utilization*** : Environmentally sound forest harvesting practices; logging and extraction techniques and principles, transportation systems, storage and sale. Anatomical structure of wood, defects and abnormalities of wood, timber identification – general principles. ◈ Need and importance of ***Wood Seasoning and Preservation***; general principles of seasoning, air and kiln seasoning, solar dehumidification, steam heated and electrical kilns. ◈ ***Composite Wood*** – adhesives - manufacture, properties, uses, plywood manufacture-properties, uses, fibre boards-manufacture properties, uses; particle boards manufacture; properties, uses. Present status of composite wood industry in India and future expansion plans. ◈ ***Non-Timber Forest Products*** (NTFPs) – definition and scope; gums, resins, oleoresins, fibres, oil seeds nuts, rubber, canes, bamboos, medicinal plants, charcoal, lac and shellac, Katha and Bidi leaves, collection; processing and disposal. ◈ ***Pulp Paper*** and ***Rayon*** – present position of supply of raw material to industry, wood substitution, utilization of plantation wood; problems and possibilities. ***Forest Policy*** : ◈ ***History*** of forest development ◈ Indian ***Forest Policy*** of 1894, 1952 and 1988. National Forest Policy 1988 of People's involvement, Joint Forest Management, Involvement of women; Forestry policies and issues related to land use, timber and non-timber products, sustainable forest management; industrialisation policies; institutional and structural changes. ◈ ***Decentralization*** and Forestry Public Administration. ◈ ***Forest Laws*** : necessity, general principles, Indian Forest Act 1927; Forest Conservation Act, 1980; Wildlife Protection Act 1972 and their amendments ◈ Application of ***Indian Penal Code*** to Forestry. ***Forest Economics*** : ◈ ***Fundamental Principles***, Cost-benefit analyses; Estimation of demand and supply; ◈ Analysis of ***Trends*** *in the* ***National*** *and* ***International Market*** and changes in production and consumption patterns; assessment and projection of market structures ◈ Role of ***Private Sector*** and ***Co-Operatives***; role of corporate financing. Socio-economic analysis of forest productivity and attitudes ◈ ***Valuation*** of forest goods and service. ***Wildlife Biology*** : There is virtually no syllabus other than mentioning the subject title + Few things linked with wildlife are scattered over the entire syllabus.

Module - 6

CONTENTS

PART – I : **FOREST PROTECTION**		
1.	Introduction	1 – 2
2.	Protection against injuries by man	3 – 16
3.	Protection against injuries by **Animal**	17 – 24
4.	Protection against injuries by **Insects**	25 – 30
5.	Protection against injuries by **Diseases**	31 – 34
6.	Remaining Part	35 - 38
PART – II : **FOREST UTILIZATION**		
1.	Wood Science & Technology : Introduction	39 – 48
2.	Timber transportation & Storage	49 – 52
3.	Timber grading	53 – 58
4.	Wood Properties	59 – 67
5.	Wood Seasoning	68 – 73
6.	Wood preservation	74 – 78
7.	Modified Timber	79 – 84
8.	NTFP	85 – 101
9.	Uses of wood	102 – 103
10.	Sale of forest produce	104 – 105
11.	Paper & Pulp manufacturing	106 – 108

PART – III : **FOREST LEGISLATION**		
1.	Forest Policies	109 – 119
2.	Forest Laws	120 – 135
3.	Other related Laws	136 – 138
PART – IV : **FOREST ECONOMICS**		
1.	Forest Economics : Intro	139 – 145
2.	Forest Market	146 – 151
3.	Role of Private Sector	152 – 154
4.	Forest Valuation	155 – 164
PART – V : **WILDLIFE BIOLOGY**		
20.	Wildlife Biology : Intro	165 – 167
21.	Wildlife management	168 – 174
22.	Wildlife Census	175 – 180
23.	Wildlife Conservation	181 – 182
24.	Human-Animal Conflicts	183 – 188
25.	Protected areas	189 – 192
26.	IUCN & Red data book	193 – 194
27.	Wildlife Projects	195 – 199
28.	Animal Diseases	200 – 201

FOREST PROTECTION

2024	• Discuss the ***Effect of Wild Animals*** on forest regeneration [P2/5(d) | 8 M]. • Explain different methods for prevention and control of ***Insect-Pests*** in forests, plantations and nurseries. Mention the major insect-pests in *Teak*, *Deodar*, *Sal* and *Shisham* [P2/6(b) | 15 M]. • What are ***Forest Rights***? Which general principles may be applied for ***Protecting Forests Against Misuse*** of rights and concessions? [*Linked* Q | P2/8(a) | 15 M].
2023	• What constitute ***Fire Environment*** in a forest? Describe different types of forest fires and write the significance of fire line [P2/7(a) | 15 M]. • Explain ***Rotational Grazing*** and discuss its significance to restore natural regeneration [P2/7(c) | 10 M]. • What is deforestation? Discuss the impact of deforestation on the environment [**P1**/6(c) | 15 M].
2022	• What are the ***Biotic*** and ***Abiotic Stresses*** on trees? Explain the responses of trees to these stresses [*Linked* Q | P2/5(a) | 8 M]. • Describe the ***Adverse Climatic Factors*** causing damage to forests [P2/8(b) | 15 M]. • Explain the ***Salvage Operations*** for plantation trees after natural disasters [P2/6(c) | 10 M].
2021	• What is ***Controlled Burning***? How does it help in improving forest regeneration? [P2/8(c) | 10 M].
2020	• What is the need to protect the forests? Enumerate the ***major threats responsible for forest injuries***. Suggest suitable preventive and protective measures to safeguard the forest wealth [P2/6(b) | 15 M]. • What is the ***significance of afforestation and reforestation*** to the ecosystem? How are the National Afforestation programme, Green India Mission and Forest Fire Prevention and Management Scheme helping in restoration of forests? [*Linked* Q | P2/7(a) | 15 M].
2019	• Describe how ***Controlled Fire*** can be used as a tool in forest management [P2/5(d) | 8 M]. • What is ***Controlled Grazing***? Describe how it helps in the better management of forest pasture land [P2/6(c) | 10 M]. • Describe the ***Causes*** *of* ***Deforestation***. What are the measures to be taken for the control of deforestation? [P2/8(c) | 10 M]. • What do you mean by ***Deforestation***? Explain the major causes of deforestation [P1/5(d) | 8 M].
2018	• What are the causes of ***Forest Fire***? What measures are taken to protect forests against damage by fire? [P1/7(c) | 10 M].
2017	• Discuss briefly the ***Impacts*** *of* ***humans*** *on* ***Forest Health***. Explain different measures to check forest encroachment [P2/6(c) | 10 M]. • Describe ***Types*** *of* ***Forest Fires***, their ill-effects and preventive measures. Briefly discuss the role of forest fire on forest ecosystems [P2/8(a) | 15 M]. • What are the major ***Grazing Systems*** *and* ***grazing regions*** in India? Describe briefly, methods to prevent pressure from grazing in forests [P2/5(c) | 8 M].
2016	• ***Forest Fire*** still remains a major threat to forest ecosystems across the globe. How do you address this issue? [P2/5(d) | 10 M].

