

4

Population

In this chapter you will learn about:

- Natural increase as a component of population change with reference to birth and death rates. The factors affecting fertility, overall **mortality**, and infant mortality. **Population structure** and the interpretation of age/sex structure diagrams.
- How birth rates and death rates change over time. A critical appreciation of the **demographic transition model** and its applicability. Changes in infant mortality and life expectancy and the issues related to youthful and ageing populations.
- **Food security**, the causes and consequences of food shortages and the technological and other innovations that impact on food production. The role of constraints in relation to sustaining population. The concepts of carrying capacity, overpopulation, optimum population and underpopulation.
- The ways in which governments can attempt to manage their population. A case study of one country's policy and the ways it is being adapted to changing circumstances.

Natural increase as a component of population change

Global population change

Modern humans have lived on the Earth for about 200 000 years and for most of that time numbers have been small. By 10 000 years ago it is estimated that 5 million people lived on the Earth. At about this time, the Neolithic farming revolution meant that people began to develop the technologies that allowed them to interact with nature in

a more systematic and destructive way. They were able to produce food in greater quantities, increasing the **carrying capacity** of their land but the farming methods that they used often led to environmental degradation and the collapse of the land's ability to produce food. The domestication of animals led to new diseases such as smallpox that increased death rates. Death control was still the way that human population growth was limited but by 2000 years ago the global population was 250 million.

RESEARCH Find out what is meant by the 'carrying capacity' of a region, in terms of the size of its human population.

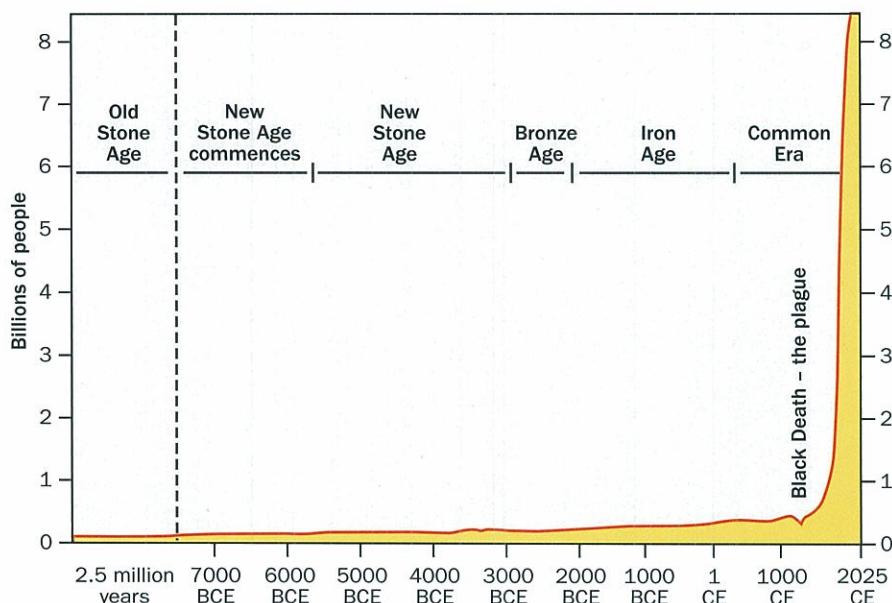


Fig. 4.1 World population growth through history

Slow growth continued throughout the first millennium CE and for most of the second millennium CE so that, despite periodic setbacks such as the Black Death **pandemic** of the mid 14th century, global population had reached one billion by the start of the Industrial Revolution some 200 years ago. It was at this point in history that population growth in the countries that we now refer to as HICs began to accelerate.

Developments in water supply and medicine allowed death rates to be reduced but because birth rates stayed high, the population in these countries began to grow rapidly. The use of fossil fuels and the machines that they powered allowed the production of food and goods to increase (economic development) so that these growing populations could be supported. Eventually, urbanisation and increasing **affluence** meant that children became an economic liability and birth rates fell. As a result the population growth rates slowed down and the population total stabilised. This is what had happened in the countries of western Europe, the USA and Japan by the middle of the 20th century.

At about the same time (1950), similar changes started to take place in the poorer parts of the world. Between 1960 and 1990 the global population increased, on average, by 70 million per year – 8000 per hour. This was not the number of babies being born but the difference between the number being born and the number of people dying. Most of this increase took place in LICs and MICs. For example, the population of Mexico increased from 38 million to 83 million during this 30-year period – an increase of 118 per cent. As a comparison, the population of the UK increased from 53 million to 57 million during those 30 years, an increase of only 8 per cent.

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What is meant by the following acronyms:

- LIC
- MIC
- NIC
- HIC?

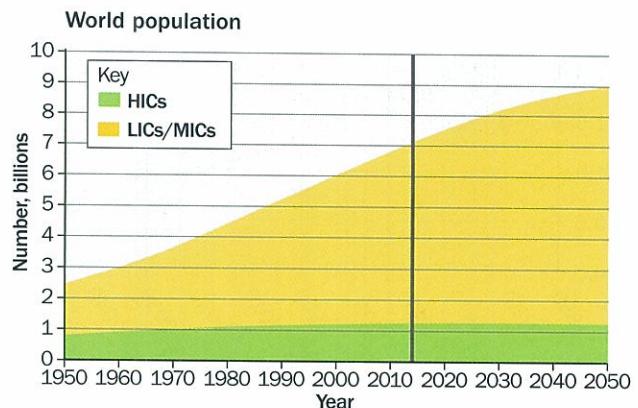


Fig. 4.3 World population growth since 1950 – comparing growth in LICs with that in HICs

- Figs 4.1, 4.2 and 4.3 are all line graphs. By changing the time scale on the horizontal axis, the gradient of the total population line changes. Figs 4.1 and 4.2 are simple line graphs but Fig. 4.3 is a compound line graph, showing two sets of data on the same graph.
Study Fig. 4.3 and then answer the following questions.
- What was the total world population in 2006?
 - What percentage of the world's population lived in HICs in 2006?
 - What percentage of the world's population lived in less developed regions in 2006?
 - How are these percentage figures expected to change by 2050?

The growth rate of the world's population peaked in the 1960s at 2.1 per cent per year. By 2012 it had declined to 1 per cent per year and was expected to continue declining in the future. Despite this, the global population is still growing and is predicted to reach 8 billion by 2025.

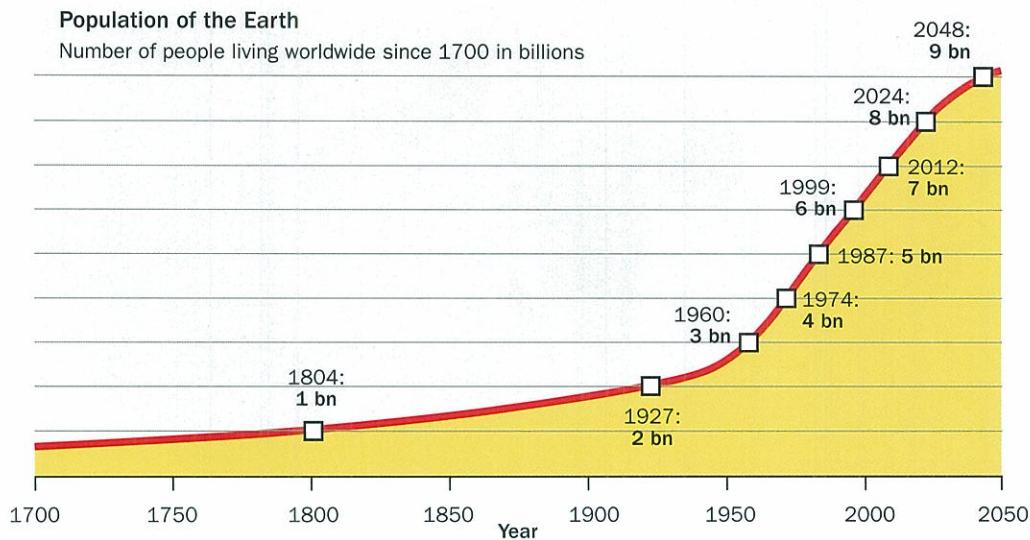
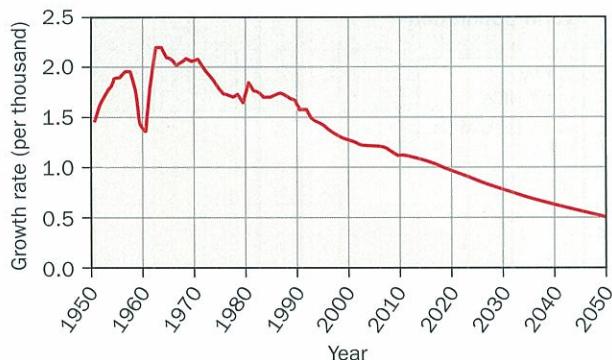


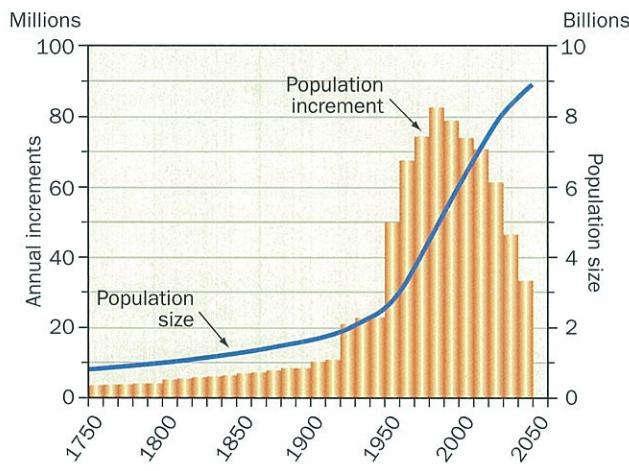
Fig. 4.2 World population growth over the last 300 years (Source: United Nations world Population Prospects Deutsche Stiftung Weltbevölkerung)



Source: US Census Bureau, international database, June 2011 update

Fig. 4.4 World population growth rates – 1950 to 2050

- 2.** Suggest reasons for the decline in the growth rate around 1960.



Source: United Nations Population Division

Fig. 4.5 Comparing annual increase in population with the actual growth in world population

Fig. 4.5 illustrates the difference between annual increase and actual population totals. The annual increase bars have been declining since the 1980s but the total population has been growing. Part of the reason is **population momentum**, the fact that there are so many young people in the population who still have to produce their own children. For example, in Uganda, 49 per cent of the population are under 15 and have not yet started having children.

- 3.** Study Fig. 4.5 and then answer the following questions.

- a) By how much did the world's population increase each year in the 1980s?
- (b) During which decade did the world's population reach 7 billion?
- 4.** Study Fig. 4.5. To what level would the annual increase have to drop before the total population line started to fall?

The components of population change

Population change is complex and to understand it some key factors need to be considered. They are also known as **vital rates**.

Birth rate: the number of live births per thousand people per year (expressed by the symbol ‰ per year).

- 5.** Using Fig. 4.6, describe the distribution of countries with a birth rate of 33% or more.

RESEARCH Fig. 4.6 is a choropleth map and also a thematic map. Find out what is meant by:

- a choropleth map
- a thematic map.

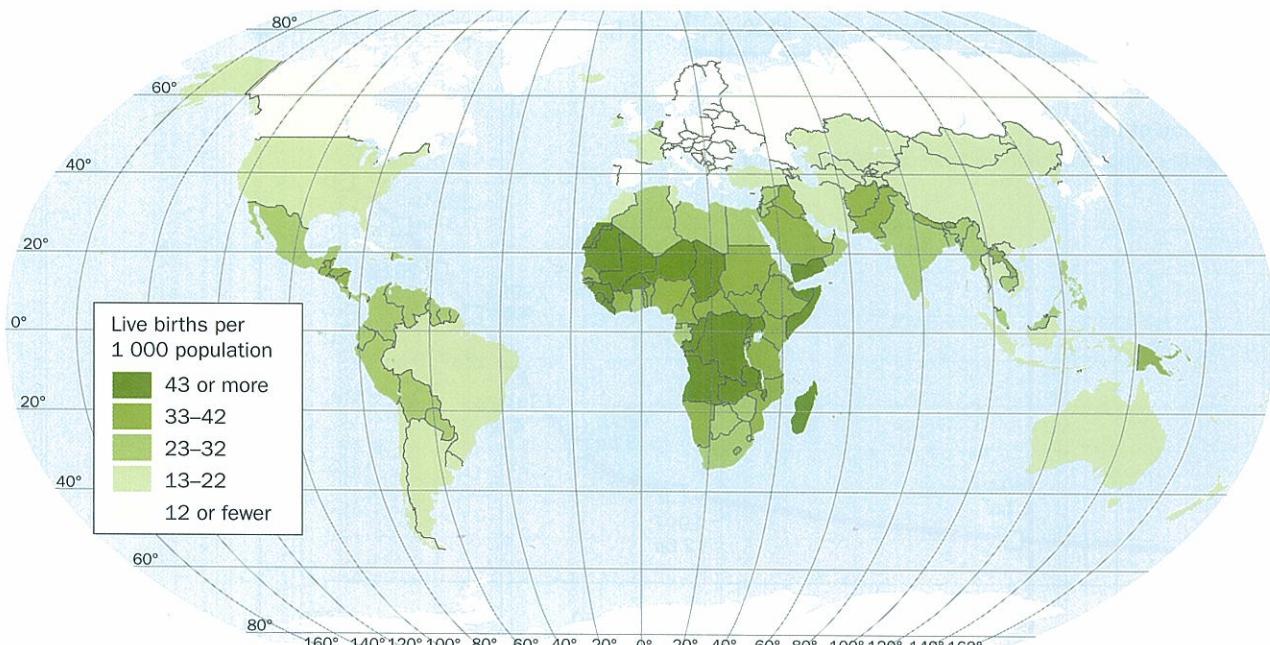


Fig. 4.6 World map showing variations in birth rate in 2013

Death rate: the number of deaths per thousand people per year.

Natural increase: the change in the size of a population caused by the difference between the birth rate and the death rate. If birth rate exceeds death rate, the population will grow. If death rate exceeds birth rate the population will decline and then we should refer to **natural change**.

Net migration: migration is the permanent change of residence of an individual or group of people. Net migration is the balance between **immigration** and **emigration**. If immigration exceeds emigration in a country, the population will grow. If emigration exceeds immigration the population will shrink. (The terms to use for movement in and out of an area *within* a country are **in-migration** and **out-migration**.)

Overall **population change** over time: the annual population change of an area is the cumulative change in the size of its population after both natural change and migration have been taken into account. This can be represented by the following equation:

$$\text{Population change} = (\text{birth rate} - \text{death rate}) \pm \text{migration}$$

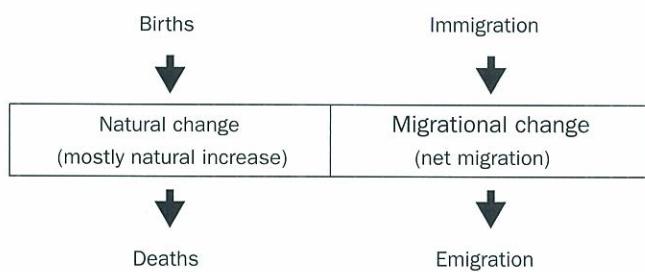


Fig. 4.7 Natural and migrational change

Although birth and death rates are expressed 'per thousand % per year', annual population change is usually expressed as a percentage (%).

Fertility rate: the average number of children each woman in a population will have in her lifetime. If this number is 2.1 population will replace itself (**replacement level**). If it is higher than 2.1, population will grow but if it is less than 2.1, population will decline. It is also defined as the number of live births per 1000 women aged 15–49 in one year.

Infant mortality rate: the number of children who die, under the age of one, expressed per thousand live births per year.

Life expectancy: the average number of years, from birth, that a person can expect to live. This means the age at which 50 per cent of the children, born in a particular year, have died. It is usually different for men and women in the same country.

Population density: population density is the number of people in a given area, usually measured as the number of people per square kilometre.

Population distribution: population distribution is usually shown on a map and uses variations in population density to show how people are spread out across an area – which could be a region, or a country, or a continent, or the whole world.

The measurement of population characteristics

Most countries in the world collect data about their populations – not just about the vital rates mentioned above but also about employment, ethnicity, educational attainment, religion, patterns of social activity, housing and affluence. The best way of doing this is by a regular **census**, where every household has to be questioned and

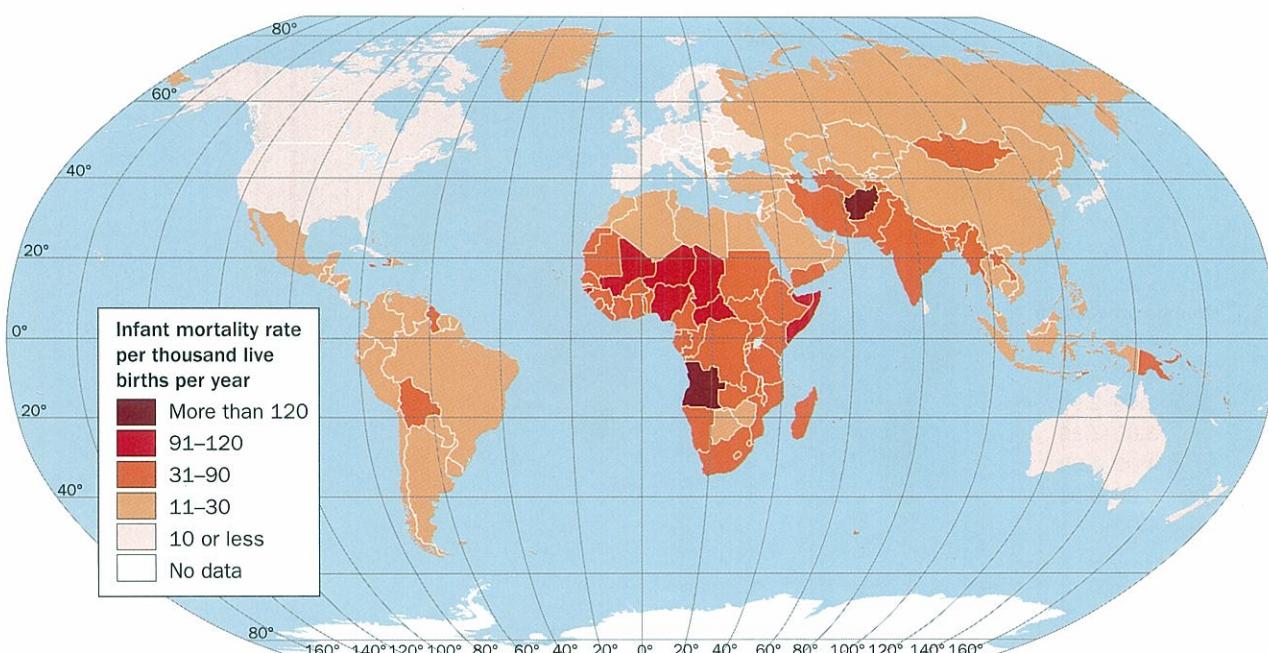


Fig. 4.8 World map showing infant mortality rates in 2012

counted. In the UK there is a census every ten years: i.e. 1991, 2001, 2011, and so on. A running total of the UK population is also kept because people have to register births and deaths, and the UK Border Agency record immigration and emigration.

Governments use this information to plan for the allocation of **resources** to services such as health, education and employment. The information is also useful to non-government bodies such as retailers, advertisers, financial services, property developers and utility providers.

Factors affecting levels of fertility

In most countries, fertility exceeds mortality, leading to population growth. The highest fertility rates are found in African countries such as Niger, Mali and Liberia. Some of the lowest fertility rates are in central and eastern Europe, e.g. Germany, Belarus and Ukraine. Fertility is clearly related to levels of economic development but other factors are also important, most of them linked in some way to wealth and **quality of life**. Global fertility started to fall in the late 20th century and the trend is expected to continue into the future.

RESEARCH Find out what is meant by the Brandt Line and why it is no longer used.

6. Describe the distribution shown by Fig. 4.9. You should refer to the general pattern, continent by continent, but also mention any anomalies. Don't forget to quote statistics to develop your points.

Factors affecting fertility include:

Death rate, especially the infant mortality rate

In the poorest countries (LICs), the birth rate is often high to compensate for the high rates of infant mortality. In some parts of sub-Saharan Africa a woman must have 8 or 9 children to be 95 per cent certain of having a surviving son to look after her in old age. Improvements in healthcare, **sanitation** and diet can reduce child deaths and therefore reduce the need to have so many children as security for the future. However, people still think they need large families even when the infant mortality rate has dropped. It takes a while for people's behaviour to catch up with the new reality.

Tradition

In many parts of the world there is a cultural expectation that people will have large families and this tradition often overrides a woman's desire to stop childbearing. Another tradition that fosters large families is the expectation that women will marry at an early age and start having babies right away.

Education

Increasing female literacy is a vital step towards lowering fertility. With education comes knowledge of **birth control**, more opportunity for employment outside the family home and more choice of lifestyle. Contraception is a powerful strategy in reducing fertility but women need to know about its availability and use, and both partners need to have a desire to use it. The following graph indicates the link between female literacy and fertility rates.

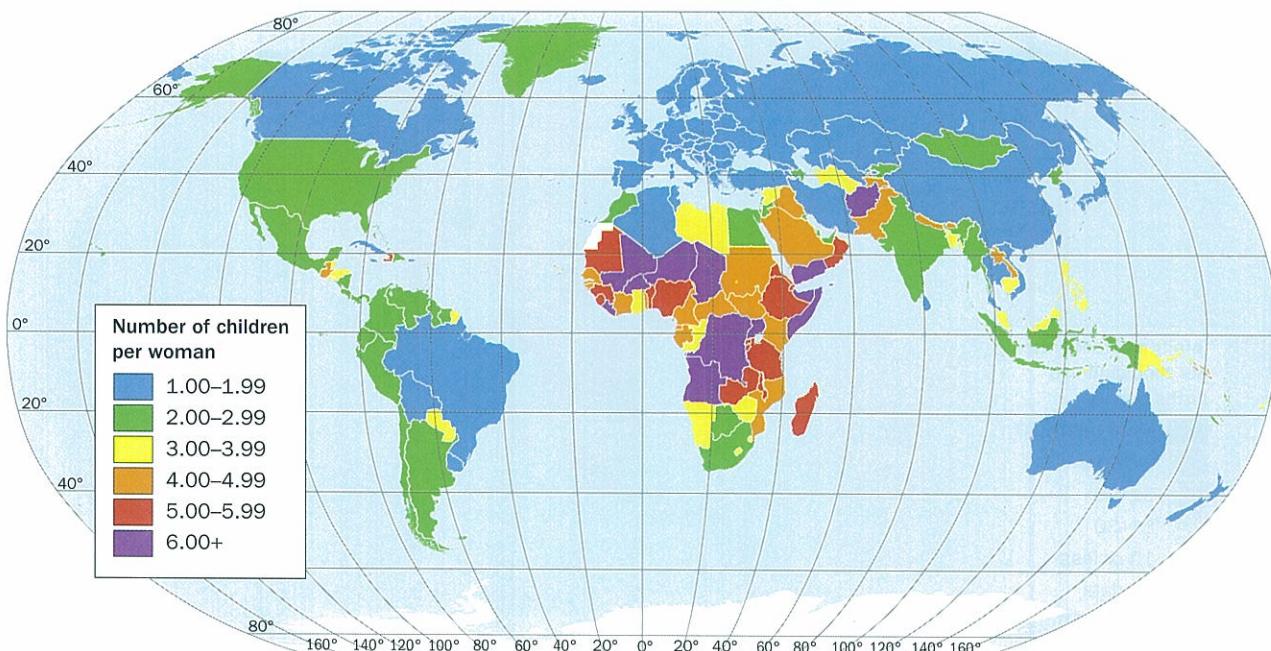


Fig. 4.9 World fertility levels in 2012

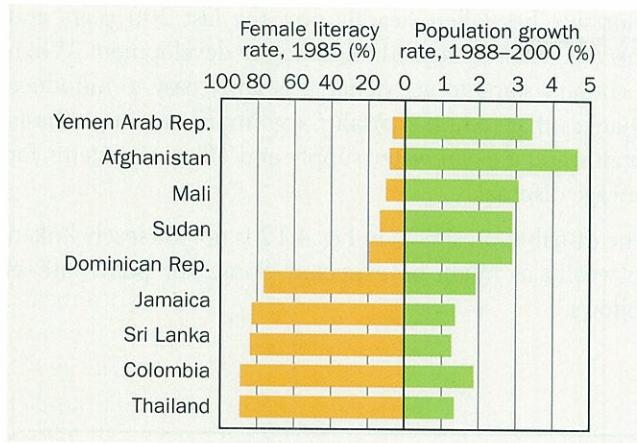


Fig. 4.10 Female literacy and population growth

Age structure of the population

This is important for the number of future births. In Mali, where 48 per cent of the population is under 16, the number of future births will be high even if fertility rates drop, simply because of all the young people who still have to find a partner, settle down and have a family. In Japan, where only 14 per cent of the population is under 16, the number of future births will be low because there are so few young women moving into the childbearing age group.

Religion

Both Islam and Roman Catholic Christianity oppose the use of artificial birth control. However, as people become richer they pay less attention to this, even if they may still be faithful to their religion in other ways. In Italy most people are Catholics and church-going is quite high but the fertility rate is very low (1.3 children per woman) and this suggests that most women use artificial contraception. In Muslim countries this change is evident too as countries become more developed – compare Afghanistan, Saudi Arabia and Iran in Fig. 4.9 (page 100).

Economic factors

In LICs children are viewed as an economic asset – they can work on the family farm or in the family workshop, they can be sent to work in a factory at an early age, and they can support their parents in old age. There is often no compulsory schooling or laws restricting child labour. A large number of children make the family wealthier. In NICs and HICs the opposite is true. Employment laws and compulsory secondary schooling mean that parents can't send their children out to work but they still have to feed and clothe them – children are an economic liability not an asset. Pensions mean that parents do not rely on their children to support them in old age. In HICs, an economic downturn means that people reduce their fertility – as in eastern Europe and the former USSR after the collapse of communism.

Government policy

In China the 'one-child' policy has been successful in reducing fertility. Russia is adopting policies to boost fertility

in order to combat a future where the population will age and then decline in number.

The status of women

In Brazil, poorly educated women have an average of 6.5 children each while the average for those with a secondary education is only 2.5 children. Many women in LICs are trapped by poverty and cultural expectations into a lifetime of childbearing. As well as having to bear children and take responsibility for the household and the family, women suffer from poverty, ill health, second-class legal status and lack of land. They are responsible for fetching water, gathering fuelwood and growing the family's crops. Women may not be able to own land, inherit property, qualify for credit or loans, or even get a decent education. In other words, they are trapped in a cycle of childbearing and childrearing that may amount to a form of lifelong **servitude**. Raising the status of women is a crucial aspect of economic development. Societies where women are better educated are more successful and more prosperous. In Kerala, in southern India, women have a high social status, birth rates and infant mortality rates are low, and poverty is declining. In the states of northern India where women have low social status, the opposite is true.

- 7.** Which of the factors affecting fertility can be classified as:
- social
 - political
 - economic?

Changing fertility rates

LICs, MICs and NICs

Since 1950, the fastest rates of population growth have been in the developing world. Birth rates are now declining and this fall is expected to continue. The greatest falls in fertility are expected over the next few decades in the LICs of Africa and the Islamic nations of the Middle East. Here there are over 50 countries which are still in stage 2 of the DTM (see page 110) but are expected to move into stage 3. Overall, the growth rates in poorer countries are slowing but their populations are still expected to grow for several decades. The huge number of young dependents in these countries will ensure that growth continues – population momentum.

HICs

Here population growth has been slow for several decades and some countries have already experienced a fall in population e.g. the former communist countries of central and eastern Europe. In these countries, and in Japan, governments are offering financial incentives for people to have children. There are already 50 countries with fertility rates below replacement level. Over the next few years more countries will see a fall in numbers and in some countries it could be substantial e.g.

20 per cent in Germany by 2050 and 25 per cent in Japan by the same date. As a contrast, in the USA fertility rates are quite high because immigration means that the population has a high proportion of 20-39 year olds.

Factors affecting changes in mortality

Mortality is the rate at which people die. It is related to infant mortality, life expectancy and **longevity** as well as to the crude death rate.

Mortality has fallen steadily over the last 200 years and this fall is closely related to economic development. When a country starts to get richer it is fairly easy to introduce changes that reduce mortality, e.g. improvements in basic healthcare, a clean water supply and effective systems for sewage disposal.

The distribution shown in Fig. 4.12 is not as closely linked to wealth as might be expected. Some key points are as follows.

Case study: Changing fertility rates: Kerala, south India



Fig. 4.11 Location of Kerala

India's population is growing very quickly, at a current rate (2015) of about 15 million per year. However India's population growth rate is slowing. Leading the way in this trend has been the southern state of Kerala. Kerala's success is thanks to the state government's priority in meeting the basic needs of the people, especially young mothers and young women in general.

Compared to other parts of India, women have been treated differently in Kerala for over a century. Keralan women are regarded as an asset rather than a drain on a family's finances. Instead of paying out a dowry when daughters marry, parents in Kerala receive money from the bridegroom's family. Some women can inherit and own land, giving them financial independence and power of their own.

Another clear difference is their level of education. While about half of Indian women cannot read and write, 85 per cent of women in Kerala are literate and girls outnumber boys in higher education. With better education, women are more likely to know how to keep their children healthy. Greater investment in healthcare by the state government helps, too. As a result, infant mortality has fallen dramatically from 240% in 1930 to 14% today. If children have a greater chance of survival, families are less likely to try for more. Improved education has other benefits. Women with qualifications are more likely to have a career, and also to marry later. The average age of marriage for Keralan women is the highest in India. Women who marry later tend to have fewer children.

In Kerala, the policy of trying to reduce the birth rate by choice, instead of coercion, is working. However, Kerala's population may stop growing altogether within 20 years, and the resultant changes in the population structure may create new problems. As in some HICs today, 33 per cent of the population of Kerala may be over 60 by 2050. Kerala will need extra money to pay for old people's homes, healthcare facilities and pensions for the elderly. More people are already using private health care as the state government struggles to meet the increasing costs of providing free health services.

Factor	Kerala	India	UK
Life expectancy (women)	75	61	80
Infant mortality (%)	14	70	6
Female literacy rate (%)	85	57	99
Percentage use of contraceptives by married women	64	48	72
Total fertility rate (average no. of children per family)	1.8	3.2	1.7

Table 4.1 Some comparative population statistics

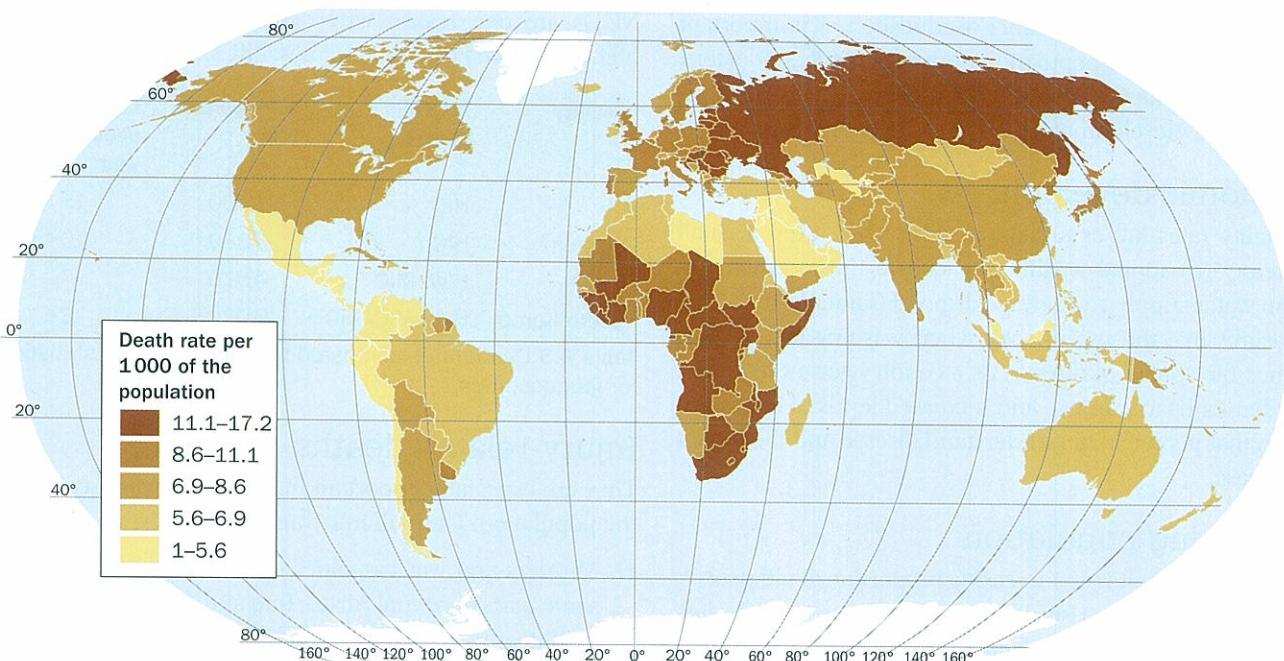


Fig. 4.12 A map showing death rates across the world in 2013

- Death rates are high in many parts of sub-Saharan Africa and this is related to low **GDP/person**. Poor nutrition, dirty water, lack of proper sewage disposal and poor healthcare are all contributory factors. The high rate of HIV/AIDS infection in the southern part of Africa has an impact on the death rate there.
- However, there are signs of improvement in Africa with countries such as Ethiopia and Kenya having similar death rates to the USA. This demonstrates that these countries are moving towards the low death-rates typical of stage three of the DTM.
- Some of the lowest death rates are in the oil-rich countries in the Middle East, Venezuela and Mexico. Oil revenues help to provide good healthcare, clean water, good nutrition and effective sewage disposal. The youthful population is also a factor in these countries – there are very few old people.
- NICs such as China, Malaysia, Brazil and South Korea also have low death rates. Increasing GDP/person and a youthful population mean that there are few deaths related to disease and old age.
- HICs tend to have rather higher death rates than might be expected in countries with plenty of food and excellent healthcare. Western Europe has an ageing population and deaths from old age are increasing. In North America and Australia the death rates are the lowest in the developed world and this reflects the fact that immigration is countering the effects of an ageing population.
- Death rates are particularly high in the former communist countries (FCCs) and this is partly due to high levels of alcohol consumption and its negative effect on health.

Factors that affect mortality

Poverty

This is the most important factor leading to high death rates. People in MICs and LICs are more likely to die young than people in HICs, and MICs and LICs tend to have higher death rates than HICs. Poverty exacerbates most of the following factors.

Infant mortality

Areas with high rates of infant mortality have high rates of mortality overall. This is not surprising because small children are some of the most vulnerable members of society and anything that tends to increase rates of disease in the population at large will affect young children more severely than the rest of the population.

Medical infrastructure

Areas with a shortage of medical facilities and trained medical staff have high death rates. A lack of hospitals and clinics means that people have to rely on traditional remedies when they get ill, and although these can be effective, they do not have success rates comparable with modern medicines and modern medical techniques.

Country	GNP/ person \$US	Death rate per 1000 per year	Doctors per 100 000 people	Adult literacy %
Austria	26 850	10	327	100
Australia	20 300	14	250	100
Congo	1 130	16	27	78
Ethiopia	100	20	4	36

Table 4.2 Some comparative statistics related to mortality

Table 4.2 shows the importance of education – it is important to have an educated population from which to train doctors, for example. The GNP/person figures show the importance of economic development as a factor affecting mortality.

Economic development

Mortality rates fall as a country gets richer. Even a small increase in national wealth can lead to improvements in clean water supply and sewage disposal (sanitation). Simple measures like the use of soap when washing can help to reduce the spread of disease. As a country gets even richer, the diet tends to improve and increased levels of education mean that people better understand disease and the causes of disease.

An ageing population

In a country that has an increasing proportion of old people, death rates tend to rise. However good a country's diet, public health and medical facilities, people can't live forever. This is why countries that have been HICs for a long time can have higher death rates than NICs, even though the NICs have a lower GNP/person.

HIV/AIDS

The incidence of HIV/AIDS is having a major effect on mortality rates, especially in sub-Saharan Africa. Botswana is a good example of a country with high rates of HIV infection. In Botswana, 25 per cent of the population aged 15–49 is HIV positive. Almost 16 people a day died from HIV/AIDS in 2010.

Non-communicable diseases (NCDs)

These are also called degenerative diseases or diseases of affluence. NCDs include health conditions for which personal lifestyles and social conditions found in HICs are contributory factors. They include heart disease, high blood pressure, lung cancer, obesity and alcoholism. NCDs are becoming more common in the world as a whole as more countries experience economic development and disposable incomes rise. The causes of these diseases include:

- Less physical activity related to the increased use of motor vehicles and the rise in sedentary jobs such as office work.
- The relatively low cost of food – much of which is high in calories, fat and sugar.
- The availability of refined foods such as white bread and white noodles. Wholemeal flour tends to be healthier for the digestive system.
- Increased consumption of alcohol and tobacco products which become available as people have more **disposable income**.
- Increased life expectancy – old people have more time to develop diseases such as diabetes and heart disease.

NCDs are one reason why death rates are significantly higher in some HICs than in most NICs.

Country	Type of economy	GNP/person \$US	Death rate per 1000 per year
UK	HIC	21 400	11
Belgium	HIC	25 380	10
Brazil	High MIC	4 570	7
South Korea	High MIC/NIC	7 970	6

Table 4.3 Death rates compared to national wealth statistics for four countries

Injury-related deaths

They are especially important in the young adult section of the population. They fall into three main types:

- Murders and war casualties – zones of conflict such as some parts of central Africa, Iraq and Afghanistan have a high death rate because of fighting.
- Road traffic accidents are increasingly important as more of the global population have access to motor vehicles.
- Industrial injuries are high in recently industrialised countries where factory jobs have increased but where health and safety laws are lax.

Population structure and age/sex structure diagrams

What is population structure?

Population structure is the number of males and females within different age groups in the population. It divides a population into groups depending on gender and on age. This is useful because it allows a detailed analysis of a country's population. It allows governments to plan ahead for the future needs of the population. It also allows comparisons to be made between the populations of different countries. Most importantly, the analysis of population structure has allowed demographers to analyse the ways in which a country's population has changed over time. This can be related to other changes in the country, especially economic development.

Data on population structure can be plotted as a graph known as an age/sex structure diagram or age/sex diagram (or population pyramid). As a country develops, the shape of the graph changes.

- The age groups usually show a span of five years and are shown on the vertical axis.
- The horizontal axis shows the total number or the percentage of males and females in each group – always take care when reading the scale on the horizontal axis. Percentage figures are best if you want to compare the population structure of different countries.

- Age/sex diagrams are very useful and can show a lot of information about a country but they have to be read very carefully.
- They are especially good at showing change over time, both historically and projected into the future.
- Population structure changes as a country develops as shown by the five stages of the DTM (see pages 110–111).
- Careful interpretation of the diagram can give useful information about the birth rate, death rate, infant mortality rate and life expectancy.
- Bulges and dips on the sides of the diagram can often be linked to people migrating in or out. Alternatively, they could be related to past variations in birth rate, e.g. the '**baby boomers**' in the UK. Another reason could be a war or famine in the past, e.g. the 1961 famine in China.
- Although it is a very broad generalisation, the ages of 15 and 65 are used to divide the population into three groups: the young dependents, the economically active (people of working age), and the elderly dependents.
- Governments often use this information to decide on their spending priorities and the level at which taxes need to be set. For example, a large proportion of young dependents might mean that money has to be spent on new schools and on family planning to bring the birth rate down. A large working population should produce high levels of tax income. A large proportion of elderly dependents might mean more money has to be spent on healthcare and pensions.

- 8.** On Fig. 4.13, the horizontal axes of the three population pyramids show percentage of population. Figs 4.16 and 4.17 use the actual population numbers on the horizontal axis. Which of these two methods is best for comparing the different population pyramids with each other? Give reasons for your answer.

Population structure – the use of indices

Population structure, particularly the age-structure of the population can be measured by a number of indices.

The dependency ratio

The **dependency ratio** shows the relationship between the **working population** and the **dependent population**. The dependent population can be split into young dependents and old dependents. In the EU, young dependents are defined as those under 19 and old dependents as those over 60. This is a very crude generalisation as many people in the working age groups may choose not to do paid work and people in the dependent population may be working. The age boundaries also vary from country to country. In LICs many older children are in full-time employment.

The dependency ratio =

$$\frac{\text{Young dependents \%} + \text{Old dependents \%}}{\text{Working population \%}} \times 100$$

Germany has a dependency ratio of 52, which means that for every 100 people in the working population, there are 52 people dependent on them. This is fairly typical of HICs

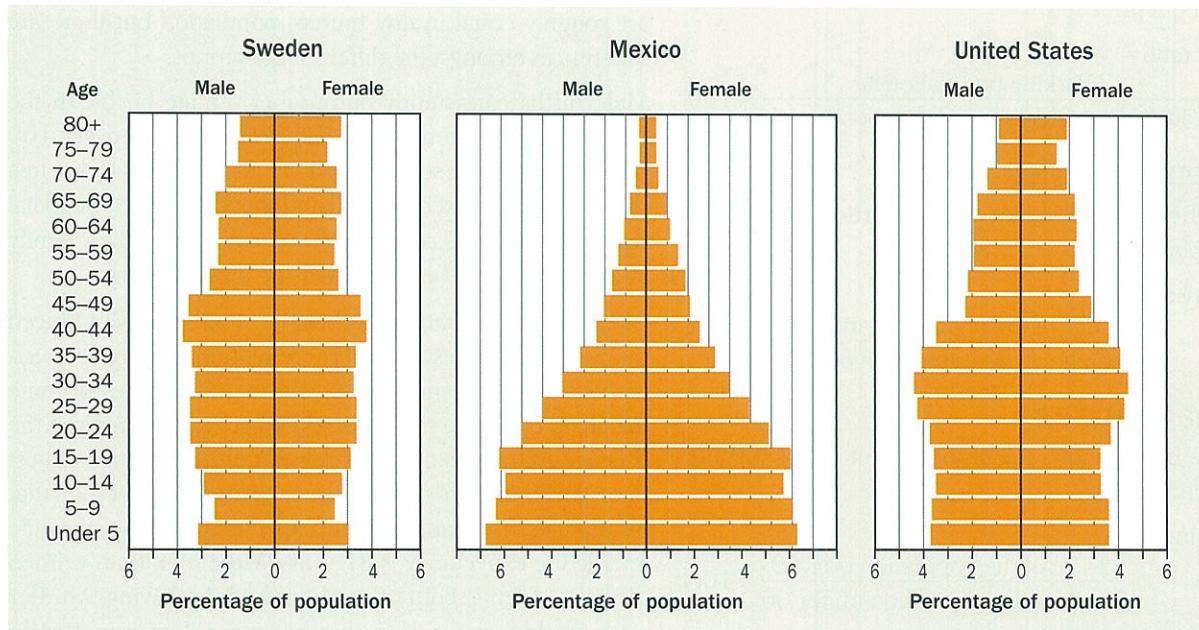
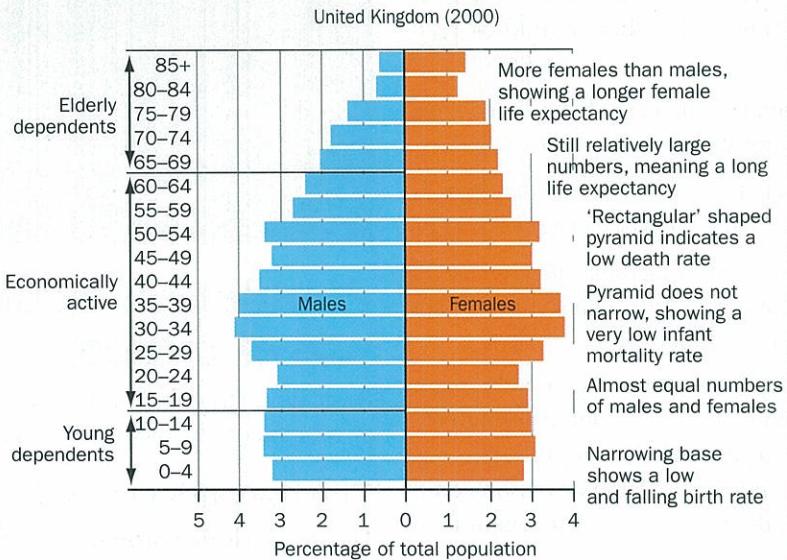


Fig. 4.13 Examples of age/sex diagrams, 2013

The bigger the top bar on the pyramid, the better the life expectancy (the average age a person can expect to live to). Life expectancy in the UK is high.

The slope of the side tells you about the death rate. The UK death rate is low so the sides are almost vertical – they only slant inwards after age 55 – young people are not expected to die in the UK.

The balance between the three main age groups can tell you what the government's priorities should be. The UK has more old dependents than young dependents so sheltered housing is more likely to be built than new schools.



The bottom of the pyramid tells you about the birth rate and the infant mortality rate. A wide base means a high birth rate and vice-versa. If the 5–9 bars are much smaller than the 0–4 bars, then the infant mortality rate is high. The UK pyramid shows that infant mortality is very low; that the birth rate is low; and that the birth rate has been falling – the 0–4 bars are smaller than the 5–9 bars.

The gender balance of a country is important. Are there equal numbers of men and women and do they live to a similar age? In the UK there are slightly more baby boys than girls but women live longer.

The bulges and dips on the side of the pyramid can tell you about migration or about past birth-rate fluctuations. The post-war 'baby boomers' bulge on the UK pyramid at 50–54 years. The bulge at 30–34 years is possibly due to their children.

Fig. 4.14 How to read an age/sex diagram

but LICs and MICs often have higher dependency ratios because of the large numbers of children in their populations, e.g. Nigeria has a dependency ratio of 85 which means that there are 85 dependents for every 100 workers. This high dependency ratio clearly puts a strain on the economy.

The support ratio

The **support ratio** is the inverse of the dependency ratio and is less frequently used.

The support ratio =

$$\frac{\text{Working population \%}}{\text{Young dependents \%} + \text{Old dependents \%}} \times 100$$

The juvenility index

The **juvenility index**: shows the proportion of younger people in a population.

The juvenility index =

$$\frac{\% \text{ age of the population under } 20}{\% \text{ age of the population over } 20} \times 100$$

The old-age index

The **old-age index** shows the proportion of elderly people in a population.

The old-age index =

$$\frac{\% \text{ age of the population over } 60}{\% \text{ age of the population under } 60} \times 100$$

Note: the indices provide a **quantitative** way of comparing population structures. Simply describing age/sex diagrams using words is a **qualitative** way of comparing population

structures. Demographers often use these indices because they are more **objective** than the **subjective** methods more commonly used by geographers.

Population structure – issues related to gender

The **sex ratio** is the number of males per 100 females in a population. As a general rule, numbers of males and females are roughly equal in any human population but there are differences amongst the different age groups.

Male births consistently outnumber female births. In the UK, there are currently 105 baby boys born for every 100 baby girls, giving a sex ratio of 1.05 at birth. This is due to a number of complex biological and social reasons. One social reason is that more couples decide to complete their family after the birth of a boy than after the birth of a girl.

Over time, this natural imbalance tends to be reduced because death rates for males are higher than for females. In most HICs the number of males and females become balanced (sex ratio = 1) in middle age but by the time the 85+ age group is reached, women outnumber men by almost 3 to 1, in other words, male life expectancy is lower than that for females. In Japan, male life expectancy is 80 years while female life expectancy is 87 years. More men than women die in accidents, both at work and while driving. Murder rates are higher for men than women. More importantly, men's body chemistry tends to make them more prone to heart disease and strokes, especially in early middle age.

In LICs the picture is different. The sex ratio at birth is much the same as in HICs but death rates among females are higher than in HICs. In many traditional societies, women occupy a subordinate position in society. Where it may be worthwhile paying for a doctor to attend a sick boy (who will grow up to head the family and contribute to the family's wealth), it may not be worth paying for a doctor to attend a sick girl (who will move out of the family household when she gets married). Women have to carry water, gather firewood and work in the fields in many sub-Saharan African countries, labour which reduces their life expectancy. Death in childbirth is more likely in a country where medical facilities are limited and where most women will have a large number of children.

Analysing the age structure of a population – using triangular graphs

A country's population can be divided into three sections:

- Young dependents (children)
- Working population (adults)
- Old dependents (elderly)

Therefore its age structure can be shown on a triangular graph.

Table 4.4 provides figures for the world as a whole and for selected countries at different stages of development.

