

**PENANG SANGAM HIGH SCHOOL**  
**P.O.BOX 44, RAKIRAKI**  
**YEAR 13 GEOGRAPHY WORKSHEET 5 – WEEK:13-14-15 /LESSON NOTES & ACTIVITIES**

|                                 |  |
|---------------------------------|--|
| <b>Strand</b>                   | Physical Geography   |
| <b>Sub Strand</b>               | 4. Vegetation  |
| <b>Content Learning Outcome</b> | Highlight the types of vegetation<br>Describe the impact of climate change on vegetation |

## **VEGETATION**



*Welcome Back to Week 13,14,15 Students hope that you have been utilizing your time wisely during this school break. Remember you have to catch up with your studies to be able to cope with me when the school starts.*

### **Lesson : 11**

#### **Instructions**

*You should spend 3 hours in this particular lesson. Try your best to understand the notes first and attempt the Diagram activity that follows.*

*Lets begin!!!!*

### **INTRODUCTION**

**Natural vegetation** can be defined as plants that have not been grown by humans. It doesn't need help from humans and gets whatever it needs from its natural environment. Some types of natural vegetation are Forests, tundra, grass lands and rainforests. The Earth's natural vegetation can be three main types – forests, grassland and desert vegetation. These three main types can be further classified into different sub-types. The first subtype is the variety of forest vegetation such as coniferous forest, deciduous forest, equatorial rainforest, tropical monsoon forest and mangrove forest. The second sub-type is the grassland vegetation that consist of two types; temperate grassland and tropical grassland and the third sub-type is the desert vegetation type that includes hot desert vegetation and cold tundra vegetation.

#### **Chapter Focus**

**In this section, you will explore the:**

- i. Types of natural vegetation**
- ii. Factors influencing their growth and distribution**

### iii. Impacts of climate change on vegetation

Vegetation refers to group of plants and trees together. Vegetation plays an important role in maintaining/sustaining the temperature and rainfall of a place. Soil type determines the particular type of vegetation grown in an area. Vegetation also plays an important role to humans as it provides food for most living things on this planet.

Ecosystem – a natural unit in which the lifecycles of plants, animals and other organisms are linked to each other and to the non-living constituents of the environment to form a natural system. For instance the Mangrove Ecosystem, Coral Reefs etc

An ecosystem depends on two basic processes: the **flow of energy** and the **recycling of nutrients**.

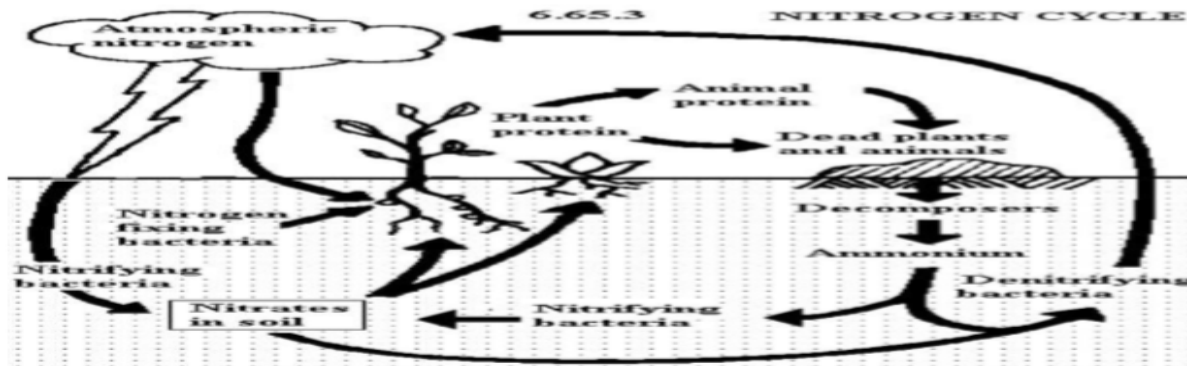
#### Flow of energy

- The sun is the primary source of energy for all living things on earth.
- The sun provides heat energy which can not be captured by plants and animals but which warmed up the communities and their non – living surroundings.
- The sun is also the source of light energy which can be captured by green plants and transformed into chemical energy through the process of photosynthesis. Without photosynthesis there would be no life on earth.

#### Recycling of Nutrients

- Trees, organisms and leaves die and fall to the ground. They are decomposed by soil organisms and turned into humus/nutrients. These nutrients are taken up by plant roots and the cycle continues.

#### **The Nitrogen Cycle**



Source: <https://image.slidesharecdn.com>

Nutrient cycle - The nitrogen cycle is the biogeochemical cycle by which nitrogen is converted into various chemical forms as it circulates among the atmosphere and terrestrial and marine ecosystems.

