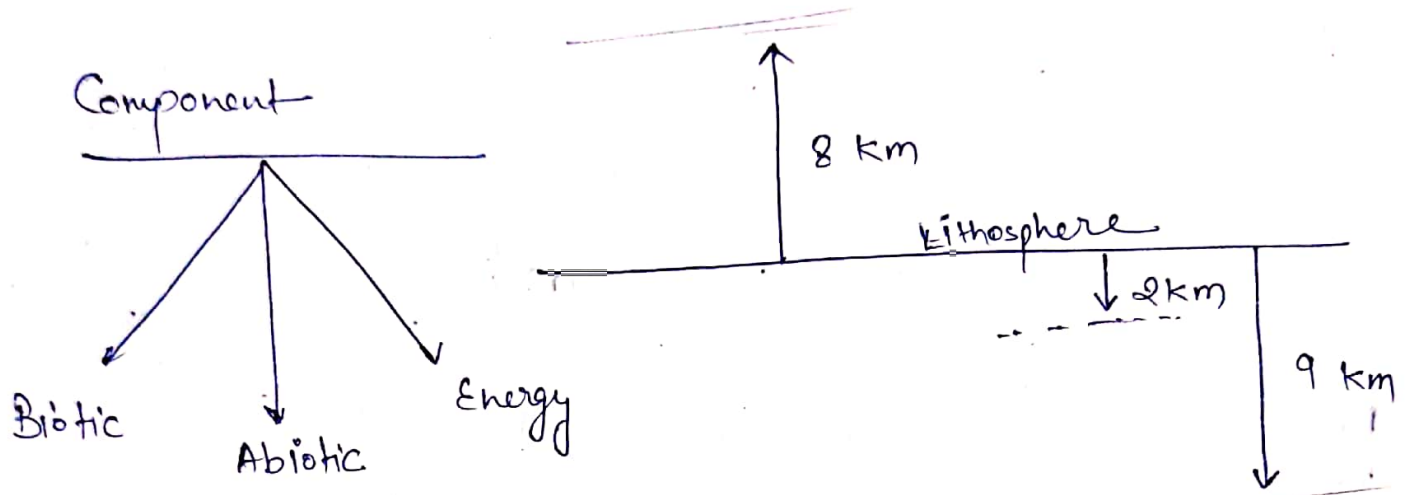


1. Biosphere

It is the organic world.



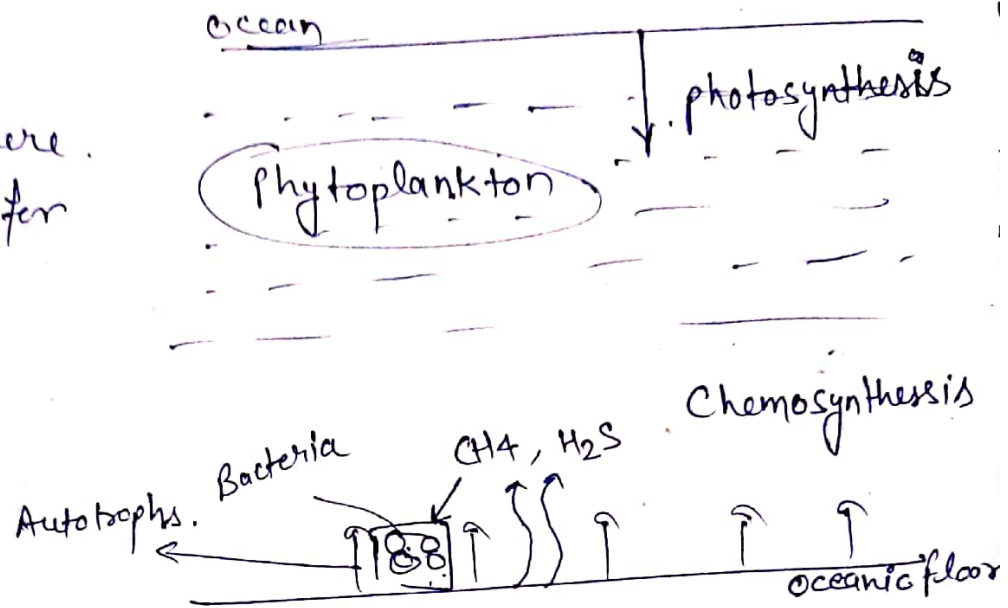
Biotic Component → Plants, Animals, Microorganism.

