

Case Study - Tropical Rainforest

Location

The Amazon Rainforest is located in the upper section of Brazil south of the Equator. The Amazon River is located 2 to 4 degrees south of the Equator.

This region includes territory belonging to nine nations. The majority of the forest is contained within Brazil, with 60% of the rainforest, followed by Peru with 13%, and with minor amounts in Colombia, Venezuela, Ecuador, Bolivia, Guyana, Suriname, and French Guiana. States or departments in four nations bear the name Amazonas after it.

CLIMATE

- Hot throughout the year – 26° – 27°c.
- Rainfall is heavy and mainly convectional although sometimes relief. Rarely frontal because little cold air. Total rainfall is 1773 mm.
- It rains nearly every day of the year, usually in the afternoon.
- No months are dry but there is a drier period between June and September.
- There are no seasons. It is always hot and always wet.

PLANTS AND ANIMALS - There are more plant and animal species in the rainforest than anywhere else on earth. The forest is dense and plant growth is vigorous. There are four layers of vegetation. The Amazon is home to more species of plants and animals than any other terrestrial ecosystem on the planet -- perhaps 30% of the world's species are found there. Its biodiversity is astounding: a single bush in the Amazon may have more species of ants than the entire British Isles, while a lone hectare of forest may have more than 480 species of trees.

HOW HUMANS ARE CHANGING THE ECOYSTEM - Estimates suggest rainforests are disappearing at a rate of 40 hectares of rainforest every minute – equal to an area 5x size of Switzerland every year. This is called deforestation.

TIMBER – responsible for about 40% of forest destruction. *Commercial* logging provides important income for many LEDCs. *Mechanisation* has led to more rapid felling of trees and widespread destruction as vehicles and machinery drive a way through the forest.

FARMING – small scale *subsistence* farming causes little damage to the rainforest. *Shifting cultivation* allows farmers to move on and the area to regeneration.

Increasing though farming is becoming more large scale and commercial and the area is unable to regenerate and is more likely to turn to desert.

CATTLE RANCHING – pasture only lasts 10 years and overgrazing combined with the torrential rains turn the land into semi-desert.

LARGE-SCALE PROJECTS – such as iron-ore mining at Carajas in Amazonia, or massive hydroelectric schemes like the Tucari Dam in Brazil also lead to destruction.

PLANTATIONS – e.g. rubber and oil palm in the Jengka Triangle project in Malaysia.

ROAD BUILDING – e.g. Trans-Amazonian Highway in Brazil.

NEW SETTLEMENTS – to house migrants from cities and workers for farms and mines. E.g. Indonesia and Brazil.

EFFECTS ON PEOPLE AND ENVIRONMENT

- **CHANGE IN BIODIVERSITY** – loss of plant and animal species as a result of loss of habitat and destructive activities e.g. burning. Many rainforest species have become extinct.
- **CHANGE IN HYDROLOGY** – without trees the water cycle is disrupted. Interception and transpiration are both reduced and surface runoff increases. Water pours into rivers making them flood.
- **CHANGE IN SOILS** – without trees to protect it the soil is easily eroded. Torrential rain removes nutrients via surface runoff and leaching, and the soil becomes infertile. Surface runoff on steep slopes can cause gulleying and mud slides.
- **CHANGE IN CLIMATE** – transpiration is reduced and evaporation increases. This leads to a drier climate. Deforestation contributes to global warming because trees use up carbon dioxide during photosynthesis. Less forest means there is more carbon dioxide in the atmosphere, and this leads to global warming.
- **GLOBAL WARMING** – the burning of the rainforest releases carbon dioxide (a greenhouse gas). In addition trees take in CO₂ and give out oxygen – it is estimated that nearly one-half of the world's supply of oxygen comes from trees in the Amazon Basin.
- **SOCIAL IMPACT** – villages flooded in creation of damage. People forced to migrate. New jobs are created in activities in rainforest.
- **FINANCIAL IMPACT** – most of money made from activities in rainforest are carried out by large firms who take the profit out of the area and sometimes out of the country.

What is government doing?

SUSTAINABLE DEVELOPMENT – means using resources in a way that will allow continued use in the future. It means being careful with the world's natural resources and ecosystem but still enabling some development to take place.

NATIONAL PARKS – e.g. Jau Rainforest Park in Brazil which is the size of Israel and the largest National Park in the world, and the Korup National Park in the Republic of Cameroon. These areas are protected from development, the aim being to ensure the survival of their unique species of plants and animals.

SUSTAINABLE LOGGING IN PERU – small-scale schemes to produce timber in a way which does not destroy the forest are in place in the Amazon Basin and in the Solomon Islands. One scheme involves *cutting a strip of forest* only 20 metres wide. Portable saws are used to cut the felled trees into logs which can then be transported out of the forest by oxen. This causes minimum damage to the surrounding forest. The felled area is left to regenerate naturally as seedlings from the surrounding forest spread there. No more felling occurs for up to 40 years.

ECO-TOURISM – a sustainable form of tourism which aims to protect the environment and respect the local culture and customs. Tourists travel in small groups and share special interests e.g. wildlife, photography.

SCIENTIFIC RESEARCH – pharmaceutical companies can be given the right to use the research medicinal plants. This provides an income to the local people.

ALTERNATIVE ENERGY – e.g. biogas, solar and wind power to reduce the amount of wood needed for fuel