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September 2021

GEOGRAPHY

EXAM BOARD: EDEXCEL **COURSE CODE: GEOGRAPHY B (1GBO)**

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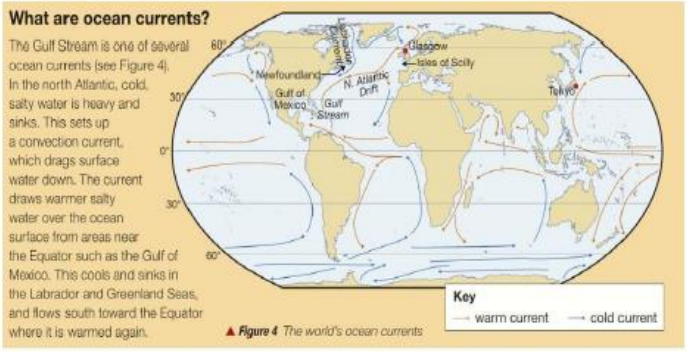
Name: ..... Tutor Group: .....

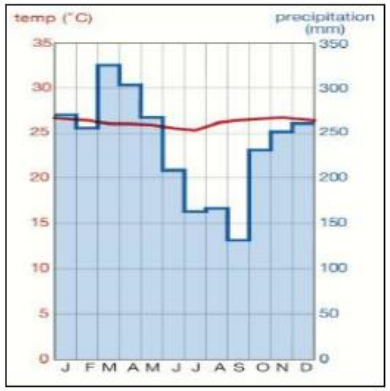
GEOGRAPHY - TOPIC 1 (page 2 – 8)

HAZARDOUS EARTH – CLIMATE CHANGE

What are ocean currents?



Describe a climate graph and identify their features.



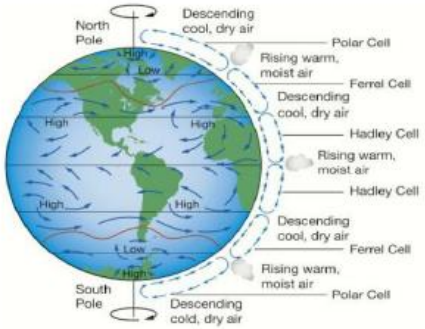
Line graph = temperature (C)

Bar graph = rainfall (mm)

Tropical regions have high rainfall and temperature.

Polar regions have low rainfall and temperature.

How does global atmospheric circulation create high and low pressure?



The equator is warm all year round as it faces the sun all year. Here air rises once heated creating LOW pressure and RAINFALL.

What are the NATURAL causes of climate change?

Sunspot theory: dark spots on the sun mean more heat is emitted e.g. Medieval Warm period 950AD

Eruption theory: volcanoes erupt and their gas reflects sunlight e.g. Mt Pinatubo led to a 0.5C fall in temp (1yr)

Orbital theory: The earth can move round the sun in a circle or in an oval. This means the earth can be closer or further from the sun so it affects temperature. This happens every 100,000 years e.g. the world was 5 – 6C colder in past glacial periods.

Asteroid collisions: When they hit they release ash and dust reflecting sunlight and cooling earth. **1km sized asteroids hit earth every 500,000 years.**

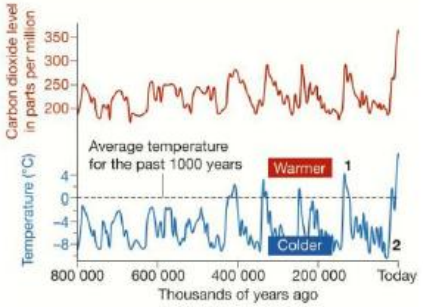
What evidence do we have of past climate change?

Glacials are colder periods. Interglacials are warmer periods.

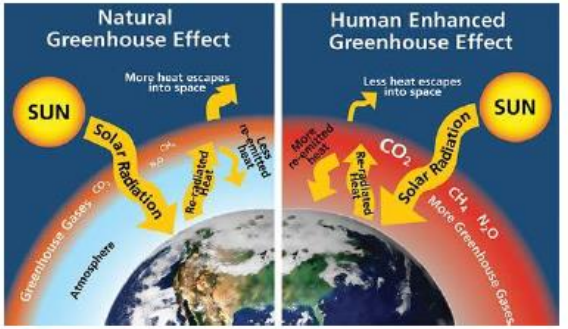
Ice Cores storing past levels of CO2.

Tree rings show how warm / wet /cold /dry each year is.

Historical sources e.g. old photos, diaries. In Roman Times 50BC to 450 AD grapes were grown in Britain.



What is the enhanced greenhouse effect and what evidence is there that humans are contributing to it?



How do people enhance the greenhouse effect?

CO2	methane	Nitrous oxide	Halocarbons
Fossil fuels deforestation	Farming rice; cows	Fertiliser; sewage	Solvents and cooling equipment

We burn fossil fuels, which releases gas e.g. CO2 which traps the suns heat and warms the earth.

Evidence shows that since the industrial revolution, CO2 levels have been rising at a faster rate than has ever been recorded in the past – hence the evidence to support the view that humans are a big cause of the 'enhanced' greenhouse effect.

What is the impact of human activity?

Sea level rise – Sea levels rose by 210mm from 1870 to 2010.

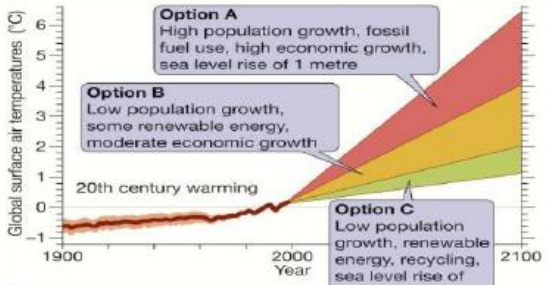
Warming oceans – thermal expansion occurs (the sea warms, expands and rises further).

Global temperature rise - The 10 hottest years on record have occurred since 1998 e.g. 2005; 2010, 2014.

Declining arctic ice – By 2012 floating sea ice in the Arctic had shrunk to less than half of what is was in 1979 and over 90% of the world's valley glaciers are shrinking e.g. Virkisjokull, Iceland.

Extreme weather – Events such as hurricanes and heavy snowfall or rain are becoming more frequent. March 2018!

How will climate change in the future?



FURTHER LINKS

https://www.theguardian.com/environment/climate-change https://www.bbc.com/education/guides/z3bbb9q/revision/1 http://www.bbc.co.uk/schools/gcsebitesize/geography/climate_change/

GEOGRAPHY - TOPIC 2 (page 9 – 12)
HAZARDOUS EARTH – TROPICAL CYCLONES

What are tropical cyclones (hurricanes/typhoons)?

Weather systems that form over the ocean in tropical areas (start over warm equatorial oceans) that produce heavy rain and strong winds.
They are classified by their wind spend using the Saffir Simpson Scale.

Category	Wind speeds
1	74–95 mph, 119–153 km/h
2	96–110 mph, 154–177 km/h
3	111–129 mph, 178–208 km/h
4	130–156 mph, 209–251 km/h
5	≥157 mph, ≥252 km/h

▲ *Figure 2 The Saffir-Simpson Hurricane Scale*

How do cyclones form?

Stage 1 Warm air currents rise (number 1 in Figure 3) from the ocean. As the warm air rises, more air rushes in to replace it; then it too rises, drawn by the draught above.

Stage 2 Updraughts of air contain huge volumes of water vapour from the oceans, which condense to produce **cumulonimbus clouds** (number 2 in Figure 3). Condensation releases heat energy stored in water vapour, which powers the cyclone further.

Stage 3 Coriolis force (number 3 in Figure 3) causes rising currents of air to spiral around the centre of the tropical cyclone, so it resembles a whirling cylinder. It rises and cools, and some of it descends to form the clear, cloudless, still, **eye** of the storm.

Stage 4 As the tropical cyclone tracks away from its source, it is fed new heat and moisture from the oceans, enlarging as it does so.

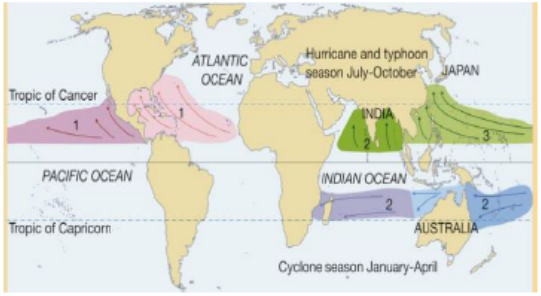
Stage 5 Once it reaches a landmass, it loses its energy source from the ocean. Air pressure rises as temperature falls, winds drop, rainfall decreases, and it **decays** to become a mere storm.

How do cyclones create storm surges?

Often regarded as one of the most destructive hazards associated with hurricanes.

Where and when do they occur?

They have a 'seasonal' distribution, as can only form when the ocean temperature reaches 26.5 celsius.



Why are some countries (developing) more vulnerable to tropical cyclones? Named example: Bangladesh (Aila)

Bangladesh: 80% of the country is under 10m above the sea.
Facts: Bay of Bengal in May 2009, 200mm of rain fell. The strongest winds were 360km/hr. The air pressure fell to 967millibars creating a storm surge.
Social impacts: 190 people killed, 750,000 homeless
Economic impacts: 59,000 animals (deer and cattle) killed so income was lost. Poverty forced people into slums. The salt water killed crops.
Environmental impacts: Fuel was lost (animal dung) so people cut down more trees, sickness and typhoid spread from dirty water, malaria spread in the water, 30 Bengal Tigers drowned.

Why are developing countries so vulnerable to cyclones?

Economic: Bangladesh is one of the world's poorest countries (GNI of $900 per capita), so they can't afford to prepare and reduce costs.
Environmental: As much as 80% of the land is less than 10 metres above sea level and they don't have flood defences.
Environmental: Three rivers including the Ganges join in Bangladesh, this means that rainfall and storm surges cause flooding.

What hazards do tropical cyclones cause?

- **Strong winds**, which whip up garden furniture, lift roofs, vehicles or caravans, bring down trees, power lines and even destroy whole buildings.
- **Storm surges,** which bring flooding caused by unusually high tides. High tides are even higher than normal during a cyclone because air pressure is so low. Sea level is raised because there is less weight of air holding it down. High tides extend inland, causing **coastal flooding** – see Figure 3.
- **Intense rainfall.** With thick, dense clouds, it is not unusual for 1000 mm of rain to fall in a single storm! China holds the mainland record – in 1967 Typhoon Carla brought 2700 mm in a single storm. That's over four times London's annual rainfall! The Pacific island of La Reunion dwarfed even that when over 6400 mm fell in 1980 during Tropical Cyclone Hyacinthe, the world's wettest!
- **Landslides.** In 2014, 53 people died in landslides in the Philippines caused by tropical storm Jangmi which saturated, heavy ground, causing it to slump.

How effectively did Bangladesh prepare and respond to the cyclone?

Weather forecasting: the Bangladesh Meteorological Dept issues warnings on TV and Radio. In 2009 houses with radios has lower death rates. In 2014 there were 50 mobiles per 100 people so this may be used in the future. ☹ Not many had access in 2009
Satellite technology for tracking: In 2012 Bangladesh spent $150M on its own satellite to track cyclones. **Warning systems**: They have an early warning system to evacuate coastal towns. They run campaigns with posters/films to educate people on what to do in storms. 😊 effective in urban areas but not in rural
Evacuation strategies: There are 3500 cyclone shelters which each hold 5000 people. 😊 effective if close by. British Red Cross helped 1000 houses
Storm Surge Defences: Embankments protect storm surges ☹ often storm surges exceed this height/ they are easily damaged.

How effectively did the USA prepare and respond to the cyclone?

Weather forecasting: Weather forecasts are frequent (even during the storms).
Satellite technology for tracking: Over 20 satellites operate in the USA every day. In 2012 one failed during Hurricane Sandy so the UK gave accurate predictions of its path. 😊 People could be warned in advance
Warning systems: The National Hurricane Centre issue warnings and educate people about cyclones. 😊 People were prepared
Evacuation strategies: Mississippi & Louisiana declared states of emergency and evacuated 70-80% of New Orleans. ☹ 30% remained and were then trapped by flood waters.
Storm Surge Defences: Embankments protect against storm surges e.g. New Orleans (2005) ☹ broke and the town flooded. Over 80% of the city was underwater.

FURTHER LINKS

https://www.bbc.com/education/guides/z9whg82/revision/1 https://www.metoffice.gov.uk/weather/tropicalcyclone/facts https://www.youtube.com/watch?v=SSx_gisp24w

GEOGRAPHY - TOPIC 3 (page 13-19)
HAZARDOUS EARTH – TECTONIC PROCESSES

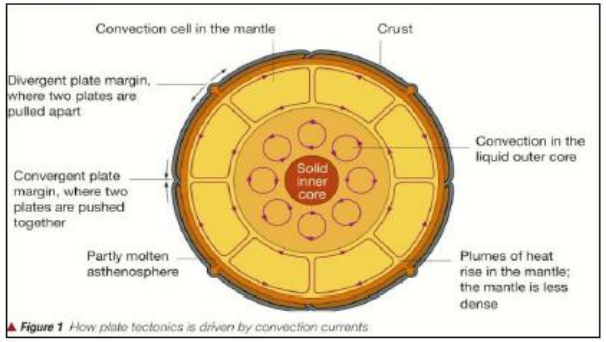
What are the key features/layers of the earth?

Layer		Density (grams/cm³)	Physical state	Composition	Temp (°C)
Lithosphere	Continental crust	2.7	Solid	Granite	Air temp - 900°C
	Oceanic crust	3.3	Solid	Basalt	Air temp - 900°C
	Asthenosphere	3.4-4.4	Partially molten		900-1600°C
Mantle	Lower mantle	4.4-5.6	Solid	Peridotite	1600-4000°C
Core	Outer core	9.9-12.2	Liquid	Iron and nickel	4000-5000°C

The earth's crust is made up of plates and there are two types:
Oceanic: denser, 6 to 8km thick, basalt,
Continental: lighter, 30 to 5okm thick, granite

How does heat from the core move the earth's crust?

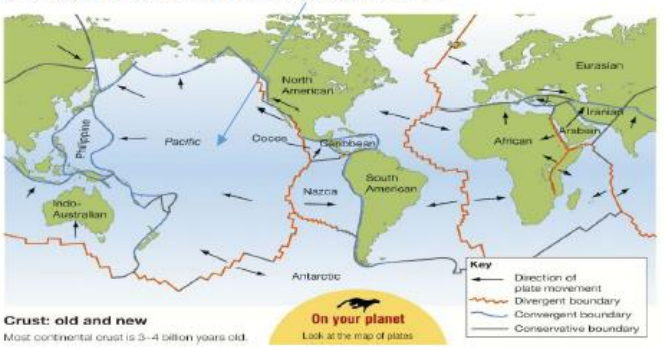
The cross-sectional diagram below shows the relative depth of each layer and how heat radiating from the core, causes convection currents in the outer core and consequently, in the mantle also.



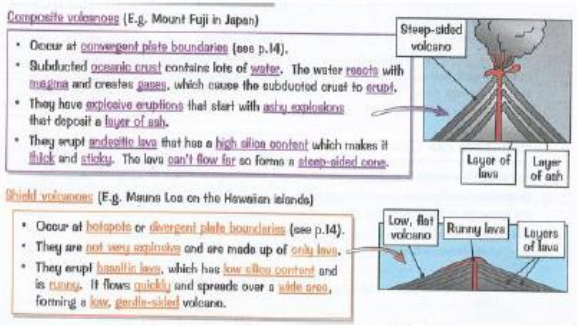
▲ *Figure 1 How plate tectonics is driven by convection currents*

Where are different plate boundaries found?