The conversion of nitrogen can be carried out through both biological and physical processes.

#### Primary Vegetation and Secondary Vegetation

**Primary Vegetation** – refers to untouched, unspoiled forest that exists in its original condition.

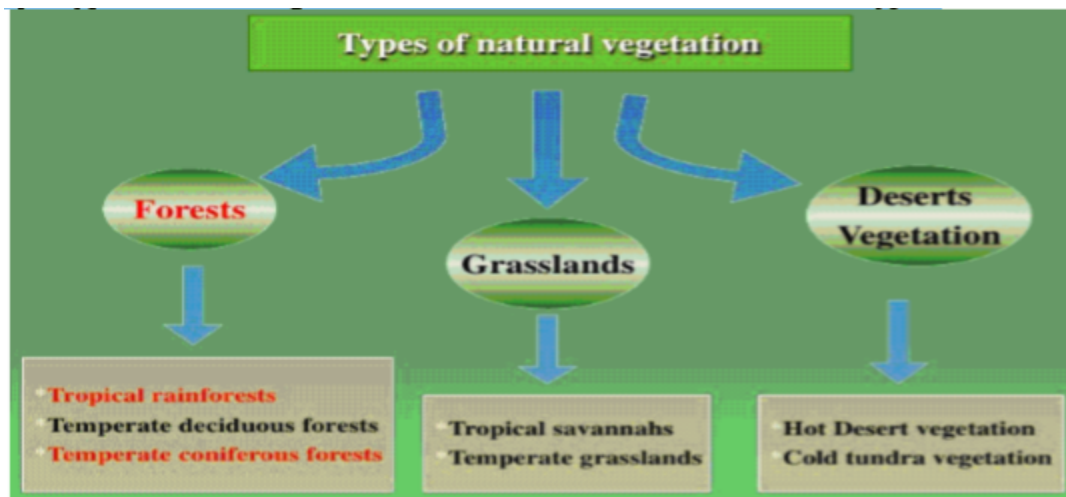
**Secondary Vegetation** – refers to forest that has been disturbed in some way, naturally or unnaturally. Areas with secondary vegetation have fewer varieties of plants.

## Types of Natural Vegetation

There are many types of natural vegetation and they can be grouped into three main major types

- Forests
- Grasslands
- Deserts

Each major type of natural vegetation can be sub-divided into various sub-types



## FORESTS

Forests refer to large areas of land that consist mainly of trees and a variety of other plants. They are usually found:

| Distribution      | Climate        |                 |
|-------------------|----------------|-----------------|
|                   | Temperature *C | Rainfall (mm)   |
| Between latitudes | -12 to 30*     | 300mm to 2000mm |

### Benefits of forests

- Natural Resources – the hardwood trees in rainforest provide wood required to make things like furniture and houses.
- Medicinal Value – many plants that grow in tropical rainforest have medicinal properties
- Recreation – a place where nature lovers can relax, used as a tourist attraction
- Natural Habitats – loss of natural vegetation will result in the loss of food and habitat for animals
- Prevents erosion of soil – plants can prevent soil erosion

### Factors that produce and control each biome

#### **Climatic**

- Precipitation - also affect vegetation because all plants require water to grow. Most trees require water to grow than grass. Hence, most forests grow in areas with high rainfall (above 1000mm a year). Areas receiving little summer rainfall, trees and shrub growing there have to be xerophytic (drought resistant) in order to survive. Places where rainfall is limited throughout the year have either a desert biome, where ephemerals(plants with very short life-cycles) dominate the vegetation, or a tundra biome, where precipitation falling as snow
- Temperature - affects vegetation because if it is too cold (less than 6degrees C), few plants can grow. On the other hand, warm temperatures (above 20degreesC) allow abundant plant growth. In areas with moderate precipitation of between 200mm and 1000mm, grasslands are more common. In areas with less than 200mm of rain, deserts are found.
- Light intensity – affects the process of photosynthesis. Tropical ecosystems receiving most incoming radiations have higher energy inputs than do ecosystems nearer to the poles. Where the amount of light decreases as on the floor of the tropical rainforests, or with increasing depth in the ocean, plant life decreases. Quality of light affects plant growth eg.the increase in ultra violet light on mountains reduces the number of species found there.
- Wind – increase the rate of evapo-transpiration and the wind chill factor. Trees are liable to bend if exposed to strong prevailing winds.

Natural vegetation is influenced mainly by climate. A climate -vegetation relationship exists because rainfall and temperature determine the type of vegetation found in a place.