	• Describe the benefits and limitations of ***Chemical*** *and* ***Biological Control Of Diseases*** in forest nurseries and plantations [P2/7(d) | 10 M].
2015	• There are measures which are taken to protect the forests from ***Fire Damage***. Which are those and how effective have they been? [P2/5(d) | 8 M]. • Does ***Rotational Grazing*** have an advantage over ***Controlled Grazing*** in the smooth management of forest ecosystems? Give your reasons for and against, both. [P2/6(c) | 10 M].
2014	• Do you think that the ***Controlled Fire*** is beneficial to forest vegetation? Discuss [P1/4(c) | 10 M].
2013	• Discuss different ***Methods of Disease Control*** in forest nursery with examples [P2/6(c) | 8 M]. • Describe the ***Anthropogenic Causes of Forest Destruction***. How can these be checked? [P1/7(a) | 10 M].
2012	• Briefly discuss – ***Lopping*** management. [P1/2(c) ii | 4 M]. • Comment on the view that after deforestation ***Forest Fires*** are most important cause of forest destruction. Also give different types of forest fires and their causes, and preventive measures for forest fires. [P1/3(c) | 8 M]. • Describe the extent, method of cultivation and effects of ***Shifting Cultivation***. Suggest some suitable alternatives to shifting cultivation. [P1/5(d) | 5 M]. • What are the main reasons for ***Decline*** *of the* ***Forest Cover*** in our country? [P1/6(a) | 5 M]. • Distinction between Potential and Deferred Grazing [P1/6(e) | 5 M]. • What are the causes of ***Forest Fire*** ? Discuss in brief the damage caused to forest by fire along with its control [P1/6(h) | 5 M]. • Describe the prevention and control of termite damages in timber [P2/7(b) | 5 M]. • State what are the plant parasitic nematodes associated with nursery forest plant species. [P2/7(d) | 5 M]. • Describe various ***Types*** *of* ***Grasslands*** mentioning the associations of grasses and their environmental locations in the different regions of India [as described by Whyte (1957)]. [P2/5(c) | 8 M].
2011	• Write short notes on – ***Forest Decline*** (2.5 m) [P1/7(c) ii | 2.5 M]. • How severe is the damage of ***Ganoderma*** in Indian Forests? Discuss with some case history [P2/6(c) | 10 M]. • How grazing is managed for the ***Browsing Animals***? Discuss various management options for *sustainable grazing* in forest. [P2/7(c) | 10 M].
2010	• Write short notes on – ***Lopping Management*** [P1/5(d) | 5 M]. • What are ***Fire-Prone Areas***? How are these detected? What precautionary measures need to be taken to overcome this problem? [P2/5(f) | 8 M]. • How is damage due to ***Teak Defoliator*** and stem borer managed in the plantations? [P2/6(b) | 10 M]. • Write causal pathogens of important diseases of ***Poplar*** *and* ***Gmelina arborea***. Write integrated management of any one disease in each species [P2/8(a) | 10 M].

