

KI : Ecosystems exist at a range of scales and involve the interaction between biotic and abiotic components

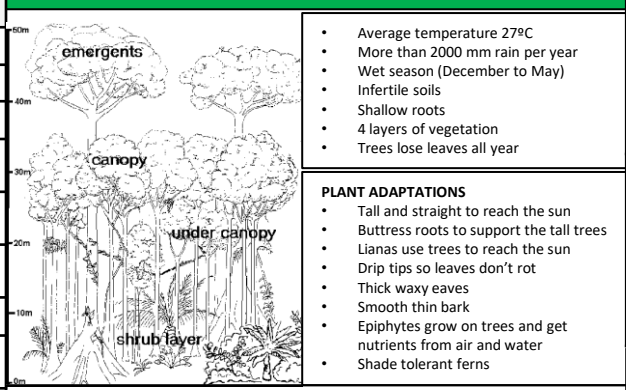
Key term	Definition
Abiotic	Relating to non living things
Biotic	Relating to living things
Consumer	Creature that wats herbivores and / or plant matter
Decomposer	An organism that breaks down dead tissue which is then recycled to the environment
Ecosystem	A community of plants and animals that interact with each other and the physical environment
Food chain	The connections between different organisms that rely on one another as their food source
Food web	A complex hierarchy of plants and animals relying on each other for food
Nutrient cycling	A set of processes whereby organisms extract minerals necessary for growth from soil and water before passing them on though the food chain
Global ecosystem	Large biomes with flora and fauna adapting to their environment
Producer	An organism or plant that is able to absorb energy from the sun through photosynthesis

Biome	Key Characteristics
Tropical Rainforests	<ul style="list-style-type: none"> Along equator (Asia, Africa / South America) 6% earth's surface 25°C – 30°C and over 250mm rain per year
Temperate Grassland	<ul style="list-style-type: none"> 40° - 60° N of the equator (N America and E Europe) Centre of continents away from the sea Short grasses Wet and dry seasons
Coniferous Forest	<ul style="list-style-type: none"> 60°N (Scandinavia / Canada) Cone bearing evergreen No sunlight for part of the year
Deciduous forests	<ul style="list-style-type: none"> Higher latitudes (W Europe, N America, New Zealand) 5 – 20°C and between 500 – 1500 mm rain per year 4 distinct seasons Lose leaves in the winter to cope with the cold
Tundra	<ul style="list-style-type: none"> Above 60°N (Arctic Circle) Less than 10°C and less than 500mm per year rain Cold, icy and dry means 2 month growing season
Mediterranean	<ul style="list-style-type: none"> 30- 40°N and S on west coast of continents Drought resistant small trees and evergreen shrubs
Tropical Grasslands	<ul style="list-style-type: none"> Between equator and tropics 20 – 30°C and between 500- 1500 mm of rain per year Wet and dry seasons
Deserts	<ul style="list-style-type: none"> Tropics (Sahara and Australia) Over 30°C and less than 300 mmm per year rain 20% of land's surface

Tropical rainforest ecosystems have a range of distinctive characteristics

Key term	Definition
Biodiversity	The way of life in the world or a particular habitat
Convectonal rainfall	Warm air at the surface heats up, rises, cools and condenses forming clouds. This leads to heavy daily rainfall

GCSE The Living World - Rainforests Knowledge Organiser



- ANIMAL ADAPTATIONS :**
- Sloths – hook to grip branches
 - Parrots – sharp beak for nuts and fruit; 4 toes per foot to clamber
 - Long limbed spider monkey – sharp nails to peel bark to get to sap
 - Flying frog – web like feet to glide through the air
 - Titan beetle – flies and lives on decaying material
 - Anteaters – long tongues; good smell and hearing; sharp claws to open ant hills
 - Harpy eagle – short pointy wings to manoeuvre

- INTERDEPENDENCE OF CLIMATE, WATER, SOILS, PLANTS, ANIMALS AND PEOPLE**
- Small changes to biotic and abiotic factors can have serious knock on effects
 - Biomass is the largest nutrient store and the biggest transfer is from soil to biomass
 - Fertility s quickly lost from the soil if trees are cut down
 - Poor soils due to leaching (the washing away of nutrients)
 - Thick litter layer. Rapidly breaks down due to climate
 - Warm humid climate means rapid plant growth

