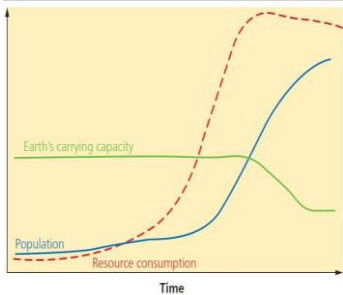


Resource Challenges		
Resources are things that humans require for life or to make our lives easier. Humans are becoming increasingly dependent on exploiting these resources, and as a result they are in high demand.		
Significance of Water		
Resources such as food, energy and water are what is needed for basic human development.		
FOOD	WATER	ENERGY
Without enough nutritious food, people can become <b>malnourished</b> . This can make them ill. This can prevent people working or receiving education.	People need a supply of <b>clean and safe water</b> for drinking, cooking and washing. Water is also needed for food, clothes and other products.	A good supply of energy is needed for a basic standard of living. People need <b>light and heat</b> for cooking or to stay warm. It is also needed for industry.

**Demand outstripping supply**

The demand for resources like food, water and energy is rising so quickly that supply cannot always keep up. Importantly, access to these resources vary dramatically in different locations

1. Population Growth	2. Economic Development
<ul style="list-style-type: none"> <li>Currently the global population is <b>7.3 billion</b>.</li> <li>Global population has risen <b>exponentially</b> this century.</li> <li>Global population is expected to reach <b>9 billion by 2050</b>.</li> <li>With more people, the <b>demand</b> for food, water, energy, jobs and space <b>will increase</b>.</li> </ul>	<ul style="list-style-type: none"> <li>As <b>LICs</b> and <b>NEEs</b> develop further, they require <b>more energy</b> for industry.</li> <li><b>LICs</b> and <b>NEEs</b> want similar lifestyles to <b>HICs</b>, therefore they will need to <b>consume more resources</b>.</li> <li>Development means <b>more water is required</b> for food production as diets improve.</li> </ul>



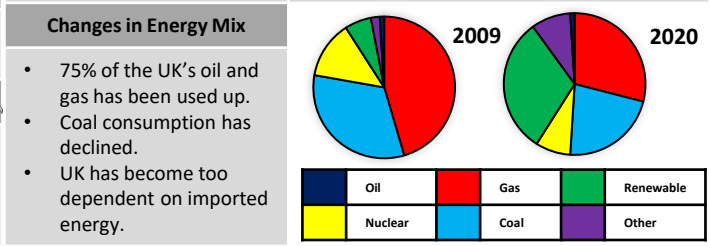
3. Changing Technology and Employment
<ul style="list-style-type: none"> <li>The demand for resources has driven <b>the need for new technology</b> to reach or gain more resources.</li> <li>More people in the <b>secondary and tertiary industry</b> has increased the <b>demand for resources</b> required for electronics and robotics.</li> </ul>

Food in the UK	
Growing Demand	Impact of Demand
<ul style="list-style-type: none"> <li>The UK imports about 40% of its food. This increases people's <b>carbon footprint</b>.</li> <li>There is growing demand for greater choice of <b>exotic foods</b> needed all year round.</li> <li>Foods from abroad are more affordable.</li> <li>Many food types are unsuitable to be grown in the UK.</li> </ul>	<p><b>Foods can travel long distances (food miles). Importing food adds to our carbon footprint.</b></p> <ul style="list-style-type: none"> <li>+ Supports workers with an income</li> <li>+ Supports families in LICs.</li> <li>+ Taxes from farmers' incomes contribute to local services.</li> <li>- Less land for locals to grow their own food.</li> <li>- Farmers exposed to chemicals.</li> </ul>

