

The English Martyrs Catholic School and Sixth Form College

# Year 11 Knowledge organiser

## Geography



**Name:**

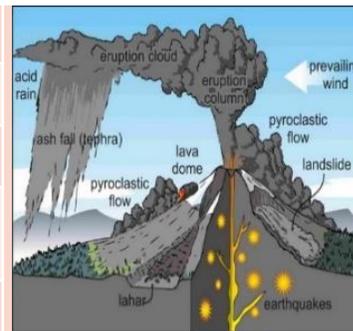


## The structure of the Earth

<b>The Crust</b>	Varies in thickness (5-10km) beneath the ocean. Made up of several large plates.
<b>The Mantle</b>	Widest layer (2900km thick). The heat and pressure means the rock is in a liquid state that is in a state of convection.
<b>The Inner and outer Core</b>	Hottest section (5000 degrees). Mostly made of iron and nickel and is 4x denser than the crust. Inner section is solid whereas outer layer is liquid.

## Volcanic Hazards

<b>Ash cloud</b>	Small pieces of pulverised rock and glass which are thrown into the atmosphere.
<b>Gas</b>	Sulphur dioxide, water vapour and carbon dioxide come out of the volcano.
<b>Lahar</b>	A volcanic mudflow which usually runs down a valley side on the volcano.
<b>Pyroclastic flow</b>	A fast moving current of super-heated gas and ash (1000°C). They travel at 450mph.
<b>Volcanic bomb</b>	A thick (viscous) lava fragment that is ejected from the volcano.



## Managing Volcanic Eruptions

Warning signs	Monitoring techniques
Small earthquakes are caused as magma rises up.	Seismometers are used to detect earthquakes.
Temperatures around the volcano rise as activity increases.	Thermal imaging and satellite cameras can be used to detect heat around a volcano.
When a volcano is close to erupting it starts to release gases.	Gas samples may be taken and chemical sensors used to measure sulphur levels.

### Preparation

Creating an exclusion zone around the volcano.	Being ready and able to evacuate residents.
Having an emergency supply of basic provisions, such as food	Trained emergency services and a good communication system.

## Convection Currents

The crust is divided into tectonic plates which are moving due to convection currents in the mantle.

- Radioactive decay of some of the elements in the core and mantle generate a lot of heat.
- When lower parts of the mantle molten rock (Magma) heat up they become **less dense** and **slowly rise**.
- As they move towards the top they cool down, become **more dense** and **slowly sink**.
- These **circular movements** of semi-molten rock are **convection currents**
- Convection currents create **drag** on the base of the tectonic plates and this causes them to move.

## LIC - CS: Nepal Earthquake 2015



**Causes:** The Indo-Australina plate is being subducted beneath the Eurasian plate. 7.8 magnitude quake in one of the poorest countries in the world – GDP: \$690/capita. It occurred in the Gorkha region of Nepal.

### Primary effects:

**Social effects:** 9000 people died and 22000 people were injured.  
**Environmental effects** 800, 000 buildings were destroyed, bridges and roads damaged. Water pipes destroyed leaving 2 million people without access to clean water and sanitation  
**Economic impacts:** \$5billion.

### Secondary effects:

The earthquake triggered avalanches on Mt Everest killing 18 people alone. Many mountain roads were blocked by landslides, preventing emergency aid from reaching remote areas. A lack of clean water caused outbreaks of typhus, which killed 13 people.



## Earthquake Management



### PREDICTING

#### Methods include:

- Satellite surveying (tracks changes in the earth's surface)
- Laser reflector (surveys movement across fault lines)
- Radon gas sensor (radon gas is released when plates move so this finds that)
- Seismometer
- Water table level (water levels fluctuate before an earthquake).
- Scientists also use seismic records to predict when the next event will occur.

### PROTECTION

**You can't stop earthquakes**, so earthquake-prone regions follow these three methods to reduce potential damage:

- Building earthquake-resistant buildings
- Raising public awareness
- Improving earthquake prediction

## HIC - CS: Kaikoura Earthquake New Zealand

**Causes:** Destructive and Conservative – the Pacific Plate is subducting beneath the Australian plate to the North, and sliding past it to the south.

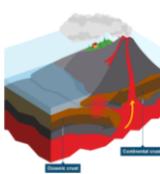
**Primary Effects:** 2 people died and over 50 people injured. Over 200km of road and over 190 km of rail line was destroyed. Communications, water, sewerage and power supplies were cut off.  
**Secondary effects:** Tsunami with waves of around 5m, leaving debris up to 250m inland. A major land slide blocked the Clarence River leading to flooding of 10 farms. The total cost of the damage was around US \$8.5 billion.

**Responses: Immediate:** International warships were sent to Kaikoura with supplies such as food, medicine and portable toilets, \$5.3 million of funding was provided by the Kaikoura District Council to help with rebuilding the towns water systems and harbour, 200 of the most vulnerable people were evacuated from Kaikoura by helicopter within 24 hours of the earthquake.

## Types of Plate Margins

### Destructive Plate Margin

When the denser plate subducts beneath the other, friction causes it to **melt and become molten magma**. The magma forces its way up to the surface to form a volcano. This margin is also responsible for **devastating earthquakes**.



### Constructive Plate Margin

Here two plates are **moving apart** causing new magma to reach the surface through the gap. Volcanoes formed along this crack cause a submarine mountain range such as those in the **Mid Atlantic Ridge**.



### Conservative Plate Margin

A conservative plate boundary occurs where plates **slide past each other** in opposite directions, or in the same direction but at different speeds. This is responsible for earthquakes such as the ones happening along the San Andreas Fault, USA.



## What is a Natural Hazard

A natural hazard is a natural process which could cause death, injury or disruption to humans, property and possessions.

### Geological Hazard

These are hazards caused by land and tectonic processes.

### Meteorological Hazard

These are hazards caused by weather and climate.

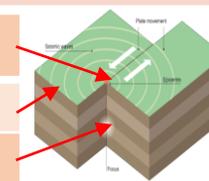
## Causes of Earthquakes

Earthquakes are caused when two plates become **locked** causing **friction** to build up. From this **stress**, the **pressure** will eventually be released, triggering the plates to move into a new position. This movement causes energy in the form of **seismic waves**, to travel from the **focus** towards the **epicentre**. As a result, the crust vibrates triggering an earthquake.

The point directly above the focus, where the seismic waves reach first, is called the **EPICENTRE**.

**SEISMIC WAVES** (energy waves) travel out from the focus.

The point at which pressure is released is called the **FOCUS**.

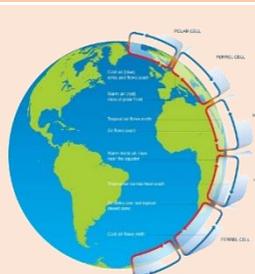


# The Challenges of Natural Hazards

## Global pattern of air circulation

Atmospheric circulation is the large-scale movement of air by which heat is distributed on the surface of the Earth.

<b>Hadley cell</b>	Largest cell which extends from the <b>Equator</b> to between <b>30° to 40° north &amp; south</b> .
<b>Ferrel cell</b>	Middle cell where air flows <b>poleward</b> between <b>60° &amp; 70°</b> latitude.
<b>Polar cell</b>	<b>Smallest &amp; weakness</b> cell that occurs from the poles to the Ferrel cell.



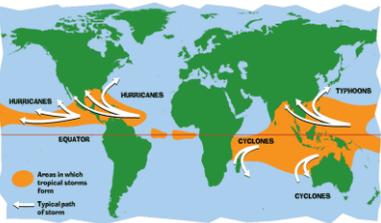
## Distribution of Tropical Storms.

## High and Low Pressure

They are known by many names, including **hurricanes** (North America), **cyclones** (India) and **typhoons** (Japan and East Asia). They all occur in a band that lies roughly **5-15°** either side of the **Equator**.

**Low Pressure**  
Caused by **hot air rising**. Causes **stormy, cloudy weather**.

**High Pressure**  
Caused by **cold air sinking**. Causes **clear and calm weather**.



## Formation of Tropical Storms

- The sun's rays heats large areas of ocean in the summer and autumn. This causes **warm, moist air** to rise over the particular spots
- Once the **temperature is 27°**, the rising warm moist air leads to a **low pressure**. This eventually turns into a thunderstorm. This causes air to be sucked in from the **trade winds**.
- With trade winds blowing in the opposite direction and the rotation of earth involved (Coriolis effect), the thunderstorm will eventually start to **spin**.
- When the storm begins to **spin faster than 74mph**, a tropical storm (such as a hurricane) is officially born.
- With the tropical storm growing in power, **more cool air sinks** in the centre of the storm, creating calm, clear condition called the **eye of the storm**.
- When the tropical storm hits land, it **loses its energy source** (the warm ocean) and it begins to lose strength. Eventually it will 'blow itself out'.

## Changing pattern of Tropical Storms

Scientists believe that **global warming is having an impact on the frequency and strength of tropical storms**. This may be due to an **increase in ocean temperatures**.

## Management of Tropical Storms



**Protection**  
Preparing for a tropical storm may involve construction projects that will improve protection.

**Aid**  
Aid involves assisting after the storm, commonly in LIDS.

**Development**  
The scale of the impacts depends on the whether the country has the resources cope with the storm.

**Planning**  
Involves getting people and the emergency services ready to deal with the impacts.

**Prediction**  
Constant monitoring can help to give advanced warning of a tropical storm

**Education**  
Teaching people about what to do in a tropical storm.

## Primary Effects of Tropical Storms

- The intense winds of tropical storms can destroy whole **communities, buildings and communication networks**.
- As well as their own destructive energy, the winds can generate abnormally high waves called **storm surges**.
- Sometimes the most destructive elements of a storm are these subsequent **high seas and flooding** they cause to coastal areas.

## Secondary Effects of Tropical Storms

- People are **left homeless**, which can cause distress, poverty and ill health due to lack of shelter.
- Shortage of clean water and lack of proper sanitation** makes it easier for diseases to spread.
- Businesses are damaged** or destroyed causing employment.
- Shortage of food as **crops are damaged**.

## Case Study: Typhoon Haiyan 2013



### Causes

Started as a tropical depression on **2<sup>nd</sup> November 2013** and gained strength. Became a Category 5 "**super typhoon**" and made landfall on the Pacific islands of the Philippines.

### Effects

- Almost **6,500 deaths**.
- 130,000 homes destroyed**.
- Water and sewage systems destroyed had caused **diseases**.
- Emotional grief** for dead.

### Management

- The UN raised **£190m in aid**.
- USA & UK sent **helicopter carrier ships** deliver aid remote areas.
- Education** on typhoon preparedness.

## Case Study: UK Heat Wave 2003



### Causes

The heat wave was caused by an anticyclone (areas of high pressure) that stayed in the area for most of August. This blocked any low pressure systems that normally brings cooler and rainier conditions.

### Effect

- People suffered from heat strokes and dehydration.
- 2000 people died from causes linked to heatwave.
- Rail network disrupted and crop yields were low.

