



TRF - Large variety of plants
Reason: As TRF receives abundant sunlight & high rainfall which is suitable for plants to grow quickly
Evergreen
Reason: Trees do not shed their leaves at particular times of the year. It grows new leaves to replace older ones that are ageing or a constantly green appearance

Subtropics claim that there is a gap between TRF and temperate forests (not being tropical) There are several tropical rainforests located in only temperate parts of the world (Chaco, Cerrado)

Tropical Rain Forest (TRF) Tropical Rain Forest (TRF) is found in South America, Africa, Asia, and Australia. It is a wet and hot climate with high rainfall and high temperatures throughout the year (Monsoon, Equatorial, Tropical)

Example of rain forest : Congo Basin

Graphs : TREE
TREnd (increasing or decreasing trend) (look at starting and ending points)
Evidence (From... in ... to... in...)
Exception (However...)

The Layers of the trees

Emergent layer :
- 30m to 50m
- Tallest trees
- Tower above other trees
- Few branches
- Tall, straight & smooth trunks which channel water down to the roots quickly

Undergrowth Layer

Scarcely vegetation	Layer of leaf litter	Not many plants	Decomposition rapid, shrubs, fungi & moss
Hot & wet	Plants are thin, small & widely spaced	Dark (little sunlight)	Damp as most water trickles down the trunks after rain

Canopy Layer:
- 20m to 30m
- Trees are Close
- Their Crowns interlock to make a Continuous Cover which Catches much rainfall