Region/ Country	% Children (0-15)	% Adults (16-64)	% Elderly (65+)
World	28	62	10
Kenya	41	54	5
Mexico	34	59	7
USA	21	67	12
UK	17	66	17
Japan	18	61	21
France	15	64	21

Table 4.4 Age structures for selected areas

When these data are shown on a triangular graph, a pattern emerges.

As a country develops economically, it follows a predictable path across the graph. This can be used to make predictions about the future structure of a country's population and the probable needs of that population. Governments can use this for planning purposes.

RESEARCH

- Find the relevant data for your own country. Is it where you'd expect it to be on Fig. 4.15?
- What other types of information can be plotted on triangular graphs?

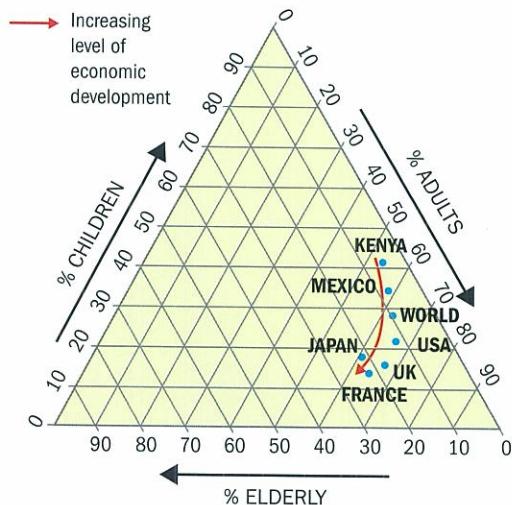


Fig. 4.15 A triangular graph to show changing age structures

Population structure – country comparisons

Population structure will vary from country to country at any one time depending on the stage of the DTM that they have reached (see pages 110-111). In other words LICs, MICs, NICs and HICs will all have different but distinctive population structures. Comparing age-sex diagrams can illustrate these differences.

Population structure of Burkina Faso

This age-sex diagram has the concave pyramid shape typical of an LIC. The wide base shows a high birth rate and the sloping, concave sides show that the death rate is high in all age groups – the life expectancy is low. The base of the pyramid shows that the infant mortality rate is especially high as the reduction between the 0-4 and the 5-9 age groups is large. Despite the high death rate, it is probably lower than it was in the past thanks to aid programmes. This means that Burkina Faso is probably in stage 2 of the DTM (see page 110). The percentage of young dependents is much bigger than the percentage of old dependents. The government should be spending money on new schools and family planning programmes.

Associated issues include:

- With so many people under 20, the population is bound to continue rising for many years to come.
- Will food production keep up with the growth in population?
- Will the economy grow fast enough to provide enough jobs for those young people who survive into their mid teens?

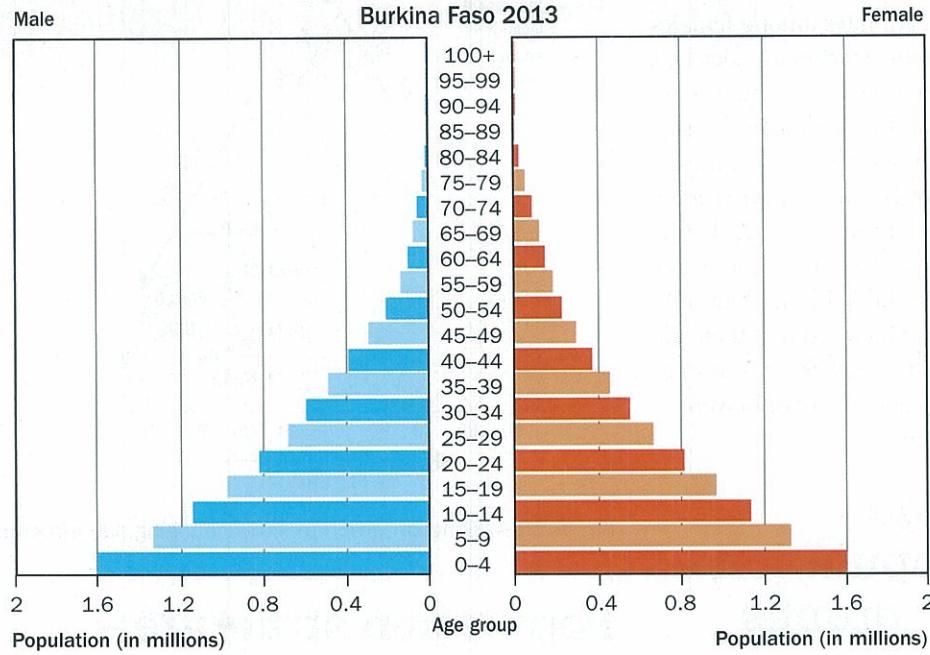


Fig. 4.16 Population structure of Burkina Faso – an LIC in Africa

Population structure of Brazil

The Brazilian age-sex diagram is typical of an NIC. The wide base shows that the birth rate is still quite high and the sloping sides above age 30 show that the death rate was high in the fairly recent past. The base of the pyramid (under 30 years) shows that the infant mortality rate is now very low and that the death rate has stabilised at a low level. This means that Brazil is probably in stage 3 of the DTM (see page 111) and the birth rate is expected to fall. The percentage of young dependents and young adults is much bigger than the percentage of old dependents. This means that the government of Brazil is probably spending a lot of

money on housing and job creation. As time goes by, Brazil's population structure will begin to look more like that of the USA. Eventually Brazil's population growth will stabilise when it reaches stage 4 of the DTM.

Associated issues include:

- Brazil is experiencing a **demographic dividend** with an increasing number of workers, many of whom will contribute to economic growth.
- Although the working population makes up a high proportion of the total, many people work in the **informal economy** and pay no tax.

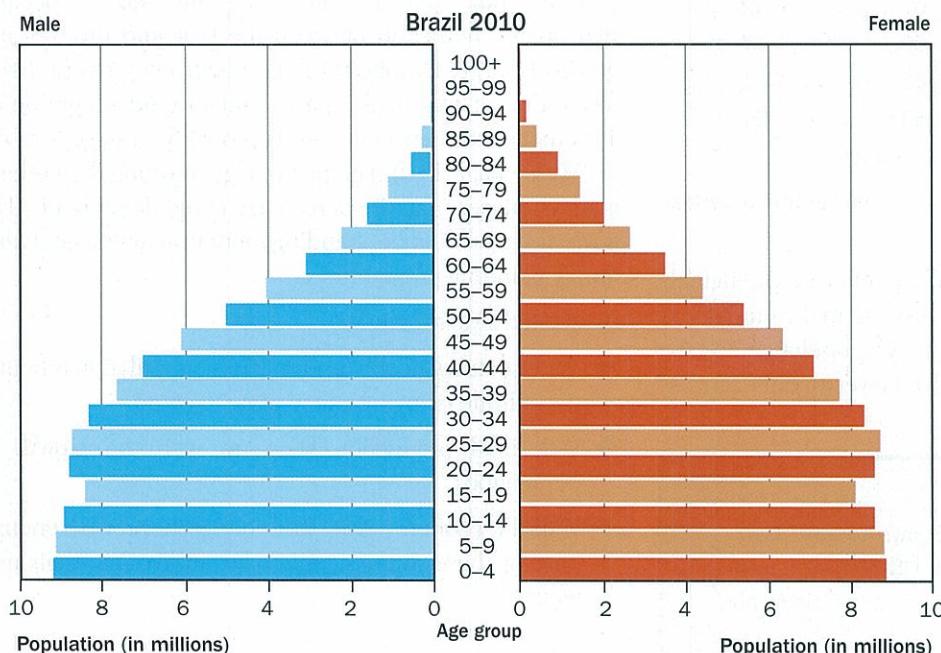


Fig. 4.17 Population structure of Brazil – an NIC in South America

- This makes it difficult for the government to pay for the job creation and housing that the youthful population require.
- With so many people under 20, the population is bound to continue rising in the future.
- Even though family size will probably fall, the number of families will continue to increase, so the demand for housing will continue to rise.

Population structure of the USA

The USA's population structure diagram has the vertical sides typical of an HIC. The relatively narrow base shows a low but healthy birth rate and the straight sides show that the death rate is low. Life expectancy is high and people don't appear to start dying in any significant numbers until after they are 55. The base of the pyramid shows that infant mortality is very low and the birth rate has fluctuated a little in the last 50 years. There are more old women than old men but no real sign that the

USA has an ageing population. It is probably still in stage 4 of the DTM (see page 111). The percentage of old dependents is likely to increase in the near future, putting pressure on healthcare and increasing the demand for sheltered housing.

Associated issues include:

- The working population still makes up a significant proportion of the total, due to immigration of young adults taking place.
- It is the immigrants who have stopped the birth rate falling too low and have prevented many of the problems associated with an ageing population.
- Immigration could lead to social tension in the country and will put pressure on housing, schools and hospitals.
- Politically, old people tend to be more conservative so the United States government may slowly move towards the 'right'.

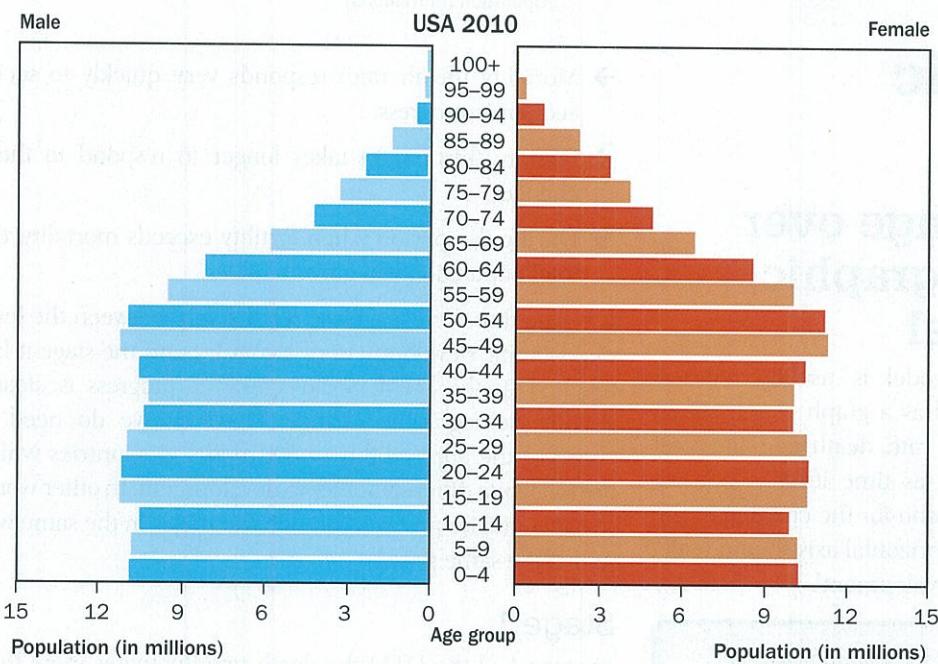


Fig. 4.18 Population structure of the USA – an HIC in North America

Population structure of Japan

The Japanese population structure diagram has the top-heavy shape typical of HICs with an ageing population. The narrow base shows a very low birth rate that has been falling steadily over the last 30 years. The large number of people over 60 shows that life expectancy is high, especially for women. This means that Japan has an ageing population and has entered stage 5 of the DTM (see page 111). The percentage of old dependents is bigger than the percentage of young dependents and the working population is relatively low. This has implications for the provision of healthcare and other services for the old dependents.

Associated issues include:

- Because the 'working population' makes up a low proportion of the total, taxes have to be high.
- The government has been adopting **pro-natalist** policies to stimulate the birth rate but they have not been very successful.
- The Japanese have decided that immigration is not a suitable solution to the problem of an ageing population. Immigration could put pressure on social services and might lead to social tension.
- Instead, Japanese companies have invested heavily in robot technology, boosting industrial productivity without the need for extra workers.

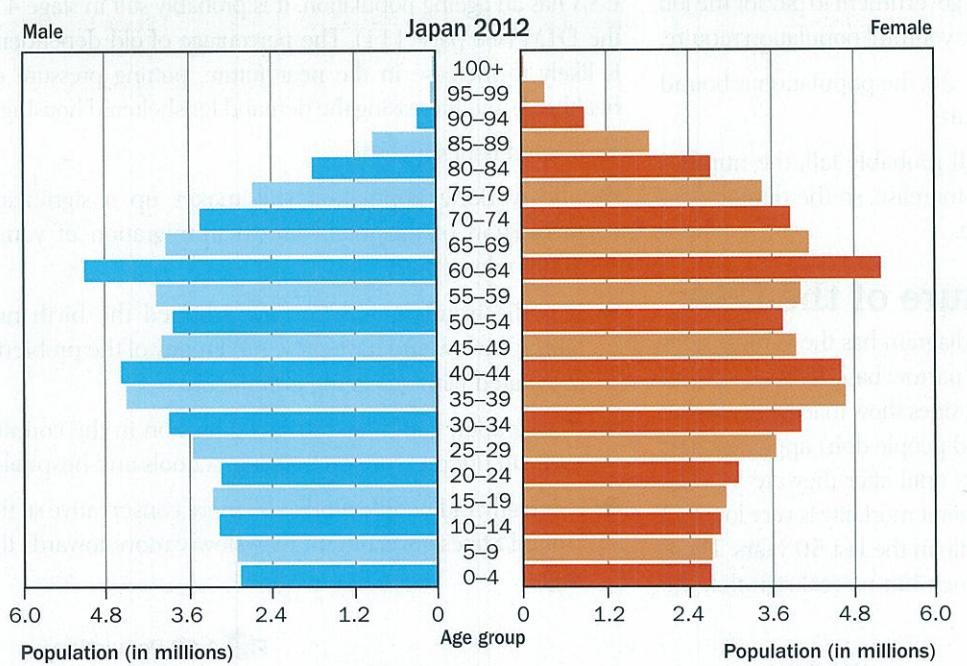


Fig. 4.19 Population structure of Japan – an HIC in Asia

RESEARCH EITHER:

Find a population pyramid for your own country. Describe and explain its shape.

OR: Find the population pyramid for Italy. Describe and explain its shape.

Demographic transition

Population change over time: the demographic transition model

The demographic transition model is usually referred to as the DTM. It is represented as a graph which shows the changes in a country's birth rate, death rate and total population over time. However, as time itself is not the independent variable (i.e. the reason for the changes in the population characteristics), the horizontal axis should really be labelled 'modernisation' or 'development'.

RESEARCH Find definitions of the following words:

- demography
- demographer
- transition
- eurocentric.

The DTM is a general model, in other words a theory that can be applied to any country. It was developed in the 1940s and was based on the changes that had occurred in HICs as they modernised. The theory assumes that LICs and MICs will follow the same path.

The DTM was based on three assumptions:

- Modernisation (socio-economic progress) takes the form of a transition from a traditional, peasant society to an urban, industrialised economy.

- Mortality (death rate) responds very quickly to socio-economic progress.
- Fertility (birth rate) takes longer to respond to these changes.
- During the period when fertility exceeds mortality, the total population will grow.

It is true that there is a close relationship between the level of economic development of a country and the stage it has reached in the DTM. Socio-economic progress is clearly driving demographic change. However, we do need to consider the applicability of the model to countries which are following different routes to development. In other words do all countries proceed through the stages in the same way and at the same pace?

Stage 1

In stage 1 of the DTM the death rate fluctuates more than the birth rate because of occasional plagues and famines but because both rates are high and relatively equal, the population remains fairly constant. Infant mortality is high and life expectancy is low. This is a pre-industrial society where most people are subsistence farmers. Because of the work of aid organisations (NGOs) which have introduced basic medical improvements and the supply of clean water, there are no countries currently in stage 1, only a few isolated tribes in remote regions such as the Amazon basin of Peru.

Stage 2

During stage 2 modernisation stimulates improvements in medicine (e.g. vaccinations), sanitation (clean water and sewage treatment) and hygiene (e.g. the use of soap) which lead to a falling death rate. Infant mortality falls and life expectancy increases. People still regard children as an

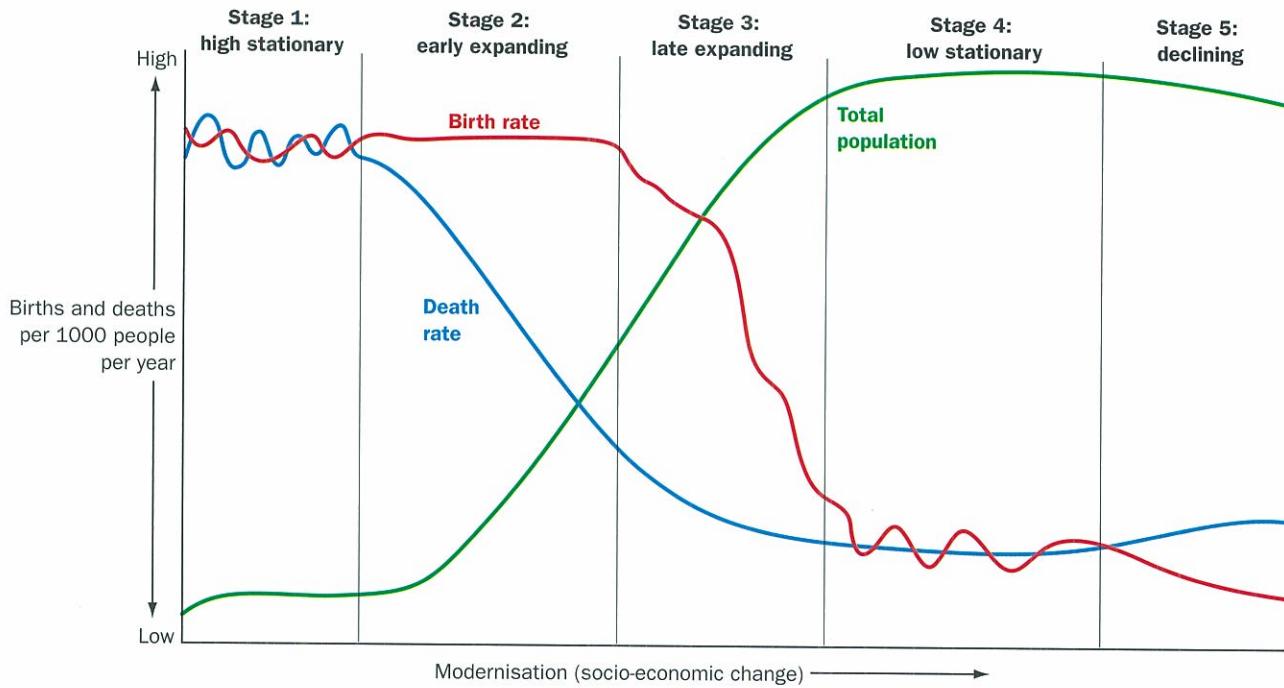


Fig. 4.20 A diagram showing the main features and stages of the DTM

economic asset (they can work on the farm or in a factory and provide support in old age) so the birth rate remains high. The gap between the high birth rate and the falling death rate leads to population growth, especially among the young dependents. Urbanisation and industrialisation are typical of this stage, partly because population pressure drives people away from the farms. The influx of labour into the cities stimulates industrialisation and economic growth which in turn leads to more modernisation. A **virtuous spiral** of cumulative causation begins to take hold.

Stage 3

In stage 3 the death rate stabilises at a low level, while the birth rate falls due to improved standards of living, the education of women and an increase in the use of contraception. Infant mortality is low. Children are seen as an economic liability because child labour is made illegal. Society is industrialised and women marry later and often have a job or career outside the home. This too reduces fertility. Birth rates are still higher than death rates, however, so the total population continues to grow. The country's economy experiences a 'demographic dividend' with a large and productive working population, a small number of old people and a falling percentage of young dependents. This is the situation in many NICs.

Stage 4

In stage 4 the industrial society is fully developed and the country is now an HIC. Both fertility and mortality are low and roughly equal so the population stabilises and stops growing. Life expectancy continues to increase but the number of old dependents is still relatively low. The birth

rate tends to fluctuate more than the death rate, responding to economic conditions, e.g. birth rates tend to fall in an economic recession when people are pessimistic about the future.

Stage 5

In stage 5 the country has arrived at the post-industrial phase with the economy dominated by service industries and hi-tech industries. The status of women is high and fertility rates decline even further as many women put a career before a family. With rising house prices and the increasing demand for leisure time and holidays, children are increasingly seen as an economic burden. The population is ageing with a large number of old dependents. People can't live forever so the death rate begins to rise. The high level of non-communicable diseases (diseases of affluence) also leads to a rising death rate. Mortality exceeds fertility and the total population begins to decline. The government may encourage immigration as a solution to a dwindling workforce and this influx of young adults may even push the country back into stage 4.

9. With a partner, or in a small group, discuss what 'stage 6' of the DTM might be and the changes in a country's population that might bring it about. Share your ideas with the rest of the class.

Uses and criticisms of the DTM

As its name implies, the DTM is a model or theory. Theories can be very useful ways of helping us to understand reality

but we have to remember that they often involve both the simplification and generalisation of reality. The DTM has proved to be a very useful theory and it has been used to explain past changes and to predict future trends. It was the DTM that the Chinese government used to justify the introduction of the one-child policy in 1980. The intention was to force China into stage 4 as soon as possible. This suggests that the DTM is a valid theory that can be applied to the benefit of a country. However, like all theories, it has its strengths and weaknesses.

The DTM is useful because:

- It is easy to understand.
- It is universal in concept – it can be applied to all countries in the world, even though its application is more valid for some countries than for others.
- It provides a starting point for the study of demographic change over time. Understanding the population explosion is essential if we are to make accurate forecasts and manage the changes well.
- The timescales are flexible: it is the speed of modernisation that determines how quickly a country moves through the stages.
- It enables comparisons to be made between countries.

The DTM is not perfect, however:

- The original model did not include the fifth stage. This had to be added once the richest countries started to experience very low fertility levels and an ageing population.
- It is **eurocentric** and assumes that all countries will follow the European sequence of socio-economic changes. Local customs, religions and social attitudes may affect changes in birth and death rates.
- It ignores differences between regions within a country. In India, Kerala state is much further through the DTM than Uttar Pradesh state, for example.
- It can't predict exactly when a country will reach a certain stage or how long it will take to pass through each stage.
- It does not take into account the role of governments and the policies they may adopt to manage their population change.
- It does not include the impact of migration, focusing solely on the balance of birth and death rates.
- It cannot predict pandemics or new diseases. For example HIV/AIDS has increased the death rate in some parts of the world, especially in southern Africa. Some people argue that this has put the DTM into reverse.
- The outbreak of war can have a similar effect, increasing death rates.

The DTM in LICs and MICs

The DTM was based on the experience of the developed countries of the time. Nowadays some general points can be made about the way that the developing countries have moved through the stages since then:

- They had higher birth rates in stages 1 and 2 than the European countries did.
- In stage 2, they had a much steeper fall in their death rate than was the case in Europe. In Europe the death rate fell slowly as industrialisation led to gradual improvements in medical care and public health. These improvements were introduced ready-made in LICs and had a much bigger and swifter effect.
- This quick fall in the death rate was helped by international aid as well as by economic development and this is the reason why no country remains in stage 1, even though their economic development may be very limited.
- Birth rates in stage 2 actually increased, e.g. in Mexico. This is thought to be because of an increase in the health of women of childbearing age. The bigger gap between birth and death rates led to a more rapid increase in population than the DTM predicted.
- Some LICs started with a much larger population than did countries in Europe and this meant that the total increase in population was much bigger. For example, the UK left stage 1 with a population of 10 million and arrived in stage 4, 150 years later, with a population of 50 million. China left stage 1 with a population of 500 million and had a population of 1000 million at the end of stage 2.
- Because of the larger and more rapid rise in total population in many MICs, their governments have intervened much more than those in Europe did. Because many MIC governments have played a bigger role in population management, there has been a weaker relationship between population change and economic development.

The validity and applicability of the DTM can be illustrated by looking at how closely it represents reality in different countries. Many countries are still passing through the DTM and a real evaluation can only be made with countries that have reached the later stages. Because it is a eurocentric model it seems to apply very well to the population history of the UK. It applies quite well to some Asian countries, such as Japan, but less well to Taiwan.

The following questions have to be asked:

- Have these countries gone through the same sequence of stages?
- If yes, how far through the DTM have they progressed?
- How does their speed of movement through the DTM compare with that of the European HICs?
- What are the links between the DTM and economic development in these countries?

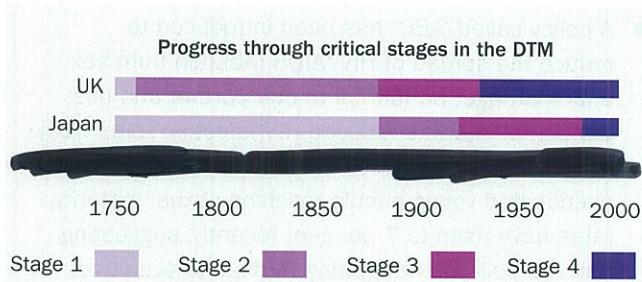


Fig. 4.21 A comparison of the main features and stages of the DTM in three contrasting countries

Japan

Industrialisation and urbanisation began around 1860. By 1970, Japan had become an HIC. The information suggests that:

- Japan followed much the same path as the UK, with a couple of small variations.
- Birth rate rose at the start of stage 2, fuelling a faster growth rate than in the UK.
- Japan passed through stages 2 and 3 in about half the time it took the UK.

Issues related to youthful and ageing populations

The causes and impacts of a youthful population

A youthful population is one with a high proportion of young dependents. This is typical of a country in stages 2 or 3 of the DTM (see Fig. 4.17, page 108: an age/sex diagram for Brazil).

The causes of a youthful population are related to the demographic changes which occur when a country leaves stage 1. In stage 1, the death rate is high so there are very few old people: life expectancy is typically around 40. In stage 2 the death rate drops, especially the infant mortality rate, but the birth rate stays high. A large number of babies are born and many more of them survive than in stage 1. This produces an increase in the number of young people and because there are very few old people, the proportion of young dependents increases.

Another cause of a youthful population is when there is a high level of immigration. Most immigrants are between 20 and 40, i.e. they are in the childbearing age group. They have babies, boosting the number of young dependents. An example is East London in the UK where there is a large immigrant population and 25 per cent of the population are under 15, a much higher proportion than in the UK as a whole.

The impacts of a youthful population are as follows:

- Food supply will need to increase to feed all the extra, non-productive population.
- There is pressure on the health service. The high birth rate means more midwives are needed and young children need clinics for check ups and vaccinations.
- There may be a shortage of kindergartens and schools.
- There is pressure on the government to provide these facilities and taxation may need to increase.
- The rapid population growth threatens to produce over-population and the government could introduce **anti-natalist** policies to reduce the birth rate.
- When the children grow up they will need jobs and this could increase unemployment.
- However, all these extra workers provide a large pool of relatively cheap labour and this could attract trans-national corporations (TNCs), stimulating industrial production and economic growth. This is known as the demographic dividend and is something that NICs experience as they reach stage 3.

Case study: Youthful population: Uganda

Uganda is an LIC in east Africa. In 2010, 50 per cent of the population were under 15 and only 2.5 per cent over 65. Uganda has recently moved into stage 2 of the DTM and the death rate has dropped, mainly due to a decrease in infant mortality. The birth rate is still high at 46% per year and fertility is high at 6 children per woman. Because the death rate was high in the recent past, there are very few old people.

The youthful population is causing problems for Uganda. High fertility and declining mortality has led to rapid population growth. Uganda had 34 million people in 2010 but this is expected to grow by over one million a year until 2025. **Overpopulation** is a serious threat and could lead to food shortages. Pressures on the health service, education and jobs are already causing problems:

- Health service – with so many babies being born, there is a shortage of midwives and maternity hospitals. 6000 women die in childbirth each year because of these shortages. As the 50 per cent of the population who are under 15 moves into the childbearing age group, this pressure will increase. The health service is also under pressure because of HIV/AIDS. There are one million AIDS orphans in Uganda. The situation could become worse in the future as the young people grow up and become sexually active because only 30 per cent of Ugandans currently use condoms.
- Only half of the children are in education and this puts pressure on the government to provide more school places. Education will reduce the birth rate and the spread of HIV/AIDS so providing more school places is a priority.
- In 2012, unemployment was 20 per cent. When the large numbers of children grow up, unemployment could rise further, causing poverty to increase and leading to economic and social problems.

The government of Uganda have adopted policies to combat these problems but implementing the policies has been difficult.

- To reduce the birth rate, the government has encouraged the use of contraception through advertising, education and the provision of free condoms. Despite this, 70 per cent of Ugandans do not use any form of contraception.

- Clinics have been built and more doctors and nurses have been trained. This should help to relieve pressure on the health service but many of the newly trained health professionals choose to emigrate to HICs where they are paid much more than in Uganda.
- A policy called 'ABC' has been introduced to reduce the spread of HIV/AIDS (Abstain from sex until marriage, Be faithful to one partner and use Condoms) and this reduced HIV infection rates from 15 per cent to 5 per cent. However, with so many uneducated young people reaching sexual maturity, rates have risen to 7 per cent recently, suggesting that the policy is not getting through to everyone.
- Money has been spent on training teachers and increasing school places. Despite this, 50 per cent of children do not go to school, reducing their future prospects.
- To reduce unemployment the government have encouraged TNCs to set up factories in Uganda, providing much-needed employment for the young people moving into the workforce. The government have increased spending on national infrastructure and this has attracted some companies, e.g. Total Oil, but many TNCs are put off by the political instability and corruption that is common in parts of Africa.
- Foreign aid is also encouraged.

Overall, the government of Uganda face the same problem as many other countries in stage 2 – getting the economy to grow fast enough to support the rapidly increasing population.

10. Produce two spider diagrams to summarise:

- the causes of Uganda's youthful population
- the problems caused by Uganda's youthful population.

11. Why is it so difficult for a country to solve the problems caused by a youthful population?

Case study: Ageing population: UK

Stage 5 is indicated by a persistently low and slowly falling birth rate, leading to an ageing population and then a slowly rising death rate. This produces a decline in total population. Is this typical of the UK in the early 21st century?

The UK's birth rate had fallen low enough to reach stage 4 in 1939. This fall in the birth rate was due to:

- the increased use of contraception
- more employment opportunities for women
- the rise of an urban society that no longer saw any advantage in having large numbers of children
- the growing perception of children as a drain on household finances.

Since 1945 the birth rate has fluctuated between 13% and 18% and by the 2014 census it was just over 12%. In other words the UK's birth rate has stayed low and this is due to the same four factors still operating. In many ways, these factors have strengthened over the years, permanently reducing fertility. More reliable and readily available contraception means more effective birth control – the introduction of the contraceptive pill in 1963 has had an important effect. British society has become even more urbanised and the costs of housing and childrearing have rocketed. For more and more people, especially women, a career is more important than having children.

Other factors have also come into play. The ageing of the population has an important affect on fertility as does the improving status of women:

- The lower birth rates of stage 4 have led to a slow ageing of the population, resulting in a smaller percentage of the population in the reproductive age range. This leads to lower fertility.
- Gender roles have been redefined and women are increasingly expected to have a career. These women may decide not to have children at all.

- Marriage is less popular and unmarried couples living together are less likely to have children than their married counterparts.
- Motherhood is delayed by many women to give them time to build a career. This results in women delaying their first pregnancy until they are in their thirties and the result is much smaller families – often one-child families.
- Government policy has not been particularly pro-family over the last 50 years.
- Women often feel that their peers look down on them if they give up work to become a full-time housewife, staying at home to raise children.

This persistently low and slowly falling birth rate has led to the ageing population associated with stage 5 of the DTM (see Fig. 4.20, page 111). Increasing life expectancy has also contributed to the ageing of the population. During the 1990s, deaths from non-communicable diseases (NCDs) fell considerably as shown by the following statistics:

- Deaths from coronary heart disease fell by 36 per cent among men and 40 per cent among women.
- Lung cancer deaths fell by 28 per cent.
- The incidence of breast cancer in women fell by 24 per cent.
- The number of stroke victims fell by 30 per cent.

All of this means that the population is ageing. In 2009, the percentage of old dependents outnumbered the percentage of young dependents for the first time. Death rates are bound to rise as the population gets older. A low birth rate and a slowly rising death rate are typical of stage 5 and could lead to a declining population total. This has not happened in the UK because of immigration during the first decade of the 21st century. The population is growing again.

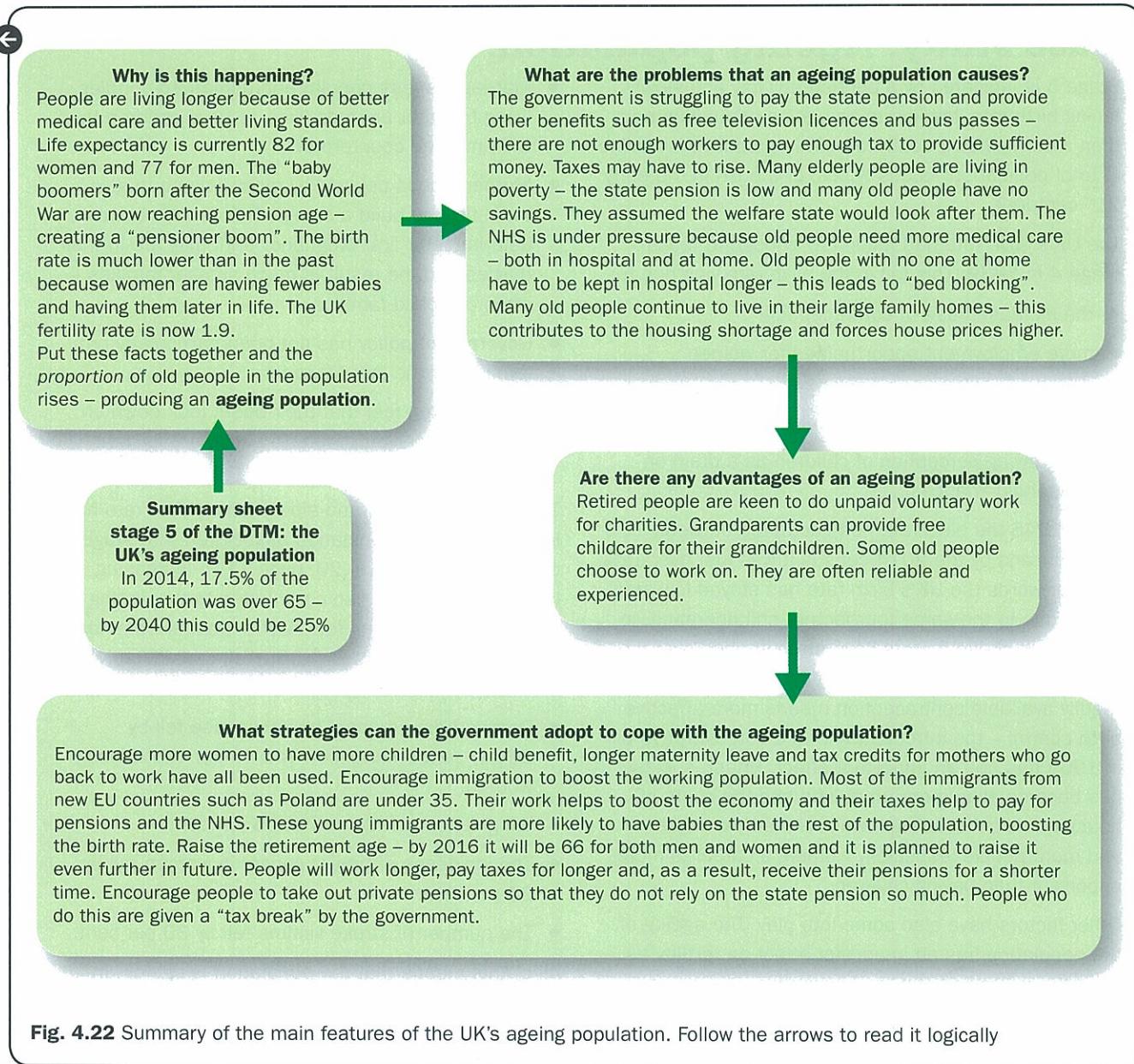


Fig. 4.22 Summary of the main features of the UK's ageing population. Follow the arrows to read it logically

12. What are the causes of an ageing population in stage 5 of the DTM?

The links between population and development

What is development?

Development is an increase in the total value of goods and services produced by a country, leading to an improvement in the people's welfare, quality of life and social well-being. There is a huge gap between countries in terms of their development. This is shown when we consider either the **standard of living** or the quality of life of the people.

Standard of living is mostly to do with economics, with money, with wealth. Quality of life is related to wealth but is also determined by social and environmental factors, it sums up everything that affects a person's well-being and happiness. Development is a much more wide-ranging concept than wealth. Good health, freedom of speech, job security, food security, education, a clean environment, leisure time, and the ability to pursue happiness are all important to people, wherever they live in the world.

Development usually goes hand-in-hand with an increased use of the country's resources. A resource is any part of the environment that can be used to meet human needs. As a country develops, more and more resources are used. Problems arise when resources are used unsustainably, in other words they are being used up so quickly that they will eventually run out.

13. How will the following factors change as a country develops:

- (a) urban population
- (b) number of people per doctor
- (c) adult literacy
- (d) infant mortality
- (e) car ownership?

To measure development the UN uses the human development index (HDI). It is a composite index that considers a variety of factors:

- Purchasing power. A dollar will buy less in the USA than in India.
- Educational provision. This considers adult literacy and the average number of years spent at school.
- Life expectancy at birth. This indicates the quality of healthcare, the adequacy of the diet and the overall quality of life.

Is there a link between development and population change?

If there really is a link between development and population change, the HDI should correlate with the stage of the DTM that a country has reached. Relating countries to a particular

stage of the DTM is difficult but one aspect of the DTM is crucial in this respect – birth rate and fertility. A country's death rate can fall because of foreign aid, even if it has not really started to modernise in any significant way. However, the fertility rate only falls when significant development has taken place.

14. Study Fig. 4.23, and then attempt to answer these questions.

- (a) Describe the distribution of areas with low HDI scores.
- (b) How might a charity, such as Oxfam, use the HDI to make decisions about its fundraising and its aid programmes?
- (c) Name two South American countries that might consider themselves 'developed' on the basis of the HDI scores.

The map shows a strong link between HDI and fertility. It confirms the link between population change and development but emphasises the fact that the link is complex. North America, western Europe, Australasia and the south of South America all have high HDI scores and low fertility rates. Most of sub-Saharan Africa and parts of the Middle East have low HDI scores and high fertility rates. This is what we would expect if there is a link between development and population change; the least developed parts of the world are at the early stages of the DTM and the most developed parts of the world have reached the later stages.

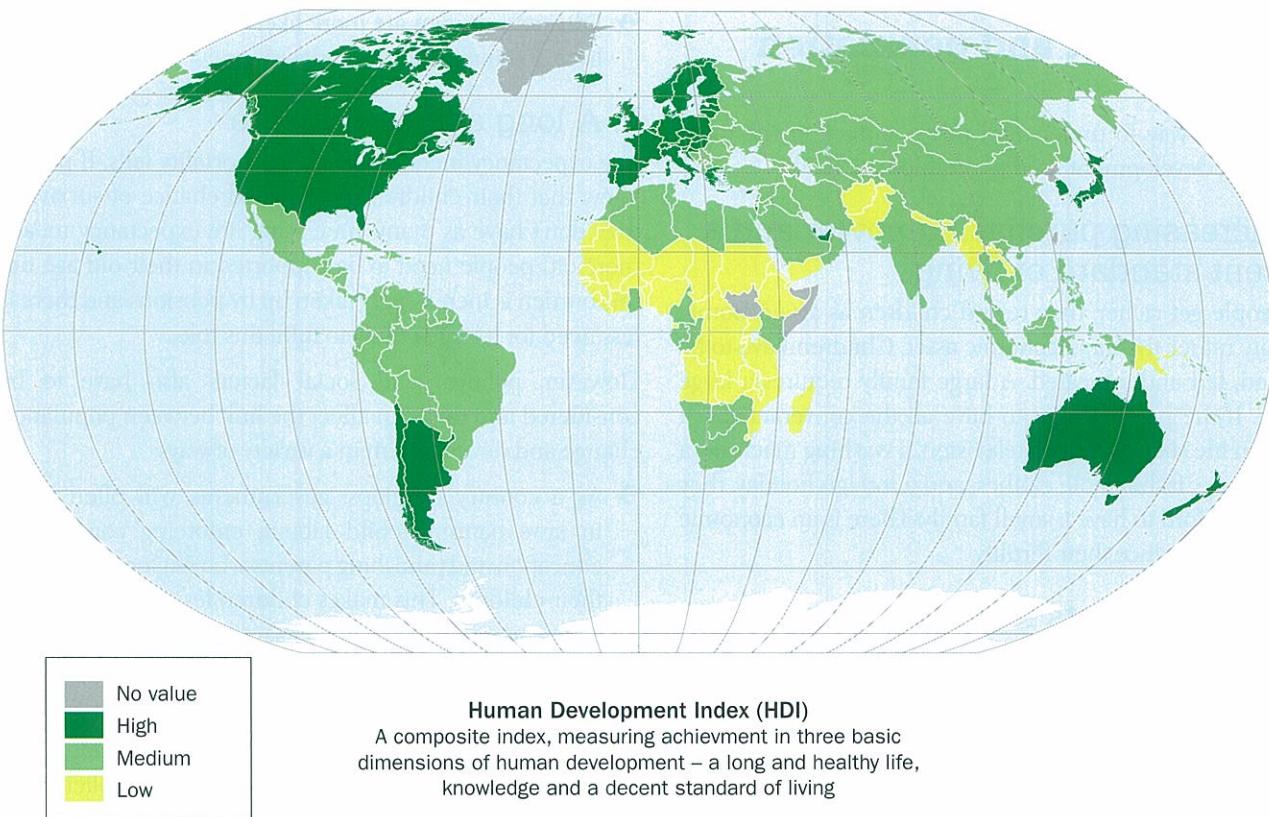


Fig. 4.23 A map to show global variations in HDI in 2011

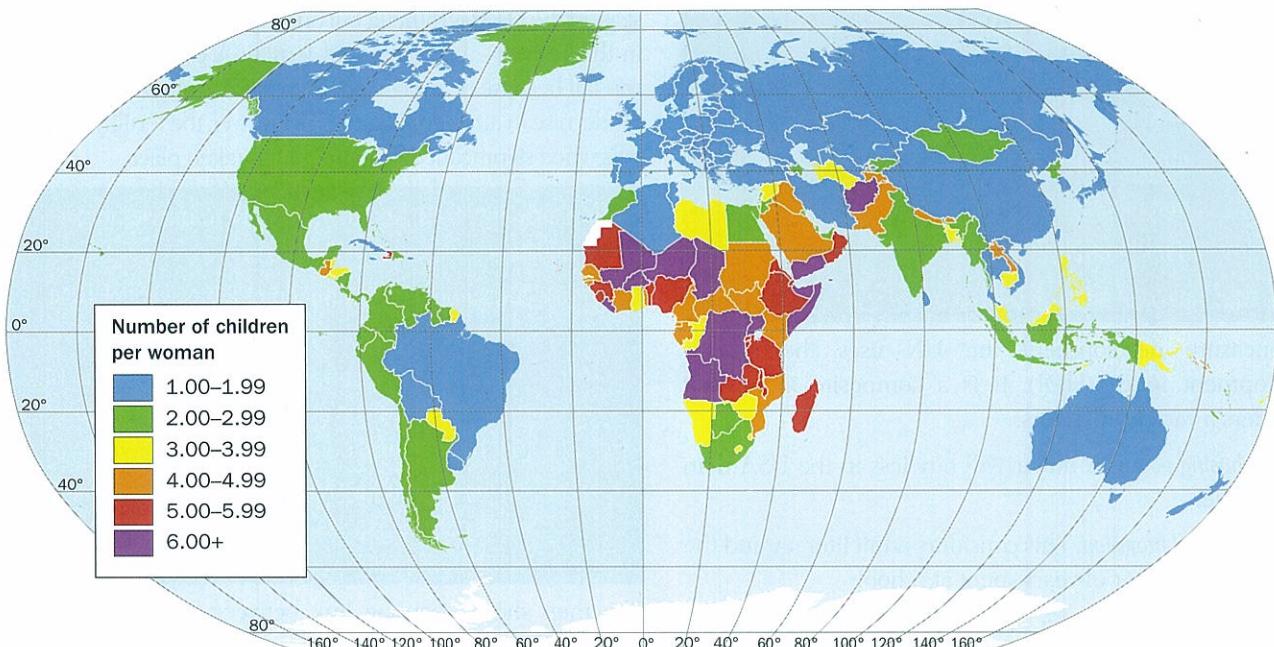


Fig. 4.24 World fertility levels in 2012

There are some anomalies, however. NICs such as Brazil and China have very low fertility but only medium HDI scores. In China this is probably due to the 'one-child' policy and in Brazil to the high levels of education for women. Southern Africa has medium HDI scores but low fertility due to the impact of HIV/AIDS on the birth rate.

Why is there a link between development and population change?

The easiest way to understand this is to look at the three strands of development used to produce the HDI.

1. Increasing purchasing power and a decent standard of living

As people get richer, they regard children as an economic liability rather than an economic asset. Children have to be clothed, fed and educated. A large family requires a large house. If the parents want to have all the conveniences of modern life such as a car, a television, a washing machine, a good house, fashionable clothes, and a foreign holiday, they can only afford to have a small family. There is an economic incentive to reduce their fertility.

2. Improvements in educational provision

This is vital in reducing fertility for a number of reasons:

→ The longer children stay in education, the later they go out to work and the longer they are a drain on family finances. Families with fewer children will experience less of a drain.

- People who are better educated are more likely to understand about family planning and methods of contraception. Being better educated they will be richer and have a greater incentive to control their fertility.
- Educated women want to have a career as well as a family. They marry later, wait longer until they start a family, and have fewer children in total.
- Educated women are more likely to take control of their lives and make their own decisions.

3. A long and healthy life

Life expectancy increases as infant mortality falls. If people know that their children have a good chance of surviving, they don't have as many. Increasing life expectancy means more old people need to be supported in their old age but this burden is increasingly taken up by pensions and there is less need for a large family to fulfil this role.

However, political and social factors also have to be considered and they can affect the link between population change and development in a variety of ways:

- As a country develops, governments will often bring in laws banning child labour, enforcing compulsory education and punishing parents who neglect or mistreat their children. This makes children less of an economic asset and encourages smaller families.
- Some governments can adopt pro-natalist policies if they feel it is important to boost their population. In other countries **anti-natalist** policies are adopted to reduce the rate of population growth. These policies can significantly alter the link between population change and development.

- Social expectations can take a long time to change. In some countries a man's status is determined by the size of his family. Religion may ban the use of contraception. The time it takes for people's social and religious attitudes to change can vary considerably from country to country.

- 15.** What is meant by the term 'disposable income'?
- 16.** Suggest how the amount of disposable income will change as a country develops.
- 17.** Explain how the desire for more disposable income might lead to changes in fertility.

Population-resource relationships

The world's population is still growing very rapidly and 95 per cent of the growth is taking place in the LICs and MICs. Population growth puts great pressure on governments to provide for their people. Although an increase in population can stimulate economic growth (people = productive workers = rising national wealth), it can also cause big problems:

- increased pressure on the environment
- increased risk of malnutrition and famine
- increased demand for houses, education, healthcare, jobs, etc.

Whether population growth is beneficial or detrimental to a country really depends on the balance between population and resources in that country.

A resource is any part of the environment that can be used to meet human needs. Basic resources include clean air, clean water, food, energy and shelter. Other resources that people need are employment, education, healthcare, transport facilities, leisure opportunities, etc.

The complication in the concept is that human brainpower and human labour is also a resource which leads many people to believe that there will always be a technological solution to problems caused by a shortage of resources. Despite this, there has always been an underlying fear that population will outstrip food supply and other resources. The rate at which resources are consumed is strongly influenced by population growth and economic development - more people consume more resources, rich people consume *even more* resources.

The growth of population in the last century is unprecedented in human history. So far, the increase in resource production appears to have kept up with population growth but how much more can population grow before the planet's ability to support us is overwhelmed? The growth rate is slowing but population momentum will ensure that numbers continue to increase.

The relationship between population growth, resources and economic development is known as the **consumption triangle**.