### Management

- The NHS and media gave guidance to the public.
- Limitations placed on water use (hose pipe ban).
- Speed limits imposed on trains and government created 'heatwave plan'.



## What is Climate Change?

**Climate change is a large-scale, long-term shift in the planet's weather patterns or average temperatures**. Earth has had tropical climates and ice ages many times in its 4.5 billion years.

## Recent Evidence for climate change.

### Global temperature

Average global temperatures have increased by more than **0.6°C since 1950**.

### Ice sheets & glaciers

Many of the world's glaciers and ice sheets are melting. E.g. the Arctic sea ice has declined by **10% in 30 years**.

### Sea Level Change

Average global **sea level has risen by 10-20cms** in the past 100 years. This is due to the additional water from ice and thermal expansion.



## Enhanced Greenhouse Effect

Recently there has been an increase in **humans burning fossil fuels** for energy. These fuels (gas, coal and oil) emit **greenhouse gases**. This is making the Earth's atmosphere thicker, therefore trapping more solar radiation and causing **less to be reflected**. As a result, the Earth is becoming warmer.

## Evidence of natural change

### Orbital Changes

Some argue that climate change is linked to how the Earth orbits the Sun, and the way it wobbles and tilts as it does it.

### Sun Spots

Dark spots on the Sun are called Sun spots. They increase the **amount of energy Earth receives** from the Sun.

### Volcanic Eruptions

Volcanoes release large amounts of **dust containing gases**. These can **block sunlight** and results in cooler temperatures.

## Managing Climate Change

### Carbon Capture

This involves new technology designed to reduce climate change.

### Planting Trees

Planting trees increase the amount of carbon is absorbed from atmosphere.



### International Agreements

Countries aim to cut emissions by signing international deals and by setting targets.

### Renewable Energy

Replacing fossil fuels based energy with clean/natural sources of energy.

### Relief of the UK

Relief of the UK can be divided into uplands and lowlands. Each have their own characteristics.

**Key**

- Lowlands
- Uplands

**Areas +600m: Peaks and ridges cold, misty and snow common. i.e. Scotland**

**Areas - 200m: Flat or rolling hills. Warmer weather. i.e. Fens**

### Types of Erosion

The break down and transport of rocks – smooth, round and sorted.	
<b>Attrition</b>	Rocks that bash together to become smooth/smaller.
<b>Solution</b>	A chemical reaction that dissolves rocks.
<b>Abrasion</b>	Rocks hurled at the base of a cliff to break pieces apart.
<b>Hydraulic Action</b>	Water enters cracks in the cliff, air compresses, causing the crack to expand.

### Types of Transportation

A natural process by which eroded material is carried/transported.	
<b>Solution</b>	Minerals dissolve in water and are carried along.
<b>Suspension</b>	Sediment is carried along in the flow of the water.
<b>Saltation</b>	Pebbles that bounce along the sea/river bed.
<b>Traction</b>	Boulders that roll along a river/sea bed by the force of the flowing water.

### Mass Movement

A large movement of soil and rock debris that moves down slopes in response to the pull of gravity in a vertical direction.

1	Rain saturates the permeable rock above the impermeable rock making it heavy.
2	Waves or a river will erode the base of the slope making it unstable.
3	Eventually the weight of the permeable rock above the impermeable rock weakens and collapses.
4	The debris at the base of the cliff is then removed and transported by waves or river.

### Formation of Coastal Spits - Deposition

**Example: Spurn Head, Holderness Coast.**

Material moved along beach in zig-zag way. Coastline changes direction. Material deposited in shallow, calm water, to form a spit.

Prevailing winds bring waves in at an angle. Spit curved with change of wind direction.

### Types of Weathering

Weathering is the breakdown of rocks where they are.

<b>Carbonation</b>	Breakdown of rock by changing its chemical composition.
<b>Mechanical</b>	Breakdown of rock without changing its chemical composition.

### What is Deposition?

When the sea or river loses energy, it drops the sand, rock particles and pebbles it has been carrying. This is called deposition.



- 1) Swash moves up the beach at the angle of the prevailing wind.
- 2) Backwash moves down the beach at 90° to coastline, due to gravity.
- 3) Zigzag movement (Longshore Drift) transports material along beach.
- 4) Deposition causes beach to extend, until reaching a river estuary.
- 5) Change in prevailing wind direction forms a hook.
- 6) Sheltered area behind spit encourages deposition, salt marsh forms.

# Unit 1c Physical Landscapes in the UK

AQA

### Formation of Bays and Headlands

**Bay** (Soft rock)

**Headland** (Hard rock)

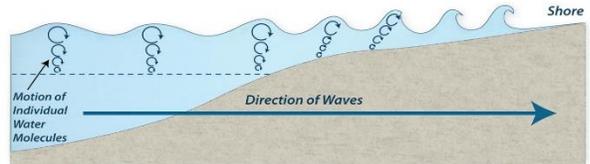
- 1) Waves attack the coastline.
- 2) Softer rock is eroded by the sea quicker forming a bay, calm area causes deposition.
- 3) More resistant rock is left jutting out into the sea. This is a headland and is now more vulnerable to erosion.

### How do waves form?

Waves are created by wind blowing over the surface of the sea. As the wind blows over the sea, friction is created - producing a swell in the water.

### Why do waves break?

- 1) Waves start out at sea.
- 2) As waves approaches the shore, friction slows the base.
- 3) This causes the orbit to become elliptical.
- 4) Until the top of the wave breaks over.



### Mechanical Weathering Example: Freeze-thaw weathering

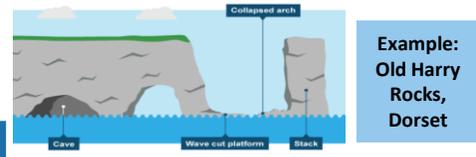
<b>Stage One</b>	Water seeps into cracks and fractures in the rock.		<b>Stage Two</b>	When the water freezes, it expands about 9%. This wedges apart the rock.		<b>Stage Three</b>	With repeated freeze-thaw cycles, the rock breaks off.	
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### Size of waves

### Types of Waves

Constructive Waves	Destructive Waves
This wave has a <b>swash that is stronger</b> than the backwash. This therefore builds up the coast.	This wave has a <b>backwash that is stronger</b> than the swash. This therefore erodes the coast.

### Formation of Coastal Stack



**Example: Old Harry Rocks, Dorset**

- 1) Hydraulic action widens cracks in the cliff face over time.
- 2) Abrasion forms a wave cut notch between HT and LT.
- 3) Further abrasion widens the wave cut notch to form a cave.
- 4) Caves from both sides of the headland break through to form an arch.
- 5) Weather above/erosion below –arch collapses leaving stack.
- 6) Further weathering and erosion eaves a stump.

## Coastal Defences

Hard Engineering Defences		
<b>Groynes</b>	Wood barriers prevent longshore drift, so the beach can build up.	<ul style="list-style-type: none"> <li>✓ Beach still accessible.</li> <li>✗ No deposition further down coast = erodes faster.</li> </ul>
<b>Sea Walls</b>	Concrete walls break up the energy of the wave. Has a lip to stop waves going over.	<ul style="list-style-type: none"> <li>✓ Long life span</li> <li>✓ Protects from flooding</li> <li>✗ Curved shape encourages erosion of beach deposits.</li> </ul>
<b>Gabions or Rip Rap</b>	Cages of rocks/boulders absorb the waves energy, protecting the cliff behind.	<ul style="list-style-type: none"> <li>✓ Cheap</li> <li>✓ Local material can be used to look less strange.</li> <li>✗ Will need replacing.</li> </ul>

## Soft Engineering Defences

<b>Beach Nourishment</b>	Beaches built up with sand, so waves have to travel further before eroding cliffs.	<ul style="list-style-type: none"> <li>✓ Cheap</li> <li>✓ Beach for tourists.</li> <li>✗ Storms = need replacing.</li> <li>✗ Offshore dredging damages seabed.</li> </ul>
<b>Managed Retreat</b>	Low value areas of the coast are left to flood & erode.	<ul style="list-style-type: none"> <li>✓ Reduce flood risk</li> <li>✓ Creates wildlife habitats.</li> <li>✗ Compensation for land.</li> </ul>

## Case Study: Lyme Regis

**Location and Background:** is a small coastal town on the south coast of England, its known as the Jurassic Coast and is famous for its fossils. The town is a popular tourist destination. In summer, the population of the town swells from 4000 to 15000! The town is built on very strong limestone but slippery clays overly this and are easily eroded by the constant attack of destructive waves which have travelled over a large fetch. Homes, roads and businesses are constantly under threat from erosion.

**Management strategies:** The Lyme Regis Environmental Improvement Scheme was set up by West Dorset Council in the early 1990-2015. Its aims reduce the threat of landslips. 2003-2004: £1.4 spent on nails and drainage to stabilise the cliffs. £22 million on a sea wall on the sea front. Creation of a new beach. Rock armour at the eastern side of the sea front. 2015: £20 on 390 metres of sea wall on the eastern side. More nails used to stabilise cliffs for 480 homes.

**Successful or not?**  
**YES:** new beaches have increased tourists and businesses are thriving, Defences have stood up to recent storms. The harbour is now better protected, benefiting boat owners and fishermen.  
**NO:** More tourists have led to conflicts with local people, traffic congestion and litter have increased. Some people think the new defences are ugly. Protecting the cliffs have stopped landslips, but fossils are now not revealed. The new sea wall may cause erosion down shore.

## Water Cycle Key Terms

<b>Precipitation</b>	Moisture falling from clouds as rain, snow or hail.
<b>Interception</b>	Vegetation prevent water reaching the ground.
<b>Surface Runoff</b>	Water flowing over surface of the land into rivers
<b>Infiltration</b>	Water absorbed into the soil from the ground.
<b>Transpiration</b>	Water lost through leaves of plants.

## Physical and Human Causes of Flooding.

<b>Physical: Prolong &amp; heavy rainfall</b> Long periods of rain causes soil to become saturated leading runoff.	<b>Physical: Geology</b> Impermeable rocks causes surface runoff to increase river discharge.
<b>Physical: Relief</b> Steep-sided valleys channels water to flow quickly into rivers causing greater discharge.	<b>Human: Land Use</b> Tarmac and concrete are impermeable. This prevents infiltration & causes surface runoff.

## Upper Course of a River

Near the source, the river flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow valleys.

## Formation of a Waterfall

- 1) River flows over alternative types of rocks.
- 2) River erodes soft rock faster creating a step.
- 3) Further hydraulic action and abrasion form a plunge pool beneath.
- 4) Hard rock above is undercut leaving cap rock which collapses providing more material for erosion.
- 5) Waterfall retreats leaving steep sided gorge.

## Middle Course of a River

Here the gradient get gentler, so the water has less energy and moves more slowly. The river will begin to erode laterally making the river wider.

