How are Resources Distributed?

Resources include food, water and energy. We need these for basic human development. Access to them affects our economic and social well-being.

Food depends on climate, soils and technology. Europe, Asia and N and S America tend to have a surplus. Africa has a deficit

Water depends on climate. The Middle East and Africa have shortages. Water is essential and many people spend large amounts of their days collecting water meaning they cannot work

Energy is affected by the distribution of fossil fuels. In theory more use of renewable energy should reduce uneven distribution but in practice knowledge and money to develop these limits use in LICs

Food in the UK

The UK imports 47% of its food

Often it is **cheaper** to produce food abroad. LICs benefit from the money, creating jobs and generating taxes to improve infrastructure, but this can affect their own livelihoods as land is used for export crops only and it places pressure on water supply

Supermarkets mean that we demand **year round seasonal food,** so we need to import food to make up the shortfall.

UK food travels 30 billion km each year. Food contributes 17% of the UK's carbon emissions. We call this the **carbon footprint.**

Trends

Organic food – does not use pesticides or fertilisers. Tends to be more expensive because yields are lower but people think it is healthier

Agribusiness is industrialised agriculture on a large scale. Farms are large, leading to loss of hedgerows to allow machinery to operate. Less people are employed in farming. Heavy use of pesticides, fertilisers etc.

Eat local and Eat seasonal. These are movements to encourage a reduction in the carbon footprint.

Surplus = more than is needed
Deficit = less than is needed
Security = having a reliable supply of affordable resource

Water in the UK

The amount of water used by the average household in the IUK has increased by 70% since 1985.

Causes

- Population growth
- Wealth so have more water-intensive appliances (eg. dishwashers)
- Demand of out of season food needs irrigation
- Leisure use (esp. golf courses)
- Power showers

Distribution

- It tends to rain in the North West (highland areas) where there is a surplus
- Demand is highest in the South East due to population concentration. Here rainfall is lower. There is a deficit
- This causes water stress
- Water needs to be managed by **transferring** it to where demand is.

AQA

Resource Management - Water

Water quality

Causes of pollution

- **Fertilisers from farming**
- **Hot water from industrial cooling**
- **Oil from ships**
- **Untreated waste**
- **Oil from roads**

Effects of pollution

- **Kills wildlife**
- **Fertilisers cause eutrophication which kills fish**
- **Toxic chemicals can enter food chain eg through shellfish**
- **Contaminated water**

Managing pollution

- Legislation – strict UK laws on discharge from farms and industry
- Education campaigns not to dispose waste in water
- Waste treatment plants
- Investing in sewers
- Green roofs filter out pollutants

Energy in the UK

The UK consumes less energy than it did in 1970 even though there are 6.5 million more people. The average energy consumption has declined 12%. Heavy industry has declined and energy efficient products have reduced household demand.

UK Energy Mix

Coal 35%
Gas 25%
Nuclear 19%
Renewables 21% (wind, solar, tidal, biofuel, HEP)

UK supplies of oil and gas are declining meaning we rely on imported fossil fuels.
There are restrictions on carbon emissions so the focus is on renewables.

Non-Renwables

Economic issues	Environmental issues
Fossil fuels	
• Non-renewable so will run out (not sustainable)	• Carbon dioxide released leads to acid rain and climate change
• Miners get sick so costs to healthcare	• Fracking can cause groundwater pollution
Nuclear	
• Expensive to build but raw materials are cheap	• Waste is radioactive for 100 years
• Cost to transport and store waste very high	• Nuclear accidents, while rare, have long term impacts on wildlife and people

Renewables

- High set up costs
- Biomass means land not used for food production so may increase costs of food
- Tourism declines as visual appeal is damaged
- Low profitability
- Considered ugly and ruins views
- Wind turbines can affect bird migration
- HEP dams flood land upstream and affects ecology of water
- Biomass reduces biodiversity as only one crop is grown (eg. sugar cane)
- Geothermal energy is limited to tectonically active countries like Iceland

GEOGRAPHY

Global water Supply & Demand

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

Water surplus When a country/area has more water than it consumes. These places have water security.
Water deficit When a country/area has less water than it consumes. These places have water insecurity.
Global Water consumption is increasing because:

- **Economic Development** As countries develop their demand for water supplies rises. Developed nations have lifestyle and eating habits which increase average water use per head
- **Rising Population** In 2015 the world's population 7.5 billion. By 2050 it is predicted to rise to 9 billion.
- **Technology** The increasing use of technology, like washing machines and dishwashers, means a greater demand for water. Better technology makes some products less water intensive but are expensive.

Impacts of water Insecurity

Economic

Water is important in energy production and manufacturing, especially in NEEs (China). By 2030, 33% of water in China will be used y industry. As a result of shortages, some factories will close impacting on economic growth. Coal mining and power stations us 20%

Environmental

Where infrastructure is limited, there may be little or no sanitation, leading to outbreaks of waterborne diseases. The River Ganges in India is an example where this can happen. It is the most polluted river on the planet.