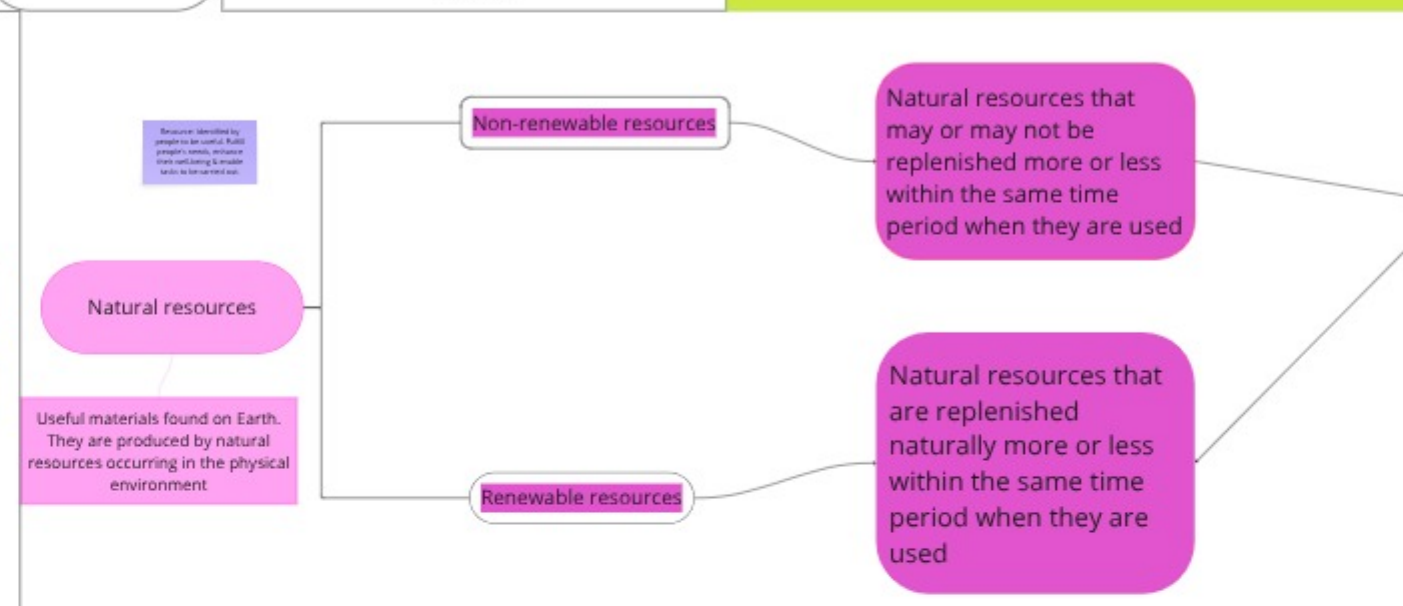
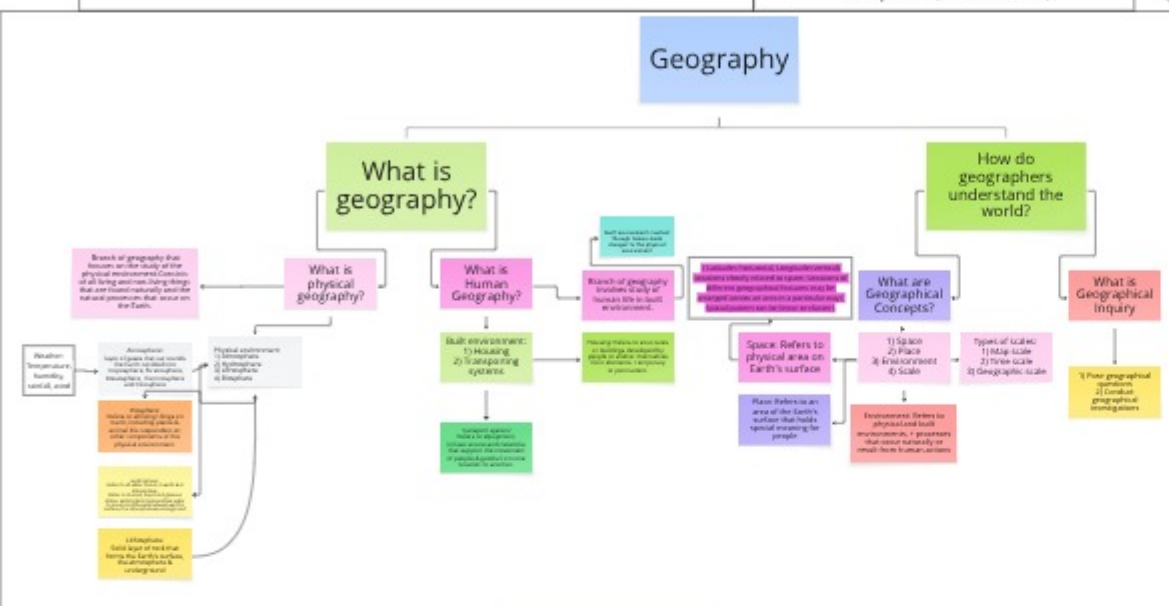
Adaptations of plants in TRF (leaves):

- 1) Broad: Large surface area to absorb as much sunlight as possible to make food for its own survival & growth
- 2) Waxy: Help plants reduces the amount of water vapour that it loses to the atmosphere through transpiration as a result of high temperatures
- 3) Drip-tips:
 1. small narrow tips that point downwards
 2. Allow rainwater that falls onto them to flow them to flow off easily thus preventing growth of fungi & bacteria

Adaptions of plants in TRF (roots) :

- 1) Buttress Root:
 1. Grow 1m to 5m tall above soil to absorb nutrients found on forest floor which has a lot of fallen leaves
 2. Help keep trees in emergent layer upright & prevent them from toppling over
- 2) Shallow roots
 1. Nutrients are concentrated at the top layer due to high decomposition rate on forest floor
 2. Water is easily available due to the high rainfall

1) Lower-lying of coasts (close to the low tide level) are flooded for longer periods. Mangrove species that are able to tolerate high tides are found here
Example : Sonneratia & Avicennia

