



GCSE Geography Revision Booklet

Paper 2: Challenges in the human environment

Length of exam: 1 hour and 30 minutes



Preparation for Y11 mock exams November 2024

Name:

Paper 1: Challenges in the human environment

Section A: Urban issues and challenges

- Urban growth
- Urban change
- Urban sustainability



Section B: The changing economic world

- Development and quality of life
- Reducing the development gap
- UK economy



Section C: The challenge of resource management

- The challenge of resource management - Question 3
- Water - Question 5

Answer questions: 1, 2, 3 and 5

Don't answer question 4 or 6

Section A: Urban Issues and Challenges

A growing percentage of the world's population lives in urban areas

The world's population is growing rapidly and reached 8 billion people in 2022. The highest rates of population growth are occurring in low-income countries (LICs), such as Zimbabwe, Malawi and Niger. Some countries are experiencing population decline, for example Japan, Russia and Ukraine.

Today more than 50% of the world's population live in urban areas. Urbanisation is the proportion of the world's population who live in cities. It is the result of the natural increase of a population (births minus deaths) plus migration. Urban growth is the increase in the area covered by cities. The number of cities with over 10 million people is increasing. These are called megacities. There are now 34 megacities in the world. The table shows the top 10 megacities.

What is urbanisation?

Why is urbanisation happening at a faster rate in LICs and a slower rate in HICs?

Causes of urban growth

The population of cities usually changes in one of two ways:

1. **Natural increase (or decrease)** - this is the difference between the number of births and the number of deaths.
2. **Migration** - this is the movement of people into or out of the city.

More and more people are leaving rural areas and moving to cities. This is called rural to urban migration. People move because of push and pull factors. **Push factors** are things that **make people want to leave** rural areas and **pull factors** are the things that **attract people** to the city.



Possible push factors

- unemployment
- lower wages
- crop failure
- poor living conditions
- poor health and education services
- few facilities
- natural disasters
- civil war

Possible pull factors

- more jobs
- higher wages
- better living conditions
- better education and health services
- better facilities
- less chance of natural disasters

Outline the factors below to explain how they affect the rate of urbanisation:

- Migration (push and pull factors): _____

- Natural increase: _____



What is rural-urban migration?

Urban growth creates opportunities and challenges for cities in LICs and NEEs

Case study of a major city in a NEE: Rio de Janeiro, Brazil

1. Rio has grown rapidly in the last 50 years and become a major industrial, administrative, commercial and tourist centre.
2. Migrants have contributed to the economic development of Rio.
3. Rio hosted the Olympics in 2016 and the Soccer World Cup in 2014.
4. Brazil exports sugar and coffee.
5. Brazil is located in the continent of South America.
6. The capital of Brazil is Brasilia since 1960.
7. There are a number of attractions including Christ Redeemer (which is one of the Seven Wonders of the World), Copacabana Beach and Sugar Loaf Mountain.
8. Major TNCs (transnational corporations) e.g. Petrobras have their headquarters located in Rio.

Complete the table to show why Rio de Janeiro is important regionally, nationally and internationally:

Regionally	Nationally	Internationally



Why is Rio a growing city? (Think about natural increase and migration).

Environmental issues in Rio de Janeiro

Issue	Problem	Solution
Traffic problem	<ul style="list-style-type: none">• Air pollution causes 5,000 deaths per year in Rio.• Heavy traffic that creates a build-up of fumes.• Mist from the Atlantic Ocean mixes with vehicle exhaust fumes	<p>As a solution they have done 3 things</p> <ul style="list-style-type: none"><input type="checkbox"/> Expand the metro system<input type="checkbox"/> Built new toll roads around the city

