

CASE STUDY: DEVELOPMENT OF HOT DESERTS: THAR DESERT, INDIA/PAKISTAN

LOCATION AND BACKGROUND

The Thar Desert is located in northwest India.



Has the highest population density of all the deserts.

The population is growing and so this environment is increasingly under threat

CLIMATE

The climate is very **hot**. Summer day time temperatures can exceed 40°C but at night the temperature can drop below 0°C.



The climate is very **dry** with less than 250 mm of rainfall a year.



Hot deserts have two distinct seasons: **summer**, when the **temperature ranges** between 35-40°C, and **winter**, when the temperature ranges between 20-30°C

ECOSYSTEM

Soil

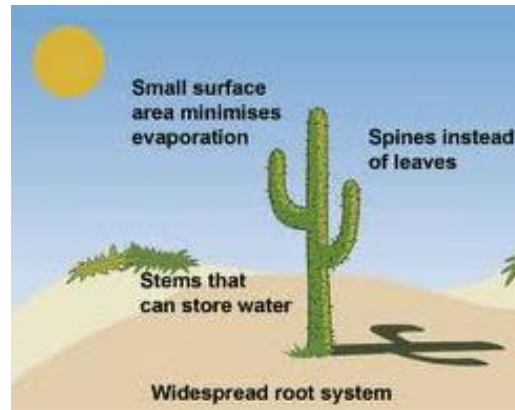
Desert soils are **thin, sandy, rocky** and generally grey in colour.

Desert soils are very dry. When it rains they soak up the water very quickly.

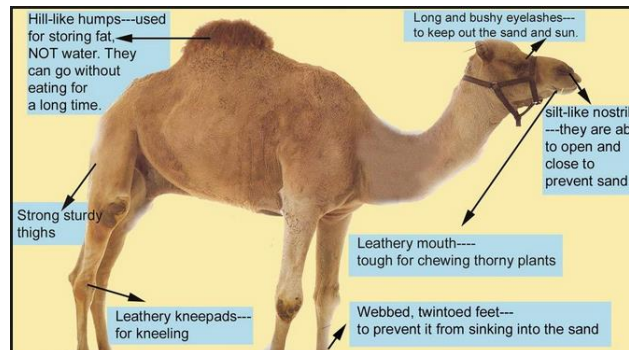
The **surface** of the soil may appear **crusty** - as it is so hot, water is drawn up to the surface of the soil by evaporation. The water evaporates and **salts** are left behind on the surface of the soil

Plants

Plants with adaptations which allow them to live in hot and dry conditions are called **xerophytic**. An example is a cactus.



Animals . An example is a camel.



CAUSES OF DESERTIFICATION

This means that the land turning into desert

Climate change - the deserts are getting **hotter and drier**

Removal of wood - wood is used for cooking. When the trees are cut down there are **no roots** to hold the soil together and it **erodes**

Overgrazing - this is when sheep, cattle and goats **eat** all the **vegetation**. This leaves the **soil** exposed to **erosion**.

Population growth - the population is **increasing** and putting greater **pressure** on the environment for **resources** such as wood and water.

Soil erosion - this is made worse by **overgrazing** and the removal of **wood**. Population growth is the primary cause of soil erosion.

The first letter of each point spells out the word CROPS

OPPORTUNITIES

Mining - the desert has valuable reserves of minerals like **feldspar, phospherite, gypsum** and **kaolin** – used to make things like fertilisers.

Limestone and marble are also quarried in the area.

Limestone is used for building and producing cement, and **marble** is used in construction.

Energy generation.

A. solar panels. This energy is used to clean water supplies contaminated with salt (desalination).

B. A wind farm consisting of 75 wind turbines has the capacity to produce 60 megawatts (MW) of electricity.

Farming - irrigation has made it possible to grow crops such as **wheat** and **cotton**, making jobs and generating income

Tourism - the Thar Desert National Park attracts many visitors who want to see some of the 120 species found there.

Tourists explore the desert with local guides on camels.

Tourism makes **money** and creates **many jobs** for local people.



CHALLENGES

Extreme temperatures - temperatures in the Thar Desert can exceed **50°C** in the summer months.



Water supply –

only 120-240 mm of rain fall per year in the desert, so water must be used sensibly and **sustainably**.

over-irrigation can cause **waterlogging** of the ground. This water evaporates and leaves a layer of **salt** on the surface making it difficult to grow crops.



Inaccessibility - the desert covers a huge area of 200,000 sq km and there are few roads



STRATEGIES TO STOP DESERTIFICATION

Planting more trees - the roots of trees hold the soil together and help to reduce soil erosion from wind and rain.

Improving the quality of the soil -this is done by keeping fewer animals and growing crops as well

The animal manure can be used to fertilise the crops.

The roots of the crops hold the soil together and stop erosion.

Water management –

Stone barriers can be used to trap water