## Formation of Ox-bow Lakes

<b>Step 1</b>	Erosion of outer bank forms river cliff. Deposition inner bank forms slip off slope.	<b>Step 2</b>	Further hydraulic action and abrasion of outer banks, neck gets smaller.
<b>Step 3</b>	Erosion breaks through neck, so river takes the fastest route, redirecting flow	<b>Step 4</b>	Evaporation and deposition cuts off main channel leaving an oxbow lake.

## Lower Course of a River

Near the river's mouth, the river widens further and becomes flatter. Material transported is deposited.

## Formation of Floodplains and levees

When a river floods, fine silt/alluvium is deposited on the valley floor. Closer to the river's banks, the heavier materials build up to form natural levees.

- ✓ Nutrient rich soil makes it ideal for farming.
- ✓ Flat land for building houses.

## River Management Schemes

Soft Engineering	Hard Engineering
<p><b>Afforestation</b> – plant trees to soak up rainwater, reduces flood risk.</p> <p><b>Demountable Flood Barriers</b> put in place when warning raised.</p> <p><b>Managed Flooding</b> – naturally let areas flood, protect settlements.</p>	<p><b>Straightening Channel</b> – increases velocity to remove flood water.</p> <p><b>Artificial Levees</b> – heightens river so flood water is contained.</p> <p><b>Deepening or widening river</b> to increase capacity for a flood.</p>

## Hydrographs and River Discharge

River discharge is the volume of water that flows in a river. Hydrographs who discharge at a certain point in a river changes over time in relation to rainfall

1. **Peak discharge** is the discharge in a period of time.
2. **Lag time** is the delay between peak rainfall and peak discharge.
3. **Rising limb** is the increase in river discharge.
4. **Falling limb** is the decrease in river discharge to normal level.

## Case Study: The River Tees

**Location and Background**  
 Located in the North of England and flows 137km from the Pennines to the North Sea at Red Car.

**Geomorphic Processes**  
**Upper** – Features include V-Shaped valley, rapids and waterfalls. Highforce Waterfall drops 21m and is made from harder Whinstone and softer limestone rocks. Gradually a gorge has been formed.  
**Middle** – Features include meanders and ox-bow lakes. The meander near Yarm encloses the town.  
**Lower** – Greater lateral erosion creates features such as floodplains & levees. Mudflats at the river's estuary.

**Management**  
 -Towns such as Yarm and Middlesbrough are economically and socially important due to houses and jobs that are located there. Tees Barrage protects against storm surges from the North Sea -Dams and Cow Green reservoir in the upper course controls river's flow during high & low rainfall. Better flood warning systems, more flood zoning and river dredging reduces flooding.

## What is Urbanisation?

## Sustainable Urban Living

## What challenges does London face?

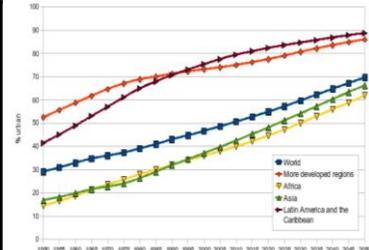


An increasing proportion of people living in urban areas. In 2007 more than 50 % of the world's population live in urban areas.

Sustainable urban living means living in an area that meets the needs of the current generation without harming the needs of the future generations.

### London's congestion problem. What are the issues?

### Where is urbanisation happening?



### Environmental problems

Air pollution increases (CO<sub>2</sub>, CO, NO). This enhances the greenhouse effect causing climate change. It also affects air quality and biodiversity.



### Economic problems

Congestion delays commuters costing businesses money. Tourists are less likely to visit places. Trade/ transport of goods is delayed costing money.

### Social Problems

There is a greater risk of accidents due to frustration. Life expectancy is reduced because of pollution (increases in lung cancer, heart disease, asthma etc.)

### Congestion Solutions

- Cycle hire scheme 'Boris bikes'
- London underground
- Congestion charges (£11.50)
- Public transport (buses etc.)
- Cycle highways/ cycle lanes
- London park and ride
- Car pooling
- Cross rail system

### Two causes of urbanisation:

#### Push factors

#### Pull

- Lack of investment in services
- Drought
- Poverty
- Secondary & Tertiary jobs
- Better education & healthcare
- Increased quality of life.

#### Increase in birth rate (BR)

#### Lower death rate (DR)

- High percentage of population are child-bearing age which leads to high fertility rate.
- Lack of contraception or education about family planning.
- Urban areas have higher birth rates
- Higher life expectancy due to better living conditions and diet.
- Improved medical facilities helps lower infant mortality rate.
- Improved education on hygiene and sanitation

### Types of Cities

#### Megacity

An urban area with over **10 million people** living there.



More than two thirds of current megacities are located in either NEEs (Brazil) and LICs (Nigeria). The amount of megacities are predicted to increase from 28 to 41 by 2030.  
**Trends:**  
 Megacities are on coasts  
 Megacities are mostly in NEEs  
 Megacities are mostly in Asia

### What are the key features of a sustainable urban area?

Resources and services in the city are accessible to all.  
 Public transport is seen as a viable alternative to cars.  
 Public transport is safe and reliable.  
 Walking and cycling is safe.  
 Areas of green space are safe, accessible and enjoyable.

Wherever possible, renewable resources are used.  
 Waste is seen as a resource and is recycled wherever possible.  
 New homes are energy efficient.  
 There is access to affordable housing.  
 Community links are strong and communities work together

### Sustainable Urban Living: East Village (London)

**Water:** Uses 50% less water than an average urban area. Rainwater is filtered and recycled in ponds for flushing toilets.

**Energy:** Energy use is 30% less. Uses combined heating and power (CHP). CHP generates electricity and produces heat from the same source of energy (burning biomass).

**Transport:** Bus and trains connect to the underground. Stratford international station gives access to central London & Europe. Cycling highways encourage cycling. Car park spaces are charged and profits are invested into the area.

**Affordable housing:** half of properties rented at lower prices for deprived people in East London.

**Green spaces:** Ten hectares of parkland. Ponds and woodland to encourage biodiversity.

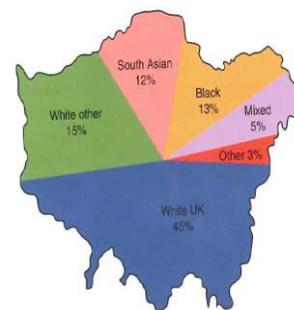
**Building design:** All buildings are insulated. Buildings are tightly packed to reduce heat loss.

**Green roofs:** plants on roofs stop water running off and encourages biodiversity.

**Public services:** A large 3-18 school and a health centre have been built for the community.

### HIC Case Study: London

**Population:** In 2015, London's population reached 8.6 million.  
**Demographic:** Young people (20-30 age group), especially university graduates, move to London for work. This age group are more likely to have children. That leads to a higher rate of natural population increase. Although net migration into London is quite low, most immigrants are young while most people leaving are older. This reduces the average age of the population and leads to greater natural increase.  
**Ethnic diversity:** London is the most diverse city in the UK. Less than 50% of London's population are of white British origin, while 37% were born outside the UK.



### Positive impacts:

- Reduce journey times –Liverpool Street to Heathrow will be reduced by 25 minutes.
- Increase the number of rail passenger journeys in London by 10% Bring an extra 1.5 million people within a 45 minute journey of Central London. Improve the integrated transport system in London by providing more interchanges with the Underground network.
- Raise property values by about 25% around stations (e.g. Custom House)

### Negative impacts:

- Cost £14.8 billion which could have been invested in cheaper alternatives
- Regeneration is often at the expense of the poorest people who have to leave areas as house and service prices increase.

### London's housing problem

Demand for housing is increasing because of an increasing life expectancy, more single parent households and more divorces. London's population is predicted to grow by 13% over the next 10 years to 10 million people.

### Where could the houses be built?

**Brownfield sites** (areas with structures already built on)  
 + Plenty of disused factories available  
 +Reduces urban sprawl  
 +Often has roads and public transport  
 +New developments improved deprived run down places  
 - Expensive because buildings need to be demolished  
 - People may not want to live near deprived/ industrial areas

**Greenfield sites** (areas that have never been built on before)  
 + Blank canvas to design on  
 +Cheaper land as there is no decontamination/ demolition needed  
 +Ideal for suburban homes with gardens  
 - Loss of habitats/ green spaces  
 - Encourages urban sprawl  
 - Transport links/; infrastructure need to be built



# Urban Issues & Challenges

Unit 2a





London's pollution problem		London urban greening
<p><b>Air pollution:</b> At least 9000 people die a year because of air pollution (twice as likely to die from lung disease) Pollution costs the up to £3.7 billion a year to the economy</p>	<p><b>Waste pollution:</b> Almost a quarter of London's waste still goes to landfill sites outside London. Waste leads to the production of methane (greenhouse gas)</p>	<p>47% of London is green space! <b>Why is there so much green space?</b> Central London Parks: including royal parks, such as Hyde Park. Local Parks: run by the council. From the 19<sup>th</sup> Century where there was concern about hygiene and health. Suburban growth: the expansion of London in 20<sup>th</sup> Century led to the development of Suburbs. Built on farmland to provide space for gardens. <b>Why do we need green space?</b> 30,000 allotments in London There are 8.1 million trees in London that reduce atmospheric CO2 Reduce flooding by intercepting runoff There are 13,000 wildlife species in London Physical and mental well-being</p>

**Solutions to the pollution problem?**

- Transport initiatives e.g. cycle highway (see previous page)
- More of London's waste is now recycled or incinerated (burnt to generate electricity). The target is for zero waste to go to landfill by 2030

Opportunity: Shoreditch	Opportunity: Docklands
<p>Deprived industrial area converted into flats and offices. Abandoned pubs are now art galleries and up market cafes. Jobs have been created in creative industries (web design, animation etc). These are mostly around 'Silicon Roundabout'. The demographic has changed from families to young professionals. The places has been gentrified (modernised) providing new sources of entertainment.</p>	<p><b>Why did the docklands decline?</b> New container ships were built for trade but the docklands were not large enough for them. Industry also moved away from the UK to NEEs. 95%+ of housing was rented and including high density terraced houses. Unemployment was at 21%</p>
	<p><b>Why have new industries grown?</b> 1981 the government set up the London Docklands Development Corporation (LDDC). They found new ways to use the land and attract private investment. Finance industries developed (banking) around Canary Wharf.</p>
	<p><b>What opportunities has this created?</b> Growth in service based jobs with over 100,000 working in the area. London became a leading financial capital of the world. Promoted further investment and improvement in services e.g. transport.</p>

Urban redevelopment: Olympic Park and it's legacy	
<p><b>What was created in its' legacy?</b> <b>Here East:</b> Media Centre hub for creative and media industries (5000 jobs). <b>Queen Elizabeth park:</b> 100 hectares of green space <b>Olympic stadium:</b> used by West Ham and other events <b>East village:</b> 2800 new homes (half for low income earners) <b>Westfield Stratford City:</b> recreational area employing 10,000 people <b>International quarter:</b> employing 25,000 people <b>Problems:</b> Many event based parts are underused and have not given good value for money based on their cost Services, shops and accommodation are too expensive for the local residents. Many have migrated to cheaper areas which has changed the identity of Newham There is still a lack of affordable council housing. Many local independent businesses also had to shut down due to competition with large scale corporations.</p>	<p><b>Favela Bairro Project:</b> site a and services for residents in the north of Rio with 26 000 people. A Pacifying Police Unit (UP) in the community to help rec</p> <p>Building of new health, leisure and education facilities</p> <p>Hillside secured to prevent landslides, or people relocated where necessary</p> <p>Access to a water supply for improved sanitation in cheaper areas which has</p> <p>Access to credit to materials to improve</p>

**Location and Importance**

Lagos is Nigeria's largest city. It lies in the South West of the country on the coast of the Gulf of Guinea close to Nigeria's border with Benin. It is an ex British colony and Lagos is a mega city in Nigeria – Nigeria is a NEE and has the highest GDP of any country in Africa.



