

Chapter 3: Population growth

Unit 6: World population growth

6.1 Growth of the world's population

Figure 4.13 shows how the world's population has changed over time. Up to around 1800, the world's population was probably less than 1 billion. Since 1800, world population has been growing at a faster rate. There are more than twice as many people on Earth today as there were in 1960.

Estimates are that by about 2045, the world population will reach 9 billion. We call this rapid growth over a short period of time **exponential growth**.

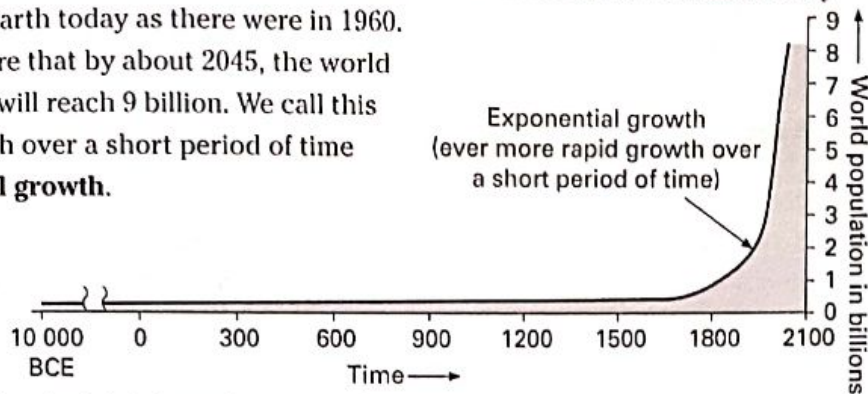


Figure 4.13 Graph of global population growth over time.

Key questions

- How has the world's population grown over time?
- What is 'exponential growth'?
- Population growth refers to how a population changes over time. It takes only about 11 years to add another billion people to the world's population.

Case study:

World population growth over time

The table shows how world population has grown in just over 2 000 years. We call the recent rapid growth in world population the population explosion.

Year (CE)	World population	Number of years to reach the next 1 billion
1	300 million	-
1200	400 million	-
1500	500 million	-
1800	1 billion	It took about 250 000 years to reach 1 billion.
1927	2 billion	127
1960	3 billion	33
1974	4 billion	14
1987	5 billion	13
2000	6 billion	13
2011	7 billion	11
2024	8 billion (estimate)	
2045	9 billion (estimate)	

This leads to exponential growth

Activity 7: Investigate world population growth

Use Figure 4.13 and the case study to answer these questions:

1. Estimate the world population in the following years:
1.1 1000 1.2 1800 1.3 1900 1.4 2000 1.5 2050. (5)
2. When did global population start to increase steeply? (1)
3. Describe the trend in the history of global population between 1 CE and 2000. (2)
4. How many years will it take from now until the world population reaches another billion? (1)
5. Explain why it is not possible to know exactly what the total population of a country or the world is. (1)

Geo fact

Every 10 seconds the world's population increases by 27 people.

Key word

exponential growth – ever more rapid growth over a short period of time

Key questions

- What does the demographic transition model show us about a country's population?
- What is the link between industrialisation, urbanisation, economic development and population?

Key word

demographic transition model – a model explaining how a country's population changes over time

Unit 7: Demographic transition model

In Geography, we use a model to try and explain how something works. A model represents reality. We can think of it as an idea or theory.

7.1 The demographic transition model

Geographers use the **demographic transition model** to show the changing relationships between birth and death rates over time. It is a graph, but we call it a model because it represents the general trend in many countries, rather than the situation in a particular country during a particular period. Geographers developed this model after studying the history of population change in countries such as the USA, Britain, Japan and Sweden.

7.2 What is the demographic transition model?

Demography is the study of the number of births, deaths and other demographic data in a country over time. Transition means a process of change. So, demographic transition is a geographical model that shows us how a country's population can change over time. We can also call it the population cycle model.