	<p>and pollutants from factory chimneys.</p> <ul style="list-style-type: none"> • Rio is the most congested city in all of South America. • Steep mountains mean that roads can only be built on coastal lowland areas. • This means main routes become congested easily. • The number of cars in Rio has grown by over 40% in the last 10 years. • Due to the high crime rate many prefer to travel by car. 	<ul style="list-style-type: none"> ❑ Making coast roads one way during rush hour traffic
Water pollution	<ul style="list-style-type: none"> • Guanabara Bay is highly polluted causing a threat to major wildlife. • Large amounts of sewage pours into the bay. • Commercial fishing has declined by 90% in the last 20. • There is a worry that pollution could destroy the two main beaches which would damage the tourist industry. • Ships empty their fuel tanks into the bay and 55 of the main rivers flowing into the bay are polluted. 	<ul style="list-style-type: none"> ❑ Ships are now fined for emptying fuel into the bay. ❑ 5KM of new sewage pipes have been laid. ❑ 12 new sewage works have been built.
Waste	<ul style="list-style-type: none"> • The worst waste problem is in the favelas. • Bin lorries cannot reach them due to steep slopes. • Most waste is dumped, this can lead to diseases e.g. cholera. 	<p>They have set up a power plant in the University which uses methane gas (biogas from rotting rubbish). It creates electricity for 1000 homes</p>

Read the information about Rio's environmental problems. Rank the problems from worst to least and explain your reasons for putting them in this order.

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Which is the most effective solution? Why?

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Urban change in cities in the UK leads to a variety of social, economic and environmental opportunities and challenges

A case study of a major city in the UK: Sheffield

The University of Sheffield is a world top 100 university attracting 50,000 students. After graduation more people choose to stay in the city more than any other university!

Sheffield is a regional powerhouse for drama. Theatre fans love the intimacy of the famous Crucible and its pioneering productions. The magnificent Lyceum has a hugely varied programme, hosting everything from opera and ballet to West End musicals.



Love the outdoors? Half of Sheffield's population lives within 15 minutes' walk of open countryside. The Peak District is cherished by cyclists, campers, climbers and anyone who just likes a nice stroll, the Peak features some of Britain's most spectacular landscapes.

List three reasons why Sheffield is a major city, both in the UK and in the wider world:

- _____
- _____
- _____

Challenge created by urban change in Sheffield

Social inequalities are the differences between poverty and wealth, as well as wellbeing and access to jobs, housing, education etc.

Dore	Darnall
	
Nearly 50% of the population have a degree or equivalent	80% of younger people have GCSEs but only 30% have A levels
Life expectancy average is 86 years	Life expectancy for men is 77 years
Highest level of car ownership in the city	Above average teenage conception rate
Between 10 - 20 antisocial behaviour issues reported per month	The majority of crimes are antisocial behaviour - up to 150 per month!



Using the information in the table on the previous page explain the social inequalities in Sheffield

Environmental challenges created by urban growth in Sheffield

- ▶ As the population of Sheffield increased **urban sprawl** (outward growth of the city) has extended particularly to the north, east and south east of the city to include places like Wincobank, Gleadless Valley and Shiregreen. Sheffield established a green belt in 1938. "The aim of the green belt is to prevent the encroachment of urban areas into the countryside and there are only certain types of development that are considered to be appropriate."
- ▶ Many industrial buildings that are no longer used have become **derelict** (disused) e.g. near Kelham Island. This can lead to a loss of economic activity / jobs in the area. It can be dangerous / attract anti-social behaviour, ugly / unsightly, expensive to secure / keep people out and make it difficult to attract investment into an area.
- ▶ On average, Sheffield residents produce over 240,000 tonnes of **waste** every year. Of this over 21% is recycled and composted and less than 17% is landfilled. 62% of waste collected in Sheffield is taken to the Energy Recovery Facility where it is burnt at temperatures of over 850°C in a specially controlled environment. The heat created from the process is converted to steam and used to generate heat and electricity to 140 buildings and 19,000 homes.

1. What is urban sprawl?

2. What areas of Sheffield grew as a result of urban sprawl?

3. How did Sheffield reduce the rate and impact of urban sprawl?

4. Explain two impacts of derelict industrial buildings in Sheffield

5. How much waste do Sheffield residents produce each year?

6. How is waste used in Sheffield?

Urban sustainability requires management of resources and transport

Urban sustainability means meeting the needs of the present urban population whilst protecting the cultural heritage, social community and improving the environment through the efficient use of resources and recycling. Land use has changed from secondary industrial brownfield sites to tertiary shops, offices and leisure facilities. This is sustainable because it improves the environment (improved appearance), creates jobs which is good for the economy and provides leisure activities which is good socially.

