

Case Study

A hot desert – the Sahara and Mali

The Sahara and the Sahel

The Sahara, sprawling across north Africa, is the world's largest and hottest desert – it covers roughly the same area as the USA. About one-quarter is covered by sand desert – known as ergs. The rest consists of gravel-strewn plains called reg and areas of barren rocks called hamada. Fossil evidence shows the desert used to be wetter 1000 years ago, but human activity and climate change – through natural and human causes – have turned the Sahara into a true desert. Today the Sahara is growing even larger, spreading to the south due to more overgrazing and deforestation. This moving edge of the desert is called the Sahel – an Arabic word that means 'fringe'. This is where desertification is increasing.

TASK 1: Study Source A and an atlas

- Describe the distribution of rainfall from north to south. Use figures in your answer.
- List all the countries in which the Sahel can be found.
- How will desertification affect these countries if the 300 mm isohyet moves further south?

TASK 2: Study Source B

- What are the causes of desertification?
- How is this different from land degradation?
- Explain how:
 - the lack of rain since 1969 has led to the Sahel extending south
 - population pressure has led to the Sahel extending south.

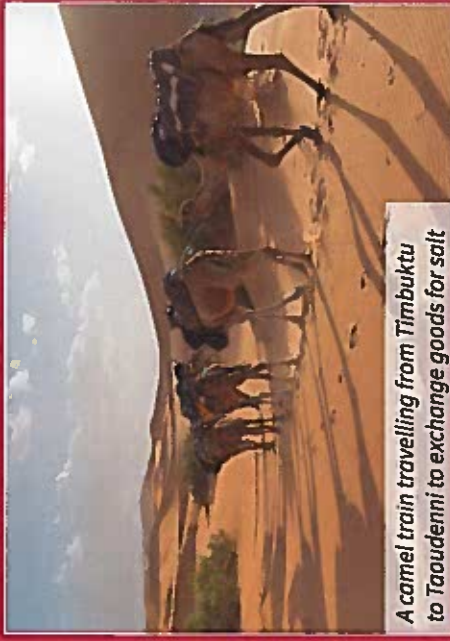
TASK 3: Study Source C and an atlas

- Describe the location of Mali. Refer to lines of latitude, neighbouring countries, the Sahara Desert and the Sahel in your answer.
- Describe and suggest reasons why the population of Mali is not evenly distributed.

TASK 4: Study Source D

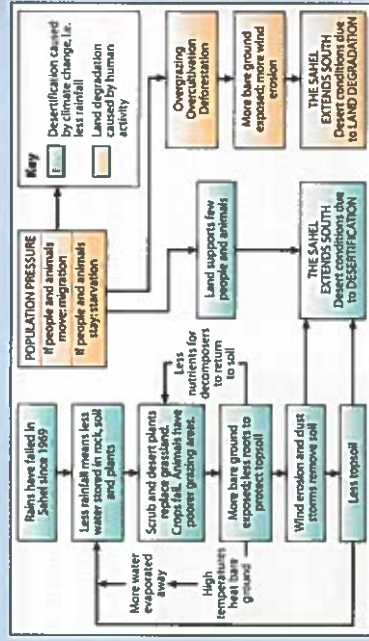
- Draw a climate graph for Timbuktu. Use the same scales on the axes as used for Monument Valley on page 123.
- Compare and contrast the two hot desert climates.
- How have the fennec fox and the acacia tree adapted to survive in northern Mali?

A The desert moves south



A camel train travelling from Timbuktu to Taoudenni to exchange goods for salt

B The changing Sahel

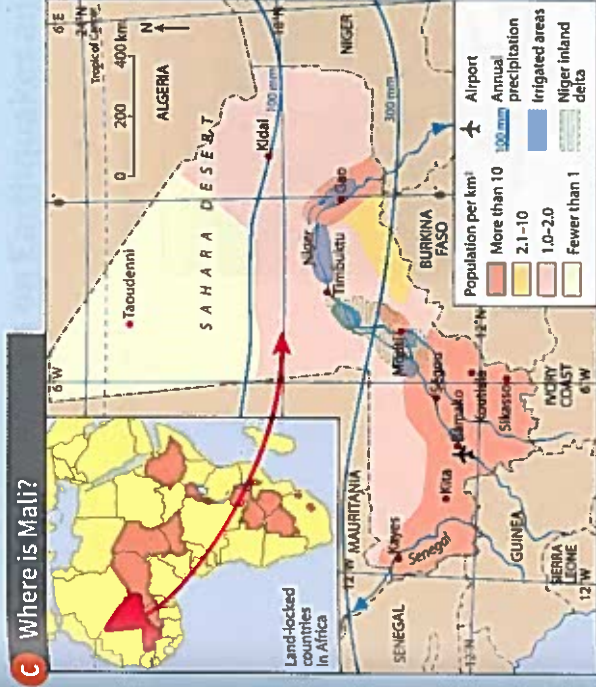


The Sahel is a semi-arid belt of poor, dry soil 300–500 km wide from north to south. It stretches from west to east across north Africa between the Sahara Desert and the savanna grasslands. In the Sahel, average rainfall ranges from 300 to 600 mm per year. When – and if – it rains, up to 90 per cent of the moisture evaporates. Drought is natural to the Sahel but **desertification** and **land degradation** by people have moved the limit for growing crops and grazing animals further south each year. Countries like Mali now have even less inhabitable land to survive on.

Mali – a land-locked country

Once home to one of Africa's greatest empires, Mali is a vast, land-locked country nestled between the Sahara Desert and six neighbouring countries in West Africa. It is the largest country in West Africa but one of the poorest countries in the world. Bordering the Sahel region of West Africa in the north, 65 per cent of Mali's land is desert or semi-desert. In these areas Malians suffer from periods of drought and widespread food shortages. Population density is only 5 per km². It is an extreme environment for plants, wildlife and people to survive in.

The Niger river is the most important feature in Mali. It provides a reliable water supply and is a vital transport route for goods and people. The Niger's high-water flood season is from August to December.



C Where is Mali?

D Surviving the desert climate

The fennec fox is a mammal and is the world's smallest fox. It has enormous ears to help radiate heat to help it stay cool. It lives deep in the ground in long, cool burrows and emerges around dusk to hunt when the day is less hot. Most of northern Mali has less than 100 mm of rainfall a year – sometimes none. In most places the main source of moisture for animals is dew. The desert is fiercely hot by day but can freeze at night. Most animals are small so they can lose heat more easily, as their surface area is large compared with their size.

The acacia tree has developed a long, shallow root system which enables it to find moisture. It has thorny leaves to prevent water loss, and its crown is wide so the foliage can absorb the maximum amount of sunlight. Smaller shrubs and cacti have little foliage above ground but rely on long or deep roots and fleshy stems for water storage.

Timbuktu, Mali (17°N 3°W)	J	F	M	A	M	J	J	A	S	O	N	D
Temperature (°C)	23	24	26	31	35	34	34	33	33	32	27	23
Rainfall (mm)	0	0	10	0	14	30	77	50	20	17	0	0

Average annual rainfall = 218 mm Temperatures are average (mean) for each month

Signs like this, found all over West Africa, indicate the remoteness of Timbuktu from other places. It was founded as a trading post in the 11th century midway between the north and south of West Africa.



TASK 5: Study Source D

Imagine you are to lead a camel train from Timbuktu to Taoudenni. The round trip will take four weeks.

- At what time of year would you **not** go? Why?

- Discuss and list the equipment and supplies you would need.

- How would you ensure the health and safety of the people and the camels?