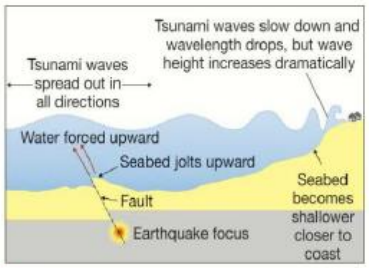
Hot spots can also be found in the middle of tectonic plates. A hot spot is an intensely hot area in the mantle below the Earth's crust. The heat that fuels the hot spot comes from very deep in the Earth. This heat causes the mantle in that region to melt. The molten magma rises up and breaks through the crust to form a volcano. E.g. Hawaiian islands on the Pacific



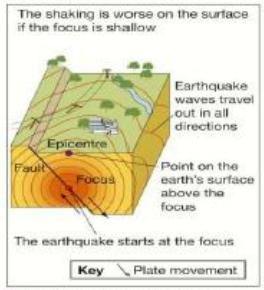
Why are there different types of volcanoes?



How do tsunamis form and how do earthquakes occur?

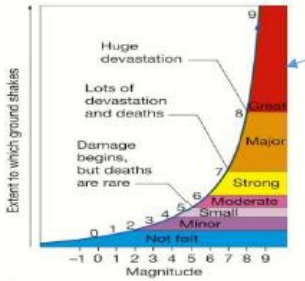


▲ *Figure 3 How a tsunami forms*



▲ *Figure 2 The focus and epicentre of an earthquake*

How do we measure earthquakes and volcanoes?



▲ *Figure 1 The Richter scale*

Earthquakes are measured using the Richter scale, shown on the diagram opposite.

Volcanoes are measured using the 'Volcanic Explosivity Index (VEI)' which measures the size / magnitude of explosive eruptions from 0 to 8. Each number is equal to ten times the explosivity of the one before it. The VEI also accounts for ash fall, pyroclastic flows and other substances that are ejected to the height, and duration, of the eruption.

What types of boundaries are there?

Plate boundary	Example	Earthquakes	Volcanoes
Conservative	San Andreas fault in California, USA. North American and Pacific plates sliding past each other.	• Destructive earthquakes up to magnitude 8.5. • Small earth tremors almost daily.	No volcanoes.
Divergent	Iceland, on the mid-Atlantic ridge. The Eurasian and North American oceanic plates pulling apart.	• Small earthquakes up to 5.0–6.0 on the Richter scale.	• Not very explosive or dangerous. • Occur in fissures (cracks in the crust). • Erupt basalt lava at 1200 °C.
Convergent	Andes mountains in Peru and Chile. Nazca oceanic plate is subducted under the South American continental plate.	• Very destructive, up to magnitude 9.5. • Tsunami can form.	• Very explosive, destructive volcanoes. • Steep sided, cone-shaped. • Erupt andesite lava at 900–1000 °C.
Collision zone	Himalayas. Formed as the Indian and Eurasian continental plates push into each other.	• Destructive earthquakes, up to magnitude 9.0. • Landslides are triggered.	Volcanoes are very rare.

DEVELOPING country: Haiti (12th Jan 2010) – effects & management

Earthquake magnitude: 7
Plates involved: Caribbean and North American
Type of plate boundary: Conservative (plates slide past each other and stick creating friction
Epicentre: 16 miles west of Port-Au-Prince
Primary EFFECTS: 220,000 killed, 1 million homeless, 250,000 homes damaged or destroyed, Presidential Palace collapsed, 1300 schools damaged, the main prison was destroyed and 4000 prisoners escaped.
Secondary EFFECTS: Cholera killed 4000 people from 2010-11, 1 in 5 people lost their jobs, dead bodies were piled up in the street as there were no hospitals or staff, the airports were poorly managed so aid was difficult to get to the country. 8 years later some areas have not been rebuilt due to lack of funding.
Prediction: There is very little monitoring of seismic activity in this region in the country itself.
Response (Short term relief): $100 million in aid given by the USA and $330 million by the European Union, 810,000 people placed in aid camps, 115,000 tents and 1,000,000+ tarpaulin shelters provided
Preparation: There was little preparation and no warning of the earthquake. Many buildings collapsed trapping and killing people. Lack of education meant people were not prepared.
Long term planning: 98% of the rubble on the roads hadn't been cleared restricting aid access, 1 million people still without houses after 1 year so still have to live in aid camps

DEVELOPED country: Japan (11 Mar 2011) – effects & management

Earthquake magnitude: 9
Plates involved: Pacific and North American Plates
Type of plate boundary: Convergent – the pacific plate sub-ducting beneath the N. American plate
Epicentre: 129km off the coast of Sendia
Primary EFFECTS: Ground shaking for 5 minutes, Japan shifted 2.4m east, a 400km stretch of coast sunk (subsided), soil liquefaction (water is squeezed out of the ground). Roads and bridges were damaged - 78 bridges and 3,918 roads.
Secondary EFFECTS: A tsunami killed 15,845 people (9000 missing or injured) 128,479 properties damaged. The wave travelled 10km inland flooding many areas. Shipping was disrupted as ports closed, the overall cost was $300 billion and 209 companies were forced into bankruptcy. The Fukushima plant exploded leaking radiation so 200,000 residents were evacuated and an energy crisis occurred.
Prediction: The Japan Meteorological Agency (JMA) monitor activity and issue warnings.
Response (Short term relief): 91 countries offered aid e.g. blankets and search dogs. Save the Children UK and British Red Cross raised money. A British rescue team searched for survivors - 59 search and rescue experts, four medics and 2 sniffer dogs flew out on a private charter plane.
Preparation: A Meteorological Agency official appeared on TV urging those affected by the quake not to return home because of possible tsunamis. A Tsunami warning was issued 3 min after the quake. No buildings collapsed in Tokyo as they had strong walls, cross bracing and rubber foundations
Long term planning: Tsunami defences have been built, emergency services do drills on how to close the walls.

FURTHER LINKS

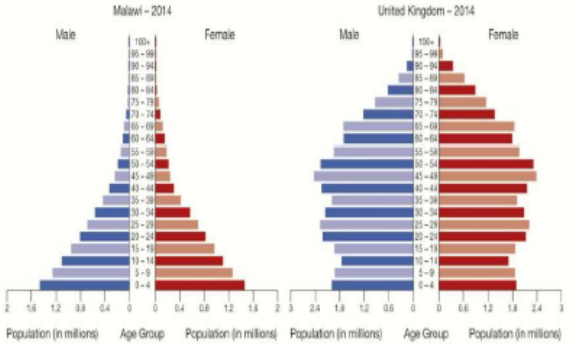
https://www.bbc.com/education/guides/ztprqty/revision/1

https://www.youtube.com/watch?v=Kg_UBLFUpYQ

GEOGRAPHY - TOPIC 4 (page 21-28)

DEVELOPMENT DYNAMICS AND INEQUALITY

How does population structure vary by level of development?



How can development be measured using indicators?

Human development Index: Combined measure of health, education and wealth on a scale from 0(worst) to 1(best).

Economic indicators: GDP– the value of all goods and services in a country vs GNI which is the same but includes income from abroad. This is often used per capita where the figure is divided by the population to give you an **average income per person.**

Social indicators: Indicate quality of life for people in a country.

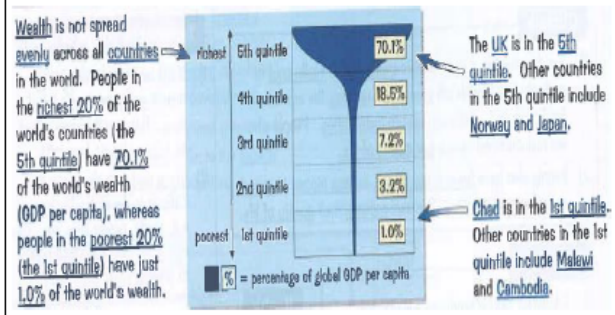
Political indicators: Corruption perceptions index ranks countries "by their perceived levels of public sector corruption, as determined by expert assessments and opinion surveys."

- **Birth rate:** number of live births per 1000 people per year.
- **Death rate:** number of deaths per 1000 people per year.
- **Dependency ratio:** proportion of people below (aged 0-14) and above (over 65) normal working age. It's calculated by adding both groups together, and dividing by the number aged 15-64 (the working population), multiplied by 100. The lower the number, the greater the number of people who work and are less dependent.
- **Fertility rate:** average number of births per woman.
- **Infant mortality**: number of children per 1000 live births who die before their first birthday.
- **Life expectancy:** average number of years a person can expect to live.
- **Maternal mortality:** number of mothers per 100 000 who die in childbirth.

How do developing, emerging and developed countries vary?

Data	Malawi	Brazil	UK
Population			
Birth rate (per 1000 people) (2014)	41.8	14.7	12.2
Death rate (per 1000 people) (2014)	8.7	6.5	9.3
Fertility rate (2014)	5.7	1.8	1.9
% population aged 0-14	46.9	23.8	17.3
% population aged 65 and over	2.7	7.6	17.3
Dependency ratio %	93.3	45.8	54.8
Health			
Life expectancy (years)	60	73.3	80.4
Infant mortality per 1000 live births	48	19.2	4.4
Maternal mortality per 100 000 births (2010)	460	69	12
Number of doctors per 100 000 population	2 (2008)	19	28
Education			
Average number of years in school	11	12	16
Literacy rate %	74.8	91 (2012)	99
Average age of first marriage for women	19.6 (2009)	29	31.8

How do we know there is inequality?



What causes global inequality?

Global inequality has many causes including:

Social causes: Such as education and health

Historical causes: Such as colonialism and neo – colonialism

Environmental causes: Such as climate and topography

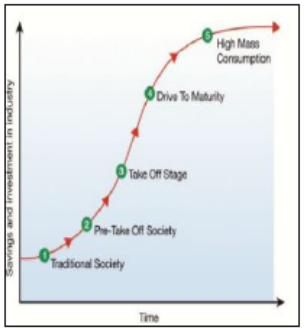
Economic causes: Such as terms of trade, trade bloc involvement and international relations

Political causes: Such as systems of governance and involvement in IGO's

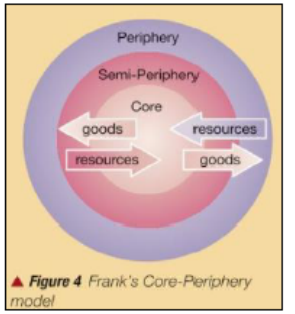
This inequality can then in turn lead to social, historical, environmental, economic and political consequences. Hence the importance of being able to identify specific countries in terms of their global inequality, to allow for sustainable global development.

What are the theories used to explain global inequality?

Rostow's Modernisation Theory



Frank's core – periphery model



▲ ***Figure 4*** *Frank's Core-Periphery model*

Who are the players involved in globalisation?

- **Trans-National Corporations:** Companies that operate in 2 or more countries e.g. BT
- **Governments:** They decide on policies for trade and investment
- **Inter-governmental Organisations (IGOs):** Large organisations made up of a range of different countries e.g. the World Bank, IMF and United Nations.
- **Non-governmental Organisations (NGOS):** Charities such as Oxfam or Wateraid they support people in poorer countries
- **Trade Blocs:** Groups of countries who work together to reduce trade barriers (taxes) for each other such as the EU.
- **G20:** The G20 are the twenty most developed economies in the world. These countries meet every year, and discuss world trade issues.

FURTHER LINKS

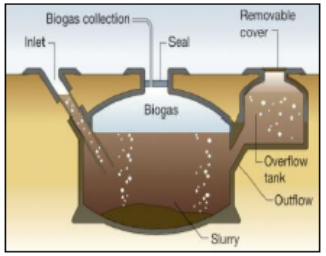
https://www.youtube.com/watch?v=FACK2knC08E
http://www.bbc.co.uk/schools/gcsebitesize/geography/development/contrasts_development_rev1.shtml
https://www.youtube.com/watch?v=XHv6NXIW1SY
http://developmentandglobalisation.weebly.com/development.html - Development and globalisation

BOTTOM UP: What are the costs/benefits of NGO led development?

Bottom up: small scale, low cost, led by local input, funded by charities.

KEY TERM: Intermediate technology: *low tech solutions for local people to train in and use cheaply which solves problems such as energy use.*

EXAMPLE: ASTRA development project led by Bangalore University to build biogas plants. By 2010 there were 4 million biogas plants in India.



Advantages (+)

Gas free cooking unlike dung or firewood so better health (lungs!)

Free time that would have been spent collecting fuel to girls go to school and it gives electricity at night so people can work and study for longer hours.

Reduces the spread of disease as cow dung is one place and the process kills of any bacteria and the sludge is used as a fertiliser for farming.

Disadvantages (-)

It is small scale so there are still many people without electricity. The poorest families won't have their own cattle to supply the biogas plants so it doesn't help everyone. It also relies on aid from charities to pay for the initial building.

TOP DOWN: What are the benefits of IGO/TNC led development?

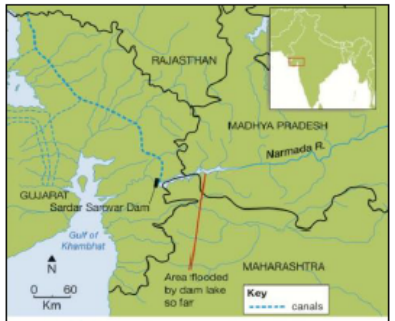
Top down: large scale, high cost, little local input, funded by governments and banks.

EXAMPLE: The dam is 163m high and built on the Sardar Sarovar river.

Advantages (+)

The dam provides 3.5 billion litres of drinking water and hydroelectric power.

Farmers in western India get water from canals fed by the dam which irrigates 1.8million hectares of farmland e.g. in Maharashtra.



▲ ***Figure 2*** *The Narmada River in western India, and the site of the largest dam – the Sardar Sarovar*

Disadvantages (-)

234 villages flooded forcing 320,000 local residents out. Farmers lose fertile silt from river flooding as the dam stops floods so less crops grow. Religious/historical sites are flooded in Western India. Earthquakes are caused by the force of the water behind the dam.

GEOGRAPHY - TOPIC 5 (page 29 – 31)

DEVELOPMENT DYNAMICS – INDIA: How is one of the world's emerging countries managing to develop?

Where is India and how connected it is?

Continent: Asia

Nearby countries: Pakistan, Sri Lanka, Bangladesh, Nepal

Nearby oceans: Indian Ocean, Arabian Sea, Bay of Bengal

How does India's location promote economic dev?

India is a former British colony. India is not landlocked, meaning it can easily transport goods internationally by boat. India aims to become a major transport hub within south east Asia. India is a large country, with good access to resources such as coal. India's population is rapidly growing, totals 1.324 billion (2016). This makes India the second most populous country in the world, with a large and growing economically active population (aged 16 – 55).

What impact have TNCs had in India?

In India many TNCs have led a process called **outsourcing** – where a company moves services or manufacturing such as call centres overseas because labour is cheaper e.g. **BT who have their HQ in New Delhi.**

Positive impacts: provides higher paying jobs e.g. BT call centres workers earn **£3000 a year** in the cities of India (higher than local wages). This creates the multiplier effect as people have more spending money so other services and shops increase. **Bangalore university** graduates enable BT to develop and support broadband services in India.