Curitiba – an example of a sustainable city

Curitiba is city in the SE of Brazil, in the state of Parana with a population of approximately 1.75 million people. It has a planned transport system, which is used by 85% of the population.

Waste

Waste separated into organic and non-organic. Recyclable are sorted and processed. Paper becomes paper again. Plastics are re-moulded and cans are turned back into cans. This costs the same as landfill but it employs more people.

Green spaces

They have solved the flooding problem by turning flood banks into green space. Trees are planted and disused factories were turned into sports facilities. Flood waters can go into the lakes which means it is diverted from city. High-rise developers could either pay cash to build more storeys or provide green spaces.

Transport

There are dedicated bus lanes and bi-articulated buses, which can carry large numbers of people. Passengers pre-pay (no time to wait for people to pay) and there are extra wide bus doors so they load/unload quickly.

As a result, there is a lack of traffic congestion in rush hour. The system is 500 times cheaper than building a subway, and the same number of people can travel as in Rio de Janeiro, but without the cost of the system. Curitiba has the lowest rate of air pollution in Brazil. It has cut travel times by 1/3 and most commuters take the bus.

Green Exchange

Low-income people can exchange their recycled products for waste food products from farmers (and it gets people to recycle rubbish). This works well as garbage trucks can't fit down the squatter settlements. It started in 1990 and it now helps around now helps 30,000 families and collects 300 tonnes of rubbish every month.

What is the definition of 'sustainable urban living'?

Identify five features of a sustainable city:

- ---
- ---
- ---
- ---
- ---

Choose two from your list above and explain how this characteristic makes a city sustainable:

- ---

- ---



Section B: The Changing Economic World

There are global variations in economic development and quality of life

Classifying parts of the world

The level of development of a country shows how **economically, socially, culturally or technologically advanced** that country is. The way in which countries are classified is changing.

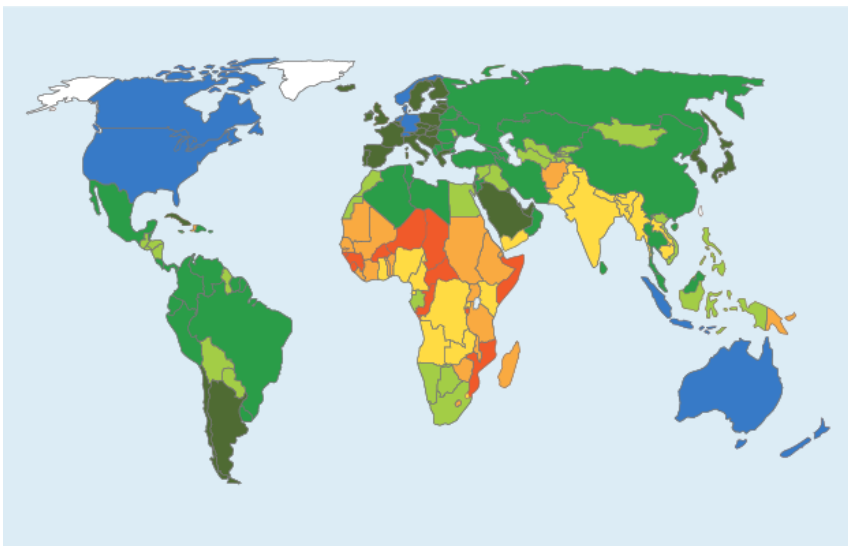
The World Bank classification

A country's level of development is now classified in a different way. The World Bank uses the names:

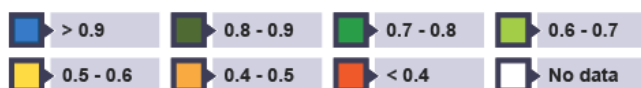
- low-income countries (LIC) - these are countries with a GNI per capita of \$1,045 or less, e.g. Chad and Ethiopia
- medium income countries (MIC) - these are countries with a GNI per capita of more than \$1,045 but less than \$12,746, e.g. Mexico and Iraq
- high income countries (HIC) - these are countries with a GNI per capita above US\$ 12,746, e.g. Germany and the USA

Measures of development

- Development in countries can be measured in several different ways. Some are economic measures, and others are social measures.
- **Human Development Index (HDI)**
- Development is measured using the Human Development Index (HDI)). HDI is calculated by the United Nations. It measures average life expectancy, level of education and income for each country in the world. Each country is given a score between 0 and 1 - the closer a country gets to 1, the more developed it is.