**City's Importance**

**regionally:** It has a very large migrant population which increases cultural diversity. It is well connected to other towns/cities with road and rail links, making it an important centre for regional trade.

**Nationally:** It has 80% of all industry and many global TNCs, it was Nigeria's capital until 1991 until Abuja took over.

**internationally:** it is the financial centre of West Africa and is the 5<sup>th</sup> largest economy in Africa. Its airport and port are very important for global trade.

**Migration to Lagos**

Lagos, which means "lakes", was a name given to the settlement by the Portuguese. Lagos was the original capital of Nigeria and has become home to various ethnic groups who have migrated here.

However, more recently, millions of people have migrated from rural areas that have suffered from conflict, drought, lack of services and unemployment to Lagos. People do this to search for a better quality of life.

This expanding population has resulted in the rapid urbanisation of Lagos.

**Opportunities in Lagos**

**Social:** Standards of living are gradually improving. 90% of primary children attend school (20,000 schools), 40% have lighting and there are more clinics and hospitals

**Economic:** has the highest income per person in the country. The city has various types of employment including oil, banking, construction and manufacturing.

**Environmental:** investment in The BRT –Bus rapid Transport system has improved air quality and Mokoko floating schools collects its own rainwater, has solar energy and is built by local from recycled materials.

**Challenges in Lagos**

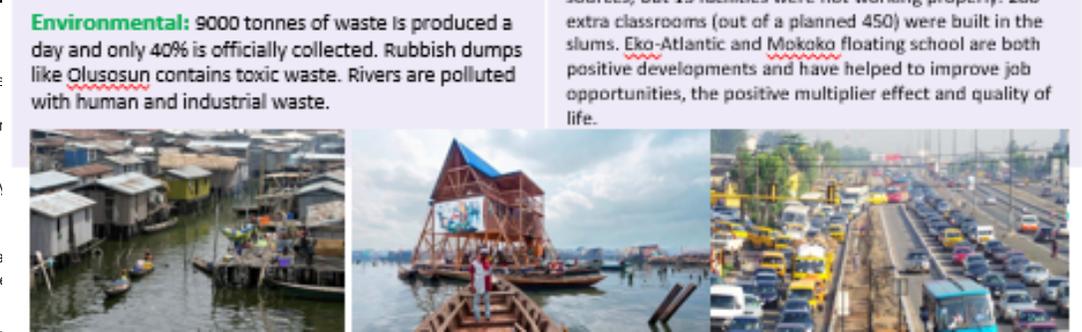
**Social:** There is a severe shortage of housing, schools and healthcare centres available. Large scale social inequality. There are 13 squatter settlements, Mokoko being one of them

**Economic:** The rise of informal jobs with low pay and no tax contributions. There is high unemployment in Mokoko squatter 30%

**Environmental:** 9000 tonnes of waste is produced a day and only 40% is officially collected. Rubbish dumps like Olusosun contains toxic waste. Rivers are polluted with human and industrial waste.

**Solutions for the poor**

**Lagos Metro Development Project (LMDP)**  
Lagos secured \$200million in funding from the World Bank in 2006 for this project. The aims of the project are to:  
Increase access to basic urban services throughout 9 of the worst slums in Lagos, including Makoko.  
Provide flood defences on the coast  
Improve waste disposal  
Successes:  
1. 95,000 people were supplied with improved water sources, but 15 facilities were not working properly. 280 extra classrooms (out of a planned 450) were built in the slums. Eko-Atlantic and Mokoko floating school are both positive developments and have helped to improve job opportunities, the positive multiplier effect and quality of life.



## 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



Without enough nutritious food, people can become **malnourished**. This can make them ill. This can prevent people working or receiving education.

#### WATER



People need a supply of **clean and safe water** for drinking, cooking and washing. Water is also needed for food, clothes and other products.

#### ENERGY



A good supply of energy is needed for a basic standard of living. People need **light and heat** 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



- Currently the global population is **7.3 billion**.
- Global population has risen **exponentially** this century.
- Global population is expected to reach **9 billion by 2050**.
- With more people, the **demand** for food, water, energy, jobs and space **will increase**.

#### 2. Economic Development



- As **LIDs** and **NEEs** develop further, they require **more energy** for industry.
- LIDs** and **NEEs** want similar lifestyles to **HICs**, therefore they will need to **consume more resources**.
- Development means **more water is required** for food production as diets improve.

#### Resource Reliance Graph

**Consumption** – The act of using up resources or purchasing goods and produce.  
**Carry Capacity** – A maximum number of species that can be supported.

**Resource consumption exceeds Earth's ability to provide!**



#### 3. Changing Technology and Employment

- The demand for resources has driven **the need for new technology** to reach or gain more resources.
- More people in the **secondary and tertiary industry** has increased the **demand for resources** required for electronics and robotics.

## Food in the UK



### Growing Demand

- The UK imports about 40% of its food. This increases people's **carbon footprint**.
- There is growing demand for greater choice of **exotic foods** needed all year round.
- Foods from abroad are more affordable.
- Many food types are unsuitable to be grown in the UK.

### Agribusiness



**Farming is being treated like a large industrial business. This is increasing food production.**  
 + Intensive farming maximises the amount of food produced.  
 + Using machinery which increases the farms efficiency.  
 - Only employs a small number of workers.  
 - Chemicals used on farms damages the habitats and wildlife.

### Impact of Demand

**Foods can travel long distances (food miles). Importing food adds to our carbon footprint.**  
 + Supports workers with an income  
 + Supports families in LICs.  
 + Taxes from farmers' incomes contribute to local services.  
 - Less land for locals to grow their own food.  
 - Farmers exposed to chemicals.

### Sustainable Foods



**Organic foods that have little impact on the environment and are healthier have been rising. Local food sourcing is also rising in popularity.**  
 • Reduces emissions by only eating food from the UK.  
 • Buying locally sourced food supports local shops and farms.  
 • A third of people **grow their own food**.

## Energy in the UK



### Growing Demand

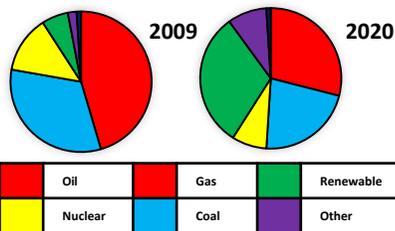
The UK **consumes less energy** than compared to the 1970s despite a smaller population. This is due to the **decline of industry**.

### Changes in Energy Mix

- 75% of the UK's oil and gas has been used up.
- Coal consumption has declined.
- UK has become too dependent on imported energy.

### Energy Mix

The majority of UK's energy mix comes from **fossil fuels**. By 2020, the UK aims for 15% of its energy to come from **renewable sources**. These renewable sources do not contribute to **climate change**.



## Water in the UK



### Growing Demand

**The average water used per household has risen by 70%. This growing demand is predicted to increase by 5% by 2020.**  
**This is due to:**  
 • A growing UK population.  
 • Water-intensive appliances.  
 • Showers and baths taken.  
 • Industrial and leisure use.  
 • Watering greenhouses.

### Pollution and Quality

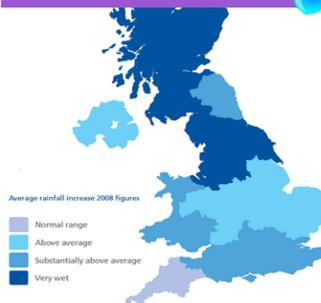


**Cause and effects include:**  
 • Chemical run-off from farmland can destroy habitats and kills animals.  
 • Oil from boats and ships poisons wildlife.  
 • Untreated waste from industries creates unsafe drinking water.  
 • Sewage containing bacteria spreads infectious diseases.

### Deficit and Surplus

The north and west have a **water surplus** (more water than is required).  
 The south and east have a **water deficit** (more water needed than is actually available).  
 More than half of England is experiencing **water stress** (where demand exceeds supply).

### Water stress in the UK



## Unit 2c



# The Challenge of Resource Management

## Energy in the UK



### Growing Demand

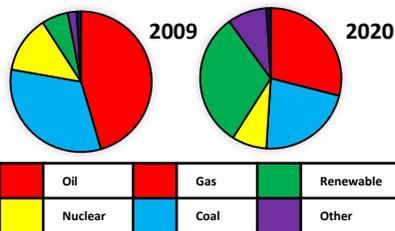
The UK **consumes less energy** than compared to the 1970s despite a smaller population. This is due to the **decline of industry**.

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### Energy Mix

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## Energy in the UK (continued)

### Significance of Renewables

+ The UK government is investing more into low carbon alternatives.  
 + UK government aims to meet targets for reducing emissions.  
 + Renewable sources include wind, solar and tidal energy.  
 - Although infinite, renewables are still expensive to install.  
 - Shale gas deposits may be exploited in the near future

### Exploitation

**Nuclear**  
 New plants provide job opportunities.  
 Problems with safety and possible harm to wildlife.  
 Nuclear plants are expensive.

**Wind Farm**  
 Locals have low energy bills.  
 Reduces carbon footprint.  
 Construction cost is high.  
 Visual impacts on landscape.  
 Noise from wind turbines.

### Management

UK has **strict laws** that limits the amount of discharge from factories and farms.  
**Education campaigns** to inform what can be disposed of safely.  
**Waste water treatment plants** remove dangerous elements to then be used for safe drinking.  
 Pollution traps catch and filter pollutants.

### Water Transfer

Water transfer involves moving water through pipes from areas of surplus (Wales) to areas of deficit (London).  
**Opposition includes:**  
 • Effects on **land and wildlife**.  
 • High maintenance **costs**.  
 • The **amount of energy** required to move water over long distances.

## Option 1: FOOD



Food Security is when people at all times need to have physical & economic access to food to meet their dietary needs for an active & healthy life. This is the opposite to Food Insecurity which is when someone is unsure when they might next eat.

### Human



- **Poverty** prevents people affording food and buying equipment.
- **Conflict** disrupts farming and prevents supplies.
- **Food waste** due to poor transport and storage.
- **Climate Change** is affecting rainfall patterns making food production difficult.