Agribusiness	Sustainable Foods
<p><b>Farming is being treated like a large industrial business. This is increasing food production.</b></p> <ul style="list-style-type: none"> <li>+ Intensive farming maximises the amount of food produced.</li> <li>+ Using machinery which increases the farms efficiency.</li> <li>- Only employs a small number of workers.</li> <li>- Chemicals used on farms damages the habitats and wildlife.</li> </ul>	<p><b>Organic foods that have little impact on the environment and are healthier have been rising. Local food sourcing is also rising in popularity.</b></p> <ul style="list-style-type: none"> <li>• Reduces emissions by only eating food from the UK.</li> <li>• Buying locally sourced food supports local shops and farms.</li> <li>• A third of people <b>grow their own food</b>.</li> </ul>

# The Challenge of Resource Management

Energy in the UK	
Growing Demand	Energy Mix
The UK <b>consumes less energy</b> than compared to the 1970s despite a smaller population. This is due to the <b>decline of industry</b> .	The majority of UK's energy mix comes from <b>fossil fuels</b> . By 2020, the UK aims for 15% of its energy to come from <b>renewable sources</b> . These renewable sources do not contribute to <b>climate change</b> .



Water in the UK	
Growing Demand	Deficit and Surplus
<p>The average water used per household has risen by <b>70%</b>. This growing demand is predicted to increase by <b>5% by 2020</b>.</p> <p>This is due to:</p> <ul style="list-style-type: none"> <li>• A growing UK population.</li> <li>• Water-intensive appliances.</li> <li>• Showers and baths taken.</li> <li>• Industrial and leisure use.</li> <li>• Watering greenhouses.</li> </ul>	<p>The north and west have a <b>water surplus</b> (more water than is required).</p> <p>The south and east have a <b>water deficit</b> (more water needed than is actually available).</p> <p>More than half of England is experiencing <b>water stress</b> (where demand exceeds supply).</p>

Pollution and Quality	Water stress in the UK
<p><b>Cause and effects include:</b></p> <ul style="list-style-type: none"> <li>• Chemical run-off from farmland can destroy habitats and kills animals.</li> <li>• Oil from boats and ships poisons wildlife.</li> <li>• Untreated waste from industries creates unsafe drinking water.</li> <li>• Sewage containing bacteria spreads infectious diseases.</li> </ul>	<p>The map shows that the south and east of England are in the 'Substantially above average' (dark blue) category, indicating water stress. The north and west are in the 'Normal range' (light blue) category.</p>

Management	Water Transfer
<p>UK has <b>strict laws</b> that limits the amount of discharge from factories and farms.</p> <p><b>Education campaigns</b> to inform what can be disposed of safely.</p> <p><b>Waste water treatment plants</b> remove dangerous elements to then be used for safe drinking. Pollution traps catch and filter pollutants.</p>	<p>Water transfer involves moving water through pipes from areas of surplus (Wales) to areas of deficit (London).</p> <p><b>Opposition includes:</b></p> <ul style="list-style-type: none"> <li>• Effects on <b>land and wildlife</b>.</li> <li>• High maintenance <b>costs</b>.</li> <li>• The <b>amount of energy</b> required to move water over long distances.</li> </ul>

Energy in the UK (continued)					
Significance of Renewables	Exploitation				
<ul style="list-style-type: none"> <li>+ The UK government is investing more into low carbon alternatives.</li> <li>+ UK government aims to meet targets for reducing emissions.</li> <li>+ Renewable sources include wind, solar and tidal energy.</li> <li>- Although infinite, renewables are still expensive to install.</li> <li>- Shale gas deposits may be exploited in the near future</li> </ul>	<table border="1"> <tr> <th>Nuclear</th> <td> <p>New plants provide job opportunities.</p> <p>Problems with safety and possible harm to wildlife.</p> <p>Nuclear plants are expensive.</p> </td> </tr> <tr> <th>Wind Farm</th> <td> <p>Locals have low energy bills.</p> <p>Reduces carbon footprint.</p> <p>Construction cost is high.</p> <p>Visual impacts on landscape.</p> <p>Noise from wind turbines.</p> </td> </tr> </table>	Nuclear	<p>New plants provide job opportunities.</p> <p>Problems with safety and possible harm to wildlife.</p> <p>Nuclear plants are expensive.</p>	Wind Farm	<p>Locals have low energy bills.</p> <p>Reduces carbon footprint.</p> <p>Construction cost is high.</p> <p>Visual impacts on landscape.</p> <p>Noise from wind turbines.</p>
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# The Challenge of Resource Management

All students MUST know about food energy and water in the U.K and at a global scale. This information is on the first slide.