Human Development Index (HDI)



Other measures of development

HDI is the best measure of development as it considers both economic and social factors. However, there are many other measures of development that can be used. Some of them are:

Measure of development	Description
Access to safe water	The percentage of people who have access to safe, clean water.
Birth rate	The number of live births per 1,000 people. Birth rates are often high in a less developed country.
Death rate	The number of deaths per 1,000 people. High death rates can indicate a less developed country.
GNI per capita	Gross national income per person. The value of a country's income, divided by the number of people in that country.
Infant mortality rate	The number of babies who don't survive to the age of 1 per 1,000 live births.
Life expectancy	The average age that a person may live to.
Literacy rate	The percentage of adults who can read and write.
People per doctor	A ratio to show the number of people per doctor. A lower ratio can indicate a richer country.

List the measures of development that are used to classify countries and give a brief definition. The list has been started for you:

- GNI (Gross National Income) _____
- HDI (Human Development Index) _____
- Literacy rate _____
- _____
- _____
- _____
- _____
- _____

Choose two of these measures and explain how it tells about the development of a country i.e. a high life expectancy means a country is developed because...

1. _____

2. _____

Explain what HDI is and why it is the best measure of development

Some LICs and NEEs are experiencing rapid economic development which leads to significant social, environmental and cultural change

A case study of a NEE: India, Asia

Describe the location of India (using geographical terminology).

Industrial structure

India is a new emerging economy (NEE) found in southern Asia. It is the world's largest democracy; it has the second largest population and a rapidly growing economy.



Changing industry in India

There are four main types of jobs or industries in India. These are:

- primary, which involves getting raw materials from the land, e.g. farming or forestry

- secondary, which is making products out of raw materials, e.g. food processing and car manufacturing
- tertiary, which is providing a service, e.g. doctors and teachers
- quaternary, which means ICT and research, e.g. computer software designers and scientists

A country's industrial structure is the percentage of people working in each job type. Changing the balance between these four sectors of industry can help a country to develop.

Up until the 1980s, India's main type of industry was primary. Many people were subsistence farmers, which is not very profitable. From the late 1980s, the Indian government encouraged foreign transnational corporations (TNCs) to set up within the country. Factories were built and secondary jobs in manufacturing were created. Factory workers earn more money, which means that they can afford to pay people for services, such as entertainment and healthcare. Workers in the tertiary (service) sector are paid more than in primary and secondary

The additional wealth generated from the changing industrial structure in India has created a multiplier effect - as one thing improves, it allows other things to improve too.



Explain how the multiplier effect creates additional wealth in India

Complete the table below about the main types of jobs or industries in India:

Sector	Definition	Example
Primary		
Secondary		
Tertiary		

Quaternary		
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What is meant by a country's industrial structure?

Major changes in the economy of the UK have affected, and will continue to affect, employment patterns and regional growth

Causes of economic change

The UK is experiencing a period of economic change. This is happening as a result of several factors, including globalisation, government policies and deindustrialisation.

Globalisation

Globalisation describes the way in which the world has become more interconnected. Globalisation has led to an increase in world trade, foreign investment, communication between different countries and the sharing of ideas.



In the past, the UK economy was based on activities that took place within the country and within Commonwealth countries. The growth of globalisation has meant that the UK economy is now more dependent on other countries. An example of this is the manufacturing industry. In the 1900s, 55% of the UK population worked in secondary jobs. The 2011 census showed that this figure had dropped to just 9%. Globalisation has allowed people to connect with other countries - it is possible to send orders abroad, locate factories abroad and get products shipped in to UK ports.