Negative impacts: rural to urban migration leaves the countryside with few workers and young men. Families are split apart as the investment is concentrated in the urban areas. This only helps educated people living in cities **such as middle class** in Bangalore not the poorest migrants who still earn low wages. **Coca Cola** are affecting water supply for locals and ruining their crops.

How has rapid economic growth created inequality in different regions in India?

Most investment goes to urban areas to attract FDI and this also attracts rural migrants to move to urban centres.

This leaves the rural areas with fewer workers and little investment in schools and education. In rural areas poverty is common along with malnutrition and low education rates.

Women tend to be the worst affected as they are left in the rural areas and often have poor literacy and education levels.

	Urban Core - Maharashtra	Rural Periphery – Bihar
Urban pop %	45	11
GDP per capita $	2561	682
HDI	0.572	0.367
Literacy rate %	83	64
Fertility rate	1.6	3.41 (highest in India)

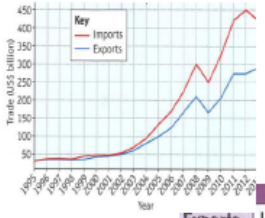
How as India's global and regional role changed?

Globally: India is a member of the G20. The G20 are the twenty most developed economies in the world. These countries meet every year, and discuss world trade issues. It is also a BRIC emerging nation and their economic growth is only second to China's. They also want to become a permanent **UN Security Council Member.**

Regionally (in Asia): The partitioning of India and Pakistan in 1947 was accompanied with riots and mass casualties. Kashmir is still an area fought over and in 2017 conflict began over supply over water (rivers start in India and flow into Pakistan). The relationship between India and Pakistan is still far from healthy Both countries are nuclear armed.

How has globalisation changed India's economy?

There has been a massive increase in the tertiary and quaternary job sector, which in turn has changed the import and export needs of India, thus increasing its economy. However, inequality still exists.

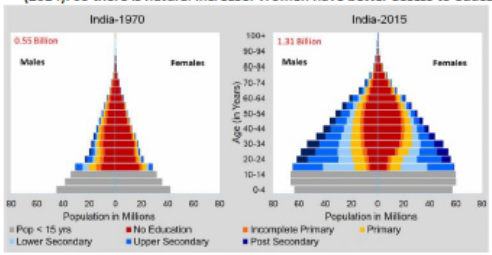


	1990	2015
GDP (¢ trillion)	0.3	2.1
GNI per capita ($)	390	1600

	1990	2015
Exports	Low-value manufactured goods, e.g. clothing, and primary products, e.g. tea	High-value manufactured goods, e.g. machinery
Imports	Manufactured goods, e.g. machinery, chemicals	Crude oil (for transport and industry)

How has rapid economic growth caused demographic change in India?

Death rates and IM have fallen due to better healthcare and education. Life expectancy is now 68 (2014). So there is natural increase. Women have better access to education overall. However, as young people move to urban areas, there are fewer workers in rural villages. So children in rural areas may get a poor education due to a lack of skilled teachers. Children may have to instead work on farms as agricultural labourers.



How has economic development impacted India's environment?

Climate change	Water pollution
India is the largest emitter of CO2 after China with 5164 million tonnes in 2014. 4/5s of India's energy come from coal. The country is getting drier with 2009 the direst monsoon on record.	175 rivers in India are polluted (2015 (up from 121 in 2010) e.g. the Ganges Less than 1/3 of sewage in cities in treated before entering water
Deforestation and desertification	**Air pollution**
25% of land in India is becoming desert including Maharashtra which affects food supply. Logging has led to flooding and soil erosion. Drought is also common with half of India's lakes and wetlands disappeared between 1911 and 2014.	India has 13/20 of the world's top polluted cities Air pollution reduces life expectancy by 3.2 years In cities, old vehicles release CO2 and sulphur. Rural villager's burn dung, inhaling smoke which causes cancer.

What role has globalisation and governmental policy played in India's development?

Globalisation:

- More than 50% of all Indian's now own a **mobile phone**, many have started their own small businesses with these and therefore increased income.
- TNCs such as Coca Cola and BT outsource manufacturing and IT here.
- India has 12 major ports and 20 international airports, which has increased trade and FDI from TNC's.

Government policy:

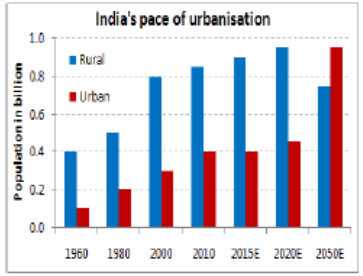
- In 1991, India received $2.2billion in **aid** from the IMF in exchange for changing policy e.g. **removing tariffs** on imports.
- In 2009 **education** was made free and compulsory – enrolment is 96%, thus increasing the level of skilled workers.
- The government spent money on road and rail upgrades e.g Delhi Metro **(infrastructure investment).**
- The government attracts FDI by relaxing laws on buying property and tax to attract TNCs and companies e.g. investment from USA and Japan.

How has rapid economic growth led to urbanisation in India?

India now has 4 megacities including Mumbai.

In addition, by 2015 **32.7% of people in India lived in urban areas** (an increase of 1.8% since 2000).

Urban areas are growing due to rural to urban migration AND natural increase but it is slower than the global average. TNCs invest in urban areas which attracts rural migrants. If they struggle to find work, many will end up working in the informal sector. There is high competition for jobs.



What are the positive and negative effects of India's economic development on different people?

Positive

- All groups have access to better healthcare, which may prolong their life.
- **Literacy rates for women** have increased from 34% in 1991 to 59% in 2011. There is also better access to **contraception** and family planning.
- The middle class workers **with degrees** benefit from TNC investment and work in IT which is better pay
- **Infant mortality rate** and **death rates** have fallen

Negative

- The **elderly** may not have skills to work in new sectors so they are left behind
- **Women are often left in rural areas** when their husbands migrate to cities so they have to provide for the home and family.
- **Crimes against women** in urban areas are common so it is unsafe – crimes increased in Delhi by 20% in 2014-15 – rape is common.
- Men may have to **do dangerous jobs** in the city with no laws to protect them as rapid industrialisation occurs.

How has India's relationships with the EU and USA changed over time?

SOCIAL AND ECONOMIC: India-EU trade is balanced; India exported goods worth €35,500 million to the EU in 2014 and imported €37,100 million euros. The EU and India have better relations and they became strategic partners in 2004 to cooperate on certain issues. The EU supports health and education programmes in India.

ECONOMIC: Exports to the USA were worth $45,200 million compared with $21,600 million. The USA sees India as a large market to sell goods to with 1.3 billion people especially renewable energy.

What are the views on the (-) and (+) of changing international relations and the role of TNCs in India?

International relations means how countries interact with each other. Some people think India should focus more on what is happening within the country and reducing inequality such as female literacy. There is also growing tension between India and China. (-). Others think having allies e.g. G20 or UN Security Council will allow India more influence in global decision such as climate change or political sanctions against countries going to war (+)

TNC investment – the benefits are clear with investment which increase spending and causes **the multiplier effect (+). However TNCs focus on urban areas creating** greater inequality and causing environmental damage e.g. Coca Cola and their use of water to produce Coke which reduces crops for local farmers. TNCs can also leave at any time (-)

FURTHER LINKS

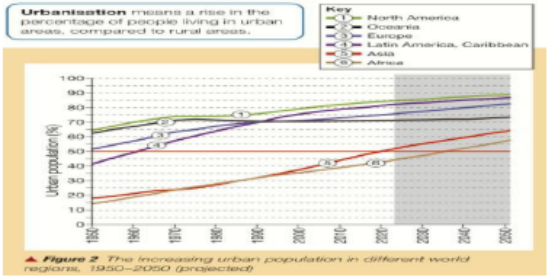
https://www.bbc.com/education/guides/zc72frd/revision/2

https://www.youtube.com/watch?v=Im0tHRs9Bng

https://www.youtube.com/watch?v=I-yjpvzGKZQ

GEOGRAPHY - TOPIC 6 (page 33 – 37)

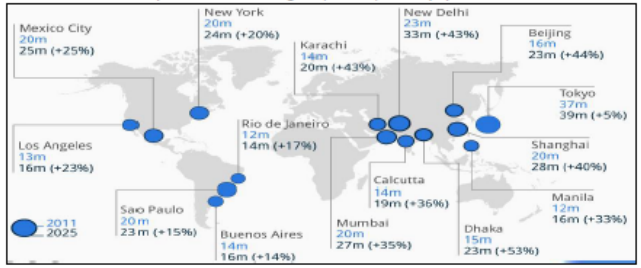
HOW AND WHY IS THE WORLD BECOMING INCREASINGLY URBANISED?



▲ **Figure 2** The increasing urban population in different world regions, 1950–2050 (projected)

How urbanised will the world be in the future?

Higher rates of urbanisation are leading to the growth of megacities. More than 50% of the world's population live in cities now. In 1980s most of the megacities were in HICs (developed nations). However in 2015 many are now in emerging countries such as India and China and only 25% were still in developed countries. A mega city is a city with a population of 10 million or more.



Why are migrants on the move?

Push factors (-) – reasons people leave an area.

- Shortage of jobs or low paid work
- Lack of schools and hospitals
- War of conflict.
- Natural disaster e.g. floods
- Lack of food due to drought
- Poverty and subsistence farming are the only options there.

Pull (+) – reasons people are attracted to an area

- More work or higher paid jobs
- Easier access to schools and hospitals
- Safety as there are more police or army present.
- The idea of a cleaner environment
- Formal sector employment if people are qualified.

Why do urban areas have more influence in some countries?

Urban primacy means one city dominates the country it is in, such as Megacities. For example, London in the UK is a primate city as it has a great...

Economic influence:

- **Investment:** TNCs locate there attracting investment in infrastructure and services e.g. Lagos.
- **Migration:** Often these cities have many job opportunities for skilled workers in quaternary and tertiary jobs in developed country megacities. However often these are low skilled informal sector jobs in emerging and developing country megacities.
- **Transport:** International ports and airports are located here encouraging further investment and migration as they are accessible

Political influence:

- TNC and government headquarters are located here so decisions about development often favour those cities rather than the rest of the country.

How does economic change impact on the city?

Developing	Emerging	Developed
Cities are growing e.g. Kampala	***Some cities are growing; others are stabilising e.g. New Delhi***	***Some cities have a stable population; others declining e.g. New York***
☺ Poor rural areas, less farmers are needed so people migrate to cities for work. *Migration CAN lead to growth!*	☺ People move to the cities for work in manufacturing and service jobs	☹ Out migration as people leave for other cities for work. *Migration CAN lead to decline!*
☺ Cities have informal unskilled work for migrants, good transport here means lots of jobs	☺ Some cities have industrial centres and manufacturing jobs, other cities have service sector jobs e.g. IT in Bangalore	☹ Low skilled workers e.g. cleaners and factory workers are attracted to more successful cities in the country (urban-urban migration)
☺ TNC investment means manufacturing is growing	☺ Countries get richer and invest in flagship projects e.g. sports stadiums to attract FDI and create jobs	☹ Deindustrialisation has led to the decline of industrial areas. Some cities are still declining e.g. Sunderland whilst others are regenerating e.g. London

How does migration impact the city?

Commercial (offices and retail)	• Mostly in the CBD – **Central Business District.** • Buildings taller than the rest of the city. • Buildings are at a higher density – few open spaces. • 'Low-rise' business and retail parks on the city edge (the **rural-urban fringe**).	• This is the most accessible part of the city (the railway station is there and most roads meet there). • Demand for land is greatest, which forces prices up. Space is limited so the only way to build is up! • Land is expensive so every bit of land is used. (City parks are protected by law). • Planners allow these near main roads for retail customers or staff to reach without going into the city.
Industrial	• Away from the centre, either in the **inner city** (older 19th century industries) or on the city edge (more recent industries). • Close to transport links e.g. motorways, rail, ports.	• Most industries need space, so these are away from the CBD. New industries are built on 'industrial estates' reserved by planners to keep industry separate. • Industries need transport. Older industries relied on canals, rivers and rail. New industries rely on road.
Residential	• Usually surrounding the CBD and industries in **suburbs**. • The oldest properties are close to the centre. • Residential areas differ between one part of a city and another. Housing varies between different parts of cities: • 19th century houses are **terraced**, in parallel rows. • 20th century houses are lower-density housing estates further out, with **semi-detached and detached** housing. • 21st century housing varies from apartments in the inner city to large housing estates on the outskirts.	• Land is cheaper further from business and commercial areas. • Cities grow outwards in 'rings', with oldest suburbs near the centre and newest on the outskirts. • Land is expensive near the centre, so terraces and flats are common. Further away from the city, cheaper land means houses can have larger gardens. • Industry owners built these at high densities for factory workers. • Land was cheaper further out, so houses had a garden and garage. Planners developed estates to house those moved from inner city slums in the 1950s and 60s. • In the 21st century planners prefer to allow housing on 'brownfield' land rather than use 'greenfield' sites (farmland that has never been built on) on the edge of cities.

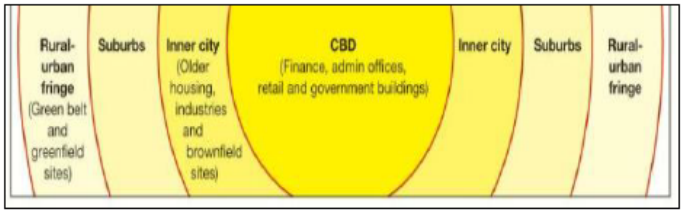
How do urban economies vary in developing, emerging and developed countries?

Kampala, Uganda	New Delhi, India	New York, USA
Developing	Emerging	Developed
80% of people in **informal** sector jobs. Mostly women and poor in informal jobs. Most Uganda's are still **subsistence farmers.** Only 5% of people work in **manufacturing.** The **formal** sector is small but mostly service sector (tertiary) e.g offices, stalls, banks etc.	75% of workers are in the **informal** sector. 39th wealthiest city. Most people work in **services (tertiary)** which earns 78% of the cities GDP. 20% of people work in **manufacturing (secondary).** Most manufacturing is still **informal** with no benefits, min. wage or good working conditions.	10% of employment comes from **manufacturing** fed by migrant workers. **Knowledge economy** is valuable e.g. banks which 10% of people work in. There is an **informal** economy earning 7% of the GDP e.g. cleaning and construction jobs.

What changes occur in urban areas over time as they develop?

Urbanisation – Cities often grow through **industrialisation** e.g. UK in the 1800s. Workers lived in terraced houses near factories (migrants). When factories moved to developing countries in the 1970s slums and apartment blocks were built to house workers there.
Suburbanisation – The movement of people from the middle of the city to the edges. This happened in the 1900s in developed countries because the cities were overcrowded and polluted but the suburbs had green space, gardens, larger houses and transport meant people could **commute** to work.
Deindustrialisation – As countries develop their secondary industry closes or moves to other countries. As this happens the inner city becomes derelict e.g. London Docklands. This happens as land is cheaper on the edge of town or labour is cheaper in developing countries. This is called the **global shift. Depopulation** occurs as people leave to find work elsewhere and poverty occurs where industry was located.
Counter-urbanisation – People move to rural areas. This began in developed countries in the 1970s. People want a higher QOL in the country and house prices are lower. Car ownership/rail means people can commute.
Regeneration – Since the 1990s some inner city areas have been regenerated e.g. London Docklands. Government/TNCS invested in the city centre to attract people and further investment e.g. young single people. This leads to re-urbanisation (people moving back into the city).

How and why does land use vary in urban areas?



