The following factors affect whether there will be a water surplus or deficit:

Water surplus or deficit?

Temperatures and the amount of evaporation
The higher the temperatures are, the greater the amount of rainfall that will evaporate before it can be used. Losses to evaporation can be as high as 90%.

The amount of precipitation
Where an area has less than about 500 mm of rainfall a year, there is far more chance of a water deficit – especially if surface water is the main source.

The importance of agriculture
Where irrigation is practised over large areas, it is common for agriculture to be the biggest user of water (compared with industrial or domestic use).

The proximity of rivers
Some areas use rivers fed by rainfall thousands of kilometres away. One example is the Nile River Valley in Egypt, which is fed by rainfall in the Ethiopian Highlands.

The level of economic development
In industrialised countries, large amounts of water are used by factories, or for cooling water in thermal or nuclear power stations.

The presence of water-bearing rocks
Even in deserts, the presence of aquifers below the surface (fed by rainfall outside the desert) can provide adequate water supplies.

The population density
Big urban areas use large amounts of water, especially in MEDCs. This is often for domestic use.

The following case study explains how these issues have affected part of southern Africa.

11 **a** What is meant by the terms water surplus and water deficit?

b How is surplus or deficit affected by climate, the degree of industrialisation, and the degree of economic development?

Discussion point

Do you live in an area of water surplus or water deficit? What are the geographical reasons for this? Where does your water supply come from and how does it reach you?