Government policies

The government manages the UK economy through the Treasury. Each year a budget is produced, which sets out things such as the minimum wage, spending on public services and levels of tax.

During the 1980s the UK was performing better than most other European countries. Several things helped this growth:

- Many state-owned businesses in the UK were privatised, eg British Telecom and British Gas. They had been owned by the government, but they were sold to individuals or other companies. This made a lot of money for the government.
- Markets were deregulated. This means that the government became less involved in running things and some companies had to find better ways to make a profit.
- Lots of factories and coal pits were closed. The government said that they could no longer compete with foreign countries where wages are lower. This is when UK jobs first began to go overseas.
- The service sector grew. Wages in the service sector are generally very good.

The UK economy continued to grow into the 1990s. The government had decided to keep taxes low so people had more money and could afford to buy more things.

In 2008, there was a global financial crisis and the UK entered a period of recession. Many of the UK's banks, eg RBS and Lloyds Banking Group, were helped out using government money. This was very expensive for the country and the level of national debt grew.

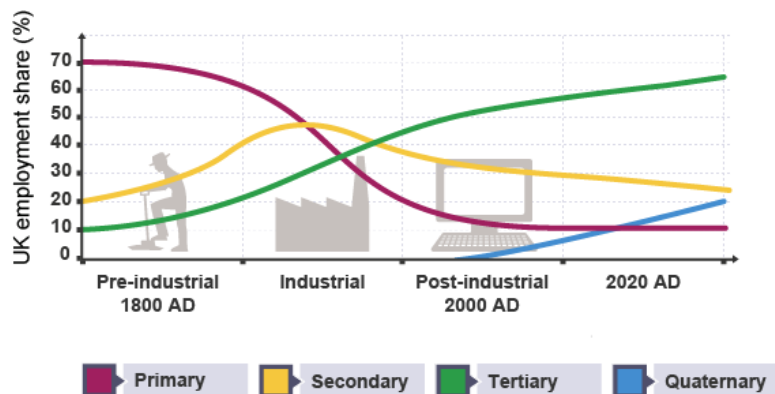
Since 2010, a programme of austerity has been in place. The government has made spending cuts to save money and has carried out quantitative easing, which involves creating more money. There are attempts to improve productivity so that the UK can earn more money. There are 24 Enterprise Zones across the UK, eg Birmingham and Manchester. These locations have incentives for businesses to locate themselves there, such as reduced taxes and relaxed planning rules.

Deindustrialisation




The UK has experienced deindustrialisation. There has been a decrease in the amount of manufacturing taking place in the country and a growth in the tertiary and quaternary sectors. Traditional industries, such as ship building and textiles, have declined. This has happened for two main reasons:

1. A global shift in manufacturing to new emerging economies (NEEs), where wages are lower, working hours are longer and trade unions are sometimes banned.
2. An increase in the number of machines used to carry out work. This is called mechanisation.

Outline how the UK's employment structure has changed since 1800 (i.e. primary, secondary, tertiary and quaternary industries).



Why has it changed in this way? Complete the table below outlining the impact of each factor on the UK economy:

De-industrialisation	Globalisation	Government Policies
		

New developments

The UK government is investing in infrastructure developments. These include new road, rail, port and airport facilities. The Department for Transport is the part of the government that oversees all forms of transport within the UK.

Roads

The Highways Agency are responsible for any new major roads in the UK. They are part of the government and they collect money through Vehicle Excise Duty (VED). Smaller roads are managed by local councils and roads in Scotland and Wales are managed by either Transport Scotland or the Welsh Assembly.

The Highways Agency have an ongoing programme of resurfacing roads and building new roads. In December 2014, the government announced that they would be spending £15 billion on improving and expanding UK roads. This money involves building smart motorways that use technology to manage congestion. Smart motorways are planned for busy routes between London, Birmingham, Manchester and Yorkshire.



Rail network

Network Rail is responsible for running, maintaining and developing Britain's railways. The number of rail journeys made have doubled over the last twenty years. As a result of this, £25 billion is being spent to upgrade the network by 2019. Improvements will include longer platforms that can cope with bigger trains and better stations.