FOREST UTILIZATION

2024	• Explain (i) tensile stress, (ii) shear strain, (iii) compressive stress, (iv) Young's modulus of elasticity and (v) rigidity modulus [P2/2(c) | 10 M]. • Explain the ***Anatomical Features*** of hardwoods [P2/5(a) | 8 M]. • Describe the ***Classification of Timbers*** based on the air-dry weight method with example of tree species [P2/5(e) | 8 M]. • What are the different types of ***Composite Woods***? Differentiate between fibre board and particle board [P2/7(a) | 15 M]. • Explain the importance of ***Wood Preservatives***. Differentiate between water soluble type and organic solvent type of wood preservatives [P2/8(b) | 15 M].
2023	• What are ***Gums***? How do they differ from resins? Write the botanical names of two plants of each. [P2/5(b) | 8 M]. • Write the botanical names of six tree species yielding ***Essential Oil***. [P2/5(d) | 8 M]. • Compare different types of ***Composite Wood***. Name the tree species which are mainly preferred for it. Write the future prospects of composite wood industry in the country [P2/7(b) | 15 M]. • Explain the present status, scope and constraints of ***Biofuel Production*** in India. Write the botanical names of five tree-borne oilseeds [P2/8(b) | 15 M].
2022	• Mention any eight ***Specialized Uses of Wood*** with examples [P2/5(b) | 8 M]. • Explain the role of renewable energy sources like solar energy in ***Wood Seasoning*** [P2/5(c) | 8 M]. • Trace the ***History of Logging*** in India. Explain how mechanization in harvesting and extraction helps in reducing the wastage and improving efficacy of logging [P2/6(a) | 15 M]. • "Increasing usage of ***Composite Woods*** necessitates the needs for increased raw material from plantations for short rotation trees" Explain [P2/7(c) | 10 M].
2021	• Write the general principles of ***Wood Seasoning***. How is electrical kiln seasoning advantageous over air seasoning? (15m) [P2/6(a) | 15 M]. • What are ***Gums***, ***Resins***, ***Oleoresings*** and ***Gum Resings***? Classify and give at least two examples under each group [P2/8(a) | 15 M]. • Unscientific harvesting of **NTFPs** has led to depletion of NTFP resources. Discuss [P2/5(d) | 8 M].
2020	• What are the recommended practices for ***Strategic Harvest Planning***? [P2/1(d) | 8 M]. • What are the rules laid down for ***Efficient Felling***? Classify the timbers based on industrial use [P2/5(d) | 8 M]. • Describe the process of ***Wood Formation***. Write in details about the physical, chemical and mechanical properties of wood [P2/8(a) | 15 M].
2019	• What is ***Reduce Impact Logging*** (RIL) ? What is its composition? Explain the benefits of RIL. [P2/5(b) | 8 M]. • Define ***Non-Timber Forest Products*** (NTFPs). Explain their importance to human societies and economy. [P2/5(c) | 8 M]. • Define wood. Explain the microscopic/***Anatomical Features*** which aid in identification of timber species in details. [P2/6(a) | 15 M].

2019	• What are ***Particle Boards***? Explain the features of different types of particle boards. [P2/7(b) | 15 M]. • List different system and methods of ***Sale of Forest Produces***. What are the different methods of sales adopted in state forest department? [P2/8(b) | 15 M].
2018	• What are the industrial uses of ***Gums*** *and* ***Resins***? Discuss the factors affecting the production and supply of gums and resins [P2/5(a) | 8 M]. • Write down four advantages of timber ***Seasoning*** and suggest which one is commercially suitable over other methods, with suitable examples. [P2/5(e) | 8 M]. • List out ***Different Types*** *of* ***Preservatives*** used for protection of timber against fungi and insects and classify them based on solvent used. [P2/6(a) | 15 M]. • What are the key elements of the wood industry and paper industry strategies? Explain [P2/8(a) | 15 M]. • Describe the ***Defects*** *that Appear* ***During Seasoning*** in timbers [P2/8(c) | 10 M].
2017	• Briefly write about the ***Natural Defects*** observed in wood. [P2/5(b) | 8 M]. • What is ***Wood Seasoning***? Write in detail the aims of wood seasoning and explain salient steps in manufacturing of plywood. [P2/6(b) | 15 M]. • What is ***Logging***? What are the objects of felling? Briefly write the general rules of felling and basic cuts of tree felling. [P2/7(a) | 15 M]. • What are the differences between ***Gums*** and ***Resins***? How are gums and resins classified? Enlist different methods of tapping resins. [P2/8(c) | 10 M].
2016	• ***Clonal Forestry*** approach proved successful in meeting the industrial wood demand particularly pulpwood. Substantiate your view and perception in this regard [P2/4(a) | 10 M]. • Dry deciduous forests are rich in ***Non-Timber Forest Products*** (NTFPs). Justify the statement with examples [P2/5(c) | 10 M]. • Give an account of ***Mechanical Properties*** of wood and suggest the standard tests for the same [P2/6(c) | 10 M]. • ***Bamboos*** become the major raw material for many cottages as well as corporate industries. Explain [P2/7(a) | 10 M]. • What are the general principles and ***Advantages of Wood Seasoning***? Describe the solar kiln seasoning with neat sketches [P2/7(b) | 10 M]. • Write critical notes on the following [P2/7(c) | 10 M]. (a) *Gums* (b) *Oilseeds* (c) *Katha* (d) Bidi leaves • Give an account of ***Composite Wood*** products and their utilities [P2/8(b) | 10 M]. • Explain the recent developments in mechanization of ***Logging Operations*** and their impact on the efficiency and wastage [P2/8(c) | 10 M].
2015	• There are various processes involved in the expression and ***Extraction*** *of* ***Oilseeds*** available in forests. Elaborate on the processes involved and their utilization [P2/5(a) | 8 M]. • Timber encounters many different problems during the process of ***Drying***. What are those problems and how are they overcome? [P2/5(b) | 8 M]. • Indian forests are found to be rich in ***Different*** *kinds of* ***Non-Timber Forest Products*** (NTFPs). Can you list at least 10 NTFPs? [P2/6(b) | 10 M].

