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Geography (UACE 250/2) paper 2: Forestry in the world

A **forest** is an area of land dominated by trees.

Broadly forests are classified into tropical rain forests and temperate coniferous forest

Tropical rain forests

- The tropical forests are forests located between $0 - 10^{\circ}\text{N}$ or $0 - 10^{\circ}\text{S}$ of the equator,
- They include tropical rainforests/equatorial forests, mangrove forests, tropical monsoon forest
- Major species such as Mahogany; ebony, teak, long wood, green heart, iron wood, azobe, ozigo etc.
- They yield hardwoods.
- Located in Brazil (amazon forests in amazon basin), DRC (in river basin), Gabon, Cameroon, Malaysia, Indonesia etc.

Characteristics of tropical rainforest

- They are evergreen forests.
- They have broad leaves so as to get rid of water.
- The trees have buttress roots to give the trees extra support.
- The trees are tall and straight on average 50m as they struggle for light.
- The trees do not exist in pure stands i.e. they are highly mixed in many different species of up to 100 or more species some colonies.
- The trees yield hard wood e.g. green heart, ebony, mahogany, rosewood, muvule etc.
- Trees have huge trunks which are heavy.
- Forests develop three layers of canopy. There is a wildering mixture with climbers, creepers e.g. epiphytes, parasitic plants.
- The trees are umbrella shaped, they have bushy spreading tops.
- Some trees bear fruits.
- Limited under growth.

Factors that favor the growth of tropical rainforest

Physical factors

- Heavy and well-distributed rainfalls throughout the year
- High temperature of over 20⁰C
- High humidity of over 70%
- Fertile soils
- Low altitude of less than 2000m above sea level
- Well drained soils
- Presence of wild animals, and vectors such tsetse fly to discourage settlement

Human factors

- Scarce population that allow land for growth of forests
- Favorable government policies of protecting forests, afforestation and re-afforestation
- Low technology that discourage massive cutting of trees
- Remoteness that discourage transportation of trees
- Low demand for wood products
- Political instability such in Congo basin that discourages the investment in forestry

Factors favoring exploitation of tropical rain forests

Physical factors

- Favorable climate that favor growth of trees
- Fertile soils that favor growth of trees
- Existence of numerous rivers favors floating and transportation of logs
- Abundant energy requirements for processing of logs into timber.
- Presence of vast areas with limited human settlement or agricultural activities where forests grow.
- Existence of a variety of favorable tree species such as Ebony, Mahogany, teak which yield highly demanded timber on the world market.

Human factors

- Presence of both skilled and semi-skilled labour to handle forestry activities such as felling trees, loading logs, etc.
- Sparse population that leaves a big proportion of land free for forestry activities.
- Relative political stability that enabled long term investment in the forestry industry through establishing processing facilities, attraction of foreign investors with huge capital to invest in the forestry industry.
- Application of modern technology like felling tractors to extract forest resources ensures efficiency and a fast process.
- Intensive research involving cutting of trees in patches to ensures sustainability, invention of new pharmaceutical plants and food stuffs all favor the forestry industry.

- Favourable government policy e.g. afforestation and re-afforestation programs.
- Presence of capital to invest in the forest Industry from local and foreign investors.
- Availability of local and foreign market for products from forest industry.
- Existence of developed transport network for timber to the processing industries and wood and medicinal products to the market.
- Presence of developed coastal ports to process and handle forestry products. Examples are Belem, Sao Louis, Oiapoque: Recife, Joao Pessoa have favored the forestry industry in Brazil.
- Existence of several industries that process logs into several aspects. These include furniture, timber, and pulp and paper industries.

Factors that limit exploitation of tropical forests

Physical factors

- Most of the commercial tree species such as omo, Okoume , mahogany are bulky & heavy hence difficult to transport.
- Most of the trees yield hardwood. For example Mahogany, Ebony, Ironwood and red heart. These have limited market on the international market because their purpose is mostly limited for furniture purposes other than a variety of uses such as pulp and paper, Newsprint etc.
- Tropical hard wood tree species such as Azobe, Okoume, teak, Ebony in Gabon have huge trunks and buttress roots that make felling of trees difficult..
- The hilly terrain (mountainous nature) in some countries such as Gabon, Brazilian highlands makes felling and transportation of logs difficult.
- There is lack of pure stands for commercial tree species e.g. mahogany
- Tropical hardwood species such as ebony, Red heart, mahogany take a long period of time to grow (mature). This may be 60 – 100 years to yield valuable timber. This affects the lumbering companies.
- Thick undergrowth and climbing plants in tropical forests makes felling and transportation of trees / logs difficult.
- Presence of fierce wild animals e.g. leopards, reptiles like pythons (anaconda) in Brazil, biting insects such as bees, wasps, red ants, black ants limits exploitation of tropical forests in Amazon (Brazil), Gabon.
- The tropical climate of hot wet and humid weather affects exploitation of tropical forests in Brazil, Gabon. For example it almost rains every day in the Congo forests hence felling of trees is halted.