Cost of the land – It is cheaper on the outskirts as there is less demand there. Houses are newer and larger in size on the edge of towns as a result.
Availability – Some cities have less land due to geography e.g. Lagos. In the CBD all land is in high demand so buildings go upwards and skyscrapers develop. Some businesses locate on the edge of cities where there is more land e.g. retail parks. Brownfield land is being built on in the inner city (land already used) e.g. Canary Wharf in London is built on a brownfield site – the old Docklands.
Planning regulations – Polluting industries may be banned from the city centre, some cities are not allowed to build on green belt (untouched) land. This is controlled by the local government planning officials.
Accessibility – CBDs are usually accessible as trains/buses run there so TNCs invest however some industry locates on the edge now as there are airports.

FURTHER LINKS

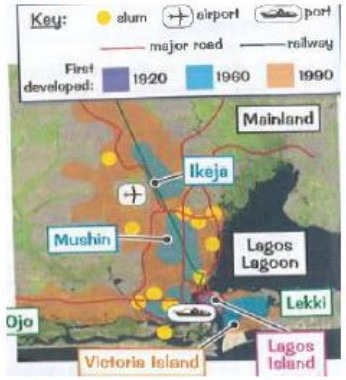
https://www.bbc.com/education/guides/zwtqnbk/revision/1 https://www.theguardian.com/cities/urbanisation https://www.geography.org.uk/Urbanisation-videocast https://www.bbc.com/education/guides/z3n9gdm/revision/2

GEOGRAPHY - TOPIC 7 (page 38 – 42)

EMERGING COUNTRY MEGACITY CASE STUDY; LAGOS, NIGERIA.

Lagos is located in Nigeria. It has a population of 21 million. Lagos is Nigeria's biggest city and it WAS the capital until 1991. It remains the biggest financial centre. Abuja is the capital. Lagos is the centre of the Nigerian film industry ('Nollywood') and a thriving music scene for 'Afrobeat' The city has spread north and west over time.

What is the structure of the city of Lagos?



How connected is Lagos?

National: main roads connect to the capital Abuja. It contains 80% of Nigeria's industry.

Regional: It has an international airport and busy port for trade with its neighbours.

Global: TNCs such as oil company 'Shell' located here.

How has Lagos' city structure changed over time?

	Area	Age and function
CBD	Lagos Island	Modern high-rise office buildings, local government headquarters and banks.
Inner city	Mushin	Older, high-density, low-quality houses.
	Ikeja	Large industrial estate built in the 1960s, with factories making e.g. plastics and textiles.
Suburbs	Victoria Island	Modern, high-class residential and commercial — lots of businesses and shops.
Rural-urban fringe	Ojo	Sprawling, low-density new housing on the outskirts of the city.
	Lekki	New industrial zone and port being built.

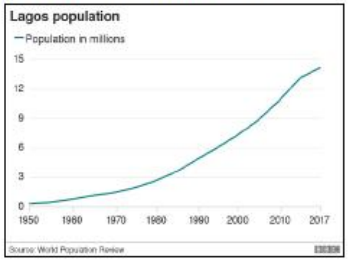
Lagos island has the oldest parts of the city but it has been regenerated so has luxury shops. The city spread north and west along the railway. Slums developed on the edge of the city and the lagoon.

Why has Lagos grown over time?

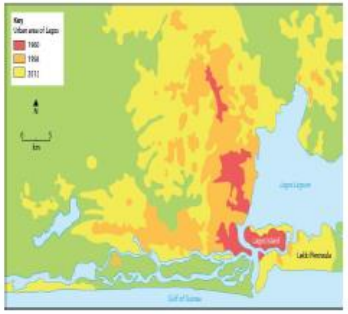
Historic – British rule attracted trade and merchants to the city

1960 to 1990 – Post independence the country sold oil attracting wealthy people. The government financed construction e.g. building ports and the jobs attracted workers from rural areas. High birth rates and falling death rates led to natural increase.

Recent change - Rural urban migration occurs (urbanisation). Poor migrants come from nearby countries e.g. Benin search of work. Migrants come from the north of Nigeria where there is conflict. International migrants come from the UK and China as TNCs from those countries move to Nigeria for oil. Natural increase is still high as many migrants are fertile and have children.



How has population growth changed land use in Lagos?



- The city expanded north along the railway line.
- Land has been reclaimed from the lagoon to make more space e.g. Banana island (has gated communiites)
- Slums also developed on wasteland e.g. Makoko although the government cleared them for waterfront developments.
- House prices have risen in the CBD forcing people to live in the rural urban fringe.
- Some residential areas have been upgraded e.g. Ikoya is one of the richest areas of Lagos now with luxury shops (was middle class housing).

What are the opportunities and challenges for people living in Lagos?

Opportunities ☺	Challenges ☹
More hospitals / schools. 68% have a secondary education	Rapid population growth means population density is now 20,000 people per km2.. 2/3 people live in slums.
Electricity for people to cook and have lighting (+ develop businesses)	60% of the population live in slums like **Makoko** - Communal toilets shared by 15 households > waste into lagoon > health problems ie cholera - Communal water point can be 3km away, illegal electricity connections often get cut off, only 1 school
Water treatment plants provide safe water piped to the city	Limited formal jobs. 60% work in informal jobs like scavenging in the Olusosun dump
Rapid growth of Lagos = jobs in construction (Eko Atlantic).	Waste disposal and emissions are not controlled > air and water pollution. 10,000 illegal industries
Job opportunities. 80% Nigeria's industry is here: 2 major ports, banks, factories	Traffic congestion is really bad (2 hour commutes) 'Go slow'

How and why does quality of life vary in Lagos?

Rich areas: Wealthier people live in gated communities eg. Banana island near the CBD (in the lagoon), they live closer to work so don't get stuck in traffic, the whole city has a lack of electricity but wealthy people run their own generators. Houses here cost an average of $2million so people can afford water supply and enough land for a high quality of life.

Poorer areas: Poorer people can't afford housing so live in slums which are built on land that floods or is close to polluting factories. The lack of electricity means people cook on stoves which damages their lungs and cause air pollution. There are a lack of toilets e.g. Makoko has one toilet for every 15 houses so disease spreads easily. The government regularly destroy the slums as they are illegal so people have no security.

What are the political and economic challenges of managing the city?

Elite residents – The wealthy and business owners have a clear influence on changes e.g. land use such as new railways proposed around Lagos were stopped as it would affect wealthy business owners lorry businesses

Wealthy residents– They want investment in modern offices e.g. Eko Atlantic as the CBD is expensive.

Poor residents– Want the slums to be improved and more affordable housing.

Corruption – This is common in Nigeria. If the government introduce laws the rich just bribe locals and police to get their way.

Which is best – government/IGO top down OR community/NGO bottom up strategies to improve the city?

Government (top down)	Community / NGO (bottom up)
+ improves the WHOLE city *+ funds expensive projects*	*+ planned with locals for their needs* *+ low cost so they are affordable*
- Expensive and money may be borrowed to pay for it *- often ignore locals needs and negatively affect them*	*- small scale so reach few people* *- rely on donations in NGOs so may run out of money* *- lack co-ordination in NGOs*
Strategies being used: 1. Improving water supply – Work has begun on a US $2.5 billion plan which includes new water treatment plants and distribution networks 2. Reducing traffic congestion – Two light rail lines are under construction to relieve road congestion. They will be emission free and will take 35 minutes instead of 4 hours by car. 3. Improving waste disposal – The Lagos Waste management authority (LAWMA) are implementing rubbish collections at night (less congestion). Recycling facilities are being built. 4. Improving air quality – Small electricity generators cause lots of air pollution, so their import has been banned.	Strategies being used: 1. Improving health – CHIEF is an NGO that is opening community health centres, particularly for the disadvantages. They also run health education programmes. 2. Improving city housing – SEAP is a Nigerian NGO who offers small loans so people can afford to get a mortgage, so people can move out of slums. 3. Improving education - The Oando foundation is a charity who have 'adopted' and renovated schools in Lagos, improving teacher skills.

FURTHER LINKS

https://www.youtube.com/watch?v=wPSM9NdilyU https://www.bbc.co.uk/news/av/world-africa-41004638/lagos-the-megacity-set-to-triple-by-2050 https://www.independent.co.uk/news/world/africa/lagos-inside-the-ultimate-mega-city-1945246.html

GEOGRAPHY - TOPIC 8 (page 44 -49

UK PHYSICAL LANDSCAPES

Geology: means different types of rock		
Sedimentary	**Igneous**	**Metamorphic**
		
Formed when layers of dead plants and animals are compacted often under the ocean.	Formed when rock melts, cools and solidifies e.g. magma from a volcano cools.	Formed when rock is put under heat or pressure – usually within the earth.
Layers of rock – less resistant and contain fossils.	These rocks are often shiny/glossy.	Contain crystals and are resistant rock.
Examples: Shale, limestone, sandstone	Examples: obsidian, granite, basalt	Examples: slate, gneiss, marble

How does human activity shape the physical landscape?

- **Direct effects:** immediate results of human activity e.g. cutting down forest to make space for fields.
- **Indirect effects:** happen as a result of direct effects e.g. building groynes causes erosion further down the coast.

Agriculture – Romney Marsh in Kent is low value land used for farming (cattle). This means it is left without defences. Clearing vegetation for farmland loosens the soil on the cliffs so it blows away. Agriculture has a massive change on the landscape as land is divided into fields and cleared of forests. Arable and dairy farming require large areas of land, with good fertile soils. Sheep farming can take place in harsher conditions in upland areas.
Forestry – This is the management of areas of woodland, they can be used for timber, recreation or conservation. There is very little natural woodland left. Coniferous trees have been planted in the UK for timber. They are often planted in lines and look unnatural, when they are felled the landscape is left bare.
Settlement – Lots of factors influence where settlements develop including; water supply, defensive positions, bridging points and the availability of water. Over time settlements grow and further influence the landscape including; concrete used which affects drainage patterns, rivers being diverted through underground channels, rivers straightened and embankments built.
Industrial growth at ports- Port Solent in Southampton is an oil and chemical refinery. This land was salt marsh as it provides flat land and is sheltered water. Building here removes the natural flood barrier making it more likely that the city will flood and erode.
Coastal management – Holderness suffers from coastal erosion. Groynes are built along some parts of the coast but not all. This increases erosion in some areas as the groynes trap the sand and make the beach narrow so it can't absorb the wave energy so the cliffs erode.

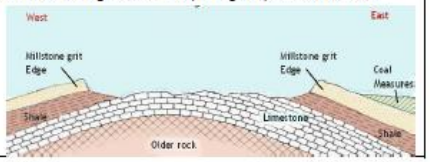
What shaped UPLAND UK landscapes? LAKE DISTRICT, NW England.

Geology: More resistant rock is found here.
Weathering: freeze thaw occurs here as temperatures drop below freezing. This creates loose 'scree' at the base of cliffs.

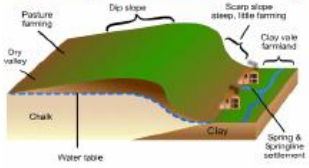
Slope processes: Rockfall occurs here due to loose rocks created by weathering.
Landslides also occur as there is high rainfall (over 2000mm) making the ground heavy

Glaciers: glaciers ploughed through the north of the UK widening river valleys and changing the landscape. They created many lakes in the Lake District and U shaped Valleys.

How has tectonic activity shaped the UK landscape?

Active volcanoes	520 million years ago the UK was closer to a plate boundary so it had active volcanoes which erupted and cooled to form igneous rock e.g. basalt.
Plate collisions	Plates met causing rocks to fold and lift creating mountains such as the Lake District. This rock is hard granite so is more resistant.
Plate movements – UK position	345-280 million years ago Britain was in the tropics and partly under water! This created carboniferous limestone e.g. Peak District, N England, S Wales and SW England. The youngest rocks are chalks and clays in S England – these form lowland landscapes and are easily eroded. 

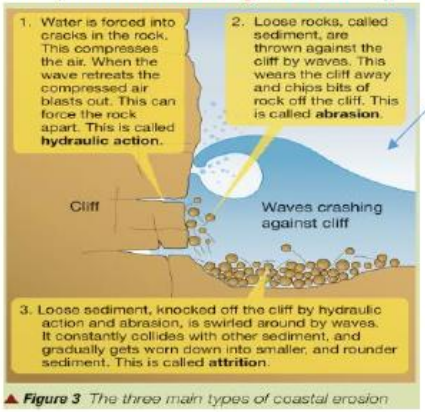
What shaped LOWLAND UK landscapes? The Weald, South England



Geology: Less resistant rock is found here e.g. chalk and clay. This formed 7 million years ago when the area was under the sea. Chalk is slightly harder than clay and it is permeable so water so there is now surface water but clay tends to have rivers and streams.. The chalk forms an escarpment made of a steep slope (scarp) and gentle slope (dip).

Tectonic activity: 30 million years ago plate movement lifted the chalk up and it was exposed to erosion leaving behind the North and South Down escarpments.

What processes of weathering and erosion shape the landscape of the UK?

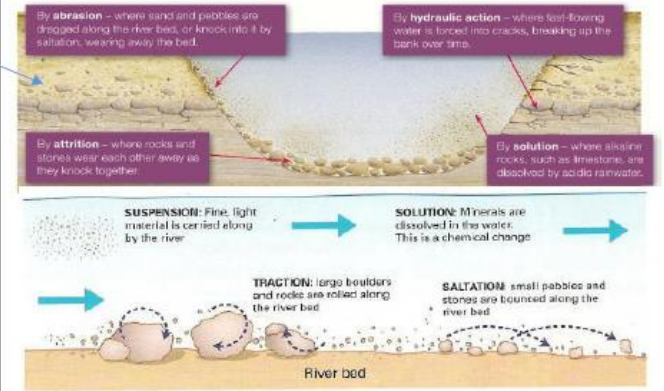


▲ *Figure 3 The three main types of coastal erosion*

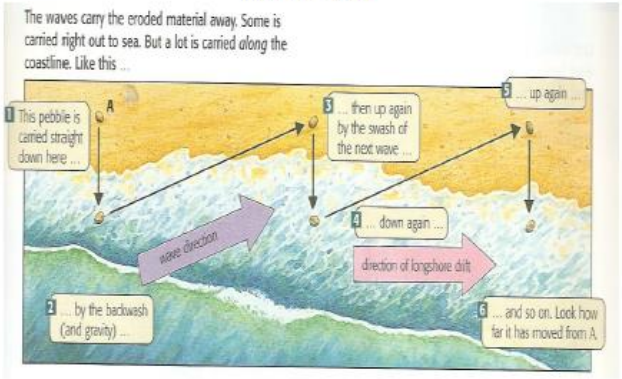
Erosion: This is the wearing away and removal of rock. Processes occur in both rivers and at the coast, leading to the formation of distinctive erosional landforms (see topic 9 & 10).

Weathering: This is the break-down of rock into smaller pieces. It can be mechanical, chemical or biological. You need to have an understanding of each type of weathering and where each type is most likely to occur and why in the UK.

What processes of erosion and transportation occur in rivers?



How does Longshore drift at the coast transport material and deposit it at the coast?



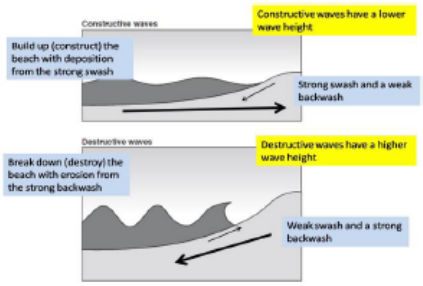
FURTHER LINKS

https://www.bbc.com/education/guides/zsg639q/revision/1 https://www.youtube.com/watch?v=pg_jKJFbA2A

GEOGRAPHY – TOPIC 9 (page 50 – 57)

COASTAL CHANGE AND CONFLICT

What are the characteristics of waves? As a wave reaches the beach: The water running up the beach is called the swash. As the wave loses energy, the water begins to run back down the beach to the sea, this is called backwash.



