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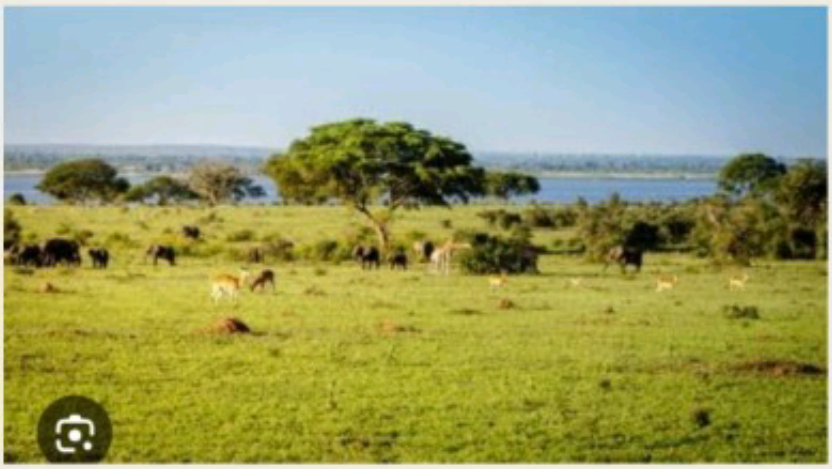
ECOSYSTEM STRUCTURE – GRASSLAND ECOSYSTEM

BOTANY (MINOR) SEMESTER – 3 TOPIC



GRASSLAND ECOSYSTEM.

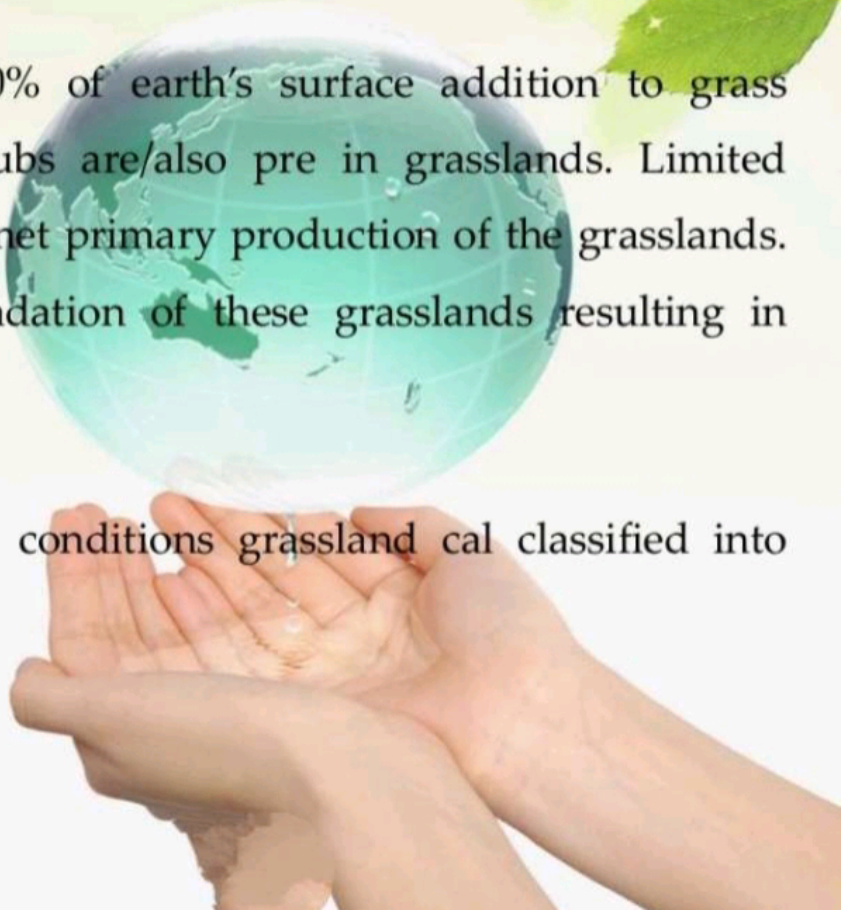
Introduction

Grassland occupies about 20% of earth's surface addition to grass species, some trees and shrubs are/also pre in grasslands. Limited grazing helps to improve the net primary production of the grasslands. But, overgrazing leads degradation of these grasslands resulting in desertification