	• What are the major ***Fibres*** and ***Flosses*** which are obtained from forests in India? Citing at least ten species, discuss their commercial importance [P2/8(d) | 10 M].
2014	• Write in detail the processing and uses of ***Tannins*** in India [P2/5(d) | 8 M]. • Explain the term ***Logging***, its purposes and stages [P2/5(e) | 8 M]. • What is wood preservation? Why is ***Preservation*** *of* ***Wood*** necessary? Mention main types of wood preservation methods [P2/6(b) | 15 M].
2013	• What are advantages of ***Wood Seasoning***? Describe the various methods of wood seasoning and mention classification of timbers for seasoning [P2/6(a) | 15 M]. • Give the ***Classification of Timbers*** based on air dry weight with suitable examples [P2/8(d) | 7 M].
2012	• Explain properties of good ***Wood Preservatives*** and classify the various Wood Preservatives with the help of a flowchart [P2/6(a) | 12 M]. • Describe the ***Boucherie Process*** of Wood preservation with its advantages [P2/6(b) | 6 M]. • Briefly comment on the extent of ***Wastage*** (in approximate percentage of total timber content) from harvesting to marketing stages and give the reasons for such wastages [P2/8(d) | 5 M]. • What are the set of tools used in ***Rill Method***? Briefly highlight their features [P2/4(d) | 10 M]. • Differentiate between the following – **NTFPs** and **MPTs** [**P1**/3(a) *iii* | 4 M]. • Write short notes on – (g) ***Heartwood*** and S***apwood*** [**P1**/8(g) | 5 M].
2011	• List 10 bamboo species of commerce in India with their scientific name & state of origin [P2/5(a) | 10 M]. • Write Common and scientific names of 10 tree species yielding resins and Oleo-resigns (10 m). [P2/5(e) | 10 M]. • What are the ***Wood Composites***? How they are prepared? What are the common gluing agents used in wood composites? [P2/7(a) | 20 M]. • Discuss the various ***Common Defects*** encountered after harvesting of the wood during stacking [P2/8(c) | 10 M].
2010	• What are the ***Keys*** *to* ***Identify Timbers*** *for* ***Construction Purpose***? [P2/5(a) | 8 M]. • Name five important tree species used for axle and wheels of different carts. In which regions of country is this sort of transportation more prevalent? State the reasons [P2/5(c) | 8 M]. • Name five ***Aromatic Grasses*** with their uses and methods of extraction [P2/8(c) | 10 M]. • There is no replacement for ***Rattans*** in forest-based industry" Justify this statement and list five important species reported from different parts of the country [P2/8(d) | 10 M]. • What are the different types of water-soluble ***Wood Preservatives***? [P2/7(b) | 10 M].

FOREST LEGISLATION

2024	• Explain, as per the ***Indian Forest Act, 1927***, (*i*) reserved forests, (*ii*) protected forests, (*iii*) unclassed forests and (*iv*) village forests [P2/5(c) | 8 M]. • What are ***Forest Rights***? Which general principles may be applied for protecting forests against misuse of rights and concessions? [P2/8(a) | 15 M].
2023	• Discuss the salient features of the ***Wildlife (Protection) Act, 1972*** and write its significance in dealing with wildlife offences [P2/8(a) | 15 M].
2022	• Write the provisions of the ***Indian Forest Act, 1927***, applied to declare village forests and protected forests [P2/5(e) | 8 M]. • Write the salient features of India's ***National Forest Policy, 1998***. Justify the statement "India needs a revision of Forest Policy" [P2/7(b) | 15 M]. • Describe the provision of the ***Forest (Conservation) Act, 1980*** on (i) restriction on the de-reservation of forest land for non-forest purpose, and (ii) diversion of forest land for regularisation of encroachment [P2/8(a) | 15 M].
2021	• Write the provisions of sections 35, 37 and 38 under the ***Indian Forest Act, 1927***, applied to control over forests and land not being the property of the government. [P2/6(b) | 15 M]. • Describe the provisions of sections (3 – 27) of the ***Indian Forest Act, 1927*** applied to declare any forest land or wasteland as a Reserve Forest over which the government has proprietary rights. [P2/7(b) | 15 M].
2020	• What are the direct roles of the ***Biodiversity Act, 2002*** in conservation of wildlife? [P2/5(b) | 8 M]. • Write in details about the historical background of forest policies in India and their aims. Describe in brief about the organization of forest sector in India. [P2/8(b) | 15 M]. • How has the ***National Forest Policy*** *of* ***1988*** changed the national scenario? Describe in brief. Highlight some major achievements in relation to the above policy. [P2/8(c) | 10 M].
2019	• Write in detail regarding the appointment of authorities and restrictions of hunting of wild animals under the ***Wildlife (Protection) Act*** *of* ***1972***. [P2/8(a) | 15 M].
2018	• What are the main differences between forest policy and forest laws? Give *salient* points of the National Forest ***Policy*** *of* ***1952*** and ***1988***. [P2/8(b) | 15 M].
2017	• Narrate the ***Background*** and ***Objectives*** of implementation of national ***Forest Policies*** of India. [P2/5(d) | 8 M].
2016	• Compare and contrast the ***Indian Forest Act, 1927*** and the ***Forest Conservation Act, 1980***. [P2/6(a) | 10 M].

	• How are "Environment", Environmental pollutant" and "Hazardous substance" narrated in environment (protection) act, 1986? [**P1**/7(b) | 10 M].
2015	• Give a comparative and appropriate statement on the Natural Forest ***Policy of 1988*** with that of **1952**. [P2/7(a) | 15 M]. • Describe the ***role*** *of* ***Permanent Forest Policy*** after its enactment for the regulation of forestry management in India. [P2/8(b) | 10 M]. • Discuss the important role of The ***Wildlife Protection Act, 1972*** in forest management. Give salient points only [P2/8(a) | 10 M]. • What is the penalty prescribed in Section 15 of the Environment (Protection) Act, 1986 for contravention of the provisions of the Environment Act rules and orders? [**P1**/5(c) | 8 M].
2014	• Describe the salient features of ***National Forest Policy 1988***. How does it differ from the 1952 Forest Policy? [P2/8(c) | 10 M].
2013	• Discuss the procedure for declaration of reserved forests in the backdrop of important sections of the Indian Forest Act, 1927 [P2/5(a) | 8 M]. • What are the factors responsible affecting forest policy? Discuss (8 m). [P2/5(e) | 8 M]. • Mention the salient features of ***National Forest Policy, 1988,*** and discuss its advantages over ***N.F.P. 1894***. [P2/6(b) | 10 M]. • Describe the salient features mentioned in the ***New Draft Forest Bill, 1994***. [P2/7(b) | 10 M]. • Briefly describe the national legislation on biodiversity. Name the activities for which States can seek funds from the Central Government [**P1**/7(c) | 10 M].
2012	• Bring out the ***Background*** and ***Need*** for ***Forest Policy Of 1988*** with its basic objectives [P2/8(a) | 15 M]. • Attempt the following, keeping your answers brief and to the point : (a) "Describe Section (2) of Forest Conservation Act of 1980" [P2/5(a) | 8 M].
2011	• Write the constitution of ***National Board of Wildlife***. Explain the provisions of the Sections of wildlife (Protection) Act 1972, Used to declare an area as 'Sanctuary' [P2/8(a) | 20 M].
2010	• What are the functions of ***Indian Board For Wildlife*** with regard to conservation of wildlife? [P2/7(d) | 10 M].