High Speed 1 (HS1) is a fast train link between London and Paris. HS2 is a planned fast train link between London and the North of England (Manchester and Leeds). HS2 is planned to be completed in

2026, at an estimated cost of at least £43 billion. It will dramatically cut journey times, for example the current journey time from London to Birmingham will be cut from an hour and a half to just 49 minutes. A further extension of high-speed rail to Scotland is possible in the future.

Ports

The importance of UK sea ports has declined over time. Many people now travel by air and the Channel Tunnel has meant that lorries no longer need to drive to a port to travel between the UK and France. Cargo ships do still arrive into UK ports, but containerisation has meant that fewer workers are needed to load and unload them. Larger ships are now used, which has made less accessible ports redundant.



UK ports remain the largest in Europe, in terms of volume of goods handled. UK ports are modern and work well, and so the government are not currently planning any major redevelopments.

Airports

The Airports Commission is the part of the government that deals with UK airports. The Airports Commission produced a report in 2015, which recommended that the expansion of UK airports was important for the country's prosperity. This is a controversial issue because many people living close to airports don't like the noise and some lose their homes to make space for runways. Airport expansion can lead to a reduction in house prices in nearby areas.

A new runway has been proposed for Heathrow. The development will generate an estimated £147 billion over 60 years and 70,000 new jobs by 2050. Flights will run to 40 new destinations. The cost of the scheme is estimated to be £18.6 billion. The proposal has largely been backed by business groups. However, some special interest groups are unhappy as there are concerns about the impact on noise and air quality on the surrounding areas, and are considering actions such as a ban on night flights and a guarantee that a fourth runway will not be built.

Improvements to transport infrastructure affect both employment and regional growth. Outline some of the improvements being made to the UK's transport links:

Type of Transport	Improvements made
<p>Road improvements</p> 	
<p>Developing ports</p> 	

<p>Airport developments</p>	



The Challenge of Resource Management - Q3

Food, water and energy are fundamental to human development

Resources - Food, energy and water

Resources are things that people use. Some resources are essential for survival, whilst others are needed to maintain a standard of living.

Food

People cannot live without food. The average person needs to consume between 2,000 and 2,500 calories per day. The actual number of calories needed depends on factors such as gender, age, height and level of activity.

Eating too few calories causes weight loss and a lack of energy. People who do not have enough food to eat find it difficult to work. If there are too many people in a country who are unable to work, then that country will lose a lot of money. Consuming too many calories causes weight gain. People who eat too much can also find it difficult to work.

Water

People cannot live without water. Water makes up about two thirds of a person's body. We need it for our body to function, eg to absorb nutrients and get rid of waste. Each person should drink between 1.6 and 2 litres of water a day. The actual amount of water needed depends on factors such as the air temperature and the type of activity that a person undertakes each day.

Water is also used to keep ourselves clean and healthy, and is also needed to grow food and for industry. In drier countries or drier seasons, irrigation enables crops to grow. Industry uses water in many ways, such as cleaning, cooling and as a raw material in production.

Energy

Energy has many uses. It heats homes and offices, cooks our food and powers transport. Much of the energy that is used is in the form of electricity. This is called secondary energy - primary energy sources, such as fossil fuels or the wind, have been used to generate it.

Energy affects both food supplies and industry. Mining and growing biofuels required to generate energy takes up valuable farmland, which reduces the amount of food available to eat. And if energy is more expensive or in short supply, then it costs more to produce and transport food. This is passed on to consumers through an increase in the price of food.

What are resources?

Food

Explain the importance of food (use the information above)

Using the information on the previous page explain what happens if people consume too little or too much food

Water

Explain the importance of water for human consumption (use the information on the previous page)

Explain the importance of water for industry and agriculture

Energy

Explain the many uses of energy (use information from the previous page)

Explain how energy affects food supplies and industry



The changing demand and provision of resources in the UK create opportunities and challenges

Food in the UK

Food resources in the UK

There is enough food to feed everyone on the planet, but globally there are still 1 billion people experiencing food insecurity. Food supply and consumption are not evenly distributed.