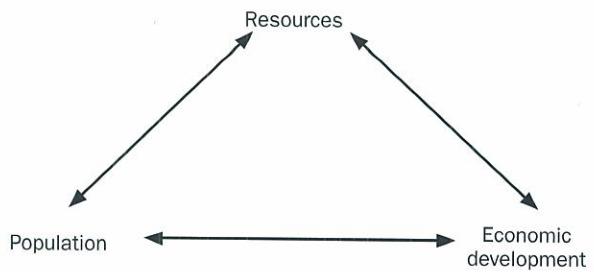


Fig. 4.25 The consumption triangle

- Resources are needed to support population growth and economic development.
- Population growth can stimulate economic development.
- Population growth increases the demand for resources, as does economic development.
- Economic development can lead to technological change which can lead to the production of new, alternative resources.

Since the Earth Summit in Rio in 1991, the general opinion of most experts is that we must aim for **sustainable development** which only uses resources and the environment in ways that ensure they will still be there for future generations. The size of the global population is a major factor when calculating how sustainable our current lifestyles are.

The importance of food security

The most important resource is food. Food security is widely seen as a major concern for governments in their attempts to sustain their population.

Food security exists in a country when everyone has access to sufficient, safe, and nutritious food enabling them to maintain a healthy and active life. The concept of food security means that food is available for the population and at a price that they can afford. It should provide for their dietary needs and for their food preferences. Food security has three main aspects:

- Food availability: sufficient quantities of food are available at all times.
- Food access: people have enough money or land to obtain food for a nutritious diet.
- Food use: people know what constitutes a good diet and they have the means to prepare and cook their food to provide themselves with this diet.

We have seen that there have been great improvements in food production in the recent past but these improvements

need to be sustainable otherwise problems related to farming and food production may become the greatest constraint on population growth.

The causes and consequences of food shortages

World population has been growing rapidly – from 2.5 billion in 1950 to over 7 billion today. Food supply has mostly kept pace with this growth in population but shortage of food is a problem in some parts of the world. Poor nutrition is a major factor contributing to poor health, especially children's health. The UN estimates that one third of all child deaths are caused by poor nutrition – not just a lack of food but a lack of the right sort of food. Well-fed children do better at school, grow into healthy adults and give their own children a better start in life – the opposite is true for undernourished children. Poverty is a major contributor to childhood under-nutrition and it is in LICs where the problem is worst.

RESEARCH Describe the causes and the effects of the following diseases:

- marasmus
- kwashiorkor
- beriberi
- pellagra.

→ **Drought** – many tropical areas have seasonal rainfall. If the rains fail, crops and animals die and famine is often the result.

→ **Floods** – rice is grown on the floodplains of large rivers. The floods help to fertilise the soil and provide the water for the fields. However, severe floods can destroy the entire crop.

→ **Tropical cyclones** are especially dangerous in coastal areas, e.g. in Bangladesh. Tidal surges lead to severe flooding by the sea. This destroys crops, drowns animals and poisons the soil with salt.

→ **Pests** – whatever crop is grown, there is a pest to eat or destroy it and farmers have to be constantly vigilant. Birds can be scared away but insects such as locusts can be devastating. Locust swarms come out of the desert and can contain 90 billion insects per swarm. A swarm can eat 200 000 tonnes of crops in a day. Farmers can do little to prevent this devastation and 10 per cent of the world's population is at risk.

→ **Disease** – fungal diseases can affect stored cereal crops and the toxins can make people ill if the cereals are eaten. The banana bunchy-top virus can wipe out the banana crop. Animals are affected too – foot-and-mouth disease reduces milk and meat yields in Brazil and Swaziland. Farmers are affected by diseases which reduce their ability to work – the worst of these diseases are malaria and HIV/AIDS.

→ **Low capital investment** – poor people have no money to improve their farms so they keep producing low yields, never have a surplus to sell and stay poor. This is a **vicious circle**.

Causes of food shortages

→ **Soil exhaustion** – leads to low crop yields. It is caused by over-cropping and **monoculture**. Crops take too many nutrients from the soil, which are not replaced by manure or fertiliser. It can lead to soil erosion and desertification.

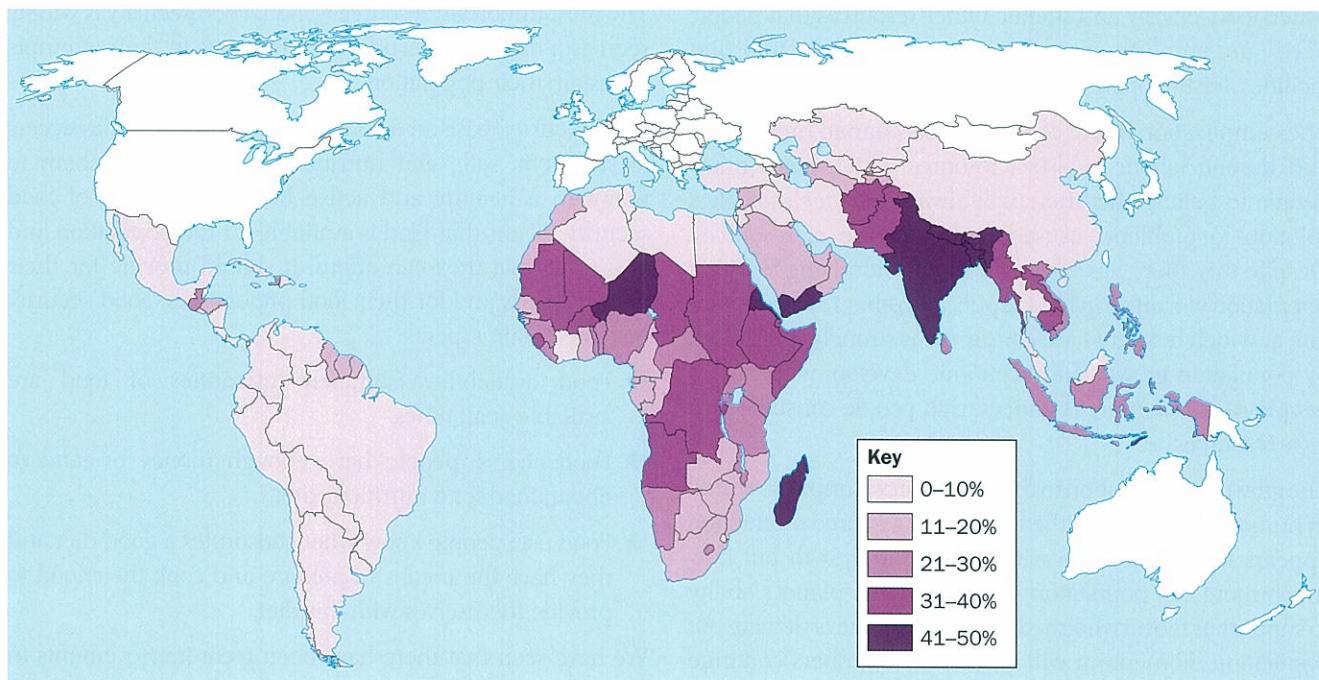


Fig. 4.26 The global distribution of child under-nutrition

- Poor transport – farmers in remote areas can't get their crops to market, even if they have a surplus.
- Wars – in parts of Africa such as DR Congo, wars have been going on for years. People have to leave their land and become refugees. They stop producing food and rely on aid.
- Biofuels – in MICs, farmers have been producing rapeseed and elephant grass on land that used to grow food. This leads to food shortages and increased food prices.

The consequences of food shortages

- Undernourishment. This has been discussed above and has a big effect on children's health. Undernourished adults are less able to work hard, which causes even further food shortages.
- Famine. In extreme cases people may die because of lack of food. This is usually the result of a major crop failure due to a **natural disaster** such as a drought.

Case study: Food shortages in Swaziland

One problem that has led to food shortages in Swaziland is unemployment in neighbouring South Africa, which has meant that many migrant workers from Swaziland are returning to their homes. This has increased unemployment in Swaziland and caused even greater poverty and food shortages there. Chronic under-nutrition is a particularly important problem for children – leading to slower growth and many underweight children.

Significant factors are as follows:

- In 2010 Swaziland's GDP/person was just \$4500.
- Between 1970 and 1990 life expectancy at birth rose from 48 to 61 years, but by 2011 it has dropped back to 48 years.
- The Swazi population has been badly weakened by HIV/AIDS. In 2009, 26 per cent of 15–49 year olds were infected (the highest prevalence anywhere in the world) and there were 96 000 orphans in a total population of just under 1.4 million.

The extent of the food problem

- A drought in 1991–2 caused Swaziland's maize output to seriously decline. As a result, the government had to seek emergency international food aid.
- By 1999 Swaziland's crop production was up again to 90 per cent of what it had been during 1989–91.
- However, between 2000 and 2010 up to two-thirds of Swaziland's people still relied on donor food aid. Swaziland's annual national maize requirement is about 140 000 tonnes. The 2008–09 harvest only produced about 71 000 (around half the amount required to feed the population).

Food aid or not?

For the last few years, the UN's World Food Programme (WFP) and other organisations have been moving away from distributing food aid towards programmes that encourage self-sufficient food production

instead. Previously, these organisations supplied food aid directly during emergency situations, and via governments during non-emergency times. They also supplied seeds for sorghum, beans or maize.

This international approach led some farmers to think that they would always be supplied, so they became dependent on the aid. They sometimes even sold what they had been given. It is important that farmers contribute and have a sense of ownership, rather than just receiving something for nothing. In Swaziland some children born since the 1990s – when drought crippled Swaziland's agriculture – do not know anything other than food aid, because their parents have given up on farming. These young people will never acquire much-needed agricultural skills at home.

Between 2006 and 2010, world food prices rose dramatically. In many countries there were protests in the streets about the price of food (e.g. Indonesia, the Philippines and Egypt).

Food crops or inedible cash crops?

Small-scale farmers often have to decide whether to grow food crops to feed their families directly, or cash crops that they can then sell for money to buy food and other goods. In Swaziland, many small-scale farmers have decided to produce cotton (in the drier areas) and sugar cane, rather than staple foods such as maize.

Sugar is Swaziland's biggest industry; in 2012 the sugar industry employed 93 000 people. Over the last 30 years, many small-scale farmers have been persuaded to abandon food crops such as maize and join cooperatives growing sugar cane instead. Up to now, these cooperatives have relied on Swaziland's guaranteed access to markets in other countries to repay the bank loans they took out to irrigate their land and buy equipment. However, the problem for these small-scale farmers is that if world sugar prices fall, or the trade agreements change and cut off their key markets, they may be in severe difficulties.

- **Vicious circles.** Poor people are often undernourished, which means they can't work hard, which means they can't fulfil the potential of their land, which means less food is grown, which means they stay undernourished.
- **Aid dependency.** During a famine, aid agencies provide free food for the people affected. This means that farmers in parts of the country not affected by the famine can't sell their food. This ruins the agricultural economy of the country and leads to long-term dependency on food aid.

The role of technology and innovation in resource development

Medical improvements, together with technological improvements in water supply and sanitation have ensured that mortality has fallen throughout the world. The fact that this has not led to massive overpopulation has been the result of other technological improvements in the production of food. Without an increase in food production, the increase in population that global economic development has produced could not have been supported. Innovations and improvements in food production were stimulated by the **Green Revolution**.

The Green Revolution and subsequent changes

These explain the huge increase in global food supply between 1960 and the present day. They are the main reason why food supply has (generally) kept up with population growth. The main features of these changes are as follows:

- New hybrid seed varieties that increased the yields of cereal crops, e.g. Rockefeller Rice. They are known as **HYV crops** (high yielding varieties).
- Better irrigation systems which mean that more land can be cultivated or that existing cropland can be cultivated in the dry season.
- Increasing the use of chemical fertilisers which boost plant growth.
- Increasing the use of herbicides and pesticides to destroy weeds and insects which damaged or destroyed crops in the past.
- Mechanisation of farming – by using machines, more work can be done more quickly, so boosting yields.
- Land reform programmes which mean that farmers work for themselves, pay less rent and have money left over to improve their farms.
- Improvements in the rural transport infrastructure, allowing food to be transported to market more easily.
- New **genetically modified (GM)** varieties of crops, e.g. Golden Rice that has higher levels of Vitamin A than natural rice.

The Green Revolution and subsequent changes in agricultural practices have been very successful in increasing crop yields and therefore providing food for the ever-increasing global population. They have improved the standard of living of many people in rural areas and moved farming away from a subsistence system towards a commercial, money-based system. This increase in rural income has encouraged more farming improvements, which in turn have led to greater food production. Peasant farmers who were once caught in vicious circles are now commercial farmers who benefit from a virtuous spiral.

However, improvements introduced by the Green Revolution have caused some problems of their own:

- Some of the new varieties required expensive fertilisers to grow properly and not all farmers were able to afford them without getting into debt.
- Some of the new varieties were susceptible to pests and diseases so large amounts of pesticides had to be used.
- Increased use of agrichemicals (fertilisers and pesticides) led to pollution of water supplies and impacted on people's health.
- Irrigation, if not properly managed, can lead to the salination of the soil. Salty soils are infertile and will not produce crops.
- Mechanisation has increased rural unemployment and encouraged rural-to-urban migration, putting pressure on the towns and cities.
- Some of the new HYVs can be low in minerals and vitamins, so reducing the nutritional quality of the diet.

We are now much more aware that all development needs to be sustainable. This awareness has made us focus on the constraints that limit population growth and economic development.

The role of constraints in sustaining populations

The work of Thomas Malthus in the late 18th and early 19th century brought into sharper focus what had been known ever since humans have existed – populations can grow at a faster rate than the growth in the resources needed to support them (see page 119). When the size of the population exceeds the ability of the resources (especially the food) needed to support it, death rates rise and the growth of the population is constrained. Demographers refer to this as **death control**. Death rates in traditional societies were heavily influenced by poverty and could raise rapidly from time to time because of famine, plague (epidemic diseases) and war.

Poverty

Lack of money and capital means that an individual cannot purchase the resources needed to sustain life and a country

cannot afford the developments of infrastructure that would allow economic development. Both of these can constrain population growth and this situation is typical of the countries of sub-Saharan Africa.

Famine

Failure of crops can be due to a natural cause such as drought but can also be due to human activity overusing resources, especially the soil. Poverty combined with a growing population can contribute to the exhaustion of the soil and a shortage of food which leads to starvation and death.

Plague

Diseases can be controlled but only at a price. Disease is most likely to affect poor people who have poor nutrition as poverty and famine contribute to the spread of disease. Diseases kill the most vulnerable members of society first, the very young and the old. Richer countries have better healthcare and are less susceptible but new diseases can arise at any time, e.g. HIV/AIDS, Ebola and new strains of the influenza virus.

War

A shortage of resources can lead to conflict over the use of those resources. Nazi Germany's invasions of other countries, the cause of the Second World War, was linked to the desire for 'lebensraum' - land to support the German population's needs. Japanese expansion in 1936 to 1942 was designed to secure oil and the other resources of South East Asia in order to support the expanding Japanese economy. Wars kill people. Other factors, both natural and human, also provide constraints on population:

Natural disasters

Natural disasters kill people and destroy a society's means of supporting itself, leading to further death. Floods, droughts, tropical storms, volcanic eruptions and earthquakes all have the potential to cause huge amounts of death, damage and disruption. The Tang Shan earthquake in 1976 may have killed up to half a million people, for example.

There are also political and economic constraints on a population's ability to sustain itself.

Political instability and corruption

Political instability and corruption should be avoided if a country is to attract the foreign investment that will help it to develop and sustain its population. The situation in Chad, a large, landlocked country in sub-Saharan Africa, illustrates this. Chad has large reserves of oil. TNCs like Exxon and Chevron began exploiting the oil reserves in 2003. Chad can't use its own crude oil because it has no way of refining it. The oil is exported by pipeline through Cameroon to the Atlantic coast. The pipeline was part funded by the World Bank on condition that 80 per cent of the revenue from the

oil was spent on projects to relieve poverty and increase food production, but the Chadian government did not honour this agreement. The oil is clearly an important source of income for the country and the money could be used to improve the economic and social conditions of the Chadian people. However, because the government is corrupt and politically unstable (Chad is threatened by Islamic fundamentalist incursions from the north), neither the World Bank nor the oil TNCs are prepared to invest in the infrastructure that would allow Chad to use its oil resources to support its people and their development.

Unfair trade policies

Unfair trade policies also make it difficult for an LIC to use its natural resources to support and sustain economic and social development. Many people think the world trading system is unfair. The situation is summarised in the following diagram:

Type of country	Exports	Imports
LIC (Poor)	Primary products and raw materials e.g. food and mineral ores.	Manufactured goods e.g. cars and machinery.
HIC (Rich)	Manufactured goods e.g. cars and machinery.	Primary products, raw materials and manufactured goods.

Table 4.5 The nature of world trade

People think world trade is unfair because:

- The prices of **primary products** are relatively low and vary quite a lot from year to year.
- The prices of manufactured goods are relatively high and have risen steadily over the years.
- Most LICs sell their minerals and cash crops abroad. This makes them very dependent on world prices, which fluctuate from year to year. World prices are usually controlled by the HICs.
- LICs often rely on the export of only one or two primary products in order to make money. Cocoa makes up 80 per cent of Ghana's export trade. Kenya relies on tea and coffee for 52 per cent of its foreign earnings. When the price of these key commodities drop, the *whole* of the country's economy will suffer.
- HICs produce a whole range of goods and do not suffer much if the price of any one of them drops.
- More money is earned by processing the goods, but this is done by HICs who prevent the LICs from processing goods themselves. They do this by imposing heavy 'import taxes' on processed goods in order to protect their own industries. This is called **protectionism** and it means that the LICs producing the food don't get as much money as they could.

- In addition, HICs subsidise their own farmers, making it easier for them to sell their produce, both at home and abroad. This is another form of protectionism.
- If LIC farmers stop growing crops for export, their government will not be able to repay the foreign loans they have borrowed (debt). The farmers themselves will not be able to repay their own debts and their land will be taken away from them. They can't just switch back to growing food crops for themselves because they won't make any money and won't be able to afford fertiliser and the other things that make their farms more productive. They are caught in a **trade trap**.

18. With a partner or in a small group, discuss ways in which the world trade system places constraints on food production in LICs. Try to come up with at least three suggestions. Share your ideas with the rest of the class.

Overpopulation, underpopulation and optimum population

Overpopulation

Overpopulation occurs in an area where the available resources are unable to sustain the population living there. An area can become overpopulated if its population grows to outstrip the resources or if the resources dwindle to a point where they can no longer support the people. Overpopulation is often the result of unsustainable development. It is always a potential problem for LICs as they develop economically and go through the DTM – will the country's economic growth (e.g. food, jobs, and housing) keep pace with the growth in population? Overpopulation is often characterised by low per person incomes, high unemployment, underemployment and outward migration.

Underpopulation

Underpopulation occurs where there are too few people in an area to use all the resources efficiently for the current level of technology. It is usually characterised by high per person incomes, low unemployment and inward migration.

Optimum population

The **optimum population** is reached when the population is in balance with the available resources of an area, given the current level of technology. It is really an economic concept and refers to the technological development of a society. When technology improves, new resources become available and more people can be supported. It is very hard to achieve, let alone maintain. The concept was derived before the ideas of sustainability became widely accepted. Governments will try to achieve the correct population-

resource balance, i.e. they aim to achieve the optimum population for their country and for the regions within their country. They do this by implementing **population policies**. A country could reach its optimum population but then population growth or a decline in the available resources could mean that the country becomes overpopulated. This means that the state of optimum population is unlikely to be permanent because the concept is an example of **unstable equilibrium**.

Carrying capacity

Carrying capacity is the maximum number of people that can be supported in a given region without damaging the area to an unsustainable extent. This is a complex concept devised by biologists. Geographers will often ask the question, 'The carrying capacity may be defined as x million people but what will be the quality of life of those people?'

Population policies

A policy refers to those actions of a government that try to control, manage or influence something, e.g. population. The nature of population policies is often determined by **population projections** - estimates of future population numbers based on the current trends and on population theories such as the DTM. They are an important planning tool for government authorities and most countries have to consider population management strategies from time to time. Population policies can be divided into three main types:

- *Influencing natural population change*: pro-natalist policies help to increase the birth rate, e.g. in countries with an ageing population. Anti-natalist policies attempt to reduce the birth rate in countries where the population is growing too quickly and is expected to outstrip the ability of the country's resources to support it, e.g. China in 1980.
- *Migration*: encouraging immigration, e.g. USA in the late 19th century and south Australia today. Limiting immigration, e.g. the UK and the USA today.
- *Redistribution*: encouraging internal migration, e.g. to Brasilia and Amazonia in Brazil and transmigration in Indonesia.

19. Using Fig. 4.25 (page 119), explain why the carrying capacity of a country might change over time.

20. Explain why a country's optimum population is probably lower than its carrying capacity.

Models of population – resource relationships

Several models/theories of population-resource relationships have been devised by demographers, biologists and economists over the years. They fall into two main types:

- pessimistic models that predict a global population crash, e.g. the ideas of Thomas Malthus

- optimistic models that predict continued economic growth and the stabilisation of world population (ZPG). These include the ideas of Esther Boserup and Julian Simon.

Thomas Malthus (1798)

A pessimistic theory. Malthus believed that, if unchecked, the population would always outstrip the food supply because population grows at a *geometric* rate while food supply can only grow at an *arithmetic* rate.

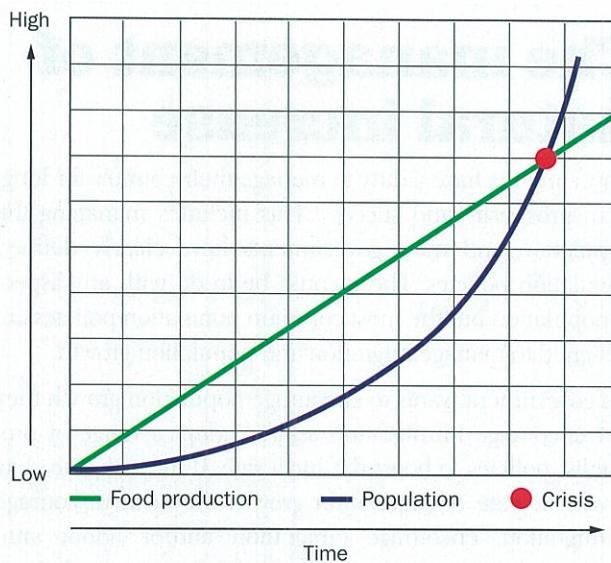


Fig. 4.27 The relationship between food supply and population growth as envisaged by Thomas Malthus

Malthus believed that population would be checked by famine, disease and wars over limited resources – i.e. by death control. Once these checks operated there would be a population crash and then the population-resource balance would re-establish itself.

Malthus appears to have been wrong – the world's population is now approaching 7 billion and the predicted population crash has not happened so far. This is because of technological improvements which he could not have foreseen, such as all the changes associated with the Green Revolution: e.g. the increased amount of cropland due to irrigation, the increased food yields due to the use of chemical fertilisers and the development of GM crops. Birth control has proved effective and has reduced population growth as countries moved through the DTM.

However, we must not dismiss Malthus outright. 800 million people currently go hungry and there has been famine and war in some parts of sub-Saharan Africa because population has outstripped food supply. Water shortages are becoming an increasing problem in many parts of the world. As people begin to take a more global perspective, Malthus' theories are becoming more popular again. Unsustainable development will inevitably lead to a Malthusian crisis on the global scale but will the effects be felt by everyone or just by the poor and the powerless?

Esther Boserup (1965)

An optimistic theory. Boserup believed that population growth would stimulate increased food supply through improvements in farming and technology. New varieties of crops would be developed and food supply would increase to support the expanding population. The improvements related to the Green Revolution support this view. She also argued that more people working on the land would lead to better food yields because of improved weeding, for example. However, she did not consider that intensive farming methods might degrade the land and lead to desertification, as in the Sahel region of Africa.

Paul Ehrlich (1968)

A pessimistic theory. Ehrlich is a biologist and the message of his book *The Population Bomb* is based on the same logic as that of Malthus: the planet has a well-defined size and contains finite resources, whereas humans have the ability to multiply themselves in endless quantities. Therefore, there will come a time in the future when the quantity of food, clean water and other resources will be so small relative to the human population that it will lead to famine and mass deaths. Overpopulation will be the cause of wars and environmental disasters.

Ehrlich predicted many disasters in the 1970s and 1980s that did not occur. He has been criticised for this. The famine that he said would break out in the 1970s, failed to materialize. Like Malthus, Ehrlich had not taken into account the Green Revolution. Instead of famine, foods became cheaper and more plentiful than ever before.

The Club of Rome (1972)

At a conference in Rome, the forerunner of today's Earth Summits, it was concluded that:

'If present day trends continue in population growth, pollution, food production and resource depletion, then limits to growth on the planet will be reached within 100 years. At this point there will be a sudden and uncontrollable decline in population. The world will have reached its carrying capacity.'

The conference's findings were published in a book entitled *The Limits to Growth*. This sounds like a pessimistic model but *The Limits to Growth* includes the following statement:

'Mankind possesses, for a small moment in his history, the most powerful combination of knowledge, tools and resources that the world has ever known. The global population has all that is physically necessary to create a totally new form of human society – one that would be built to last for generations.'

In other words, we still have 50 years to develop a truly sustainable global society – but it is up to us, and population growth is just one aspect of the drive to a sustainable future.

Julian Simon (1981)

A very optimistic theory, referred to as the 'Ultimate Resource Model'. Simon believed that the supply of natural resources is really infinite. As a resource begins to run low, its price will rise and so it will be worth investing time and money in developing technology that will produce more of the resource or in developing alternatives to the resource or in reorganising society so that it does not have to depend on that particular resource. Global exploitation of crude oil since 1980 seems to fit Simon's theory very well.

Bjorn Lomborg (2002)

Lomborg is a Danish environmental scientist who wrote *The Sceptical Environmentalist* in 2002. He directly challenges popular environmental concerns and believes that major problems such as pollution, HIV/AIDS, hunger, overpopulation and species loss are area-specific and highly correlated with poverty. They can therefore be solved by economic and social development. In other words, population growth will stabilise once all parts of the world are economically developed, in accordance with the predictions of the DTM.

- 21.** Which of the models of population-resource relationships do you think is the most realistic? Prepare a short presentation outlining your views and justifying your opinions.

But what about the future?

The optimistic theories are very attractive but it is worth remembering that *globally* the planet's human population is still in stage 3 of the DTM - population growth is starting to slow down but the population total is still increasing. Zero population growth (ZPG) has not yet been achieved. ZPG is the stabilisation of the world's population total, and should be achieved when global birth rates drop to the level of global death rates. The pessimists argue that Malthus will still be proved right at the global scale. They are asking some important questions:

- Will the Earth's resources run out?
- Will the resources that we have be fairly distributed?
- Will people really restrict their family size?
- Will so many people wreck the natural environment?
- Will economic development prove to be sustainable?
- Will new diseases cause major pandemics?

- 22.** With a partner or in a small group, discuss each of the six questions listed above. Consider the arguments for and against. Share your conclusions with the rest of the class.

Future problems may be to do with economics rather than with people. The consumption triangle (Fig. 4.25, page 119) may hold the answer. As countries develop, their people become richer. Rich people can afford more goods. Even if the global population reaches the stage of ZPG, increasing affluence will lead to increasing demand which could overuse resources. Fewer resources, even with a stable population, could lead to overpopulation and all the problems that overpopulation implies. In the end, it might not be just people who destroy the planet but *rich people*.

The management of natural increase

Governments have a duty to manage their country for long-term prosperity and success. This includes managing the population and most governments have clearly defined population policies. These could be to do with any aspect of population but the most common population policies are designed to manage migration and population growth.

If a government wants to encourage population growth they can encourage immigration and/or adopt a range of pro-natalist policies to boost the birth rate. If they want to slow down the rate of population growth they can discourage immigration, encourage emigration and/or adopt anti-natalist policies to reduce fertility. A third group of policies is designed to encourage internal migration within a country in order to reduce overpopulation in one part of the country and combat underpopulation and the under-exploitation of resources in another part of the country.

Anti-natalist policies

These policies are often adopted when a country is worried that their population is rising too quickly, leading to the problem of overpopulation. This is especially true of countries in stage 2 or 3 of the DTM. Policies can include:

- Education regarding family planning and the various methods of contraception.
- Providing free contraception at clinics throughout the country.
- Providing free **sterilisation** for parents who feel their families are large enough. Financial incentives have sometimes been given to encourage people to be sterilised.
- Legalising abortion. This is a controversial policy in many countries and even when legalised and promoted by the government, it can still face social, ethical and religious opposition.
- Introducing laws limiting family size. For example, Vietnam had a two-child policy between 1960 and 1993. China introduced the one-child policy in 1979 and has only recently started to ease it.

Recent changes to the policy

A fertility rate of 1.8 is well below 'replacement level' and China is aware of the importance of a large and productive workforce for the future. The policy has been eased:

- In rural areas it is now easier to have two children – 45 per cent of the Chinese population still live and work in the countryside.
- If one partner has a disability, they are allowed a second child to help with looking after them.
- In 2014, the Chinese government announced that if one partner is a single child, they are allowed to have two babies. Because so many of the under-35 age range in China are single children, this in effect means that most couples are allowed two children.

23. How successful has China's one-child policy been? Consider both economic and demographic factors in your answer.

24. How sustainable is China's one-child policy? Consider each of the economic, social and environmental strands of sustainable development.

Key concepts

The key concepts listed in the syllabus are set out below. For each one a summary of how it applies to this chapter is included.

Space: A country's population has to live in the space that the country's surface area provides. Not all of the space may be habitable, for example China has large areas in the west which are too dry or too cold to support many people. The balance between the number of people and the available living space is an important factor when deciding if a country is overpopulated or underpopulated. Living space is an important resource which includes land on which to grow food.

Scale: Population is a fundamentally social topic and spatial scale is not as important as the time scale over which recent population changes have been happening. Densely populated areas tend not to expand in area; they just become more densely populated. Malthus recognised that human populations have the potential to grow rapidly over a very short period of time. For a person born in 1950, there are now three people for every one that existed then, an amazingly rapid increase. Three times as many jobs and houses are required and three times as much food has to be produced.

Place: The nature of a place will determine how attractive it is to people. This in turn will impact on the population density of different places. Places with a high density of population tend to have a pleasant climate, fertile soil and the conditions which encourage the development of industry and trade. In other words, dense populations develop in areas where people can get a job and obtain a decent standard of living. People avoid places with a harsh climate, infertile soil and limited economic potential. As a result, some places are densely populated while other places remain sparsely populated.

Environment: The natural environment sustains human populations in a multitude of ways. It is fair to say that human survival depends on maintaining a clean and functioning natural environment. The rapid population growth of the past 60 years has put huge pressure on the environment. Natural habitats have been destroyed; soils have been rendered infertile, seas over-fished, and the atmosphere polluted to such an extent that the climate is changing. More people need more food and more resources and it is the natural environment that has had to provide these and environmental degradation has often been the result.

Interdependence: Population growth in one part of the world impacts on other parts of the world. The rapid rise in the population of Africa and the Middle-East has led to pressure for these 'extra' people to move elsewhere. Europe appears to be a suitable destination and as the countries of Europe have restricted legal immigration, illegal migration has soared e.g. the thousands who risked death crossing the Mediterranean in 2015. This may appear to be a migration issue but it is population growth and the predictable operation of the DTM which is the real cause of these movements. Human populations are supported by a range of resources and many of these resources are traded over large distances. This is another way that people in one part of the world are dependent on other parts of the world. The concept of 'food miles' is illustrative of this point.

Diversity: Countries at different levels of economic development experience different levels of population growth. This is the fundamental message of the DTM; it is development that drives change, not time. However, almost all countries are passing, or have passed, through the same stages of the DTM, indicating that the way populations react to changing economic stimuli is fundamentally the same wherever people live.

Change: The population of a country or of an area is constantly changing. There are two aspects that contribute to population change:

- Natural change – the balance of births and deaths
- Migrational change – the difference between immigration and emigration.

These changes provide challenges for people and for their governments. Because of theories such as the DTM, population changes are fairly predictable and can be planned for. Planning may need to involve changes in the government's spending priorities in both the short term (for migrational change) and the long term (for natural change).

Exam-style questions

1

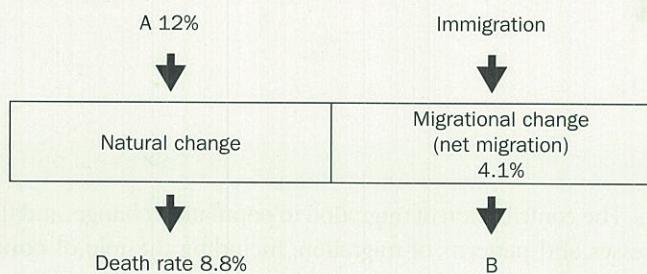


Fig. 4.29 The elements of population change – UK, 2014

- (a) Using Fig. 4.29, identify:
- (i) A [2]
 - (ii) B
- (b) Use Fig. 4.29 to calculate the following:
- (i) The natural change
 - (ii) The overall population change [3]
- (c) Explain **three** factors that can influence the death rate. [5]
- 2 (a) (i) Give the meaning of the term *optimum population*. [2]
- (ii) Explain why a country's optimum population may vary over time. [5]
- (b) With the use of examples, explain how food shortages can occur. [8]
- (c) With reference to one or more examples, assess the effectiveness of the strategies a country may adopt to reduce its population growth. [15]

5

Migration

In this chapter you will learn about:

- The nature of permanent population movements. The contribution of migration to population change, and the causes of migration – push and pull factors. The processes and patterns of migration, including the role of **constraints**, obstacles, and barriers.
- The causes and impacts of migration within a country, including rural-urban, urban-urban, and urban-rural migration. Movements of people within urban settlements. The impacts of these internal migrations on the **source areas**, receiving areas and on population structure.
- The causes and patterns of international migrations, including voluntary movement, forced migration, economic migration, and the flows of refugees. The impacts of international migration on the source areas and the receiving areas.
- A case study of a recent international migration stream to illustrate its causes, character, scale, pattern, and impacts.

Migration as a component of population change

Movements of population

Migration is an important issue in the 21st century. Because of population growth, globalisation, improvements in the spread of information and the greater ease and speed of transport, more people are migrating than ever before. These migrations are not random; they are driven by economic, social and political factors and several important intercontinental and global migration streams have developed during the past 50 years.

People are a resource and the movement of young people of working age into an area can boost economic growth. Employers, economic planners and government finance ministers regard immigrants as good thing. However, migrants also have needs: they require houses, schools for their children and hospitals for when they are ill. These needs can produce huge social pressures on the receiving areas and can lead to the original inhabitants of the area regarding the immigrants in a negative light.

Some basic definitions

Migration: the permanent change of residence of an individual or group of people. The United Nations defines 'permanent' as a change of residence that lasts for more than one year.

Movements of less than a year should not to be defined as migration. These short-term movements include:

- Commuting: this is when people move to and from work on a daily basis.
- Tourism: people often move to a different place for a holiday.
- Seasonal movements: groups of people often change their place of residence for a short time at different times of year. Examples include: hotel workers moving from inland Spain to the coastal areas during the summer, UK gap-year students moving to work in Alpine ski resorts during the winter and reindeer herders in northern Norway moving their herds to the coast in the summer to graze the tundra pastures. The UN defines these as 'circulatory movements'.

1. Explain why commuting, tourism and seasonal movements are not considered to be migration.

International migration: this is defined by the UN as the movement of people across international frontiers (i.e. from one country to another) for a minimum period of one year. An **emigrant** is someone who leaves a country. An **immigrant** is someone who moves into a country. These terms must be used carefully. An emigrant, by definition, is also an immigrant. For example, someone who moves from Morocco to France is an emigrant in Morocco and an immigrant in France.

Internal migration is when people move from one place to another *within* a country. **Out-migration** is the term used to describe the movement of internal migrants out of a region of a country. **In-migration** is the term used to describe the corresponding movement of internal migrants into a region.

Net migration is the balance between people moving into a region or country and the people moving out of that

region or country. Net migration is combined with natural population change when the total population change of a region or country is calculated.

2. What is meant by natural increase, and how is it calculated?

The **source area** is the place the migrants have come from. The best-known theory of migration (see page 138) states that they are driven from the source area by **push factors**, bad things about the source area that they want to escape from. The area of destination is the place that the migrants are moving to. They are attracted to the area of destination by its advantages, known as **pull factors**.

Migrants are only affected by one set of push factors because the push factors only apply to the place of origin. Migrants may have to consider a variety of destinations before they actually migrate and this means that they have to consider the relative merits (pull factors) of all the possible destinations. The area with the strongest pull factors will probably be chosen as the migrants' destination but they also have to consider the relative importance of the **barriers to movement** that they will have to overcome when moving to the different destinations. A destination with the strongest pull factors but with considerable barriers to movement may be rejected by the migrants in favour of a destination with less powerful pull factors but with fewer barriers.

Migration tends to be subject to the concept of **distance-decay** – the number of migrants declines as distance between the source area and the area of destination increases. Much improved transport facilities and the greater availability of information has reduced the impact of distance-decay in recent decades.

3. What are the possible barriers to migration?
4. Suggest why the concept of distance-decay applies to migration.

Chain migration: when a small number of people move from a source area to an area of destination, they are often followed by an increasing number of people making the same journey. Migrant 'pioneers' will send information back to relatives and friends in the source area. When this information is positive, others will follow. This trend is enhanced when **remittances** (money sent home by the pioneer migrants) accompany the positive information. Migrants sharing a common source area and destination form a **migration stream**. Not all the migrants will be satisfied with the area of destination and some of them may decide to move back home. For every migration stream, there is usually a smaller counter stream of migrants moving in the opposite direction.

Voluntary migration is when the migrants choose to move. They are affected by push and pull factors but the

final decision to move is their own. Many of the people who make a free decision to migrate are **economic migrants**, moving in order to obtain a better standard of living, e.g. a better or more highly paid job.

Forced migration occurs when the migrants feel they have no alternative but to move. A natural disaster may have destroyed their home or their ability to make a living. War may mean that they have to flee in fear of their lives. Religious or political persecution is another reason why people may feel that they have to move away from their place of origin. People who are forced to migrate are called **refugees** because they move to seek refuge from a life-threatening situation. When they reach their place of destination they may apply to stay there permanently – they are known as **asylum seekers**.

Migrants who are granted asylum and migrants who have permission to move into a country and stay there are legal immigrants. Nowadays, many people migrate without permission and if they are able to overcome the barriers placed in their way, they arrive in their country of destination as **illegal immigrants**. With no legal status they are often subject to abuse, for example being paid below the minimum wage for that country, or forced to live in squalid conditions. If they are caught by the authorities in the destination country, they may be detained and then deported (sent back to where they came from).

Rural-urban migration (rural-to-urban): in LICs and MICs, economic development results in industrialisation and urbanisation. Together with the commercialisation and mechanisation of agriculture, this results in strong push factors in rural areas and equally strong urban pull factors. The resulting movement of people from the countryside to the urban settlements is known as urbanisation. **Step migration** is when the move from rural villages to large cities is done in stages or steps. At first people move to a local town, then to a regional city and finally to a major port or the capital city. The final stages of step migration are examples of **urban-urban migration** (urban-to-urban).

Intra-urban migration is when people move within an urban area. A classic scenario is when poor immigrants move into a city and live in an area where the rent is cheap. As the immigrants work hard and become richer, they are able to move into more expensive housing.

Urban-rural migration (urban-to-rural): in HICs many people have chosen to leave the cities in order to live in villages or small towns in the countryside. They still work in the city and commute daily between their rural home and urban workplace. This phenomenon is known as **counter-urbanisation**. Another form of urban-rural migration is when city people retire and move to the countryside.

RESEARCH Find examples of the following types of migration. For each one you should state an origin and a destination:

- international migration
- internal migration
- a migration stream
- voluntary migration
- forced migration
- illegal immigration
- rural–urban migration

5. In 2012, the following statistics applied to the UK.

• total population at the start of the year	= 63 200 000
• number of births	= 800 000
• number of deaths	= 560 000
• number of immigrants	= 518 000
• number of emigrants	= 350 000

Calculate the following:

- (a) the natural increase
- (b) the birth rate, per thousand
- (c) the death rate, per thousand
- (d) the migrational change (net migration)
- (e) the total UK population at the end of 2012.

Refer back to Chapter 4 (and Fig. 4.7) for help with these calculations.

depends on information received from the media or from relatives or friends who have already moved there). Migrants often find that the destination area is not as good as they expected and this is one reason why migration counter streams exist.

6. Consider your own place of residence and compare it with a place that you would like to live. Make a list of the push and pull factors that might influence your decision to move there.

The role of constraints, obstacles and barriers

As well as considering the push and pull factors, migrants have to be aware of the difficulties they will face when making the journey to a new home and the difficulties they may face once they have arrived. For internal migrants the main constraints are cost, distance and the dangers of the journey. International migrants also have to consider the immigration laws of the country they are moving to, and possibly the restrictions on emigration imposed by their own country.

Cost

The financial cost of **closing-up** at the point of origin may be insignificant for an individual leaving their family or even for a poor family with few possessions and who do not own their house. In richer countries, the costs of disposing of possessions and selling a house may be significant. The emotional cost of leaving friends, family and a familiar location is difficult to quantify but can be significant. The cost of the journey itself will depend on the distance travelled and the type of transport used. Very often it is the **opening-up cost** of purchasing or building a house at the point of destination which is the greatest barrier to migrating. There is also the cost of purchasing the everyday items needed for the new home, e.g. furniture and domestic appliances. Many rural–urban migrants in LICs and MICs build their own shelter in a **shanty town** to reduce these opening up costs. Others

Causes of migration

Push and pull factors

The decision to migrate is made in the source area so people's knowledge of the push factors is always more accurate than their knowledge of the pull factors (which

Push factors	Pull factors
Low wages, low standard of living, poverty.	High wages, improved standard of living.
Lack of job opportunities, only unskilled jobs available.	More job opportunities, better jobs available.
Lack of access to amenities such as schools and hospitals.	Better amenities and services.
Poor quality of life, e.g. poor housing.	Improved quality of life, e.g. the prospect of better housing.
Conflict, war and/or political oppression.	Freedom from oppression.
Persecution of minority groups within society.	Tolerance of other people's views, opinions and attitudes.
Natural hazards, e.g. volcano or drought.	Better environment, no natural hazards.

Table 5.1 Some of the push and pull factors that can affect migration

move into cheap accommodation in run-down areas of HIC cities or live with relatives, often sharing a room. The belief that things will get better sustains the migrants during these early days.

The journey

Distance is often the greatest barrier. Longer journeys take more time and cost more money. It is difficult to return to the point of origin if the migrant has moved a long way and this makes it difficult to keep in touch with family and friends. A two-day walk or donkey ride to the nearest bus route may be a significant deterrent to anyone contemplating moving from a remote rural location to a distant urban settlement. Jet aircraft have made intercontinental journeys much faster than in the past but for a poor person from west Africa, the journey to Europe may involve walking to the nearest main town, a lorry ride across the Sahara and then a boat trip over the Mediterranean. It is estimated that well over 100 000 people actually made this sort of trip in 2014, travelling from Africa to southern Italy. This route also illustrates the dangers of the journey. In 2014, the bodies of several migrants were found in the Sahara after their vehicles broke down and they were abandoned by their guides. Many have drowned when overcrowded boats sank on the journey across the Mediterranean.

Immigration laws

During the 19th century, the government of the USA considered the USA to be underpopulated and they encouraged immigration, especially from Europe where population growth was leading to overpopulation. Unrestricted migration from Europe solved the problem of population pressure and provided workers for the USA.

More recently, population growth in LICs and MICs has led to increased migration to HICs such as the USA and the richer countries of the EU. Initially, there were only minor restrictions on movement - the UK encouraged migration from the West Indies after 1945 in order to boost economic growth by providing a pool of cheap labour prepared to do the unskilled jobs which the growing economy needed. In the USA, migrants from Mexico were tolerated as they provided cheap agricultural labour to harvest the crops demanded by an increasingly affluent population and the domestic servants that many rich Americans wanted to employ. However, as the flow of poor migrants increased, most countries imposed greater and greater restrictions. Most HICs now allow in only those workers with high-level skills such as doctors and entrepreneurs. These significant barriers mean that many people choose to migrate illegally.

Two further points are worthy of note:

- During the Cold War, the communist regimes of eastern Europe imposed restrictions on emigration. The Berlin Wall was constructed in 1961 to stop the huge flows of people escaping East Germany to live in the West.
- In China, the system of *hukou* was enforced until recently. This was a population register which defined an individual as either a rural or an urban dweller. Permission was required if a person wanted to change their status, and permission was often denied if they wanted to move from the countryside into the cities. Only if they had a job and a house to move to was permission granted. This is one way in which the Chinese government avoided the shanty town problem which was common in many other MICs.

The role of push and pull factors and the reduction of barriers and constraints is illustrated in the case study of rural-urban migration in Brazil on page 142.

Processes and patterns of migration

The processes of migration are complex and the patterns of migration change over time.

The main migration streams shown in Fig. 5.1 include:

- The huge flows of Europeans into North America and other areas colonised by European countries.
- The flow of African slaves to the Americas.
- The overland flows of Europeans westwards across the USA and Canada and eastwards across the Russian Empire into Siberia.
- The movement of East Asian (mainly Chinese) people into South East Asia and North America.
- The movement of South Asian people (from the Indian subcontinent) to territories around the Indian Ocean and to the UK.
- The movement of people from Mexico, Central America and the Caribbean into the USA.

7. Which of the flows shown on Fig. 5.1 are:

- (a) international
- (b) internal
- (c) voluntary
- (d) forced
- (e) economic?

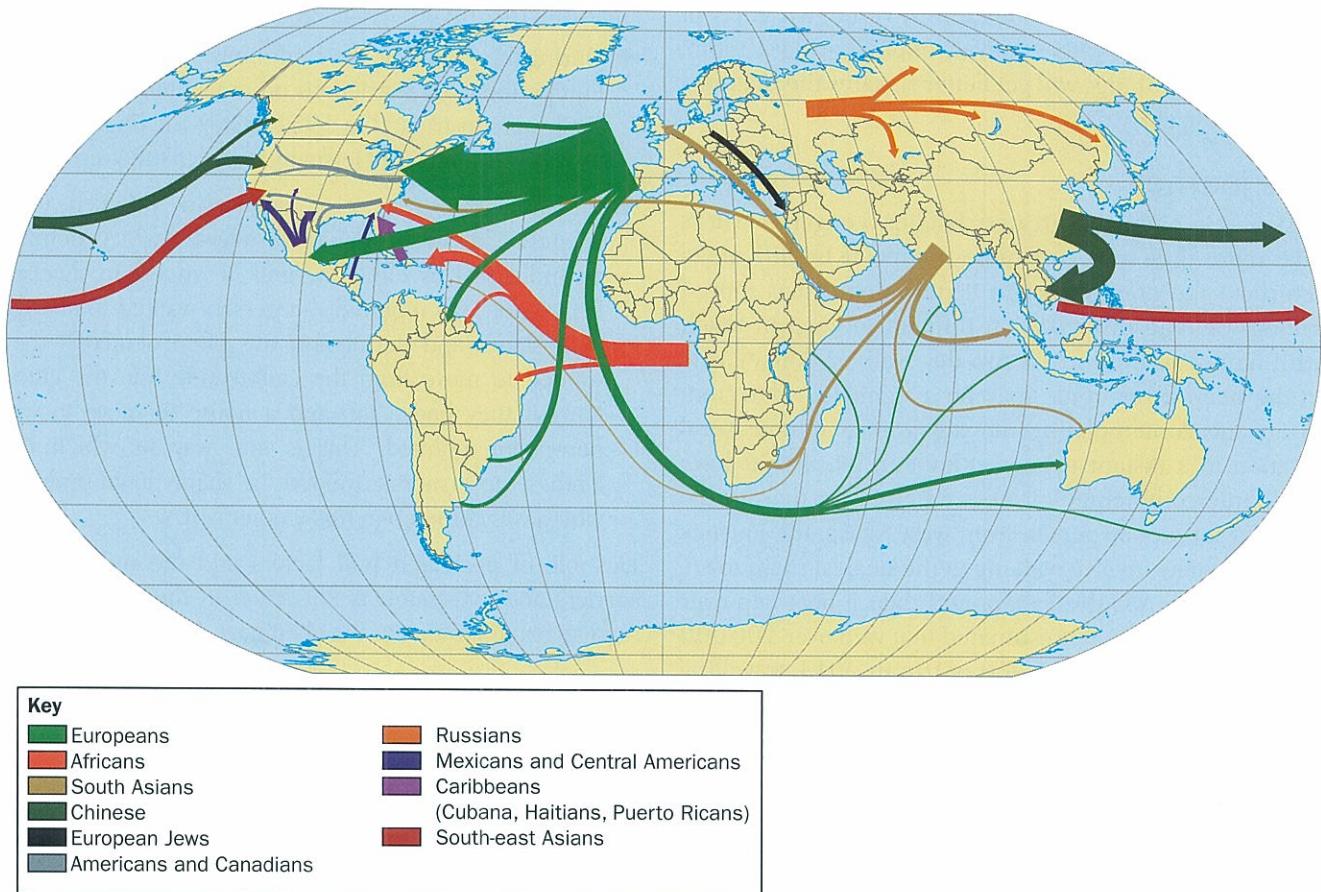


Fig. 5.1 Patterns of major global migration streams over the past 300 years

More recent flows show a different pattern.