FOREST ECONOMICS

2024	• What are ***Ecosystem Services***? Differentiate between use values and non-use values. Explain different methods of valuation of ecosystem services [P2/7(b) | 15 M].
2023	• Explain the ***Fundamental Principles*** involved in forest economics [P2/5(e) | 8 M]. • What is ***Cost-Benefit***? Explain demand and supply with respect to forestry [P2/6(a) | 15 M].
2021	• Mention different ***Methods of Valuation*** of intangible services from forest ecosystem and explain any one [P2/5(e) | 8 M].
2020	• How does inflation influence forest goods? Briefly explain the ***Types*** *of* ***Inflation*** that directly influence the price of forest goods. [P2/5(c) | 8 M]. • Discuss the role of forest resources in the Indian economy. Suggest suitable storage methods for wood or other forest produce and their management strategies [P2/6(a) | 15 M]. • What do you understand by ***Forest Valuation***? Discuss in brief. Describe various valuation techniques for forests. [P2/7(c) | 10 M].
2019	• Discuss various ***Channels*** *for* ***Marketing*** of forest products [P2/5(e) | 8 M]. • What is ***Forest Valuation***? Write its objective and briefly explain the methods of forest valuation. [P2/7(a) | 15 M].
2017	• Explain the ***Discounting Measures*** *in* ***Forest Business Management*** with different formulae used in forest economics. [P2/7(b) | 15 M]. • Discuss in detail the roles and interventions of Government and Private agencies in marketing of forest produce. [P2/8(b) | 15 M].
2016	• Explain the ***Concept*** *of* ***Demand*** with the help of demand curve and its application in forest trade. [P2/6(b) | 10 M].
2013	• Give the important features of ***Demand*** *and* ***Supply Curves***. What are the factors responsible for demand and supply of forest produce? [P2/6(d) | 7 M].

WILDLIFE BIOLOGY

2024	• What are the different five main ***Conservation Categories*** under IUCN? [P2/8(c) | 10 M].
2022	• What do you understand by ***Human-Wildlife Conflict***? Explain with examples [P2/7(a) | 15 M].
2020	• What is the ***Significance*** *of* ***Wildlife*** in today's perspective? Discuss in brief about the components of wildlife ecology [P2/5(e) | 8 M].
2018	• How is ***Enumeration*** *of* ***Animal Population*** in natural forests carried out in general? Also specify the method(s) adopted in the case of tigers. [P2/6(b) | 15 M].
2015	• To protect the wild animals venturing out from their core areas, some administrative and management arrangements are made. What are those? Discuss. [P2/5(c) | 8 M].
2014	• Discuss in detail the importance, success and limitations of the '***Project Tiger***' [P2/5(c) | 8 M]. • Discuss the role of National Parks in conservation of biodiversity [P2/6(a) | 10 M].
2013	• What do you understand by ***Wildlife Census***? Write different methods of census in brief [P2/7(c) | 10 M].
2012	• Describe the mathematical expression for ***Biotic Potential*** and ***Environmental Resistance***. [*Linked* Q | P2/6(c) | 6 M]. • Describe the importance of ***Pug Marks*** and illustrate sex differentiation based on pug marks. How do these help in Forest management system? [P2/6(e) | 10 M]. • What is the role of different techniques involved in connection with conservation and multiplication of threatened species? [**P1**/6(g) | 5 M].
2010	• List five each of the important resident and ***Migratory Birds*** noticed in Indian forests [P2/5(b) | 8 M].

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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)

IFoS 2017 : Discuss briefly the *impacts of humans on forest health*. Explain different measures to check forest encroachment (15 m).

IFoS 2013 : Describe the anthropogenic causes of forest destruction. How can these be checked ? (10 m).

- 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.

2.1 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.

IFoS 2019 : Describe the *causes of deforestation*. What are the *measures to be taken for the control* of deforestation? (10 m).

IFoS 2019 : What do you mean by *deforestation* ? Explain the *major causes of deforestation* (Paper-1 | 8 m).

IFoS 2012 : What are the main reasons for decline of the forest cover in our country ? (5m).

IFoS 2011 : Write short notes on – *Forest decline* (2.5 m).

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*.

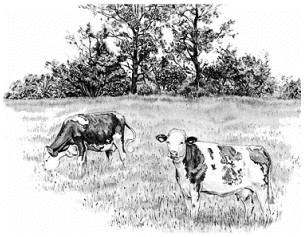
CHAPTER 3

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 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 decreases the palatable crops inside the forest* besides *increasing the weeds*. We can say that this type is a *low input – low output system* of 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 5

PROTECTION AGAINST INJURIOUS DISEASES

Branch of forestry that deals with the diseases of forest species & timber : Forest Pathology

Causes of diseases

- Parasitic or infectious
- Non-infectious : by adverse weather

Types of diseases

- Endemic : in a particular locality, *i.e.*, Monkey fever
- Epidemic : India/Indian Sub-continent level
- Pendemic : Continent or global level, *i.e.*, Malaria, COVID-19.