Types of grassland ecosystem

Depending upon the climate conditions grassland cal classified into three types

1. Tropical grasslands.
2. Temperate grasslands.
3. Polar grasslands.



Features of different types of grassland

1. Tropical grasslands

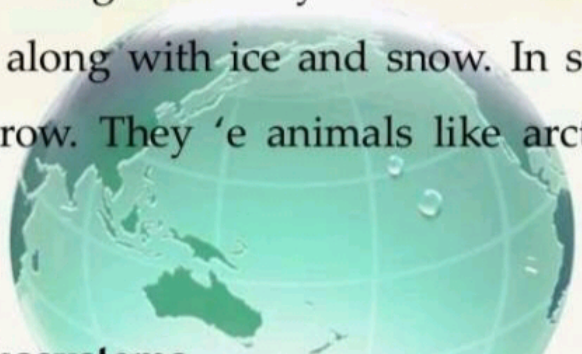
They are found near the borders of tropical rain . forests. are characterized by high temperature and moderate rainfall (40 to 100 cm). It is also known as Savanna type. They ye tall grasses with scattered shrubs and stunted trees and animals like zebras, giraffes, antelopes, etc.,

2. Temperate grasslands

They are usually found in the centers of continents, oil sloped hills.. They are characterized by very cold winters and hot summers: Intense grazing and summer fires, do not W shrubs or trees to grow.

3. Polar grasslands

They are found in arctic polar regions. They are characterized by severe cold and strong winds along with ice and snow. In summers several small annual plants grow. They ‘e animals like arctic wolf, weasel, arctic fox, etc.,



Characteristics of Grassland Ecosystems

Grassland ecosystem is a plain land occupied by grasses. Soil is very rich in nutrients and organic matter. Since it has tall grass, it is ideal place for grazing animals. It is characterized by low or uneven rainfall.

Structure and function of the grassland Ecosystems

I. Abiotic components

Nutrients, , H, 0, A, P, S, etc.,

These abiotic components are supplied by $C0_2$, H_2, C, Nitrate, phosphates and sulphates.

II. Biotic Components

1. Producers: They produce food.

Example :Grasses, forbs and shrubs.

2. Consumers:.

Primary consumers (herbivores) :They depend on grasses for their food

Examples: Cows, buffaloes, deer, sheep, etc.,

Secondary consumers (carnivores) :They feed on herbivores.

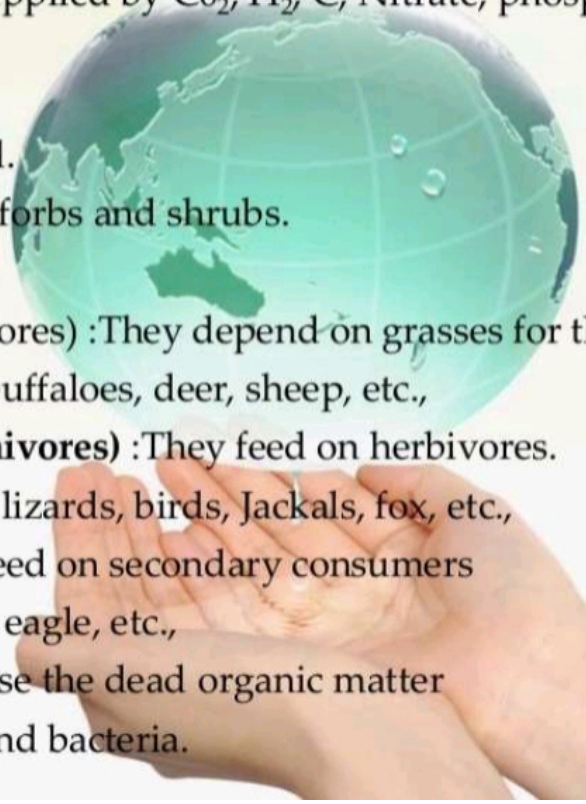
Examples: Snakes, lizards, birds, Jackals, fox, etc.,

