What are Resources?

Key term	Definition
Resources	Materials that have value for people. They may be needed for basic survival e.g. water, or appreciated as something that improves quality of life e.g. coffee.
Resource management	The control and monitoring of resources so they don't become depleted or exhausted.
Surplus	When there is more of a resource than is needed to meet demand.
Deficit	When there is not enough of a resource to meet demand.

Global inequalities in the supply and consumption of resources

Food

- Average UK calorie consumption is 3200 calories per person per day.
- Average calorie consumption in Mali is 2590 calories per person per day.
- Areas of greatest population growth have highest levels of undernourishment.
- Demand depends on changing diets and increasing population.
- Supply depends on climate, soil and level of technology.

Water

- Fresh water is unequally distributed.
- Water footprint is the amount of water used per day.
- Global average is 1240 litres per day
- Bangladesh is 896 litres per day, USA is 2483 litres per day.
- Water scarcity (where demand is greater than supply) can be physical e.g. reduction in rainfall or economic e.g. lack of money to enable access to water.
- 1 in 5 (more than 1.2 billion people) live in areas of water scarcity.
- 1 in 3 (2.4 billion people) have no access to clean drinking water.

Energy

- The richest 13% of people globally use 50% of the world's energy.
- The poorest 13% of people globally use 4% of the world's energy.
- Countries import and export energy.
- Some countries do not have their own sources of energy.

The significance of food, water and energy to economic and social well being

Water food and energy are key for human wellbeing. All lead to social and economic benefits, which all increase the standard of living and quality of life.

Food

- Calories provide energy.
- Availability of food depends on climate, soil and level of technology.
- Malnourishment leads to disease and death. In children it can lead to underperforming at school which decreases economic wellbeing in life. In adults they will be less productive (less able to work).
- Globally more than 1 billion people are malnourished.
- 2 billion are undernourished (poor diet).
- Obesity is an issue in some areas, mainly HICs.

Water

- Used for survival, washing, food production, industry.
- Clean, safe water enables development and allows people to break free from the cycle of poverty.
- Globally 2 billion people drink from contaminated water sources. Over 500,000 people a year die because of diarrhoeal diseases linked to contaminated water supplies.

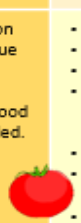
- Traditionally we get energy from oil, coal and wood.
- Many different sources are generated by changing technology.
- Used for electricity production, heating, transport and for water supply (e.g. wells).
- Supports industrialisation and development.

Changing demand for Energy in the UK creates opportunities and challenges

The changing energy mix	UK Energy mix in 2015 : • Fossil fuels (65%) Coal 31%, Gas 25%, Nuclear 19%, Renewable sources 22%. In 1970 91% from fossil fuels. • The UK has invested in renewable energy e.g. solar energy and subsidies are given by the government.
Decreasing domestic supply of oil, coal and gas.	• Reserves of North Sea oil and gas are declining. • EU regulations on gas emissions has led to a decrease in fossil fuel use. • Energy efficient appliances and industry mean less energy is used in homes and industry.
Economic and environmental issues linked to energy use.	• It is cheaper to import coal into the UK than to mine it. • Nuclear Power Stations are being decommissioned and all current plants will close by 2023 – there are issues of contamination and disposal of nuclear waste. • Economic issues – costs, jobs, set up costs, research, reliability. • Environmental costs – ecosystems, waste, noise, emissions, pollution, radiation leaks.

Changing demand for food in the UK creates opportunities and challenges

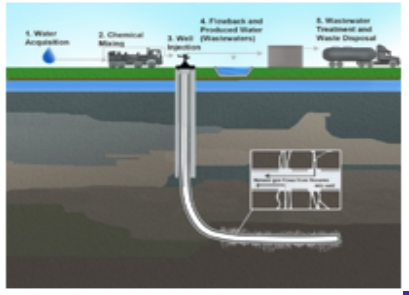
The growing demand for high value food exports from LICs and all year demands for seasonal food and organic produce.	• Food used to be seasonally and locally sourced. Now we eat globally sourced foods all year. • In 2013 47% of UK food was imported. • More disposable income has led to an increased demand for greater quantities and wider choice. • Not all foods can be grown the UK, and some foods can only be grown at certain times e.g. strawberries in July and August. • High quality products are five times the price of similar products e.g. Madagascan vanilla, gourmet coffee. • Positive impacts : Jobs and wages for those in LICs, more tax income leads to a better quality of life. • Negative impacts – less land for locals to farm for themselves, high water use and exposure to chemicals (pesticides and fertilisers). • Organic – no pesticides or fertilisers used. Since the 1990s there has been an increase in demand. Now worth £2 billion a year in the UK.
Larger carbon footprints due to the increased number of food miles travelled.	• Food can be grown more cheaply elsewhere. • Production and transport create a carbon footprint. • 17% of the UK's carbon footprint is due to food. • Tomatoes have less of a carbon footprint being grown in Spain and imported to the UK than if we grew them in the UK where greenhouses would have to be heated. • Annual food miles travelled by UK food imports is 18.8 billion miles. • 68% of food imported to the UK is from within the EU, 32% from the rest of the world. • UK are now encouraging buying local and having an allotment.
A trend towards agribusiness.	• Agribusiness is a farm run as a business with the main aim being profit. • Agribusiness has significant impacts on the environment as they are associated with heavy use of pesticides and fertilizers leading to reduction in wildlife and eutrophication. • East Anglia has a lot of agribusinesses.