Constructive Waves: Light winds, low energy, cause deposition. Stronger swash, so material is carried up the beach and deposited.

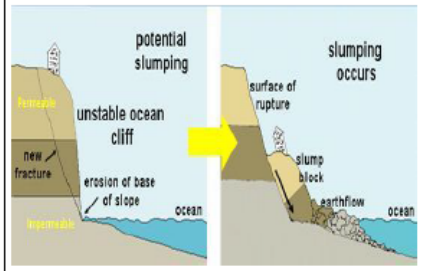
Destructive Waves: Strong winds, powerful waves and cause erosion. They are tall and steep. The backwash is stronger than the swash, so material is eroded.

How does the UK climate and Subaerial processes affect coastal erosion?

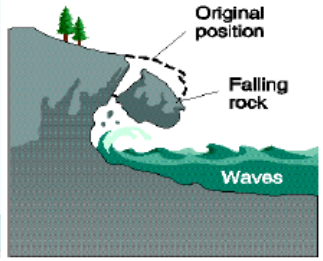
UK weather: In the UK, we often experience winter storms (such as Storm Brian, Dylan etc.), which can bring torrential rain and winds in excess of 100mph. These storms bring very large waves and tidal surges, increasing erosion rates. UK temperatures vary with freeze thaw likely in the colder north.

Sub-aerial processes (weathering and mass movement). See UK landscapes KO on weathering

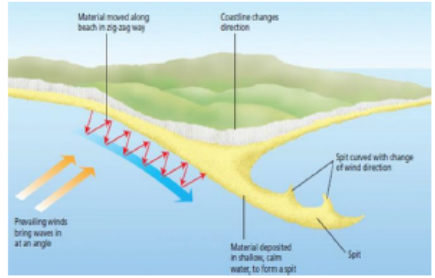
Slumping:



Rockfall:



How do bars, beaches and spits form?

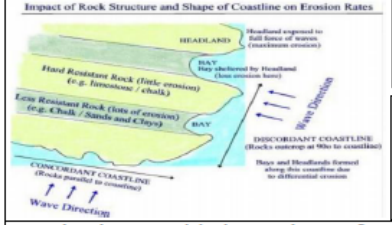


Longshore Drift is the movement of material along the beach, via the swash and backwash. This movement creates depositional landforms. Beaches form when eroded material is transported by longshore drift and deposited by constructive waves.

A spit is a narrow ridge that stretches out from the coast into the sea. Longshore drift moves sediment along the coast until a change in the land occurs. This builds up overtime until the spit extends out further into the gap. Saltmarshes begin to form behind the spit due to it being enclosed. A spit curves as wind direction changes out at sea.

A bar is a ridge of sand/shingle across a bay or river mouth. A bar forms through the same process as longshore drift.

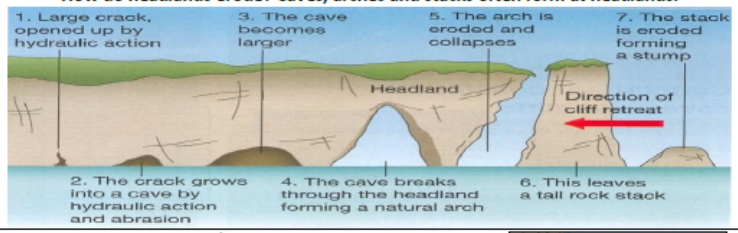
How do headlands and bays form?



Discordant Coastline: Bands of differing rock strengths (resistant and less resistant) face the coast. creating headlands and bays.

Concordant Coastline: Bands of rock run parallel to the coastline. limestone (resistant rock) runs along the entire length of the coast creating coves

How do headlands erode? Caves, arches and stacks often form at headlands.



How do wave cut platforms form?

Cliffs are produced through the process of hydraulic action and abrasion, where destructive waves erode the cliff between high and low tide to create a wave cut notch. As this notch is eroded, the cliff above becomes unstable, collapses and is removed by waves. Below the wave cut notch, an area of exposed rock is left; visible during low tide.

How does human activity impact the coast?

Settlement	Over 20 million people in the UK live near to the coast. Along the Holderness coast, 29 villages have been lost due to coastal erosion.
Tourism	Coastal tourism is BIG business! 13% of jobs at Dawlish are in tourism. Coasts are often managed for tourists, such as building groynes to trap sediment for beaches.
Infrastructure	Roads, railways, shipping ports and oil refineries are just some of the infrastructure found at the coast. The Esso oil refinery at Southampton sees 2000 ships dock each year. Hard engineering features are often built to harness infrastructure.
Construction	Dredging the sea to construct ports can have adverse effects to wildlife. It can also impact areas further down the coastline, due to altering the sediment budget and cell.
Agriculture	Sea level rise and increased coastal erosion will impact farmland due to it being of a low economic value, and therefore low priority in management.

How do human and physical processes shape Holderness?

The Holderness coast is in Humberside, North East England. It Suffers one of the fastest rates of erosion in world losing 1-2 m per year.

Physical causes of erosion

Soft rock, made of boulder clay which contains small pebbles and clay

Strong waves powered by fetch from the North Sea (500-800km)

slumping occurs her frequently (see boxes above)

LSD moves sand, narrowing beaches so the waves erode the land.

Human causes of erosion – not all areas are protected and sometimes this increases erosion.

£2m spent at Mappleton to protect the 100 village residents; 2 rock groynes built (1991) to protect coast road. This increased erosion in Great Cowden to the south as the beaches are narrowed now.

Withernsea: groynes to create wider beaches + sea wall, some rip-rap placed in front of original sea wall (built 1875) when damaged in severe storms 1992 – these groynes stop LSD and narrow the beaches further down the coast which increases rates of erosion.

Spurn Point: Eastern side is protected by groynes and rip-rap to protect the gas terminal.

What causes coastal flooding?

A storm surge is a large increase in sea level due to a storm. High winds push the sea water towards the coast and low air pressure at the centre of the storm "pulls" the water level up, by about 1 cm for every 1 millibar change in pressure. Like water in a straw!

Thermal expansion is where sea temperatures rise and the sea expand so the water rise PLUS ice caps also melt adding to the rising sea level. Caused by climate change.

Storms will increase as the atmospheric temperature rises so more cold and hot air mix creating more rain and wind – this can increase the size of storms and waves at the coast. In Jan and Feb 2014, the UK was hit by a series of low pressure **systems (storms),** bringing heavy rainfall and extremely strong winds. The SW of England was worst hit, with some areas having their wettest January since records began.

How will climate change threaten people and the environment?

Sea level has risen along the English Channel by 12cm in 100 years. This is predicted to rise by a further 11-16cm by 2030.

The social/economic effects of this could be...

- flooding may injure/kill people
- psychological impacts
- settlements need to be moved or defended which is expensive
- coastal tourism lost so jobs lost e.g. Hornsea or even Bognor Regis!
- flooding of roads/rail makes travel difficult e.g. Dawlish, Devon railway line collapsed in 2014.
- loss of farmland will affect food production

The environmental effects of this could be ...

- Erosion may increase so beaches will disappear
- Spits and bars (depositional landforms) may be submerged/destroyed
- Natural ecosystems/habitats destroyed e.g. marshes or lagoons in Holderness

Erosion may increase and lead to cliff collapse/loss of more land

Sea Wall	Protects base of cliff. Made of resistant concrete that deflects energy.	Expensive and unattractive. Restricts access.
Groynes	Maintains a wide beach and attracts tourists	High cost of maintenance. Can impact other areas of the coastline.
Beach Replenishment	Looks natural, attracts tourists and is cheap.	Material is easily eroded. Needs constant replenishment.
Slope Stabilisation	Prevents mass movement, and is safer for people using the beach.	Difficult to install and is very expensive.

What are the costs and benefits of a range of coastal defences?

Hard engineering = built structures

Soft engineering = natural e.g. sand

What is a coastal management policy?

Planners must try to find sustainable ways of managing the coastline, and do this using a process called Integrated Coastal Zone Management (ICZM). This involves Shoreline Management Plans (SMPs) being drawn up, which recommend to do one of the following things:

No Intervention	No investment in flood defences.
Hold The Line	Maintain the existing coastline with defences.
Managed Realignment	Allow the shoreline to change naturally, but manage this process and the impacts.
Advance The Line	Build new defences on the seaward side.

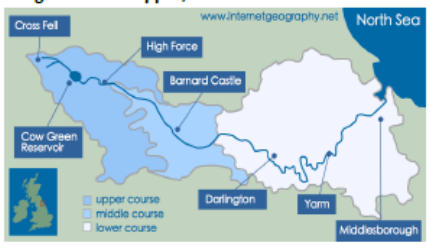
FURTHER LINKS

https://www.youtube.com/watch?v=J-VzLGt5yMQ http://www.bbc.co.uk/schools/gcsebitesize/geography/coasts/

GEOGRAPHY - TOPIC 10 (page 59 – 70)

RIVER PROCESSES AND PRESSURE

How does the River Tees change from the upper, middle to lower course?



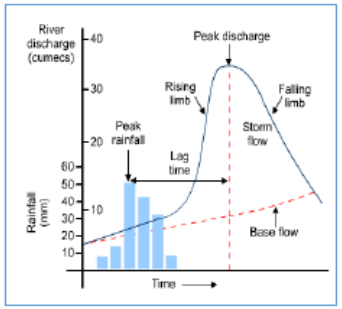
Upper course: Cross Fell is the source, around 732m above sea. **Geology:** limestone **Valley**: steeper sides **Channel**: narrow, shallow. Low discharge and lower speed due to friction from the rough surface. *High force waterfall.* **Load:** large, angular stones.

Middle course: Lateral erosion taking place. **Geology:** sandstone **Valley:** wider and flatter, prone to flooding. **Channel:** wider and flatter **Load:** smaller and more rounded. *Meanders found at Sockburn and Neasham.*

Lower course: Mouth between Redcar and Hartlepool.

Geology: clays, **Valley**: flat and wide 5.5iles, **Channel**: wide, deep, **Load:** small sands and shingle, round. *Estuary mudflats and sandbanks.*

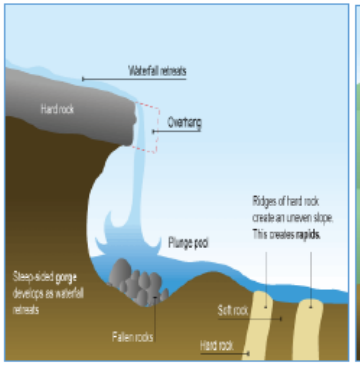
What is a hydrograph? *Bar – rainfall; Line – river discharge*



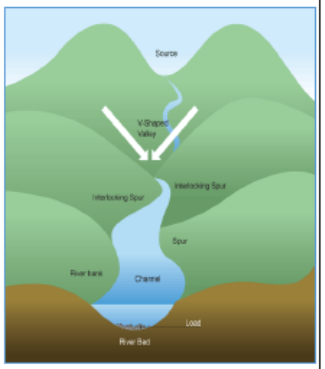
Geology: impermeable rock e.g. granite means water reaches the river quicker as it can't infiltrate so the hydrograph line rises quickly. **Drainage basin shape:** a smaller drainage basin means water will reach the river more quickly so the line rises more quickly. **Soil type:** clay has small pore spaces so holds very little water – so water sits on the surface and enters the river quickly. **Antecedent conditions:** the weather a few days before a flood e.g. heavy rain saturates the nearby ground so water quickly runs across the surface filling the river.

What landforms are created in the upper course of a river

WATERFALLS



INTERLOCKING SPURS



What influence does climate, geology and slope processes (mass movement) have on rivers and their sediment load?

Climate: rivers in wetter climates have more water (discharge) so erosion increases as hydraulic action is stronger because more water means more energy.

Geology: More resistant, harder rock erodes more slowly so there will be less sediment in the river. Harder rock also means steeper valleys as the water only has energy to erode down (vertical) not laterally (sideways). Waterfalls form where hard rock sits on top of soft rock as the soft rock erodes more quickly.

Slope processes: Rockfall is common in the upper course as vertical (downward erosion makes valleys steeper. Slumping can also add a lot of sediment to the river as during cold weather the material is loosened by freeze thaw then it is weighed down by rainfall in warmer periods and collapses into the river.

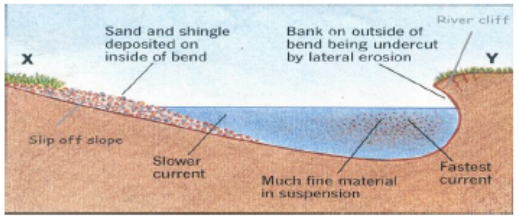
Why are river floods becoming more common?

Population increase – the UK population is currently around 65 million and rising so more people live on or near floodplains as the country becomes more crowded. Building on floodplains has put 2.3 million properties at risk as people create impermeable surfaces out of concrete.

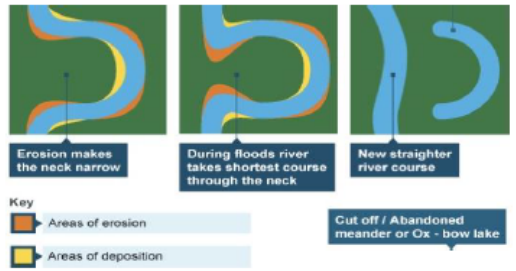
Climate change – this is causing more frequent storms so rivers channels fill up with heavy rainfall and overflow their channels e.g. Boscastle 2004 and Somerset 2014.

Changing land use – the growth of cities means more impermeable concrete surfaces so rainfall becomes surface run off and enters rivers more quickly. Even people paving their gardens has an impact! Often trees are cut down so there is no interception (which slows down the rainwater entering the river).

What landforms are created in the middle course of a river?



Meanders



Ox bow lakes

What are the impacts of physical and human processes on: Valency, Boscastle, Cornwall?

Intense rainfall of 6 inches in 6 hours filled the river quickly as a low pressure passed over Cornwall.

The location in the steep valleys meant that water did not infiltrate and ran straight into the rivers.

Confluence of the Valency and Jordan increased the volume of water in the river.

Narrowing the river channel for narrow bridges led to debris being trapped which forced the water to overflow the channel.

Urbanisation meant there were impermeable surfaces e.g. the council car park so water couldn't infiltrate and became surface run off.

What are the threats to people and the environment of river flooding?

Examples from the Boscastle floods:

Social: Around 100 people, especially the elderly, were rescued and airlifted by seven helicopters. Shops stayed shut for the rest of the season, resulting in a negative multiplier effect for the entire local community. The value of their homes is permanently reduced, now that Boscastle is associated with a serious flood risk.

Economic: 25 businesses destroyed; telephone, water, electricity and gas supplies were all interrupted and had to be repaired. Insurance companies paid out an estimated 20 million pounds to repair damaged property.

Environmental: 58 buildings flood damaged, coastal pollution caused as fuel from cars flowed out to sea. A sewage main burst making Boscastle inaccessible.

What are the costs and benefits of river hard engineering?

For each of these identify a cost and benefit of using it (So/Ec/En)

Flood walls: Build a high wall alongside a river to increase its capacity.

Construct levees: These are raised land (usually walls) either side of the river which increase the amount of water the river can hold.

Dredging: Dig the river channel so it is deeper and can carry more water or line it with concrete to speed up the flow of the river.