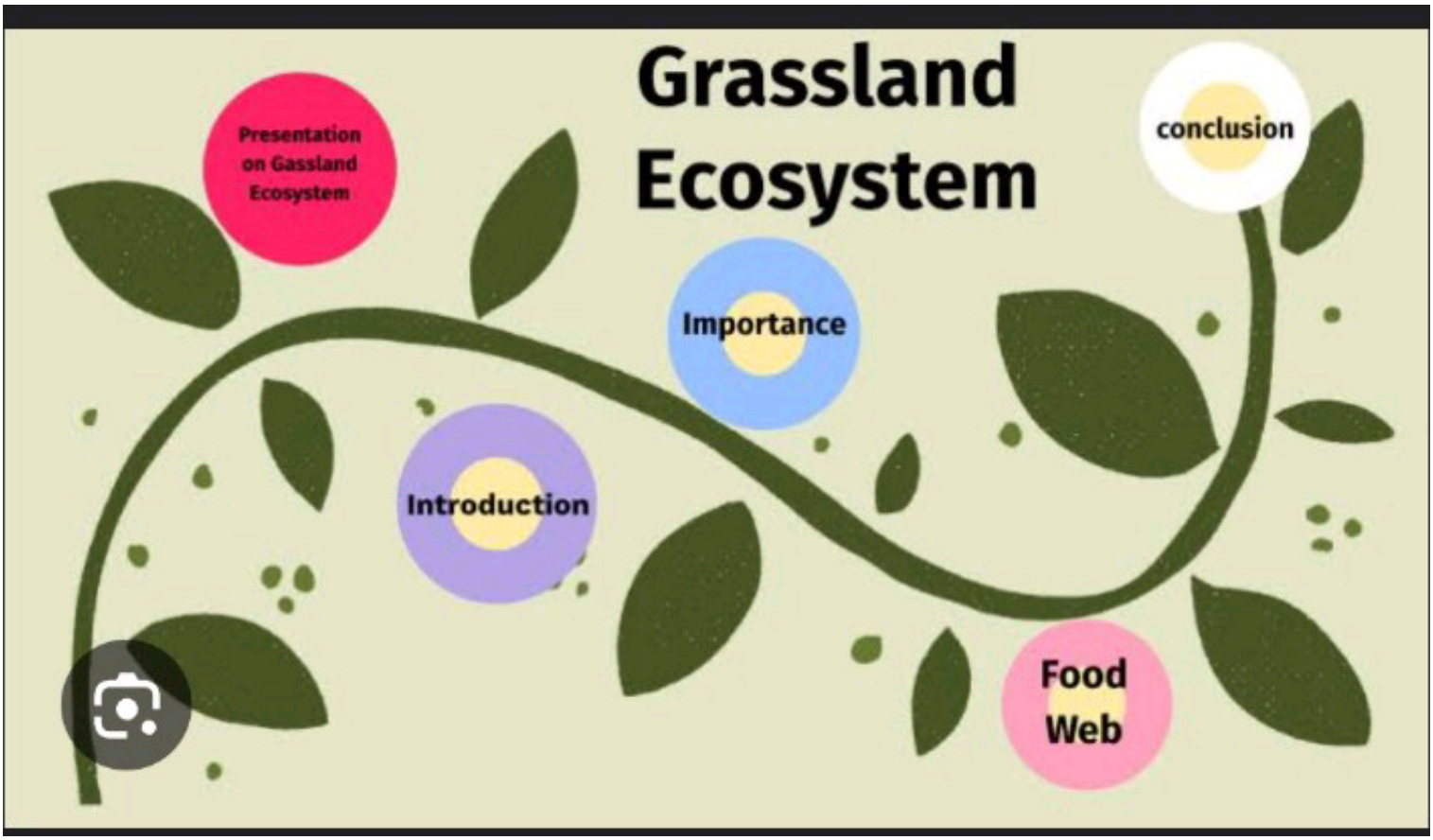
Tertiary consumers: They feed on secondary consumers

Examples :Hawks, eagle, etc.,

3. Decomposers : They decompose the dead organic matter

Examples **:**Fungi and bacteria.




Grassland Ecosystem
Presentation on Gassland Ecosystem
conclusion
Importance
Introduction
Food Web

Grassland Ecosystem is an area where the vegetation is dominated by grasses and other herbaceous (non-woody) plants. It is also called transitional landscape because **grassland ecosystems** are dominated by the grass with few or no trees in the area where there is not enough for a forest and too much of a forest. Grasslands (also called Greenswards) are areas where the vegetation is dominated by grasses and other herbaceous (non-woody) plants. Grasslands occupy about 24% of the earth's surface. They occur in regions too dry for forests and too moist for deserts.

