

Global Distribution of Resources

Resource is a stock or supply of something that has a value or purpose. The three most important are: food, water, energy

Food
Human health is affected by how much food is eaten and nutritional value of food. WHO suggest 2000-2400 calories a day to be healthy. Over 1 billion people fall below this level and are described as malnourished. Another 2 billion suffer from undernutrition – a poorly-balanced diet lacking in minerals and vitamins. Growing issue with obesity in HICs.

Water
Quantity and quality of water are important for well-being and economic development. Water is vital for people, animals, crops and food supply. Important source for providing energy. As population grows – more people face water shortages. Imbalance is mainly due to climate and rainfall. Rainwater needs to be stored in reservoirs or taken from rivers – all very expensive. By 2025, UN predicts 50 countries facing water scarcity.

Energy
Energy is required for economic development – powers factories, machinery and fuel for transport. Past – rely on your own supply. Today – energy is traded. Energy consumption is increasing as world becomes more developed – demand increases. HICs use far more than LICs. Middle East provides most of oil, yet consumption is relatively small.

Provision of Food in the UK

By 2037, population of UK predicted to be 73million increasing the demand for food. UK is not self-sufficient for food supplies and imports 40% of all food consumed.

Why does the UK import so much food?

- UK-produced food can be expensive due to poor harvests and price of animal feed.
- Demand for greater choice and more exotic foods.
- Availability of cheaper food from abroad imported by supermarkets
- UK climate is unsuitable for production of some foods (cocoa, tea, bananas)
- Demand for seasonal food all year round (strawberries, apples)

UK food miles (distance food travels) is increasing and therefore our carbon footprint (emission of CO₂) is also increasing due to production and transportation of food.



Unit 2c The Challenge of Resource Management

Responding to the Challenges of Food Provision

Agribusiness – Lynford House Farm, East Anglia

570 hectares of land using chemicals, machinery and other investments. Flat, fertile land is intensively farmed – maximise productivity and profitability. Main crops- wheat, sugar beet, potatoes. Chemicals widely used as pesticides and fertilisers. Machinery costs are high but make farm more efficient. 54-million litre reservoir built to avoid water shortage

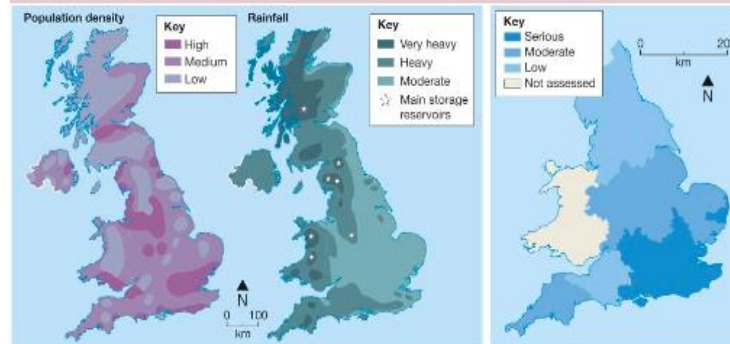
Organic Produce - Riverford Organic Farms, Devon

Organic food and dairy farm providing local fresh food to local people weekly. Reduces food miles. Supports local farmers. Provides local employment. Builds strong links between grower and customer.



Provision of Water in the UK

50% of UK water is used domestically, 21% is wasted through leakage. Demand for water expected to increase by 5% by 2020 due to: rising population, more houses, increase in water-intensive domestic appliances.



B UK population density and water supply

C Water stress in England

Managing Water Quality

Water quality is just as important and water quantity. The Environment Agency is in charge of managing water quality.

Managing Water Quality

- Monitoring quality of river water
- Filtering water to remove sediment
- Purifying water by adding chlorine
- Restricting recreational use of water sources
- Imposing strict regulations for use of water

Deterioration of Groundwater

- Leaching from old underground mine workings
- Discharge from industrial sites
- Runoff from chemical fertilisers used on farmland
- Water used for cooling in power stations released back into rivers.

Water Transfer – Kielder Water, Northumberland, UK

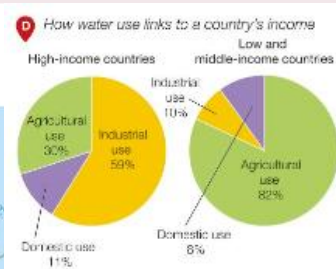
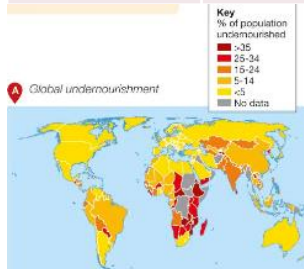
Largest man-made reservoir in Europe. Dam is 1.2km long and 50m high. Benefits Newcastle, Sunderland, Durham, Darlington, Middlesbrough. Transferred by aqueduct – Airy Holm, Frosterly and Eggleston. (Airy Holm – Frosterly; Frosterly – Wear; Eggleston – Tees)

Advantages

- Income created through tourism
- Reliable water source – sold to rest of UK
- Provides hydro-electric power
- Dam prevents river flooding nearby towns
- New habitats created
- In 1995 droughts – Kielder provided water for North East.

Disadvantages

- Conservation areas were disrupted/removed for the scheme
- Habitats destroyed – flooded an Area of Outstanding Natural Beauty
- People had to be relocated
- Never been less than 90% full – not needed/waste of money
- 1.5m trees cut down



Provision of Energy in the UK

Despite increasing demand for electricity, UK consumption has fallen due to decline of heavy industry and improved energy conservation.

75% of UK oil/natural gas reserves have been exhausted. By 2020 – UK importing 75% of its energy.