Flood relief channel (aka culverts): Create extra channels to divert extra flood water from the main channel. Used in Boscastle.

What are the costs and benefits of river soft engineering?

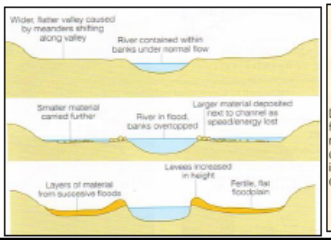
For each of these identify a cost and benefit of using it (So/ Ec/ En).

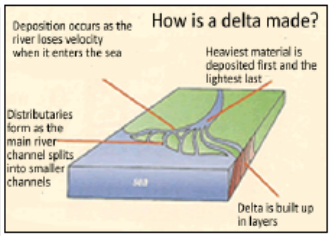
Flood plain retention: The flood plain level is lowered and land is restored to grass and shrubs which hold more water and release it slowly.

River channel restoration: Restoring the river back to its original state e.g. if meanders were removed rebuilding them to slow down the water, removing concrete and lowering river banks if they were altered.

What landforms are created in the lower course?

FLOODPLAINS AND LEVEES





FURTHER LINK

http://www.bbc.co.uk/schools/gcsebitesize/geography/water_rivers/ https://revisionworld.com/gcse-revision/geography/river-landscapes

GEOGRAPHY – TOPIC 11 (page 72 – 76)

THE UK'S EVOLVING HUMAN LANDSCAPE

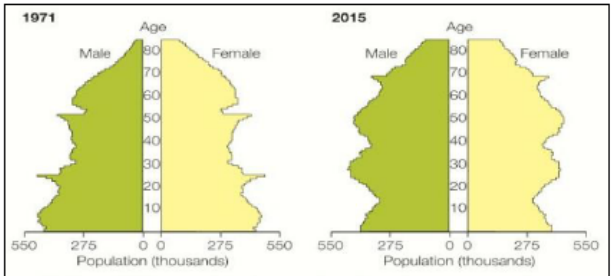
What are the characteristics of the rural periphery and urban core?

	Rural means countryside	Urban means built up (towns and cities).
Population density	High – over 200 people per sq km2	Low, 1 to 100 people per sq km2
Age structure	Many young adults and single people	Many older and single people
Economic activities	Retails – shops, offices and TNC HQs, many jobs and cultural centre e.g. lots of museums.	Farming, fishing, mining, forestry; working from home in IT, tourism and renewable energy.
Settlement	Cities, towns, conurbations; mix of low and high rise buildings; expensive property	Market towns, villages and isolate farms; low rise buildings; cheaper property

What strategies used to develop rural areas e.g. EU grants and transport?

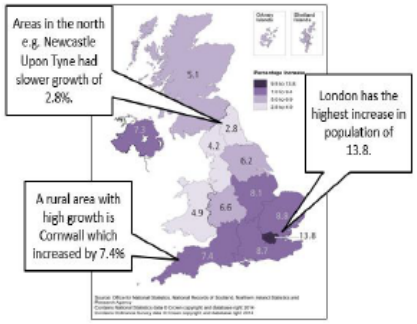
Strategy	Costs (negative)	Benefits (positive)
Enterprise zones:	Most enterprise zones are in urban areas.	100% off council tax. This saves businesses money.
Regional Development grants:	The funds are really small and you should have most of the capital already.	They are widely spread throughout the UK. Really good advice to help business start-up.
EU grants:	Only for people under the EU average- so doesn't help everyone.	Helps the poorest people live a better life.
Improvements to transport:	Cornwall, North Wales and the Scottish Highlands don't have motorways – this means transport links are poor.	Places that they have helped have improved transport links including the Scottish Borders.

How is the UK population structure changing?



▲ **Figure 3** Census data showing the changing structure of the UK's population – 1971 on the left, 2015 on the right

Why have the changes in national migration occurred in the UK for the last 50 years?



Rural to urban migration is movement of people from the countryside to the city. **People move for jobs, education and culture.**

Urban – urban migration: e.g. Newcastle to London looking for work.

Retirement migration means older people move and retire to a different part of the UK. **Older people often retire to the coast.**

How have the changes in international migration to the UK contributed to increasing ethnicity and cultural diversity?

Cause of the changes

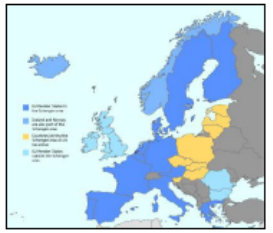
- In the 1950s the UK government encouraged immigration from former colonies e.g. Caribbean and India to fill jobs in transport and industries such as textiles and steel.
- In the 2012-15 period many people fled from fighting in Syria and Afghanistan and migrated to Birmingham and other UK cities.
- 7 countries joined the EU in 2004 so immigrants began to arrive e.g. Poland, Latvia and Estonia as all EU members have the right to work in other European countries.

Effects of these changes to international migration

- In the 1970s jobs were filled so immigration became government controlled to reduce it
- Most Eastern European migrants were young so the age structure of the UK changed as 80% were aged 18 to 34 years as they bring children or have children whilst here.
- Many immigrants went to cities e.g. London and Birmingham where they found jobs in industries or services where they fill empty jobs e.g. cheap, unskilled OR skilled e.g. DRs
- An increase in city population means pressure on services such as schools, hospitals and transport.
- Migrants often introduce their home culture to their new area and open new businesses such as restaurants or religious sites creating a multicultural UK.
- By 1971, about 1 million people had moved to the UK, including 250,000 from the Caribbean and another 250,000 from India, Pakistan and Bangladesh. These were mostly young adults with young children, or single men so the population increased.

How has policy has affected migration e.g. EU and Schengen agreement including ethnic and cultural diversity?

UK Government policy: After WW2 the UK required workers to rebuild the country and with so many fatalities they required labour so many people came from commonwealth countries such as Jamaica. They arrived on the 'windrush' boat. We also accepted Asian Uganda's in the 1970s being expelled from Uganda by the lead Idi Amin.



The EU and UK policy has increased migration because of the the Schengen Agreement (1995). In 2004, Latvia, Lithuania, Estonia, Poland, Hungary, Slovenia, Slovakia and the Czech Republic joined the EU (accession). This means that people can move without passports for work from one EU member state to another so if there is high demand for jobs businesses can find workers. The UK, Sweden and Ireland allowed free migration of these people.

Why has there been a decline in primary (e.g. mining) and secondary (e.g. steel) in the North East of England, UK?

In the 1960s, over 100 000 men in north-east England and Yorkshire worked in coal mining. Coal was supplied to steelworks in Redcar or Sheffield. In the north-east, steel was used in the engineering industry and shipbuilding on the Tyne and Wear rivers (Figure 3a). In Yorkshire, Sheffield made cutlery and steel for machinery. These 'heavy' industries were linked – coal was needed to make steel, which was used to build ships or machinery.

However, each industry suffered problems:

- Coal was expensive to mine, because it was deep. Little coal is produced in the region now.
- Steel suffered from cheap overseas competition. In 2015 the steel works at Redcar was closed.
- Shipbuilding and engineering collapsed when Asian countries began to build cheaper larger ships. Shipbuilding on the Tyne finally ended in 2007.

What happened is a process called the 'domino effect' (Figure 3b) – as one industry collapses, it leads to the collapse of others. When this happens, it also damages other local businesses and services. This led to **de-industrialisation** (see section 3.3) across northern England.

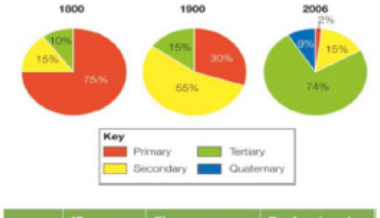
▲ **Figure 3a** Shipyards lining the River Tyne in the 1970s

▲ **Figure 3b** The 'dominoes' – coal, steel, engineering and shipbuilding

Why has there been a rise of tertiary (services) and quaternary (research) in London, UK?

London Docklands: Canary Wharf

The docklands was an important port for bringing in goods from British Empire colonies. Containerisation in the 1970s saw the creation of large ships that didn't fit up the River Thames and this led to unemployment of 10,000 people almost overnight. However in the 1980s it was regenerated as there was lots of open space 8 miles from the city centre. It was also cheaper land to rent for offices as the city was expensive. Companies located there as government incentives and subsidies e.g. reduced tax rates encouraged banks like HSBC and Morgan Stanley. **The impacts has however been hat areas nearby e.g. Poplar are still deprived whilst Canary Wharf has become richer.**



	IT	Finance, insurance & property	Professional scientific & technical
1980	767 000	1 027 000	1 013 000
2015	1 344 000	1 679 000	2 958 000
% rise	70%	64%	192%

▲ **Figure 2** The growth of tertiary and quaternary employment in the UK since 1980

What is the role of globalisation, FDI, free trade, TNCs and privatisation on the UK economy?

Globalisation: the world becoming more connected and reliant on each other.

Foreign Direct Investment (FDI): money a company or government spend in another country e.g. opening businesses, making roads, creating buildings.

TNCs: large companies that operate in more than one country e.g. Coca Cola (they invest FDI). **Tesco** began in east London in 1919 and now has over 850 stores worldwide with over 500,000 people in 14 countries. You can find Tesco in many countries including the USA, Poland & Thailand. Tesco sold value jeans for £3 in 2007 which were sourced via Tesco agents in Hong Kong, which use suppliers in China and India. Average hourly wages are only 50p in China and less in Sri Lanka. 60% of Tesco's global profits now come from Asia.

Privatisation: when a government sells anything it owns to private companies e.g. railway services to China or healthcare to private companies such as BUPA.

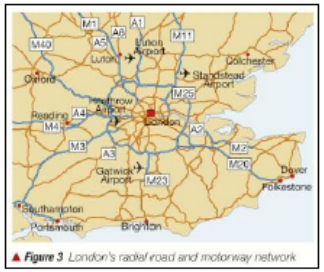
FURTHER LINKS

https://www.bbc.com/education/guides/zx3bwxs/revision/1 https://www.bbc.com/education/guides/zx3bwxs/revision/4

GEOGRAPHY - TOPIC 12 (page 77 – 82)

HOW IS ONE MAJOR CITY UK CITY CHANGING: LONDON Case Study

What are the site, situation and connectivity of London on a range of scales?



▲ *Figure 3 London's radial road and motorway network*

Site: Located on the Thames River, the land is flat as it is on the **flood plain**. This was a **'bridging point'** during Roman times.

Situation: It is <u>situated</u> in the SE of England, in Western Europe. The M25 runs around London and other roads connect e.g. M1, M11 and M23 meaning quick access to other cities. There are 5 airports so tourists and trade are easily attracted- London can be considered a **global hub** for air travel. Ferries and Eurotunnel allow for further increase in trade which helps to boost FDI.

What are the characteristics of each land use zone in London?

London's structure is more complex than both the **Burgess model** and the **Hoyt model.** Its main **economic function** has shifted to the **Docklands** and now includes **Canary Wharf.** In some ways you could say London has 2 CBDs, many businesses and tourists are attracted to **Central London.**

CBD – 18th century, West end of London, Shopping streets e.g. Oxford. This area has poor air quality due to traffic congestion.
Inner City – 19th century, terrace housing e.g. Poplar and old industrial factories. Redevelopment has taken place here e.g. Canary Wharf. Blocks of flats were built here in the 1960s and 70s.
Suburbs – 20th century, this is a mix of terraced and semi-detached housing in the inner suburbs e.g. Kensington, there is more open space and less pollution.
Rural – urban fringe -This is where most of the post war housing has been built (20th century). Usually in estates of mainly detached and semi-detached houses. These housing developments were only possible as most families now own at least one car e.g. Loughton.

What are the changing characteristics and parts of London due to international migration?

Clusters of migrant populations occur as culture develops. New immigrants can be supported by friends and family with settling and language barriers. **Brick Lane** is an example of immigration playing a role in changing culture, restaurants, shops selling saris and a mosque are all evidence of this. The population predominantly living in this area is Bangladeshi. **China town** is an example of a **'diaspora'**; the dispersion or spread of any people from their original homeland.

Migration influences the character of different parts of the city including; high percentage of working age in the inner city; ethnic diversity higher in the inner city; population growth rates increasing due to rapid immigration; overcrowding due to population increase; high demand for services in the inner city, where population is growing fastest; cultural diversity with over 200 languages spoken in the city.

What are the impacts of migration in two differing parts of the city?

1 Newham

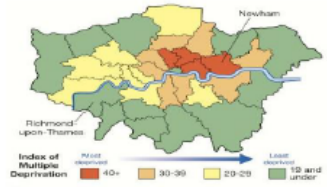
- **Ethnicity.** One of London's most diverse boroughs – 30% white, 26% black Caribbean and African, 39% Asian (mainly India, Bangladesh and Pakistan).
- **Income.** Low-income area.
- **Housing.** Mostly rented. 32% own their property, 35% rent privately, 32% rent from social housing.
- **Services.** Schools under pressure caused by high birth rate. Pressure on social services with 38% of children living in poverty.
- **Culture.** Mainly Asian with several temples, mosques, and African Anglican churches. Many Asian food shops and small businesses.

3 Richmond upon Thames

- **Ethnicity.** One of the least diverse boroughs in London – 83% white, 7% Asian or Asian British. But many residents born overseas – USA, EU.
- **Income.** Very high income area – 69% have professional or managerial occupations. Average income £41,000 – almost double UK average.
- **Housing.** Stable area where affluent people buy expensive property. 69% own their property, 16% rent privately, 15% rent from social housing.
- **Services.** Less pressure on schools with fewer children, but has higher than average percentage in care homes.
- **Culture.** Predominantly white middle class.

Why is there inequality in London?

In 2012 London had over 2 million people who lived in poverty (28% of the population). This is 7% higher than the rest of England! The census is taken every 10 years and the information below indicates the level of inequality in London. This includes education and health data.



▲ *Figure 2 Map showing Index of Multiple Deprivation for London boroughs*

Census data	Newham	Richmond
Infant mortality (per 1000 live births)	5.5 / 1000	2.75 / 1000
Premature deaths (before 65yrs) per 100,000	210/100,000	121/100,000
% 19 yr olds with no qualifications	41%	37%
% adults with a university degree	26%	64%

What challenges has London faced in the past and today?

Deindustrialisation - By 2001 only 7.5% of people work in manufacturing (30% in 1971)	This happened when container ships arrived as they were too big for the Thames so the docks closed.
De-population - 500,000 people left London between 1971 to 1981	This happened because the docks closed so there were not jobs left here.
Suburbanisation and subsequent developments in trasnport - Electric railway in the 1920s e.g. it takes 30 min to travel from Guildford which is 50km.	This meant that people could live further away in cheaper towns with houses and gardens but still work in London.
Decentralisation - Retail e.g. Bluewater shopping centre in Kent and business parks e.g. Stockley opened in the edge of London.	This attracts shoppers from the suburbs so people stop going to the CBD as the edge of town is less congested and parking is better.
E-commerce – growth of online shopping. Eg. Amazon/ Amazon prime in London some items can be delivered in 1 or 2 hours!	Has put pressure on high street shops. Some have moved to edge of city, others have had to close.

Why have some parts of the city experienced economic & population growth?

What are the impacts of rebranding and regeneration in London?

Re- branding improves a place's image so that people want to go there. It usually involves regeneration, which is making actual improvements to an area. **The London Docklands** were regenerated and rebranded in the 1980's – 90's. **Canary Wharf** is now classed by many as the 'CBD' of London. It had many impacts...