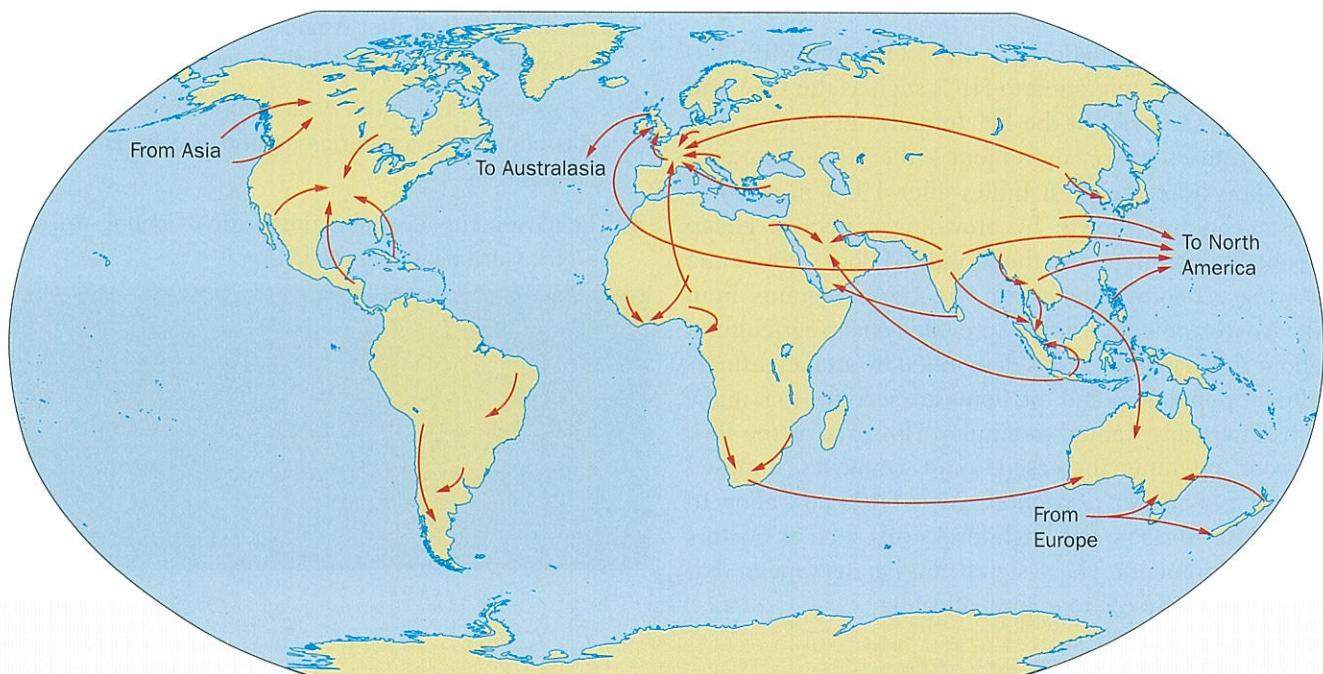


Fig. 5.2 Recent global migration streams

- 8.** Which of the streams shown on Fig. 5.2 are likely to be:
- Students going to prestigious universities?
 - Construction workers attracted by rapid development in oil-rich states?
 - Economic migrants in search of a better standard of living?
 - The result of free movement within the European Union?
 - Young men attracted by jobs in a rapidly expanding mining industry?
- 9.** Which recent movements of people are not represented on Figure 5.2?

Fig. 5.3 shows that there are several possible destinations and that a migrant may choose to move in steps (not all the possible steps are shown). As well as the push and pull factors there are factors which the potential migrant does not perceive to be important - these may vary with the age and the gender of the individual concerned. There are also several uncertainties because flows of information are never perfect, especially for an individual living in a rural area in an LIC or MIC. Sometimes the information is provided by friends and relatives who have already moved and the prospect of moving to join someone you already know is very attractive.

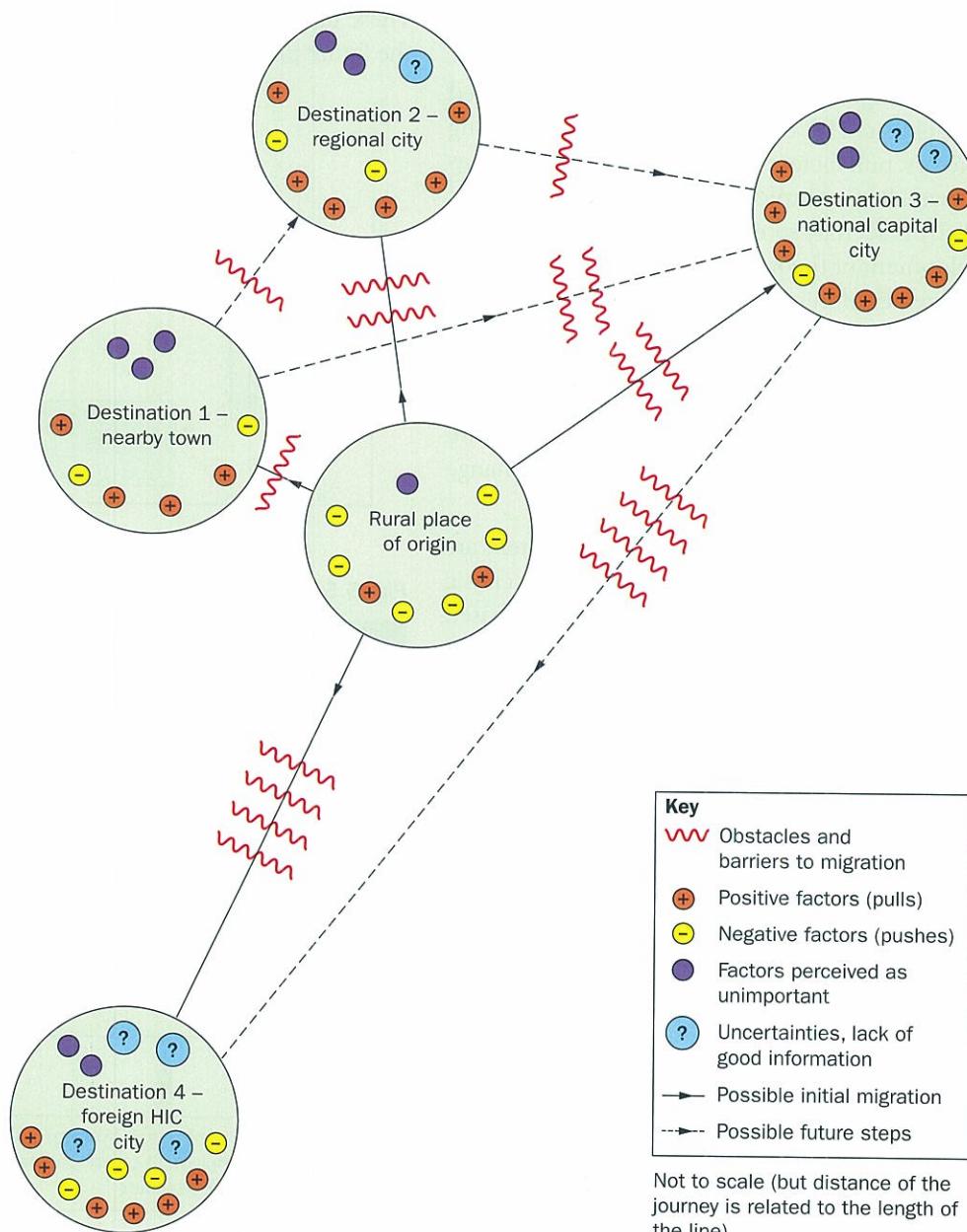


Fig. 5.3 The complex choices that a potential migrant has to make

10. Use Fig. 5.3 to suggest why a migrant's choice of destination is a difficult one.

11. Use Fig. 5.3 to explain why stepped migration is common in LICs and MICs.

Theories of migration

Despite the fact that Fig. 5.3 illustrates the complexity of the choices facing migrants, several theories attempting to explain the process of migration have been produced. In terms of migration, it is the economic and social aspects of geography that dominate; environmental factors are usually less important, unless the migration is the result of a natural disaster. As rural–urban migration has been very important over the past 50 years, many of the theories focus on this aspect of the topic.

The push-pull hypothesis

In *Principles of Migration* (1966), Everett Lee updated Ravenstein's classic 19th century theory by considering the push factors, pull factors and barriers to migration (as outlined above). It is a simple yet successful theory but its very simplicity is seen by some as a weakness and has led to the development of theories that seek to explain more of the complexities of migration.

The systems approach

Akin Mabogunje considered rural–urban migration in Africa as a system of interrelated elements. Systems have inputs, processes and outputs and dynamic systems change in response to changes in their inputs.

When applied to migration, the inputs into the system are quite easy to define as most of them relate to the classic push and pull factors. The output is also clear – based around the individual's decision to migrate or stay put. The nature of the output includes the destination and the distance moved. Consideration of the various inputs helps to explain the eventual output. The systems theory of migration

also considers change over time, e.g. how the individual is influenced by the 'rural control sub-system' when living at the point of origin but then comes under the 'urban control sub-system' once the move to the city has been completed. These changing controls affect the migrant's perception and may lead to further migration.

The Todaro model

Michael Todaro argued that consideration of economic costs and benefits was the key to explaining an individual's decision to migrate. Todaro argued that the decision to migrate was an individual, rational decision based upon the differences in expected income rather than differences in income at the time of migration; in other words potential migrants are willing to endure short-term difficulties (including a drop in earnings) in the hope of better prospects in the future. These future prospects may include a calculation based on the future prospects of the migrant's children.

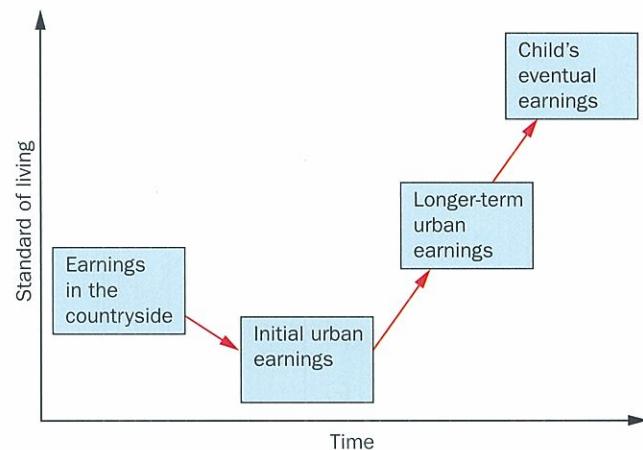


Fig. 5.5 The Todaro model of migration

12. The push-pull hypothesis is still the best way of explaining migration.' To what extent do you agree with this statement?

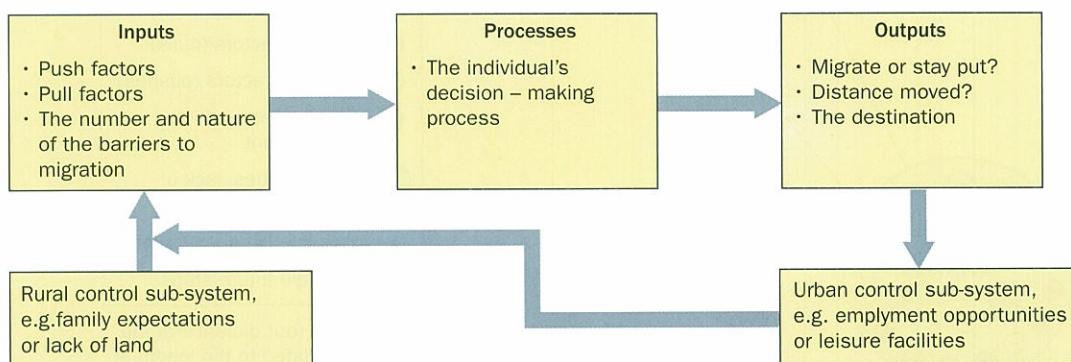


Fig. 5.4 Migration systems theory

Gender-based factors

Some modern research has focused on the different opportunities available for male and female migrants at different destinations. Gender-based factors change quite rapidly over time and reflect social and economic conditions at both the destination and the place of origin.

Traditionally, men have migrated to find work and send remittances back to their family. This has been reinforced by the barriers to international migration where only the worker and not the worker's family are allowed entry into the destination country. The remittances not only improve the family's standard of living but, in effect, make the woman the head of the household in the place of origin. This improves her status in the family and in the local community. This may be one reason why the rest of the family do not always migrate to join the man. In Brazil, however, the barriers to internal migration are low and whole families have moved – as suggested by the Todaro model.

Changing employment structures in the place of destination are also important. If most of the jobs available are in construction or in heavy industry, then it is usually men who migrate to fill these jobs. The population structure of Bahrain (Fig. 5.6) shows this very clearly. Notice the massive bulge on the male side of the age/sex structure diagram between the ages of 20 and 50. This represents the foreign males who have moved to Bahrain to work in the construction and oil industries.

As the economy of the place of destination develops, there are fewer manufacturing jobs available but more service jobs. As a result, more women migrate to do this work, for example as unskilled domestic servants. The National Health Service in the UK employs more nurses than doctors and the majority of

nurses are female. Many female nurses from countries such as the Philippines have migrated to the UK to fill these jobs.

Age-based factors

Traditionally, it has been young people who have migrated, looking for improved economic and social conditions. Young people are fit, healthy, have ambition and few family ties in the place of origin. More recently, students have migrated to rich HICs where the universities are seen as superior to those in their own country. Once they graduate they may return to their country of origin. Other migrants are poor and they settle in the poorer parts of the destination cities. In the UK, London attracts many migrants and they move into the inner part of the city where accommodation is relatively cheap. This can be seen in the population structure of inner London (Fig. 5.7). Notice the bulges between the ages of 20 and 40. This represents workers and students. The bulges affect both sides of the structure diagram because students and workers in service industry tend to be fairly equally split in terms of gender.

Old people also migrate, especially when they retire, and especially in MICs. They move from the cities in which they have worked to areas with a pleasant climate and relaxing scenery. This often means coastal areas, sometimes to places where they have enjoyed holidays in the past. In the USA, Florida is an especially favoured area for retirement communities. In the UK, coastal areas of Devon have large numbers of old people for this reason. This is illustrated in Fig. 5.8. Notice the 'extra' population over the age of 55. This represents the retired people who have moved into the area.

The bulges affect both the male and female sides of the structure diagram but over the age of 70, women outnumber men, reflecting their longer life expectancy.

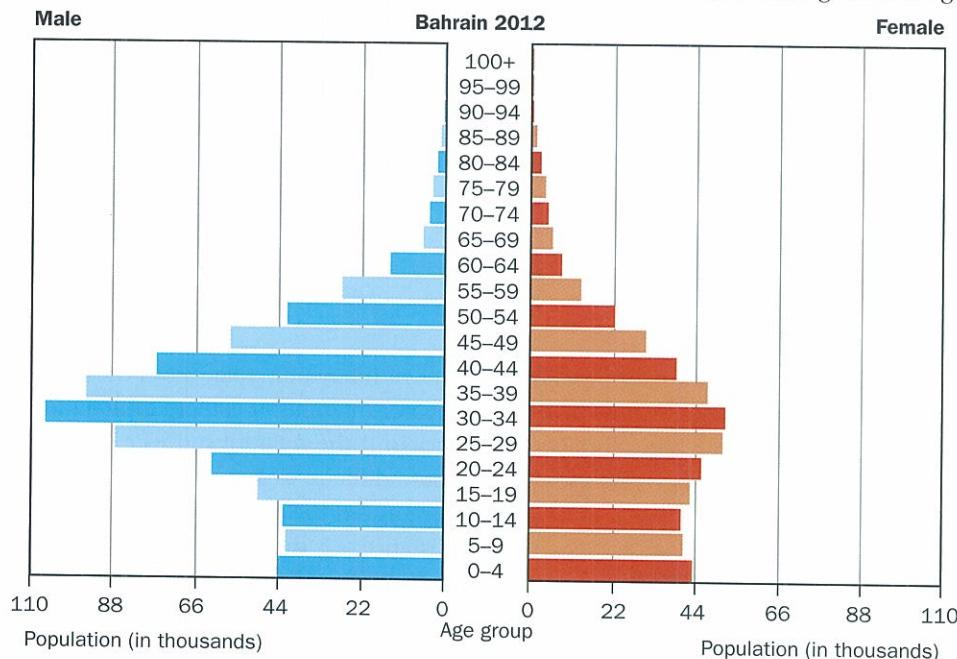


Fig. 5.6 Population structure of Bahrain

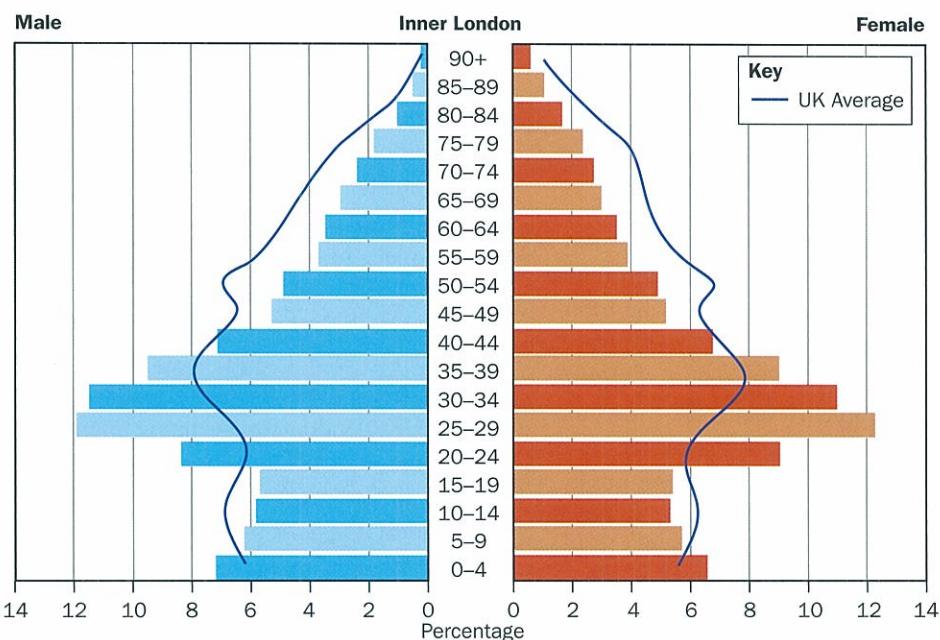


Fig. 5.7 Population structure for inner London

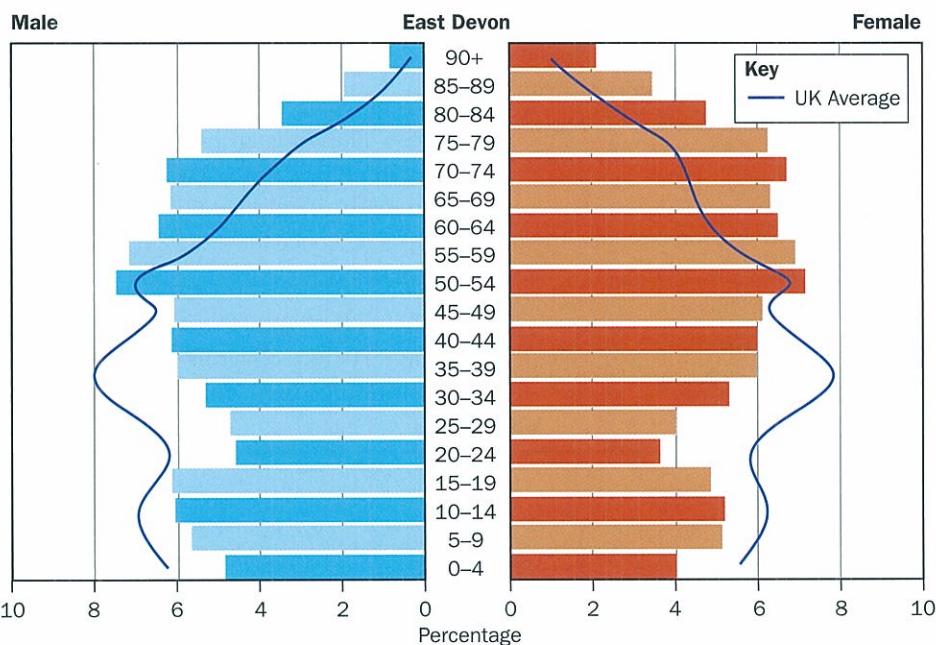


Fig. 5.8 Population structure of East Devon, UK

This phenomenon can influence international migration too. Many Dutch and German pensioners retire to the Costa del Sol in southern Spain where the climate is much pleasanter. This is facilitated by free movement within the EU.

Distance as a factor in migration

Distance is a significant barrier to migration. Fig. 5.3 (page 137) shows the significance of distance for migration. Long journeys take more time and cost more money: some

forms of intercontinental travel may be beyond the means of poorer migrants. It is more difficult to return to the point of origin if the migrant moves a long way and this makes it more difficult to keep in touch with family and friends. An improved transport infrastructure can reduce the effect of distance, e.g. the better roads and better public transport system in Brazil made it much easier for rural dwellers to move to the cities. Better sources of information about the place of destination also tend to reduce the impact of distance.

Internal migration (within one country)

Internal migration, the movement of people within one country, is easier and involves more people than international migration. This is because:

- All migration is affected by the principle of distance-decay, more people migrate over a shorter distance than over a longer distance and distances within a country are often shorter than distances between countries.
- The barriers to internal migration are mostly social and economic while the barriers to international migration are social, economic and political – immigration laws often make it difficult to cross international frontiers.
- When considering the pull factors of different locations, the potential migrant will probably have a better knowledge of the destinations within their own country than of destinations abroad, mainly because of a common language and information transmitted by national media.

Rural–urban migration

From 1960 to 1990, one of the biggest global movements of people was from the countryside to the cities in LICs and MICs. This rural–urban migration (rural-to-urban) was closely linked to the processes of industrialisation and urbanisation which occur when a country develops economically.

Causes of rural–urban migration

The causes of rural–urban migration can be illustrated by the relevant push and pull factors. The rural push factors include poverty, low wages, hard and boring jobs, not enough jobs, poor amenities (no running water or electricity) and poor services (no secondary schools or hospitals). The urban pull factors are the mirror image of these.

Another cause of rural–urban migration is when economic development leads to improvements in water supply and healthcare in rural areas. This reduces the death rate and rural population growth is the result. More children survive than in the past and the family farm has to support more people. This population pressure leads to underemployment, increased poverty and a major incentive to move to the city in search of alternative work.

Mechanisation of commercial farming, for example on the large sugar cane estates in rural Brazil, means that many agricultural labourers lose their jobs. They and their families then move to find employment in the cities.

Cumulative causation also stimulates rural–urban migration. People move into the towns and take jobs working in the new factories. They get paid wages which they spend on

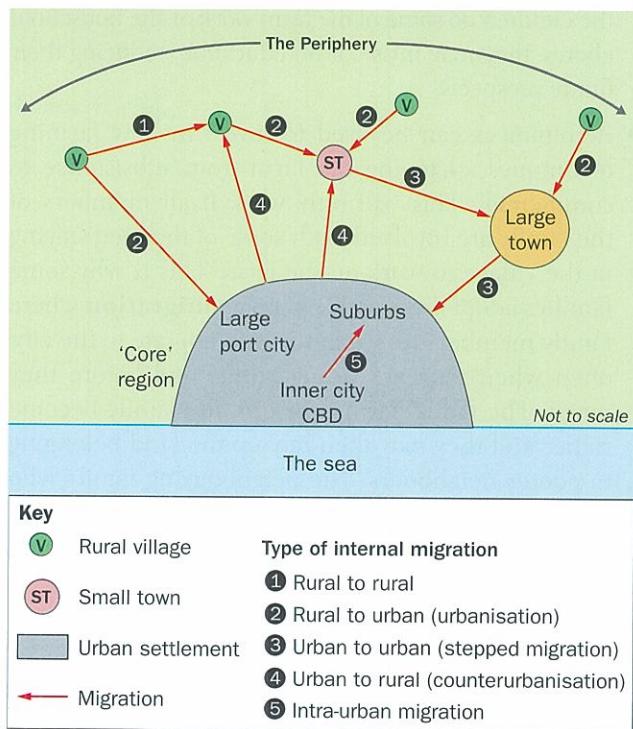


Fig. 5.9 Types of internal migration

food and consumer goods. This stimulates demand, leading to the development of new industries and new factories to produce the goods to meet this demand. This attracts more workers to the towns, who spend their wages, stimulating further demand, and so on.

Barriers to rural–urban migration within one country are often quite low, especially if the distances involved are small. The barriers become even lower as the transport infrastructure of the country improves and as knowledge of urban life increases. If a relative has already moved to the city, the social and economic barriers are even less because reliable information is available, the relative may have contacts that can provide employment, and they may be able to provide temporary accommodation when the migrant first moves.

Impacts on the rural area

The traditional view is that the young, skilled and able males leave. The elderly, females and the sick are left behind, leading to greater inefficiency in farming and more poverty. This might be compensated, however, by the remittances that the migrants send home from the city. However, there are other scenarios that can be considered:

- If the man migrates, the woman becomes the head of the household and this gives her increased social status in the community.
- This is countered by the extra work that the woman has to do (looking after the farm) in addition to the traditional work that she still has to do in the home. If

the children do some of the farm work or the household chores, they may miss out on education, reducing their future prospects.

- Remittances can be used to invest in new farming techniques, changing the farm from subsistence to commercial. This will only work if all members of the family are involved, with some of the men staying in the village to work on the farm. This is why some families adopt the practice of **relay migration** where family members take it in turns to migrate to the city, often when they are young adults and before they marry. The family farm develops, the family become richer and they may then buy up the land belonging to poorer neighbours. The neighbouring family who have sold their land then move to the city. This can lead to a general improvement in conditions in the countryside.
- If the countryside is regularly affected by natural hazards such as drought, whole families may decide to move. They may sell or simply abandon their land as they have decided that it can no longer support them. This can be beneficial in that marginal land is no longer being overused and environmental problems such as soil erosion may be reduced.

In the short term, movement of people from the villages can reduce the **standard of living** and the **quality of life** of the people remaining in the villages but in the long term, reduced population pressure, the economic stimulus of the remittances and the change from subsistence to commercial agriculture results in a better standard of living for many of the remaining rural population.

Impacts on the cities

New arrivals in the city increase pressure on already limited job opportunities, housing and services. Shortage of jobs leads to a huge **informal economy**. Shortage of housing means people have to live in very poor conditions. Crime and poverty often increase in these conditions. City councils may try to help but new arrivals often pay no taxes, so money for improvements is in short supply. However, most people feel better off in the city and they often retain higher expectations of their future prospects.

The case study of Khayelitsha in Chapter 6 (pages 195–197) illustrates some of the problems of shanty towns in South Africa and the ways that these informal settlements can be managed.

Case study: Rural–urban migration in Brazil



Fig. 5.10 The main flows of internal migration in Brazil

The causes of rural–urban migration in Brazil

As with all forms of migration, the internal migrations of people from the countryside into the cities of Brazil have been caused by push and pull factors. They can be summarised as follows:

- *Rural population growth*: many villages in rural areas now have clean water and proper sewage disposal. This reduces the death rate and the population grows. The farms can't support all the extra people so the people move to the cities.
- *Mechanisation of farming*: as farming becomes more efficient, fewer people are needed to work on the land. Unemployed farm workers move to the towns looking for jobs. This has been especially important on the big sugar estates in north-east Brazil.
- *Natural hazards*: the inland areas of north-east Brazil have long droughts followed by devastating floods. Many peasant farmers simply gave up the struggle and moved to the cities.
- *Industrialisation*: industries grow up in cities and ports and workers move in to take up the new jobs. These jobs are better paid and more secure than working on the land. Cities have a much wider range of unskilled and semi-skilled jobs than in the countryside.
- *More interesting lifestyle*: rural life can be boring, especially for young people. Cities have a wider range of entertainments.
- *More opportunities and better jobs*: most secondary schools and all the universities are based in the cities. Most of the well-paid, important and powerful jobs are in the cities.
- *Better amenities and services in urban areas*: cities have schools and hospitals, clean running water and electricity. In rural areas these services and amenities may be basic, expensive or absent altogether.

There are other factors that have helped to accelerate the movement from the countryside to the cities:

- *Better transport*: as the transport infrastructure develops, it becomes easier to move around the country, reducing the barriers to migration.
- *Better information*: news media and social media let country people see what city life can be like. This often makes the cities even more attractive.
- *Success feeds on itself*: industries attract workers who provide an affluent market. This market attracts other industries and services which attract more workers, and so on. This is called **cumulative causation**.

The impacts of rural–urban migration in Brazil

The Brazilian countryside has coped quite well. Because the population was growing rapidly and because Brazilian agriculture was being mechanised, labour shortages have not been a problem and rural services have continued to expand.

The impacts have been much greater in the cities:

- The extra workers have led to rapid industrial growth and an increase in Brazil's GDP and tax revenues. Brazil has become an NIC with important automobile and aerospace industries.
- However, many workers are paid low wages and they can't afford a proper house. This led to the growth of shanty towns (called favelas in Brazil) made up of shacks people built for themselves out of scrap materials. The favelas were built on land no-one else wanted: steep slopes and marshy floodplains that made landslides and floods a common hazard. They were overcrowded with no proper water supply or sewage disposal. Diseases spread quickly. Homes had no electricity.
- Not everyone could find a job so the informal economy flourished. People opened their own shops, bars and workshops, but they did not pay taxes and the city council found it hard to raise the funds needed for improved housing and services.
- Urban services such as schools and hospitals struggled to cope with the increased demand from all the extra people.
- Overcrowding was severe and the extra people led to increased traffic congestion and air pollution.

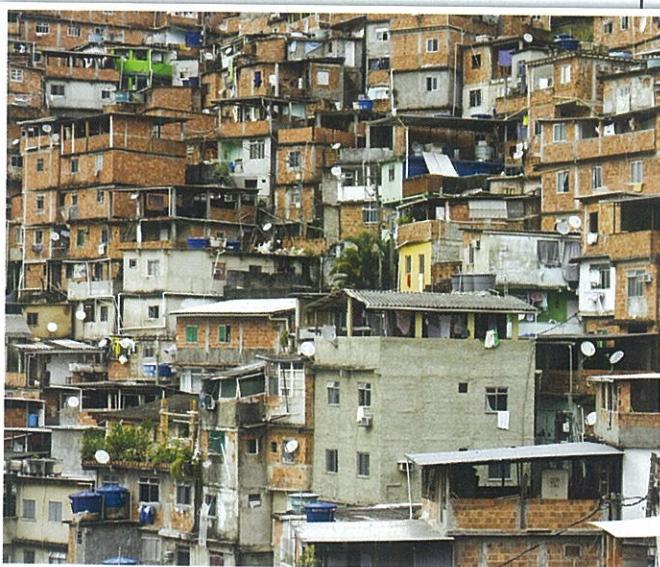


Fig. 5.11 Rocinha, a favela in Rio de Janeiro

How can the results of Brazil's rural–urban migration be managed?

- The government encouraged trans-national corporations (TNCs) to move in and set up new factories, e.g. Fiat in Belo Horizonte. This ensured more people were employed in the **formal economy**, earning a fair wage and paying taxes.
- People with jobs made money and they used this money to improve their homes. Every weekend they would help each other to build proper houses made out of bricks, with good roofs. The council started up 'self-help' schemes where they provided the locals with the materials they needed for these improvements.
- Sometimes the council would build the shell of a house and rent it to tenants who would then finish it off. These houses had a clean water supply, electricity and toilets connected to a sewer infrastructure.

- The council also tried to provide services to the existing favelas, such as clean water, sewers, electricity and schools. The favelas improved and became known as the *periferia*.
- By improving public transport the congestion and air pollution was improved. Curitiba in south-east Brazil now has one of the most sustainable transport systems in the world.
- By improving conditions in the countryside, the 'push' factors were eased and fewer people wanted to move. This is reducing the flow of people from the countryside and easing pressure on the cities.

13. 'National economic development is both the cause and the consequence of rural–urban migration in Brazil'. To what extent do you agree with this statement?

Urban–urban migration

This is when migrants move from town to town, town to city or city to city. It is a very common form of internal migration. Stepped migration occurs when migrants move from a village to a local town, then on to nearby city and finally to a really large city, possibly the capital city.



Fig. 5.12 Stepped migration. Steps 2 and 3 constitute urban–urban migration

The rationale for stepped migration is that the obstacles to each small step are lower than the obstacles to one big step from the village to the major city. For a short step, distances are less than for a big step and because migration is subject to the principle of distance-decay, more people are prepared to move over shorter distances. The cost of a short distance movement is less than the cost of a large movement. The migrant will probably have more information about the local town when moving from the village because the local town is where they will have visited for shopping or for selling their agricultural produce. Once living in the local town, the migrant becomes urbanised and learns the labour skills that are useful for factory or service industry work. There are more people to talk to than in the village and more people

to give advice on the next step in the sequence. The same factors apply after the move to the regional city, but more so, and will help the migrant decide to make the final step.

A Brazilian example might start with a move from a village in the deprived rural *sertao* (outback) of north-east Brazil. Droughts are common in these inland areas and this can be a powerful push factor. In a local town nearer the coast, agricultural work could be available in the sugar cane and cotton estates. Mechanisation of this type of agriculture could then push the migrant to move into one of the coastal cities such as Recife or Salvador where work is available in the informal sector of the economy or in some of the labour-intensive clothing and shoe factories. As the jobs available here are very low paid and mostly for women and teenagers, the final step might be to the richer south-east core region of Brazil where better-paid semi-skilled jobs are available, for example in the Fiat factory in Belo Horizonte.

Urban–rural migration

This involves the migration of people out of the big cities into the villages and small towns of the city's *umland*. Urban–rural migration, also known as counterurbanisation, is now important in most HICs, including Canada, the USA, in western Europe, Japan, Australia and New Zealand. It has been driven by the rise of commuting, especially commuting by private car. In this form of urban–rural migration, people move out into the countryside around the city but still commute to work in the city each day.

Case study: Urban–urban migration within the core region of Brazil: Rio de Janeiro to Barra da Tijuca

A Brazilian example of urban–urban migration involves a move from Rio de Janeiro to the new **edge city** of Barra da Tijuca 32 kilometres down the coast. Barra was developed in the 1980s as it was only a short distance from Rio and it had flat land which would allow for future growth. It now has a population of 130 000.

The problems of living in Rio – push factors

Rio de Janeiro is built on a very narrow and congested site between mountains and the sea and houses and apartments are packed into this confined area. The roads are congested and traffic jams develop at rush hour. This produces noise pollution and air pollution from the vehicle exhausts, and time is wasted when travelling. Street crime and graffiti are additional problems in Rio. The city has many favelas where crime and drug abuse have been common. This crime spills out into the rest of Rio. There is little space for leisure, and the beach is usually overcrowded.

Although the richer, professional people have a high standard of living, their quality of life is poor. Many of those who can afford it and are able to commute to work each day have moved out to Barra da Tijuca.

The benefits of Barra (pull factors)

One advantage of Barra is that the modern apartment complexes have guards on the gates so, because security is good, well-off parents are prepared to let their children out on their own. The coastal motorway

keeps traffic flowing and allows commuting by car into Rio. Local shops are available for convenience goods and there are large, modern shopping malls for **higher order goods**, providing excellent quality and choice.

Public transport within Barra is cheap, clean and efficient. The design of the city means individual areas tend to be fairly self-contained – you don't need to go far to get what you want. A lot of service industries are based here, with many office blocks (in particular there is a big office block called 'Le Monde') so plenty of work is available for those people who don't want to commute. Barra was chosen to host several of the 2016 Rio Olympic venues, increasing its leisure and entertainment facilities. Barra has the highest human development index (HDI) in Brazil (0.970): this is comparable with middle class areas of European or North American cities.



Fig. 5.13 Modern apartment blocks in Barra da Tijuca. Note the traffic-free highway, the landscaped gardens and the clean sandy beach

RESEARCH Find out what is meant by the *umland* of a city. How does it compare with the *hinterland* of a port?

In most HICs people move between the countryside and the cities in a variety of complex ways. While some people, such as younger people, are moving into the cities, many others are moving out. It is important to remember that urban–rural migration is only one aspect of the complex migration of people into and out of cities but in many of the richest countries urban–rural migration is the *dominant* movement of people.

The places that are pulling people out of the cities are mostly within **commuting range** of the city so that each day people can travel to and from their jobs in the city. Settlements that

are close to a railway station on a line into the city or close to a junction on a motorway into the city are the ones that have grown most quickly. They are usually within 80 or 100 km of the city, but many are much closer.

What are the causes of urban–rural migration?

Like all forms of migration, we have to consider the push and pull factors. What are the problems of city life and the attractions of the countryside and which groups of people are most affected by these particular factors?

The CBDs of most large HIC cities contain a wide range of retail services and leisure facilities and the buildings are constantly being upgraded to keep them attractive. Despite this, people have been moving out because the cities still

have problems, especially the older inner-city areas. The problems of city life (the push factors) include:

- Pollution - air pollution, noise and visual pollution.
- Crime and anti-social behaviour - graffiti, street crime, drugs, knife crime, guns, gangs and prostitution.
- Traffic congestion - people waste time stuck in traffic jams.
- Loneliness - especially for old folk living on their own. A perception that people don't talk to their neighbours much.
- Racial tension - ethnic groups may cluster in **ghettos** and trouble often erupts between different groups.

Many richer people who live close to run-down city areas find that their quality of life is poor and they move away if they can. They still work in the city and use their car or the train to commute to and from work. They often move to smaller towns which have a rural feel. Some move into truly rural areas where new houses have been built in the villages, designed for the commuters and for the pensioners who leave the city when they retire. These villages and small towns are seen to have many advantages (the pull factors):

- Houses are often cheaper in the countryside so migrants can get more for their money: bigger houses with bigger gardens. Housing is also lower density.
- The local environment is cleaner and greener with opportunities for country walks in the fresh air.
- Crime rates are often much lower in the countryside and the country towns.
- Local schools often achieve higher exam results than many schools in the city.
- There is seen to be good 'social interaction', with people talking to their neighbours and helping each other out.
- Entertainment and shopping facilities are poor in rural areas but migrants can often easily reach the cities by road or rail to compensate for this.
- For the same reason (good transport), people can commute to their well-paid city jobs.
- Country towns have all the advantages of a rural location but they also have reasonable entertainment and shopping. This is one of the reasons why they have proved so popular with people leaving the city.

What are the impacts of urban-rural migration?

Impacts on the city – the place of origin

Only the richer people can afford to move out. The poor can't move so the city gets into a downward social spiral.

The richer people who have moved out are now paying their local taxes in the rural areas so the city council has less tax revenue with which to deal with the problems that it faces. It becomes harder to deal with the run-down and deprived areas that helped to cause the migration in the first place.

Impacts on the rural towns

The population of small towns in rural areas near to big **conurbations** has grown rapidly. Because of this growth in population, businesses and services in the small towns have also grown, providing more jobs for the local people. Most people, especially the commuters, feel that the move has improved their quality of life but some of the original inhabitants feel that their town is becoming too crowded and congested as a result.

Impacts on the rural villages

Fifty years ago, villages were thriving communities, full of people who lived and worked in the countryside. There were shops, schools, and services such as blacksmiths and builders. There were good railway and bus services to the nearby towns. Since then the commuters and rich pensioners have moved in. They own cars and use them to get to and from their work. They have fewer children than farm workers and they may send them to private schools and/or urban schools. They spend their money in the shops in the city, or in the retail parks that they pass on their way home each day. The demand for houses in the villages has increased, so new houses have been built, increasing the proportion of 'townies' in the village population. The results of these changes have been as follows:

- Village schools have closed down.
- Village shops and village-based services are rare.
- Bus and train services have been used less and less, eventually leading to their closure in many cases.
- The roads are much busier with cars.
- Village community life has declined: village clubs and organisations have fewer members.
- Many old agricultural buildings have been renovated and turned into expensive dwellings (known as barn conversions).
- House prices have risen and it is difficult for young local people to find a place to live in their own community.

This does not really affect the people who have moved out of the cities but the rural poor have suffered. They can't afford a car so they are cut off from the shops and services which are now concentrated in the towns. Local young people have found themselves unable to afford a house in their own village.

How can urban–rural migration be managed?

In the small towns in rural areas, the planners are trying to concentrate development on ‘brownfield’ sites close to the town centre rather than allowing the town to sprawl into the surrounding countryside. New jobs are being encouraged to reduce commuting.

In villages, housing associations have been building affordable houses that only the local people are allowed buy.

But what can be done in the city? Once an area gets into a downwards social spiral it is difficult to reverse the trend. Re-urbanisation and **gentrification** could be tried but where do the ‘problem families’ go?

14. In terms of quality of life, who are the winners and who are the losers in urban–rural migration?

Case study: Urban–rural migration: Counterurbanisation and naturbanisation in Andalucía, Spain

Location and background

Andalucía is the southernmost region of Spain. There is a narrow coastal strip with high mountains inland. There are two major cities: Málaga is a major port city on the coast with a population of 570 000 people and Granada is a historic city further inland (population 240 000). There are many tourist resorts along the coast and a series of new motorways have recently been built. Especially important is the ‘Autovía del Mediterráneo’ which runs along the coast from Algeciras, past Málaga and on towards Almería.



Fig. 5.14 Eastern Andalucía and the settlements mentioned in the case study

The push and pull factors driving urban–rural migration in this part of the world are much the same as elsewhere. People who can afford it are driven out of the city by the crowded and congested conditions, by the air and noise pollution, by the high property prices and the high crime levels. They are attracted to the countryside

by the lower property prices, the cool fresh air of the hills, better security and the opportunity to have a larger house with a garden and a swimming pool.

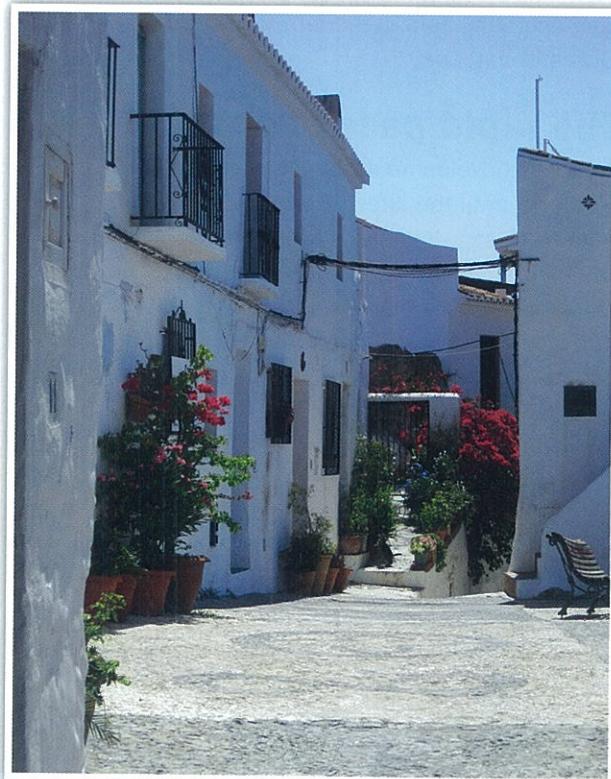


Fig. 5.15 What the migrants are looking for – the old village of Frigiliana. Frigiliana is a village in the foothills of the Sierra Tejeda, about 50 km east of Málaga

New building has taken place on the outskirts of the old villages but also in the actual countryside itself, producing a **dispersed settlement** pattern. The opportunity to commute to the cities via the new motorways shows how the barriers to migration have been reduced.



Fig. 5.16 The recently completed A7 motorway 'Autovía del Mediterráneo'. This is the junction leading to the hillside village of Frigiliana

However, studying geography is rarely simple and work by Briggs in the late 1990s has shown that urban–rural migration is only one of the migration flows that have been operating here in the recent past and that other flows still continue.

The rapid pace of change

Economic development did not really begin in Andalucía until the late 1950s with the growth of the tourist industry. Initially, urbanisation dominated, as with all regions undergoing rapid economic growth. People left the rural areas to find work in the coastal tourist resorts or in the manufacturing and service industries of the rapidly expanding cities. Traditional farms were neglected and many old rural dwellings were abandoned. However, with increasing affluence and the completion of the new motorway system in the first decade of the 21st century, many of the richer urban dwellers decided to move into the countryside for a better quality of life, in a new house with good amenities. They continued to work in the cities, commuting daily along the excellent new motorways. The two migration flows (rural–urban and urban–rural) still continue today but the number of people moving into the countryside greatly exceeds the number leaving. Accessibility is a key factor within this. Many new houses are being built in rural areas close to the new motorways and are gaining people, while the more remote rural areas are still losing people with old houses being abandoned.

The role of 'naturbanisation'

Work by Berry and Champion in the USA in the 1970s and more recently by Prados in Andalucía has investigated a trend whereby urban–rural migrants

have tended to move into the most scenic areas of the countryside, such as the National Parks. This process has been called **naturbanisation**. Prados' work in Andalucía has shown that naturbanisation is one factor driving urban–rural migration in Andalucía, albeit a minor one. Most of the new building north of the A7 motorway to the east of Malaga has been in the foothills of the Sierra Tejeda but not in the National Park itself.

The role of international migration

Not all the new buildings in rural Andalucía are occupied by local people moving out of Malaga and Granada. Many of the new residents are from the countries of northern Europe such as the UK and the Netherlands. If the foreigners have bought these properties as holiday homes, used for only a few weeks each year, this counts as tourism and is not a form of migration. However, if they have been bought by people who are retiring to southern Spain from northern Europe, they are permanent residents and this is a form of migration. It is also a form of urban–rural migration because most of the migrants are moving from the cities of northern Europe to rural areas in Andalucía. This shows that urban–rural migration is not just a feature of *internal* migration as suggested by most of the theories, but can also be an aspect of *international* migration. This has been stimulated by the lowering of the barriers to migration within the European Union. Retired UK pensioners are able to access their pensions and medical care just as easily in Spain as in the UK. The attractions of retirement in sunny Spain are a powerful pull factor.

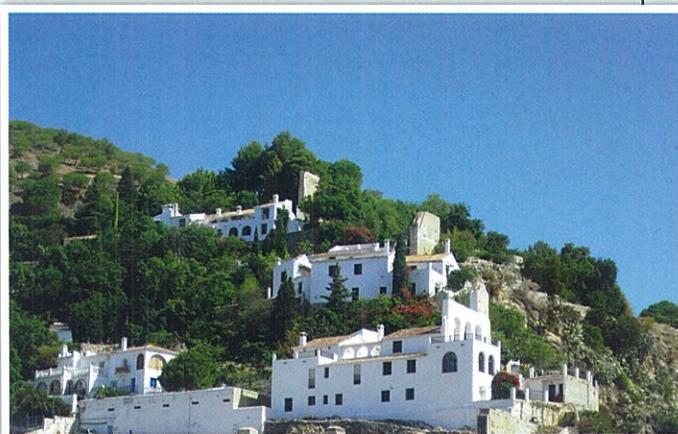


Fig. 5.17 Old and new in Frigiliana. The new houses in the photograph have been built in the ruins of an old olive oil factory which went out of use when the local economy moved from agriculture to tourism. The walls of the old factory buildings can be clearly seen

Intra-urban migration

This type of migration is by its very nature small scale and occurs over short distances. The causes are related to changes in an individual's family life cycle and to changes in their employment status which influence their affluence. Movements are also closely related to the fact that different types of accommodation are found in different parts of a city and the size and cost of the accommodation reflect the size

and nature of the migrant's family and their wealth at different stages in their life.

Recent work in the UK and Canada has shown that the patterns of intra-urban migration depend on the social class and income of the people involved. This can be illustrated using the Mann-Robson model of urban structure.

Intra-urban migration paths are likely to be different in an MIC city.