- High rainfall – forests - Moderate rainfall – grassland - Low rainfall – desert vegetation

Climate is a major factor that influences the distribution of natural vegetation. Other factors like the type of soil and altitude can also affect its distribution.

### Topographic

- Altitude - as it increases, there will be fewer species, they grow less tall and therefore less dense cover. Relief could also bring about a rainshadow effect.
- Slope angle – influence soil depth, acidity (ph) and drainage. Steeper slopes have thinner soils, are less water logged and less acidic than gentler slopes.
- Aspect – is the direction in which a slope faces. Aspect affects sunlight, temperatures and moisture. South facing slopes in the northern hemisphere are more favourable to plant growth than those facing north because they are brighter, warmer and stronger.

Edaphic – variation in vegetation is due to soil and underlying parent rock. Plant growth is affected by soil texture, structure, acidity, organic content, depth, water and oxygen content, nutrients.

Biotic factors – includes the element of competition between plants for light, root space and water and competition – increases with density of vegetation.

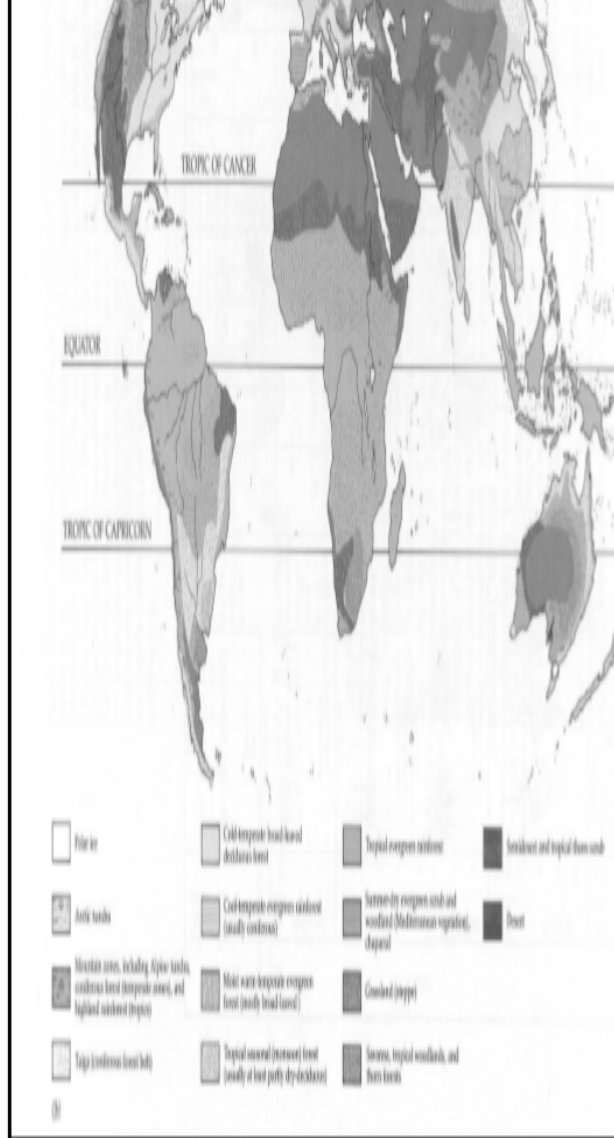
- Competition from introduced species who can wipe out or invade an area that used to be covered by a particular species.
- Natural selection is an important biotic factor. The composition of seral communities and the degree of reliance upon other plants and animals either for food or energy are also biotic factors

### Biome

A biome is a large global ecosystem and gets its name from the dominant type of vegetation formed within it, (coniferous forest, temperate grassland, etc)

### Distribution of Biomes

- i. Near the equator you find tropical rainforests, for example the Amazon, they are mainly found in Brazil. Some in South Africa and some east of Africa.
- ii. Also tropical grasslands are found mainly in Africa. Hot desert is mainly found in North Africa and some parts of Asia.
- iii. North of Africa you find a Mediterranean biome.
- iv. Then you find temperate grassland in southern parts of Asia.
- v. Temperate deciduous forests are found north of the temperate grassland biome. 'Deciduous' means loses leaves.
- vi. Coniferous forests are found in North Asia and some parts of Canada.
- vii. Then Tundra biome is at the northeast point of the globe like Iceland and the northeast point of Canada and Greenland.
- viii. South of South Africa you find tropical grassland. But there are 'other biomes' such as ice and mountains.



## Types of Biomes

### 1. Tropical rainforest

1. Location – found in hot, humid environments in equatorial climate. Tropical rainforests are found mainly along the equator between 23.5° N and 23.5° S of the equator.