Human factors

- There is limited skilled labour to exploit tropical forests.
- Limited capital to purchase the necessary logging equipment such as tractors, chain saws etc.
- Inaccessibility due to limited communication lines in most tropical forests such as the

- Amazon in Brazil, Gabon forest makes exploitation of tropical forests difficult.
- Competition from other countries that produce valuable soft wood such as Norway, Switzerland, Canada, Finland affect exploitation of tropical forests.
 - Local demand for charcoal and firewood cause destruction forest.
 - Low levels of technology characterized by use of band axes, hand driven saws in Gabon, Brazil make felling of trees difficult
 - Political instabilities in Gabon and neighboring countries limit exploitation of tropical forests. These forests are used as hiding places by rebels.
 - Competition from other sectors of the economy affects exploitation tropical forests. For example in Brazil exploitation of forests is competing with iron ore mining at Serra dos Carajas, gold mining at Serra Palada. In Gabon oil mining competes with forestry.
 - Bush fires started by hunters, lead to destruction of tropical rain forest.
 - Limited electricity to process timber limits exploitation of tropical forests.
 - High population growth rate encroaches on forest for agriculture or settlement
 - Occurrence of accidents during the process of lumbering / felling of trees has often resulted into loss of lives. Hence discourage lumbering.
 - Limited researches to identify commercial tree species, controlled lumbering, replanting of the forests, market have affected forest exploitation.
 - Environmental conservative organizations tend to advocate against lumbering/cutting down forests. This limits exploitation of tropical forests in Gabon. Brazil.
 - Mining and quarrying destroy forest

The reasons for rapid forest destruction tropical rain forests

- There is increased demand for fuel wood and charcoal
- The increasing population used part of the forest area for settlement
- The mining and quarrying destroy forest cover.
- There is increasing need for agricultural land
- The creation and extension of urban centres/ urbanization
- The construction of transport routes i.e. railways, roads, etc. destroy forests
- The poor government policies e.g. degazetting forests, failure to restrict exploitation and destruction
- The influence of pests and diseases
- Political instability
- Improved technology by manufacturing industries for forest products to be used as raw materials
- High demand for forest products such as herbs , fruits, roots have led to rapid clearance of forests
- Wild/bush fires
- Destruction by wild animals.

Effects of deforestation on the environment

- Destruction has led to changes in climate in the area e.g. decline in rainfall
- Removal of vegetation results into problems of soil erosion.
- Rapid loss of soil fertility due to loss of humus which affects crop production. Lowering of water table that is reflected in loss of surface water.
- Leads to siltation of river channels due to the excessive run off.
- It increases pollution especially of air and reduction in purification due to loss of carbon absorbers.
- Loss of valuable tree species e.g. for medicine, timber/loss of animals and birds.
- Destruction of natural habitats for wild animals leading to migrations
- Shortage of wood fuel and charcoal leading to energy crisis.
- Causes reduction in government revenue and foreign exchange.
- Displacement of the communities which depend much on the forests for their livelihood.
- Leads to unemployment
- The flooding of rivers destroys lives and property
- It contributes to landslides and its negative effects
- It has created energy crisis/ scarcity of fuel
- Lack of wind breaks contribute to the destruction caused by wind storms
- There is displacement of the indigenous forest communities
- Loss of revenue / decline in export/ industrial earnings.

Measure being taken to combat deforestation

- Afforestation
- Re-afforestation
- Controlled exploitation of forestry resources
- Forest protection legislation
- Use of alternative source of energy such as electricity, solar energy, biogas etc.
- Educating the public to plant trees, and protect the available forests
- Training official forest worker on efficient utilization of forests
- Encouraging agroforestry
- Carry out research in forestry

Temperate coniferous forests

- The temperate forests are forests located between 45° – 70°N of the equator.
- Major species such as Douglas, fir, spruce, pines, Western hemlock, etc.
- They yield soft woods.
- Located in Canada (British Columbia) Finland, Sweden, Norway etc.