Fracking – Opportunities and Challenges

Opportunities
- Shale gas is readily available in UK.
- Will act as a bridging fuel until alternative technologies are developed.
- Increased cost of fuel makes fracking now affordable.

Challenges
- Contaminated water is pumped back into the ground and can affect water supplies.
- Fracking uses a lot of energy.
- 3% of gas extracted is lost to atmosphere; this is methane, a greenhouse gas.

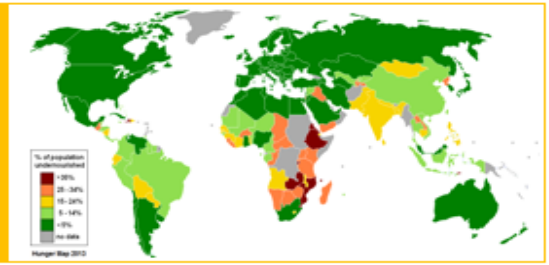


Unit 2c

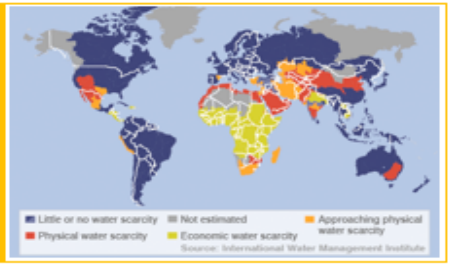
The Challenge of Resource Management

AQA

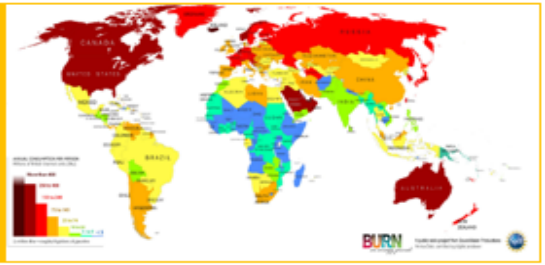
Distribution of malnourishment



Distribution of water scarcity



Distribution of malnourishment

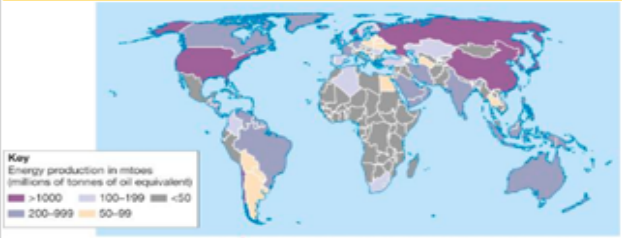


Geography Resource Management: Learning Cycle 3

Resource Security

Key term	Definition
Energy security	Uninterrupted availability of energy sources at an affordable price. This means that an area is energy secure.
Energy insecurity	When the demand for energy is greater than the supply of energy there will be a deficit. This means that the location is energy insecure.
	Security and insecurity can be used to describe access to water and food as well.

Global Per Capita Water Availability (2015)



Global energy supply (production)

Energy security (surplus)
Russia and Eastern Europe
- Large reserves of natural gas and oil
- Uranium resources which can be used for nuclear energy
- Conflict between Russia and Ukraine affect fuel supply

Middle East
- Large oil reserves
- Unstable political regimes affect fuel supply

Energy security (insecurity)
Western Europe
- Dependent on energy imports

North America
- Large coal reserves
- Opportunity to exploit oil in Arctic

Asia
- Large coal and uranium deposits

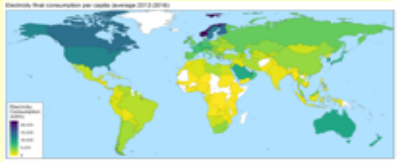
Sub-Saharan Africa
- TNC's exploit reserves

Energy consumption

Energy consumption per person is very high in wealthy countries. This is due to growing demand for industry, transport and domestic use.

It is low across most of Africa and parts of south east Asia.

If supply exceeds demand then a country has an energy surplus.
If demand exceeds production, there is an energy deficit.



Why is energy consumption increasing?

Economic development
- As countries develop their demand for energy supplies rises. NEEs will account for more than 90% of the growth in demand for energy to 2035. Recent growth in Asia's energy demand has been led by China, but this has now started to slow down.

