

CHAPTER 7

THROUGH THE SANDY EXPANSE

1. What is a desert? How can deserts be primarily classified?

- Regions receiving less than 25 cm of annual rainfall are called deserts.
- They are primarily classified into two: Cold Deserts and Hot Deserts.
- **Cold Deserts:** Extremely cold regions covered with snow throughout the year, found in polar regions and high mountains (e.g., Antarctica, Ladakh).
- **Hot Deserts:** Dry regions with high daytime temperatures found on the western parts of continents between 15° and 30° latitudes (e.g., Sahara, Thar).

2. Explain the natural boundaries of the Thar Desert.

- Located in the northwestern part of India, the boundaries of the Thar Desert are as follows:
- **Northwest:** Sutlej River basin.
- **West:** Indus River basin.
- **East:** Aravalli mountain ranges.
- **South:** Rann of Kutch.

3. What role do the Aravalli mountain ranges play in the formation of the Thar Desert?

- The Arabian Sea branch of the Southwest Monsoon passes parallel to the Aravalli ranges, failing to bring rain to the interior of Rajasthan.
- Since the Aravallis block the Bay of Bengal branch, that wind also fails to provide rain to the desert.
- By either blocking or standing parallel to both rain-bearing winds, the Aravallis contribute to the formation of the Thar.

4. Write the differences between 'Marusthali' and 'Rajasthan Bagar'.

- Based on its characteristics, the Thar Desert can be divided into two sub-regions: Marusthali and Rajasthan Bagar.
- While Marusthali is the actual desert part with sand dunes and severe drought, Rajasthan Bagar is a semi-arid sandy plain with some agriculture and water flow.

Marusthali:

- The extremely dry westernmost part of the Thar Desert.
- The most arid part of the Thar Desert.

- Both rocky and sandy areas are found here.
- Due to strong wind erosion and deposition processes, diverse sand dunes are formed.
- Constantly shifting sand dunes in Marusthali are locally called 'Dhrians'.
- Surface water sources are very scarce; available water bodies have high salinity (salt content).

Rajasthan Bagar:

- The semi-arid region between the Aravalli ranges and Marusthali.
- Located immediately west of the Aravalli mountain ranges.
- Short-term streams originating from the Aravallis flow through this region, becoming active only during the rainy season.
- Fertile patches formed by the flow of these streams are called 'Rohi'.
- Compared to Marusthali, conditions here are suitable for agriculture. Wheat and barley are cultivated in Rohi areas.
- Luni, the main river of Rajasthan, flows through the southern part of this region.

5. What is 'Deflation' by wind? Which landform is created by this?

- Deflation is the erosional process where strong winds lift and remove dry sand particles from one place to another.
- Shallow depressions are formed in the soil through this process, known as deflation hollows.

6. How are Mushroom Rocks formed in the desert?

- Wind can only lift rock particles up to a certain height.
- Therefore, the intensity of abrasion is higher at the lower part of rocks in the desert.
- As a result, the top part of the rock remains wide while the bottom becomes narrow.
- Since it takes the shape of a mushroom, these are called Mushroom Rocks.

7. What are sand dunes? What are the different types of sand dunes found in Thar?

- Sand dunes are hills formed when sand particles are deposited due to a decrease in wind speed or the presence of obstacles.
- **Types of sand dunes:**
 - Barchans (Crescent-shaped)
 - Parabolic sand dunes
 - Seifs (Linear sand dunes)

- Transverse sand dunes

8. What are the features of Sambhar Lake?

- It is the largest saltwater lake in Rajasthan.
- Located 65 km west of Jaipur.
- During the rainy season, its area extends to about 225 square km.
- This lake is primarily used for salt production.

9. Why is the 'Diurnal Range of Temperature' high in hot deserts?

- Clear skies and dry air allow solar radiation to reach the ground quickly during the day.
- Since sand heats up rapidly, daytime temperatures rise very high.
- At night, the lack of clouds allows terrestrial radiation to occur without hindrance, causing the sand to cool down quickly.
- This creates a large difference between day and night temperatures (Diurnal Range).

10. Explain the desert erosional process 'Abrasion'.

- This is the process where sand particles and rock materials carried by the wind strike forcefully against standing rocks, causing wear and tear.
- This leads to the formation of landforms like mushroom rocks and caves.

11. How does 'Rohi' help agriculture in the desert?

- In the Rajasthan Bagar region, short-term streams originate from the Aravallis.
- The fertile patches created by these streams are called 'Rohi'.
- Agriculture is more feasible here compared to other parts of the desert.

12. What is 'Thali'? Where is it located?

- The vast sandy expanse found to the north of the Luni River is called 'Thali'.
- It is a unique geographical feature of the Thar Desert.

13. Write the characteristics of Barchan sand dunes.

- Barchans are crescent-shaped sand dunes formed through wind deposition.
- Their two "horns" point in the direction the wind is blowing.
- They are common in the Thar Desert.

14. Explain the extent of the Thar Desert and its location in India.

- The total area of the Thar Desert is over 2 lakh square km.
- Out of this, 1.75 lakh square km is in India.

