

THE LIVING WORLD Ecosystems



🗐 🗡 Key Terms



Abiotic – The non-living elements of an ecosystem e.g. climate, soil and water.



Biotic – Organisms found in an ecosystem e.g. plants, insects & animals.



Ecosystem – a community of plants and animals sharing an environment with non-living things.



Producer – A type of organism produce their own food usually by photosynthesis.



Consumer – Organisms that consume other organisms to obtain their energy.



Decomposer – Organisms that break down dead plants and animals.



Food chain – The flow of energy from producer to tertiary consumer.

Food web – A diagram showing lots of food chains and how they overlap.



Nutrient cycle – The transfer of nutrients through an ecosystem.



Fragile environment – An environment that is both easily disturbed and difficult to restore if disturbed.



Tundra – The flat, treeless Arctic regions where the ground is permanently frozen.

Wilderness area – A natural environment that has not been significantly modified by human activity.





Biodiversity – The variety of life in the world or a particular habitat.



Biome – Areas of the planet with a similar climate and landscape, where similar animals and plants live.



Inaccessibility – Very difficult to travel or impossible to travel to or reach.



Commercial farming – Farming to sell produce for a profit.



Debt reduction – National debt relief in return for protecting rainforests.



Deforestation – The chopping down and removal of trees.



Ecotourism – Responsible travel to natural areas that conserves the environment and benefits locals.



Logging – Cutting down trees and selling the timber.



Soil erosion – Removal of topsoil faster than it can be replaced.



Sustainability – Progress meting todays needs with affecting future generations.



Mineral extraction – The removal of solid mineral resources from the earth.



Permafrost – Permanently frozen ground.



Polar – Most extreme cold environment inc. Antarctica and much of Greenland.

S Food Chains

Trophic Level	Grassland Biome	Pond Biome	Ocean Biome
Primary Producer	grass	algae	phytoplankton
Primary Consumer	grasshopper	mosquito farva	zooplankton
Secondary Consumer	rat B	dragonfly Iarva	fish
Tertiary Consumer	Snake	fish	seal
Quaternary Consumer	hawk	raccoon	white shark

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- Climate change and extreme weather events such as heatwaves affect water levels ultimately if a pond dries up the ecosystem could collapse.
- Fertilisers from farmland can be washed into the pond this means algae grows rapidly, depriving other organisms of oxygen. This causes other plants and animals to die. This is eutrophication.
- Alien species can be introduced such as predatory perch (a fish) this can reduce the food supply for other organisms further up the food chain such as herons.





THE LIVING WORLD Global biomes - Rainforests



• Location



read

10°N and 10°S of the Equator

South America (Amazon), the DRC (Africa), Indonesia & Malaysia (Asia)

Adaptations



Emergents and lianas grow to reach the sunlight. Buttress roots anchor the trees in the shallow soil.

Smooth bark to deter epiphytes.

Plants have thick, waxy leaves & drip tips to channel water.

Poison Dart Frog - bright colours deter predators. **Sloths** - long, sharp claws that help them cling onto branches.

Spider Monkey - prehensile tail to be able to grasp the branches of trees.

Jaguars - large claws, which enable them to climb small trees and catch their prey.

Value of rainforests

Services

- ्र हिं
 - Carbon sink Water and nutrient cycling
- Protection against soil erosion
 - Wildlife habitats
- (4) ヴー山 Wildlife habit のっ、
- Biodiversity
- Employment opportunities

Goods

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- Native food crops (fruit and nuts)
 - Wild meat and fish
 - Building materials (timber)
 - Energy from hydro electric power
 - Water
 - Medicines

::) Characteristics

Climate - High temperatures (27°C) and high rainfall (2000mm +)

quiz

• Water – Distinct wet season lasting several months. Leaching during this time.

Soil – Not very fertile. Nutrients concentrated in the topsoil & quickly absorbed.

Biotic – Highest biodiversity in the world. Thousands of species of plants and animals.

People – Traditional tribes live sustainably. Exploitation for \$\$ gain by non-indigenous.

🔅 The Nutrient Cycle





Rainforests





Causes of Deforestation

🚓 Logging – Hard wood (mahogany & teak) valued for furniture. Small trees pulped/charcoal.

Road building – Increased accessibility encourages development e.g. Trans-Amazonian.

Mineral extraction – Minerals (gold, bauxite, and copper) mined extensively.

Energy development – High rainfall creates ideal conditions for HEP.

Settlement and population growth –

Settlements developed to service developments.

Impacts of Deforestation

Economic Development

- Commercial farming and mining generate employment and tax income
- Education, health care and social conditions are improved from tax revenue.
- Raw materials used by processing industries increasing the value of exported products.
- Cheap, renewable energy = development.
- Long-term economic losses due to forests being destroyed and rivers polluted.
- Loss of biodiversity affects tourism.

Soil Erosion

Exposed land increases soil vulnerability to soil erosion reducing fertility.

Climate Change

- Local environment becomes hotter and drier.
- Reduction in carbon sink due to deforestation.
- Burning trees releases carbon dioxide.

Sustainable Management



Case study - Malaysia

Causes

- Subsistence and commercial farming Malaysia is the biggest exporter of palm oil in the world.
- Logging Largest exporters of tropical wood including mahogany and teak. 80% of deforestation due to logging.
- Road building gives access to new mining areas, ٠ settlements and energy projects.
- Mineral extraction Tin mining is common & drilling for oil and gas has recently started in Borneo
- Energy development Several large dams and reservoirs in Malaysia for HEP. EG. Bakun Dam in Sarawak flooded over 700km2 of forest and farmland.
- Settlement and Population Government policy called transmigration. 15,000 hectares of the rainforest felled to settle migrants from urban areas.

Economic benefits

- More jobs both directly (construction, farming) and indirectly (supply and support industries)
- Increased taxes-improve public services such as education and water supply
- Improved transport infrastructure opens up new areas for industrial development
- Products such as palm oil and rubber provide raw materials for processing industries
- HEP will provide cheap and plentiful energy
- ٠ Minerals such as gold are very valuable

Negatives

- Loss of biodiversity
- Plants that could bring huge medical benefits and high profits become extinct
- Soil Erosion & increased risk of flooding
- Removal of a carbon sink contribution to global warming.
- Number of tourists could decrease as biodiversity decreases

National Forest Policy

•Encourage alternative timber sources (e.g. rubber trees). Increase public awareness of forests.

Increase research into forestry.

•Involve local communities in forest projects.

 Selective Management System – encourage selective logging Creation of Permanent Forest Estates and National Parks

Developing Ecotourism

Small scale tourism with minimal environmental damage. Creates a source of income for local people. Based on: Small groups; Local guides; Buildings using local materials Environmentally friendly buildings (sustainable water, energy and waste management).

Construction and maintenance provide employment for locals.