Rising population and technology
- In 2015 the world's population was 7.5 billion. By 2050 it is predicted to rise to 9 billion. All these extra people will use more energy. Many will grow up in an increasingly energy thirsty world.
- The increasing use of technology, like computers and other electrical equipment, means a greater demand for energy. As quality of life improves and prosperity increases, the demand for vehicles, lighting and heating also increases.

Factors affecting energy supply

Costs of exploitation and production	- Some energy sources are costly to exploit. - Oil rigs and pipelines require huge investment. - Nuclear power stations are expensive to build.
Physical factors	- The geology of an area determines the location and availability of fossil fuels. - Coal is formed from vegetation laid down and altered by pressure and heat over millions of years. - Natural gas and oil is trapped in folded layers of rocks. - Geothermal energy is produced in areas of tectonic activity like Iceland and the Pacific Rim.
Political factors	- Political factors affect decisions about which energy sources to exploit and from which countries energy can be obtained. - Political instability in the Middle East has meant that many oil-consuming countries are looking for alternative sources of energy. - Some Western countries and Israel currently want to stop Iran developing nuclear power. They fear it will be used for non-peaceful purposes.
Technology	- Technological advances have allowed energy sources in remote of difficult environments, such as the North Sea and the Arctic, to be exploited. - They can also reduce costs. -Technology has made possible the exploitation of shale gas by fracking.
Climate	- The amount of sunshine and wind influence the availability of solar energy and wind energy. Tidal power needs a large tidal range in order to be effective. HEP needs a suitable dam site, often in sparsely populated mountainous areas with high rainfall.

Impacts of energy insecurity

Exploiting resources	Exploiting the Arctic	Food production	Industrial output	Conflict
In the past, energy resources were relatively easy to exploit. For example, coal seams have been exposed at the Earth's surface. Today, complex techniques and expensive equipment are needed to extract oil and gas reserves in sensitive areas, such as deep below the North Sea. Energy resources exist in some of the worlds most hostile and sensitive areas.	This region holds an estimated 13% of the world's undiscovered oil resources and 30% of its unexploited natural gas. This region has great potential to supply energy in the future, but exploitation is difficult and expensive. The environmental consequences of an oil spill, for for example, would be catastrophic for the fragile Arctic ecosystem.	 Food production uses 30% of global energy. Energy is used to power farm machinery, store farm produce, and to manufacture fertilisers and chemicals. Agriculture is also an energy generator. Use of biofuels has increased in response to concerns about CO2 emissions.	Energy is essential for industry as a source of power and a raw material. Oil, for example, has many uses in manufacturing chemicals, fuels, plastics and pharmaceuticals.  Some countries suffer from shortfalls in electricity production, resulting in frequent power cuts.	Shortages of energy can lead to political conflict when one state holds a bigger share of an energy resource. For example, Russia controls 25% of the world's natural gas supplies. Middle East produces 40% of the worlds gas and 56% of its oil. 

Strategies to increase energy supply

Renewable energy sources
Biomass - energy produced from organic matter includes burning plant matter or production of biofuels.

Wind - turbines on line or at sea are turned by the wind to generate electricity. In 2014, wind power met 10% of the UK's electricity demand.

HEP - large-scale dams create enough water to turn turbines and generate electricity. Large dams are expensive and controversial.

Non renewable Fossil fuels - Nuclear - Nuclear power stations are expensive to build. Uranium is cheap to buy but nuclear waste is radioactive for 100yrs

The Chambamontera micro-hydro scheme

Where? - isolated community, Andes Mountains

- Development limited by subsistence farming and lack of electricity
- ½ population survive on $2 a day
- Isolated in winter due to mountain location
- Small population meant it wasn't economical to connect the village to the national grid

Solution
- Part-funded by charity 'practical action' $51,000
- High rainfall and steep slopes allow fast-flowing water to turn a turbine and generate electricity
- Allowed vaccines to be stored in fridges, access to internet etc.

Sustainable energy

Energy conservation
- Hot water recirculation
- Energy-efficient appliances
- Double glazing
- Cavity wall insulation
- High-efficiency water heating
- Solar panels

Reducing demand
- Financial incentives
- Awareness of energy waste and costs
- Off-peak energy tariffs
- Encouraging people to wash clothes / use dishwasher at lower temperatures.

Carbon footprint - an indicator to compare the total amount of greenhouse gases emitted from an activity, product, company or country.

Example of an energy source

Gas - a non-renewable resource

Natural gas is hydrocarbon. It comes from decomposition of organisms. It takes millions of years to form. It is found mainly in Russia, Iran and Qatar.

Advantages
Cleanest fossil fuel.
Less risk of environmental accidents
Provides employment for 1.2 million people.
Can be transported easily.

Disadvantages
Dangerous if handled or transported carelessly.
Some gas reserves are found in politically unstable areas.
Contribute to global warming by producing CO2.

Geography Resource Management: Learning Cycle 3