

4.7 Consequences of global warming

In previous spreads in this chapter, the effects of climate change in the past have been presented. What about now? If present warming trends continue, what are likely to be the consequences for our world? Answers are very difficult to determine, as no-one is able to predict how much warmer the globe will become, or how quickly any temperature rise may occur. However, present trends offer a starting point.

Risks to low-lying islands

The archipelago nation of the Maldives is a small republic in the Indian Ocean, to the south-west of India. It is made up of about 1200 tiny islands, most of which average no more than one metre above sea level, the highest point in the island group being just 2.4 metres above sea level. Economically the nation depends on tourism and the continuing appeal of its beautiful beaches, which would be very much at risk if sea levels were to rise.

The Boxing Day **tsunami** of 2004 exposed how vulnerable the Maldives was, when the wave swept across many low-lying islands, causing widespread destruction of its fruit plantations. The relatively low number of deaths was due to the fact that most of the population live in Male, which is protected by a huge sea wall.

The longer term threat to the Maldives, however, is posed by global warming. Sea levels are currently estimated to be rising by about 2 to 3 millimetres each year. Melting glaciers and polar ice are adding to the water volume of the oceans; also, as the water warms, its volume increases. The UN Intergovernmental Panel on Climate Change predicts that by the year 2100 sea levels will have risen by anywhere between 9 and 88 centimetres. In the worst case, this would see the entire nation of the Maldives virtually submerged.

Various schemes are being examined by the government, including moving populations from islands more at risk, building barriers against the rising sea, raising the level of some key islands, and even building a completely new island. However, these approaches offer only short-term solutions. The longer term challenge is

FIGURE 2



A Mozambique village in flood, March 2000

to deal with the basic problem: global warming itself. It is perhaps understandable that the Maldives was one of the first countries to sign the **Kyoto Protocol**, which sought international agreement to cut back carbon dioxide emissions.

Consequences for health

One of the current responsibilities of the World Health Organization (WHO) is to study the likely health consequences of global warming. Accurate predictions are impossible, but several possibilities have been suggested by the WHO as longer term impacts:

- Largely tropical diseases such as malaria and dengue fever may spread into new areas.
 - Malnutrition is likely to increase as ability to grow food is affected by increased drought or higher levels of rainfall leading to widespread flooding.
 - New, as yet unheard of diseases may flourish in warmer temperatures.
 - Heat-related deaths will increase.
 - There may be more extreme weather events, with resulting health problems (e.g. cholera outbreaks following floods).
- The year 2005, for example, the second hottest on record (after 1988) and the third worst for extreme weather events in the

United States, saw at least 214 US climate records broken. The Amazon rainforest had the worst drought in 100 years, and there were 27 named storms in the Atlantic, beating the previous record of 21 set in 1933.

- In urban areas, respiratory problems caused by increased warmth reacting with air pollutants, and bringing rises in ground-level **ozone**, are likely to increase.

Low water supplies

Around Australia, water restrictions and a growing awareness of the critical importance of water as a resource are becoming more commonplace. As the article from *The Age* (above right) indicates, planning is already under way to counter potential adverse impacts climate change may have on urban water supplies.

FIGURE 3



A woman and her baby at a protest against rising pollution levels in Hong Kong in 1999. Rising air temperatures would be likely to increase air pollution, especially ground-level ozone.

Kyoto Protocol an agreement negotiated in 1999 between 160 countries designed to bring about reductions in greenhouse gas emissions

ozone a gas created by the action of ultraviolet radiation on oxygen in the stratosphere; provides us with a protective screen against ultraviolet radiation

tsunami a powerful ocean wave triggered by an earthquake or volcanic activity under the sea

Melbourne could run out of water in 11 years if the worst climate change impacts eventuate, the State Government says.

Releasing options to boost the city's supplies, Premier Steve Bracks said the state's central region of Melbourne, Geelong, Ballarat, the Macedon district and West Gippsland faced significant

water challenges from global warming and population growth.

With mid-range climate change, the city's water demand would exceed supply by 2019, according to the Government's figures. By 2055, Mr Bracks said, Melbourne would have a water gap of 190 billion litres.

By Melissa Fyfe, *Environment Reporter*,
The Age, 21 October 2005

Activities



Student worksheet
4.4, 4.9

REMEMBER

- 1 In what way is the island nation of the Maldives threatened by flow-on effects of global warming? Why do the geographical features of this nation make it particularly vulnerable?
- 2 What actions is the Maldives government taking to implement (a) short-term and (b) longer term solutions to the problems facing its country's physical survival?

THINK

- 3 Look carefully at the photograph of Male (figure 1). Can you identify the sea wall that protects the city? Given this island's topography, what solutions might you recommend to help protect this city in the event of the sea levels rising significantly? Discuss solutions with a partner. Think creatively.
- 4 What health problems do you think the people of Mozambique shown in figure 2 might face now and in the immediate future as a result of severe floods such as this?

ICT

- 5 Use the internet to investigate what strategies have been suggested or are being implemented to make sure that Melbourne does not run out of water. Share your findings on a class blog. Include your own recommendations for securing Melbourne's water.

DESIGN AND CREATIVITY

- 6 Use ICT tools (e.g. Photoshop) to create a dramatic poster designed to shock people into becoming more water-conscious. Work in small groups, blending your various skills to develop graphics and captions and to use ICT. Share any specialised skills you have with group members in developing your product, which you will display before the class for feedback.

COMMUNICATE

- 7 (a) As a class, discuss other parts of the world you can think of that might also be threatened if the sea levels were to rise by about one metre over the next 100 years. Justify your views.
(b) Think of a place on the coast you know of, live near or have visited recently. Draw a sketch to show how its coastal landforms and features might change if the sea level was a metre higher than it is at the moment.
- 8 The information about possible health consequences of global warming seems to be all bad news. Can you think of any positive outcomes that could flow from global warming? For example, areas that might get a lot more rain than they currently do might be able to produce more food. Discuss in small groups.

FIGURE 1



Male, the capital of the Maldives, occupies an entire island of its own.