### Physical



- The **quality of soil** is important to ensure crops have key nutrients.
- **Water supply** needs to be reliable to allow food to grow.
- **Pest, diseases and parasites** can destroy vast amounts of crops that are necessary to populations.
- **Extreme weather** events can damage crops (i.e. floods).

### Daily Calorie Intake



This map shows how many **calories per person** that are consumed on average for each country. This can indicate the global distribution of **available food** and **food inequality**.

### Food Supply



This map shows the amount of **food produced** in different countries. Whilst Asia and **North America** have **high** production outputs, **Africa** and **Central America** have **low** production outputs.

### Increasing Food Supply



- **Hydroponics** - A method of growing plants without soil. Instead they use nutrient solution.
- **New Green Revolution** - Aims to improve yields in a more sustainable way. Involves using both GM varieties and traditional and organic farming.
- **Biotechnology** - Genetically modified (GM) crops changes the DNA of foods to enhance productivity and properties.
- **Irrigation** - Artificially watering the land so crops can grow. Useful in dry areas to make crops more productive.

### Sustainable Food Supply



This ensures that **fertile soil, water and environmental resources** are available for future generations.

- **Organic Farming** - The banned use of chemicals and ensuring animals are raised naturally.
- **Permaculture** - People growing their own food and changing eating habits. Fewer resources are required.
- **Urban Farming** - Planting crops in urban areas. i.e. roundabouts.
- **Managed Fishing** - Includes setting catch limits, banning trawling and promoting pole and line methods.

### C.S. Thanet Earth



Located in Kent, the site involves four **huge greenhouses** using hydroponics.

#### Advantages

- Supports more than 500 jobs.
- Produces food all year round.
- Provides UK with food security.

#### Disadvantages

- Money generated mostly goes to large companies not community.
- Requires a lot of energy.
- Causes visual & light pollution.

### C.S. LIC - Indus Basin Irrigation System



Largest irrigation scheme in the world. Involves large and small dams. Thousands of channels provides water to supports Pakistan's rich farmlands.

#### Advantages

- Improves food security by adding 40% more land for farming.
- Increased yield & range of foods.

#### Disadvantages

- Few take an unfair share of water
- Water is wasted and demand is rising due to population growth.
- High cost to maintain reservoirs.

## 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



- **Pollution** caused from human and industrial waste being dumped into peoples water sources.
- **Poverty** prevents low income families affording water.
- **Limited infrastructure** such as a lack of water pipes and sewers.
- **Over-abstraction** is when more water is taken than is replaced.

### Physical



- **Climate** needs to provide enough rainfall to feed lakes and rivers. Droughts affect supply if water.
- **Geology** can affect accessibility to water. Permeable rock means sourcing water from difficult aquifers, whereas impermeable allows water to run-off into easily collected basins.

### Impact of Water Insecurity



#### Food production

The less water available for irrigating crops the less food that will be produced. This could lead to starvation.

#### Industrial output

Manufacturing industries depend heavily on water. A severe lack of water can impact economic output.

#### Disease and Water Pollution

Inadequate sanitation systems pollutes drinking water causing diseases such as cholera and typhoid.

#### Water conflict

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.

### 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.

### C.S. Lesotho Highland Water Project



Lesotho is a highland country dependent on South Africa. Lesotho has water surplus due to high rainfall.

#### Advantages

- Provides 75% of Lesotho's GDP.
- Provides water to areas of drought in South Africa.

#### Disadvantages

- Dams displaced 30,000 people.
- Destruction to key ecosystems.
- 40% lost through pipe leakages.

### C.S. NEE - The Wakel River Basin



A project in India that aims to improve water use by encouraging greater use of rainwater harvesting techniques.

#### How does the project work?

- Provides 'taankas' that store water underground.
- Small dams called 'johed' interrupt water flow and encourages infiltration.
- Villages take turns to irrigate their fields so water is not overused.
- Maintained by farmers so it is entirely sustainable.
- Greater education for awareness.

## Option 3: ENERGY



Energy security means having a reliable, uninterrupted and affordable supply of energy available. Energy insecurity can be experienced by countries with both a high and low energy consumption. Technology is increasing energy consumption.

### Physical



- **Geology** determines the availability of fossil fuels.
- **Climate variations** will affect the potential use of renewable energy.
- **Natural disasters** can damage energy infrastructure.

### Economic



- **Cost** of extracting fossil fuels is becoming costly and difficult.
- **Price of fossil fuels** are volatile to potential political changes.
- **Infrastructure** for energy is costly, especially for LICs.

### Technology



- **New technology** is making once difficult energy sources now reachable/exploitable.

### Political



- **Conflict** and turmoil in energy rich countries can affect exports.
- **Stricter regulations** over Nuclear.

### Impact of Energy Insecurity



#### Sensitive environments

Exploration of energy resources threatens to harm sensitive areas such as the oil drilling in Alaska, USA.

#### Food production

Food production depends on the energy needed to power machinery and transport goods to different markets.

#### Energy conflict

Shortages of energy resources can lead to tensions and violence. Conflict can be caused by fear of energy insecurity.

#### Industry

Countries can suffer from shortfalls in energy leading to a decline in manufacturing and services.

### Increasing Energy Supply



- **Non-renewables**  
**Fossil Fuels** - Conventional power stations can be made more efficient with carbon capture overcoming the environmental impacts.  
**Nuclear** - Once a nuclear plant is built it can provide a cheap and long-term dependable source of energy.  
**Renewables**  
**Wind, Solar, Biomass** - These are examples of environmentally friendly renewable sources that can't run out but cost a lot to install.

### Sustainable Energy Supply

This involves balancing supply & demand. It also includes reducing waste & supporting the environment.

- **Home design** - Building homes to conserve energy. i.e. roof insulation.
- **Reduce demand** - Changing attitudes towards energy used to save energy.
- **Efficient technology** - Making cars more efficient by improving engine design and weight. i.e. Hybrid engines.
- **Transport** - Using public buses & bikes.

Fracking is used to extract natural gas trapped in underground shale rock. It is a method considered by the UK.

#### Advantages

- Estimated to create 64,000 jobs.
- UK has large shale gas reserves.
- Is far cheaper than natural gas.

#### Disadvantages

- May cause groundwater pollution
- Is a non-renewable resource.
- May trigger minor earthquakes.

### C.S. LIC - Chambamontera



Chambamontera is an isolated community in the Andes of Peru. It introduced a micro-hydro to exploit water power as an energy source.

#### Benefits to the community

- Provides renewable energy.
- Low maintenance & running costs
- Has little environmental impacts.
- Using local labour and materials.
- Businesses are developing.
- Less wood is needed to be burnt.

## What is development?

Development is an improvement in living standards through better use of resources.

<b>Economic</b>	This is progress in economic growth through levels of industrialisation and use of technology.
<b>Social</b>	This is an improvement in people's standard of living. For example, clean water and electricity.
<b>Environmental</b>	This involves advances in the management and protection of the environment.

## Measuring development

These are used to compare and understand a country's level of development.



### Economic indicators examples

<b>Employment type</b>	The proportion of the population working in primary, secondary, tertiary and quaternary industries.
<b>Gross Domestic Product per capita</b>	This is the total value of goods and services produced in a country per person, per year.
<b>Gross National Income per capita</b>	An average of gross national income per person, per year in US dollars.

### Social indicators examples



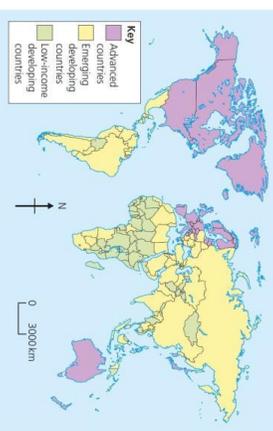
<b>Infant mortality</b>	The number of children who die before reaching 1 per 1000 babies born.
<b>Literacy rate</b>	The percentage of population over the age of 15 who can read and write.
<b>Life expectancy</b>	The average lifespan of someone born in that country.

### Mixed indicators

<b>Human Development Index (HDI)</b>	A number that uses life expectancy, education level and income per person.
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## Variations in the level of development

<b>LICs</b>	Poorest countries in the world. GNI per capita is low and most citizens have a low standard of living.
<b>NEEs</b>	These countries are getting richer as their economy is progressing from the primary industry to the secondary industry. Greater exports leads to better wages.
<b>HICs</b>	These countries are wealthy with a high GNI per capita and standards of living. These countries can spend money on services.



## Causes of uneven development

Development is globally uneven with most HICs located in Europe, North America and Oceania. Most NEEs are in Asia and South America, whilst most LICs are in Africa. Remember, development can also vary within countries too.

## Unit 2b

# The Changing Economic World



## Physical factors affecting uneven development

<b>Natural Resources</b> <ul style="list-style-type: none"> <li>Fuel sources such as oil.</li> <li>Minerals and metals for fuel.</li> <li>Availability for timber.</li> <li>Access to safe water.</li> </ul>	<b>Natural Hazards</b> <ul style="list-style-type: none"> <li>Risk of tectonic hazards.</li> <li>Benefits from volcanic material and floodwater.</li> <li>Frequent hazards undermines redevelopment.</li> </ul>
<b>Climate</b> <ul style="list-style-type: none"> <li>Reliability of rainfall to benefit farming.</li> <li>Extreme climates limit industry and affects health.</li> <li>Climate can attract tourists.</li> </ul>	<b>Location/Terrain</b> <ul style="list-style-type: none"> <li>Landlocked countries may find trade difficulties.</li> <li>Mountainous terrain makes farming difficult.</li> <li>Scenery attracts tourists.</li> </ul>

## Human factors affecting uneven development

<b>Aid</b> <ul style="list-style-type: none"> <li>Aid can help some countries develop key projects for infrastructure faster.</li> <li>Aid can improve services such as schools, hospitals and roads.</li> <li>Too much reliance on aid might stop other trade links becoming established.</li> </ul>	<b>Trade</b> <ul style="list-style-type: none"> <li>Countries that export more than they import have a trade surplus. This can improve the national economy.</li> <li>Having good trade relationships.</li> <li>Trading goods and services is more profitable than raw materials.</li> </ul>
<b>Education</b> <ul style="list-style-type: none"> <li>Education creates a skilled workforce meaning more goods and services are produced.</li> <li>Educated people earn more money, meaning they also pay more taxes. This money can help develop the country in the future.</li> </ul>	<b>Health</b> <ul style="list-style-type: none"> <li>Lack of clean water and poor healthcare means a large number of people suffer from diseases.</li> <li>People who are ill cannot work so there is little contribution to the economy.</li> <li>More money on healthcare means less spent on development.</li> </ul>
<b>Politics</b> <ul style="list-style-type: none"> <li>Corruption in local and national governments.</li> <li>The stability of the government can effect the country's ability to trade.</li> <li>Ability of the country to invest into services and infrastructure.</li> </ul>	<b>History</b> <ul style="list-style-type: none"> <li>Colonialism has helped Europe develop, but slowed down development in many other countries.</li> <li>Countries that went through industrialisation a while ago, have now develop further.</li> </ul>

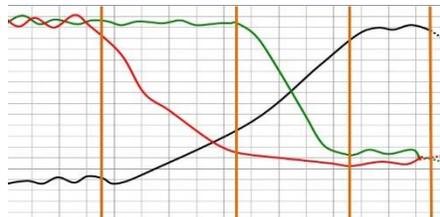
## Consequences of Uneven Development

Levels of development are different in different countries. This uneven development has consequences for countries, especially in wealth, health and migration.