The UK does have food security. Around 40% of the UK's food has been imported and much of it has been processed.

The growing demand for food imports

In the past, people ate food that was in season, eg cabbages and leeks in the winter and tomatoes and cucumbers in the summer. Nowadays, people in wealthier nations can eat any type of food at any point in the year. Heated greenhouses allow crops to grow out of season and cold storage allows food to be transported from other parts of the world. Trans-national corporations (TNCs) work in several different countries, processing food and exporting it across the globe.

Agribusiness

Intensive farming aimed at maximising the amount of food produced. Farms are run as commercial businesses. They have high levels of investment, and use modern technology and chemicals. It means food can be produced cheaply.

The demand for organic produce

Organic foods are grown without using any chemicals. They use natural fertilisers, such as animal manure, and natural predators instead of chemical pesticides. The consumption of organic produce has risen in the UK as fewer people are prepared to eat food that has been sprayed with harsh chemicals.

When farmland is converted to become organic, yields initially drop, but then they can improve to similar levels as non-organic crops. Organic farms are environmentally sustainable, in that they don't use artificial chemicals. Some people believe that organic farming is unsustainable as it can lead to a greater use of land area.

Many foods travel long distances, known as '**food miles**'. This is very expensive and adds to our **carbon footprint** (an individual's use of greenhouse gases). Many vegetables come from Kenya, e.g. mange tout and green beans. The farmers in Kenya receive only 12% of the final price, whereas, supermarkets earn 45% of the price.

Why do some people still have food insecurity even though there is enough food for everyone on the planet? _____

The UK imports about 40% of the total food consumed. List 4 reasons why it imports so much food below:

- _____
- _____

- _____
- _____

How will agribusiness help to reduce the reliance on foreign imports?

Agribusiness helps because _____



What is **organic produce**?



Give 3 advantages of eating local food for people in the UK and the environment.

- _____
- _____
- _____

Demand for water resources is rising globally but supply can be insecure, which may lead to conflict.

Reasons for increasing water consumption

Water consumption has been rising globally over time. There are two main reasons for this:

Rising population

Everyone needs water in order to survive. Water makes up at least 60% of a person's bodyweight and it is needed for all bodily functions. People also use water for hygiene, cooking and cleaning. The population of the world is increasing, but there is only a fixed amount of fresh water available for us to use.

Economic development

As countries develop, their water use increases. People in wealthier nations have water delivered into their homes via pipeline. Modern appliances, such as dishwashers and washing machines, use a lot of water. Commercial agriculture, industry and tourism in high income countries (HICs) consume vast quantities of water too. The water footprint of HICs is much higher than low-income countries (LICs). As more countries develop, the demands on water will increase.

Complete the table below to show the reasons for increasing global water consumption:

Rising population	Economic development

Different strategies can be used to increase water supply

Strategies to increase water supply

As the global population continues to increase, countries are finding ways to secure water supplies.

Dams and reservoirs

Rivers transport water to the sea. Dams block rivers so that reservoirs of water build up behind, rather than drain away. This provides large supplies of drinking water all year round and reduces water insecurity, especially where precipitation may be seasonal. Dams and reservoirs can also prevent flooding, as the flow of the river is controlled, and they can generate electricity through hydroelectric power (HEP). There are over 600 dams in Africa. The Akosombo dam in Ghana and the Aswan dam in Egypt are two of the largest.

Water transfers

When a country has a water surplus in one area and a water shortage in another, supplies can be transferred. This is called a water transfer scheme. Reservoirs collect and store water in areas of high rainfall. Canals and pipes transport the water to rivers or reservoirs in other parts of the country. Water transfer schemes can be found in lots of different countries. The city of Las Vegas is able to exist in the Nevada Desert because water is transferred to it.



Desalination plants

It is not possible to drink seawater as it contains salt. Desalination plants remove the salt from seawater to make it safe to drink. Desalination plants could solve many of the world's water insecurity issues, but the process is expensive and therefore not viable in some developing countries. The UK has opened its first desalination facilities on the river Thames. The plant removes the salt from tidal water from the river Thames to help the UK during times of prolonged low rainfall and drought.