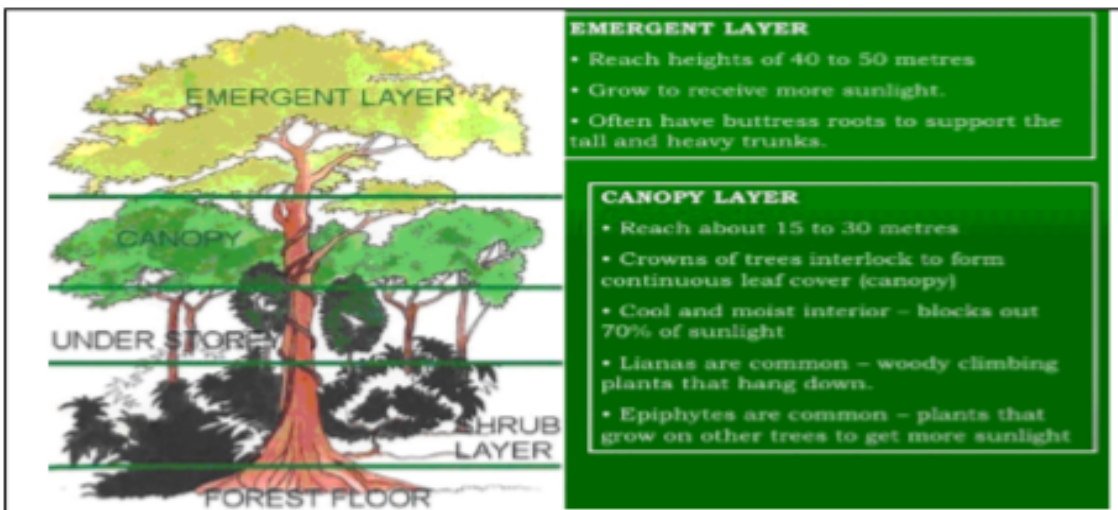
| Distribution  | Ferralticsoils (latosols)   | Climate  |   | Location                                 |
|---|---|--|---|--|
|   |   | Temperature °C   | Rainfall (mm)   |  |
| Between latitude of 23.5° N and 23.5° S of the equator which has a tropical climate | Result from the high annual temperature and rainfall causing rapid chemical weathering of bedrock<br><br>Red in colour because heavy rainfall causes the release of iron and aluminium from the parent material | High between 20° and 30°C and constant throughout the year | High 1000 mm to 2000 mm due to the convergence of the trade winds at the ITCZ | Amazon Basin                             |
|   |   | Annual temperature range under 30°C                        | Rapid evapotranspiration from rivers, swamps and trees                        | Malaysia and Indonesia in Southeast Asia |
|   |   | Insolation evenly distributed throughout the year          | Violent storms with heavy rain, accompanied by thunder and lightning          | The Congo Basin in Africa                |



Source: <https://mrogren.wikispaces.com>

Features

- i. Contain the most diverse range and highest volume of plant and animal life found anywhere on earth.
- ii. Trees grow very close to each other, making the forest very dense.
- iii Provide 40 per cent of the net primary production of terrestrial energy because of high solar radiation, an all-year growing season, heavy rainfall, rapid leaf litter and the recycling of nutrients.
  - iii. Tropical forests trees are evergreens as the leaves remain green throughout the year .
  - iv. Some plants called epiphytes overcome the shortage of sunlight by growing high up on tree branches to get sunlight (eg. Ferns, orchids).
  - v. Other plants known as lianans grow upward to get more sunlight by winding around tree trunks.
  - vi. The leaves are also waxy and have drip tips to allow water to drain off.
  - vii. The bark of trees in the tropical rainforest is thin because they are not required to protect the trees from dry or cold conditions.
  - viii. Branches are also located in the top one-third portion of the trunks and they are shaped like umbrellas to capture as much sunlight as possible.
  - ix. Roots of tropical forest trees are shallow because they do not need to reach deep into the soil for water.
  - x. Some of the tallest trees have buttress roots to support their great weight and prevent them from falling over.
  - xi. A mature equatorial rainforest has a distinct structure of five layers: Emergent layer, Canopy layer, Understory layer , Shrub layer- consists of shrub and small trees which are adapted to living in the shade of their taller neighbours and the Undergrowth.





### Diagram Activity



(i) Identify the five layers of a mature tropical rainforest. Tallest to shortest

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(ii) Describe the interrelationship shown between plants and animal.

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(iii) State three ecological and three cultural significance of forests.

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(iv) Describe two adaptive features of tropical rainforest vegetation.

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(v) Describe two physical factors that influence the growth and distribution of vegetation.

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