Positive Impacts	Negative Impacts
• <u>Transport</u> links were <u>improved</u> — the new <u>Docklands Light Railway</u> and <u>Jubilee Line</u> extension carry thousands of passengers every day.	• Many local people were <u>forced out</u>. 36% of the local population were <u>unskilled workers</u> and most lived in <u>council housing</u>, so couldn't <u>afford</u> the <u>new houses</u> and weren't <u>suited</u> to the new jobs.
• The <u>environment</u> has been <u>improved</u> and quality <u>green space</u> created, e.g. the Thames Barrier Park.	• Some <u>traditional businesses</u>, e.g. pubs, and old <u>community centres</u> closed, and were replaced with <u>services</u> for the <u>wealthier newcomers</u>, e.g. expensive restaurants and artisan bakeries.
• <u>Businesses</u> have been <u>attracted</u> back, creating <u>jobs</u> — <u>Canary Wharf</u> is now home to many <u>media organisations</u> and <u>global banks</u>, e.g. Barclays.	• <u>Existing communities</u> were <u>destroyed</u> — local people were <u>moved</u> to <u>new towns</u> and <u>estates</u> on the <u>edge</u> of London, e.g. Chigwell in Essex.
• The population has <u>increased</u> and people have <u>more money</u> to spend in <u>local shops</u> and <u>cafés</u>, so many businesses have <u>thrived</u>.	

What sustainable strategies are used in London to improve quality of life?

Congestion charge (2003) – charging people to drive in the centre of London (Mon to Fri). It has increased bus use by 6% and the extra money invested in better transport such as hybrid buses (all new buses are hybrid since 2012).
Working from home – people are encouraged to work from home 1 to 2 days a week and the % of people doing so has doubled from 4.3% to 8.6% in 2012 (1 in 12). This only works for certain jobs!
Affordable housing – East Village in Stratford is 50% affordable housing however houses are still very expensive (£60,000) for people on minimum wage. FIRST STEPS offers part ownership for low income groups e.g. they can buy 25% or 50% of a home and pay rent on the rest.
Energy Efficient – BEDZED! – Built in 2002, Sutton in South London. The homes use 81% less energy for heating and 58% less water. They recycle 60% of their waste.
Green spaces – Queen Elizabeth country park has been regenerated in East London. Before it was a brownfield site with toxic waste. It was cleaned up for London 2012.
Recycling – London aims to reduce household waste by 10% by reusing waste, providing recycling bins and developing waste burning power stations. One third of the fuel used in the Energy Centre in the Olympic Park is household waste which heats water for the whole park.

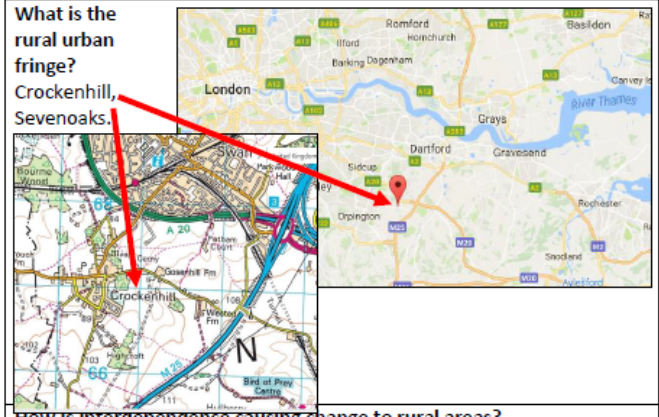
FURTHER LINKS

https://www.citymetric.com/fabric/after-thirty-years-canary-wharf-how-has-it-changed-geography-east-london-3565 https://www.edenproject.com/eden-story/eden-timeline https://www.london.gov.uk/what-we-do/environment/london-environment-strategy

GEOGRAPHY - TOPIC 12 continued (page 81 – 82)

What is the rural urban fringe?

Crockenhill, Sevenoaks.



How are urban areas like London interdependent with the rural fringe like Sevenoaks?

	How are London and Sevenoaks connected?
Labour	Around 40% of people in Sevenoaks district **commute** to London for work. Students and young professionals move to live close to their work and **entertainment** e.g. in **Camden.**
Goods	London relies on rural areas for **food** . Many farmers sell their products to **wholesalers** who transport it into the city. Many rural people travel into London for shopping as there is a greater selection e.g. **Harrods** .
Services	London has specialist **hospitals** such as Great Ormond Street children unit as well as **private** schools so people travel from rural areas to use them. Often Londoners travel to the countryside for **leisure** activities such as **golf** or walking.

What impacts does this interdependent relationship have for the city and rural urban fringe?

Social	Economic	Environmental
+ Some buildings have been turned into homes and renovated e.g. Kent oasts (old farm buildings) and sold so there is a bigger community. - Some schools/GPs in rural areas close due to lack of people e.g. there is no secondary school in Edenbridge, Sevenoaks. - Commuter trains in London are packed with people and overcrowded. + There is less pressure on houses in London as people move to rural areas nearby so more people can get a house. - Commuter settlements are empty during the day as everyone leaves for work in London e.g. Ivy Hatch, Sevenoaks.	- House prices in Sevenoaks are 7x higher than elsewhere in the UK (except London) so young people can't afford homes. + Farms have been able to diversify and earn money through tourism e.g. Tanner Farm Park has a large camping site. + Businesses e.g. pubs have seen an increase in customers as newer residents arrive with higher incomes. - Companies in the city don't have enough workers so commuters add to the workforce.	- Loss of fertile agricultural land as land is sold off to build more homes. - New housing estates have been built for commuters which destroys wildlife habitats e.g. Dunton Green, Sevenoaks. - Commuters drive to the train station in London which increases traffic and air pollution in rural areas. - London congestion has also increased with commuters driving to the city. They had to bring in the congestion charge. The Congestion Charge is an £11.50 daily charge for driving a vehicle within the charging zone between 07:00 and 18:00, Monday to Friday.

How is interdependence causing change to rural areas?

Forecasts suggest that between 2001-2026 the number of people of working age will decline and those 65+ will increase by 50%.

- Almost all of Sevenoaks District residents identify themselves as "white" and were born in the UK.
- The population of Sevenoaks District is well educated with 20% of residents educated to degree level or above.
- Car ownership is significantly higher than in Kent, the South East and England.
- A high proportion of Sevenoaks residents use trains as their means of travelling to work, more than three times the South East average.
- 45% of the resident workforce in Sevenoaks live and work in the district, 20% commute to Inner London and 15% commute to other Kent authorities.
- 55% of the workplace population in Sevenoaks live and work in the district, 25% commute from Kent authorities and 10% commute from the Outer London Boroughs.
- Sevenoaks District has the second lowest level of deprivation amongst adjoining authorities and is the 59th lowest in the country.

What is an accessible rural area?

- Sevenoaks has many bus routes and a train station to enable people to commute easily to and from London, as well as other parts of the SE region.
- It is a 24 minute commute via train to London with trains running regularly throughout the day.
- It is also very straightforward to access the M25 from Sevenoaks, taking just an hour to drive to the city centre (traffic dependent!)

What challenges do changing rural areas face like Sevenoaks face?

Employment: Some employment deprivation in areas like Swanley. In addition, increases in technology for agriculture have decreased the number of workers needed in rural areas. In Kent, manufacturing has declined by more than 30%.

Housing: Sevenoaks district is among the 30% most deprived areas for housing affordability. Mush higher housing than the UK average, which creates challenges in providing affordable housing for young people whose income is often lower.

Health care and education: Ageing populations require more healthcare. Schools are closing down due to declining numbers of pupils, e.g. there is no secondary school in Edenbridge. This means that the elderly may struggle to get to healthcare further away and children may have to travel further distances to access education.

How has rural diversification been used to regenerate rural areas like Sevenoaks?

2) Some farmers are finding alternative ways of making money, either by farm-based activities or by starting a new business. This is known as rural diversification. Rural diversification includes:

	Example	Environmental impacts
Farm shops	Stanhill Farm in Wilmington, Kent has opened a farm shop selling produce from the farm and the local area.	Land can continue to be farmed. More varieties of crop are grown using more environmentally-friendly methods than monoculture (growing large areas of one crop for supermarkets).
Accommodation	Tanner Farm Park in Kent has turned some land into a large touring caravan and camping park.	Large caravan parks can be unsightly. There is more pressure on the natural environment from the large numbers of visitors — through increased use of water and energy and the amount of waste generated.
Leisure activities	The Hop Farm in Kent has an animal petting area, children's rides and places to eat.	Land is built on to create car parks, visitor facilities etc. Traffic increases in the area, leading to air pollution.

3) Tourism can also create new economic opportunities in rural areas. For example, Leeds Castle (in Kent) is a historic building that has developed various attractions (e.g. a maze and golf course) and events to encourage more people to visit. However, this can mean that new tourist facilities are built on greenfield land and lead to an increase in traffic congestion.

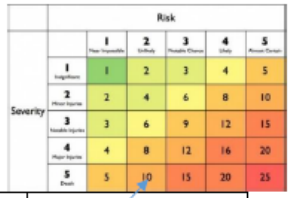
GEOGRAPHY - TOPIC 13 (page 84-85)

COASTAL FIELDWORK: FELPHAM BEACH

1. How do the coastal defences impact on coastal processes and communities in Felpham?

Reasons for title: Gives the study a direction, we therefore know what to test. The title is easy to investigate using simple equipment.
Why the location was appropriate: We can easily walk there and back in a day, meaning it allows for maximum time collecting data.
Justification for your choice of areas to investigate:

- We used secondary data via the BGS map to find a coastal location, near to our school that has been affected by coastal processes and has been protected using coastal management strategies.
- From this we were able to **devise tests** and pick the **correct equipment** to find out if this secondary data was true.



Identify a risk when completing your human fieldwork investigation:

Risk	*Why?*	*Mitigate*	*Rank score*
Tide coming in whilst completing our primary data	Drowning	Check tide times. Do fieldwork while the tide is out.	**Severity 5 x Risk 2 = 10**
Slips and trips on the groynes	Cuts, Bruises, Grazes	No climbing on the groynes and sea defences. Work in small groups. First aider with group.	**Severity 2 x Risk 3 = 6**

2. Secondary data – BGS geology map

What does it show? BGS geology map. Information about where different types of rock were located along the coast.

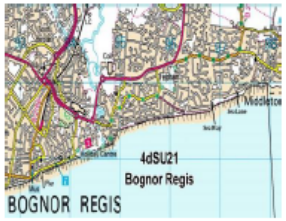
What does this mean? Tells us the rock type is sedimentary and we can assume the processes: Erosion is more likely on areas of less resistant rock.

Evaluation of this data:
+ Official government collected data, so large sample = reliable.
- Only done every 10 years so it is out of date as this was last done in 2011. This means I cannot link my primary data to this effectively.
- only indicates the suitability of the area, but no other information about the impacts or management.

3. Secondary data – OS map

What does it show? This map shows the communities behind the coastline and shows a selection of different businesses including a café and sailing club. The map also shows the use of groynes to manage the coastline and trap material from travelling east along the coastline.

What does this mean? This shows us that this is a good location of study as it is **defended** by a hard engineering strategy (groynes) to try to stop **LSD (process),** in order to build up the beach and protect the **community** living and working here.



Evaluation of this data:
+ Officially recorded using accurate scale to show realistic sizing.
- Only updated every 3 to 5 years, so management strategy may have changed/ been lost or the coastline may have changed shape.

4. Primary data: Groyne height drop (quantitative)

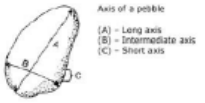
How? – Measured top of groyne to the beach on east and west side = found difference.

Why? - Help show how the groynes effect LSD and if they effectively protect coastal communities.

Sampling – We used bias sampling – measuring each groyne once where the greatest drop height existed = gives strong evidence to answer the key question. Did it 5 times (5 groynes) = mean worked out = anomalies removed = accurate.

Evaluation of this data:
+ Recorded results 5 times along each of the 5 groynes, to enable us to calculate a mean for each groyne and therefore remove any anomalies.
+ Data from 5 different groynes allowed us to measure the trapping of material along a wide sample of beach to increase the reliability of results.
-Used random sampling to decide where our 5 sites along the groyne would be which may lead to inaccuracies. Systematic along a transect would have been more reliable.
-Only measured it on 5 groynes, so a larger sample of groynes may have been more accurate.

5. Primary data: Sediment size (quantitative)



How? – Measured the long axis of 5 pebbles at 3 equally spaced points between two groynes.

Why? – Sediment will get larger as we move from the west side of the beach to the east side, as this is the direction of LSD.

Sample – Did this 5 times measuring the long axis of each pebble at each of the 3 sample points = mean worked out = anomalies removed = accurate.

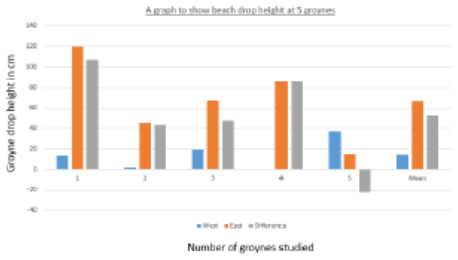
Evaluation of this data:
+ Counting 5 pebbles at 3 sites along one stretch of beach, meant that I could calculate a mean pebble size for each of the 3 sites and therefore remove anomalies.
+ measuring the long axis each time helped to remove inaccuracies.
- Used random sampling to select the 3 sites – data is not accurate as systematic sampling along a transect would be more reliable.
-Only 3 sites chosen along one stretch of beach between 2 groynes = small sample size = not necessarily representative of the whole stretch of coast.

6. Primary data: Photograph (qualitative)

How? – Took a picture of the coastal defences and the community behind
Why? – Visual evidence to link to our quantitative data.
Sample – We did this once, but tried to cover as much of the beach as possible, so that the coastal defences and community were fairly represented.

Evaluation of this data:
+ Visual representation to support quantitative data.
+ Shows housing/ communities and groynes being used as management. Shows material building on the west side and lower on the east to support the view they are stopping LSD.
-Staged = bias

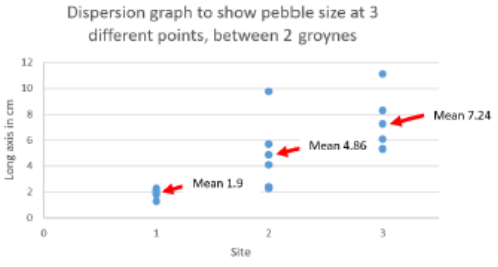
7. Presentation of primary data: Bar graph to show drop height



Evaluation of method:

+ Easy to read
+ Colours make it easy to compare east and west
+ Excel produced = accurate.
-Axis goes up in 20's = can't extract data accurately.

8. Presentation of primary data: Dispersion graph to show sediment size



Evaluation of method:

+ Shows each recoding of pebble size in each location.
+ Use of excel = accurate.
- Some points on top of one another = difficult to read.
- X axis goes up in 2s = difficult to read to a decimal place.

9. Overall conclusions:

- Wooden groynes are being used effectively to defend the impact of coastal erosion and prevent longshore drift from West to East at Felpham beach.
- In turn, these groynes have enabled the beach to build up, therefore protecting the coastal communities behind.

Reliability of my conclusions:
+ I found a significant difference in regards to the beach drop height between the east and west side, of 52.42cm = clearly shows the groynes are stopping LSD making a wider beach = protecting the communities behind.
+Sampled the groynes 5 times so calculated a mean = unreliable data has been removed and my conclusion is accurate
-Use of random sampling on groyne drop and sediment sampling means that results are over exaggerated/ subject to bias.
-Results collected over a short section of beach on 5 different groynes and one section of beach = small sample = may not be representative.