Algae → 1. Diatom → Single cell Algae (Two shield like structure)
2. Zooxanthellae → $\frac{1}{4}$ of Biomass
→ also primary producer of food chain.
→ Diatom can be used for water purification.

2. Zooxanthellae → Corals
↔ Symbiotic Relation.

Chemosynthesis

It is a process where Chemical are used for the generation.



BRINE POOLS → It is a site of Chemosynthesis.

Bromine

Cage like structure

1. Low temp
2. High Pressure

CH₄

Oceanic floor

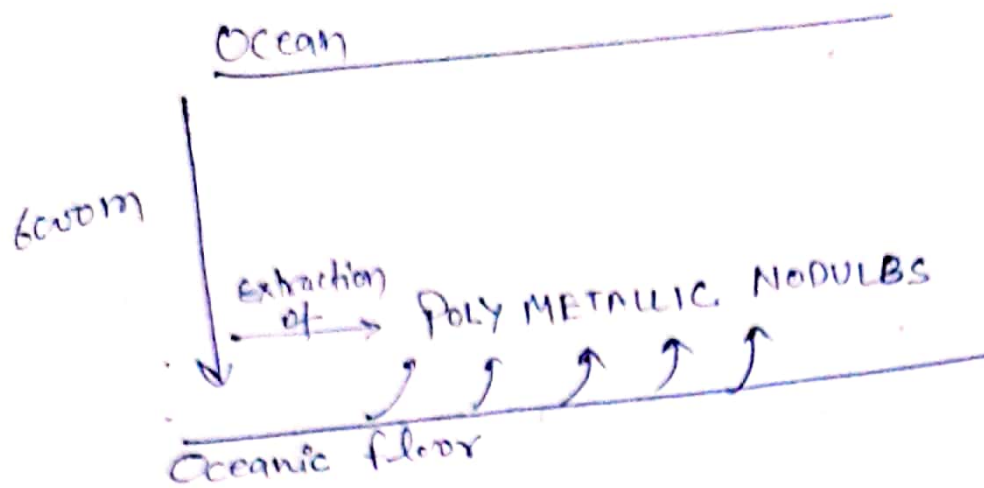
GAS Hydrates

Permafrost Area

These are icy areas where temp above the freezing point.

Condition → High Altitude
High Latitudes

Gas Hydrates forms in Permafrost Area.



Deep Ocean Mission

By Ministry of Earth Science.

Animals and Organism

- Saprophytes
- Parasites
- Scavengers

VULTURES

Decline population of vultures in India due to drug

DICLOFENAC:

(Anti-inflammatory drug)

Decline in population of

Gyps Vulture

40 million

↓

19,000

Energy Component

Biosphere

Biosphere is referred to as the organic world. It is that part of the Earth where organisms are present. It is a narrow contact zone between land, air and water where living organisms are present.

There are three components of Biosphere.

1. ABIOTIC Component

which includes a non-living component like, Atmosphere, Lithosphere and Hydrosphere.

2. BIOTIC Component - includes plants, Animals and Microorganisms.

Plants are regarded as Autotrophs as they manufacture their own food. They are also referred to as primary producers of the food chain. But photosynthesis is also performed by Bacteria, Algae and modified roots.

→ Diatom

→ Zooxanthellae

Diatoms are single cell Algae with two shield like structures,

it is present in the abundance and $\frac{1}{4}$ th of Biomass is made up of Diatoms only.

There are two conditionality responsible for survival of Diatoms ⑤
→ 1. Sunlight
2. Moisture.

Zooxanthallae are algae which are in the symbiotic relationship with CORALS.

An Agency can be Autotroph not only on the basis of photosynthesis but also on the basis of Chemosynthesis which is a process in which chemical are utilised for generation of organic matter. This process is performed by Bacteria near the ocean floor and a food chain would be constituted. As such there are two types of food chain are present in the

Ocean.

first in the upper part the basis of which is photosynthesis.
second in the lower part, the basis of which is chemo-synthesis

Near the oceanic floor Gas Hydrates are also present.

Gas Hydrates water has a unique characteristics it is responsible for forming cage like structure at low temperature and high pressure in which gas is trapped and are known as Gas hydrates.

Also,

Gas Hydrates are also present in the Permafrost region where near low temperature is responsible for formation of Gas Hydrates. ⑥

Oceanic floor is also known for poly METALLIC NODULES (PMNs) — are small sized rocks which consist of iron, manganese, Nickel, Cobalt and used for economic purpose.