5.1 DAMPING OFF

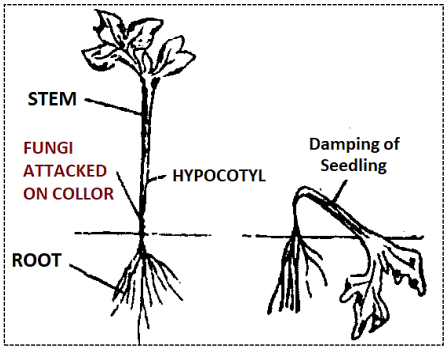
Damping-off is the *most widespread and serious forest nursery disease* in India as well as the world. It primarily affects *conifer seedlings* growing in a temperate climate, though it also attacks *broad-leaved seedlings* as well—results of large-scale mortality in forest nurseries = upset plantation activity.

► **MORTALITY OCCURS AT 3 STAGES OF SEEDLING GROWTH**

(1) Pre-emergence blight : The seedlings are killed even before they emerge above the ground level. As a result, very few seedlings are able to come up above the ground and this is wrongly attributed to the poor quality of seeds. It is difficult to estimate the loss due to pre-emergence blight unless the killed seedlings have been dug up from the soil.

(2) Post-emergence blight : The seedlings may be killed after emergence from the ground as a result of rotting of tissues at the base (*Hypocotyl*) or roots, or Both.

(3) Root rot : Pathogenic fungi may attack the roots of older seedlings. Usually, it affects succulent root tips resulting in poor growth performance. However, in extreme cases when prolonged drought and other environmental-biotic stresses followed by these fungal attacks may cause death.



► **PATHOGEN** : A number of *soil fungi**** may cause this disease. Usually, they are *soil saprophytes****, but under favorable conditions, they become pathogenic. Fungi of the genus *Pythium**, *Rhizoctonia**, *Phytophthora** and *Fusarium** are mainly responsible for dumping off. In India, *Rhizoctonia solani* is the most important cause of damping-off in conifer nurseries.

CHAPTER 2

TIMBER TRANSPORTATION & STORAGE

2.1 TIMBER TRANSPORTATION

► TYPES

Based on the Distance of transportation

- *Minor* or *Off-road* transport : for a short distance
- *Major* transportation : for long-distance

Medium of transportation

- *Land* transport, *i.e.*, by road
- *Water* transport, *i.e.*, by river, canals or coastal routes
- *Overhead* transportation, *i.e.*, By ropeway, chopper

► CHOICE OF METHODS OF TRANSPORTATION

- Cost of transportation and labour requirements
- Damages or losses to the products during this
- Volume of timber available in Local area + Size of Market & Sawmill
- Topography + Available transportation facilities, *i.e.*, Land, Water, Air

TRANSPORTATION by **LAND**

- Human-powered : Uphill terrain + small to medium-sized timber + Short distances. This method is the costliest but causes the least damage.
- Animal-assisted : Mules, Elephants, Camels, etc.
- Bullock carts
- Dragging
- Rolling
- Sliding
- Motorized methods : Trucks and Trackers

What are the rules followed in the felling of trees? Explain the different methods of land transportation of timber followed in India [OPSC Civil (Main) 2011].

TRANSPORTATION by **WATER**

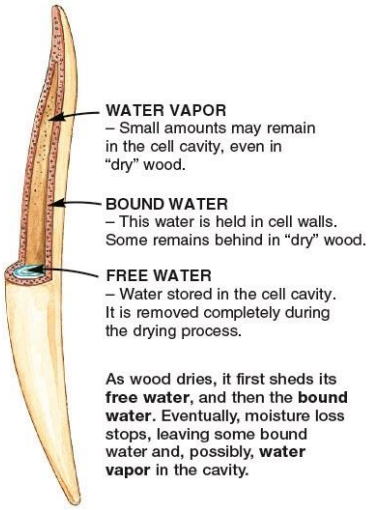
The oldest and cheapest mode of transportation, particularly in the *Forest* area. Widely practiced in the Himalayan region, Peninsular India, Eastern & Western Ghats.

Types : (1) Floating, (2) Rafting and Boom, and (3) Wet slide

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 6 WOOD PRESERVATION

Wood preservation is the process of *improving the natural durability of wood* through treatment with chemicals that are toxic to insects, fungi, and other decaying agents.

NECESSITY

- To *increase the lifespan of wood* : Woods uses extend to various sectors of the economy (*e.g.*, telephone poles). However, due to cellulose and moisture, its durability or working lifespan diminishes significantly. Therefore, some forms of treatment are necessary to prevent this.
- To *enhance the working ability of wood* under specific conditions, we also require a specific type of wood that can function effectively under particular conditions, such as heat or salt stress conditions (marine environment), where normal wood may not work efficiently.
- To *avoid frequent replacement* of wood.

Durability : The property or ability of wood to remain sound. Usually, it's lost due to fungal attacks, insect attacks, animals, fire hazards, or mechanical wear and tear.

Factors Affecting Durability : Moisture contents in the wood (Provide a base for fungal attack), its hardness (↑↑), deposition of resin and gums (↑↑), and use of wood.

Hardwood + more gum/resin deposition = more durable

Ralph Pearson*** : Father of wood preservation. Started scientific studies on wood preservation at FRI in 1908

Sonti Kamesam developed a wood preservative "ASCU" in the 1930s at FRI.

6.1 WOOD PRESERVATIVES

Preservatives are chemical that is used in preservation, usually poisonous to insect pests. Property of an ideal preservative

- It should be *Highly toxic to fungi*, insects and marine organisms whereas least toxic to human beings
- High permanency (*resist to leaching* by water or by any other solvent)
- It should *impregnate the wood easily* (*High Penetrability*) and retain it permanently
- It should be *neither volatile nor liable to become inactive* after some years (High chemical stability).
- It should be *cheap and available in plenty*
- It should *not increase the inflammability* of wood
- It should *not corrode metals*
- It should be a *colourless, odourless, and paintable* one.
- It should *not affect the strength* of the wood.

CHAPTER 7 MODIFIED TIMBER

7.1 COMPOSITE WOOD

Composite wood is a general term for built-up bonded products consisting either *wholly of natural wood or of wood in combination with metals, plastics, etc.*

Various processes and methods have been developed, most of them in recent years in building larger pieces from relatively small pieces or in treating and modifying wood by means of pressure, heat, and chemicals.