Characteristics of Temperate coniferous forests

- Trees exist in pure stands
- Trees are predominantly soft wood e.g. spruce, pine, Hemlock, Douglas fir, maple, redwood.

- They are evergreen throughout the year
- Trees have needle shaped leaves to reduce transpiration
- The barks and leaves are covered by wax.
- Trees have thin tall straight stems
- Trees have conical shape
- Trees mature in a short period
- Trees produce cones instead of fruits
- Trees produce light wood
- Trees lack prominent under growth
- Trees have thin shallow lateral roots

Factors that have favored development of the temperate coniferous forests

- Favorable climate of cool temperature and high rainfall that favors the growth of commercial varieties of coniferous trees such as Douglas fir, Western Hemlock, Red cedar, Spruce
- The poor soils discourage agriculture but favor the growth of trees.
- Rugged terrain landscape that discourages settlement but favors growth of trees.
- Existence of rivers that are used for transportation of logs to the saw mills and factories at a relatively cheaper cost for export or processing into other products.
- Presence of reliable electricity to facilitate exploitation of forests
- Presence of pure water for soaking and bleaching the pulp (paper).
- Presence of a variety of valuable tree species e.g. spruce, Red cedar, western Hemlock, Pines etc. which are used for pulp and paper, Douglas fir, suitable for sawn wood for production of furniture & pre-fabricated building timber.
- Presence of vacant land for growth of forests.
- Snow during winter facilitates easy transport of logs.
- Modern technology such as use of tractors, chain saws promotes cutting, loading and transportation of logs.
- Ready local and foreign market for timbers, pulp and Newsprint etc.
- Wide spread pure stands of a single species of say spruce, or Hemlock over encourages large scale exploitation for commercial purposes.
- Availability of skilled labour force working in the forestry industry to select, fell and chop trees into logs.
- Availability of local and foreign capital to invest in forestry industry
- Presence of a well-developed transport Network by road, railway for transportation of logs and timber products to processing factories and products to the market
- Political stability encourage long term investment in the forest industry
- Favorable government policy which emphasizes afforestation, re-afforestation, attraction of foreign investors, allocation of land to processing factories, etc.
- Intensive research to develop the forestry industry for example fast growing trees.

Differences between boreal forests and tropical rain forests.

Boreal forest	Tropical forest
Locates in high latitudes or temperate land	Located in tropical or equatorial area
Dominated by soft or light wood e.g. conifers, firs, spruces	Dominated by hard or heavy woods e.g. mahogany, teak, rosewood, ebony etc.
Trees grow in pure stands	Trees grow in impure stands (valuable trees are scattered.)
No creepers and climbing e.g. lianas, epiphytes	Presence of creepers and climbing plants
Have needle shaped leaves	Have broad shaped leaves
Have shallow roots	Have buttress roots
The trees are conical shaped and one layer	Trees are umbrella shaped with e canopies/layers/tier
Have medium sized stems	Very tall trees
They are located in high altitude	They are located in low altitude
Few tree species	Many tree species
Waxed leaves	Not waxed leaves
produce cones	Produce fruits

Contribution of forestry to the economy of a country

Positive contributions

- Source of foreign exchange from export of wood and medicinal products such as quinine from Congo basin.
- Source of government revenue from local taxes on forestry industries.
- Sources of fuel (firewood/charcoal)
- Source food/fruits
- Provision of employment from cutting, loading, and transportation of tree/logs
- Forestry has encouraged development of social services such as road and railway network, HEP etc..
- Forestry stimulate development of urban centres
- Forest favor rainfall in an area
- Forest support wild life that attracts foreign exchange from tourists.
- Forestry contribute to diversification of the economy
- Trees provide raw materials such poles and timber in construction industry.
- Source of medicinal products such as quinine for malaria.
- Forests attract foreign investment.

Negative contributions

- Forests hinder settlement and development of transport routes
- Forests support wild animals and vectors
- Accident occur during cutting trees, and transportation of logs
- Timber processing industries cause environmental pollution
- Deforestation lead to environmental degradation
- Lead to development of urban areas and negative consequences.

Thank you
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