

Tropical Rainforests: Case Study Amazon rainforest, Brazil



Brazil is a NEE country in South America. 60% is a tropical rainforest with 18% of it not being interfered with. However, Brazil has experienced fast rates of deforestation compared to some parts of the world

Adaptations to the rainforest		Rainforest inhabitants
Sloths	Large arms to swing & support in the tree canopy.	Many tribes have developed sustainable ways of survival. The rainforest provides inhabitants with... <ul style="list-style-type: none"> • Food through hunting and gathering. • Natural medicines from forest plants. • Homes and boats from forest wood.
Drip Tips	Allows heavy rain to run off leaves easily .	
Lianas & Vines	Climbs trees to reach sunlight at canopy.	

Issues related to biodiversity

Why are there high rates of biodiversity?	What are the causes of deforestation?
<ul style="list-style-type: none"> • Warm and wet climate encourages a wide range of vegetation to grow. • There is rapid recycling of nutrients to speed plant growth. • Most of the rainforest is untouched. 	<p>Logging </p> <ul style="list-style-type: none"> • Most widely reported cause of destructions to biodiversity. • Timber is harvested to create commercial items such as furniture and paper. • Violent confrontation between indigenous tribes and logging companies. <p>Agriculture </p> <ul style="list-style-type: none"> • Large scale 'slash and burn' of land for ranches and palm oil. • Increases carbon emission. • River saltation and soil erosion increasing due to the large areas of exposed land. • Increase in palm oil is making the soil infertile.

Main issues with biodiversity decline	Mineral Extraction	Tourism
<ul style="list-style-type: none"> • Keystone species (a species that are important of other species) are extremely important in the rainforest ecosystem. Humans are threatening these vital components. • Decline in species could cause tribes being unable to survive. • Plants & animals may become extinct. • Key medical plants may become extinct. 	<p></p> <ul style="list-style-type: none"> • Precious metals are found in the rainforest. • Areas mined can experience soil and water contamination. • Indigenous people are becoming displaced from their land due to roads being built to transport products. 	<p></p> <ul style="list-style-type: none"> • Mass tourism is resulting in the building of hotels in extremely vulnerable areas. • Lead to negative relationship between the government and indigenous tribes • Tourism has exposed animals to human diseases.

Impacts of deforestation	Economic development	Energy Development	Road Building
	<p></p> <ul style="list-style-type: none"> + Mining (such Carajas Iron ore mine) farming and logging creates employment and tax income for government. + Products such as rubber and palm oil provide valuable income for countries. - The loss of biodiversity will reduce tourism. 	<p></p> <ul style="list-style-type: none"> • The high rainfall creates ideal conditions for hydro-electric power (HEP). • The Tucuruí Dam in Brazil is key for creating energy in this developing country, however, both people and environment have suffered. 	<p></p> <ul style="list-style-type: none"> • for Roads, such as the Trans Amazon highway, are needed to bring supplies and provide access to new mining areas, settlements and energy projects. • In Brazil, logging companies use an extensive network of roads heavy machinery and to transport wood.

Soil erosion 

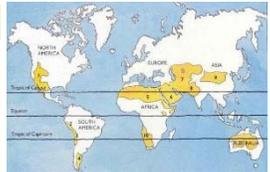
- Once the land is **exposed by deforestation**, the soil is more **vulnerable to rain**.
- With **no roots to bind soil together**, soil can **easily wash away**.

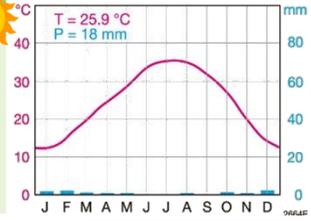
Sustainability for the Rainforest	Climate Change
<p>Uncontrolled and unchecked exploitation can cause irreversible damage such as loss of biodiversity, soil erosion and climate change.</p> <p>Possible strategies include:</p> <ul style="list-style-type: none"> • Agro-forestry - Growing trees and crops at the same time. It prevents soil erosion and the crops benefit from the nutrients. • Selective logging - Trees are only felled when they reach a particular height. • Education - Ensuring those people understand the consequences of deforestation • Afforestation - If trees are cut down, they are replaced. • Forest reserves - Areas protected from exploitation. • Ecotourism - tourism that promotes the environments & conservation 	<p></p> <ul style="list-style-type: none"> -When rainforests are cut down, the climate becomes drier. -Trees are carbon 'sinks'. With greater deforestation comes more greenhouse emissions in the atmosphere. -When trees are burnt, they release more carbon in the atmosphere. This will enhance the greenhouse effect.