TYPES OF COMPOSITE WOOD

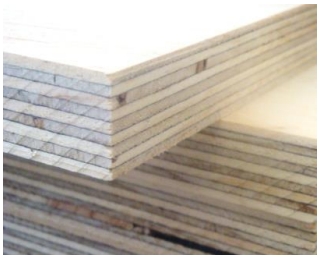
- Plywood
- Laminated wood
- Core boards
- Sandwich boards
- Fibreboards
- Particleboards

IFoS 2023 : Compare different types of composite wood. Name the tree species which are mainly preferred for it. Write the future prospects of composite wood industry in the country [15 M].

IFoS 2016 : Give an account of *composite wood* products and their utilities [10 M]

IFoS 2011 : What are the wood composites ? How they are prepared? What are the common gluing agents used in wood composites? [20 m]

► **PLYWOOD** : It is a glued wood construction built up of veneers in such a manner that the *grain of each veneer is at right angles* (called the *cross-bonded construction*) to that of the adjacent veneer in the assembly. The outer faces are called *Faces* and the center one is called *Core*. The number of veneers is always in *Odd Numbers* (usually *3 to 13*).



- Normal sheet size of plywood : **4 Foot** × **8 Foot** or **122 cm** × **244 cm**
- The minimum number of plies in plywood is = 3

PLYWOOD (COMPOSITE WOOD) PROPERTIES / ADVANTAGES

- The density of wood/ board is uniform = *Tensile strength is equal in all directions****
- All knots, twists, air pockets, bonding defects, and graining issues have been eliminated
- The smooth surface finish makes them ideal for carving and painting.
- There are no dimensional limitations in terms of *Size, Shape, and Thickness* and we can customize them to any required length and width.
- have *high resistance to impact****
- Can make them water-resistant, fire, or chemical-proof
- Do not show any swelling, shrinking, or wrapping properties.
- More durable than natural wood.

CHAPTER 9 USES OF WOOD

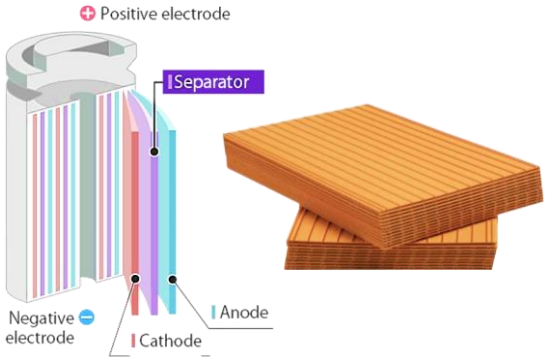
- **Aircraft Industry** : requires light wood with straight fibres and great strength, *i.e.*, *Picea sitchensis, Picea smithiana****, *Ochroma pyramedelis**** (Balsa = *Lightest wood*)***, etc.

- **Agriculture Implements** : only the strongest, hardest wood can be suitable to hold pressure developed during uses in bullock carts, Plough, handles, etc. With this, species also must be locally available.

  Example : Babool (*Acacia nilotica*), *Xylia xylocarpa*, *Anogeissus latifolia*, etc.

- **Battery Separators** : wood should be light, sufficiently strong, straight grain, and especially free from volatile acids, tannins and resinous material so it couldn't affect electrolytes.

  Examples : *Conifers**** – *Abies pindrow*, deodar, pines, spruce, etc.



- **Boat and Shipbuilding** : should be strong, elastic, durable and free from defects to stand the enormous strains and marine environment. With this, it should be light in weight and corrosion-resistant

  Examples : Teak*** (*Best ship building timber****)
  Ochroma pyramidalis (Balsa) and *Bombax ceiba* for life-saving apparatus.

The *Beypore Uru* is a traditional dhow that was built in Beypore, India, with a legacy that dates back to the 11th century. Made from pure Malabar teak and coir, these vessels have been used for generations to facilitate trade, and are renowned for their unique design and skilled craftsmanship.

- **Furniture Industry** : The essential qualities required are good colour, handsome grain or figure, non-liability to crack, split, warp or ease of working and finishing.

  Examples : Teak (*Tectona grandis*), Rosewood (*Dalbergia latifolia*), Siris (*Albizia spp.*).

- **Matchwood Industry** : required wood should have straightness of grain, good fissility, strength, good white color, freedom from knots, easily peelable, and capacity to absorb paraffin

  Examples : *Boswellia serrata**** (Salai), *Populus tremula*, *Ailenthus excelsa****, *Bombax ceiba**** (Semul, mainly planted in North India for the matchwood industry)* etc.

- **Packaging Industry** : would be light, free from knots and should have straight fibres to provide excellent packaging with not increasing packaging weights. Examples : Conifers.

CHAPTER 10

SALE OF FOREST PRODUCES

There are many different systems under which timber and other forest produce may be disposed to purchasers –

SYSTEM OF SALE

(a) Lump-sum sale
(b) Payment on outturn (Royalty)

LUMP SUM SALE : These cover all systems of sales under which a fixed sum is paid for the product, whether the exact quantity of such product is known or not. A lot of logs, an area of grass, a fuel coupe, a lot of trees marked for felling may be sold under this system. The sales may be by auction, tender or direct.

In the same way, the sale may be of some unknown quantity of produce; in this case, the purchaser usually buys the permission to collect and extract such products from a specified area of forest by the purchase price paid is by lump sum payment. The exact amount of produce extracted being unknown at the time of purchase.

PAYMENT ON OUT TARN : This includes the sales when the amount fixed corresponds with the actual amount of products sold or extracted. There are many varieties of this system. Royalty may be on volume, weight, or on quantity.

► HOW THESE 2 systems OF SALE WORKS ?