Movements of a working class resident

- Childhood in 1930s rented council house.
- Leaves school and moves into rented rooms in the industrial area close to where a job is available.
- Marries and moves to a rented flat in a council tower block.
- Starts a family and moves into a rented 1960s council house.
- Retires to an old person's bungalow rented from the council.

Movements of a middle class resident

- Childhood in a 1930s private semi-detached house.
- Leaves university and moves into a rented flat close to a job in the CBD.
- Marries and moves into a private semi-detached house close to a good school for the children. Able to commute to office in the CBD.
- Promotion at work allows a move to a private, detached house in an affluent modern suburb. Commutes to work in the CBD.
- Retires to a large house in the **rural-urban fringe** close to the new edge-of-town retail park for shopping.

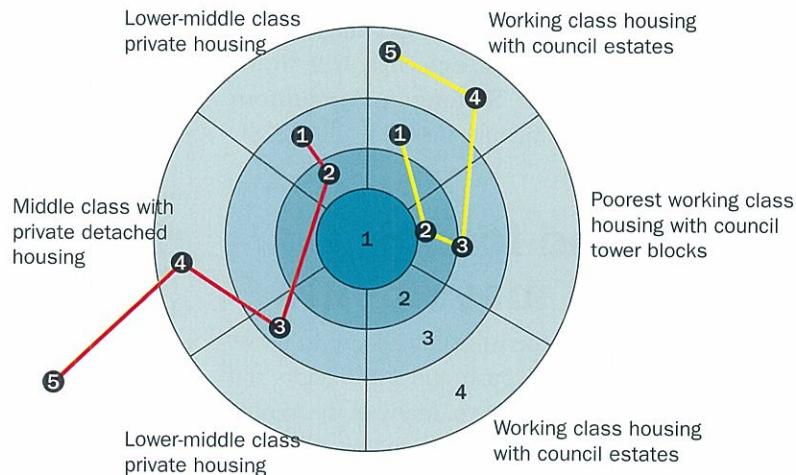
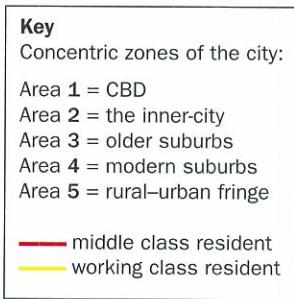


Fig. 5.18 Two possible intra-urban migration paths based on the Mann-Robson Model of a typical UK city

- The male migrant is most likely to have moved in from the countryside and begins by living in a *favela* with a relative who has already moved to the city.
- Once the migrant has built their own home in another *favela*, the rest of the family can move to the city to join him.
- Working in the informal sector and then in a nearby car factory allows the family to move to a self-help housing scheme run by the council in the *periferia* where conditions are better than the *favela*.
- One of the children of the family does well at school and gets a service industry job in the CBD. This pays enough for this second generation migrant to afford an apartment in an affluent area close to the CBD.

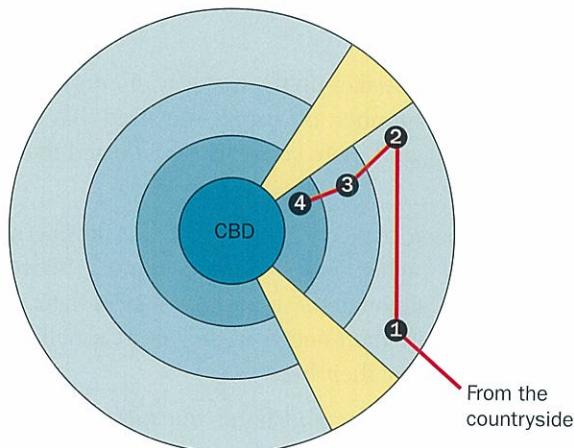
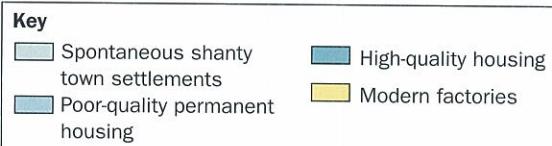


Fig. 5.19 Possible intra-urban migration path in a Brazilian city

International migration

International migration is defined as the movement of people across international frontiers from one country to another. Three per cent of the global population currently live outside the country of their birth.

International migration can be explained with reference to the relevant push and pull factors and the nature of the intervening barriers in the same way that all migration can be explained. The main factors that appear to have driven recent international migration streams are:

- Population pressure in the source country.
- Economic differences between countries which mean that people move in search of a higher standard of living.
- War, natural disasters, lack of personal freedom and persecution in the source country which makes people move in search of a better quality of life.
- The reduction of barriers to international migration in some parts of the world. This is especially true in the European Union where the **Schengen Agreement** allows free movement of people between all the EU member states.

Voluntary and forced (involuntary) movements

Voluntary migration is when the migrants choose to move. They are affected by the usual push and pull factors but the final decision to move is their own. Many of the people who make a free decision to migrate are economic migrants, moving in order to obtain a better standard of living, i.e. a better or more highly paid job. A distinction needs to be drawn, however, between *independent* movement when an individual makes the decision to move, and *dependent* movement when the family decides to move and some members of the family may not be involved in making the decision.

Voluntary migration makes up the majority of international movements. The number of people involved has been steadily increasing and more countries are affected than in the past.

- There has been a recent increase in the numbers of students and highly skilled workers moving between countries but, although these migrants stay in their new country for more than one year, they don't usually stay there for the rest of their lives.
- Globalisation, cheaper and faster transport, rapid and free movement of information, and the reduction of barriers to migration in some parts of the world have contributed to the increase in numbers.

→ The number of female migrants has been increasing steadily and women currently make up almost half of all international migrants. This reflects the changing employment structure in many of the receiving countries with more service industry jobs and fewer manufacturing jobs available.

- Most emigrants from HICs go to other HICs.
- Emigrants from LICs tend to move to MICs, NICs and HICs. This has forced many HICs to increase the barriers to immigration.

Forced (involuntary) migration occurs when the migrants feel they have no alternative but to move. A natural disaster may have destroyed their home or their ability to make a living. War may mean that they have to flee in fear of their lives. Religious or political persecution is another reason why people may feel that they have to move.

Historically, forced recruitment of labour was a cause of involuntary migration. The abduction of 15 million Africans to be sold as slaves in The Americas is the largest forced migration stream in history. Transportation of convicted criminals from the UK made a significant contribution to the early settlement of the British colonies in America and in Australia. Less well known is the practice of indentured labour which was widely used in the British Empire e.g. the movement of people from the Indian sub-continent to work in South Africa and in the sugar cane fields of Mauritius at the end of the 19th century.

However, it is war and civil conflict that is the main cause of forced migration. There are 42 million **displaced people** around the world, but not all of them have crossed an international frontier. Those who have are known as refugees while people who have moved within their own country are **internally displaced persons** (IDPs). War is more common in LICs than in HICs, especially in Africa, and modern light weapons are cheap and can be used to arm local militias. Many people simply flee the violence of war but others may actually be forcibly evicted as part of **ethnic cleansing** operations.

Refugees have a major impact on the country of destination, which is usually a neighbouring country as most refugees stop travelling as soon as they have left the danger of their own country. As many conflicts are in LICs this means that it is often neighbouring LICs that have to cope with the influx of refugees. Refugees need shelter and food and because they are mostly women caring for children they have little positive economic impact on the economy of the receiving country. This puts considerable strain on the ability of the receiving country to cope and the United Nations High Commission for Refugees (UNHCR) often has to step in to help. Refugees also flee from natural disasters. Once again, it is LICs that are worst affected, as they don't have the money to invest in measures that would protect their people from the impact of these hazards. An example of this was the volcanic eruptions

on the Caribbean island of Montserrat between 1995 and 1999, when over 50 per cent of the island's population were forced to leave, some to neighbouring countries in the Caribbean and some to the UK.

Human-induced disasters can also lead to forced migration. Over 100 000 people have left the area around the Aral Sea in Central Asia as a result of the environmental degradation caused by overuse of irrigation water and the consequent drying up of the Aral Sea. The future impacts of human-induced climate change are bound to affect different countries in different ways and this will certainly lead to international migration streams developing.

In theory, there is a clear difference between voluntary and forced migration. However, in reality there is a spectrum between the two with considerable overlap in the middle of the range. Recently, economic migrants have been claiming to be refugees in order to get into HICs and become richer. This is one of the reasons why many HICs have increased the barriers to migration.

The causes of international migration

Since the end of the 20th century and the beginning of the 21st, there has been an increasing trend for poor people to move to HICs. There is pressure from people in LICs and MICs who want a higher standard of living, for example people from Africa moving to the EU and people from Mexico and other Central American countries moving to the USA. It is now a major global issue and it causes a lot of misunderstanding, fear and worry. The two main causes can be summarised as **population pressure** in the LICs and MICs and the economic differences between the LICs, MICs and the HICs, differences which seem to be widening rather than reducing.

Population pressure

Population pressure is the direct result of development moving poorer countries into stages 2 and 3 of the DTM (see pages 110–111). As death rates fall and birth rates remain high, the population grows. Population pressure is closely linked to the idea of overpopulation with more people in a country than the resources can support. Underemployment and poverty are typical symptoms of overpopulation and poor, unemployed people see migration as a sensible solution to their problems.

Economic differentials

The obvious destination for an economic migrant is a richer country. In richer countries jobs will be available and wage rates will be higher. It is these economic differentials that have stimulated people to move from LICs and MICs to HICs, despite the difficulties placed in their way. As more

and more people decide to move from the poor global 'South' to the richer global 'North', the HICs have increased the barriers to movement, fearing that they will be swamped by a wave of poor, unskilled people.

The changing barriers to international migration

The barriers to international migration are generally quite high and are usually much more significant than the barriers to movement within one country or within one city. Initially, there were only minor restrictions on movement, however as the flow of poor migrants has increased most HICs have imposed greater and greater restrictions. Most of them now only allow in skilled workers, such as doctors. The main barriers to international migration are cost, distance, limited information, cultural differences and immigration laws.

Cost

Cost includes the cost of closing-up at the point of origin and the opening-up cost of purchasing or building a house at the point of destination. The economic cost of the journey itself will depend on the distance travelled and the type of transport used. Air travel is quick but expensive and is the way that most intercontinental migrants choose to travel. Illegal immigrants may not use air travel because the checks at airports are often very rigorous but even when travelling overland or by boat, the cost of paying an intermediary to organise their unobserved, illegal entry into the destination country can be very high. The emotional cost of leaving friends, family and a familiar location is difficult to quantify, but is not insignificant.

Distance

This is often the greatest barrier to international migration. Long journeys take more time and cost more money. It is more difficult to return to the point of origin if the migrant has moved a long way and this makes it more difficult to keep in touch with family and friends.

Cultural and information barriers

The immigrant may well have limited information about conditions in the destination country, knowing only that there are improved chances of making money. They may speak a different language, follow a different religion and hold a very different cultural outlook from the people in the destination country. This can lead to big problems for the migrant when they arrive because they will stand out as different and they may well suffer persecution as a result. This often results in people from the same country of origin clustering together in ethnic ghettos once they arrive at their destination. However, information is flowing much more

freely than it used to. Internet services such as Google Street View allow prospective migrants to take a virtual 'walk' down the streets of many destination cities. Social network sites allow instant communication between people in the place of origin and the prospective destination. Services such as Skype™ allow migrants to keep in touch with relatives at home much more easily than in the past. All these things reduce the social barriers to migration.

Immigration laws

During the late 20th century most HICs imposed restrictions on immigrants, including:

- Limiting the number of migrants at the point of origin by making **visa** requirements much more demanding.
- Only allowing people claiming to be tourists in if they have already purchased a return ticket. This aims to stop people who claim to be tourists from entering the country and then disappearing.
- Intercepting illegal sea crossings, for example between north Africa and Sicily.
- **Repatriating** ineligible asylum seekers immediately and making the airline that brought them pay for their return.
- Making people who host foreign visitors pay a large deposit which is only refunded once the visitors have returned home.
- Using holding bases in a third country where the papers of potential migrants can be checked. Germany has used this technique to reduce the influx of Bulgarian and Romanian migrants.
- Building border fences. The USA has done this to prevent the entry of Mexican and Central American immigrants.

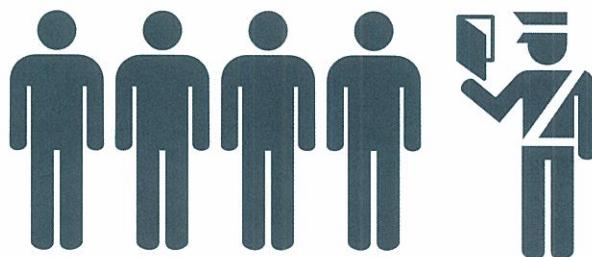


Fig. 5.20 Passport control

The patterns of international migration

Fig. 5.2 (page 136) shows some of the main migration flows and patterns of recent years. The main ones include:

- Economic migrants from Mexico, Central America and the Caribbean into the USA.

- Economic migrants from west Africa into the EU.
- Free movement within the EU of people from the poorer countries of eastern Europe to the richer countries of western Europe.
- Economic migrants from south-east Asia into Australia.
- Construction workers from south Asia into the oil-rich countries around the Gulf.
- Young men moving to work in the mining industries of South Africa, Botswana and Australia.
- Refugees fleeing from wars in Afghanistan and Syria - mostly into neighbouring countries.
- Students from China and Russia going to school and university in the USA and the EU.

This can be illustrated by studying maps of migration related to individual countries.

The patterns shown on the map (Fig. 5.21) are:

- Large numbers of migrants moving from Cameroon into neighbouring countries - the influence of distance-decay which means that short distance movements are easier than long distance movements. Gabon and Nigeria are especially important destinations as they both have a growing economy, partly fuelled by oil exports.
- Movement to HICs but especially the EU. Because Cameroon was a French colony, many people speak French and this explains the large number of migrants in France.

The patterns shown on the map (Fig. 5.22) are as follows:

- The UK receives migrants from a wide range of countries. This reflects the nature of the former British Empire and the popularity of English as a 'global' language.
- Free movement within the EU provides another large source of migrants, especially from the relatively poorer countries of eastern Europe such as Poland. Distance-decay, historic ties and a common language explain the large numbers of migrants from the Republic of Ireland.
- Refugees from Somalia and Afghanistan have been driven from their homes by war.
- Globalisation explains the movement of business people from other rich HICs such as Germany, the USA, Canada and Japan. In 2013 the Bank of England, an archetypally English institution, appointed a new governor from Canada.
- Many of the migrants from China and Russia are students accessing internationally-valued British educational institutions.

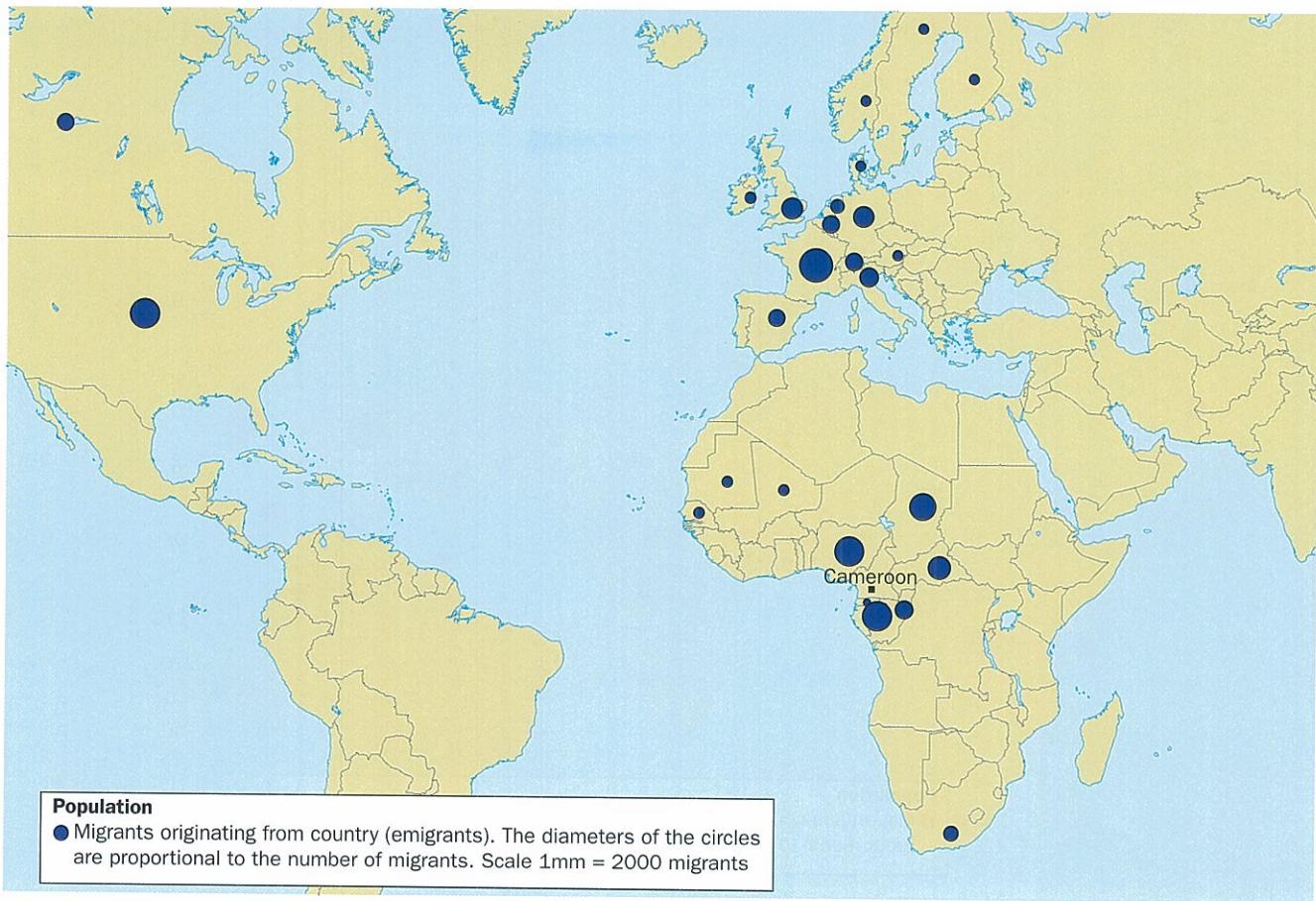


Fig. 5.21 The destinations of migrants from Cameroon, a country in west Africa. Data are for 2013

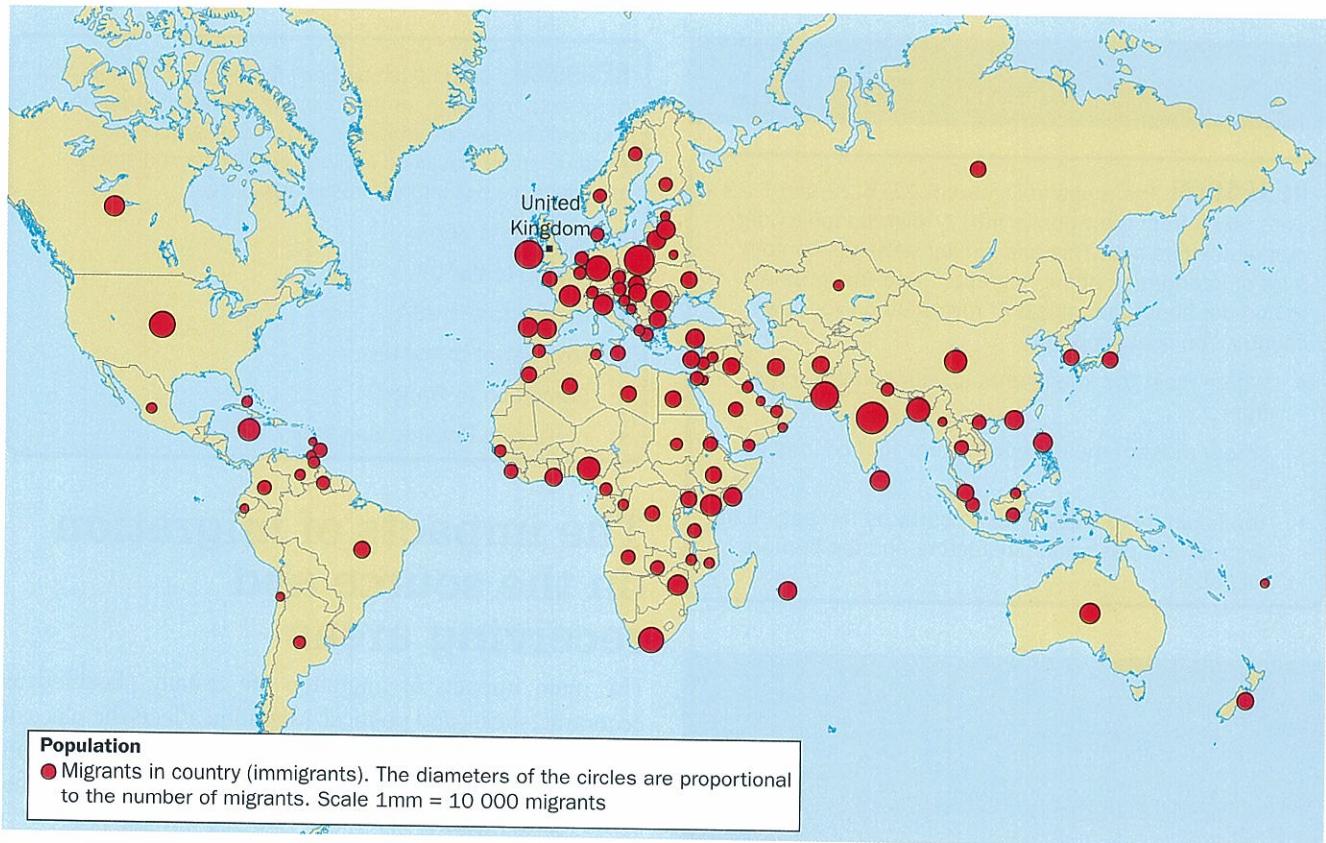


Fig. 5.22 The origins of migrants into the UK, a country in Western Europe and a member of the EU. Data are for 2013

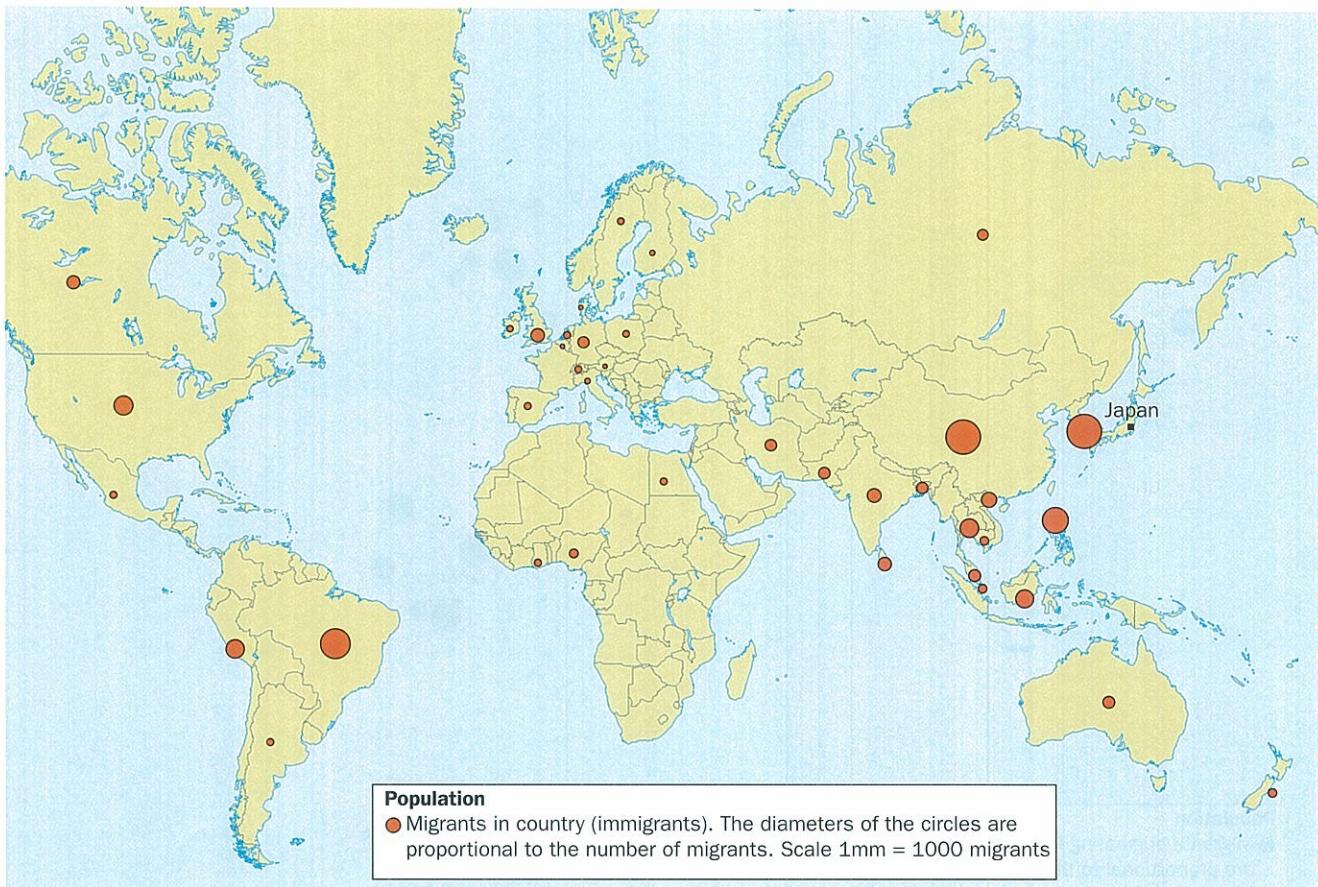


Fig. 5.23 The origins of migrants into Japan, an HIC in east Asia. Data are for 2013. © OpenStreetMap contributors

15. Describe and try to account for the distribution of Japanese immigrants shown in Fig. 5.23.

RESEARCH The maps in Figures 5.21, 5.22 and 5.23 were taken from the website <http://migrationpolicy.org/> programs/data-hub. This and similar websites contain a lot of information about migration. Use the internet to find out about the impact of migration on your own country. You could find out:

- Where most the immigrants to your country come from.
- Where most of the emigrants from your country go to.
- You could try to explain these patterns by considering the relevant push and pull factors and the barriers to migration.

16. The four photographs in Fig. 5.24 tell the story of a current migration stream. Write a paragraph to tell this story, including place of origin, push factors, pull factors, the nature of the journey, and the life of the migrant in the destination country.

RESEARCH List the push and pull factors and the potential barriers to migration for the following migration streams. You should also determine what type of migration each stream can be classified as, for example short distance/long distance, voluntary/forced, legal/illegal.

- Somalia to Kenya
- Poland to the UK
- Mexico to the USA
- Montserrat to the UK
- Cameroon to France
- north-east Brazil to Sao Paulo.

The impacts of migration on the source and receiving areas

The main impacts of migration are usually classified as economic, social, and political. Migration affects the place of origin differently to the place of destination. Each migration stream is unique but the notes below try to summarise some of the main impacts.

Case study: The impact of migration on the place of origin: Bulgaria

Bulgaria is a former communist country (FCC) in south-east Europe.

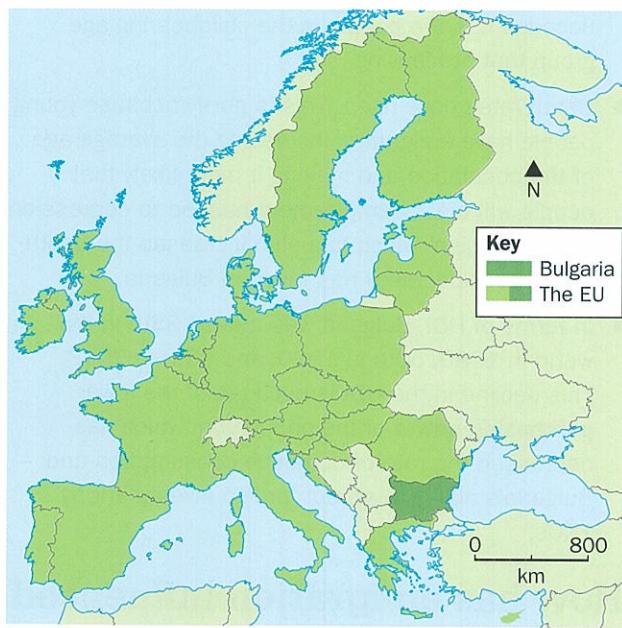


Fig. 5.25 The location of Bulgaria in Europe

Bulgaria – some social statistics:

- population = 7.3 million
- birth rate = 9.5% per year
- death rate = 15% per year
- life expectancy = 74 years
- fertility rate = 1.43 children per woman
- total rate of population change = minus 6.2% per year
- proportion of single person households = 33 per cent
- proportion of families with no children under 16 = 76 per cent.

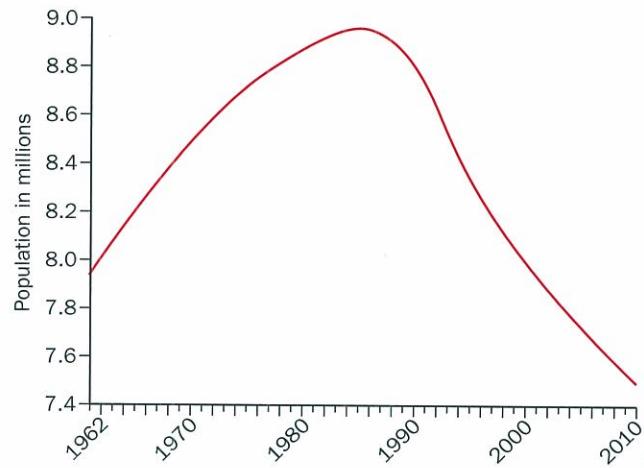


Fig. 5.26 Bulgaria – population change 1961 to 2009

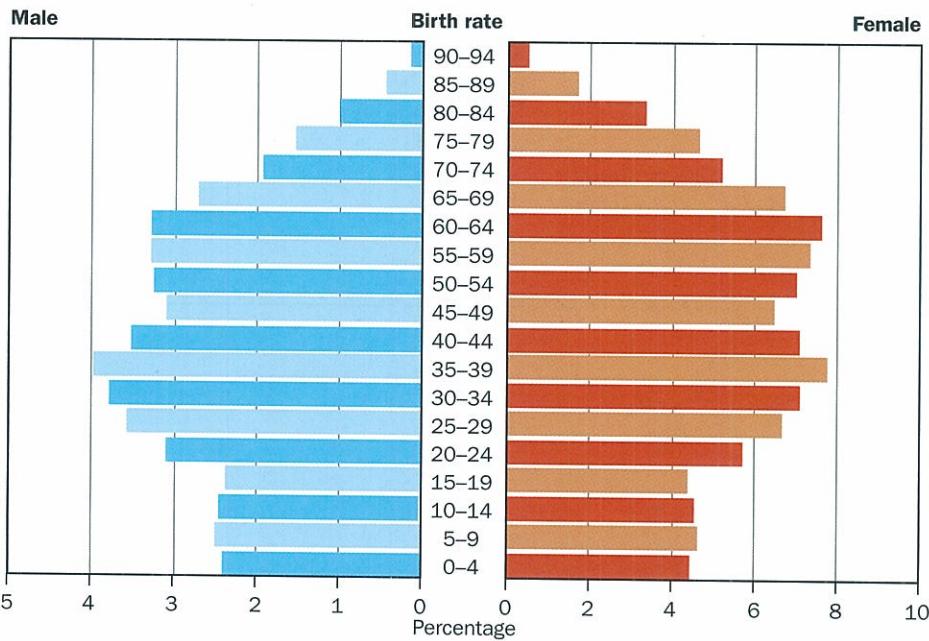


Fig. 5.27 Population structure of Bulgaria in 2013

What are the reasons for Bulgaria's declining population?

Emigration is the main reason for population decline and has been caused by the following factors:

- *Economic decline*: in the 1980s, Bulgaria was a communist country with a centrally planned economy. The fall of communism in 1989 meant that the collective farms were split up and the old, out-dated industries closed down. This led to high rates of unemployment and rapidly rising prices. Poverty increased dramatically. This provided powerful push factors, encouraging emigration.
- *Reduction of the barriers to migration*: there has been a huge exodus of people leaving the economically-troubled country in search of a better life abroad. Most of the emigrants are young and well educated. The fall of communism 1989 removed restrictions that had prevented people leaving the country. Bulgaria joined the EU in January 2007 and this allowed free movement to the rest of the EU. Some EU countries blocked Bulgarian immigration in 2007 but the restrictions were lifted in 2014.

The impacts of emigration on Bulgaria

Declining population causes economic and social problems:

- The country's economy is affected because of the decline in the working population which reduces productivity, reduces the GDP and reduces the government's tax revenue. There are not enough workers to fully exploit the country's resources. Fertile agricultural land is no longer being used because there are not enough people to work on the land.
- The ageing population puts pressure on government expenditure because of the need for more pensions and more healthcare.

- Remittances from Bulgarians abroad may soon rival the domestic sources of Bulgaria's national income.
- Socially, older people become very lonely because their children have moved abroad.
- High emigration rates have reduced the birth rate because it is the people in the childbearing age group that are leaving.
- Death rates have risen. This is partly because young people have emigrated, increasing the average age of the population and making it more likely that people will die. Unemployment has led to depression and alcoholism which has also increased the death rate. Life expectancy has fallen in Bulgaria.
- In terms of HDI, Bulgaria was ranked 38th in the world in 1980, 50th in 1990, and 58th in 2013. This decline in the HDI is because of the lower **purchasing power** of the population, which has depressed the rate of domestic consumption and Bulgaria's ability to attract foreign investment by TNCs.

How has emigration influenced government policy?

Depopulation is a serious worry for Bulgaria's government. If young people keep leaving, or not starting families, there will be no workers to pay for pensions and social welfare. The government are providing extra tax relief to persuade couples to have more children. Government policy to provide kindergarten places is intended to enable women to combine having children with work and careers. Joining the EU could lead to economic development and a rise in foreign investment by European TNCs which would encourage more people to stay. Foreign TNCs are also attracted by the low labour costs. The government needs to introduce policies to encourage this foreign investment.

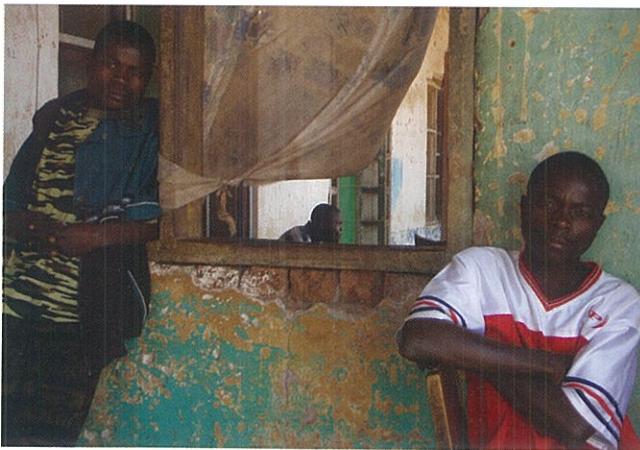


Photo A: Young unemployed men in Nigeria



Photo B: Across the Sahara



Photo C: Across the Mediterranean



Photo D: Working in the informal economy in Paris

Fig. 5.24 Photographs illustrating a modern migration stream

Impacts of migration on the country of origin

Negative economic impacts

- The loss of young adults from the labour force.
- Farms could be abandoned, reducing agricultural output.
- Loss of the labour force may deter inward investment by foreign TNCs.
- Economic development may be slowed if skilled workers leave (a 'brain drain').
- The old people left behind lead to an ageing population, reducing tax revenues and increasing government expenditure on pensions.

Positive economic impacts

- A reduction in unemployment and welfare payments. The remaining workers become more productive.
- There may be more food available, increasing the daily calorie intake.

→ There is less pressure on essential services and amenities such as schools and healthcare.

→ Housing shortages may be reduced.

→ Farms may become larger and more commercial, boosting food production and the economy.

→ Migrants send remittances home and this money can stimulate demand, leading to economic growth.

→ Returning migrants may bring a wider range of employment skills with them, improving the quality of the labour force.

Negative social impacts

→ If the migrants are successful in their new country, this may encourage more young people to migrate, unbalancing the social structure of the country of origin.

→ Because young men tend to migrate more than young women, both may find it difficult to find marriage partners.

→ The traditional extended family is disrupted by the emigration of the younger generation. There may be no support for the old people left behind.

Positive social impacts

- Population density is reduced and the number of people per household may also be reduced – children may be able to have a room of their own.
- Birth rate decreases because most migrants are of childbearing age. This reduces pressure on child clinics and reduces class size in schools.
- If the man of the family migrates, the woman becomes head of the household, improving her social status.
- Remittances may be able to pay for home improvements and private education.
- Returning migrants may increase social expectations in the community. They may be more aware of the value of education and the need for leisure facilities.

Political impacts

- If migration leads to population decline, the government may adopt **pro-natalist policies** to boost the birth rate.
- The government may try to discourage emigration.
- Taxes may be increased to compensate for the lost tax revenue that the emigrants would have generated.

Impacts of migration on the destination country

Negative economic impacts

- More people mean that the cost of providing health and education services increases. Because most migrants are young people, they are in the childbearing age range, meaning that more maternity beds and school places have to be provided.
- More housing will need to be built, sometimes by the local council, increasing local taxes.
- Some industries may rely too heavily on migrant labour, e.g. fruit picking and the building industry, causing problems for local workers.
- Some of the money earned is sent back as remittances and not spent in the destination country.
- It may be more difficult to reduce unemployment in the original population. This means welfare payments remain high, even though the economy is growing.

Positive economic impacts

- Economic migrants take the less desirable jobs: the difficult, dirty and dangerous (and low paid) jobs.
- The destination country gains skilled labour at reduced cost, especially in terms of training costs.
- Skills shortages can be filled quickly.
- Because immigrants will work for low wages, this reduces labour costs for employers in the destination country.

- If migrants return to their place of origin when they retire, the cost of their pensions does not have to be borne by the destination country.
- If migrants are allowed in on **work permits**, these can be revoked when the economy goes into recession, saving money on **welfare benefits**.

Negative social impacts

- Ethnic ghettos develop when groups of immigrants choose to live in the same area. This can depress house prices and lead to racial tension.
- Schools in these areas tend to become dominated by migrants' children and the parents of local children may choose to educate them elsewhere.
- Eventually, aspects of the migrants' cultural identity are lost, especially for second generation migrants.

Positive social impacts

- Creation of a multi-ethnic society can lead to a greater appreciation and understanding of other cultures.
- Immigrant families often move into and revitalise declining services such as local convenience stores.
- A wider range of products and foods become available to the whole community.

Political and cultural impacts

- In the destination country, discrimination against minority immigrant groups can lead to unrest. The government may bring in laws to outlaw racism and extremism.
- This may lead to a reaction from the original population, leading to the election of anti-immigration parties or the shifting of government policies towards anti-immigrant policies.
- There may be calls for restrictions on immigration which can lead to more border checks and increased barriers to international movements of people.
- The migrants may 'close ranks' and emphasise more strongly their cultural identity.
- The arts can be enhanced by immigrant culture. Immigrant music may move into the mainstream and immigrant styles may influence mainstream fashion.

Environmental impacts

- Reduced population pressure in places of origin can lower the rate of environmental degradation, e.g. less destruction of woodland for firewood and a lower risk of soil erosion.
- Immigration leads to the growth of cities, leading to more air pollution and noise pollution.

17. 'Immigrants bring more advantages than disadvantages for the destination country.' To what extent do you agree with this statement?

Case study: The impact of migration on the place of destination: Mexico to the USA



Fig. 5.28 Mexican migration to the USA

Mexican emigration to the United States has been one of the most important migration flows in recent years. There is a 2000 km land border between the USA and Mexico which is difficult to patrol. Up to half a million migrants from Mexico arrive legally or illegally in the US in any given year, joining the estimated 12 million already in the country. Most Mexicans have settled in the states that border Mexico, such as Texas and California. Clearly the principle of distance-decay applies here but historical considerations are also important as these border states used to belong to Mexico before 1836.

What have been the impacts of Mexican immigration on the USA?

Economic impacts

- Mexican migrants often take low paid, unskilled jobs, as these offer higher wages than they'd earn in Mexico. At one point in the 1990s, the minimum wage in the USA was seven times higher than the average wage in Mexico. The fact that the migrants fill these jobs is an advantage to the USA economy,

as most Americans don't want these jobs but employers need people to fill them.

- Whenever unemployment rises in the USA, Americans want these menial jobs but they are already filled by the migrants. This creates a perception that immigrants take jobs away from American workers.
- Migrants work for very low wages. Americans who want similar jobs are expected to work at these low wages too, which leads to increased poverty for these poorly-qualified Americans.
- Some companies are replacing American labour with cheaper migrant labour, increasing unemployment rates in the indigenous population as people are forced out of their jobs.
- Legal Mexican migrants are working and paying taxes which helps to pay for social spending and infrastructure development in the USA.
- However, the migrants often send money they earn back to their families in Mexico as remittances, rather than spending it in America. This can impact on the USA's economy as there is less money being spent on products and less purchase tax being raised.

Social impacts

- Integration of Mexicans into some American communities has been difficult. Many Mexicans don't speak fluent English and if they live together with other Mexican immigrants their second language skills often remain low.
- There are concerns that immigrants are increasing the crime rate in the areas that they move to. Low income and poor education are factors which can lead to crime. A vibrant drug trafficking industry in Mexico means some Americans have concerns that some Mexican migrants might be smuggling drugs into America or have links to those that do.
- The introduction of Mexican cultural traditions to America has been a positive development. Mexican-themed food has become very popular with burrito and taco fast-food shops opening up across the country. Mexican food and music has further increased the cultural diversity of America.
- With such a large number of Mexican migrants not speaking good English, Spanish is now taught in many American schools, widening the language skills of the younger population and improving their potential career opportunities. This also helps to ease social tensions caused by people speaking different languages which locals don't understand.
- The influx of young, healthy labourers into the US from Mexico will help to counteract a potential population decline in the US, something currently occurring in parts of Europe. Migrants' contributions to the social security system help offset the pensions taken by the ageing US population.

Political impacts

Because many Mexican immigrants are illegal or undocumented, and because of the negative economic and social attitudes adopted towards them by many Americans, their entry has triggered a variety of government and popular responses aimed at reducing the number of Mexicans entering the USA.

One criticism surrounds the use of public services by illegal Mexican immigrants, and this has led to the introduction of California's Proposition 187 that seeks to limit public education and healthcare for non-citizens. However, research suggests that illegal immigrants possibly pay more in US taxes than they consume in services.

Despite such evidence to the contrary, many in the US perceive Mexican immigration as a burden on the economy. Culturally and socially, many Americans are uncomfortable with the rising Spanish-speaking population, especially in the American south-west. This has led to:

- Debates in the US Congress about immigration policy. In 2006, President Bush proposed an immigration reform bill which included citizenship for illegal immigrants already in the country. The bill was defeated.
- The construction of a physical barrier or border fence along the US-Mexico frontier designed to prevent illegal crossings. Along with this has come a 300 per cent increase in border guards. This costs up to \$12 billion per year.
- Patrols by civilian militias (vigilantes) have also increased. Many US residents living near the border have mobilized to prevent illegal crossings.

Overall

Mexican immigration into the USA has similar impacts to the immigration of people from poorer countries into richer countries throughout the world. Mexican immigration acts as a subsidy to businesses that employ unskilled workers, holding down labour costs while taxpayers pick up the costs of providing services to a much larger poor population. In other words, the advantages tend to be economic while the costs are social. In theory, the extra boost to the economy that the migrants' labour provides should pay for the social costs of supporting the migrants and their families. The problem is that there is always a lag time before the extra economic benefits can be used to improve the social infrastructure.

Case study: International migration: Poland to the UK



Fig. 5.29 The EU, locating Poland and the UK

The European Union allows free movement of EU citizens within and between all the member countries. This means that UK residents don't need a visa to go on holiday to Spain and if a student wants to spend their gap-year working in a ski resort in the French Alps, there are no restrictions to stop them.

This also means that people from other EU countries can come to live and work in the UK. Until 2004 this was not a problem as most EU countries were rich and there was no great economic advantage if you moved to another EU country.

This changed in 2004 when several new countries joined the EU, most of them from eastern Europe where people were much poorer. Many people, especially from Poland, moved west to get jobs which paid higher wages than they could get at home. The UK government encouraged this because the immigrants paid their taxes and helped the economy to grow. However, many more people moved in than were expected. Between 2004 and 2007 half a million Polish workers moved to the UK when only 60 000 had been expected.

Some British people were not so sure about the advantages of unrestricted immigration because local schools, hospitals and housing were put under pressure.

Causes: why did it happen?

Push factors from Poland

- High unemployment – 19 per cent.
- Low wages – one third of the EU average.
- Housing shortages and overcrowding – only 300 dwellings for every 1000 people.

Pull factors to the UK

- Ease of migration – the UK allowed unrestricted access to Polish citizens (not all EU countries did).
- Plenty of jobs and high wages – a big demand for affordable, reliable tradesmen (e.g. plumbers), and wages were much higher than in Poland.
- Good exchange rate – the pound was worth five Polish złoty so sending a few pounds home made a big difference to the family in Poland.

What were the consequences of this migration?

Impacts on Poland

- Economic – a shortage of workers slowed Polish economic growth but the economy was boosted by the remittances that the migrants sent home – £2.2 billion a year.
- Social – the migrants were young so this led to an ageing population but housing shortages and unemployment were reduced.

Impacts on the UK

- Economic – the UK economy grew because of the extra workers but some of the money was sent back to Poland.
- Economic – Polish workers paid taxes that helped to pay for UK pensions.
- Social – some British people resented the Polish workers taking ‘British’ jobs.
- Political – British immigration laws have been made much stricter, especially for people from outside of the EU.
- Political – When Bulgaria and Romania joined the EU in 2007, the UK government put temporary restrictions on their citizens coming to the UK.
- Economic and cultural – Polish shops opened in many UK high streets.

How did the UK government react to this immigration?

Many UK residents thought the country couldn't cope with such large numbers of immigrants – there was pressure on jobs, schools and housing. There were ethnic riots in Wrexham. The government did not restrict access to Poles but it made them register under the *Worker Registration Scheme* so the UK Border Agency (another new development to control immigration) could monitor the situation. The government also severely restricted access to workers from the two newest EU states (Bulgaria and Romania) when they joined the EU in 2007. People from outside the EU have been affected because the government have now introduced strict limits on immigration from outside the EU.



Fig. 5.30 A Polish food supermarket in Liverpool, UK

Lincolnshire

Between 2001 and 2008, Boston's population grew from 55 000 to 70 000, a rise of over 25 per cent. Most of these new people were migrant workers from Eastern Europe, especially from Poland. They made a significant contribution to the local economy as there was work for them on the surrounding farms and in the town's factories, but rapid migration has produced some social problems. The original inhabitants sometimes feel that there are more foreigners than English people, which can lead to resentment and ethnic tension, especially as the immigrants will work for lower wages than the locals. Pressure is put on public services – houses, hospital beds and school places can't be provided quickly enough to cope with the rapid influx of so many people.

18. On balance, are the original inhabitants of Boston in favour of migration, or against it? Justify your answer.

The character and pattern of Polish immigration to the UK

Earlier migration streams to the UK had often involved people of non-European ethnic origin. They moved into the big cities such as London and Birmingham where work was available. They tended to cluster together in ethnic groups, producing recognisable ethnic ghettos in these big cities. Polish immigrants did not just move to the big cities but moved to a wide range of smaller towns where work was available. Wrexham in north Wales received large numbers of Polish immigrants because it had many jobs available in its out-of-town industrial zone – one of the largest in Europe. Rural towns such as Hereford and Boston also received large numbers of migrants because of the work available picking fruit and flowers in these agricultural areas (which often had long histories of employing seasonal workers from eastern Europe). As a result of this, the impact of Polish immigration was much more widespread than previous migration streams.