The model explains what happens to birth rates, death rates and overall population growth over many years. It allows us to compare the demographics of different countries and regions. Geographers think that most countries will eventually go through all four stages of the demographic transition model. Figure 4.14 shows the demographic transition model.

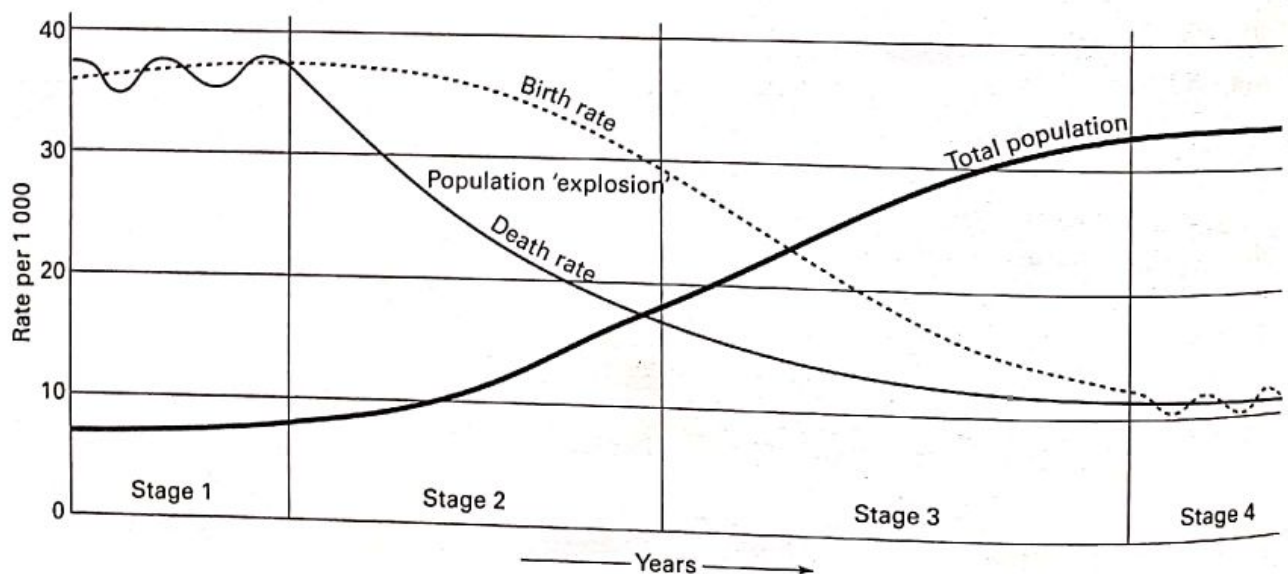


Figure 4.14 Demographic transition model.

The four stages of the demographic transition model are the following:

- Stage 1 – High stationary phase: BR and DR are high; total population remains low; there are slight changes in total population due to factors such as war, famine and disease. BR is high due to a lack of birth control and because children are regarded as important status symbols and labour units. IMR and DR are high due to disease, plagues, famine, poor diet, poor hygiene and the absence of medical services.

- Stage 2 – Early expanding phase: BR remains high; IMR and DR start to drop due to factors such as improved medical services, better diet, better services and infrastructure and fewer wars. So, LE increases and total population starts to grow. We call this the population explosion.
- Stage 3 – Late expanding phase: DR stabilises at a low level and BR continues to drop due to increasing urbanisation and industrialisation. Total population starts to level out as the population growth rate decreases.
- Stage 4 – Low stationary phase: BR and DR have stabilised at low levels. Total population remains stationary. If BR drops below DR, there is a negative NI and the population gets smaller.

7.3 Declining populations

Geographers suggest that the demographic transition model should provide for a fifth stage. In some highly economically developed countries, such as Germany and Japan, birth rates have begun to fall below death rates, leading to declining populations.