The annual rainfall ranges between 25- 75 cm, usually seasonal. The principal grasslands includes Prairies (Canada, USA), Pampas (South America), Steppes (Europe and Asia), and Veldts (Africa).

The highest abundance and greatest diversity of large mammals are found in these ecosystems. The dominant animal species include wild horses, asses and antelope of Eurasia, herds of Bison of America; and the antelope and other large herbivores of Africa.

Types of Grassland Ecosystem

Grassland ecosystem contains five types of grasslands that are:

- Tropical Grasslands
- Temperate Grasslands
- Flooded Grasslands
- Montane Grasslands
- Desert Grassland

Tropical Grasslands

Tropical Grasslands are the ones which receive 50 cm to 130 cm rain. Furthermore, they have both rainy and dry days. As a result, they are warm all year round. Moreover, tropical grasslands are also

called Savanna. These grasslands contain shrubs and small trees that are dry in nature. Also, the tropical grasslands contain quite short plants which makes it an excellent hunting ground. For instance, the African savanna is one of the tropical grasslands. In conclusion, the tropical grassland is a home for elephants, giraffes, lions, cheetahs, zebras, and other spectacular species.

Temperate Grasslands

Temperate grasslands receive rainfall of the range 25 cm and 75 cm. Furthermore, the climate in the temperate grasslands makes it both dormant and growing. Moreover, these grasslands suffer extreme climates. In the cold season, the temperature can reach up Flooded Grasslands to 0 degrees Fahrenheit. While in the summer season it reaches up to 90 degrees in some areas. The precipitation in these grasslands is mostly in the form of dew and snow. For instance, some vegetation that grows here are, cacti, sagebrush, perennial grasses, buffalo grass clovers, and wild indigos, etc.

Flooded Grasslands

The flooded grasslands are having water all year-round. Furthermore, these grasslands contain numerous vegetation that grows in water. Various water birds migrate to these areas while some are residents of it. Most Noteworthy the Everglades is the world's largest flooded grasslands. Furthermore, it features various types of birds, fish, mammals, reptiles, seed-bearing plants, amphibians, and butterflies, etc.

Montane Grasslands

Montane means ' high altitude' therefore these are the grasslands that are high altitude shrublands. These are called high altitude because they are above the tree line level of the ground. Moreover, the plants found here have a rosette structure, abundant pilosity, and waxy surfaces. For instance, the northern Andes contain this type of habitat.

Desert Grasslands

The desert grasslands are the type of grasslands that separates the true desert of the lowlands and the montane grasslands. Furthermore, these grasslands receive very low precipitation. As a result, these are the hottest and the driest grasslands. These grasslands are mostly scattered as they are dependent

on the areas of rainfall. Since the precipitation varies through regions. Therefore the vegetation of the grasslands also varies. Moreover, various types of animals are present in these grasslands.

For instance reptiles like the prairie rattlesnake, western diamondback, gopher snake is present here. Furthermore, birds like Horned lark, Larkbunting, Meadowlarks, scaled quail are present here.

Grassland Biome Key Characteristics

The following are the key characteristics of the grassland biome:

- Vegetation structure that is dominated by grasses
- Semi-arid climate
- Rainfall and soils insufficient to support significant tree growth
- Most common at mid-latitudes and near the interiors of continents
- Grasslands are often exploited for agricultural use

Structure of Grassland ecosystem

Biotic Components:

1. Producer Organisms:

In grassland, producers are mainly grasses; though, a few herbs and shrubs also contribute to primary production of biomass. Some of the most common species of grasses are: Brachiaria sp., Cynodon sp., Desmodium sp., Digitaria sp.

2. Consumers:

In grassland, consumers are of three main types:

(a) Primary Consumers:

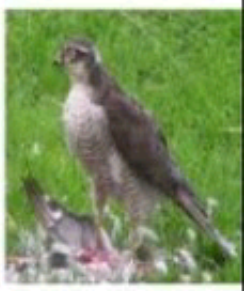
The primary consumers are herbivores feeding directly on grasses. These are grazing animals such as Cows, Buffaloes, Sheep, Goats, Deer, and Rabbits etc. Besides them, numerous species of insects, termites, etc. are also present.