Students then have a choice of 3 options. We study Option 2: Water.

Some of your case studies from other units will be relevant e.g. BedZed sustainable settlement in London.

## Option 2: WATER



Water security is when people have good access to enough clean water to sustain well-being and good health. Water insecurity is when areas are without sufficient water supplies. Water Stress is when less than 1700m<sup>3</sup> is available per person.

Human factors affecting water supply	Physical factors affecting water supply
<ul style="list-style-type: none"> <li><b>Pollution</b> caused from human and industrial waste being dumped into peoples water sources.</li> <li><b>Poverty</b> prevents low income families affording water.</li> <li><b>Limited infrastructure</b> such as a lack of water pipes and sewers.</li> <li><b>Over-abstraction</b> is when more water is taken than is replaced.</li> </ul>	<ul style="list-style-type: none"> <li><b>Climate</b> needs to provide enough rainfall to feed lakes and rivers. Droughts affect supply if water.</li> <li><b>Geology</b> can affect accessibility to water. Permeable rock means sourcing water from difficult aquifers, whereas impermeable allows water to run-off into easily collected basins.</li> </ul>

Impact of Water Insecurity	
Food production	Industrial output
The less water available for irrigating crops the less food that will be produced. This could lead to starvation.	Manufacturing industries depend heavily on water. A severe lack of water can impact economic output.
Disease and Water Pollution	Water conflict
Inadequate sanitation systems pollutes drinking water causing diseases such as cholera and typhoid.	Water sources that cross national borders can create tensions and even war between countries.

### Increasing Water Supply



**Water diversion** - Involves diverting water to be stored for longer periods. Often water is pumped underground to prevent evaporation.

**Dams and Reservoirs** - Dams control flow and storage of water. Water is released during times of water deficit.

**Water transfer** – includes schemes to move water from areas of surplus to areas of deficit.

**Desalination** – Involves the extraction of salt from sea water to produce fresh drinking water. Extremely expensive

### Case study of a large scale water transfer scheme: Katse dam, Lesotho

Lesotho is a land-locked highland country dependent on South Africa for most resources. Lesotho has water surplus due to high rainfall. Katse dam collects water that is then transferred abroad to South Africa.

- Advantages**
- Provides 75% of Lesotho's GDP.
  - Provides water to areas of drought in South Africa.
  - Used by mines and other industries in South Africa.
  - Short term job opportunities building the dam.

- Disadvantages**
- Dams displaced 30,000 people in rural Lesotho
  - Destruction to key ecosystems.
  - 40% lost through pipe leakages.
  - It could be argued that people who live near the dam get nothing and that the benefits go to South Africa.

### Sustainable Water Supply



Ensures water supplies don't cause damage to the environment whilst also supporting the local economy.

**Water conservation** - Aims to reduce the amount of water wasted.

**Groundwater Management** - Involves the monitoring of extracting groundwater. Laws can be introduced.

**Recycling and 'Grey' Water** - Means taking water that has already been used and using it again rather than returning it to a river or the sea. This includes water taken from bathrooms and washing machines.

### Case study of sustainable supply of water: Sand dams, NE Kenya

Local people and a British charity called Excellent Development build a dam across seasonal rivers. Sand is trapped behind the dam. Water is stored inside the sand. The cost of the materials is paid for by the charity. The labour is provided for free by local people. Sand dams bring a permanent, year round supply of clean water

**Health** – Clean water supply year round so there has been a fall in the infant mortality rate and an increase in life expectancy.

**Education** – Children no longer have to walk long distances to collect water so they have time to go to school.

**Food security** – Women have more time to grow food

**Environment** – It raises the level of the water table, recharges the aquifer and reverses desertification