- ISSUES RELATED TO BIODIVERSITY**
- More than half the world's species are found in rainforests
 - Human exploitation is a major threat
 - Many extinct and endangered species are leading to a decrease in ecosystem productivity

KI : Deforestation has economic and environmental impacts

Key term	Definition and facts
Commercial farming	Farming to sell produce for a profit. Palm oil in Malaysia. Cattle and crops. 80% of destruction as ruins soil and nutrients
Deforestation	The chopping down and removal of trees to clear an area of forest
Logging	The business of cutting down trees and transporting the logs to sawmills. Selective logging and clear felling. Teak and Mahogany worth the most
Mineral extraction	The removal of mineral resources from the earth. Gold, Bauxite, Oil and gas. Tin in Malaysia. Pollutes rivers and air
Soil erosion	Removal of topsoil faster than it can be replaced due to natural, animal and human activity
Subsistence farming	A type of agriculture producing food and materials for the benefit only of the farmer and his family
Other uses	<ul style="list-style-type: none"> Road building –Opens up rainforest for other uses Settlement – Government resettled poor and gave them land Energy development – HEP rots vegetation and turbines corrode e.g. Bakun Dam, Malaysia.

IMPACTS IN MALAYSIA

<p>Economic development</p> <ul style="list-style-type: none"> Brings in jobs and income Tax revenue to improve services. Improved infrastructure – benefits tourism etc. Cheap renewable power from HEP Destroys resources in the long term Livelihoods of locals destroyed Rainforest tourism could decrease 	<p>Soil erosion</p> <ul style="list-style-type: none"> Land left unprotected from heavy rain leads to landslides and flooding Nutrients are washed away decreasing nutrients in the soil Rivers silt up
<p>Contribution to climate change</p> <ul style="list-style-type: none"> Trees cut down change the water cycle and make it drier and warmer Rainforests are the lungs of the earth and so when deforested there is ore carbon dioxide in the air and less oxygen. Burning also releases carbon to the air (Greenhouse effect) 	<p>Others</p> <ul style="list-style-type: none"> Loss of biodiversity – possible plants with medical potential. Loss of indigenous tribes Tribal people re settled due to Bakun dam may have drugs and alcohol issues. Loss of indigenous knowledge Conflicts between developers and indigenous people

KI : Tropical rainforests need to be managed to be sustainable

Key term	Definition
Debt reduction	Countries are relieved of some of their debt in return for protecting their rainforests
Ecotourism	Responsible travel to natural areas that conserve the environment, sustains the well being of local people and may involve education
Selective logging	The cutting down of trees which are mature or inferior to encourage the growth of the remaining trees
Sustainability	Actions and forms of progress that meets the needs of the present without reducing the ability of future generations to meet their own needs

GOODS AND SERVICES

<p>GOODS : Food; Building materials; HEP; Water; Medicines (1/4 of drugs use products found in the rainforest)</p>	<p>SERVOCES : Air purification; Water and nutrient cycling; Protection from soil erosion; Habitats; Biodiversity; Employment</p>
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MANAGEMENT STRATEGIES

STRATEGY	KEY FACTS
Selective logging and replanting	<ul style="list-style-type: none"> Only fell fully grown trees on 30 – 40 year cycle Replanting – collect seeds from primary forest; grow in nurseries and replant Forest Stewardship Council – mark sustainably sourced timber
Conservation and education	<ul style="list-style-type: none"> Education of locals key WWF (NGO) – education; train conservation workers; provide practical help; buy threatened areas and set up nature reserves
Ecotourism	<ul style="list-style-type: none"> Minimises damage to environment and benefits locals Small visitor numbers Waste and litter disposed of properly Locals employed so incentive to preserve environment
International agreements about use of tropical hardwoods	<ul style="list-style-type: none"> International Tropical Trade Agreement 2006 and 2011 – restricts trade in hardwood from rainforests Needs to be felled from sustainably managed areas and stamped with registration numbers UN Sustainable development goals include protection of forests
Debt reduction	<ul style="list-style-type: none"> Debt for nature swaps – in 2010 USA converted debt of \$13.5 million from Brazil and used the funds to protect the rainforest HICs wipe off debts of debts of LICs