(b) Secondary Consumers:

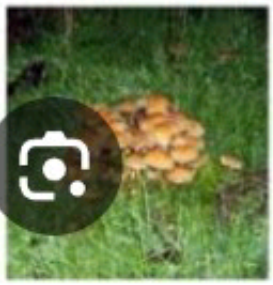

Producers: Different grass species



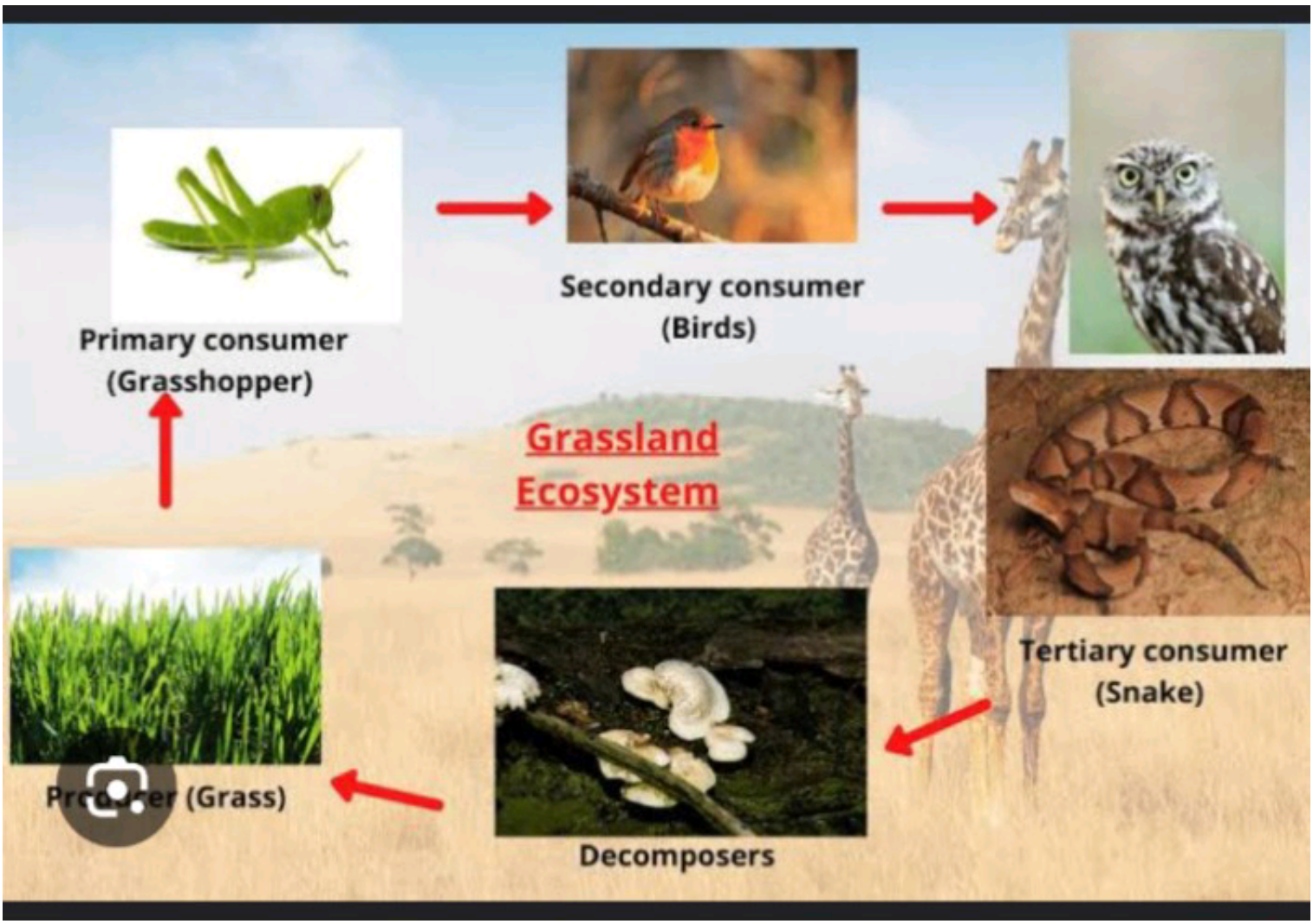


Consumers of Grassland ecosystem




Decomposers in a Grassland ecosystem


Primary consumer
(Grasshopper)
Secondary consumer
(Birds)
Grassland
Ecosystem
Tertiary consumer
(Snake)
Decomposers

These are carnivores that feed on primary consumers (Herbivores). These include;-Frogs, Snakes, Lizards, Birds, Foxes, Jackals etc.