<b>Wealth</b>	People in more developed countries have higher incomes than less developed countries.
<b>Health</b>	Better healthcare means that people in more developed countries live longer than those in less developed countries.
<b>Migration</b>	If nearby countries have higher levels of development or are secure, people will move to seek better opportunities and standard of living.

## The Demographic Transition Model

The demographic transition model (DTM) shows population change over time. It studies how birth rate and death rate affect the total population of a country.



STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
High DR High BR Steady	BR Low Declining DR Very High	Rapidly falling DR Low BR High	Low DR Low BR Zero	Slowly Falling DR Low BR Negative
e.g. Tribes	e.g. Kenya	e.g. India	e.g. UK	e.g. Japan

## Reducing the Global Development Gap

### Microfinance Loans



This involves people in LICs receiving smalls loans from traditional banks.

- + Loans enable people to begin their own businesses
- Its not clear they can reduce poverty at a large scale.

### Foreign-direct investment



This is when one country buys property or infrastructure in another country.

- + Leads to better access to finance, technology & expertise.
- Investment can come with strings attached that country's will need to comply with.



### Aid



This is given by one country to another as money or resources.

- + Improve literacy rates, building dams, improving agriculture.
- Can be wasted by corrupt governments or they can become too reliant on aid.

### Debt Relief

This is when a country's debt is cancelled or interest rates are lowered.

- + Means more money can be spent on development.
- Locals might not always get a say. Some aid can be tied under condition from donor country.



### Fair trade



This is a movement where farmers get a fair price for the goods produced.

- + Paid fairly so they can develop schools & health centres.
- Only a tiny proportion of the extra money reaches producers.

### Technology

Includes tools, machines and affordable equipment that improve quality of life.

- + Renewable energy is less expensive and polluting.
- Requires initial investment and skills in operating technology

## CS: Reducing the Development Gap In Jamaica



### Location and Background



Jamaica is a LIC island nation part of the Caribbean. Location makes Jamaica an attractive place for visitors to explore the tropical blue seas, skies and palm filled sandy beaches

### Tourist economy



- In 2015, 2.12 million visited.
- Tourism contributes 27% of GDP and will increase to 38% by 2025.
- 130,000 jobs rely on tourism.
- Global recession 2008 caused a decline in tourism. Now tourism is beginning to recover.

### Multiplier effect

- Jobs from tourism have meant more money has been spent in shops and other businesses.
- Government has invested in infrastructure to support tourism.
- New sewage treatment plants have reduced pollution.

### Development Problems

- Tourists do not always spend much money outside their resorts.
- Infrastructure improvements have not spread to the whole island.
- Many people in Jamaica still live in poor quality housing and lack basic services such as healthcare.

## Case Study: Economic Development in Nigeria



### Location & Importance

Nigeria is a NEE in West Africa. Nigeria is just north of the Equator and experiences a range of environments. Nigeria is the most populous and economically powerful country in Africa. Economic growth has been base on oil exports.



### Influences upon Nigeria's development

#### Political

Suffered instability with a civil war between 1967-1970. From 1999, the country became stable with free and fair elections. Stability has encouraged global investment from China and USA.

#### Social

Nigeria is a multi-cultural, multi-faith society. Although mostly a strength, diversity has caused regional conflicts from groups such as the Boko Haram terrorists.

#### Cultural

Nigeria's diversity has created rich and varied artistic culture. The country has a rich music, literacy and film industry (i.e. Nollywood). A successful national football side.

#### Industrial Structures

Once mainly based on agriculture, 50% of its economy is now manufacturing and services. A thriving manufacturing industry is increasing foreign investment and employment opportunities.

#### The role of TNCs

TNCs such as Shell have played an important role in its economy. + Investment has increased employment and income. - Profits move to HICs. - Many oil spills have damaged fragile environments.



#### Changing Relationships

Nigeria plays a leading role with the African Union and UN. Growing links with China with huge investment in infrastructure. Main input includes petrol from the EU, cars from Brazil and phones from China.

#### Environmental Impacts

The 2008/09 oil spills devastated swamps and its ecosystems. Industry has caused toxic chemicals to be discharged in open sewers - risking human health. 80% of forest have been cut down. This also increases CO<sup>2</sup> emissions.

#### Aid & Debt relief

+ Receives \$5billion per year in aid. + Aid groups (ActionAid) have improved health centres, provided anti-mosquito nets and helped to protect people against AIDS/HIV. - Some aid fails to reach the people who need it due to corruption.

### Effects of Economic Development

Life expectancy has increased from 46 to 53 years. 64% have access to safe water. Typical schooling years has increased from 7 to 9.

## Case Study: Economic Change in the UK



### UK in the Wider World

The UK has one of the largest economies in the world. The UK has huge political, economic and cultural influences. The UK is highly regarded for its fairness and tolerance. The UK has global transport links i.e. Heathrow and the Eurostar.



### Causes of Economic Change

De-industrialisation and the decline of the UK's industrial base. Globalisation has meant many industries have moved overseas, where labour costs are lower. Government investing in supporting vital businesses.

### Towards Post-Industrial

The quaternary industry has increased, whilst secondary has decreased. Numbers in primary and tertiary industry has stayed the steady. Big increase in professional and technical jobs.

### Cambridge Science Park

A major quaternary industry on the outskirts. Good transport access to the A14 and M11. A good location for sourcing highly educated workers from Cambridge University. Staff benefit from attractive working conditions. Attracts clusters of related high-tech businesses.



### Change to a Rural Landscape - South Cambridgeshire

Cambridge is one of the fastest growing cities in the UK. Current population is 155,000 but will increase to 175,000 by 2026.

#### Social

Rising house prices have caused tensions in villages. Villages are unpopulated during the day causing loss of identity. Resentment towards poor migrant communities.

#### Economic

Lack of affordable housing for local first time buyers. Sales of farmland has increased rural unemployment. Influx of poor migrants puts pressures on local services.

### Improvements to Transport



A £15 billion 'Road Improvement Strategy'. This will involve 10 new roads and 1,600 extra lanes. £50 billion HS2 railway to improve connections between key UK cities. £18 billion on Heathrow's controversial third runway. UK has many large ports for importing and exporting goods.

### UK North/South Divide

- Wages are lower in the North.
- Health is better in the South.
- Education is worse in the North.
- + The government is aiming to support a Northern Powerhouse project to resolve regional differences.
- + More devolving of powers to disadvantaged regions.

## What is an Ecosystem?

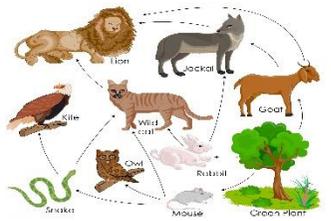
An ecosystem is a system in which organisms interact with each other and with their environment.

## Ecosystem's Components

**Abiotic** These are **non-living**, such as air, water, heat and rock.

**Biotic** These are **living**, such as plants, insects, and animals.

<b>Flora</b>	Plant life occurring in a particular region or time.
<b>Fauna</b>	Animal life of any particular region or time.

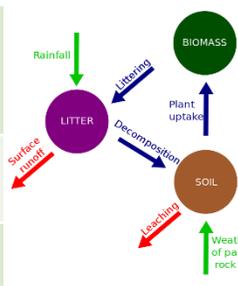


## Food Web and Chains

Simple **food chains** are useful in explaining the basic principles behind ecosystems. They show only one species at a particular trophic level. **Food webs** however consists of a network of many food chains interconnected together.

## Nutrient cycle

Plants take in **nutrients** to build into new organic matter. Nutrients are taken up when animals eat plants and then returned to the soil when animals die and the body is broken down by **decomposers**.

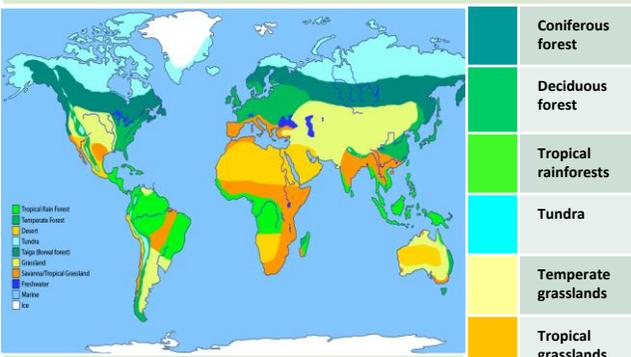


**Litter** This is the **surface layer** of vegetation, which over time breaks down to become **humus**.

**Biomass** The total **mass of living organisms** per unit area.

## Biomes

A biome is a **large geographical area of distinctive plant and animal groups**, which are adapted to that particular environment. The climate and geography of a region determines what type of biome can exist in that region.



The **most productive biomes** – which have the greatest biomass- grow in climates that are **hot and wet**.

## Biome's climate and plants

Biome	Location	Temperature	Rainfall	Flora	Fauna
<b>Tropical rainforest</b>	Centred along the Equator.	Hot all year (25-30°C)	Very high (over 200mm/year)	Tall trees forming a canopy; wide variety of species.	Greatest range of different animal species. Most live in canopy layer
<b>Tropical grasslands</b>	Between latitudes 5°- 30° north & south of Equator.	Warm all year (20-30°C)	Wet + dry season (500-1500mm/year)	Grasslands with widely spaced trees.	Large hoofed herbivores and carnivores dominate.
<b>Hot desert</b>	Found along the tropics of Cancer and Capricorn.	Hot by day (over 30°C) Cold by night	Very low (below 300mm/year)	Lack of plants and few species; adapted to drought.	Many animals are small and nocturnal: except for the camel.
<b>Temperate forest</b>	Between latitudes 40°- 60° north of Equator.	Warm summers + mild winters (5-20°C)	Variable rainfall (500-1500m /year)	Mainly deciduous trees; a variety of species.	Animals adapt to colder and warmer climates. Some migrate.
<b>Tundra</b>	Far Latitudes of 65° north and south of Equator	Cold winter + cool summers (below 10°C)	Low rainfall (below 500mm/ year)	Small plants grow close to the ground and only in summer.	Low number of species. Most animals found along coast.
<b>Coral Reefs</b>	Found within 30° north – south of Equator in tropical waters.	Warm water all year round with temperatures of 18°C	Wet + dry seasons. Rainfall varies greatly due to location.	Small range of plant life which includes algae and sea grasses that shelters reef animals.	Dominated by polyps and a diverse range of fish species.