- **Sale of a whole coupe or area** : Consists in selling the right over a given area to a person or a firm known as a lessee, to extract timber or other produce for a fixed period. Lease value may be realized lump-sum, in one or more installments, or on a royalty basis.
- **Sale of standing trees** : Trees are selected and marked and the whole coupe sold standing, by auction, tender or private bargain. The sale may be a lump sum or by royalty.
- **Sale of a few selected trees** : This consists of selling, usually by a private bargain or by fixed tariff a few selected trees, in special cases of sale.
- **Sale by means of license or permit** : The intending purchaser to apply for a license to extract timber or other forest produce of certain descriptions in a specified area and within a fixed period.

► **METHODS OF SALE**

1. Sale by the private bargain.
2. Sale to the highest bidder : Open tender/Sealed tender
3. Sale by royalty or fixed tariff

CHAPTER 1 FOREST POLICIES

SYLLABUS : History of forest development**;** Indian Forest Policy of 1894, 1952 and 1988. National Forest Policy 1988 of People's involvement, Joint Forest Management, Involvement of women; Forestry policies and issues related to land use, timber and non-timber products, sustainable forest management; industrialization policies; institutional and structural changes. Decentralization and Forestry Public Administration.

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** : Religious persecution by Muslim rulers, threats of forced conversion, forcefully abducting their women, collapse of many empires, displacement of people to forests = increasing pressure on it.

- **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

CHAPTER 2 FOREST ACTS

SYLLABUS : Forest Laws - necessity, general principles, Indian Forest Act 1927; Forest Conservation Act, 1980; Wildlife Protection Act 1972, and their amendments.

Laws are a body of principles recognized and applied by the state in the administration of justice.

Forest Law : All principles, regulations, or acts that govern the forest and its related activities either inside or outside of the forest.

- Law is a generic term, whereas 'Acts' pertains to a specific situation.
- Forest law is a **Special law**

IFoS 2018 : What are the main differences between forest policy and forest laws ? Give *salient* points of the National Forest *Policy of 1952* and *1988* (15 m).

Forest Policy : policy is a purposeful course of action, undertaken by an organisation that deals with the uses and management of forest resources.

Forest Law	Forest Policy
Laws or 'Acts' are related to regulating and governing a particular situation or act. If you violate it you will be punished.	The policy is a guiding principle and is related to our future Goal where we want to go. If someone violates it, there is a provision for punishment.
Passed by Parliament	By Executive decision, no need to go through parliament

2.1 INDIAN FOREST ACT (1927)

- *21st September* 1927
- Act to consolidate the law relating to forests, the transit of forest produces and the duty leviable on timber and other forest produce.

Chapter : 1 **Preliminary**	Section 1 : This act may be called the Indian Forest Act of 1927 Extent – Whole India. Section 2 : Definitions –
	[2.1] Cattle includes elephants, camels, buffaloes, horses, mares, geldings, ponies, colts, fillies, mules, asses, pigs, rams, ewes, sheep, lambs, goats and kids. **[2.2] Forest officer** **[2.3] Forest offences** - offence punishable under this Act or under any rule made thereunder

CHAPTER

1

WILDLIFE BIOLOGY

[INTRODUCTION]

The term 'Wildlife' is commonly referred to all forms of undomesticated animals, including mammals, birds, reptiles, amphibians, fish, and invertebrates, that exist and thrive in their natural habitats.

IMPORTANCE OF WILDLIFE / POSITIVE VALUES

- *Ecological Value* : play an important role in the food chain, biogeochemical cycles, and through positive and negative population regulation, maintains the delicate balance of an ecosystem. For example, illegal killing of snakes (for illegal skin trade or from fear or taboo) leads to the increase of the rodent population, which ultimately results in huge economic loss in terms of loss of a certain quantity of crop, as well as, increased cost towards pest management by using rodenticides.
- *Economic value* : Various products obtained from wildlife include timber, firewood, natural rubber, gums, resins, tannins, essential oils, honey, etc. Wild medicinal plants are the source of several medicines. Animal products like hides, horns, ivory, fur, etc., are good sources of income for many countries.
- *Sports and Enjoyment* : Wild animals are also a good source of game, fun, and recreation for people from all walks of life. In some countries, people spend a large amount of money on hunting, fishing, bullfighting, cockfighting, etc. 'Bird watching' and 'Wildlife photography' are two very popular and growing hobbies for many people.
- *Scientific Value* : Several life-saving drugs have been discovered from different species of flora and fauna. The efficacy of new medicine or any new surgical method is often tested first on animals. Sea urchins helped to understand human embryology, rhesus macaques to understand the human blood group, antlers of deer are used to study radioactive contamination, and birds' feathers help assess the heavy metal pollution in the environment.
- *Genetic Resource* : Genes from wild flora and fauna are used to devise better and more productive crop varieties and breeds through genetic engineering. Thus, wildlife serves as a resource for traits like higher productivity, better disease and pest resistance, greater climatic adaptability, etc.
- *Cultural and Religious Value* : Wildlife is protected by different cultures like the Bishnois of Rajasthan protecting and worshipping blackbuck. Epics such as Ramayana and Mahabharata depicted that deer, birds, and several animals and plants were protected and roamed freely in the vicinity of the ashramas of the saints.

IFoS 2020 : What is the *significance of wildlife in today's perspective*? Discuss in brief about the components of wildlife ecology (8m).

IFoS 2018 : What is the ecological and economical importance of biodiversity ? Mention the salient measures for conservation of biodiversity (8 m).

- Why wild life conservation? Comment [OPSC Civil (Main) 2018].
- Differentiate between - Positive and negative values of wildlife [HPSC Civil (Main) 2017]

NEGATIVE VALUES OF WILDLIFE

- Destruction of properties (*i.e.,* by elephant), food crops, vehicles, etc.

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