Social

Water shortages can lead to conflict as rivers cross borders. By building a dam, you might block water from reaching another country.
Food production may decrease impacting on health

Local scheme to increase sustainable water supply
Wakel River basin project

North west India. One of the driest regions within the Thar desert.

Over use of water for irrigation has led to waterlogging and salinization. Over-abstraction from unregulated pumps has resulted in falling water tabled and some wells have dried up.

United stages agency for development has funded and worked with locals to improve problems. Aims are to increase water supply and raise awareness

Increasing water supply and raising awareness
Project encourages greater use of rainwater harvesting techniques to collect and store water. This benefits villages and individual families. Methods include using Taankas, Joheds and Pat systems. All of these increase water supply by reducing over use and ensure water isn't evaporated. Education is used to raise awareness of the need for communities to work together. By conserving water, water security is increased and problems such as desertification and groundwater pollution are reduced.

Factors Affecting Water availability

Climate

Regions with high rainfall usually have surplus water. Those areas with drier climates have less water available. In the UK, the South East is an area of deficit whereas Wales is an area of surplus,

Over-Abstraction

Pumping water out of the ground faster than it is replaced by rainfall can cause wells to dry up, sinking water tables and higher pumping costs. Lower water tables mean that rivers are no fed by springs in the dry season,

Infrastructure

Poorer countries may lack the infrastructure for transporting water to areas of need, for example pumping stations / pipes. Also, pollution can contaminate sources from raw sewage leading to waterborne diseases such as Cholera. This is especially true in LICs and NEEs e.g. Brazil / Nigeria

Geology

The geology of an area determines the location and availability of water. Some rock is permeable and therefore builds up groundwater supplies (water underground). Much of London's water comes from the chalk underlying the city. However impermeable rock will lead to rapid surface run off meaning a potential loss of water.

Costs of increasing water security

Water transfer and Desalinisation are very expensive schemes. Desalinisation is only used in areas where there are no other alternatives e.g. Dubai

Increasing Water Supply

There are a number of ways to increase supply however the total amount of water available is limited. To make more water available you have to move it from an area of surplus to an area of defecit.

Dams & Reservoirs

Dams control the flow of water and can therefore store water behind them in reservoirs. It helps prevent flooding and provides a supply of water. They can be small to large scale and also include hydroelectricity plants.

Desalination

Water supplies ca e artificially diverted and stored for use over longer periods. Water can be stored in deep underground aquifers. This process usually involves vertical pipes allowing the water to reach storage areas.

Water Transfer

Water transfer schemes involve the movement of a lot of water from an area of surplus to an area of deficit through pumping stations and pipes. These can be 100s of miles long. Man made canals may also be used. Examples of this include Lesotho water transfer project, Elan Valley and China's south – north transfer scheme. They are very expensive to build and maintain. As a result, it is not often you see them being built today. Although the UK has a ambitious plan to link water from the north of England to London. This is just a plan at this stage.

Desalination

This is the process of removing salt from seawater to produce fresh water. This is a very difficult and therefore expensive process. It is only used where there is a serious shortage of water e.g. Dubai and where few alternatives exist. There are several issues:

- It is very expensive to transport water to mainland
- Environmental effects on ecosystems where waste salt water is dumped back into the sea.
- A lot of energy is required enhancing CO2 emmisions. =

Lesotho Highland Water Project

This is a large scales water transfer scheme from a LIC nation to a NEE nation. South Africa is an area of deficit whereas Lesotho, while a LIC, is an area of surplus.

Advantages

- Provides 75% of Lesotho's GDP
- Income provides development for Lesotho
- HEP provides electricity
- South Africa has a reliable source of water
- Ecosystems are improving in rivers
- Transport infrastructure in Lesotho has improved as a result from the scheme.

Disadvantages

- Villages in Lesotho have been forced to move from land
- Corruption has prevented money from reaching these people.
- Some ecosystems have been destroyed.
- Cost is $4 billion
- 40% of water lost through leaks
- Corruption from both countries
- Water bills increase to pay for project.

Sustainable Water supplies in the Future

Water conservation to reduce waste and unnecessary use. Strategies like reducing leaks, monitoring illegal use higher water tariffs, prevention of pollution can help
Individuals at home can help by having low flow shower head, turning off taps when brushing teeth, dual flush toilets, consideration of food consumption
Groundwater management so that over abstraction cannot happen. This can be monitored by governments but is difficult in LICs
Recycling and grey water can help by using treated domestic and industrial water in farming and power stations. Grey water is untreated but if used within 24 hours it can be used as fertiliser for farms.

GEOGRAPHY