

DESERT ECOSYSTEM →

Very few areas of the world, apart from ice-sheets are absolute deserts devoid of any form of life.



17%

area under desert with <25cm rainfall.

Due to scarcity of water & high temp. the biota is poorly represented.

COMPONENTS OF IT:-

1) BIOTIC COMPONENTS:-

Producers → These include shrubs especially bushes, some grasses and few trees.
(b) The shrubs have wide-spread branched root system with their leaves, branches & stems variously modified.
(c) Some lower plants like lichens, xerophytic mosses and succulents like cacti are also present.

OR

Producers → There are 3 life forms of plants that are adopted to desert.

- (i) Annuals which avoid drought by growing only when there is adequate moisture.
- (ii) Succulents such as the cacti, which store water
- (iii) Desert shrubs which have numerous branches & a special root system which help them to adopt to desert conditions.

CONSUMERS →

- (i) Most common animals are reptiles, insects able to live under xeric conditions.
- (ii) Nocturnal rodents & birds, camel feed on tender shoots of the plants.

DECOMPOSERS → Due to poor vegetation the amount of dead organic matter is correspondingly less.

There are some fungi & bacteria, most of them are THERMOPHILIC.

~~STRUCTURE~~ ①

2) ABIOTIC COMPONENTS →

In desert ecosystem temp. is found to be very high & r.f. very low. The nutrient cycling is poor due to scanty biota.

DESERT ECOSYSTEMS :-

Deserts are found all over the world in areas

- bordering cold oceanic currents
- lacking cloud intercepting mts.
- lying far away from cloud seeding regions or rain shadow.

Location :- ~~Asia~~ Asia (Tibet, Gobi, Thar & West Asia), Central western Australia, North Africa (Sahara), S.W USA, Mexico, coastal areas of Chile & Peru.

Physical Characteristics :-

(1) Precipitation → Low annual rainfall of less than 25cm.

(2) Hot deserts → (1) It has high evaporation rate, sand dunes, (Sahara & Australian desert) sand storms or rocky areas.

(2) Nights are cold but days are very hot.

Temp. → 50°-60°C of day.

Flora → (1) 60% desert floras are made up of annual or ephemeral species.

(2) It includes low woody scrub formations, cacti communities, intermittent swards of perennial grass tufts, ephemeral or seasonal herbaceous vegetation.

(3) Accidental vegetation in areas where R.F. may occur only once in several years.

(4) BOERHAVIA REPENS of Sahara desert has a life span of 10-14 days

(5) hardy grasses, Echinops, Salsolium arbuscula, cacti, euphorbias.

(6) Succulent perennial root system eg - Date, Acacia, Prosopis, Tamarix.

Fauna →

(1) Ants, locusts, wasps, scorpions, spiders, lizards, rattlesnakes, insectivorous birds like swifts & swallows, seed eating quails, doves, desert rats, hares, foxes, jackals & cats.

(2) In bigger camels are most imp. while Desertor Kangaroo Rat is exceptional mammal.

TUNDRA / Cold deserts :-

Location :- 60°N latitude below the polar ice. i.e. - N America, Europe & Asia. Area covers 8 million km².

Physical Characteristics :-

Precipitation → Area receives very little precipitation of 25 cm/yr, mostly in the form of snow.

Climate → It is extremely cold with winter Temp - 30°C to -40°C.

(5) Summer is of short duration 45-75 days with temp. 10°C.

Flora :- vegetation is thin.

(a) It contains very sparse low growing vegetation devoid of any tree.

(b) Vegetations are shallow rooted as the subsoil is permanently frozen.

(c) Mosses & lichens show best development in the area. Bog Moss, Reindeer Moss.

(d) Others are grasses & sedges, heaths, few shrubs, dwarf willows & dwarf birches, alder.

(e) Reproduction takes place vegetatively, by seed production.

Fauna →
(1) Amphibians & reptiles are absent from tundra.
(2) Arthropods & worms appear in the area during summer.

(3) Common animals are warm blooded & have protective covering like feathers (birds) & hair skins (mammals)

(4) Imp. animals are lemmings, polar bear, arctic hare
* arctic fox, musk, ox, caribou, reindeer, snow owl & snow grouse. * wolf bears

(5) Shore & water birds visit area during summer.

[* (-) carnivores & omnivores, herbivores.]

Ecosystem Features:-

(1) Animal biomass is relatively small & undergoes marked seasonal fluctuations in volume.

(2) Due to lack of animal diversification there is small no. of trophic levels.

(3) Food webs are often made complex by the relatively high proportion of omnivores in the system.

(4) Less species but more specialisation.

(5) Lack of plant food restricts the no. of heterotrophs.

[Map - Pg 279
Source - Rupa Pub.]

3) 1) AQUATIC ECOSYSTEM →

Marine Ecosystem + Freshwater Ecosystem

(from C.S. book ← source)

Environmental Conditions →

The main envt. gradients in the sea are related to temp, salinity &

light intensity.

⇒ Factors determining Marine Ecosystem:-

(1) Distance from shore,

(2) Drainage of rivers or glaciers,

(3) Depth of water.

Temperature

- (1) Surface temp. of the warmest seas 32°C & coldest sea -2°C .
- (2) Along British Isles it vary annually from about 8°C to 17°C .

~~tasks~~ of Ocean basins $\rightarrow$ Pg 88 - 91
open sea to Estuary,
91 to 93 Lakes to streams

(*) source - H.M. Savana

* Other Plant life :- Primary Production

- (1) Marine plants are confined to the euphotic zone by the light factor.
- (2) Algae, Angiosperms, visible algae seaweeds but 99% vegetation is microscopic floating algae i.e. phytoplankton.