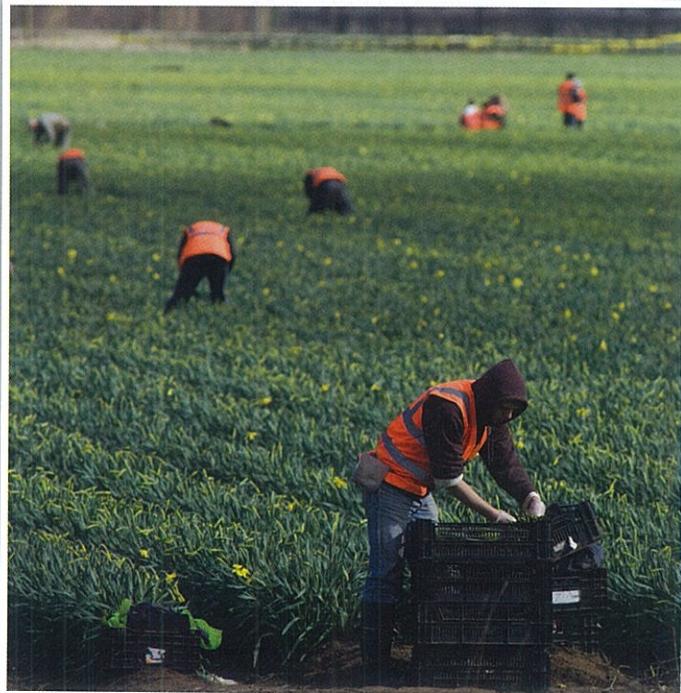


Fig. 5.31 Picking flowers in the rich agricultural land around Boston was one of the jobs that attracted Polish workers

Key concepts

The key concepts listed in the syllabus are set out below. For each one a summary of how it applies to this chapter is included.

Space: migration involves movement across the space between the place of origin and the place of destination. The nature of this space will contribute to the migrant's decision-making process. The types of transport available will change the migrant's perception of this space, e.g. walking will make the space appear larger than travelling by bus. The availability of air transport will shrink the space in the migrant's perception. Barriers to migration might make the space appear to be uncrossable for the migrant.

Scale: movements within a city (intra-urban migration) usually involve short distances and can be considered to be small-scale movements. Rural–urban internal migrations, including stepped migrations, will take place over a larger scale. International migrations can involve very long movements, which can be considered to be intercontinental or global in scale.

Place: migration involves people moving from the place of origin to the place of destination. The distinctive aspects of the place of origin contribute to the push factors that make the migrant want to move away. The migrant may consider a variety of destinations and each of these places will have a range of attractions to the migrant, the pull factors. The place with the strongest pull factors will be the place that the migrant moves to. It is the distinctive character of each of these places which is crucial, emphasising the importance of the migrant's *sense of place*.

Environment: natural environmental hazards can be one of the push factors stimulating migration, e.g. 50 per cent of the population of Montserrat had to leave their island when the Soufrière Hills volcano erupted between 1995 and 1999. Environmental degradation can also stimulate migration e.g. the Dust Bowl in 1930s USA which led to many people moving west to California. Environmental changes related to human-induced climate change (enhanced global warming) will certainly lead to large movements of people in the future. People moving out of an area can reduce the impact on the environment or lead to nature 'taking back' former cultivated land as in present day Bulgaria.

Interdependence: refugees are forced to migrate by circumstances beyond their control. They often have to rely on the goodwill of others to survive in their new home, especially if they are living in a refugee camp. The UNHCR often helps to organise these camps, showing how the rest of the world can help people in need. Remittances sent by migrants to their families can improve the standard of living of those families, increasing their purchasing power and stimulating the economy in the place of origin. Economists often talk about the *trickle down effect*, when money made by richer people ends up helping poorer people who work for them. Remittances could be considered to be a *trickle across effect*, linking people and economies in different places.

Diversity: international migration mixes people of different cultures, religions and ethnic groups. This can lead to increased diversity at the place of destination. In this chapter, mention has been made of curry restaurants in the UK, burrito bars in the USA and Polish shops in Wales. All of these increase diversity and can be seen to encourage tolerance and understanding.

Change: migrations lead to change, especially for the migrant and the migrant's family. The migrant has to adjust to a new way of making a living in a new part of the world. The family left behind at the place of origin also has to adjust to changed circumstances. Migration stimulates social change and economic change. At the beginning of a migration stream, the place of destination can experience positive economic change and negative social change. Over time these changes should even out. Reaction to migration can lead to political change e.g. in the UK general election of 2015, migration was a major factor determining the way that people voted.

Exam-style questions

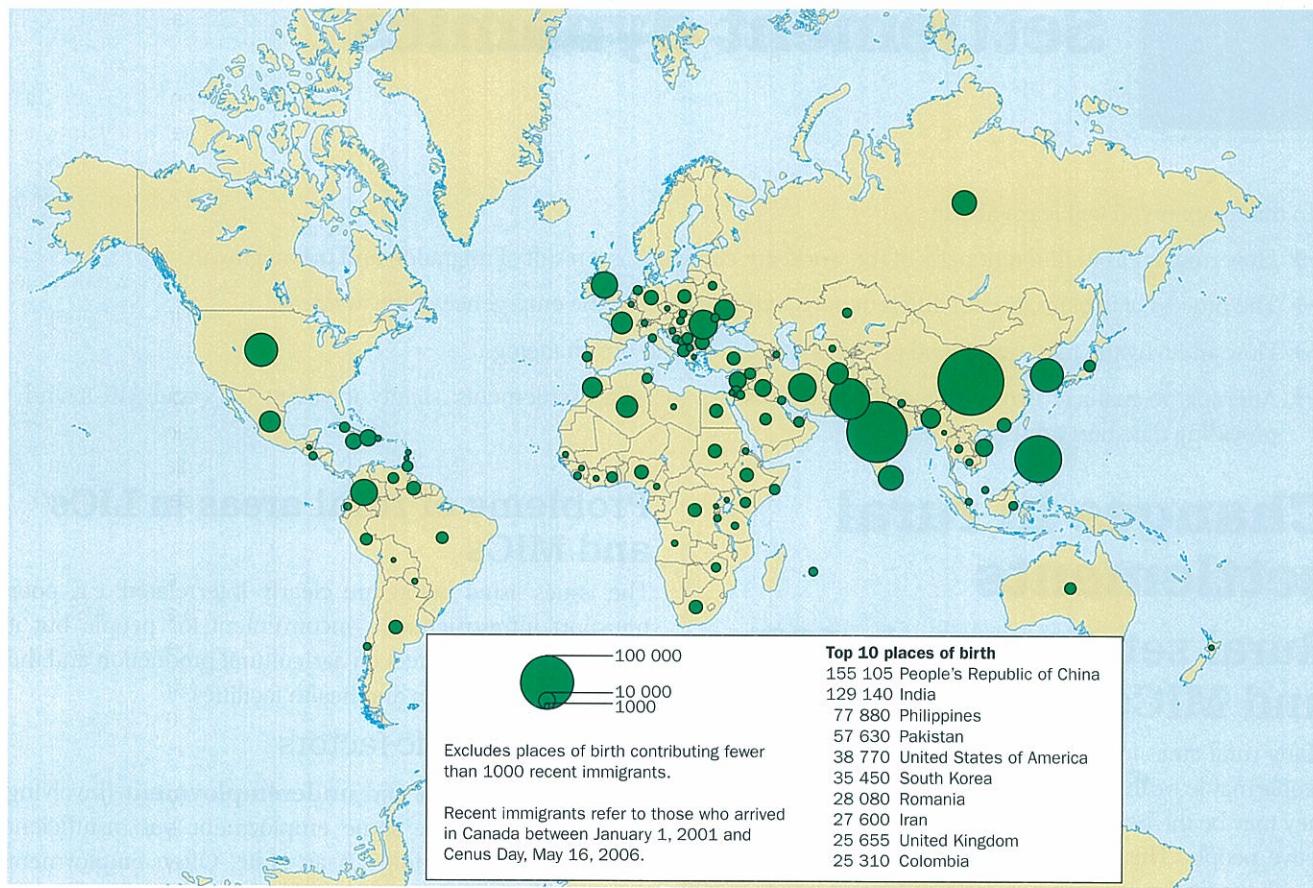


Fig. 5.32 Place of birth of immigrants to Canada in 2006 (source: Statistics Canada)

- 1** (a) According to Fig. 5.32, which two countries provided the greatest number of immigrants to Canada? [2]
- (b) Describe the pattern of the source areas shown in Fig. 5.32. [3]
- (c) Suggest reasons why Canada, an HIC, may be an attractive destination for migrants. [5]
- 2** (a) Explain why intra-urban migration may occur in LICs and MICs. [7]
- (b) Use one or more examples to explain how rural-urban migration has both advantages and disadvantages for the destination area. [8]
- (c) With the aid of examples, assess the importance of the obstacles and barriers to migration? [15]

In this chapter you will learn about:

- How rural areas in different parts of the world are changing as a result of migration and urban growth.
- The process of urbanisation in different parts of the world and the emergence of the *world city*.
- How and why the patterns of land use in urban settlements are changing.
- Attempts to manage two of the most difficult issues in urban settlements: shanty towns in LICs and MICs; and providing transport infrastructure.

Changes in rural settlements

Rural settlements in LICs and MICs

Many rural areas in these countries face complex pressures. People may leave the area as part of rural–urban migration and they may be the better educated and the more economically active people. This may be helpful in that there are fewer mouths to feed and to provide services for, but it may mean that there is a decline in the numbers of skilled people and of physically active people needed to maintain agricultural production. At the same time, high birth rates and declining death rates may mean that the overall population is still increasing, despite migration, and with that increase there is an increased demand for basic services, food and land. Some areas are overpopulated and some are underpopulated.

Many rural settlements were based on agriculture and developed a dispersed settlement pattern. Other settlements were nucleated, and developed partly because of the need for defence. Today, in nucleated settlements provision of services and basic infrastructure is much easier and rural industries are more easily organised. This means that facilities such as electricity, piped water and clinics are available to a smaller percentage of the population in the remote, sparsely populated rural areas. Children often face a long walk to school. However, even in relatively sparsely populated areas transport is available by private minibus services (known by various local names) and it is the norm for car drivers to give lifts for a small fee.

The physical environment is challenging in many tropical and sub-tropical LICs and MICs. This is mainly due to poor, easily eroded soils; climatic issues such as drought and hail; insect pests affecting crops and animals; and human disease, particularly malaria and HIV/AIDS.

Problems of rural areas in LICs and MICs

The issues listed below are clearly interrelated, e.g. poor transport infrastructure is inconvenient for people but it also has a negative effect on agricultural production and the provision of education and health facilities.

Socio-economic factors

- **Unemployment** and **underemployment** (involving people who have some employment but insufficient to occupy them fully) is an issue. Often employment in agriculture is in the informal sector and may only provide seasonal work.
- **Population growth** leads to increased demand for food and services and shortages of land.
- **Rural–urban migration** leads to rural depopulation, an ageing population, and a decline in the workforce but may alleviate population growth. Financial remittances (money sent home by migrant workers) may be important to families.
- **Low capital investment** is an issue. The vicious circle of low output and poverty is described in Fig. 6.1.

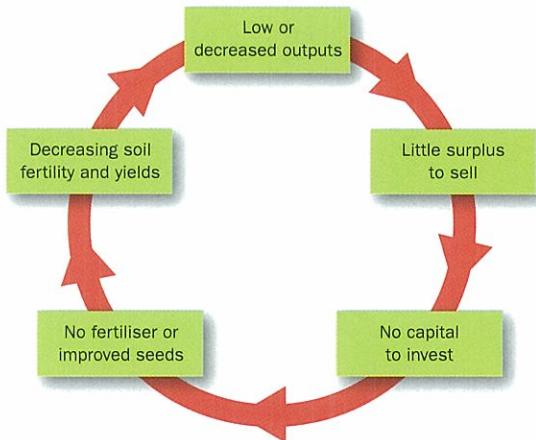


Fig. 6.1 The vicious circle of low agricultural outputs and lack of capital

→ **Human diseases** not only kill people, but also have a debilitating effect on the workforce. The World Health Organization (WHO) estimated that there are more than 225 million cases of malaria, killing around 781 000 people each year. Ninety per cent of malaria-related deaths occur in sub-Saharan Africa. Malaria is commonly associated with poverty and is a major hindrance to increased food production. The effect of HIV/AIDS is also important, particularly in southern Africa. In Swaziland between 1970 and 1990 life expectancy rose from 48 to 61 years but by 2008 it had dropped to 46. The population has been weakened by HIV/AIDS-related disease. In 2007, 26 per cent of 15–49 year-olds were infected and there were 96 000 orphans in the population of just over one million.

→ **Wars and government corruption** have significant effects on the well-being of the population in many countries. Many of the countries with the highest rates of poorly nourished children have been badly affected by internal conflicts. The prolonged conflict in the eastern part of the Democratic Republic of Congo is an example. Where people are forced to leave their homes, become refugees and have uncertain futures, this has an obvious effect on their ability to make long-term investments in increased food production. Corrupt officials may work to maintain their own positions and wealth to the detriment of development in the area.

Provision of services and infrastructure

→ **Clean, piped water** may not be available. Dirty water increases the incidence of diseases such as dysentery and diarrhoea which affect health, especially of children.

→ **Sewerage** services may be non-existent or poor. The complete lack of toilets or the use of communal pit latrines is common in rural areas.

→ **Electricity** might not be available. Without electricity, light in the evenings is only available from oil lamps and wood is burned for cooking and heating. This in turn leads to lung diseases. Imagine trying to do homework without electric light.

→ **Tarred roads** may not exist. Farmers in remote areas find it difficult to receive supplies and information about possible improvements to farming. Also they cannot sell surpluses easily and are therefore less likely to raise any capital and more likely to remain poor.

→ **Clinics and schools** in remote rural areas may be completely lacking, especially secondary schools, and children may need to leave home and stay with relatives in a larger town in order to attend. Poverty means that paying fees is difficult. Data for countries with a large percentage of rural population often show that while about 80 per cent of children start primary school, only about 30 per cent continue to attend until the final grade and 20 per cent or fewer go on to secondary education. In rural areas the figures may be worse.

RESEARCH The United Nations Children's Fund (Unicef), is a United Nations programme with its headquarters in New York. It provides humanitarian and developmental assistance to children and mothers in developing countries.

Unicef's website, <http://data.unicef.org>, is an excellent source of social data for individual countries. Choose two countries, one with a large urban population and one with a large rural population and compare the statistical social indicators.

Food shortages and agricultural problems

→ **Soil exhaustion** can be caused by over-cropping (growing too many crops on a plot) and monoculture (growing the same crop every year, using up the same minerals). This leads to low yields. Insufficient fertiliser and manure are added to replace the lost minerals.

→ **Drought** can be disastrous: in areas of the tropics where seasonal rainfall occurs, a whole year's food can be lost if the rains fail. Seeds for the following year may have to be eaten.

→ **Floods** can destroy crops. Some of the densest rural populations in the world occur on flood plains. Examples include the Ganges/Brahmaputra and Indus flood plains in Bangladesh and Pakistan. Naturally fertile alluvial soils which require little or no fertiliser have led to very dense populations. Seasonal flooding, e.g. that associated with summer monsoon rains, can lead to the complete loss of a year's harvest.

→ **Tropical cyclones**, which bring strong winds, torrential rain and associated floods, can destroy crops.

→ **Pests** can affect crops and livestock. Various pests can destroy crops in the fields or the harvested crops during storage. Among the most serious are the locust swarms that devastate crops. However, the more everyday pests such as birds that eat crops in the fields, or rats that eat stored crops, can be just as important.

→ **Diseases** can affect crops and animals. A variety of diseases can destroy crops in the fields or during storage. Nagana or trypanosomiasis (sleeping sickness in humans) is spread by the tsetse fly and limits the keeping of cattle to the drier areas of the tropics. It results in low production of meat and milk or death of animals.

→ **Increased use of biofuels** meant that in some countries land previously used for the production of food was changed to produce crops for biofuel production. This led to increases in world food prices and decreases in the food supply. Paraguay has been particularly affected with large areas of land being given over to the farming of soya for biofuel production.

- **Social changes** can cause problems (e.g. if young people have a lack of interest in working in agriculture and agriculture is held in low esteem).
- **Land tenure systems** (systems of allocating land to people) can lead to the land being fragmented into small plots, with one person's land being scattered over the village area. Communal grazing may inhibit the possibilities of improving the land.

1. Explain the advantages and disadvantages to rural areas in LICs of rural-urban migration.
2. Describe some of the issues for rural settlements in LICs which are the result of a tropical environment.
3. What are the effects of improving electricity, water and roads in rural areas in LICs?

Case study: Uthukela district, Kwazulu-Natal, South Africa – an MIC

This case study examines current issues in a rural area in South Africa. Uthukela (uThukela) is one of the 11 districts of the KwaZulu-Natal province in the eastern part of South Africa. This case study concentrates on Okhahlamba municipality, a predominantly rural area which includes part of the Drakensberg mountains. The largest towns in Okhahlamba are Bergville (population 700) and Winterton (population 2100). The economy is based on subsistence farming, commercial farming (ranching and dairy farming), and tourism focused on the hotels found in the foothills of the mountains.

In the commercial farming areas settlements tend to be nucleated. In the subsistence farming areas the pattern is far more dispersed.



Fig. 6.2 The foothills of the Drakensberg mountains in Okhahlamba province with commercial agriculture in the background

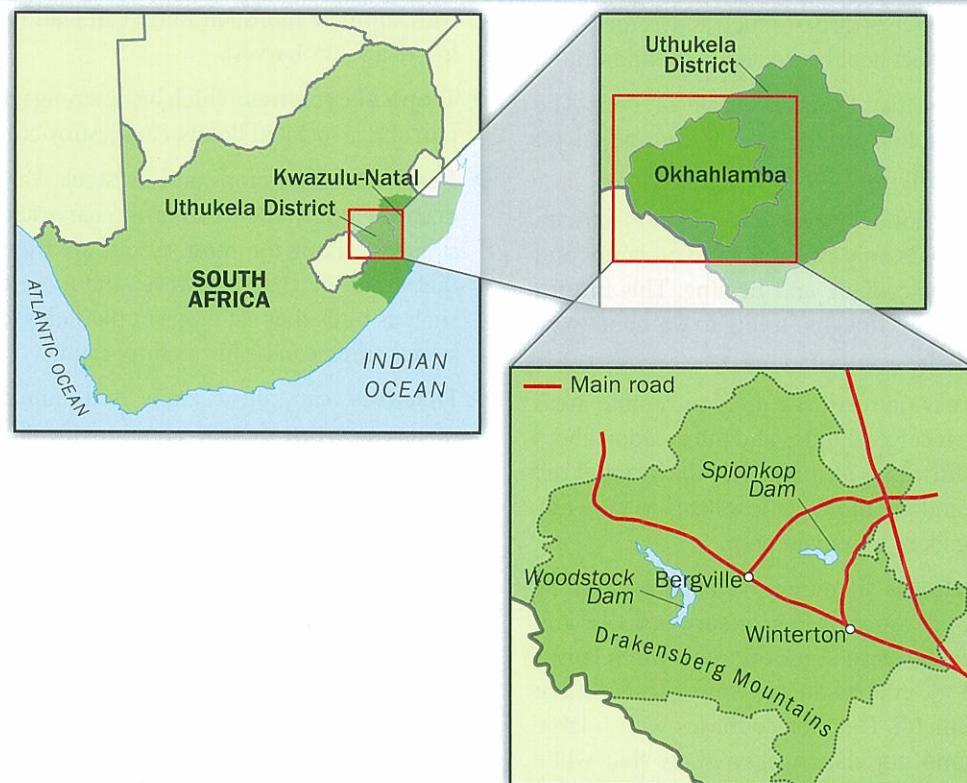


Fig. 6.3 Kwazulu-Natal province, Uthukela district and Okhahlamba municipality

← The physical environment is variable. There are some areas of rich soils, developed on volcanic rocks. However, droughts are common. The torrential summer rains cause water erosion on even relatively gentle slopes and hail can damage crops. In the dry winters wind erosion is a problem. Locusts and other insect pests also damage crops.

The 2011 population census of South Africa showed that in the lifetime of the current population, almost a million people (986 553) had left the province of Kwazulu-Natal and about three-quarters of a million people (781 153) had moved into the province. This gives a net migration of minus 205 400 and shows that 1 767 706 people had moved either out of, or into, the province. There is a tradition in South Africa of temporary migration of males seeking employment in the mines in Gauteng province, the area around the capital Johannesburg. Periods of low employment in the mines lead to migrant workers returning to their homes, increasing unemployment and leading to even greater poverty and food shortages. In addition to movements between provinces, there is movement within the province, often to the large towns and cities such as Durban, Pietermaritzburg and Ladysmith. The unemployment rate in Kwazulu-Natal (2011 census) is 47.6 per cent but 36.6 per cent when the informal sector is considered. The latter is particularly important in rural areas where temporary work in agriculture and tourism is common.

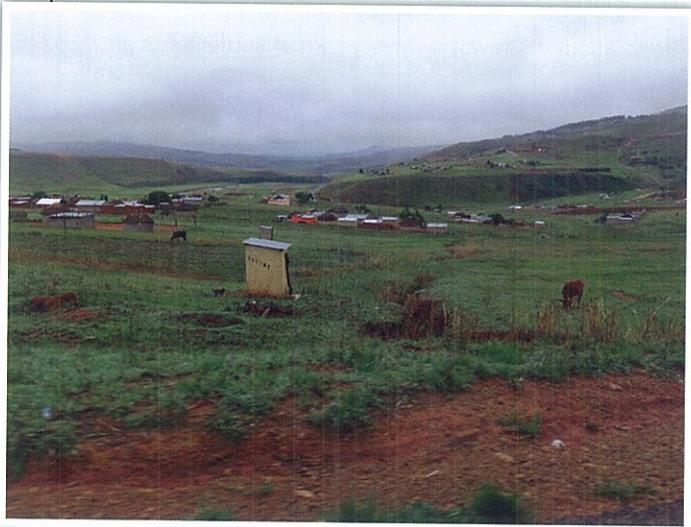


Fig. 6.4 A subsistence farming area in Okhahlamba province. What is the small building in the foreground?

The population of Kwazulu-Natal increased by 7 per cent between 2001 and 2007. However, 22 municipalities recorded a decrease in their populations. This illustrates that movements of population are complex and that

there is no simple overall pattern of rural–urban migration. In Uthukela, 54 per cent of the population is female, showing the greater tendency for men to move to urban areas for employment but also reflecting the overall structure of the population in South Africa. In Okhahlamba municipality the population increased from 137 525 in 2001 to 151 441 in 2007, an increase of 10.1 per cent. Birth rates and death rates are the main factor, and during this period the average size of a household increased from 5.0 to 5.2. Thirty-eight per cent of the population over 20 have had no schooling.

Living conditions

The population census for 2007 showed that 56 per cent of houses in Okhahlamba were of traditional construction and 41 per cent were classed as formal. Other dwellings in Okhahlamba were classed as ‘informal’. Owner-occupied properties make up 70 per cent of dwellings, 16 per cent are rented and 12 per cent are occupied rent free.

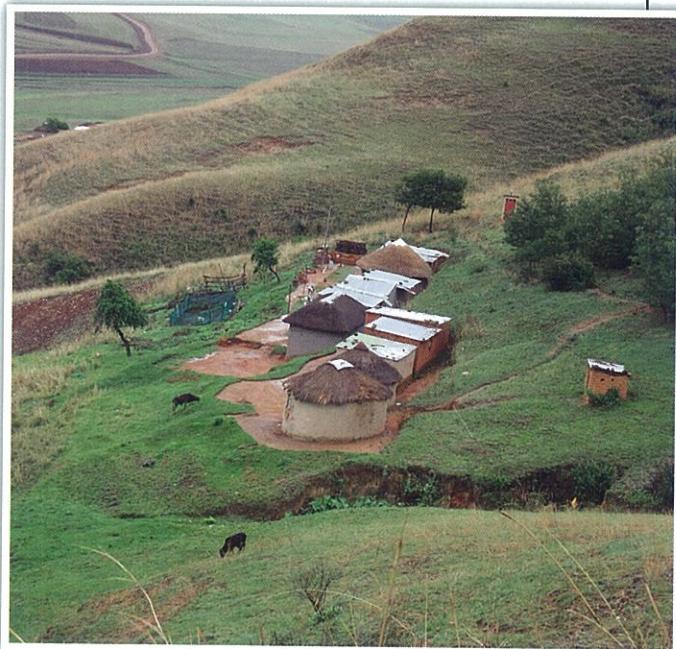


Fig. 6.5 A subsistence farm in Okhahlamba province

4. Describe the houses shown in Fig. 6.5.
5. Describe the evidence in the Fig. 6.5 for
 - (a) arable farming
 - (b) pastoral farming
 - (c) soil erosion.
6. The photograph in Fig. 6.5 was taken in spring. Give evidence for this.

The population censuses of 2001 and 2007 show some of the social changes that have occurred in the area, many as a result of intervention by the municipal authorities.

% of the population with access to:	2001	2007
electricity for lighting	39	62
electricity for cooking	17	34
electricity for heating	13	17
piped water	52 (5 per cent piped inside)	
pit latrine	65	52
no toilet	24	14
refuse removal by local authority/ private company	68	76
cell phone	22	76
radio	69	78
refrigerator	26	44
television	28	43
computer	2	5

Table 6.1 Living conditions in Okhahlamba municipality (data from the population census of South Africa)

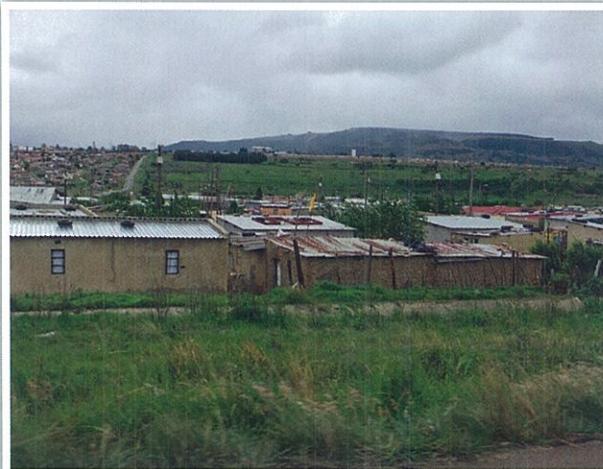


Fig. 6.6 Informal settlement on the edge of a town in Okhahlamba province

7. What are the particular push and pull factors relevant to population migration in Kwazulu-Natal?
8. How has life for rural residents in Okhahlamba changed and how much is due to the efforts of the municipal authorities?
9. Describe and explain the changes in the total population of Kwazulu-Natal.

Rural settlements in HICs and higher MICs

Many areas of rural settlement in Europe and North America have gone through three phases of development. This is shown in Table 6.2. It would be wrong to think that all areas go through these phases and, as the case studies in this chapter show, the situation is quite complex. Local factors mean that growth and decline happen at different times in different places. Villages may grow at the same time as the surrounding countryside is depopulated.

Growth

In the growth phase of rural settlements, critical factors are: **site** (the land the settlement is built on, including altitude, gradient, **aspect**, water supply, bridge points and fords, and the location of natural resources such as minerals); and **situation** (position in relation to the surrounding area, including transport routes, agricultural productivity of the area and position in relation to other towns).

Decline

The decline of rural settlements in HICs has taken place at different times. Rural-urban migration and urbanisation

Approximate time period	Phase	Factors
Up to about 1850 or 1900	Growth	Rural settlements grew to serve an agricultural population In some areas fishing or mining were also important
1850–1970	Decline	Urbanisation Rural–urban migration
1970–today	Redevelopment	Counter-urbanisation Urban–rural migration In some areas tourism is important

Table 6.2 Phases of development of rural settlements in HICs

took place much earlier than in LICs, first as a result of the **Industrial Revolution** and later because of the decline of employment in the primary industries (see Chapter 5).

The effect of this has been to cause a series of interrelated issues. These issues are greater in areas which are more distant from urban centres:

Agriculture	Most villages came into being as agricultural settlements because agricultural use of land took place to provide food. In many cases this was subsistence agriculture; however, commercial farming systems soon developed in many areas, e.g. the Canadian Prairies. These settlements may have been dispersed (consisting of scattered isolated dwellings and small hamlets with few villages). This was especially so where the agricultural land is poor and where people need large areas of land, e.g. for grazing. On better land nucleated settlement patterns developed (with dwellings clustered together as villages, and fewer isolated dwellings). Here smaller areas of land were needed so it was possible to have the social benefits of village life and still be near to the land.	
Mining	Mining villages are typically nucleated or linear in pattern and at the sites of mineral deposits. Good examples are found in the coal-mining areas of Western Europe such as the Sambre-Meuse coalfield in Belgium.	
Tourism	Few rural settlements have originally developed as tourist resorts. In most cases tourism has allowed the further development of settlements which were originally coastal fishing ports or inland agricultural settlements.	
Fishing	As in mining villages, in fishing villages the majority of the population was engaged in, or had links to, the primary industry. These settlements are situated on sheltered bays.	
Defence	Defensive villages are, by their very nature, nucleated. Site is often a critical factor and these villages occupy meander loops or hilltops, such as the hilltop villages of central Italy. Here steep slopes are an advantage.	
Altitude	In mountainous areas the highest areas may be so cold that agriculture is extremely difficult. These areas may be covered in snow for much of the year and may be uninhabited. The lowest areas are sometimes sparsely populated because of poor drainage, diseases and dense vegetation.	
Gradient	Gentle slopes have the advantages of being well drained, easy to cultivate and easy to build on, therefore settlements are often located in valley floors and avoid steeper valley sides. Where flatter land is in short supply, people are forced to live on steep slopes, e.g. in the rural settlements on the Canary Islands. Steep slopes make transport more difficult and the areas may be prone to landslides which can destroy roads and buildings.	
Aspect	This is an important factor in mountainous areas, especially in valleys that run east–west. The sun always rises in the east and sets in the west but in the northern hemisphere it moves around the southern sky and in the southern hemisphere it moves around the northern sky. This is critical in areas further away from the equator (high latitudes) particularly in winter because the sun is low in the sky. In the Alps, warm sunny slopes are referred to as the <i>adret</i> and cold, shaded slopes as the <i>ubac</i> . Agriculture and settlements tend to be concentrated on the <i>adret</i> slopes.	
Soils	Alluvial soils of river valleys and the soils that develop on certain volcanic rocks such as basalt are naturally fertile. The dense rural population in Bangladesh and in Madeira are examples. In the savanna plains of Africa infertile <i>latosols</i> support sparse populations. Soil rarely influences the sites of the settlement within an area. However, in some rural areas such as desert oases, rich soils are too important to build houses on, so the settlements are built on adjacent less fertile land.	
Water supply	Sites with reliable sources of water from rivers, springs and wells in otherwise dry areas are called wet point sites and are often settlement sites. Transporting water was hard, time-consuming work, so the settlements needed to have their own supply.	
Drainage and flooding	Very low-lying areas such as plains which frequently flood are not easy places to settle. They might also be permanently waterlogged and difficult to farm. In tropical regions these areas might also be prone to water-borne diseases such as bilharzia and river blindness, or diseases carried by insects such as malaria or sleeping sickness. Nevertheless, in areas of dense population and shortage of land such as Bangladesh, flood plains are sometimes densely settled. Higher points in otherwise poorly drained areas are known as dry point sites. These are slightly higher than flood plains and have gentle slopes which are well drained, good for farming and provide good sites for rural settlements.	
Accessibility	Linear settlement patterns may develop along roads or tracks. Where roads meet (route centres), or at the bridging points of rivers, larger villages and regional service centres may develop.	

Table 6.3 Factors influencing the development of rural settlements in LICs, MICs and HICs

- Mechanisation means fewer jobs in the primary industry.
- Lower wages, unemployment and lack of opportunity for higher-skilled employment mean that people leave the area. This particularly affects young people who may leave initially for higher education.
- Services such as schools, post offices, public transport and shops begin to close because there are fewer people to use them and this accelerates the decrease in population.
- Lack of demand and greater transport costs means that provision of services is more expensive, e.g. fuel prices are higher in remote areas.
- The average age of the population increases.
- A downward spiral of depopulation occurs.

In rural areas isolated dwellings can fall into disrepair. The ageing population can put a strain on medical and social services. Where rural areas are sufficiently close to urban centres, significant numbers of people may travel outside the area to work. The villages can become **dormitory settlements**.

Redevelopment

Since about 1970, there has been significant redevelopment of many HIC rural areas. Much of this has been related to the reversal of the previous rural-urban migration. The process of people moving out of the cities into villages and country towns is called **counter-urbanisation**.

In most HIC people move between the countryside and the cities in a variety of complex ways. While some people, such as younger people, are moving into the cities, many others are moving out. It is important, however, to remember that counter-urbanisation is only one aspect of the complex migration of people into and out of cities but in many HIC counter-urbanisation is the dominant movement of people.

The places that are 'pulling' people out of the cities are often within **commuting range** of the city so that each day people can travel to and from their jobs in the city. Settlements that are close to a railway station on a line into the city or close to a junction on a motorway into the city are the ones that have grown most quickly. They are usually within 80–100 km of the city but many are much closer.

In the English Midlands, UK, the main conurbation is the area which includes the city of Birmingham. The settlements most affected by counter-urbanisation from this conurbation are rural towns such as Shrewsbury, Market Drayton and Bridgnorth and villages such as Shifnal, Much Wenlock and those in the Corve Dale in South Shropshire. Roads such as the M6, M54 and A5 have been important in this process as well as the railway stations at Shrewsbury, Telford and Shifnal.

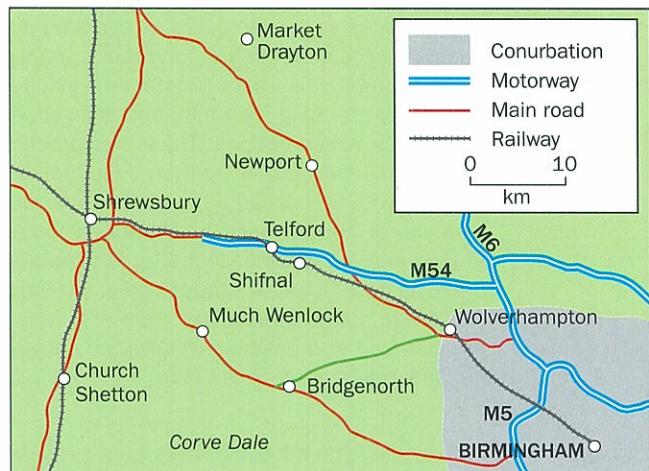


Fig. 6.7 The commuter belt to the north and west of Birmingham, UK

The push and pull factors which are the causes of rural-urban and urban-rural migrations were dealt with in Chapter 5.

Effects of counter-urbanisation

The people who are part of counter-urbanisation may be:

- commuters
- retired people
- second-home owners
- skilled people able to work from home.

High housing costs in cities have allowed people to sell city properties and buy large houses at lower prices in the countryside. The population of country towns has increased. In the example above, the population of Shrewsbury grew from 60 000 in 1981 to 102 000 in 2001. The new motorway link to the West Midlands conurbation meant that Birmingham was only about an hour away by car. People could live in the pleasant environment of Shrewsbury and commute to their well-paid jobs in the West Midlands conurbation.

Businesses and services in Shrewsbury expanded because of this growth in population, providing more for the local people to do, e.g. a new theatre was built. Most people, especially the commuters, feel that the move to Shrewsbury has improved their quality of life but some of the original population feel that the town has become too crowded and congested. Long-distance commuting by car is not very sustainable as it uses a lot of fuel.

The effect on villages is more complex. In 1960, villages in Europe were thriving communities, full of people who lived and worked in the countryside. There were shops, schools, and services such as blacksmiths and builders. There were good railway and bus services to the nearby towns.

Since then the commuters have moved in. They own cars and use them to get to and from their work. They have fewer children than farm workers do. They spend their money in the shops in the city, or in the retail parks that they pass on their way home each day. The demand for houses in the villages has increased, so new houses have been built, increasing the proportion of newcomers in the village population.

Modern ICT has meant that an increasing number of people such as accountants or architects are able to spend at least part of their working week working from home and are therefore able to make their permanent home in a rural area.

In addition, relatively wealthy pensioners have been attracted to living in the countryside. The effect of this has been to push up house prices in rural locations, leading to an ageing population because younger people cannot afford to live there.

In some areas such as south-west England and the English Lake District wealthy people have bought properties to use at weekends and for holidays. These houses are unoccupied for the rest of the time.

The effects of these changes are as follows:

- Village services such as shops, cafés, schools and hospitals have closed down.
- Bus and train services have been used less and less, eventually leading to their closure.
- The roads are much busier with cars.
- Village community life has declined – village clubs (including sports clubs) and organisations have fewer members.
- Many old agricultural buildings and disused village schools have been renovated and turned into expensive dwellings.
- House prices have risen and young local people are finding it difficult to find a place to live in their own community (even though second homes stand empty for much of the time). Many of these young people have to leave the area.

Much of this does not affect the people who have moved out of the cities very much but the rural poor have suffered. If they cannot afford a car they are cut off from the shops and services which are now concentrated in the towns.

Overall, life is less *sustainable* because there is greater use of private cars as opposed to public transport (thereby depleting fuel *resources* and damaging the *environment*) and the *quality of life* for some local people has declined.

Managing counter-urbanisation

In towns such as Shrewsbury in the English Midlands (see above), the planners are trying to concentrate development

on 'brownfield' sites rather than allowing the town to sprawl into the surrounding countryside. New high-density housing is being built near to the town centre, e.g. in the St Julian's Friars area. There are attempts to provide new jobs in Shrewsbury itself to reduce commuting to Birmingham. Office developments at Abbey Lawn, on Old Potts Way and at the Emstrey Business Park have provided skilled and well-paid jobs.

In villages, housing associations have been building 'affordable' houses that only local people can buy.

In some rural areas the process of counter-urbanisation has been accompanied by the development of the tourist industry. This has been especially so in picturesque fishing villages such as those in Brittany (north-west France), Cornwall (south-west England) and the Algarve (south Portugal) where seaside tourism is important. It has also happened in mountainous areas such as the Alps, Pyrenees and Sierra Nevada (Spain) where there are attractions such as ski resorts, places of historical interest and outdoor activities such as mountain biking and hillwalking. This has provided additional employment in hotels, restaurants, transport and as tour guides.

10. Make a list of the problems that rural areas in LICs and HICs have in common.
11. Describe how counter-urbanisation has led to new problems for rural areas in HICs.

Urban trends and issues of urbanisation

The process of urbanisation in LICs, MICs and HICs

Urbanisation

Urbanisation is the increase in the *proportion* of a country's population that live in towns and cities. It is caused, in part, by the high natural increase of population in cities but mostly by the process of rural-urban migration. It is strongly linked to economic development and, particularly, to *industrialisation*. As it is happening, urbanisation often causes severe economic and social problems. Urbanisation took place earlier in the richer countries in Europe and North America and in some MICs. Today generally more than 90 per cent of the population lives in towns and cities in these countries. Urbanisation started over 200 years ago when these countries went through the Industrial Revolution. People left their jobs in agriculture in rural areas

Case study: County Mayo, Republic of Ireland – an HIC

This case study deals with a rural area on the western fringe of Europe and the European Union (EU). County Mayo is in the province of Connacht and is bounded on the north and west by the Atlantic Ocean. Mayo is the 3rd largest in area of Ireland's 32 counties and 15th largest in terms of population. The north consists of poor soils and is covered with large areas of extensive peat bog, whereas the south is a limestone area and agricultural land is therefore more productive. The population is predominantly rural and the largest towns are Castlebar (population 12318), Ballina (11086), Westport (6063), Claremorris (3412) and Ballinrobe (2704).



Fig. 6.8 Buildings like these, abandoned many years ago, are features of the landscape of western Ireland

The economy was traditionally based on agriculture with some fishing. The population grew to its highest point of 388 887 in 1841 (in 2011 it was 130 638) with potatoes being the basic staple crop. In August 1845 a fungus (*phytophthora infestans*) started to

destroy the potato crop. This led to famine, and of the 8 million people living in Ireland, about a million people died and another million left the country, mainly for England, Scotland and the USA. In County Mayo nearly 90 per cent of people depended on the potato as their staple food. By 1848, Mayo was a county of misery and despair, with any attempts at alleviating measures in complete disarray. Whole settlements were abandoned and the effects can still be seen in the landscape, as they can in many counties of western Ireland.

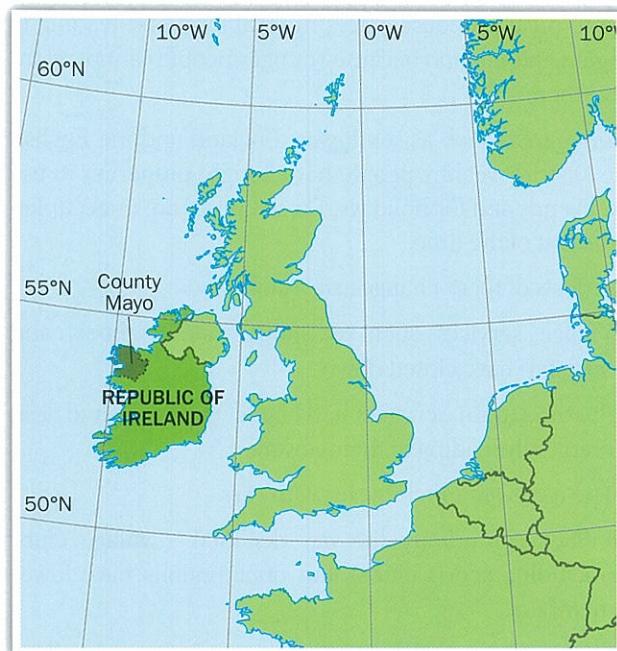


Fig. 6.9 The location of the Republic of Ireland and County Mayo in western Europe

Table 6.4 shows the effect of the famine on the population.

Year	Population	Change from previous census
1841	388 887	
1851	274 499	-29.4%
1861	254 796	-7.2%
1871	246 030	-3.4%

Table 6.4 The effect of the potato famine on the population of County Mayo

12. Fig. 6.11 shows the more recent changes in population in County Mayo. Explain how this illustrates the phases of development of rural settlements in HICs shown in Table 6.2.

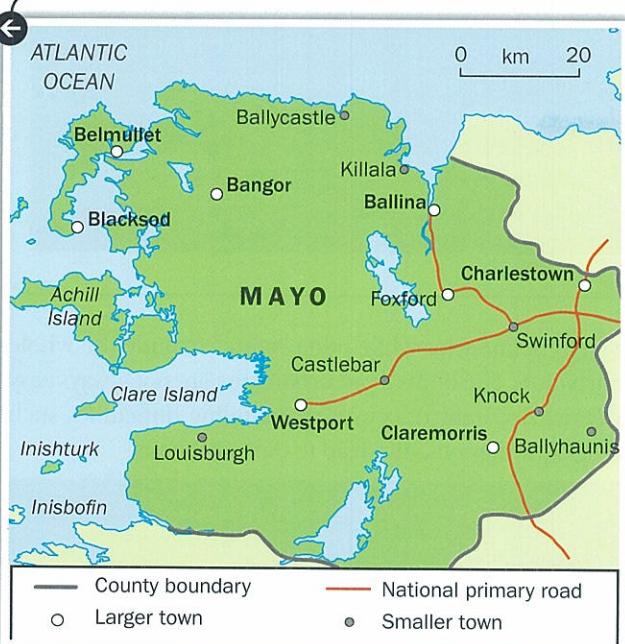


Fig. 6.10 County Mayo, Republic of Ireland

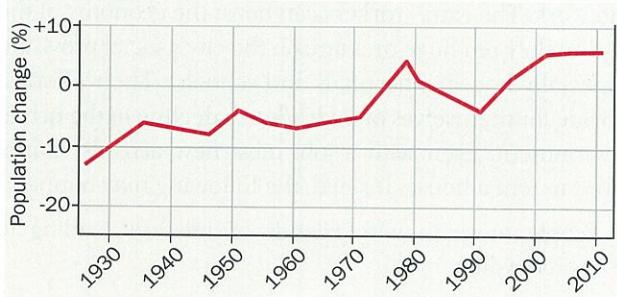


Fig. 6.11 Population change in County Mayo

Although the population of County Mayo as a whole grew between 2006 and 2011, it is unlikely that the population living outside the small towns increased in the same way. In County Mayo 71 per cent of the population live in a rural setting. In 34 of the 152 electoral districts within Mayo (22 per cent) the population actually decreased. A striking feature of the countryside is the contrast between the many abandoned buildings and the number of large, new houses. Many of these were built in the 1990s and 2000s when the Irish economy was strong. The counter-urbanisation factors mentioned earlier of commuters (in this case people commuting to neighbouring urban centres such as Galway), retired people and skilled people able to work from home have led to growth of the population. However, many of the new houses are the second homes of people who live far away in Dublin or Cork.

No county in Ireland showed an increase in the rural population, as a percentage of its total population, between 2006 and 2011. The results of the 2011



Fig. 6.12 Abandoned house in the foreground and large modern expensive houses in the background in County Mayo

census show that three-quarters of all people who moved house stayed within the same county and that one-third moved to a new home in Dublin. Larger towns of 10 000 or more people attracted almost 20 per cent of movers. While 38 per cent of the population lived in rural areas, only 23 per cent moved to a new address in a rural area in the year to April 2011. Counter-urbanisation is therefore limited. The most mobile segment of the population of Ireland was people between the ages of 20 and 34, accounting for 55 per cent of the total. A significant number of those aged between 20 and 24 were students who moved to new rented accommodation.



Fig. 6.13 Small fields in County Mayo. Notice the new, dispersed houses. The hill in the background is bare limestone, showing the difficulty of farming the area

Outside the small towns, the settlement pattern is quite dispersed. This is partly the result of the early agricultural system with small areas cultivated by hand, as shown in Fig. 6.13. This also means that services are concentrated in the small towns. The Irish national bus company, Bus Éireann, has 18 routes in Mayo, with 7 of them connecting outside the county to bigger settlements such as Galway and Sligo. However, some

of the routes such as Ballina to Belmullet and Blacksod have as few as one bus a day. As Fig. 6.10 shows, the network of national primary roads is limited.

There are few obvious factors that affect the site of individual towns. With the economy originally based on agriculture, there are few coastal settlements based on fishing, as Fig. 6.10 shows.

13. What is the evidence that the growth in population in County Mayo is in the small towns and not in the countryside?

14. To what extent does County Mayo show the three phases of development of settlements in rural areas described in Table 6.2?

and migrated to the growing towns and cities to work in factories. In these countries urbanisation is now either very slow or has stopped.

The LICs and MICs in Africa and south east Asia have much lower levels of urbanisation because industrialisation took place later. LICs and MICs in South America have higher levels of urbanisation than those in Africa and south east Asia, with several countries having urban populations of over 75 per cent. Urbanisation in HICs mostly took place between 1850 and 1950. Urbanisation in LICs has been happening since 1950. Urbanisation is still an important factor in the development of many Asian and African countries. Some of the fastest growing cities today are in south-east Asia. Dhaka (Bangladesh), Karachi (Pakistan), Delhi (India) and Bangkok (Thailand) all doubled their populations between 1985 and 2000. Many of the fastest growing cities are in the tropics.

In 1900 there were only two cities with populations of over one million (**millionaire cities**), Paris and London. Today there are over 400. In 1975 the largest city in the world had a population of 16.5 million; today the largest urban area, Tokyo-Yokohama, has a population of over 35 million. **Mega-cities** are cities with populations of over 10 million, including extremely large **conurbations** (such as Tokyo-Yokohama). Urbanisation is particularly rapid in China.

Population statistics for cities are sometimes confusing. This is often because some figures are for the area within

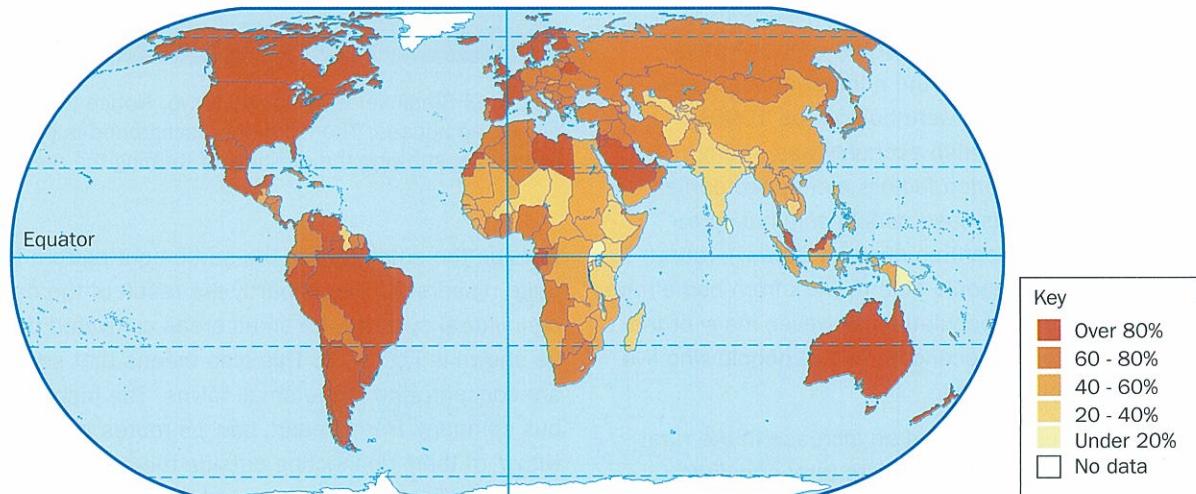
the city's boundaries while other figures include the whole conurbation. The limits of an urban area are not always easy to define. Accuracy of censuses, including difficulties such as illegal immigrants, also lead to data problems.