The Ministry of Earth Science is with an allocation of 8000 Cr has started The Deep Ocean Mission, where a desalinization Plant would be stabilised with the help of Tidal Energy and a Submersible Vehicle would be used which can move deep inside ocean for the extraction of polymetallic Nodules.

India has been allocated an Area of 75,000 sq km by the International Sea Bed Authority for this purpose.

Animals and Microorganism

Animals and microorganism can be different type - like

- Saprophytes
- Parasites,
- Scavengers,

VULTURES

The Diminishing number of Vulture in India is due to a drug called DICLOFENAC which is anti-inflammatory drug. is responsible for kidney failure in cattle.

DICLOFENAC is also responsible for diminishing number of Eagles in India.

There are three types of Endangered GYPS Vulture in India which includes

1. White backed vulture (6000)
2. Long Billed Vulture (12000)
3. Slender Billed Vulture (1000)

MOEF (Ministry of Env't. & forest). in association with

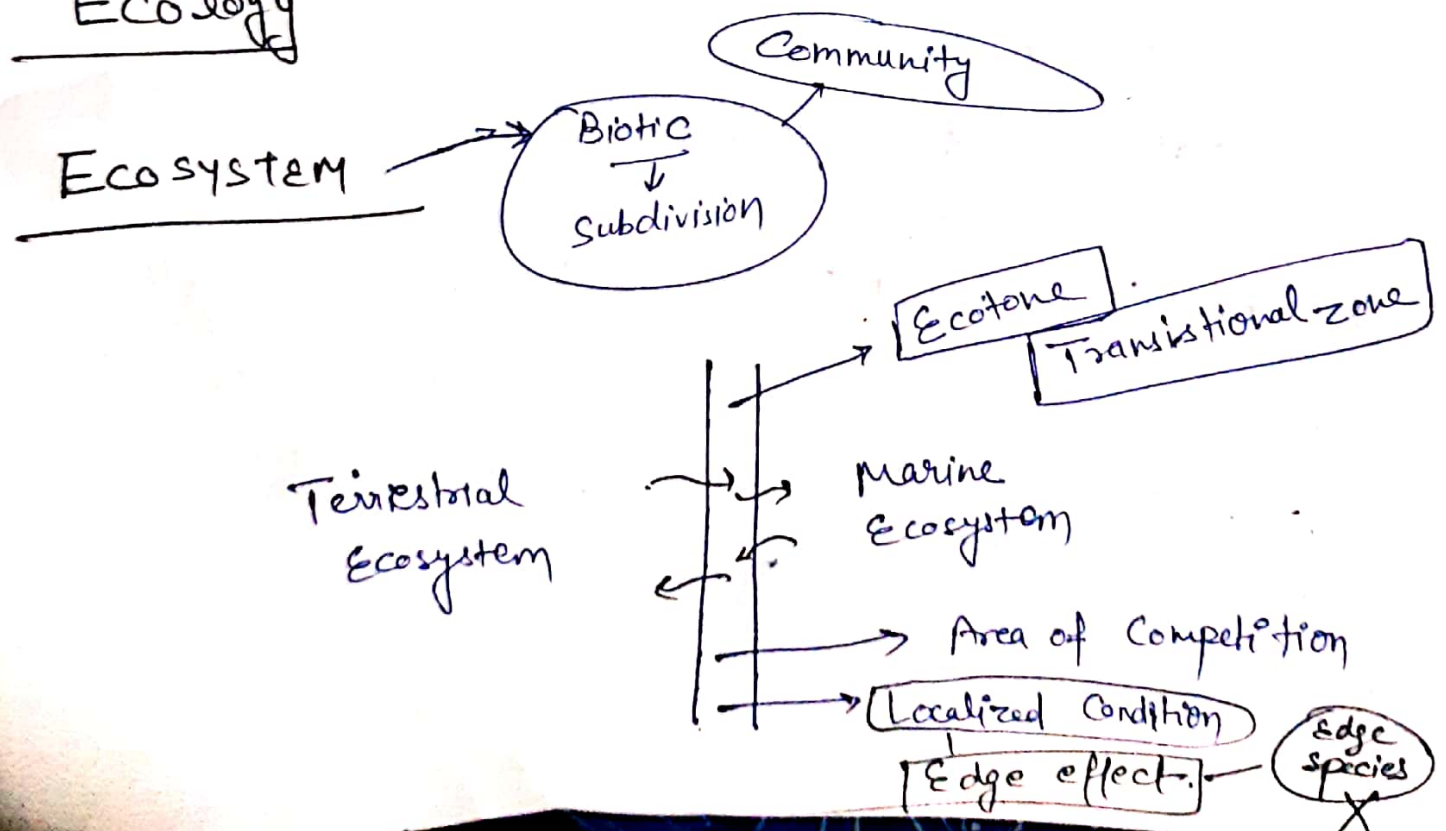
Bombay Natural History Society (BNHS) was responsible for establishing 8 Vulture Breeding and conservation centres.