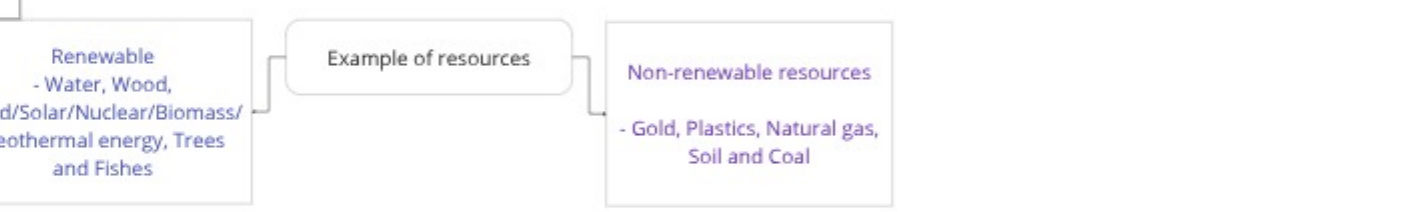
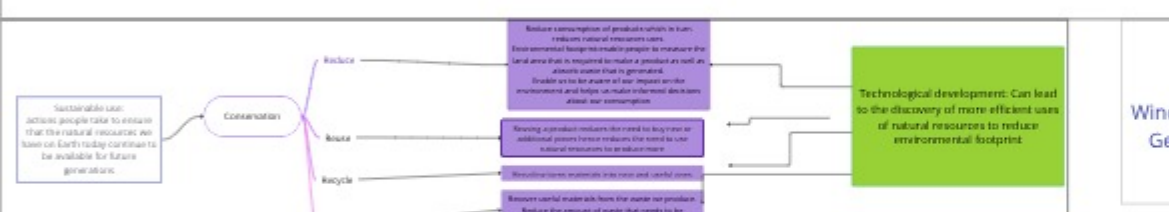


Nature-centred: Physical environment is seen as valuable in itself (naturally found) - little/no damage to it (conserve it or protect it)

Human-centred: Physical environment is valuable because humans can obtain materials from it for their use and benefit by extracting it to earn money

2) Other groups of plant species that are not so tolerant of high tidal water are found near high tide levels where duration of flooding by tide is shorter
Example: Rhizophora & Bruguiera

Extraction can negatively impact the availability of resources (if faster than natural renewal, could lead to resource depletion and to environmental degradation)



What are Mangroves & where are they found?

- 1) Most areas where Mangrove forests are located, experience tropical climate as when they are unable to withstand freezing conditions
- 2) Grow best when average air & water temperature do not fall below 20 degree celsius
- 3) Require calm water conditions to encourage accumulation of fine sediments containing nutrients hence they are found in sheltered environment along or very close to coast.

low-energy wave

Characteristics of Mangroves

- 1) lesser diversity compared to TRF as not many plants species have evolved to survive in waters of high salinity
- 2) Significantly less dense than TRF, resulting in less competition for sunlight
- 3) Not shaded conditions to obtain as much energy from the sun to survive in difficult coastal environment
- 4) Relatively uniform in height as there is less competition for sunlight & need for as much energy from the sun, Mangroves cannot survive in a dark undergrowth.
- 5) Some species are able to survive in higher salinity water & withstand longer flooding periods by the tide compared to others. This results in Horizontal Zonation.

Zonation refers to the distribution of plants in specific areas.

6) High salinity (contains salt) - Mangroves are found a long or very close to the coasts. Able to grow in water that has a higher salinity than fresh water due to the lack of competition from other types of plants

Adaptations of plants in Mangroves: (Salt- secreting leaves)

- 1) Enables plants to remove salt from the saline water that their roots absorbed
- 2) The concentrated salt solution secreted will crytallize through evaporation, salt crystals are left behind on the leaf surfaces and are subsequently removed by rain or wind
- 3) Some mangrove species are unable to secrete salt through leaves hence, they deposit excess salt in older leaves which they eventually shed. This helps prevent salt from building up within the plant.