15. Describe the world distribution of levels of urbanisation shown in Fig. 6.14.

Consequences of urbanisation today

Most cities find it hard to cope with rapid population growth caused by a high urban birth rate and the influx of poor people from the countryside coming to the city to find work. The extra workers can boost the economy of the city but they put huge pressure on the city's social provision (especially housing, hospitals and schools). Their effort to provide for themselves often leads to a decline in the urban environment. Even with a job, most new arrivals cannot afford to rent a house. Instead, the following may happen:

- People move in with friends or relatives leading to overcrowding.
- People live rough, sleeping on the streets. Others become pavement dwellers or live in public buildings such as railway stations.
- Gangs of abandoned or orphaned children roam the streets.
- People become squatters, building a house on unused land. This leads to 'shanty towns' known as *favelas* in



Natural population growth	Urban areas tend to have a relatively low age profile. Young adults (15–40 years old) move into the cities for work. Young adults tend to be the people who have children. Due to better healthcare and sanitation in cities in LICs and MICs, infant mortality rates are lower than in the countryside. Cities therefore have higher rates of population increase than surrounding rural areas.
Rural-urban migration: push factors (see also Chapter 5)	Rural population growth puts pressure on the land. This causes over-farming, low yields and soil erosion. Inheritance laws may mean that plots of land are divided up until each plot is very small and people cannot produce enough to feed their family. Floods, droughts and desertification add to the problems faced by subsistence farmers. Farmers who try to improve their farms often get into debt which is difficult to pay back, so they sell up and leave. The move towards commercial farming (cash crops are produced for export to help pay off the nation's debts) means a few farmers prosper, farms are amalgamated and more machinery is used. Farm workers become unemployed and many small farmers sell their land to the bigger farmers. Sometimes it is the landlord who organises the land into bigger farms and the tenants are forced off the land. A lack of clean water and proper sewage treatment means disease is common. Rural medical facilities are often non-existent. A lack of job opportunities (other than peasant farming) and very poor living conditions mean that the quality of life is usually very low. Washing may have to be done in a river. Houses may be no more than wooden shacks. War and civil strife may force people to move to the safety of the cities. Life in the countryside can be very uneventful and education only covers the basics.
Rural-urban migration: pull factors (see also Chapter 5)	Jobs, or the perception of jobs, in factories and service industries (e.g. hotels) which are better paid than rural jobs are attractive. There is also the opportunity to earn money from the informal sector of the economy (e.g. selling goods on the street, driving a taxi or rickshaw, prostitution). Even begging and crime can be more lucrative in the city than working on a farm in the countryside. Better social provision (e.g. education, healthcare, entertainment and leisure) are all attractions. There is also the overall perception, fed by the media, that life is better in the city.

Table 6.5 The causes of urbanisation today

Brazil, *barrios* in the rest of South America, *zopadpattis* in Mumbai and *bustees* in Calcutta. This is not just a LIC phenomenon. In the 1960s, refugees from North Africa lived in shanty towns around Paris, known as *bidonvilles*. Much of the land used for these shanty towns is too steep (subject to landslides), too polluted or too marshy (and subject to disease) for other development – it is therefore a bad place to live. Some of the land is owned but not used and the owner can throw the squatters off when a development opportunity arises.

- The influx of labour often exceeds the demands of industry, leading to unemployment, poverty, and/or the growth of the 'informal' economy.
- Large numbers of unskilled labourers depress the wage rates leading to even greater poverty.
- Unscrupulous factory owners employ women and children and make them work in dirty and dangerous conditions.
- City councils find it hard to raise taxes when many people are living in poverty and/or working in the 'informal' economy. As a result, public amenities such as healthcare, education, clean water and sewerage systems often cannot keep up with the growth of population.
- Pollution is often a consequence of rapid urban and industrial growth. Factories dispose of smoke and toxic liquids directly into the air and rivers. Raw sewage is dumped on tips or allowed to flow into rivers. Garbage is common in the streets.

However, it appears that economic development needs cities. Cities provide the 'critical mass' of people and capital that drives economic development. Most people who move into developing cities are prepared to put up with appalling conditions because they believe that things will be better in the future – if not for them, for their children. They expect the wealth created by economic development to filter down to them eventually. The history of urbanisation in North America and Europe suggests that this will be the case.

Most of the problems produced by rapid urbanisation are the result of unplanned growth. In China, the economy is developing rapidly along capitalist lines. However, the government exerts a much greater level of control over people's lives than, for example, the government of Brazil. This means that



Fig. 6.15 Shacks below skyscrapers in Singapore. Contrasts in wealth and poverty are common in many world cities

urbanisation can be planned more carefully, avoiding some of the problems. Country folk can only move to the city when they are given permission. This is not usually given until there is a job for them, a place for them to live, and sufficient urban amenities for them and their dependants. This has allowed economic growth, without too many social problems. Pollution of the environment seems inevitable, however.

Despite these problems, the people who live rough or in shanty towns expect things to improve. After all, many of them have some way of making a living. Although some people may regard the shanty towns as 'slums of despair', people living in them think they are 'slums of hope'. In Brazil many of the *favelas* have evolved into more substantial housing areas with some basic services - the '*periferia*'. Improvement strategies include the following:

- Oil-rich countries such as Nigeria and Venezuela have enough money to build high-rise apartment blocks to rehouse the slum dwellers.



Fig. 6.16 Garbage piles near homeless people's shacks. You may think this picture shows an area in an LIC but, in fact, it was taken in Portland, Oregon, USA

- **Site and service schemes** are popular in many countries. Councils provide land near places of work. The land is divided into building plots and roads are built. Electricity, water and sewerage services are provided. People can rent a plot of land and build their own house, slowly making improvements as they earn more money.
- **Self-help schemes** are also popular. People who have built a house on land that does not belong to them are given ownership of the land. Knowing they cannot be evicted, they begin to make improvements and organisations (e.g. the council) can provide materials and help with these improvements. Brick or breeze-block walls, proper windows and doors, water supply, waste collection, a community health centre, bus services and schools all slowly materialise, provided by the council or by the local community. This is the main way in which Brazil's *favelas* became the *periferia*.
- The '**brown agenda**' focuses on the environmental conditions of the urban population and particularly

the urban poor. It places emphasis on sustainable development in the urban areas of LICs.

These issues are dealt with later in this chapter.



Fig. 6.17 Macau, a special administrative region of China, first a port, then a centre of manufacturing and tourism

RESEARCH Choose one large urban settlement. Research the factors which led to its growth, including its site, situation and functions.

Suburbanisation and urban sprawl

Suburbanisation is the movement of people from homes in central areas of a city (CBD and inner-city) to homes on the outer edges (known as the residential zones or the suburbs). It was a major feature of European cities during the first half of the 20th century. In the USA, suburbanisation led to urban sprawl and the growth of the **megalopolis**. It occurs in all areas of the world but is particularly noticeable in countries such as the USA, Canada and Australia where urban areas tend to have low-density suburbs - single or two-storey houses with large gardens.

Suburbanisation has resulted in the outward growth of urban development which has engulfed surrounding villages and rural areas. During the 20th century this was facilitated first by the development of public transport systems and then by the increased use of the private car. The presence of railway lines and arterial roads enabled wealthier commuters to live some distance away from their places of work. Between the two World Wars, there were few planning controls and urban growth took place alongside main roads. This was known as **ribbon development**. By the late 1940s, this growth and related growth between the 'ribbons' became a cause for concern. It was known as **urban sprawl**. This led to the creation of green belts - areas of rural open space and low-density land use around some cities where further development was, in effect, banned.

Function	Purpose	Examples
Nodal points (route centres)	These are where natural routes, such as valleys, meet (e.g. important road and railway junctions are found at nodal points). This means that these points became the most accessible ones in the area and were the best places to provide services.	Khartoum (Sudan) where the Blue Nile and the White Nile meet Lyon (France) where the Rhône and Saône meet New York
Industrial centres	These provide mass employment and draw in investment causing an upward spiral of development.	Manchester (UK) in the Industrial Revolution Bangalore (India) in the high-technology age
Ports	These are points with deep water close to the shore, shelter from strong winds and rough seas, provided by bays and river estuaries and a large area linked to the port from which goods are exported and to which goods are imported. This is known has the hinterland – meaning the land behind. Big ports are often entrepôts – places where goods are imported then re-exported without traders paying taxes.	Rotterdam (Netherlands) linked to much of Europe by road, rail and the navigable river Rhine Cape Town (South Africa) Shanghai (China) Mumbai (India)
Capitals	Cities with the government and civil service (administration) provide jobs but are also attractive locations for company headquarters because of the close proximity to decision-making and political power. They are often located centrally or for other strategic reasons.	Madrid (Spain) Abuja (Nigeria)

Table 6.6 Factors affecting the location of large urban settlements

Since 1950, suburban expansion has continued (especially around towns and smaller cities) but it has been better planned. In the UK during the 1950s and the 1960s, large-scale construction of **municipal housing** by local government took place on the only land available, which was the suburban fringe. In the 1970s there was an increase in home ownership which led to private housing estates being built, also on the urban fringe. In Europe it has become common to refer to the **rural-urban fringe** which is the transition zone where urban and rural land uses are mixed. The rural-urban fringe will be characterised by agricultural land but with other types of land use linked to the urban area. Building in these areas of relatively cheap land allowed people to have bigger gardens and more public open spaces. New detached and semi-detached houses and bungalows have been built in these suburban areas, along with local shopping centres and schools. As car ownership grew (and as the city centres became more congested) the edge of town, where there is more land available for car parking and expansion, became the favoured location for new offices, factories and retail outlets.

In a number of cases, the strict control of the green belts was relaxed. Suburbanised areas demonstrate other key elements of the rural-urban fringe, such as residual woodlands, parks, cemeteries, golf courses, roads (especially motorways and bypasses), recycling facilities and landfill sites, park-and-ride sites, airports, hospitals, sewerage facilities, large out-of-town shopping facilities (e.g. large supermarkets) and playing fields. Many are now well-established housing areas, highly sought after in the property market.



Fig. 6.18 The urban sprawl of Los Angeles at night

Social factors have also played a part. In many HICs, there has been an increase in the adult population, which accounts for three-quarters of the growth in the demand for houses. This is due to the change in the age structure of the population, with a fall in the proportion of young dependents and a proportionate rise in the other age groups. Old people are living much longer than in the past so their houses are not coming onto the market as frequently and many large family houses are occupied by one surviving pensioner.

Suburbanisation was an urban process that dominated many European cities from 1910 to 1970. Many of those suburbs are now declining too. The housing stock is getting old and it needs repair or renewal. Private owners tend to maintain and repair their homes as and when it is needed. This means that large areas of decline do

not develop, even though individual houses and gardens may fall into disrepair for a short time. The high cost of private housing in the UK ensures that developers will move in and renovate a declining property as the profits are considerable.

A recent trend, again fuelled by high house prices, is **infilling**. A large old house with a large garden is bought by a developer. The old house is modernised and sold on with a much reduced garden. The rest of the garden is used to build several up-market properties. Profits are considerable.

Municipal houses were built on greenfield sites on the rural-urban fringe mainly between 1930 and 1970. In the UK they were mostly semi-detached houses for rent all built to the same design. Elsewhere in Europe apartment blocks were the rule. People were moved here from the slum clearance schemes of the inner cities and they helped to house the rapidly rising population in the 'baby boom' years after the Second World War. To begin with people liked them because they had gardens and open spaces. However, because they were designed for poorer people who could not afford to buy a house, they led to social segregation and were often remote from the jobs and services in the CBD. People began to feel isolated and abandoned. As the better-off moved out to private estates, social cohesion began to break down and the cheaply built houses began to need expensive maintenance. Many municipal estates are now 'social sinks' with high levels of crime, drug use and unemployment.

In the UK, most of these houses were fairly well built, however, and when they were offered for sale to their tenants in the 1980s many of the better houses were bought and renovated by the people who lived in them. Other council estates were already rather 'rough' and no-one was prepared to buy properties on them. The council found it hard to keep up with the maintenance and the area fell into a downward spiral of decline. 'Envelope' schemes have been successful in some areas. The house is stripped down to its shell, then a new roof is built and the rooms are renovated with modern doors and windows, new plumbing and heating, and rewiring. The resulting properties are attractive and popular.

16. List the factors which have led to suburbanisation.

17. List the features of suburbs and the rural-urban fringe.

These are some examples of the problems of suburbanisation:

- It results in high levels of racial and socio-economic segregation. The middle classes become suburbanised and lower socio-economic groups become concentrated in the inner city or in run-down suburbs.
- There may well be inadequate facilities within the spreading suburbs (e.g. entertainment, shops, doctors).

- Providing social facilities has a high cost.
- Public transport costs are high.
- There is high dependence on cars and this has associated environmental problems.
- Commuting brings the problems of lost time and productivity.
- The character of the countryside is changed and the rural way of life is lost.

New York is often quoted as an example of urban sprawl. There has been growth outside the city in mid-Hudson Valley areas such as Orange County and in areas on Staten Island such as Richmond County. This has been caused by the following:

- People, especially the affluent middle classes, often leave the inner areas for a better lifestyle in the outer suburbs, with larger houses and more garden space. They also flee the air and noise pollution, high crime rates and poorer education facilities in the inner areas.
- Some suburban growth north of New York City has been attributed to worried city residents moving after the 11 September 2001 terrorist attacks.
- House hunters have been priced out of more expensive areas closer to the city.
- Businesses have relocated to the suburbs because of cheaper land and better accessibility. In wealthy suburbs most people no longer commute to the city for work.
- The overall population is growing. The US Census Bureau reported that between 2000 and 2009 the population of New York increased by 383 195 people.

The following solutions to urban sprawl have been suggested:

- The number of people living in homes that already exist could be increased by renovating and reusing empty or abandoned private and municipal houses.
- Tax incentives could be offered to encourage people to take in lodgers to share their homes.
- New, high-density housing could be built on brownfield sites. This includes developers buying up large houses and their large gardens in established suburban areas, demolishing them and building several new houses on the land.
- Building could be allowed in rural villages and small towns on land that has not been previously developed – in effect this would encourage counter-urbanisation.
- In Europe, planning regulations have reduced urban sprawl. For example, the UK's 'green belts', where development is restricted, were established around many cities. This was to protect the countryside and agriculture from urban sprawl and force developers to use brownfield sites in the towns.

Counter-urbanisation

Counter-urbanisation is the movement of people from homes in the large urban areas to homes in smaller towns and villages in rural areas, leap-frogging the rural-urban fringe. It leads to longer-distance commuting, mainly by private car, but also by rail if the 'rural' settlement has a railway station. It is driven by an urge to improve quality of life, exchanging the problems of life in the big cities with the perceived advantages of life in market towns and villages. Modern ICT developments leading to homeworking and teleworking mean that the expense of commuting can be reduced and the rural advantages maximised.

- 18.** The effects of counter-urbanisation on rural areas have already been discussed in this chapter. Make a list of these effects of counter-urbanisation.

In urban areas the effects of counter-urbanisation have been the same as those of suburbanisation. They have added to the downward spiral of decline in the inner city. The solutions are not simple and a downward spiral is not easy to reverse. Re-urbanisation and urban renewal, discussed later in this chapter, all have a role to play.

Urban renewal

This involves the redevelopment of run-down urban areas which brings about improvements. It may be a product of natural market forces but often the input of local government triggers the process. This may involve **property-led regeneration schemes** such as the redevelopment of the London Docklands and the recent move towards **sustainable urban communities** such as the Greenwich Millennium Village, both in the UK. A spectacular example is the Guggenheim museum in Bilbao, Spain. This is a building of spectacular modern architecture developed in a run-down area of the sea port.

Urban regeneration schemes are classified into three types:

- Property-led regeneration – the initiative is taken by national government, and local people and councils have very little input into the scheme.
- Partnership schemes – national government is the prime mover but local councils and private developers are also involved. There is more local accountability and input.
- Private initiatives – private developers or private individuals buy a house and renovate it. Areas of lower class and slum housing and industry are transformed into fashionable residential areas. This is known as gentrification.

Re-urbanisation

Re-urbanisation is the movement of people and economic activities back into the central areas of cities, including the CBD, and inner-city residential and industrial areas.

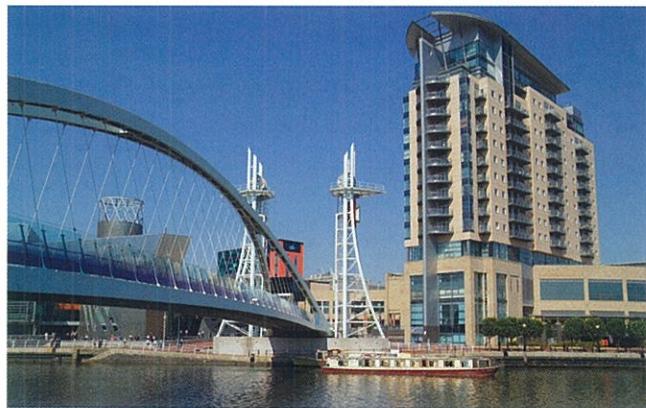


Fig. 6.19 Salford Quays, Manchester, UK. Once derelict docks, now home to the Imperial War Museum, the Lowry Centre, BBC News.

It attempts to bring a balanced mix of housing of different costs and sizes, and employment opportunities to inner-city areas. At its best it recognises that housing needs to be found for the urban poor as well as the wealthy. Re-urbanisation of this type rarely occurs without some sort of government intervention and capital.

Competition for land

Different people and different land uses compete for land in the city and the more sought-after land becomes more expensive. This competition is expressed in the city's land prices, property prices and property rental prices. This is not a static pattern, e.g. redevelopment of certain areas has caused the price of residential property to increase in many areas, as has an increasing tendency for properties to be bought by rich property companies for 'buy to let' purposes. The concept of bid-rent is described later in this chapter. The other factor is the planning law of different countries.

The effects of this competition can be:

- derelict sites
- increased concentration of social classes in ghettos
- poorer people forced out of parts of the inner city.

These issues can only be addressed through the intervention of local and national governments.

World cities

World cities are a key part of globalisation. In 1991 the term **global city** was used by Saskia Sassen. It meant the way that cities such as New York have an economic, cultural and political significance beyond the boundaries of their own countries. This is what we mean by a **world city**. Sassen's work has been developed further, including by the work of the Globalisation and World Cities (GaWC) research network created in the Geography Department at Loughborough University, UK. Much of this chapter

has been about studying the internal features of cities and making comparisons between them. The concept of the world city focuses on the relationships between cities.

RESEARCH Look at the website of the GaWC: <http://www.lboro.ac.uk/gawc/group.html>. Use the site to research the links between a city that you have chosen and other cities.

Causes of the growth of world cities

The key factors in the growth of world cities have been:

- the development of trans-national corporations
- the communications revolution.

World cities form an interlocking network where the cities are the nodes. The development of modern electronic communications and computerisation from the 1980s onwards allowed companies providing services in the cities to have links with other cities across the world. Sassen (1994) spotted two contrasting effects of globalisation:

- Production of goods became dispersed to places with cheaper labour, often in LICs and lower MICs.
- Management and business service industries became more concentrated in world cities where there were financial, professional and creative services. From these world cities, global brands were managed.

Where these firms choose to locate their offices is very important. Numerous electronic communications flow between the offices of these trans-national corporations, providing information, advice, planning, strategy, knowledge, etc. using teleconferencing as required. Travel for face-to-face meetings may only be needed occasionally. Head offices and other major sites of companies can be located near political power, financial institutions and the offices of related activities. They can also locate near centres where employees with the required skills are found – such as accountants, managers, marketing and computer experts.

19. Explain the ways in which computerisation and electronic communication are important to and affect the work of trans-national corporations.

The hierarchy of world cities

The GaWC network assessed the position of a city in the hierarchy of world cities by asking about importance of a particular office in a particular city in a firm's overall office network. This is called the *service value of a city* to a firm. These values are coded as shown in Table 6.7.

The higher the score for service value, the more important an office and the more exchanges of information with other

Service value	Description
0	No office in the city
1	Minor offices of a firm
2	Standard offices of a firm
3	Major office of a firm
4	Important offices such as regional headquarters
5	Headquarters of a firm

Table 6.7 Service values of cities

offices it will generate. Two important offices will generate a much higher level of flow of information between their cities than two minor offices between their cities. Scores for all the firms in a city are added up to provide a total score for the city. The total scores are used to develop the hierarchy. Cities are classified as alpha, beta or gamma cities, as shown in Fig. 6.20.

The categories were broken down further as shown in Table 6.8. This shows how the pattern changed over time.

These are some of the changes up to 2008:

- London and New York maintain dominance.
- Hong Kong is consistently number 3 and is gaining in importance and approaching the alpha ++ level.
- The alpha +/+ levels are over-represented by western Pacific Rim cities as shown by the development of Sydney, Shanghai and Beijing.
- In the USA, Miami and Atlanta drop out in 2004, and San Francisco is missing from the 2008 list. This leaves the USA with just three alpha world cities, New York plus Chicago and Los Angeles.
- The rise of cities from 'emerging markets' is very clear: Seoul, Moscow, Mumbai, Buenos Aires and Kuala Lumpur.
- The emerging cities' rise from 2004 to 2008 is largely at the expense of leading western European cities: Amsterdam, Frankfurt and Zurich move down to alpha - level. However, Milan rises to alpha +.
- In the ex-communist countries of eastern Europe in which economic privatisations in the 1990s led to their services-led integration into the world economy, Warsaw appears to be a leading city by 2008.
- Cities with stable positions include Paris, Singapore, Toronto, Mexico City, Taipei, Jakarta, Stockholm, Bangkok and Dublin.
- The rapid rise of Dubai.

20. Write an account of the changes in the hierarchy of alpha world cities between 2008 and 2010.

	2000	2004	2008	2010
Alpha ++	London New York	London New York	London New York	London New York
Alpha +	Hong Kong Paris Tokyo Singapore	Hong Kong Paris Tokyo Singapore	Hong Kong Paris Singapore Tokyo Sydney Milan Shanghai Beijing	Hong Kong Paris Singapore Tokyo Sydney Milan Shanghai Beijing
Alpha	Chicago Milan Los Angeles Toronto Madrid Amsterdam Sydney Frankfurt Brussels Sao Paulo San Francisco	Toronto Chicago Madrid Frankfurt Milan Amsterdam Brussels Sao Paulo Los Angeles Zurich Sydney	Madrid Moscow Seoul Toronto Brussels Buenos Aires Mumbai Kuala Lumpur Chicago	Milan Beijing Toronto Sao Paulo Madrid Mumbai Los Angeles Moscow Frankfurt Mexico City Amsterdam Buenos Aires Kuala Lumpur Seoul Brussels Jakarta San Francisco Washington
Alpha -	Mexico City Zurich Taipei Mumbai Jakarta Buenos Aires Melbourne Miami Kuala Lumpur Stockholm Bangkok Prague Dublin Shanghai Barcelona Atlanta	Mexico City Kuala Lumpur Buenos Aires San Francisco Beijing Shanghai Seoul Taipei Melbourne Bangkok Jakarta Dublin Munich Warsaw Stockholm Mumbai Miami Budapest	Warsaw Sao Paulo Zurich Amsterdam Mexico City Jakarta Dublin Bangkok Taipei Istanbul Rome Lisbon Frankfurt Stockholm Prague Vienna Budapest Athens Caracas Los Angeles Auckland Santiago	Miami Dublin Melbourne Zurich New Delhi Munich Istanbul Boston Warsaw Dallas Vienna Atlanta Barcelona Bangkok Taipei Santiago Lisbon Philadelphia Johannesburg

Table 6.8 Alpha world cities. Bold shows those cities which moved up a category

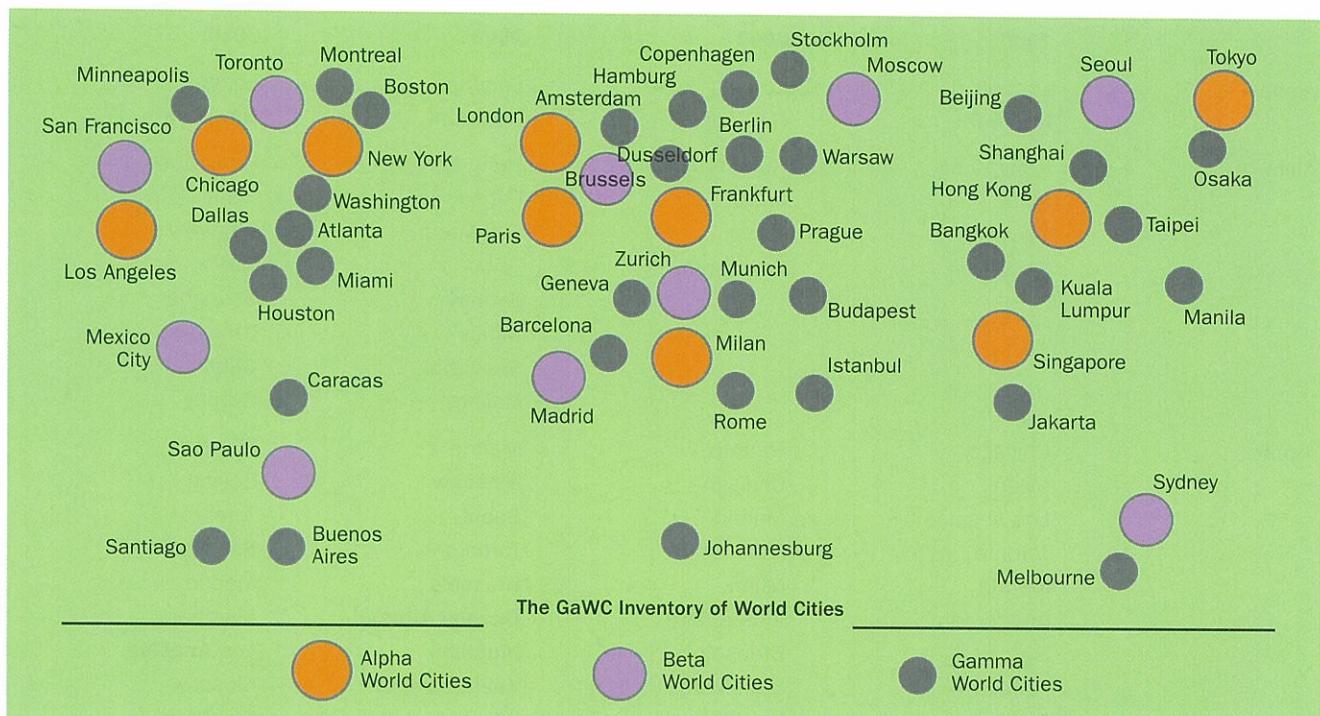


Fig. 6.20 Alpha, beta and gamma world cities (Source Globalisation and World Cities (GaWC) Research Network, Loughborough University)



Fig. 6.21 Hong Kong's influence as a world city has increased

The changing structure of urban settlements

Functional zonation, spatial competition and bid-rent

Bid-rent theory

This concept was introduced in the 1960s by Alonso. It was based on three ideas:

- Land would be occupied by the land use that could afford to pay the highest rent.

- Land values would decrease from the city centre outwards.
- Shops and offices would be able to afford the highest rents, followed by industry, followed by residences.

This is illustrated in Fig. 6.22.

If this theory worked perfectly then the city would be made up of a series of concentric zones. The weaknesses of this are discussed later when considering the **Burgess model**. Alonso explained low-income residential areas in inner cities by saying that higher population densities could overcome the higher rent per area. Affluent people seeking large properties could afford larger areas of land in the outer suburbs.

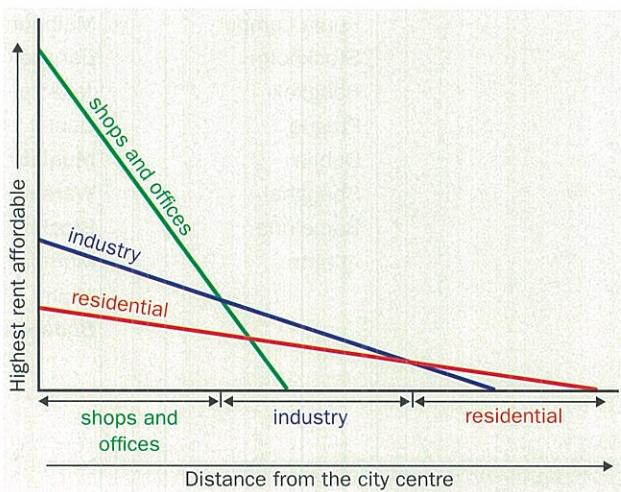


Fig. 6.22 The bid-rent model of urban morphology

Some urban studies have focused on **gradient analysis**, i.e. measuring changes in land values and population density from the city centre outwards. In LIC and MIC cities these tend to show:

- a continual rise over time in the central population density
- stable gradients as the city extends outwards with increases in density at every point.

In HIC cities the pattern is more complex. These show the following:

- The population density gradient reduces as the city extends outwards.
- Population density in the CBD increases then decreases.
- Population density in inner-city residential zones increases then decreases.
- The zone of maximum population density moves outwards.

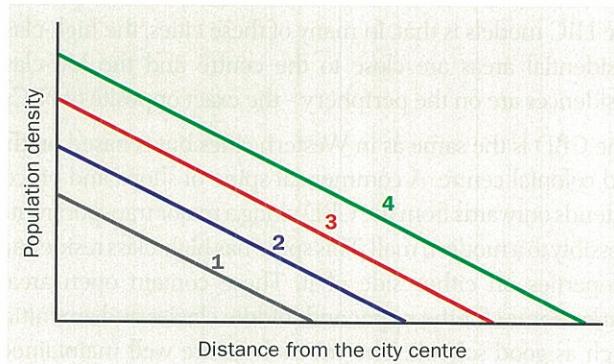


Fig. 6.23 The changes over time in population density gradient for an LIC or MIC city

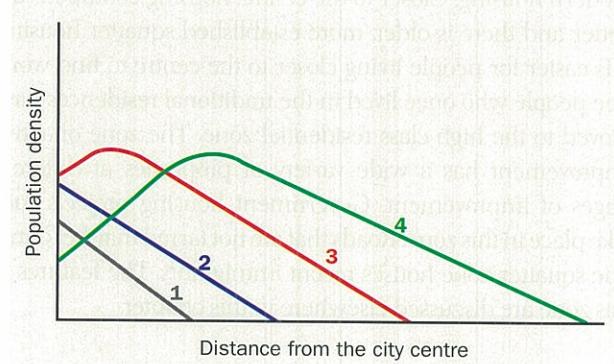


Fig. 6.24 The changes over time in population density gradient for an HIC city

The effect of transport routes on land values is discussed later in this chapter.

21. Over time population density in the HIC CBD has increased then decreased and population density in the HIC inner-city residential zones has increased then decreased. Suggest why these changes have happened.

Urban models

Urban land use is often explained by models. A **model** is a simplified theory which attempts to explain the patterns and the reasons for them. None of the models works perfectly but they help to explain some of the features of urban morphology.

Burgess's concentric zone model

Burgess developed this model in 1925, based on the structure of US cities including Chicago.

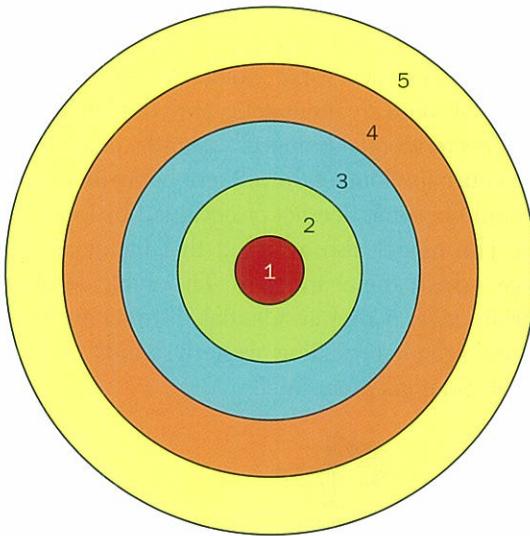


Fig. 6.25 Burgess's concentric zone model

The link to bid-rent theory is obvious. As well as the assumptions of bid-rent theory, there must be a uniform land surface with no differences in physical geography, free competition to space and free access to transport in all directions. The theory also assumes that, as the city grew outwards, the land-use zones would expand outwards, therefore there was a constant change with one land use taking over from another.

The CBD develops at the original growth point which was at the intersection of major roads where there is the greatest accessibility and the highest land values. Surrounding the CBD is the zone of transition. Here large, older houses are being converted into flats or offices, or light industry. Beyond the CBD is a manufacturing zone. New immigrants moving into a city move into inner-city areas with cheap housing, close to sources of employment. Housing quality and social class increase with increasing distance from the centre. Increasing affluence and developing public transport allow people to live long distances from their places of work.

22. Quite clearly, the Burgess model explains some features of urban morphology but not all of them. Take the assumptions made in bid-rent theory and the Burgess model and explain the weaknesses of the model.

Hoyt's sector model

Hoyt's model was developed in 1939, again based on cities in the USA. It is based on transport routes. These are the principles:

- Industry develops along major roads or rivers.
- Manufacturing industry and high-class residential areas are never next to each other and there is always a 'buffer zone' between them.
- Once areas of land use become established they tend to continue that way and grow outwards.

In common with the Burgess model, the CBD is at the centre, the most accessible point. Although the model assumes that zones are more static, Hoyt did think that older, higher-class residential properties near the centre would be left by suburbanisation of the affluent population and these areas would become derelict or occupied by lower-income groups. The model also assumed that high-class housing develops where there are more favourable locations. In industrial cities, poorer residential districts are often the 'East End' where prevailing westerly winds blew smoke pollution and unpleasant smells.

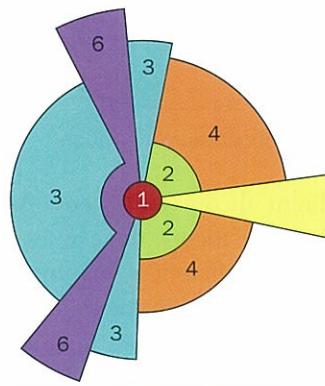


Fig. 6.26 Hoyt's sector model

The Harris and Ullman multiple nuclei model

Harris and Ullman (1945) argued that cities will have more than one growth point. These may be old villages which have merged or been swamped by expansion of the city. Other growth points may be newer industrial estates. Rather like Hoyt, Harris and Ullman argued that certain activities will tend to group together and agglomerate while others will repel one another. The model also takes into account residential suburbs and features which today would be part

of the rural-urban fringe such as the commuter zone and industrial suburbs. Many of today's conurbations are made up of more than one city which have merged: Tokyo-Yokohama, Japan; Minneapolis-St Paul, USA; Manchester-Salford, UK.

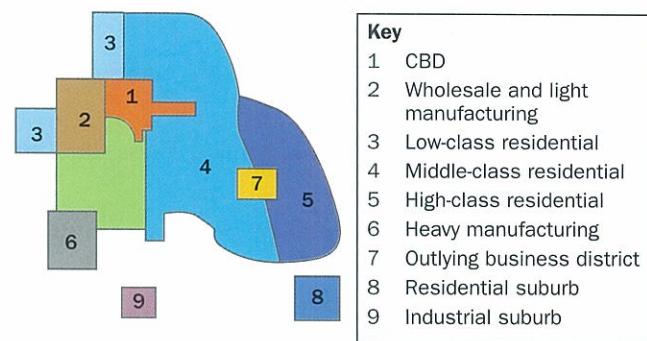


Fig. 6.27 Harris and Ullman's multiple-nuclei model

A model of a Latin American city

The most obvious difference between LIC/MIC cities and the HIC models is that, in many of these cities, the high-class residential areas are close to the centre and the low-class residences are on the periphery - the exact opposite of HICs.

The CBD is the same as in Western cities but is based on the old colonial centre. A commercial spine of shops and offices extends outwards from the CBD along a major transport route, possibly to a modern mall. This spine has high-class residential properties on either side of it. These contain open areas, parks, homes for the upper and middle classes and amenities such as good schools. The streets here are well maintained. Industries which need power and water are near the centre, with an industrial spine extending outwards. The inner zone of better residences is a 'zone of maturity' with traditional and modern housing. Closer to the centre, housing conditions are better and there is older, more established squatter housing. It is easier for people living closer to the centre to find work. The people who once lived in the traditional residences have moved to the high-class residential zone. The zone of active improvement has a wide variety of properties at different stages of improvement. Government housing projects may take place in this zone. Roads that are not tarred may be found. The squatter zone houses recent immigrants. The features of this zone are discussed elsewhere in this chapter.

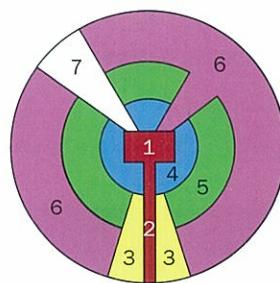


Fig. 6.28 A model of a Latin American city

Changes in the location of retailing and services

As mentioned earlier in this chapter, the CBD developed as the most accessible place in the city for people to get to. Radial roads, railways and bus services focused on this point. This in turn made it highly desirable. Shops and retail services could have access to many customers and business offices could enjoy contact with banks and other businesses. Today this is not always the case. Increased car ownership has led to congestion, slowing down journey times. Car parking space is extremely limited, even in relatively small towns. In some countries, the authorities charge people to park. London, UK, has a congestion charge which means car owners have to pay a daily fee to enter the centre. Ulaanbaatar, Mongolia restricts entry to cars with different number plates on different days of the week.



Fig. 6.29 Grid lock in the morning rush hour in Ulaanbaatar, Mongolia

In larger HIC cities, smaller shops which could no longer afford the high rents often left the CBD long ago. Many larger retailers have now moved too. There are two types of movement:

- Relatively low rents may be found on **brownfield sites** in the inner city. These may be the former locations of slum housing which has been cleared or the previous sites of industries which have shut down. Retailers found in this area include car showrooms ('automobile row' in the USA) and DIY, furniture and carpet shops. These retailers require space. This is relevant to the concept of **core** and **frame** discussed in the CBD section later in this chapter.
- Major department stores and hypermarkets have moved to **greenfield sites** on the outskirts in the suburbs or

the rural-urban fringe. Here land is cheaper so extensive single-storey buildings can be erected at low cost. People with cars can drive easily to these locations, often along ring roads, and there is plenty of parking space. Rather than individual stores, developers often establish whole new retail parks. It is sometimes important to the developers to attract an **anchor store** to a new retail park. The anchor store will be a major retailer and will attract not only customers but other stores that will want to locate next to it to get extra business.



Fig. 6.30 The West Edmonton Mall, Edmonton, Canada claims to be the world's biggest shopping mall. It lies in the outer suburbs of the city. It is entirely indoors because of the severe winters in the area

If more and more shops move, fewer people will go shopping in the CBD, more shops will be forced to leave and there will be a downward spiral of decline. People's perception of the CBD may become one of a run-down area with empty derelict buildings, which is unsafe, dirty and suffers from litter and graffiti. Since 2000, the rapid growth of online shopping has led to a further decline in the CBD, and the world economic recession which began in 2008 has put further pressure on retail outlets. In the UK a survey in September 2013 showed that 14 per cent of town and city shops were empty and the figure was much higher in some towns.



Fig. 6.31 Empty shops in the main shopping street at Barrow in Furness, UK

Changes in the location of companies and administration

Declining accessibility, difficult car parking and high land values have led many companies to relocate their administrative offices away from the CBD. Modern electronic communication systems have ended the need to be near to the offices of similar types of company or to financial institutions. New purpose-built premises on the outskirts have allowed firms to overcome any difficulties of old, cramped premises and, at the same time, take advantage of lower land prices, good access for employees using private cars and easy parking.



Fig. 6.32 An aerial view of Walmart Stores headquarters in Bentonville, Arkansas, USA

- 23.** List the advantages and disadvantages of out-of-town shopping centres under the headings of: accessibility (public and private transport), parking, prices for customers, range of goods on offer, land prices, effect on the environment, run-off and flooding, effect on the CBD, a 'friendly environment'.

Changes in the location of manufacturing

From the time of the Industrial Revolution, many HIC cities were **industrial cities** with industries close to the centre. The reasons for this were as follows:

- Industries associated with sea or river ports, requiring imports or exports were at the heart of the city, e.g. sugar refining at Liverpool, UK.
- Industries were close to railways or canals.
- Before the development of public transport and the private car, industries were located next to workers' houses close to the centre, e.g. the textile-producing towns of north-east France such as Lille, Roubaix and Tourcoing.

In the second half of the 20th century **deindustrialisation** took place and HIC cities have been described as **post-industrial cities**. Industries in the inner city closed down or moved for these reasons:

- Cramped multi-storey buildings were no longer suitable and single-storey premises were more efficient.
- Sites were too small.
- Land prices were too high.
- Planning restrictions prevented further development.
- The labour force had moved to the suburbs with the development of public transport and, later, the private car.
- Newer industrial areas closer to the outskirts of cities were preferred. These were on greenfield sites with good access to road transport.
- Many older industries which occupied inner-city sites, such as the textile industry in the USA and Europe, have gone into decline.

Factors affecting the location of activities within urban areas

Economic factors

The concept of bid-rent has already been discussed (see page 184). In addition to the cost of buying or renting land or premises, local taxes come into play. In many countries higher premises taxes are levied on premises in the CBD, increasing the need for businesses to achieve high profits to pay for these.

Physical factors

These factors often relate to the historical development of the city. Here are some examples:

- Cities which developed as ports often had their original growth point close to the waterfront and this developed into the modern CBD. Examples include Chicago, USA; Cape Town, South Africa; Oslo, Norway; Helsinki, Finland.
- Similarly, original defensive sites such as hilltops or meander loops were original growth points. Sometimes these sites are cramped and modern development has outgrown them so that the CBD is immediately outside these points. One example is Edinburgh, Scotland.
- Areas of very steep slopes are often avoided. Cape Town is built around the lower slopes of Table Mountain. Ulaanbaatar, Mongolia, is a very elongated city restricted on one side by mountains.
- Low-lying, marshy land may be unattractive, especially for residential areas. In the tropics it may also be affected by diseases carried by insects. These areas may be unoccupied, used for industry or for slum housing, as in the case of Lagos, Nigeria.
- Restricted sites such as islands often have very dense urban populations, e.g. Hong Kong.

Transport routes

The earlier section on models of urban land use has already described the effects of transport routes on urban morphology. Ribbon development of services serving the local community is common along arterial routes in LICs, MICs and HICs. There may be a greater concentration of services at intersections. These locations are more accessible but may have higher rents.

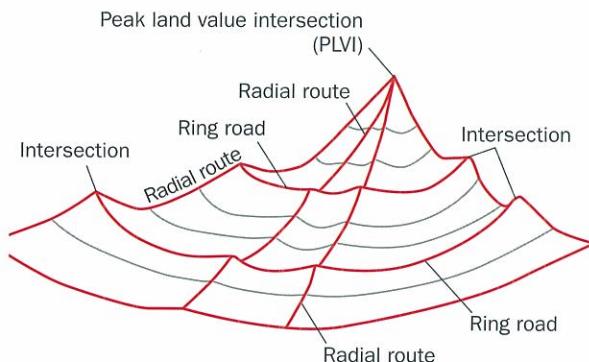


Fig. 6.33 The theoretical effect of transport routes on land values

Those cities which are very compact and have buildings closer together are more easy to serve by public transport.

This is seen in some of the cities of the Far East and Russia, e.g. Moscow, Tokyo, Singapore and Hong Kong. In contrast, cities in the USA, Canada and Australia, e.g. Houston, Los Angeles, Toronto and Melbourne, tend to have much lower population densities, are spread out over much larger areas and the private car is much more important. There may also be ribbons of development along routes into the rural-urban fringe.

Planning

This topic is very difficult to generalise because there are great differences between the amount of local and national government influence in different countries. In some countries it may be a case of planning regulation affecting what can be built where. In the UK, the development of **green belts** around major cities was designed to limit urban sprawl. In some cases, governments have played a much stronger role in planning, as in Plaine Saint-Denis, Paris, France. Traditionally, the ex-Soviet bloc countries have been affected much more by control from central government. A more recent example is the development of Astana as the new capital city of Kazakhstan, illustrated by the case study below. In the recent developments in Astana central government planning is the most important factor.

Case study: Astana, Kazakhstan: the influence of government planning

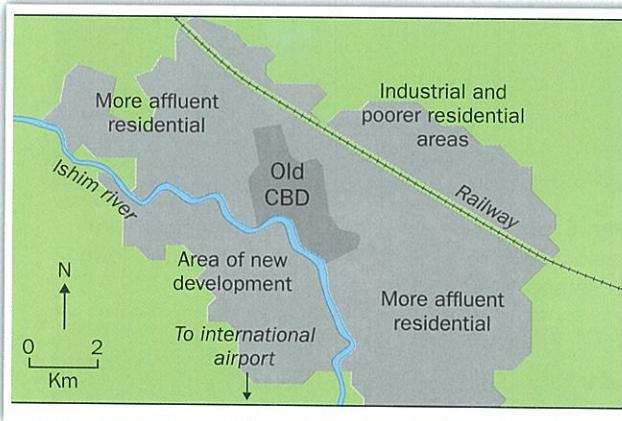


Fig. 6.34 The location and morphology of Astana

Kazakhstan became an independent state after the break-up of the Soviet Union in 1991. The capital was officially moved from Almaty to Akmola in 1997. The name was changed to Astana in 1998. Astana is located in central Kazakhstan on the Ishim River on flat, steppe (temperate grassland). The surrounding area is very sparsely populated which has allowed new developments to be particularly spacious. A new capital was developed for these reasons:

- Almaty has a risk of seismic activity.
- Almaty had insufficient room for expansion.
- Almaty was close to the international borders and Astana is more central.
- The area around Astana has a large ethnic Russian population so moving the capital to this area may have been an attempt to link it more closely with the rest of the country and encourage more Kazakhs to settle in the area.

Issues which could potentially affect the new capital include:

- the city's isolated location in the centre of the Kazakh steppe
- the harsh winter climate
- the large expenditure of public funds to build the new government offices
- the cost of airfare and hotel expenses for the many government workers who still live in Almaty.

By 2007, Astana's population had more than doubled, to over 600 000. It is projected to rise to 1 million by 2030. Workers have been attracted from the rest



of Kazakhstan and neighbouring countries such as Uzbekistan and Kyrgyzstan. Younger professional people are well represented in the population. The ethnic Kazakh population of the city has risen.

Morphology

The older areas of the city lie north of the Ishim River while new developments have been centred south of the river.

The CBD lies between the railway line and the Ishim River. On its margins there is redevelopment, including the area along the river bank. This includes multi-storey apartments and hotels.

To the west and east of the CBD are more elevated, residential areas with parks. North of the railway line, which crosses Astana in an east-west direction, are industrial and poorer residential areas.

The new area of development to the south of the Ishim includes the diplomatic quarter and a variety of government buildings. These stretch beyond the older built-up area. To have these functions in such a location would be unusual in an older city. These are to be completed by 2030.



Fig. 6.35 Futuristic office and apartment buildings contrast with older residences, south of the Ishim River in Astana, Kazakhstan



Fig. 6.37 Modern apartment blocks on the north side of the frozen Ishim River in winter in Astana, Kazakhstan. The CBD is immediately beyond

The international airport lies 16 kilometres to the south of the city. Plans for this and the original plans for the new Astana were drawn up by the Japanese architect Kisho Kurokawa. Astana Railway Station is an important hub for cities in Kazakhstan. International trains leave for Russia, Ukraine, Kyrgyzstan, Uzbekistan and Urumqi in China. An underground railway, the Astana Metro, is planned.

