**Biodiversity and change**

* Explain the concept and importance of biodiversity in tropical rainforests. Examine the causes and consequences of reduced biodiversity in this biome.

Biodiversity in tropical rainforests:

**Ecosystem:** A dynamic complex of plant, animal and microorganism communities and their nonliving environment interacting as a functional unit.

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| **Importance** | **Causes of destruction** | **Consequences** |
| * **Biodiversity:** Could contain up to 50% of the world's biodiversity.
* **Photosynthesis:** Convert carbon dioxide back into oxygen. The Amazon rainforest alone produces about 20% of the earth's oxygen.
* **Flood control:** Rainforests cause interception, extending river’s lag times and vegetation takes up water and transpires.
* **Control of soil erosion:** Roots give structure. They prevent erosion of topsoil and landslides.
* **Source of nutrients to humus layer in soil**
* **Medical remedies:** Drugs (anti-malaria drug).
* **Ecotourism:** Income source.
* **Home to indigenous groups**
 | * **Cattle Ranching:** As the world's population gets bigger and richer, the demand for meat is increasing.
* **Subsistence Farming:** Unsustainable farming methods, burning rainforest and degrading soil.
* **HEP:** Dams and reservoirs cause damage during flooding and construction.
* **Mining:** Income source with negative effects (mercury contamination)
* **Road building**
* **Urban growth**
* **Population growth:** Land and resource demand increases.
* **Plantations:** Income source (palm oil).
* **Timber:** Hardwoods like mahogany to make things like furniture. The extraction kills trees around them.
* **Hunting:** Sale of animals
 | * **Flooding:** Less structure, more runoff and mud sliding potential.
* **Landslides:** Saturated grounds cause landslides.
* **Biodiversity loss**
* **Reduced photosynthesis**.
* **Silting of rivers and oceans:** Increased silt may cause ecosystem changes and harden navigation.
* **Breaking of nutrient cycle:** With increased erosion the topsoil (humus) layer is quickly washed away.
* **Desertification:** Rainforest soil loses its fertility very quickly after deforestation, causing desertification.
* **Loss of indigenous homes**
* **Reduced rainfall:** Less water is intercepted and transpired from vegetation into the atmosphere, reducing clouds and rainfall.
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**Biodiversity:** The variety of flora and fauna. Can be viewed at three scales:

* Species diversity: Variety of species (species richness)
* Genetic diversity: Variety of genes. Allows adaptation.
* Ecosystem diversity: Variety in ecosystem types, their ecological processes and diversity of habitats.

Tropical rainforests have the most productive and diverse ecosystems on land. Most are found between the tropics of Cancer and Capricorn. Rainforests increase large amounts of rainfall and storms. The Amazon rainforest makes up one third of the remaining rainforests. Specie richness is concentrated in equatorial regions and tends to decline moving outwards.

Global rainforests decreased from covering 15% of the world’s surface to 6% due to human activity, being main cause for the reduction in biodiversity.

**Management strategy – Guyana Rainforest sale**

* Guyana is located in South America and is an LEDC. It wants to protect its large rainforests but does not have the financial possibilities to protect it against exploitation (logging, mining).
* To protect it, countries and investors who want to make sustainable commitments and achieve carbon neutrality can buy parts of the rainforest.
* As regulations become stricter, countries and businesses may buy parts of the rainforest to reduce their net emissions and possibly gain financial benefits (subsidies).