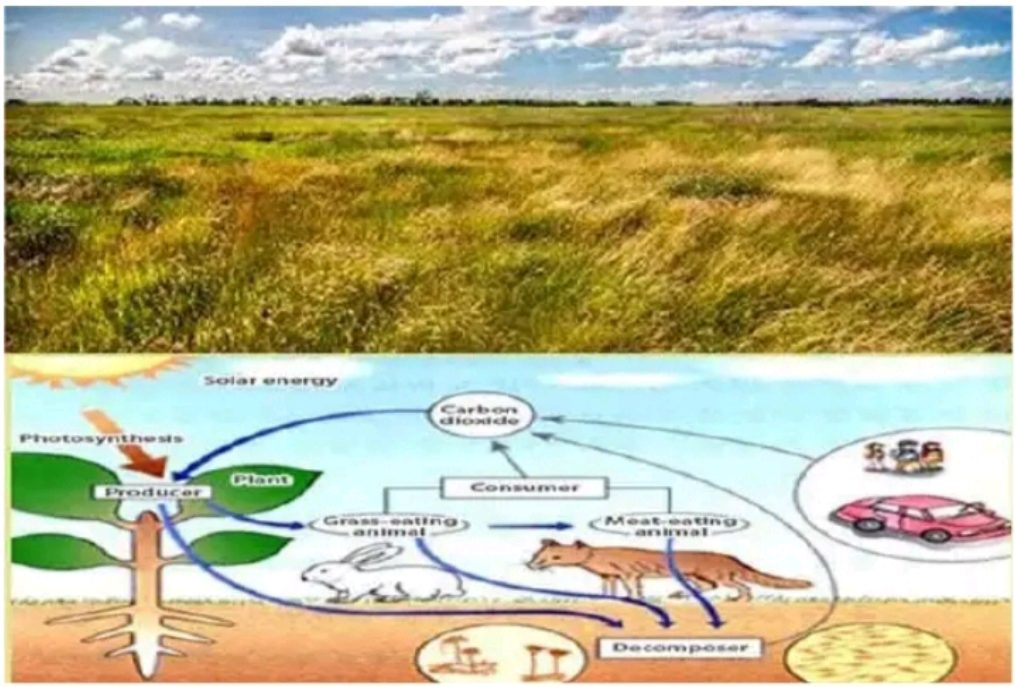
(c) Tertiary Consumers:
These include hawks etc. which feed on secondary consumers.

3. Decomposers:

These include wide variety of saprotrophic microorganism like: Bacteria; Fungi; Actinomycetes.

A-biotic Components:

These include basic inorganic and organic compounds present in the soil and aerial environment. The essential elements like C, H, N, O, P, S etc. are supplied by water, nitrogen, nitrates, sulphates, phosphates present in soil and atmosphere.



Grassland Ecosystem

Functions of the Grassland Ecosystem

The primary function of an ecosystem is productivity. The producers fix the solar energy and produce the complex organic matter with the help of minerals. It provides forage for livestock, protection and conservation of soil and water resources, furnishing a habitat for wildlife, both

flora and fauna and (contribution to the attractiveness of the landscape. The functional aspects of the Grassland can be studied by two means:

1. Food Chain in an ecosystem: There is an important feature of the ecosystem that one level of an organism serves as food for another level of the organism. A series is formed which is known as Food Chain. In an ecosystem, the food chain does not follow the linear pattern, but an organism may feed upon more than one organism in the same food chain or upon organisms of different food chains. Thus interconnected food chain system is formed known as a food web.