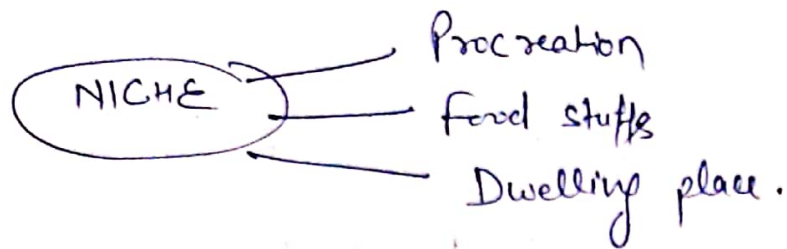
1. PINJORE (Haryana)
2. RAJA BHATKARWA (W.B)
3. RANI (Assam)
4. KERWA (Near Bhopal)
5. JUNAGARH (Gujarat)
6. Nandan Kanan (Orissa)
7. Hyderabad (Telangana).
8. MUTA (Near Ranchi)

3. Energy Component

Main source of energy in the biosphere is the sun and the transference of energy in food chain is governed by the law of thermodynamics that energy neither created nor destroyed.

Ecology





Ecology

It is not only the study of habitat in which an organism lives but also the study of two types of mutual interaction in nature. First among the biotic components themselves. Second between the biotic and abiotic components, which is responsible for not only determining species diversity but also their abundance.

Ecosystem

It is the fundamental unit of Biosphere consisting of three similar components.

Ecosystem can be large like terrestrial or coastal ecosystem. It can be small like that constituted by bacterial cells inside human body.

Ecotone It is the demarcation zone between two ecosystems. eg - mangrove swamp, estuaries.

It is also a transitional zone where the characteristics of one ecosystem would be reducing and the other would be enhancing.

It is an area of stiff-competition as the members of two ecosystems would be striving hard for

their survival.

The localised condition in this area is favourable for development of a large number of species.

this phenomena is called edge-effect.

Community

A Biotic subdivision of the ecosystem and within ecosystem. There can be different level of community.

NICHE The members of community are responsible for performing certain function for.

They are three type of NICHE.

If the function is procreation, it is called

Reproductive NICHE.

If the function is making of Dwelling place it is called Habitat Niche.

If the function is accumulation of food, it is called

TROPHIC NICHE.

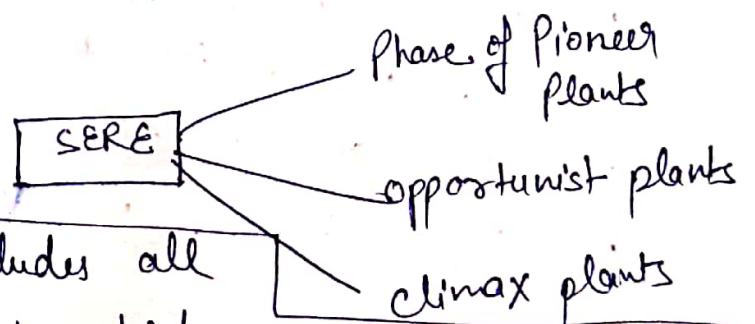
Principles of Ecology

1) Homeostatic Principle / Resilience Characteristic

Each and every ecosystem would be having an inbuilt self-regulatory mechanism of its own. By virtue of which internal conditions in the ecosystem would be maintained despite change in external condition. The ecosystem would be adjusting and adapting for this purpose which reflects the resilience characteristic of the ecosystem but this characteristic can be exhibited to a certain level only which is called the Resilience limit.

But if the magnitude and nature of external change is such that the Resilience limit of the ecosystem is surpassed it is at this juncture that environmental degradation takes place.

2. Plant Succession



It is a process which includes all ecological changes through which vegetation gets established in an area.