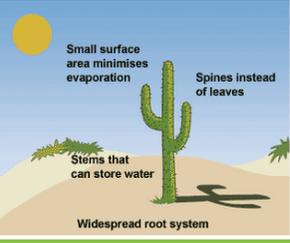
Hot Desert: Case Study Thar Desert – India/Pakistan



The Thar Desert is located on the border between India and Pakistan in Southern Asia. With India soon becoming the most populated country in the world in the next five years. With this, more people will plan to live in the desert.

Distribution of the world's hot deserts	Major characteristics of hot deserts
<p>Most of the world's hot deserts are found in the subtropics between 20 degrees and 30 degrees north & south of the Equator. The Tropics of Cancer and Capricorn run through most of the world's major deserts.</p> 	<ul style="list-style-type: none"> • Aridity – hot deserts are extremely dry, with annual rainfall below 250 mm. • Heat – hot deserts rise over 40 degrees. • Landscapes – Some places have dunes, but most are rocky with thorny bushes.

Hot Deserts inhabitants	Climate of Hot Deserts
<ul style="list-style-type: none"> - People often live in large open tents to keep cool. - Food is often cooked slowly in the warm sandy soil. - Head scarves are worn by men to provide protection from the Sun. 	<p></p> <ul style="list-style-type: none"> • Very little rainfall with less than 250 mm per year. • It might only rain once every two to three years. • Temperate are hot in the day (45 °C) but are cold at night due to little cloud cover (5 °C). • In winter, deserts can sometimes receive occasional frost and snow. 

Adaptations to the desert	Desert Interdependence
<p></p> <p>Small surface area minimises evaporation</p> <p>Spines instead of leaves</p> <p>Stems that can store water</p> <p>Widespread root system</p>	<p>Different parts of the hot desert ecosystem are closely linked together and depend on each other, especially in such a harsh environment.</p> 

Opportunities and challenges in the Hot desert	
Opportunities	Challenges
<ul style="list-style-type: none"> • There are valuable minerals for industries and construction. • Energy resources such as coal and oil can be found in the Thar desert. • Great opportunities for renewable energy such as solar power at Bhaleri. • Thar desert has attracted tourists, especially during festivals. 	<ul style="list-style-type: none"> • The extreme heat makes it difficult to work outside for very long. • High evaporation rates from irrigation canals and farmland. • Water supplies are limited, creating problems for the increasing number of people moving into area. • Access through the desert is tricky as roads are difficult to build and maintain.

Causes of Desertification		Strategies to reduce Desertification
<p>Desertification means the turning of semi-arid areas (or drylands) into deserts.</p>	<p>Climate Change </p> <p>Reduce rainfall and rising temperatures have meant less water for plants.</p>	<ul style="list-style-type: none"> • Water management - growing crops that don't need much water. • Tree Planting – tree planting can act as windbreakers to protect the soil from wind and soil erosion. Great Green wall • Soil Management - leaving areas of land to rest and recover lost nutrients. • Technology – using less expensive, sustainable materials for people to maintain. i.e. sand fences, terraces to stabilise soil and solar cookers to reduce deforestation.
<p>Fuel Wood</p> <p>People rely on wood for fuel. This removal of trees causes the soil to be exposed.</p>	<p>Overgrazing</p> <p>Too many animals mean plants are eaten faster than they can grow back. Causing soil erosion.</p>	
<p>Over-Cultivation</p> <p>If crops are grown in the same areas too often, nutrients in the soil will be used up causing soil erosion.</p>	<p>Population Growth</p> <p>A growing population puts pressure on the land leading to more deforestation, overgrazing and over-cultivation.</p>	