Quadrant II – Transcript and Related Materials

Programme: Bachelor of Arts/Commerce/Science (First Year)

Subject: Environmental Studies

Paper Code: AECC

Paper Title: Environmental Studies

Unit: III

Module Name: Introduction, types, features, structure and functions of desert ecosystem

Module No: 36

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Notes

Introduction:

Deserts are specialized and sensitive ecosystems that are difficult to inhabit. Desert ecosystems can be hot (as in the sandy Sahara) or cold (as on the peaks of mountains where the high altitude makes conditions very harsh) both hot and cold deserts have in common the fact that they are difficult for organisms to inhabit.

Types of desert ecosystems:(On the basis of temperature)

1. **Hot and dry deserts**
2. **Cold deserts**

1. **Hot deserts:**

- **They are warm throughout the year but winters bring a little rainfall.**
- **These deserts are utterly hot during daytime (43° – 49° Celsius) but extremely cold at night (-18° Celsius).**
- **The annual rainfall does not usually exceed 250 millimeters.**
- **Desert soils are very dry hence when it rains, they soak up the water very quickly.**
- **As the water evaporates, salts are left behind on the surface of the soil.**
- **Plants in the desert are called xerophytic and succulents - drought tolerant.**
- **They have tap roots that reach deep under the ground to access water supplies.**
- **Small leaves with waxy skin to reduce water loss by transpiration.**
- **Spines lose less water than leaves and prevent animals from eating the plant.**

Examples:

- **Sahara and Kalahari in Africa,**
- **Arabian Desert in Middle East,**
- **Great Victoria Desert in Australia,**
- **Gobi Desert in Asia,**
- **Great Basin Desert in North America and**
- **The Thar desert in India.**

2. Cold Deserts:

- **These regions are characterized by long winter season and very short summer season.**
- **The winter lasts for nine months with an average temperature ranging around -2 to 4° C. During the three months of summer, the mean temperature lies around 12° C.**
- **Precipitation takes place in two ways, rain and snow. The annual rainfall does not exceed 250 mm.**
- **Since the sun does not strike hard on cold deserts, the evaporation is not as much as in hot deserts.**
- **The soil is almost covered in snow.**
- **Plants shed their leaves (deciduous) and are scattered with needle like leaves.**
- **Animals here have burrowing nature.**
- **They have thick fur coat which can protect them from the cold season during the winter season.**
- **The animals commonly found in cold deserts include foxes, jackrabbits, kangaroo rats, antelopes etc.**
- **e.g., the Antarctic and Arctic deserts, Ladakh is a cold desert in India.**

Structure and Functions of Desert Ecosystem:

I. Biotic components

1) Producers

Producers are mainly shrubs/bushes, some grasses & few trees.

Dominant plant species include: Succulents (water-retaining plants adapted to arid climate or soil conditions) & hardy grasses.

Some lower plants such as lichens & xerophytic mosses are also present.

2) Consumers

These include animals such as insects, reptiles which are capable of living in xeric conditions. Besides some nocturnal rodents, birds & some mammalians like camel are also found.

3) Decomposers

Due to poor vegetation with very low amount of dead organic matter, decomposers are poor in desert ecosystem. The common decomposers are some bacteria & fungi, most of which are thermophilic.

II. Abiotic components

- **Temperature fluctuations**
- **Very low rainfall**
- **The organic substances are poorly present in the soil.**