It is of two types

Primary Plant Succession

(12)

Through which vegetation established in those area where no vegetation is present from the very beginning.

Secondary plant succession - where vegetation established in those are where there is temporary loss of vegetation.

The Sequential manner in which vegetation established is referred to as SERE. There are three stages in SERE.

1. The stage of PIONEER Plants

where in the fissures of rocks small vegetation like lichens and mosses thrive which are responsible for broadening of these fissures and also initiate soil formation.

2. Stage of OPPORTUNIST Plants.

After soil formation small vegetation like grasses, herbs or shrubs would develop grasses survive for 2 or 2 year. But during this period they generate enormous amount of seeds ensuring the survival of their future generation.

3. Phase of CLIMAX PLANT

During this phase trees having greater height would be developing (for eg Pine, spruce, Oak, deodar). The leaves of these trees obstruct solar

radiation because of which the lower vegetation is very scarce.

Himalaya is the best explanation of SERE.

3. Ecological Productivity

It is the rate at which organic matter is generated per unit area per unit time. The two factors are responsible influencing it.

x factor - Ecological Productivity	
1. Swamps	↓
2. Grasslands	
3. Lakes	
4. Ocean	

1. The amount of Solar Radiation.
2. The Ability of plants to convert Solar energy into Chemical Energy.

Productivity decreases from the Equatorial Area towards the Pole and would be maximum for tropical Rain forest. The productivity of Ocean happened to be low due to two main factors —

1. obstruction of Solar Radiation.
2. Lack of Nutrients in Saline water.

But that part of ocean which is near the coast productivity is high and the net productivity is greater than tropical Rain-forest.

Due to deposition of sediments brought by the rivers in this area the nutrient content enhancing and the concentration of phytoplankton, Algae is more in these area when compare to the mids of oceans.

In the continental cells the CORAL are also present which is in symbiotic relationship with zooxanthellae the primary producer.

In those areas where CORALS are present and where biodiversity enriched are referred to as tropical rainforest of oceans.

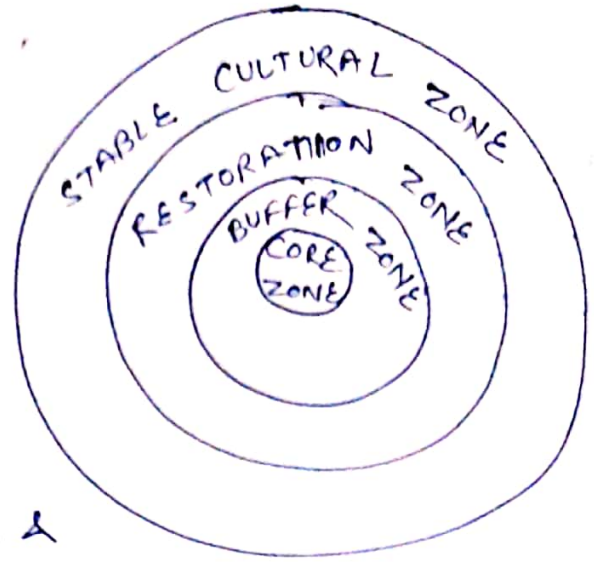
Wetlands

Wetlands are areas of ~~terrestrial~~ temporary or permanent accumulation of water which behaves as a separate ecosystem. Among wetlands the productivity is maximum for mangrove swamps which are present near the coastal Areas followed by the MARSHES (lakes/Rivers) followed by fens.

which is formed due to accumulation of under ground water or drain water followed by PEAT BOGS which is formed by melting of snow and Rainwater Accumulation.

Biosphere Reserves

Biosphere Reserves are areas of Terrestrial or coastal ecosystem which ~~have~~ have been declared as reserves under the Man &



Biosphere Programme of UNESCO (1971).

They are not only meant for protection for Biological diversity but also cultural diversity.

Biosphere Reserves is differ from wildlife sanctuary and national parks on three main basis

1. Comprehensiveness

B.R are the most comprehensive productivity area within it more than wildlife sanctuary or National parks inside it.

2. Regulation of Human Activity

Human activities are strictly regulated in national parks where hunting, grazing, timber collection are prohibited, but it can be utilised for recreational activities.

In wildlife Sanctuaries timber collection, harvesting cultivation can be allowed with permission.

3. Orientation - B.Rs are ecosystem oriented.
Wildlife Sanctuaries are species oriented and
National park is meant for protection of Animals.