- Two-thirds of its area in India lies in Rajasthan.
- The remaining part spreads across Haryana, Punjab, and Gujarat.

15. How does high evaporation in the desert affect rainfall?

- Extreme daytime heat quickly evaporates moisture from the air.
- Dry winds and high evaporation rates prevent the formation of rain clouds.
- This continuous process over millions of years causes the region to remain arid.

16. How are caves formed in the desert?

- Continuous deflation (wind erosion) on rocks causes wear.
- Over time, this results in small holes and eventually caves within the rocks.

17. Is the Thar Desert a rain-shadow region? Analyze.

- Yes, regarding the Bay of Bengal branch of the Southwest Monsoon, Thar is a rain-shadow region.
- As the Aravallis block these winds traveling from east to west parallel to the Himalayas, the desert region does not receive rain.

18. What are the different types of erosional landforms in the desert?

- The following landforms are created through wind erosion (deflation and abrasion):
- Deflation hollows
- Caves
- Mushroom rocks

19. Why is salinity high in the water bodies of the Thar Desert?

- The main reasons are lack of rain and high evaporation.
- Salts accumulate as water evaporates.
- Additionally, it is believed this area was once under the sea.

20. What process occurs when there is an obstacle in the wind's path?

- Sand particles carried by the wind fall down when the speed decreases or an obstacle is met.
- This is called the deposition process.
- This paves the way for the formation of sand dunes.

21. Why doesn't the Arabian Sea monsoon branch provide rain in Thar?

- This wind entering via Gujarat travels parallel to the Aravalli mountain ranges.

- Since the mountains do not act as an obstacle, the wind does not rise, and thus, it does not rain in the interior of Rajasthan.

22. "Oases are unique landforms that transform life and geography in the desert." Analyze this statement based on the following hints:

- **Formation:** Fertile areas formed around freshwater sources in desert regions are called oases. They are formed by natural springs or other groundwater sources.
- **Agriculture:** Crops like cotton, citrus fruits, other fruits, wheat, and maize are usually cultivated in oases.
- **Human Life:** Oases are the only places where water is available in the harsh desert environment. Because water is available for drinking, farming, and livestock, people settle around oases. These often develop into trade centers.

23. "Climate variations in the Thar Desert are extreme and diverse." Analyze this based on the text.

- **Summer:** From March to June. Daytime temperatures can rise to 40°C–45°C. Atmospheric humidity is very low. Strong hot winds and dust storms blow. 'Loo', a dry hot wind blowing at noon, is a specialty here.
- **Rainfall:** From July to September. Though monsoon winds blow, rain is very scarce. In western parts, average annual rainfall is less than 25 cm. The position of the Aravallis is the main reason they don't block rain clouds.
- **Winter:** From December to February. The sky is clear, and humidity is low. Though the average temperature is between 5°C and 10°C, in places like Bikaner and Churu, nighttime temperatures can drop below 0°C (extreme cold).

24. How have desert plants adapted to the climate? Explain.

- To prevent water loss through transpiration, plants have thorns or hairs instead of leaves.
- Plants like cacti store water in their fleshy stems.
- As surface water is unavailable, they have long roots to reach moisture deep in the soil.
- A wax-like coating on leaves and stems helps reduce water loss.

25. What are the main characteristics of the soil in the Thar Desert?

- The soil is mainly known as 'Desert Soil' or 'Arid Soil'.
- The soil is sandy and brownish in color.
- Due to high evaporation from high temperatures, salinity is very high.
- Organic matter is very low due to lack of rain and vegetation.
- Though generally unsuitable for farming, agriculture is possible with scientific irrigation and fertilizers.

26. Prepare a note on the biodiversity of the Thar Desert.

- Various species capable of surviving extreme heat live here.
- Camels, Desert Foxes, wolves, wild cats, and mongooses are found.
- The 'Great Indian Bustard', which faces extinction, is a major bird here. Vultures and eagles are also seen.
- Various snakes, lizards, and scorpions are abundant.
- Most animals hide in burrows during the day to escape heat and come out to hunt at night.

27. "Despite adverse climatic conditions, life in the Thar Desert is active with diverse economic activities." Explain the main sources of income and development projects.

- **Agriculture:** Despite heat and water scarcity, farming occurs where irrigation is available. Wheat, mustard, and cotton are grown using water from the Indira Gandhi Canal, India's largest canal project.
- **Animal Husbandry:** This is the main livelihood where agriculture is limited. Goats, cows, and camels are reared for dairy, wool, and meat.
- **Mining:** Thar is rich in minerals. The world-famous Makrana marble (used for the Taj Mahal) comes from here. Mining of gypsum, lignite, and salt is also important.
- **Energy Production:** Wind farms utilize strong desert winds to produce electricity. Solar plants and desalination plants for purifying saltwater are also active.
- **Tourism:** Sand dunes, historical forts like Jaisalmer, and camel safaris attract tourists worldwide, providing a major income source for locals.
- **Handicrafts:** Diverse embroidery on clothes, pottery making, and traditional handicrafts support the livelihoods of desert people.