# Unit 1b The Living World



## Tropical Rainforest Biome

Tropical rainforest cover about **2 per cent** of the Earth's surface yet they are home to **over half of the world's plant and animals**.

## Interdependence in the rainforest

A rainforest works through **interdependence**. This is where the plants and animals **depend on each other** for survival. If one component changes, there can be **serious knock-up effects** for the entire ecosystem.



## Distribution of Tropical Rainforests

Tropical rainforests are **centred along the Equator** between the Tropic of Cancer and Capricorn. Rainforests can be found in South America, central Africa and South-East Asia. **The Amazon** is the world's largest rainforest and takes up the majority of northern South America, encompassing countries such as Brazil and Peru.

## Rainforest nutrient cycle

The **hot, damp conditions** on the forest floor allow for the **rapid decomposition** of dead plant material. This provides plentiful nutrients that are easily absorbed by plant roots. However, as these nutrients are in high demand from the many fast-growing plants, they do not remain in the soil for long and stay close to the surface. If vegetation is removed, the soils quickly become **infertile**.

## Climate of Tropical Rainforests

- Evening temperatures rarely fall below **22°C**.
- Due to the **presence of clouds**, temperatures rarely rise above **32°C**.
- Most afternoons have heavy showers.
- At night with no clouds insulating, temperature drops.

## CASE STUDY: UK Ecosystem: Kielder Forest



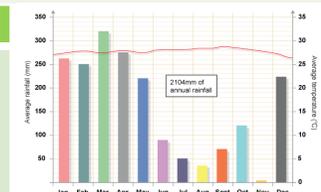
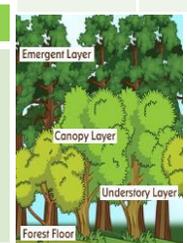
Habitats include: Coniferous forest, wetlands, broadleaf woodland, marshy grasslands, blanket bogs and wildflower meadows.

## Components & Interrelationships

Spring	Flowering plants (producers) such as bluebells store nutrients to be eaten by consumers later.	Management
<b>Summer</b>	Broad tree leaves grow quickly to <b>maximise photosynthesis</b> .	With <b>too many deer</b> overgrazing and preventing natural forest regeneration, the biodiversity of our woodlands is suffering alongside many UK wildlife species. The reintroduction of the <b>Eurasian lynx</b> has been suggested – this would be a predator for the deer.
<b>Autumn</b>	Trees shed leaves to <b>conserve energy</b> due to sunlight hours decreasing.	
<b>Winter</b>	Bacteria <b>decompose</b> the leaf litter, releasing the nutrients into the soil.	

## Layers of the Rainforest

<b>Emergent</b>	Highest layer with trees reaching <b>50 metres</b> .
<b>Canopy</b>	Most life is found here as it receives <b>70% of the sunlight</b> and <b>80% of the life</b> .
<b>U-Canopy</b>	Consists of trees that reach <b>20 metres high</b> .
<b>Shrub Layer</b>	Lowest layer with <b>small trees</b> that have adapted to living in the <b>shade</b> .



# Tropical Rainforests: Case Study Amazon Rainforest



Malaysia is a LIC country in south-east Asia. 67% of Malaysia is a tropical rainforest with 18% of it not being interfered with. However, Malaysia has the fastest rate of deforestation compared to anywhere in the world

## Adaptations to the rainforest

<b>Howler monkeys</b>	Large arms to swing & support in the tree canopy.
<b>Drip Tips</b>	Allows heavy rain to <b>run off leaves easily</b> .
<b>Lianas &amp; Vines</b>	Climbs trees to reach sunlight at canopy.

## Rainforest inhabitants: Yanomami tribe

Many tribes have developed sustainable ways of survival. The rainforest provides inhabitants with...

- **Food** through hunting and gathering.
- **Natural medicines** from forest plants.
- **Homes and boats** from forest wood.

## Issues related to biodiversity

## What are the causes of deforestation?

### Why are there high rates of biodiversity?

- **Warm and wet climate** encourages a wide range of vegetation to grow.
- There is **rapid recycling of nutrients** to speed plant growth.
- Most of the rainforest is **untouched**.

### Main issues with biodiversity decline

- **Keystone species** (a species that are important of other species) are extremely important in the rainforest ecosystem. Humans are threatening these vital components.
- **Decline in species** could cause tribes being unable to survive.
- **Plants & animals** may become **extinct**.
- Key medical **plants** may become **extinct**.

### Logging

- Most widely reported cause of destructions to biodiversity.
- Timber is harvested to create **commercial items** such as furniture and paper.
- **Violent confrontation** between indigenous tribes and logging companies.

### Mineral Extraction

- **Precious metals** are found in the rainforest.
- Areas **mined** can experience **soil and water contamination**.
- **Indigenous people** are becoming **displaced** from their land due to roads being built to transport products.

## Impacts of deforestation

### Economic development

- + Mining, farming and logging creates employment and tax income for government.
- + Products such as beef provide valuable income for countries.
- The loss of biodiversity will reduce tourism.

### Soil erosion

- Once the land is **exposed by deforestation**, the soil is more **vulnerable to rain**.
- With **no roots to bind soil together**, soil can easily wash away. (soil erosion)

### Climate Change

- When rainforests are cut down, the climate becomes **drier**.
- Trees are **carbon 'sinks'**. With greater deforestation comes more greenhouse emissions in the atmosphere.
- When trees are burnt, they **release more carbon in the atmosphere**. This will enhance the **greenhouse effect**.

### Energy Development

- The **high rainfall** creates ideal conditions for **hydro-electric power (HEP)**.
- **Belo Monte Dam** is key for creating energy in this developing country, however, both people and environment have suffered.

## Sustainability for the Rainforest

Uncontrolled and unchecked exploitation can cause irreversible damage such as loss of biodiversity, soil erosion and climate change.

### Possible strategies include:

- **Agro-forestry** - Growing trees and crops at the same time. It prevents soil erosion and the crops benefit from the nutrients.
- **Selective logging** - Trees are only felled when they reach a particular height.
- **Education** - Ensuring those people understand the consequences of deforestation
- **Afforestation** - If trees are cut down, they are replaced.
- **Forest reserves** - Areas protected from exploitation.
- **Ecotourism** - tourism that promotes the environments & conservation

### Agriculture

- Large scale '**slash and burn**' of land for ranches and soy farms to feed the cattle.
- Increases **carbon emission**.
- **River saltation and soil erosion** increasing due to the large areas of **exposed land**.

### Tourism

- **Mass tourism** is resulting in the building of hotels in extremely **vulnerable areas**.
- Lead to **negative relationship** between the government and indigenous tribes
- Tourism has **exposed animals** to human diseases.

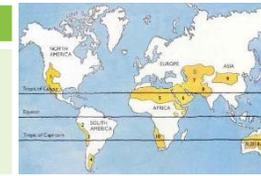
### Road Building

- **2000 miles** Trans Amazonian Highway
- **Roads** are needed to bring supplies and **provide access** to new mining areas, settlements and energy projects.
- This allowed access for more deforestation

# Hot Desert: Case Study The Sahara Desert

The Sahara Desert is the world's largest hot desert Located in **North Africa**, it covers large sections of the continent - covering 9,200,000 square kilometres

## Distribution of the world's hot deserts



Most of the world's hot deserts are found in the **subtropics** between **20 degrees and 30 degrees north & south** of the Equator. The **Tropics of Cancer and Capricorn** run through most of the world's major deserts.

## Major characteristics of hot deserts

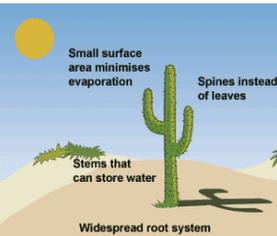
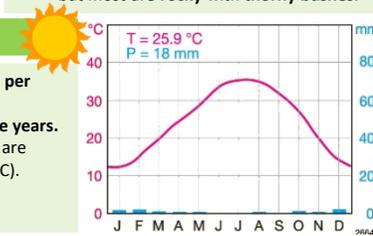
- **Aridity** – hot deserts are extremely dry, with annual rainfall below **250 mm**.
- **Heat** – hot deserts rise over **40 degrees**.
- **Landscapes** – Some places have dunes, but most are **rocky with thorny bushes**.

## Hot Deserts inhabitants

- People often live in large **open tents to keep cool**.
- Food is often **cooked slowly** in the **warm sandy soil**.
- **Head scarves** are worn by men to provide **protection from the Sun**.

## Climate of Hot Deserts

- **Very little rainfall** with less than **250 mm per year**.
- It might only **rain once every two to three years**.
- Temperate are **hot in the day** (45 °C) but are **cold at night** due to little cloud cover (5 °C).
- In winter, deserts can sometimes receive occasional frost and snow.



## Adaptations to the desert

### Cactus

- **Large roots** to absorb water soon after rainfall.
- **Needles** instead of leaves to reduce surface area and therefore **transpiration**.

### Camels

- Hump for storing **fat (NOT water)**.
- **Wide feet** for walking on sand.
- **Long eyelashes** to protect from sand.

## Desert Interdependence

Different parts of the hot desert ecosystem are **closely linked together and depend on each other**, especially in such a harsh environment.

## Opportunities and challenges in the Hot desert

### Opportunities

- **Mineral resources** – Morocco is the world's largest exporter of **phosphate**, which is used in fertilisers, cleaning products and batteries etc. contributing to 1.6% of the country's GDP
- **Farming** – water is essential for plant growth. For example **olive trees and almonds in Morocco**. Commercial agriculture is only available in areas where there is enough irrigation water – the **Aswan Dam provides this for Egypt**.
- **Tourism** – many people are fascinated by remote and exotic desert locations. dune boarding and cross desert treks on camels are popular tourist activities. Growing in cities such as Marrakesh in. wanting to visit desert locations featured in several films.
- **Morocco** is building one of the world's biggest solar power plants The huge 160-megawatt uses curved mirrors totalling 1.5 million square meters

### Challenges

- **The extreme heat makes it difficult to work outside for very long.**
- **High evaporation rates from irrigation canals and farmland.**
- **Water supplies are limited, creating problems for the increasing number of people moving into area.**
- **Access through the desert is tricky as roads are difficult to build and maintain.**

## Causes of Desertification

**Desertification means the turning of semi-arid areas (or drylands) into deserts. Soil erosion is the removal of top soil by wind or rain**

**Climate Change**  
Reduce rainfall and rising temperatures have meant less water for plants.

**Fuel Wood**  
People rely on wood for fuel. This removal of trees causes the soil to be exposed.

**Overgrazing**  
Too many animals mean plants are eaten faster than they can grow back. Causing soil erosion.

**Over-Cultivation**  
If crops are grown in the same areas too often, nutrients in the soil will be used up causing soil erosion.

**Population Growth**  
A growing population puts pressure on the land leading to more deforestation, overgrazing and over-cultivation.

