

Desertification

What is desertification?

At first glance, figure 4.31 looks just like any other desert photo - lots of sand. But if you look more closely, you can see signs of change in this environment. In the recent past, this landscape looked very different. You can see signs of dead vegetation, plus the remains of animals that once grazed the area. The land in the photo is turning into a desert. This is called **desertification**.

How widespread is the risk of desertification?

Figure 4.32 shows the location of land vulnerable to desertification across the world. The most vulnerable areas tend to be located on the margins of the hot deserts. The UN estimates that roughly a third of the world's land surface is currently affected by desertification.

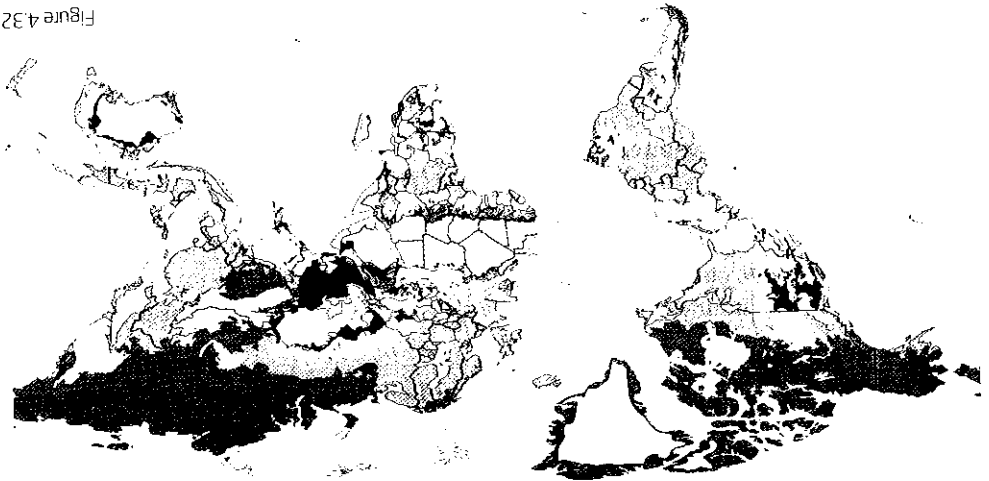


Figure 4.32

What causes desertification?

Natural causes

The main natural cause is connected to climate, which has changed throughout geological time - altering global temperature and rainfall patterns. For instance, there is evidence that - as recently as 8000 years ago (around the age of the last Ice Age) - the climate in North Africa and the Middle East was much wetter than it is today. This evidence includes large aquifers (groundwater reserves) lying beneath desert countries like Egypt and Jordan, as well as fossil plant remains and archaeological evidence (such as ancient rock art). Natural climate change turned this region into desert thousands of years ago - long before humans had any major impact.

Climate worldwide is still changing today, but now there is serious international concern that human actions are worsening natural global warming and climate change. For example, serious droughts have become more common in many parts of Africa over the last few decades.

Temperature and rainfall patterns worldwide have certainly been changing. But the changes have not been gradual or consistent - they have been erratic, and have involved extremes of drought and flood.

The climate is becoming more unpredictable and more variable. Only time will tell how much of this is a direct cause of current and future desertification.

Human causes

People are not likely to deliberately damage the land on which they depend on for their survival. However, circumstances can lead to people's actions tipping the delicate balance and inadvertently contributing towards the process of desertification. Most commonly, this involves:

- **over-cultivation.** Intensive farming on marginal land can reduce soil fertility and damage its structure. The lack of organic matter makes it crumbly and more likely to be washed or blown away. It also reduces its capacity to retain moisture.
- **over-grazing.** Marginal grassland has a sustainable carrying capacity - the number of animals that can be supported without causing long-term damage. If this number is exceeded, the system becomes unsustainable and the vegetation and soil deteriorate. If it continues, desertification can result.
- **over-irrigation.** If plants are appropriately irrigated, little water should be wasted. However, if land is over-irrigated, salinization can occur. This creates an impermeable and infertile salty crust on the surface, which (according to UNESCO) is a key feature of desertification.

Other human activities that can damage the soil and vegetation (leading to soil erosion and ultimately desertification) are: road building, deforestation, and inappropriate tourism.

Source: Ross, S., Digley, B., Chapman, R. & Cowling, D. (2011), pp.146-7, *AQA Geography*, Oxford: Oxford University Press.

GLOSSARY

climate change (n) changes in the earth's weather, especially the rise in temperatures caused by the increase of particular gases
cultivation (n) the preparation and use of land for growing plants or crops
drought (n) a long period of time without rain
grazing (n) land with grass that cows, sheep, etc. can eat
irrigation (n) the supply of water to an area of land through pipes or channels for growing crops
marginal (adj) on the edge of
sustainable (adj) involving the use of natural products and energy in a way that does not harm the environment