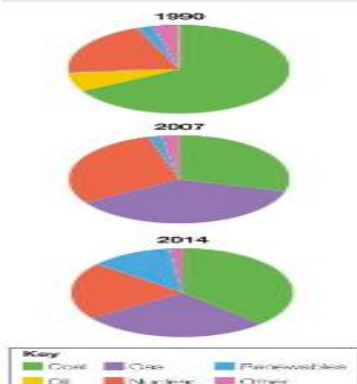
Energy security is affected due to reliance on imports.

2/3 of UK gas reserves remain.

UK oil production has declined 6% a year for last decade.

Over 75% of UK coal comes from Russia, USA, Cambodia

All UK coal power stations closed by 2025.



Region	Energy security	Energy sources
Russia and Eastern Europe	Energy surplus	<ul style="list-style-type: none"> Large reserves of natural gas and oil. Uranium resources which can be used for nuclear energy.
Western Europe	Energy insecurity (deficit)	<ul style="list-style-type: none"> Dependent on energy imports, particularly oil and gas. Low energy efficiency.
Middle East	Energy surplus	<ul style="list-style-type: none"> Large oil reserves. Unstable political regimes affect fuel supply.
North America	Energy insecurity	<ul style="list-style-type: none"> Large coal reserves. Opportunity to exploit oil reserves in sensitive areas like the Arctic. Huge energy consumption. Deficit in energy until technological advances allowed exploitation of oil shale.
Asia	Energy insecurity	<ul style="list-style-type: none"> Large coal and uranium deposits. Rapidly increasing demand outstrips supply.
Sub-Saharan Africa	Energy insecurity	<ul style="list-style-type: none"> Depends on foreign TNCs to exploit reserves, for example Nigerian oil. Limited energy supplies with rising rates of consumption.



CS: Micro-Hydro Scheme – Chambamontera, Peru

Why was the scheme needed?

Most people in the area are dependant on subsistence farming. Development has been severely restricted by lack of electricity for heat, light and power. Nearly half the population survive on US\$2 a day.

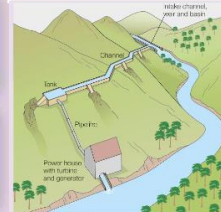
Steep slopes rise to 1700m and rough roads are impassable in winter. Very isolated location and due to low population density it was uneconomic to build electricity grid to serve the area.

What is the scheme?

A micro-hydro scheme to solve energy deficit. Supported by charity Practical Action. High rainfall, steep slopes and fast flowing rivers make this an ideal location for water power. Total cost of the scheme was US\$51,000. Some government money and support from Japan but each family had to pay US\$750 in form of no-cost loans.

Benefits to the local community.

- Renewable energy
- Low maintenance and running costs
- Little environmental impact
- Local labour and materials
- Reduced rural-urban migration (population has grown)
- Regulated water flow has reduced flood danger
- Less need to burn wood for heat – reduced deforestation and soil erosion
- Will last 25 years
- Electricity is available in winter
- Reliable electricity for fridges, light and entertainment
- Street lights make it safe on a night
- Healthcare improved as medicines can be stored correctly
- Improved education as schoolwork can be done after dark
- Reduced fire risk as kerosene lights no longer used
- Business development is possible



Non-Renewable Energy Extraction – Fracking – Kirby Misperton, North Yorkshire

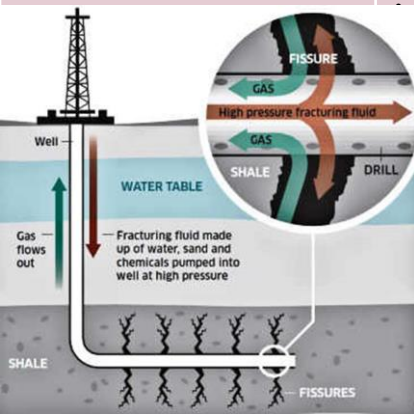
UK has rich reserves of natural gas trapped deep underground in shale rocks. High-pressure liquids are powered into rocks to release the gas - fracking

Advantages

- Use local companies to produce all equipment
- Could provide jobs in hospitality all year round so not relying on tourism
- More taxes paid – better services provided
- 100% of business rates go direct to local council
- Community Benefit Scheme worth £100,000 per well

Disadvantages

- 24/7 site – noise, light, air pollution all increase
- 50% of wells will leak and pollute water supplies in 15 years of opening
- 4000 HGV journeys are required for all transportation (50 a day, including Sundays)
- 59 chemicals in air that are harmful to human health
- Earthquakes are caused by fracking
- Tourist industry decimated



People demand higher wages to work there

Drilling equipment may sink during the summer thaw

Political issues develop because the territory north of the Arctic Circle is claimed by eight countries

Factors Affecting Energy Supply

Costs of Exploitation and Production

Oil rigs and pipelines require huge investment. Nuclear power stations are expensive to build.

Physical Factors

Geology determines location and availability of fossil fuels. Geothermal energy is produced in areas of tectonic activity like Iceland.

Political Factors

- Political instability in Middle East means many oil-consuming countries are looking for alternative sources
- Western countries and Israel want to stop Iran developing nuclear power.
- Germany plans to stop generating nuclear power by 2020.
- UK government has cut subsidies for wind and solar energy.

Technology

Advances have allowed energy in remote/difficult places such as North Sea and Arctic to be exploited. Fracking now happens to exploit shale gas.

Climate

Sunshine and wind influences availability of solar and wind power. HEP needs a suitable dam site in areas of mountains and high rainfall.



Strict environmental controls are needed to prevent damage

Long distances and limited transportation increases transport costs

Special equipment is needed to withstand the extreme temperatures