## Strategies to reduce Desertification

- **Water management** - growing crops that don't need much water.
- **Tree Planting** - trees can act as windbreakers to protect the soil from wind and soil erosion.
- **Soil Management** - leaving areas of land to rest and recover lost nutrients.
- **Intermediate Technology** – using less expensive, sustainable materials for people to maintain. i.e. stone lines, terraces to stabilise soil and solar cookers to reduce deforestation.
- The Great Green Wall stretches across Africa 8000KM – roots of trees combine the soils and stop erosion

# Physical Geography Field Work

## 1 Introduction and Aims:

Title Question or Hypothesis: **"Longshore drift moves sediment north to south along the beach at Seaham"**

### Did this connect to physical/human/both?

Both: longshore drift is a physical process leading to erosion but if there is no beach here (due to LSD) then tourist would not visit and bring money to the local economy

**2. Theory Longshore Drift:** Longshore drift is how sediment is transported along the coast. Waves can approach the coast at an angle because of the direction of the prevailing wind. The swash of the waves carries material up the beach at an angle. The backwash then flows back to the sea in a straight line at 90°. This movement of material is called transportation.

**3. Location:** Why was this a suitable site? Both sites were easily accessible by walking, There was a coastal path to reduce risks, Data collected away from unstable cliffs, Shallow water, Range of survey points available to show changes over distance (up the beach)

### 3. Location: What were the disadvantages of this location? What were the risks

Risk	Who	How to reduce risk?
Slipping on footpath	Staff and students	Wear sturdy shoes and hold onto railing
Water risk	Staff and students	Awareness of water safety, staff supervision. Data collected in shallow water
Unstable cliffs	Staff and students	Data collected away from cliffs

## 4. Method: Primary data collection

1. Make a mark in the sand using a person as starting point.
2. Use the ball thrower to throw one tennis ball (it will float) into the sea.
3. Time 2 minutes, with a person following the ball as it moves.
4. Observe and record the balls movement across the distance (does it zig zag, does it come back to the beach in straight line)
5. At two minutes one person collects the ball and stays at that position.
6. A different student measures the distance from where the first person is stood (threw the ball) to the point

### What type of sampling did you use?

Justify your choice.  
We used a systematic approach so that a good coverage of the study area could be achieved in the time we had.

### How did you record your data?

Recorded onto pre-drawn table with pencil so this would work in the rain.

### Data presentation How did you present your data?

We used a bar chart to present our data.

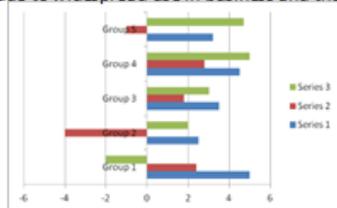
The bar chart had a central point and data was plotted either side of the 'origin' (centre) to show if the ball was travelling north/south and in which direction. The graph showed how far the ball had travelled in each direction.

### Statistical data analysis technique:

**What and why did you use this statistical method to analyse your data?**

The data analysis technique used was calculating the 'mean' average direction the ball travelled in. This was calculated easily by dividing the frequency in the category (N/S) by the entire sample number (15) e.g. 12/15 = 80%. This made it easier to summarise data, spot patterns and anomalies, and any links in data.

**STRENGTHS:** Easy to construct using PC/pencil and graph paper, shows each data category in a frequency distribution, summarize a large data set in visual form. Easy to see trends compared to tables of data, estimate key values at a glance, easily understood due to widespread use in business and the media



### Explanation:

**Describe:** Our results showed that the ball mainly travelled in northerly direction away from Seaham.  
- From the 15 recordings made 12 were travelling North, this was 80% of the readings made. Only 3 were travelling in a southerly direction. (20%)  
- If the ball did travel south it did not travel more than 4m in the 2 mins of recording.  
- The maximum distance it travelled north was 5 m and on 4 occasions travelled more than 4 meters. If the ball was travelling north it travelled an average distance of 4.75m. (57m (total)/12 = 4.75)  
- If the ball was travelling south it travelled an average distance of 2.9m in comparison.  
**Explain:** Firstly we can explain the direction of movement was linked to wind direction. We can also say that on this day the weather was particularly bad and the gusts of wind and rain made the movement of the ball erratic. Theoretically, the direction of Longshore drift is linked strongly with prevailing wind on any particular coast. The shape and angle of the beach may also have impacted of the direction of travel.  
- One anomaly can be seen where the ball travelled south by 4m. This was considerably further than expected and according to average results. This may be due to a strong backwash at this site because the sea was deeper here?

### What secondary data could you have collected?

We could have looked at the weather forecast to check wind direction. We could have looked at old maps to see where the beach was widest N or S

### Weaknesses? These information shown will

need to be explained and it does not tell you what causes the information.

### Conclusion: Did you accept or reject your hypothesis?

We rejected our hypothesis that states that LSD will be from a North to South direction. 80% of the data we collected on the day states that the main direction of LSD was in fact from South to North. The average distance travelled in a northerly direction was 4.7m compared to 2.9m in a southerly direction (only 20% of the time). On only 3 occasions did the ball travel south at all.

### How reliable is your conclusion?

Issues and weaknesses with data collection methods mean our results may be unreliable, therefore making our conclusion unreliable

### Evaluation:

Did these things 'limit' our investigation?

**Sample sizes** – were these large enough for the student to be able to have confidence in the results obtained? **Timings** – did the time of day or duration of data collection (only 2 mins) have an impact on the results collected?

**Weather** – did the poor weather really impact on the reliability of the results? issues associated with equipment – did all equipment function properly and/or was the equipment used correctly?

Did all students in **groups** listen well and follow instructions? The tape measures dragged in sand and the ball was too light – easily impacted on **by the wind**. Heavier object needed next time to gain more accurate results.

To improve this next time:

**If we did this study again we would/could:** Cover a much larger area along the stretch of beach so that more data could be collected. We would repeat the study over a series of days also so that we could get a more reliable set of data. We might use a different / heavier object instead of a ball so that it didn't blow away/off course with the wind.

We also might go when there were less people on the beach so that they did not interfere with the sampling points/ dog walkers might not be there to run off with the ball.

# Human Geography Field Work

## Question or Hypothesis:

**"Tourism has an effect on Seaham's economy"**

## Did this connect to physical/human/both?

Both: This connected to both H/P geography because the beach and the sea are the main attraction to tourists who come and spend their money in the local economy. (B&Bs, shops, ice creams, restaurants etc)

**2. Theory:** To investigate spatial differences in function (land use) within an urban area. We were looking to see if there was a concentration of businesses that relied on tourism in Seaham

**What were the disadvantages of this location?** A disadvantage of our chosen location was that this was a public area (main high street/sea front strip) and members of the public may have been in the spot where we were trying to collect data.

## Location: Why was this a suitable site?

Both sites were easily accessible by walking, Safe road and parking access in small town. Short journey time to site, Coastal resort which attracts visitors for a number of reasons – both human and physical, Business in a clear strip/transect to observe in short time frame.

## What were the risks?

Risk	Who	Reduce risk by:
Road traffic accident/knocked over	Staff and students	wear high-vis jackets so easily seen by drivers

## 4. Method: Primary data collection

1. Using a large scale map of the study area we selected a transect line from south to north up the high street. 2. We developed a land-use classification key for use during the data collection. This was based on the type of land use that we expected to observe. (residential, tourism related, etc.) 3. Our key allowed us to easily classify each individual building we encountered along the transect. 4. We walked up the transect route and gradually built up information on our base maps by adding colours or codes from the key which was pre-defined. 5. Photos were taken so we could check the

## Statistical data analysis technique:

### What and why did you use this statistical method to analyse your data?

The data analysis technique used was calculating the **'mean' average** of any one type of land use. This was calculated easily by dividing the frequency in the category (type of land use according to the key) by the entire sample number (32) e.g.  $7/32 = 14$ . This made it easier to summarise data, spot patterns and anomalies, and any links in data. This gave us a % of different types of land use.



Land Use type	Code	Colour
Tourist shops e.g. souvenir shops	TS	Blue
Food (cafés, restaurants, takeaways etc.)	F	Red
Accommodation (B&Bs, hotels, caravan parks etc.)	A	Green
Other tourist facilities	O	Purple
Residential for locals	R	Yellow

## Data presentation

A pre-devised colour key was used to complete a land use map of the study area. Each colour has a code. I made a decision what that building was used for and shaded it in a particular colour using the key.

### Strengths of data presentation

This method of data presentation was used as it was a very simple and effective way to show 'clusters' and 'types' of land use according to colour/key. This method a relatively quick and broad overview of the land use

**Stratified sampling** was used to collect our data. Stratified sampling - this is where people or places are deliberately chosen according to the topic being investigated;

**Equipment:** Base maps of study locations, Appropriate land use classification key, Pencils and clipboard, Notepad or record sheets, Digital camera

Type of data collected: primary quantitative  
Results were recorded onto a pre-drawn base map, colour coded.

## Results: (analysis)

### Here is a summary of the results:

#### Describe

- Our results showed that out of the 32 units sampled, more than half of the land use along Seaham front was mainly geared towards tourism (56%)
- The most units represented (11) were Food (cafes, restaurants, takeaways, etc). These could be used by both locals and tourist (34%).
- The least amount of tourist facilities were tourist souvenir shops (only 2 were recorded at this time).-
- There were only 4 residential properties in this sample which equated to 0.12 % of the land use here.

#### Explain

- These results may show a large proportion of land use geared towards tourism as this area has diversified away from the traditional industry that used to take place here (shipping/docks). New ways of making money for the local economy are essential following industrial decline since the 70s
- This location has many physical (natural) attractions like the beach and the ocean which will draw tourist in - - Tourism facilities have been invested in to 'capture' the tourist pound, as visitors will look to spend a full day at the 'seaside'.0
- There may not be very many residential properties in this area as land values may be too high due to the sought after waterside/coastal scenery.

**Conclusion:** Did you accept or reject your hypothesis? We can conclude, then, that according to our results that out of the 32 units sampled, more than half of the land use along Seaham seafront was mainly geared towards tourism (56%).

This was what we predicted and we will accept our hypothesis.

## Evaluation: How reliable is your conclusion?

1. The results we got were from a small transect along the 'seafront' area in Seaham, at one particular time (date). The small survey area may have given us a false picture. If a larger area was surveyed, a street back from the sea front or a continuation of the area down to the harbour, we may have got more reliable results. We perhaps needed to look at a larger area.
2. We only collected data on one day and at one time. If we went out in a different season or two years in a row we may have got completely different results as land use was changing even when we were there buildings on the sea front were being demolished.
3. The weather was very bad on this day and may have caused us to rush our decisions about that type of land use, as we wanted to get out of the poor weather. Incorrect data may have been recorded.
4. The land use was decided on purely 'subjectively' and what we thought it was/could have been. Human error, misunderstanding the key and mis-judgement could have impacted on our results and incorrect information could have been written down
5. If the method we carried out was flawed/faulty then our results cannot be considered trustworthy. If your results were not entirely trustworthy then our conclusions can be seen as **UNRELIABLE**.