Case study:

Germany's changing population

Germany has undergone a transition in its population indicators over the years. The population indicators in the following table show changes in only 14 years between 1996 and 2010:

Germany	Total population	BR	DR	NI (%)	% population under 15 years	% population over 65 years
1996	81,9 million	10	11	0,1	16	15
2010	81,6 million	8,2	10,8	- 0,26	13,7	20,3

(Data from US Census Bureau *International Database 2011*)

From these indicators, we can say the following about how Germany's population has changed over time:

1. The total population has increased slightly through immigration of people from other countries, although it is set to decrease due to the negative NI.
2. Birth rates are declining.
3. Death rates have declined very slightly.
4. There is a negative natural increase because death rates are greater than birth rates.
5. The number of younger people in the population is decreasing.
6. The number of older people in the population is increasing.

Germany's population is shrinking by 100 000 people a year. Estimates are that by 2050, Germany's population will have reduced by 10 million.

Activity 8: Apply a demographic transition model

1. Study the table on page 202. Concentrate particularly on BR, DR and natural increase. For each of the eight countries, decide in which stage of the demographic transition each country might be. (8)
2. Copy the demographic transition model on page 210 into your exercise book. Then draw the lines that would illustrate a possible Stage 5 of the model, where a country has a declining population, such as Germany. (3)



Figure 4.15 Developing countries have large numbers of younger people.



Figure 4.16 Developed countries have large numbers of older people.

Unit 8: Overpopulation

By 2024, there may be 8 billion people on Earth and by 2045, this figure may have risen to 9 billion.

8.1 Is Earth overpopulated?

Overpopulation happens when there are too many people for the available land and resources to support them. Some people say the Earth is overpopulated, while others say our planet can cope with many more people.

Key questions

- What is overpopulation?
- Are there too many people on Earth?
- How many people can Earth support?