Complete the table below showing how the strategies increase water supplies and their advantages and disadvantages:

Scheme	How the scheme increases water supplies	Advantages and disadvantages
Dams and reservoirs		
Water transfer schemes		
Desalinisation plants		

An example of a large-scale water transfer scheme in a LIC or NEE to show how its development has both advantages and disadvantages

Case study: Lesotho Highland Water Project (an example of a large-scale water transfer scheme)

The Lesotho Highland Water Project is a huge water transfer scheme aimed to help solve water shortage in South Africa. On completion, 40% of the water from the Segu (Orange) River in Lesotho will be transferred to the River Vaal in South Africa. It is a massive scheme involving the construction of dams, reservoirs and pipelines as well as roads, bridges and other infrastructure developments that will take 30 years to complete. Water is then transferred to South Africa via a 32km tunnel enabling HEP to be produced at the Muela plant. By 2020 there will be 200km of tunnels and 2000 million m³ of water will be transferred to South Africa each year.

Advantages for Lesotho

Provides 75% of its GDP	Income from the scheme helps development and to improve standard of living
Supplies the country with all its hydro-electric power (HEP) requirements	Improvements to transport infrastructure with access roads built to the construction sites
Water supply will reach 90% of the population of the capital, Maseru	Sanitation coverage will increase from 15 to 20%

Advantages for South Africa

Provides water to an area with an uneven rainfall pattern and regular droughts	Provides safe water for the 10% of the population without access to safe water supply
Fresh water reduces the acidity of the Vaal River Reservoir. Water pollution from industry, gold mines and sewerage was destroying the local ecosystem	The influx of water from Lesotho is restoring the balance

Disadvantages for Lesotho

Building of the first two dams meant 30 000 people had to move from their land	Destruction of a unique wetland ecosystem due to control of regular flooding downstream of the dams
Corruption has prevented money and investment reaching those affected by the construction	Construction of the Polihali Dam will displace 17 villages and reduce agricultural land for 71 villages

Disadvantages for South Africa

Costs are likely to reach US\$4 billion	40% of water is lost through leakages
Increased water tariffs to pay for the scheme are too high for the poorest people	Corruption has plagued the whole project

Why was the Lesotho Highland Water Project created?

Evaluate the impacts of project on Lesotho (include both advantages and disadvantages)

Evaluate the impacts of project on South Africa (include both advantages and disadvantages)

Overall has the Lesotho Highland Water Project brought more advantages or disadvantages? Explain your answer:

Geography Guide to Writing Successful Answers

Know the command words

Assess	Make an informed judgement
Calculate	Work out the value of something
Compare	Identify similarities and differences
Complete	Finish the task by adding to given information
Describe	Set out characteristics
Discuss	Present key points about different ideas or strengths and weaknesses of an idea
Evaluate	Judge from available evidence (e.g. advantages and disadvantages)
Explain	Set out purposes or reasons
Give	Produce an answer from recall
Identify	Name or otherwise characterise
Justify	Support a case with evidence
Outline	Set out main characteristics
State	Express in clear terms
Suggest	Present a possible case
To what extent	Judge the importance or success of (strategy, scheme, project, etc)

When answering questions worth **9 marks** include:

- **Three** fully explained ideas showing thorough geographical understanding and demonstrating detailed knowledge (A02). Refer back to the question at the end of each paragraph (A03).
- A range of **examples / evidence** to support your ideas (A01)
- A **conclusion** explaining your overall judgement and which addresses the command word (A03)

When answering questions worth **6 marks** include:

- **Two** fully explained ideas showing thorough geographical understanding and demonstrating detailed knowledge (A02)
- A range of **examples / evidence (this could be from a figure)** to support your ideas (A01 and A03)

When answering questions worth **4 marks** include:

- **Two** explained ideas showing clear geographical understanding (A02)
- Supporting evidence (this could be from a figure) / example (A01 and A03)

Assessment objectives:

AO1 - Knowledge (facts)

AO2 - Understanding (explanation)

AO3 - Evaluation (judgement)

AO4 - Communicate findings (skills)