One of the most striking things about the new Astana is the architecture, particularly the futuristic structures. One of these is the Khan Shatyr, a shopping mall that doubles as the world's largest tent, designed by the UK architect Norman Foster. The Palace of Peace and Reconciliation is a 60-metre-tall glass pyramid, also designed by Foster. The Central Concert Hall seats 3500 people and looks like a budding flower. It was made to resemble a traditional Kazakh instrument, known as a dombra. There is a circus shaped like a flying saucer. The presidential palace was designed to replicate the White House. The Baiterek Tower is 100 metres tall and evokes the local legend of the 'Tree of Life'. The building is topped with a golden orb representing an egg.



Fig. 6.36 Looking along the Green Water Boulevard (also called 'The Shining Path') to the Baiterek Tower in Astana, Kazakhstan



Fig. 6.38 The Presidential Palace from the Baiterek Tower in Astana, Kazakhstan. The Central Concert Hall is in the background

24. What is the difference between urbanisation and urban growth?

25. Discuss the factors affecting the location of activities in an urban area you are familiar with.

26. What are the similarities and differences between the morphology of Astana and the models of urban morphology?

Residential segregation and the process basis of residential zonation

Types of residential area

High-density housing	This is where dwellings are relatively small and there is little or no open space. This is often found in the older parts of towns and cities, close to the centre. In parts of northern Europe long rows of houses joined together called terraces were built when the towns expanded rapidly during the Industrial Revolution. In other areas apartments form the high-density housing. In some towns and cities the high-density housing is several hundred years old.
Low-density housing	In these areas there are fewer dwellings per square kilometre and there is open space between the housing, usually in the form of garden plots for recreation. The areas are usually more modern and further away from the city or town centres.
Apartments	These are multi-storey buildings which contain a number of different units. In some European countries they are owned by local government or a single owner who rents out the individual units. In theory, they allow more open space by building upwards. This type of housing can be found in any part of the town or city. It can be very high quality and expensive but it is not always suitable for families with children. Apartments are also known as condominiums (condos), usually when the individual units are privately owned. In north-west Europe in the 1960s, blocks of flats were seen as the solution to the problem of old slum housing dating to the period of industrialisation, which was demolished.
Shanty houses	Known in parts of the South America as <i>favelas</i> , in parts of Asia as <i>bustees</i> and by the United Nations as informal settlements, these are a type of slum housing. They are often built spontaneously out of any available materials such as plastic sheets, metal sheets or even cardboard. They often lack normal services such as water supply and sewerage. Shanty areas are associated with the outer areas of cities in LICs, although they may occur even in relatively small settlements. They are described in detail later in this chapter.

Table 6.9 Types of housing

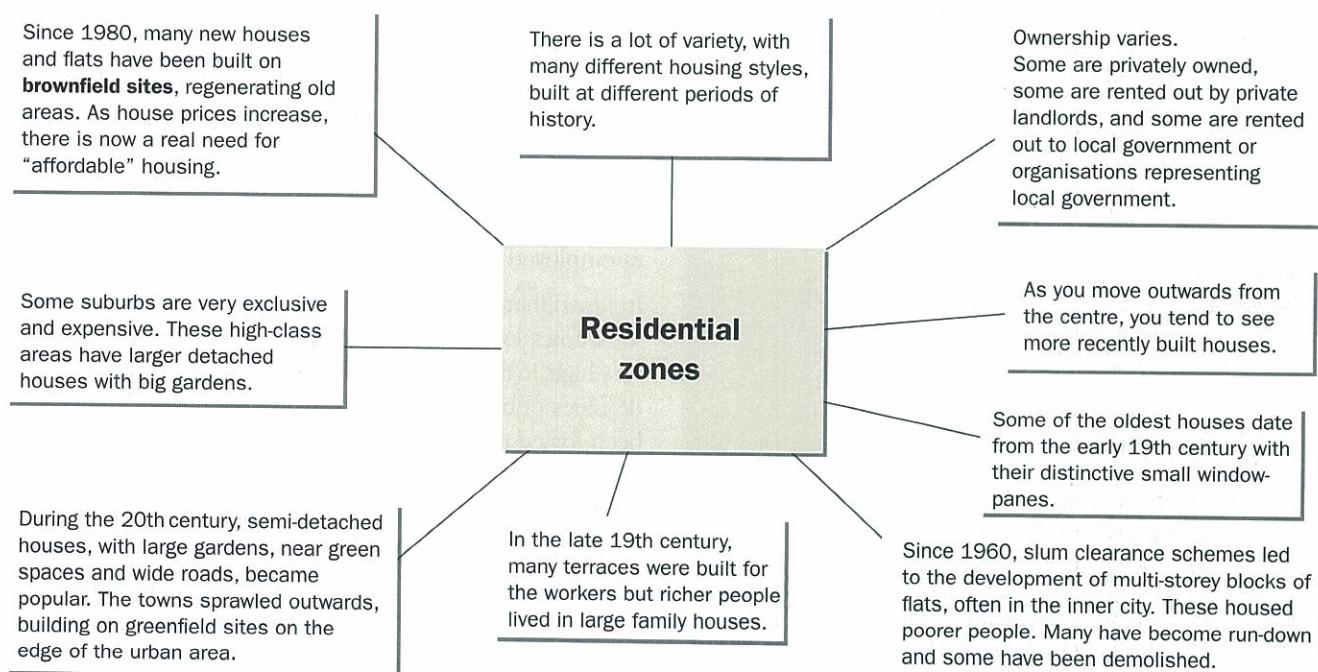


Fig. 6.39 Some styles of housing seen in north-west Europe

Styles of housing vary greatly from country to country. Fig. 6.39 shows some of the styles seen in north-west Europe.

One characteristic of many urban residential areas is the way that the nature of the area can change fairly suddenly from one neighbourhood to the next. Very different areas may exist side by side. The construction of the buildings and their state of repair may change but there may also be changes in the majority of people who live in the areas. This segregation is a feature of many cities and its basis is described in Table 6.10.

Income segregation	Richer people tend to buy the most expensive houses. These social groups then become more concentrated in exclusive affluent suburbs with large houses and gardens. This can be seen in the UK, for example, in affluent suburbs of Manchester such as Hale. In extreme cases this leads to the development of gated communities where rich people live behind high walls, with security guards at the gate, as seen in so many suburbs in LICs and areas where the differences in income are greatest. However, people on lower incomes have little choice and tend to live in the cheaper housing. Another factor is car ownership, which may restrict lower-income groups to areas of the inner city with cheap public transport. Lower-income groups are also concentrated in local government social housing estates, e.g. the council houses in the UK.
Age segregation	People are most likely to move house at the stages in their lives when they change jobs, when a family grows, or when they retire, for example. The effect of this is that the size of the property they occupy tends to reflect their needs at the time. As properties of a particular size tend to be concentrated in a particular area, age groups tend to concentrate together too. This has an effect on the need for social services. An area with a lot of cheaper, family houses will have a lot of young families so the need for schools will be greater. Areas with many old people will have a need for more medical and social care facilities.
Racial segregation	Different racial groups tend to be concentrated in certain areas of cities. Cities have also always attracted high levels of immigration. Recent immigrants are often poor and require cheap housing. They also want to live near to people from their own culture and speaking their language. An area of poverty which also has a concentration of a particular immigrant community is called a ghetto . Conflict may arise between immigrant communities and the native population or between different immigrant communities. The term ' diaspora ' is used to describe the way people from a particular country or racial group are scattered across the world.

Table 6.10 Types of residential segregation

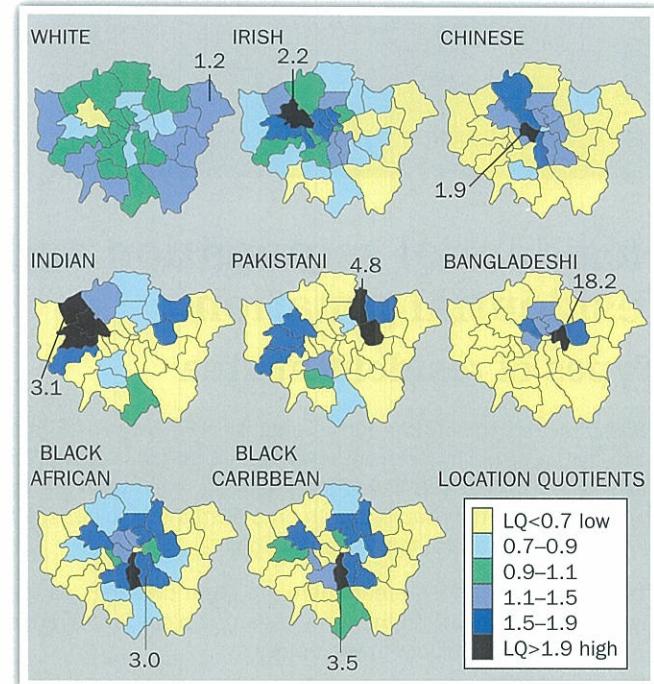


Fig. 6.40 Location quotients for different ethnic groups in the boroughs of London, UK. A high quotient indicates a higher than normal concentration of that group compared with the rest of the city. There are concentrations of Irish in Brent; Chinese in Islington; Indians in Harrow, Brent and Ealing; Pakistanis in Waltham Forest and Newham; Bangladeshis in Tower Hamlets; and Black Africans and Caribbeans in Lambeth

27. Explain how each of the following processes can result in residential segregation: operation of the housing market; influence of family, friends and culture; planning.

Housing shortages

Housing shortages are a problem often linked to segregation of residential areas. In both HIC and LIC cities older properties in the inner city require renovation or renewal. Immigration and natural growth have meant that demand for housing has grown faster than supply. The result has been that property prices are too high for those who are unemployed or on low wages.

In Japan there is a shortage of flat land and so the houses are sometimes extremely small and the density of population is very high. In the urban area of Osaka-Kobe there are population densities of up to 10 000 per square kilometre. The city has been forced to reclaim land from the sea to build residences. Port Island and Rokko Island were formed and flats built there.

In the UK changes in government policy have had an effect. Between 1930 and 1970 there were major slum clearance schemes in inner-city areas, with the older housing replaced by blocks of flats or new houses in the suburbs. These properties were owned by the local government authorities. Several completely new towns were built in the countryside. Since the 1980s there has been little building of municipal housing.

The changing CBD

As already mentioned, the CBD is often the original growth point of a settlement and the age of the buildings is the oldest in the urban area. The CBD was also the point where roads from the outskirts converge. This made the area the most accessible area of the town and so a very desirable place for services such as retailing. This meant that it became the **peak land value intersection** (PLVI) and only certain

services could afford to locate there. Buildings grew tall to make the best use of the expensive land.

In many areas the CBD is seen as an area of decline (see the section on the changes in retailing and services on page 187). It is a zone of constant change.

Problem	Description	Possible solutions
Decline of retailing	In many towns and cities there are areas of the CBD which have been almost abandoned, with shops boarded up and properties in a poor state of repair (see the section on the changes in retailing and services on page 187). Within the CBD there is often a state of flux, where some streets or areas go into decline and others become fashionable. Businesses such as banks, shoe shops, clothes shops and estate agents often form agglomerations on particular streets and even these can change over time.	These include: <ul style="list-style-type: none">● pedestrianisation● shopping malls● visual improvements such as litter collection, flower beds, statues● better security● improved or free parking.
The CBD in the evening	The CBD can be very empty in the evening. If only the bars, restaurants and night clubs are open, the CBD can be an unsafe place with high crime rates.	Security systems such as regular patrols and closed circuit TV may help.
Traffic problems and accessibility	Traffic congestion – see the section on city infrastructure later in this chapter.	
Problems of the 'frame' or transition zone	Land use at the centre and outsides of the CBD are different and have been described as the core and frame . The edge of the CBD is likely to be particularly affected by change and has often been called the transition zone . It is often a zone of decline associated with derelict land and buildings. Where there is some housing in the area it may suffer high rates of crime and social problems. The features of the core and frame are shown in Fig. 6.42.	Economic forces may help if the CBD expands in that direction the area will be improved. However it usually requires the municipal authorities to take control of the area and plan its redevelopment. See the section on urban renewal and re-urbanisation (see page 181).

Table 6.11 Problems of the CBD

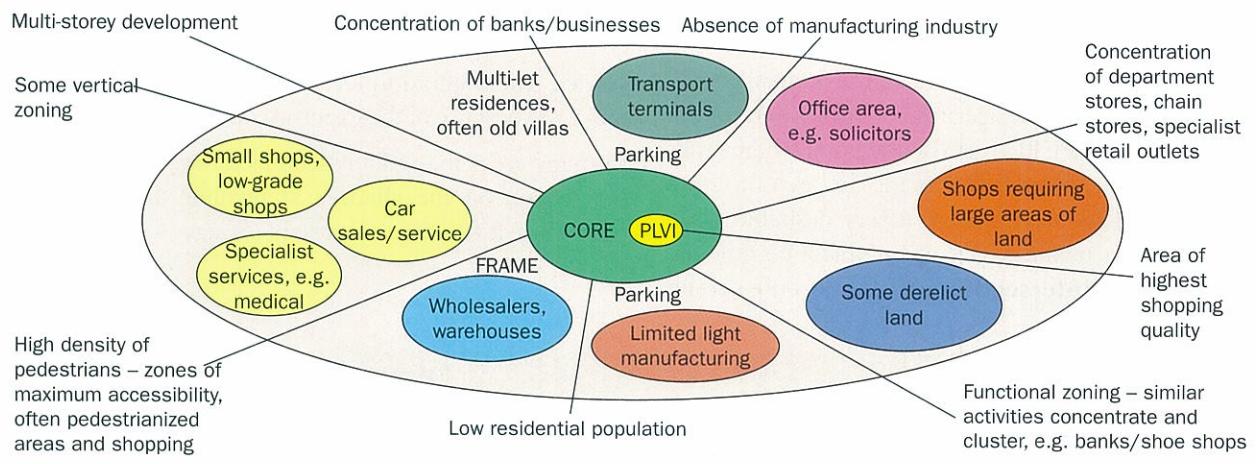
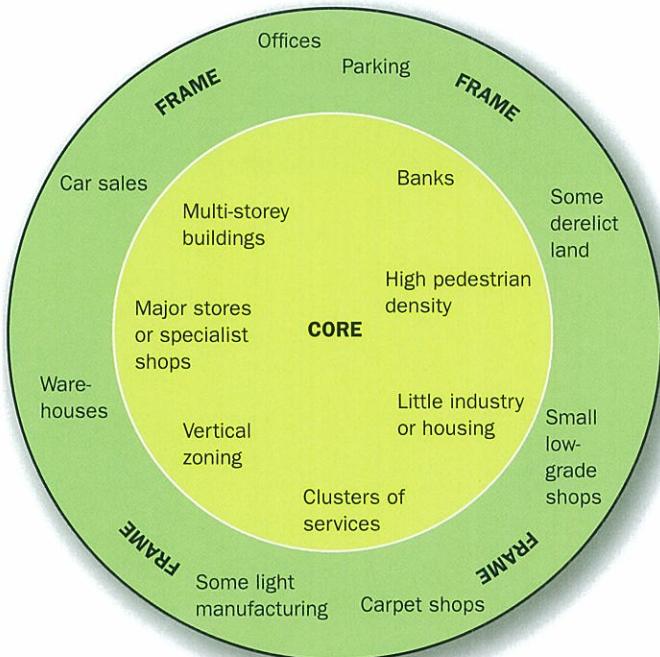


Fig. 6.41 Factors affecting the decline of the CBD



28. Suggest why agglomerations (concentrations of particular functions) occur within the CBD.

29. Explain the solutions to traffic problems in the CBD listed in Table 6.11.

Fig. 6.42 The core and frame of the CBD

The management of urban settlements

Shanty houses and squatter settlements in LICs and MICs

The problems created in cities by rapid **urbanisation** have been described earlier (see pages 176–177). The main issue is the development of informal settlements – a type of slum housing, often in the outer areas of cities and towns in LICs and MICs. They face the following difficulties:

- The residents do not own the land or have a legal right to occupy the land and could be evicted at any time.
- The houses are not weatherproof and can be cold in winter.
- There is no proper sanitation and water supply, leading to diseases such as cholera.
- There may be no refuse collection.
- In some cases there is no electricity supply or it is an illegal supply.
- The location on the outskirts means that there is no local employment.
- There is extreme poverty and high unemployment.

- There is extreme overcrowding with families living in one or two rooms.
- There are high levels of crime, and drug and alcohol abuse.
- The favelas of Rio de Janeiro, Brazil, are on steep slopes and landslides and mudflows often destroy housing.
- People face long journeys to the central areas of the city for work and there may be little public transport.
- Local employment is often in the informal sector.

Providing solutions to these problems is difficult because the countries concerned are poor and the number of people in these areas is so great. Solutions include the following:

- Low-cost housing schemes can provide basic housing with running water, electricity and proper sanitation. This can be done with people who have some employment and are able to pay rent because they are rather better off financially.
- Self-help schemes may be able to provide groups of people with the materials to build proper houses. These schemes can help produce a sense of community.
- Another solution is the provision of basic services such as sewerage, piped water and refuse collection by the city authorities.

The following case study of Khayelitsha, a partly informal settlement, shows some, but not all, of the problems described above.

Case study: Khayelitsha, Cape Town, South Africa – the difficulties of informal settlements and evaluating the attempted solutions

The development of Khayelitsha

There is an area 15–20 kilometres from the centre of Cape Town, on the western edge of the city next to the international airport, called Cape Flats. It is the home of about a million people – nearly half the population of the city. It includes Khayelitsha, Crossroads, Mitchell's Plain, Guguletu, Nyanga and Langa. These suburbs share the problems of other shanty or informal settlements with communities split along racial lines – economic, health and crime problems. Khayelitsha is along the N2 motorway close to Cape Town International Airport.

In the 1980s the South African (**Apartheid**) government tried to clear these areas. In 1986, 70 000 people were driven out and others killed.

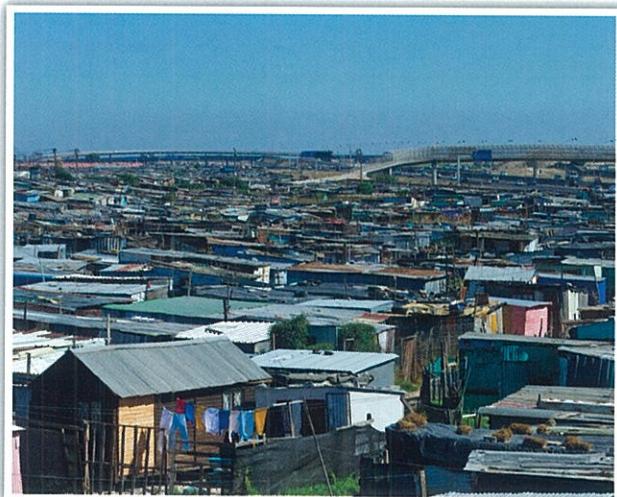


Fig. 6.43 Khayelitsha with the N2 motorway in the background

Back in 1957 Cape Town had started to implement the Group Areas Act, which resulted in the city becoming racially segregated. Rural–urban migration led to people, mainly Xhosas from what is now the Eastern Cape, settling in the outskirts of Cape Town in search of work. People settled illegally in townships such as Nyanga and Crossroads. At the time police policy was to destroy temporary shack dwellings. Bulldozing illegal housing was not just the preserve of the South African apartheid government, it has happened in many countries, notably in the Kibera settlement in Nairobi, Kenya. The apartheid regime also established new black neighbourhoods; Khayelitsha was one of these, set up in 1985. People were relocated there, sometimes with violent force. The influx control system, operating at the time, prevented Xhosa people from migrating from the Eastern Cape to Cape Town without a permit.

When apartheid ended in 1994 this came to an end and there was a great influx of people in search of

work and education. In 2011 around 62 per cent of residents in Khayelitsha were rural–urban migrants, most coming from the Eastern Cape. Many of them erected shacks made of tin, wood and cardboard. The new government has also had to try to deal with the AIDS pandemic and drug-related crime. Some improvements have been made but the size of the problem is so great that improvements will be slow.

Khayelitsha today

In Khayelitsha, older areas of mostly formal houses built by the apartheid government are found in Bongweni, Ikwezi Park, Khulani Park, Khaya Park, Tembani, Washington Square, Graceland, Ekuphumleni and Zolani Park. These include areas of bank bond (bank loan) housing and generally have more affluent populations. Mandela Park was established in Khayelitsha in the late 1980s by the banks, who bought the land and started building housing; this is one of the few areas in South Africa where Africans bought housing through bank bonds.

Site B, Site C, Green Point, Litha Park, Makaza, QQ Section, TR Section, RR Section, Enkanini and Harare are newer areas built up around the older areas. With the exception of Litha Park, these areas contain a high number of informal settlements, ‘RDP houses’, and people living informally in other people’s backyards.

The Reconstruction and Development Programme (RDP) was a policy framework set up by the government of Nelson Mandela in 1994 to address the immense socio-economic problems of the country. Its aims included:

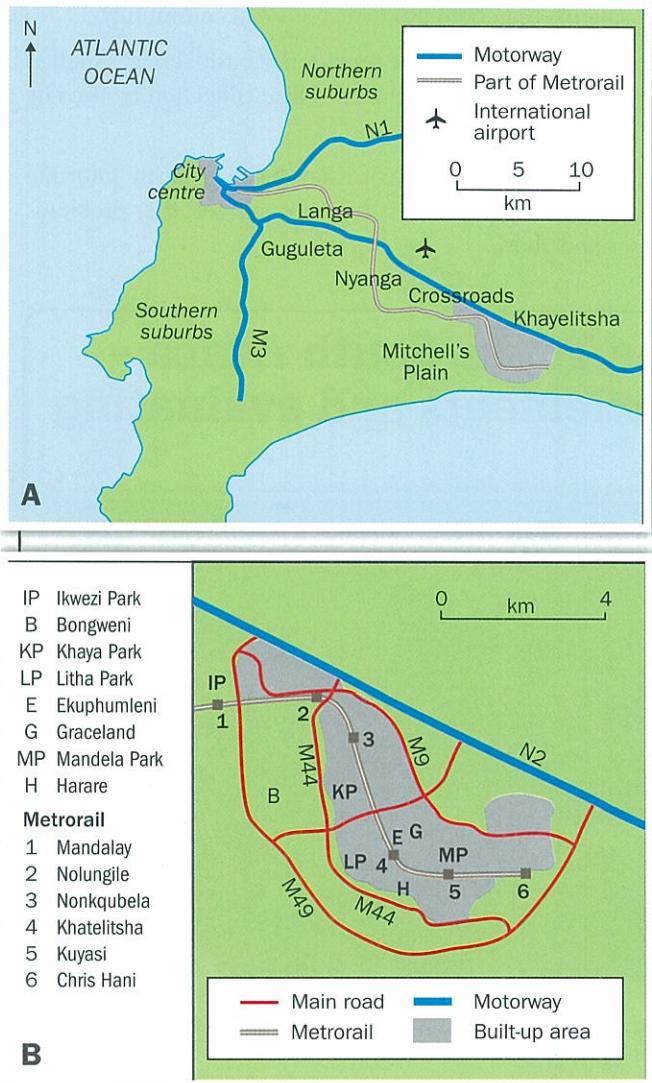
- alleviating poverty
- improving social services
- boosting the economy
- introducing infrastructure projects, including housing.

The 2011 census recorded the population as 391 749, with density of 10 000 people per km², with a mainly Black African population. Khayelitsha has a very young population: fewer than 7 per cent of its residents are over 50 years old and over 40 per cent of its residents are under 19 years old. Growth is continuing – between the 2001 and 2011 censuses, the population of Sub-council Area 10, which is part of Khayelitsha, increased from 125 314 to 143 097.

Changes since 1994

The main changes are:

- new brick housing



Figs. 6.44 A and B The location of Khayelitsha

- new schools – there are now 37 primary schools and 21 secondary schools
- a new CBD.

Some of the developments have been controlled by the Khayelitsha Community Trust (KCT), set up in 2003. These include the KCT mall, a 19 254m² shopping centre with 58 tenants. There is a plan to build 2000 residential units in the Khayelitsha Business District. Phase One will include 376 institutional subsidy housing units targeted at those people with an income of R3500 a month.

Initiatives for young people include the following:

- As part of the 2010 FIFA World Cup preparations, a Football for Hope Centre was constructed. Grassroot Soccer, operating from the Football for Hope Centre, is focusing on HIV prevention and life skills programmes for young people.
- AMANDLA EduFootball Safe-Hub is a youth friendly space where young people can find safety, both physical and emotional. This aims to prevent chronic youth-driven violence.

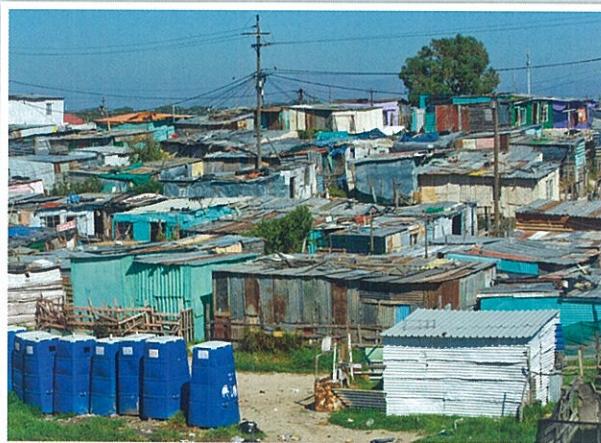


Fig. 6.45 Khayelitsha. Notice the communal toilets and electricity cables

Transport includes the Golden Arrow Bus Services which operates from various bus stations. Trains are the cheapest and most used form of transport and Metrorail links six stations (Mandalay, Nolungile, Nonkqubela, Khayelitsha, Kuyasa and Chris Hani) with the city centre. As in much of Africa, minibus taxis are important. There are a number of taxi ranks, although most taxis pick up passengers on the main roads.

Khayelitsha District Hospital opened in Khayelitsha in February 2012 and has specialist facilities. There are three provincial government clinics: Khayelitsha (Site B), Michael Maphongwana (Harare) and Nolungile (Site C). There are various smaller clinics throughout the township.

Recently a tourist centre opened on Look Out Point. Companies offer 'township tours', a form of social tourism.

However, note the following points:

- Crime rates remain high.
- Shacks are still homes for 70 per cent of residents.
- One in three people has to walk 200 metres or further to access water.
- Only 53 per cent of the working age population is employed. Of those employed, the breakdown by type of job carried out is:
 - 19.4 per cent: domestic work
 - 15.2 per cent: service work
 - 15.2 per cent: skilled manual labour
 - 11 per cent: unskilled manual labour
 - 10.4 per cent: security services.
- As many as 89 per cent of households are either moderately or severely food insecure.

Khayelitsha fire: End to South Africa's shack life?

By Mark Lobel, BBC News, Khayelitsha, Cape Town, 10 January 2013

As building gets under way after catastrophic New Year's Day fires in Cape Town's Khayelitsha township, the one thing Eugenie Joki, 54, wants from South Africa's government is a brick house – which she believes would have saved her cousin's life. Her cousin, a 26-year-old security guard, was killed as flames engulfed his tin shack – one of at least five people killed in the fires. Khayelitsha – which has a population of about one million residents – does have some brick-built houses but its ever-expanding slum areas, known as informal settlements, are home to about 10 000 mainly unemployed people.

While politicians predict that one of the worst settlement fires in Cape Town's history may signal the beginning of the end of shack life, little seems to have changed on the ground. Piles of charred debris from the windswept fires that consumed hundreds of makeshift homes on the first morning of 2013 still tarnish the land where thousands of South Africa's poorest people once lived. One badly damaged plot I approach is silent, bar the sound of one capped man tapping away at a wooden beam. Alarmingly, all the ingredients that led to the disaster are still clearly visible – with very few there questioning this return to a dire status quo. The household parts for sale along the road – from the wooden frames and corrugated zinc to the mattresses, carpets and varnished and painted items – are all extremely vulnerable to fire. The wooden poles and zinc sheets provided by the city's relief workers are a straight match for the frameworks that were destroyed.

Many of the displaced are now holed up in community centres and town halls, living on hand-outs, longing to return to start rebuilding. Surveying the damage, a drama teacher from the area, Nokuphiwo Jada, says the problem remains a lack of space. 'In that situation, there is just no way to prevent a fire' she told the BBC. The schools in which Ms Jada works were not affected and are surrounded by adequate firebreaks.

In most of the shack areas, the only amenities provided by the state have been cement-walled toilets, with

outside water taps. In a large sports hall, hundreds of the displaced, some without even ID cards and passports, join together to chant songs of praise. Standing silently in the corner Ms Joki looks on wearily and distraught. She suspects an upturned paraffin-powered barbecue, probably used to cook sausages – there is no electricity in large parts of the slums – started the fire in her area. It blew over in incredibly strong winds before the fire spread with devastating speed.

As residents ran for safety, grabbing whatever belongings they could in the dark, nobody realised her cousin, who she described as 'sweet and humble', was still asleep. The tragedy could have cost many more lives as lots of dwellers were fortunately away, visiting the Eastern Cape for the holiday season, only to return to find their homes gone. But the city authorities are determined to stop the haphazard rebuilding beginning in the area in which Ms Joki lives. Bright yellow bulldozers are busy levelling the most devastated section where 700 families lost everything. The city's authorities hope a new, ground-breaking housing scheme may soon rise from the ashes.

'The argument is usually lost when residents talk to bureaucrats' said Aaron Hobongwane, Khayelitsha housing worker.

Cape Town's Executive Director for Safety and Security, Richard Bosman, puts it bluntly: 'The challenge is to eradicate informal settlements.'

Known as a 're-blocking', the plan is to align the plots in rows, leaving three metres between them for emergency vehicle access, and include the provision of essential services. But the new layout would mean some people would have to be relocated. That would have to follow lengthy negotiations with the community – as getting residents to agree to break up their social networks, on which some of the poorest greatly depend, would undoubtedly take time. Were this redesign to succeed, the authorities would hope to replicate it on a mass scale, but even Mr Bosman's most optimistic forecasts suggest it would take five to ten years. Until then

Mr Bosman stressed the importance of educating people about how to deal with fires – but among the small sample of people I spoke to there was scant evidence such a programme has had any effect so far.

During the tragic start to the New Year, fire engines could not get down the main access road as people had piled it with whatever belongings they could grab. Mr Bosman said it was also crucial to increase employment among the dwellers, pointing out that 10 000 jobs for informal settlers have been created in the city in the last six months as part of an expanded public works programme. But even in a city he calls 'a benchmark' for other places in South Africa, there are huge challenges. Anywhere where a woman with tuberculosis loses all her medical records while saving her 89-year-old mother and a child from a fire only to have to beg and wait for what may be weeks for the same flammable structure to be reinstated is far from a benchmark.

'I think that's why the city is intervening so strongly' Mr Bosman explained.

'In a sense it is saying: "Listen, you can't go back to the way you were. You were lucky this time. Next time you are not going to escape. Just think about it." And that's part of the problem – in a week the memories subside – and you click into survival gear, to get back to work and house your kids.'

Mr Bosman is optimistic that future negotiations and the success of the re-blocking scheme may yet prove a turning point in shack life. People who are trying to improve Khayelitsha's housing, like Aaron Hobongwane, are a lot less optimistic. 'The argument is usually lost when residents talk to bureaucrats' he said. 'What needs to happen is better urban planning, as urbanisation is here to stay.'

For Ms Joki, her attention is now on preparing for her cousin's funeral, which will be held in the Eastern Cape, with his widow and young daughter also present. When she returns to Khayelitsha she will continue her wait for a new – hopefully more secure – house.

- 30.** What are the current challenges to improving the lives of people in Khayelitsha?
- 31.** What has been done to solve the problems of the Cape Flats area in the past and today?
- 32.** Evaluate the success of what has been done so far.

Provision of transport infrastructure for a city

Traffic congestion is an issue in many large towns and cities for these reasons:

- Ancient cities were built long before the need for mass public transport and not designed for cars, buses and trains.
- Use of private cars has increased.
- Having people commuting to work by car means that there are major movements into towns and cities in the morning rush hour and out during the evening rush hour. Many of the trains and buses that carry these people are not needed during the rest of the day.
- People visiting the CBD for sightseeing, shopping or business purposes add to the congestion.
- Cities such as Nairobi and Sydney are the focal points of national transport systems and this means that many people pass through them in transit.

The solutions used in different cities include the following.

Integrated transport policies

This means that different forms of transport – bus, overground rail, underground rail – are planned so that they link together for the benefit of the customer. A single

body may be responsible for coordinating services run by different companies.

Road

Many cities have inner and outer **ring roads**, the Paris 'Boulevard Périphérique' being particularly famous. Where there are outer ring roads traffic does not have to travel through the city. Inner ring roads help traffic flow between parts of the city without going through the centre. Traffic lights (robots) control the traffic. In places traffic lights above the carriageways allow **tidal flow** – more lanes are available for traffic travelling inwards in the morning and more lanes are available to traffic travelling outwards in the evening. Roundabouts (circles) are used on the major intersections. Smaller urban areas in the UK, e.g. Oxford and Cambridge, have **park and ride** schemes to increase the use of buses.

Underground railways

The London Underground, Budapest Metro and Glasgow Subway were opened before 1900 so underground railways are nothing new. London is developing Crossrail, a completely new railway running from east to west. It will operate with mainline-sized trains, carrying more than 1500 passengers in each train during peak periods.

Air

International airports are mostly located outside the main built-up areas because of space requirements and noise problems. This means that rapid transport routes to and from airports are particularly important. London City Airport is different in that it was developed on a derelict industrial site in the docklands area of the inner city. It is used by short take-off and landing aircraft and serves the business and banking quarter known as 'The City'.

Case study: Curitiba, Brazil – difficulties and attempted solutions in the provision of infrastructure for a city

Introduction

Curitiba is the capital of Paraná state in Brazil. The 2010 census recorded the population of the city as 1.7 million; however, the Curitiba Metropolitan Area has a population of about 3.2 million. The Rede Integrada de Transporte or Integrated Transportation Network was established in 1974. It was set up using public funds but operates as a non-subsidised, privately owned, public transport system. The well-planned, integrated transport system, based principally on buses, is claimed to be the inspiration behind other cities' transport systems, such as those in Bogotá, Colombia; Guayaquil, Ecuador; and Eugene, Oregon, USA.

Factors leading to the development of the new transport system in Curitiba

- Curitiba's rapid population growth was putting great pressure on the existing transport network, including the electric trolley system. By the 1960s the population had reached 430 000 and it is over four times this today.
- The government wanted to stimulate economic growth in the area.
- The fare payment system and narrow bus doors caused delays and there was congestion at bus terminals.

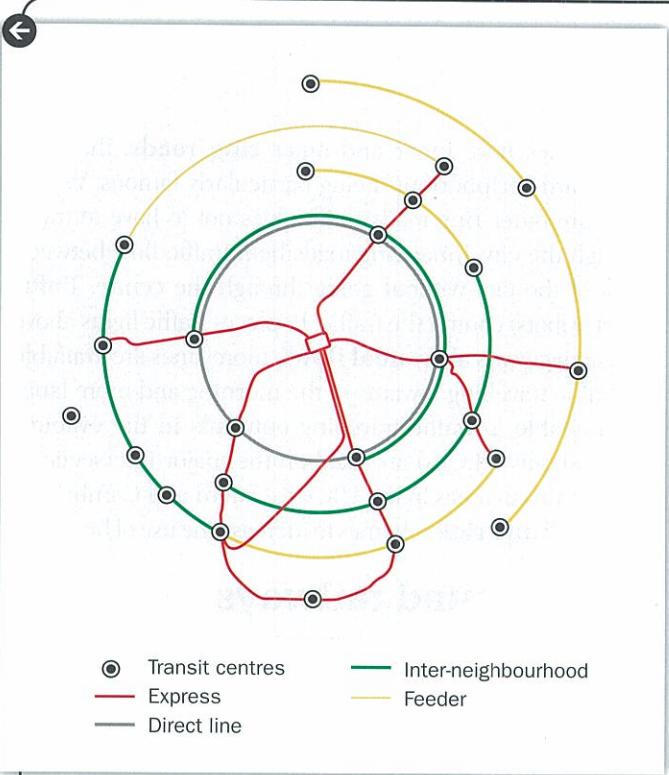


Fig. 6.46 Map of part of the Curitiba Integrated Transportation Network

- It was difficult to extend the electric trolley to new routes because of the narrow city streets.
- Periods of hyper-inflation discouraged development of the roads.

In 1964, architect Jaime Lerner, who later became mayor of Curitiba, led a team from the Universidade Federal do Paraná that suggested a reduction of traffic

in the downtown area and a convenient and affordable public transit system. The cost of a new underground railway system was estimated at over \$90 million per kilometre, compared with just \$200 000 per kilometre for construction of new bus routes. The plan was adopted in 1968.

Features of the transport system

- Buses travel in dedicated lanes on major streets.
- Buses are long, split into three sections ('triple bendy buses').
- Bus stops have elevated, undercover platforms with disabled access.
- Passengers board and exit buses simultaneously.
- There is a one fare irrespective of distance travelled.
- There is a bus stop within 400 metres of all houses.
- There are over 20 'transit centres', where it is possible to transfer between routes.
 - Traffic lights are delayed for oncoming buses.
 - Sensors in the road detect buses and are used to tell waiting passengers when to expect the bus to arrive.
 - Fares are pre-paid, reducing queues to board the bus.
- The system carries 2.3 million passengers a day and is used by 85 per cent of Curitiba's population.
- The main thoroughfare of 15 November Street is pedestrianised.
- The 'trinary road system' uses two one-way streets moving in opposite directions with a two-lane bus street in between.
- Five 'trinary roads' form a star that converges on the city centre.
- Land farther from the trinary roads is zoned for lower-density developments to reduce traffic away from the main roads.
- Tall buildings are allowed only along bus routes.
- Areas subject to floods were condemned and are now parks.
- Buses run on biofuels – Brazil is a major producer of soybeans and ethanol.
- In many parts of the world buses are traditionally stereotyped as being for use by the 'lower class'. The system is designed to get away from this and encourage middle-class people to use buses.



Fig. 6.47 Passengers entering one of the tube-shaped bus stops at Curitiba

- Buses are colour coded as follows:

Bus name	Colour	Function
Express	Red	<p>These:</p> <ul style="list-style-type: none"> use the five 'star routes' are called the 'above-ground subway' because of their speed, capacity and frequent service use tubular-shaped stations. <p>Passengers pay to enter the stations to allow quick and simultaneous boarding and disembarking.</p>
Inter-neighbourhood	Green	<p>These:</p> <ul style="list-style-type: none"> travel outside the city centre circle the city centre on lines 1 and 2 travel on lines 3 to 6 which are important connections between neighbourhoods.
Direct line (the 'quickie bus')	Silver	<p>These:</p> <ul style="list-style-type: none"> make few stops link with express stations.
Feeder	Orange	<p>These:</p> <ul style="list-style-type: none"> use the local bus lines link one passenger terminal to a neighbourhood link with the express buses have large windows to allow better views.
Downtown circulator	White	<p>These:</p> <ul style="list-style-type: none"> are small buses circle the city centre.
Regular route	Yellow	<p>These:</p> <ul style="list-style-type: none"> operate radially from the city centre.
Inter-hospital	White	<p>These:</p> <ul style="list-style-type: none"> link the main city hospitals.
Tourism line	Multi-coloured	<p>These:</p> <ul style="list-style-type: none"> focus on the city's tourist attractions. <p>Paying a single fare allows passengers to get on and off the bus five times.</p>

Table 6.12 The buses in Curitiba Integrated Transport Network

Current issues

- Cost issues have reduced the number of buses and limited maintenance.
- Overcrowding sometimes causes difficulty boarding the buses.
- There are still frequent traffic jams in the city.
- Buses represent only 1 per cent of automobiles in the city (there are 1.2 million vehicles for a population of 1.7 million).
- There are issues regarding integrating bicycles with the system. There are just 35 kilometres of cycle lanes. In contrast, the cycle-friendly city of Amsterdam,

Netherlands, has 400 kilometres of cycle lanes for a population of 0.7 million. In Curitiba, cyclists often illegally use the dedicated bus lanes.

- 33.** What is an integrated transport system?
34. List the reasons for congestion in cities such as Curitiba.
35. Why are buses seen in many societies as the transport used by the lower class?
36. Evaluate the success of the Curitiba Integrated Transport Network.

Key concepts

The key concepts listed in the syllabus are set out below. For each one a summary of how it applies to this chapter is included.

Space: the physical environment provides the spaces in which settlements grow. This includes factors such as slope angles, climate and availability of water. Human activity and economic factors then determine how the spaces are used and different types of settlement develop, from small villages to the CBD or the shanty town. A particular space may develop as the service centre or market for the surrounding area. Within that space, different spaces have different land uses such as residential, industrial, services or recreational.

Scale: the time scale is a critical feature of the development of settlements. The pace and timing of urbanisation have varied from Western Europe to South America and Africa. The rate of population growth has affected the time scale at which settlements have grown. Spatial scale is also a key concept in settlement studies, with a hierarchy of settlements from isolated dwellings to conurbations existing at different scales. The growth of the world city has led to the interaction of settlements at the global spatial scale.

Place: settlements grow in different types of place from road junctions, to bridge points to coastal ports. Different places present different advantages or challenges to settlement. Some places may be remote with few resources while others may be centrally located and rich in natural resources. A place such as an agricultural village may be highly advantageous for settlement but economic and social factors may change leading to its depopulation. Then further changes may mean that the place is advantageous for counter-urbanisation. Similar changes occur for places within settlements.

Environment: the rural environment in which people live differs greatly in LICs, MICs and HICs. In LICs rural dwellers may lack the most basic services whereas in HICs rural dwellers may be affluent and have good access to services, although there may be some decline. Modern cities are affected by a number of environmental issues, including the problems of the CBD, shanty settlements and traffic problems. This chapter describes the causes of these issues and examines the possible sustainable solutions.

Interdependence: rural and urban settlements are interdependent at the local, national and world scale. At the local or national scale, urbanisation may result in the growth of towns but a decline in rural settlements. This change may be reversed through counter-urbanisation and then reversed again through re-urbanisation. At the world scale the development of the world city illustrates the complex interacting human systems and processes that create links and interdependencies. The economic development of a city is linked to activity in other parts of the world.

Diversity: spatial differences occur in both rural and urban settlements, between LICs, MICs and HICs and the diverse nature of rural and urban settlements is described in this chapter. This includes the differences between places, environments, cultures and people in LICs, MICs and HICs. However, all cities in HICs do not have the same pattern of land use and the concept of the urban model is somewhat out-dated. Some processes such as urbanisation, or residential segregation, or competition for land, can be seen to be operating in all cities, but each city has its own distinctive features. The case studies in this chapter illustrate how the same processes act, but that villages, towns and cities remain diverse in character.

Change: the whole of this chapter is about change and the dynamic nature of places, environments and systems is illustrated by the changes occurring in rural and urban areas. These changes include rural depopulation, changes in service provision, migration, urbanisation, counter-urbanisation, re-urbanisation, the development and changes in the hierarchy of world cities, and changing patterns of urban land use. These changes present challenges such as the development of shanty towns or the provision of appropriate transport infrastructure.

Exam-style questions

- 1** Fig. 6.48 gives information about the population in two counties of Iowa, USA. Pocahontas is a largely rural county and Johnson is a largely urban county.

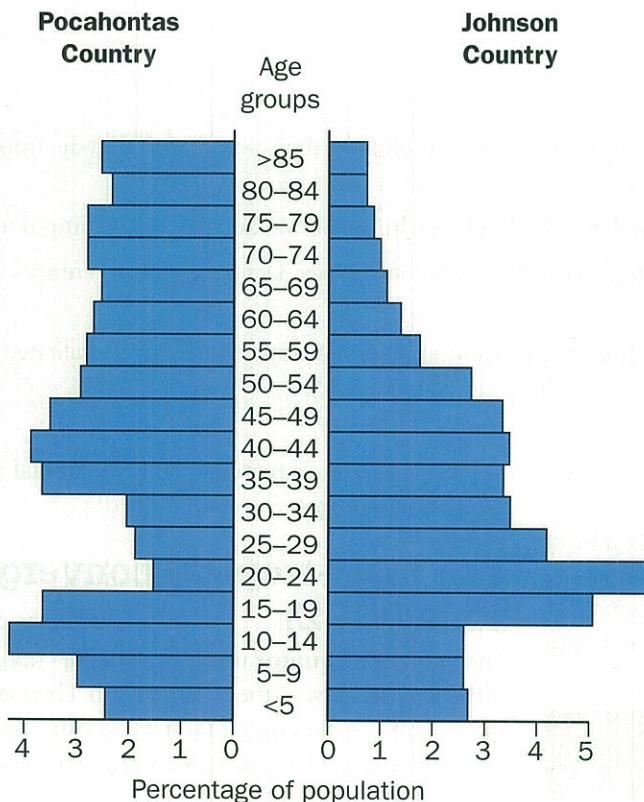


Fig. 6.48 The population distribution, by age, in Pocahontas County (left) and Johnson County (right), Iowa, USA

- (a) Compare the populations of the two counties. [2]
- (b) Suggest reasons for the differences. [4]
- 2** (a) Describe the meaning of the concept of bid-rent and its effects on the location of functions in urban areas. [7]
- (b) Explain other factors which affect the location of functions in urban areas. [8]
- (c) The process of urbanisation has been different in LICs, MICs and HICs. Evaluate this statement, referring to causes and consequences. [15]

In this chapter you will learn about:

- How the humid tropical and seasonally humid tropical climates result from their positions within the tropics and the factors interacting there.
- Unique landscapes, both ancient and modern, that have developed in the humid and seasonally humid tropics.
- How the humid tropical and seasonally humid tropical climates and other factors cause differences in soil and vegetation cover.
- How the use by humans of ecosystems in the humid and seasonally humid tropics presents a challenge to manage them sustainably.

Tropical climates

The humid and seasonally humid tropical climates lie almost entirely within the tropics. In one of the most frequently used classifications of climates, by Köppen, modified by Trewartha, the letter A signifies a tropical climate with rain and with *a coldest month temperature above 18 °C*.

1. Use a physical atlas map to explain why some equatorial areas do not have a humid tropical climate.

Influences on the tropical climates

Understanding these depends on knowledge of Chapter 3.

Latitude

The hot temperatures all year of humid tropical climates result from the high angle of the noonday sun all year. Its lowest angle is only 66½°, so there is a low annual temperature range, which is smaller than the diurnal range. Equatorial areas are not the hottest on Earth because of their cloudiness. Further from the Equator, the seasonally humid

tropical climates experience greater annual and diurnal temperature ranges.

The inter-tropical convergence zone (ITCZ)

The **thermal Equator** migrates with the changing position of the Earth relative to the overhead sun. This causes seasonal movements of the equatorial low pressure belt and of the trade winds that blow into it, forming the ITCZ and the wide convectional rain band.

The general position of the ITCZ is related to where the sun is highest in the sky but it lags behind changes in the sun's position relative to the Earth. It moves north in the northern hemisphere summer and south in the southern hemisphere summer, but not usually as far away from the Equator as the thermal Equator. The mean position of the ITCZ overall is 5°N; in July it is 8°–14°N, whereas in January it is 2°–8°S, with the lowest pressures in the troughs over South America and Africa. The ITCZ is wide because the air masses meeting there are similar in temperature and moisture content, so mixing can occur.

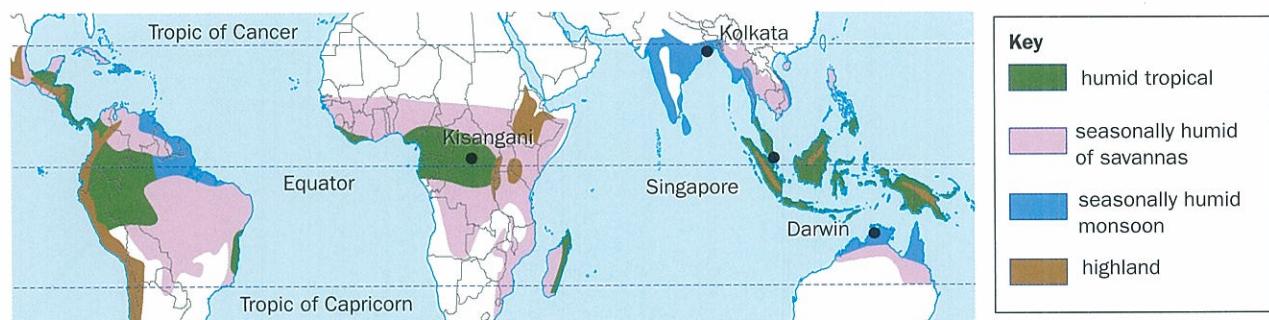


Fig. 7.1 The global distribution of the humid tropical and seasonally humid tropical climates