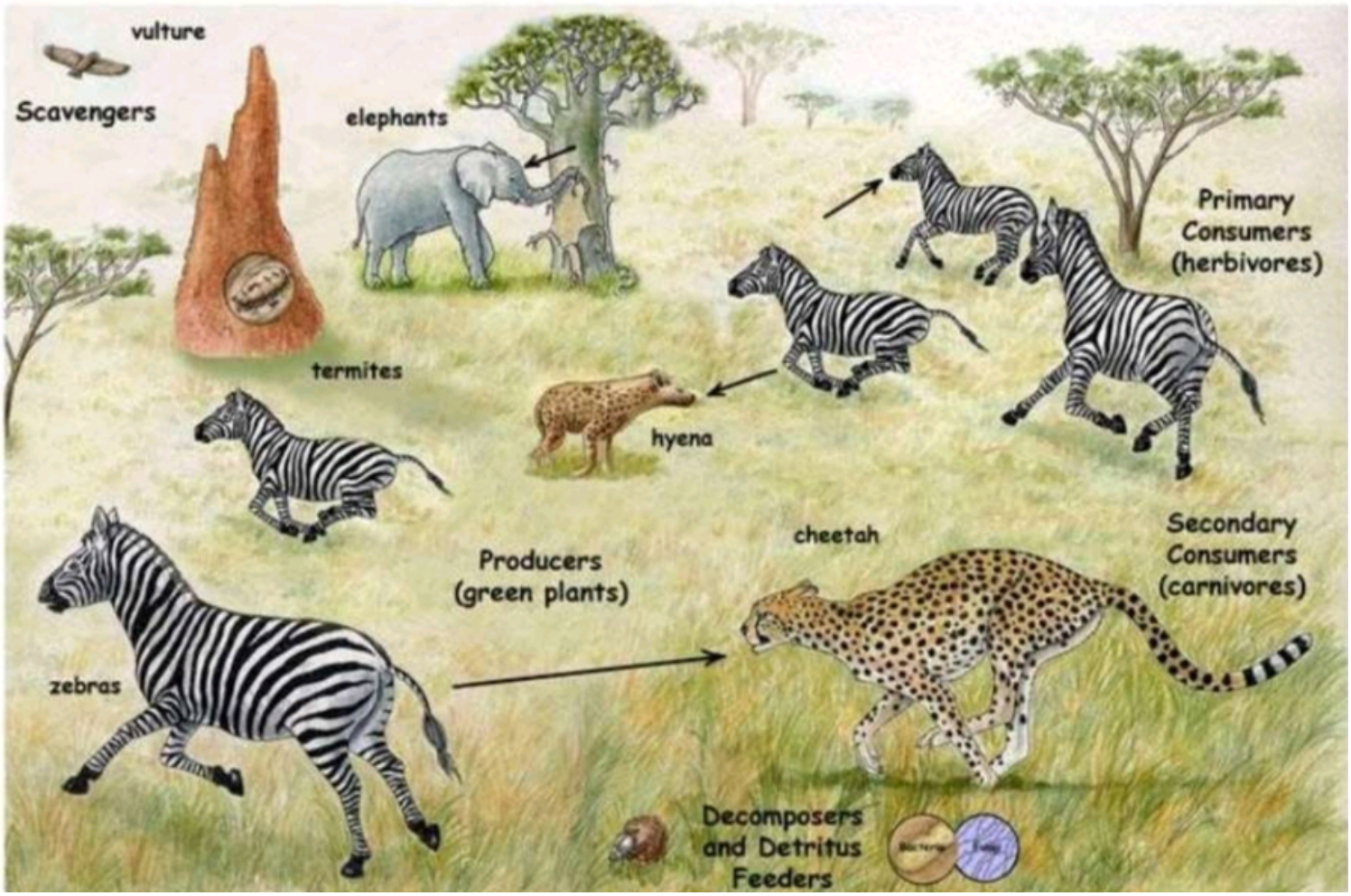
2. Nutrient cycle in an ecosystem: For any ecosystem to be successful, it is important that the constituent materials move in a cyclic manner. The producers (green plant) takes up the mineral elements from the soil and air, convert them into organic form and after passing through the different trophic levels, are again returned to the soil and air.

Economic importance of Grassland Ecosystem

Grass lands biomes are important to maintain the crop of many domesticated and wild herbivores such as horse, mule, ass, cow, pig, sheep, goat, buffalo, camel, deer, zebra etc. which provides food, milk, wool and transportation to man.

Hence, we can say that the Grassland Ecosystem is a mixture of grass, clover and other leguminous species, dicotyledonous, herbs and shrubs which contribute to a high degree of the preservation.

Grassland Food Web



Grassland Food Chain