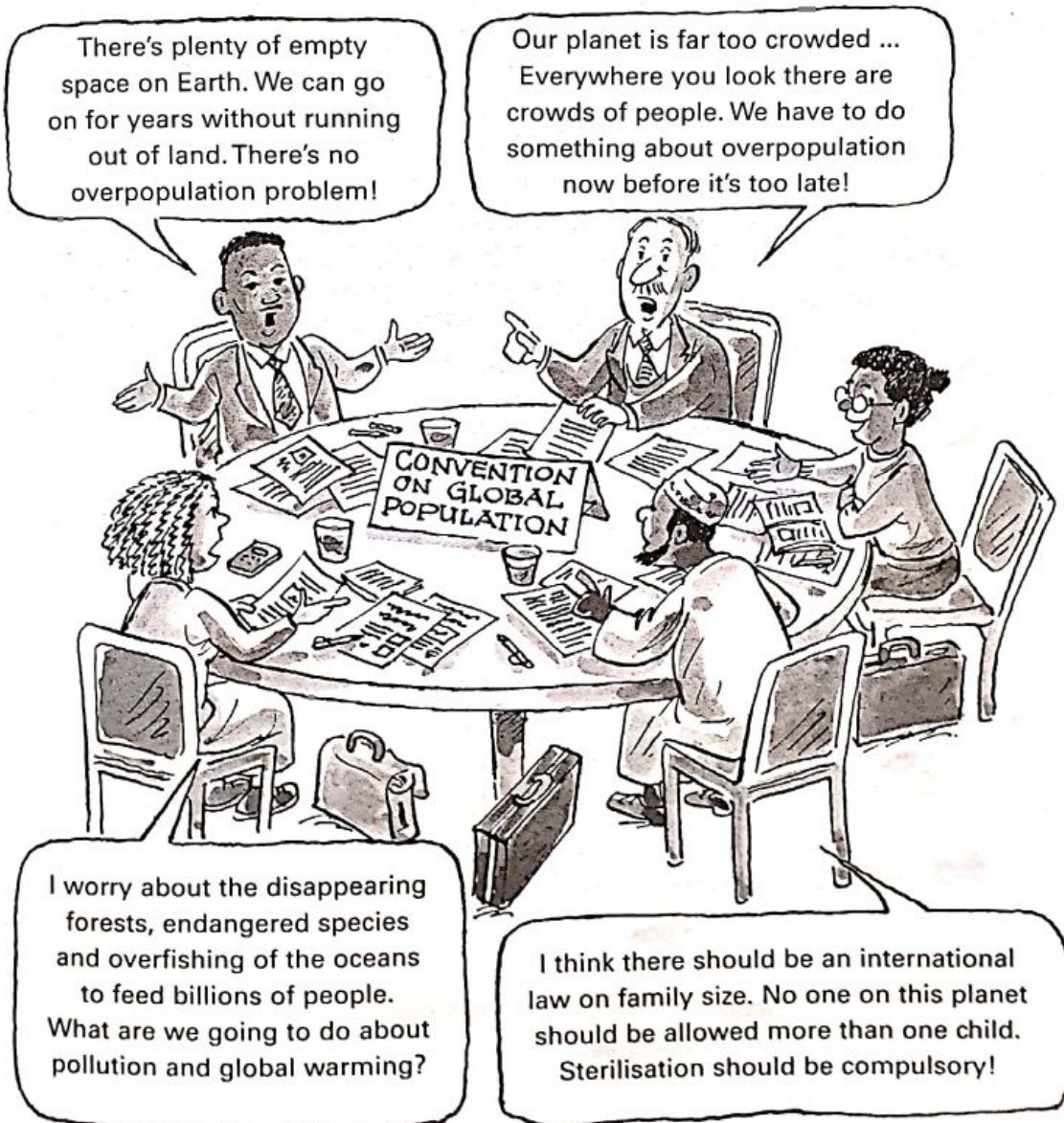


Figure 4.17 Different opinions about overpopulation.

Case study:

Nigeria: Africa's most populous country

In 1991, Nigeria's population was 99 million. By 2010, the population had grown to 152 million, the largest in Africa. Lagos is Nigeria's largest city and has a population of 10 million.

Almost half of the population is under 15 years. Large families of six to seven children are the norm in this country. Close to half of the population lives in poverty. Geographers are worried that the economy of Nigeria will not be able to keep up with the rapid population growth. Nigeria's economy depends on oil: 90% of exports and 30% of the country's GDP come from this resource. The country also has large reserves of natural gas. What will happen when these valuable resources run out? Will other resources be able to support a growing population into the future?

Some people suggest that Nigeria's most valuable resource is its people. They form Africa's largest market. The country has a large agricultural sector which can be developed further.

Geo fact

Nigeria: With a population of 152 million in 2010 and a rate of natural increase of 2,04%, Nigeria's estimated population in 2050 will be 213 million.

Activity 9: Debate overpopulation

1. Read the statements of the four delegates at the 'Convention on Global Population' in Figure 4.17 on page 213.
 - 1.1 Consider every delegate's point of view. Do you agree or disagree with the delegate? (4)
 - 1.2 Do you think Earth is overpopulated? Explain why you say this. (3)
2. Read through the case study on Nigeria. Do you think Nigeria is overpopulated or do you think its resources will be able to support a growing population? Motivate your answer. (4)

8.2 Overpopulation and Earth's resources

When will Earth reach the point of having too many people? Our planet has a limited area of space suitable for humans to live, as well as resources. It has a limited carrying capacity. **Carrying capacity** refers to the number of people an area can support on a sustainable basis given the available space, resources and prevailing technology.

Our population can only keep on growing if we use resources in a sustainable way. **Sustainable development** is the idea that a community can develop and keep going if they use the resources available to them in a manner that will ensure the survival of that community.

The following are some of the issues of the world's increasing population:

- **Global population:** Global population is currently over 7 billion. Less-developed areas contain 80% of the world's population. Population growth is higher in these areas, at an average rate of 1,5% per year. In economically developed areas, the average rate of population growth is 0,2% per year. So, poorer parts of the world have to support many more people with fewer resources.

Key words

carrying capacity – the number of people an area can support on a sustainable basis

sustainable development – the idea that a community can develop and keep going if they use the resources available to them in a manner that will ensure the survival of that community