10. Improving the study:

Groyne drop: How? Use systematic sampling, measure out transect and measure every 1 metre along groyne. **Why?** Larger sample of data and reduces bias. **Impact?** Leads to more accurate, less bias and more representative data sample.
Sediment size: How? Use systematic sampling along transect to collect 10 stones at 5 equally spaced sites along transect. **Why?** Larger sample, reduces bias. **Impact?** More accurate measure of change in sediment size along beach as more sediment is sampled.
Photograph: How? Construct a transect along beach, and take a range of photographs using systematic sampling, at 3 equally spaced out intervals. **Why?** Will reduce bias of stopping where we want. Using this method means the locations are pre-determined. **Impact?** Reduces bias, leading to more accurate, reliable results/ conclusions.

GEOGRAPHY – TOPIC 14 (page 84 – 85)

URBAN FIELDWORK: BRIGHTON

1. How and why does quality of life vary in Queens Park Ward, Brighton?

Reasons for title: Gives the study a direction, we therefore know what to test. The title is easy to investigate using simple equipment.

Why the location was appropriate: We can easily get there and back in a day, meaning it is a cheap trip and allows for maximum time collecting data.

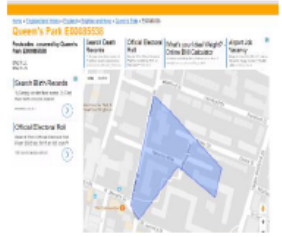
Justification for your choice of areas to investigate:

- We used secondary data to find two areas of significant difference in deprivation within Brighton. We picked Queens Park Terrace = Low Index Multiple deprivation > Higher quality life. We also picked Ashton Rise = Higher Index Multiple deprivation > Lower quality of life.
- Therefore, the secondary data enabled us to pick two contrasting areas. From this we were able to **devise tests** and pick the **correct equipment** to find out if this secondary data was true.

Identify a risk when completing your human fieldwork investigation:

Risk	*Why?*	*Mitigate*
Traffic accident	Near busy city roads	Cross roads at traffic lights. Follow the Green Cross code
Getting lost	Unfamiliar location	Arrange a meeting point, work in close proximity to teacher.

2. Secondary data – Census



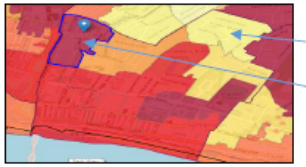
What does it show? In Queens Park Terrace there is a greater level of owner occupied housing at 82%, whereas Ashton Rise's level of owner occupied housing is 13%.

What does this mean? This means that quality life is better in Queens Park Terrace, as people most likely have higher incomes and can therefore afford a mortgage.

Evaluation of this data:

+ Official government collected data, so large sample = reliable.
- Only done every 10 years so it is out of date as this was last done in 2011. This means I cannot link my primary data to this effectively.

3. Secondary data – IMD



What does it show? This shows that the Living environment, income, and employment in Queens Park Terrace is in the 10% least deprived areas based, whilst Ashton Rise is in the 10% most deprived.

What does this mean? This means that the quality of life is likely to be significantly better in Queen's Park Terrace, and not just in regards to income, but also environmental quality and social indicators.

Evaluation of this data:

+ Official government collected data, so large sample = reliable.
- The areas mapped show an average for the entire area. Therefore, it does not show those individual households in each of the two areas which could be significantly different.

4. Primary – Qualitative - Questionnaire survey

What did we do? Asked 3 closed questions, termed strongly agree to strongly disagree, in both Queen's Park Terrace and Ashton Rise.

Sampling? Random sampling, 50 people in total (25 in each area).

Benefits of sampling? Large sample size, meaning a range of answers, avoids bias, gives fair, accurate opinions of QOL in each area.

Problems: Random sampling resulted in us asking people in groups. This can lead to biased opinions, as people in groups often hold similar views = results therefore could be inaccurate, leading to over exaggerated conclusions.

5. Primary Quantitative – Environmental quality survey

What did we do? We compared the environment in the two locations, by completing an EQS, with a scale from -2 (v. bad) to +2 (v. good)

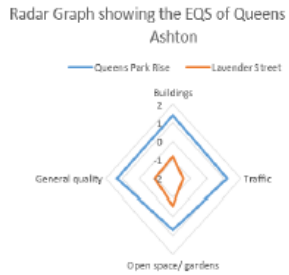
Sampling? Completed the survey 3 times in each location, at random points.

Benefits of sampling? Doing the survey 3 times in each location means a mean can be worked out = anomalies removed = accurate results = reliable conclusions.

Problems: The EQS is subjective, so the scores might over exaggerated particular results, based on our pre-conceived ideas of the places before visiting.

We did not have equally spaced intervals between our 3 stops to record. Again this could over exaggerate our results, as we picked to stop in places that would reflect our pre-conceived ideas.

6. Primary data presentation - EQS shown via a radar graph



What do the results show?

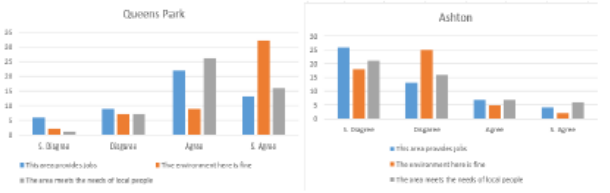
- Queens Park has a higher mean score for the environment in each of the categories.
- Shows environment is better in Queen's Park. This supports the secondary data and the qualitative data.
- Significant difference e.g. 2.6 difference in traffic score.

Evaluation of presentation technique:

+ Easy to compare areas, as the lines to represent them are shown in different colours. As a radar graph is used, it is easy to see differences due to the spatial distance between the lines.

- The axis goes up in 0.5. This makes it difficult to interpret the data accurately as, some of the scores were 0.32 for example.

7. Primary data presentation - Bar graph to show questionnaire results



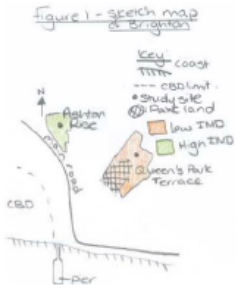
What do the results show?

- Queens Park scores better in all 3 categories.
- Shows quality of life is judged better by the residents in Queen's Park Terrace; this supports the secondary data and the quantitative EQS data.
- Significant difference e.g. 39 people disagreed that Ashton Rise provided jobs, whilst 35 thought Queen's Park Terrace did.

Evaluation of presentation technique:

+ Easy to compare areas, as the bars are shown in different colours, orange, blue and grey for the three questions asked = easy to make comparisons and spot differences.
+ Excel used = quick and easy to make, also accurate.
- There is a lot of data on the 2 graphs, as the 3 questions have 4 categories, and there are two locations. This can make it confusing and therefore difficult to compare questions easily.

8. Using an annotated sketch map, explain how you chose your sites or location for data collection. (4 marks)



WAGOLL:
We picked the two locations as they show contrast in QOL (1) and are close together so we can collect enough data easily in the time. (1) *Additional 2 marks are collected from a detailed map showing the sketch map of the area chosen.*

9. Primary data presentation - Photo annotation presenting photo analysis (Qualitative)

What do the results show?

- Building quality is better in Queen's Park Terrace – front gardens, lower density = better QoL as more privacy etc.
- Links to, and supports the secondary data and the qualitative and quantitative data.

Evaluation of presentation technique

+ Visual information, which can be used to support the quantitative and qualitative data, through annotation. Bringing results to life.

- Only a snap shot in time, can be misleading and show bias from the photographer = inaccurate results as they will be over exaggerated.

10. Overall conclusions:

- The QoL is higher in Queen's Park Terrace in comparison to Ashton Rise. All of the data (primary and secondary) supports this.
- Significant differences in environment, employment, building quality between locations. All of the data triangulates this, supporting this conclusion.

Reliability of conclusion:

+ V. reliable due to the significant differences in findings, supported by all information. For example, the data from the EQS shows significant differences of 2.6 in terms of environment. This relates to the questionnaire, which shows there are significantly more jobs in Queen's Park Terrace, both of which support the Census and IMD data.
+ Sampling strategies were used to reduce bias and inaccuracies, including asking the questionnaire to 50 people giving a big range and conducting the EQS 3 times to work out a mean. This removed anomalies and gave accurate results and a reliable conclusion.
- However, our overall judgement is only based on the areas of Queen's Park Terrace and Ashton Rise and therefore it is not representative of the whole of Brighton as an urban area.
- Our sampling methods had significant limitations – refer to boxes 4&5 – therefore, our results are likely to be exaggerated, possibly inaccurate and conclusions unreliable.

11. Improving the study

Questionnaire:

How: Use systematic sampling, asking every 5th person that walks past.
Why: This will reduce bias of asking people in groups.
Impact: A range of opinions, reduces bias, leading to more accurate, reliable results/ conclusions.

EQS:

How: Construct a transect through Queen's Park Terrace and Ashton Rise before we go, and then record the EQS using systematic sampling, at 3 equally spaced out intervals.
Why: This will reduce bias of stopping where we want. Using this method means the locations are pre-determined.
Impact: Reduces bias, leading to more accurate, reliable results/ conclusions.

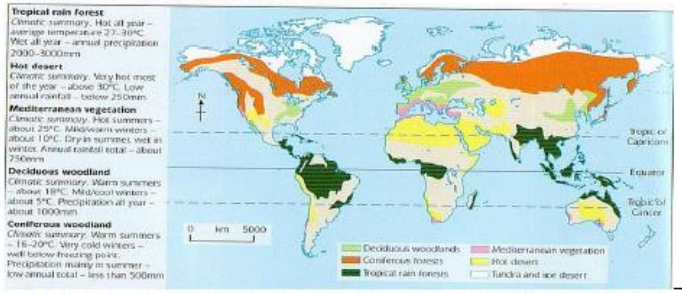
Photograph analysis:

How: Construct a transect through Queen's Park Terrace and Ashton Rise before we go, and take a range of photographs using systematic sampling, at 3 equally spaced out intervals.
Why: This will reduce bias of stopping where we want. Using this method means the locations are pre-determined.
Impact: Reduces bias, leading to more accurate, reliable results/ conclusions.

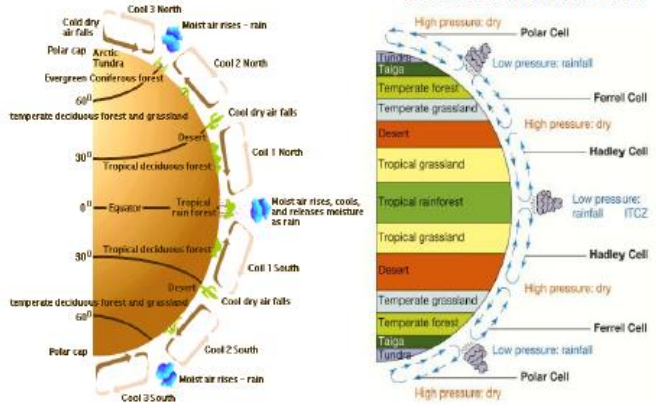
GEOGRAPHY – TOPIC 15 (page 87 – 93)

PEOPLE AND THE BIOSPHERE

Climate is the average temperature and rainfall measured over 30 years.
A **biome** is an area of the world with similar plants, animals and climates e.g. a desert or rainforest.
The **biosphere** is the living part of the earth (plants and animals)
An **ecosystem** is a smaller biome e.g. a specific desert or rainforest e.g. Amazon rainforest.
The taiga is also known as the coniferous forest.



How does the climate (temperature and rain) influence the characteristics and distribution of biomes?



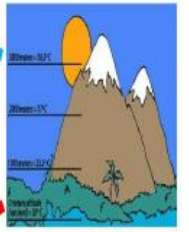
How do local factors influence the distribution of biomes?

Local factors are difference that alter animal and plant species in a biome.
Rock and soil type: soils can be neutral, acid or alkaline as when rocks break down through chemical weathering they release nutrients into the soil.
Water availability and drainage: some plants prefer drier soils and others wet soils. How wet the soil is, is affected by the amount of rainfall, the amount of evaporation which is affected by temperature and how permeable the soil is (high easily water can pass through it).
Altitude (height of the land): temperature drops by 6.5C for every 1000m increase in height. This means few plants grow higher up as it is too cold. Rainfall often increases with height.

Why does Temperature drops at higher Altitude?

Air : Less Dense
- Less compact
- Less ability to absorb heat
- Lower temperature

Air : Dense
- More compact
- Higher ability to absorb heat
- Higher temperature



How do the biotic (living) and abiotic (non-living) components of a biome interact?

The abiotic factors e.g. the sun provide energy for biotic components ie plants.

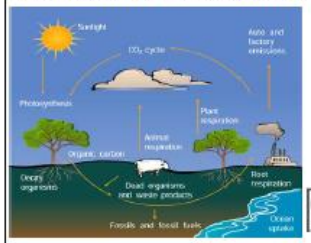
Worms can aerate the soil as they move through it making it more fertile.

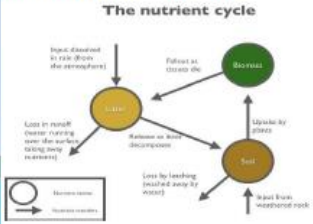
What goods and services does the biosphere provide for people?

Provisioning services (goods)	Supporting services
These are products obtained from ecosystems: • food: nuts, berries, fish, game, crops • fuelwood • timber for buildings and other uses • genetic and chemical material.	These keep the ecosystem healthy so it can provide the other services: • nutrient cycling • photosynthesis and food webs • soil formation.
Regulating services	**Cultural services**
These services link to other physical systems and keep areas, and the whole planet, healthy: • storing carbon, and emitting oxygen, which keep the atmosphere in balance • purifying water and regulating the flow of water within the hydrological cycle	These are benefits people get from visiting, or living in, a healthy ecosystem: • recreation and tourism • education and science • spiritual well-being and happiness.

How does the biosphere regulate the atmosphere, maintain soil health and regulates the hydrological cycle?

The biosphere stores carbon in the carbon cycle. It also maintains soil health as dead plants and animals rot and become soil humus in the nutrient cycle. Plants and trees also store water and release it through transpiration into the atmosphere.



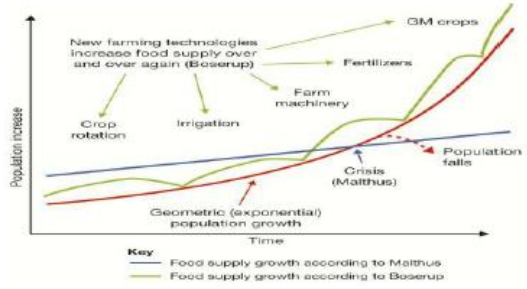


How is the biosphere being exploited for energy, water and minerals and why is demand for those resources rising?

- **Rising global population:** The population has risen by 3.4 billion since 1975 and more people means more demand for food, water and energy so forests are cleared for farmland.
- **Rising affluence:** People are more wealthy now as earnings have risen on average by $6700 so people use more goods and energy e.g. computers, fridges, washing machines.
- **Urbanisation:** More people live in cities now globally (55% in 2015) which have taken over biomes even deserts! This also increases demand for water and food.
- **Industrialisation:** Since the 1970s many countries increased their industry and factories especially Asian countries such as China. In 1998 China had no high speed railways but by 2015 it had over 200km worth; Cars in India rose by 24 million from 2000 to 2015.
- **Asian growth:** There has been a clear rise in population in Asia (more than anywhere else). The impact on resources is vast since 1975 and by 2015. water use has increased by 70%, oil by 220%, coal use by 624% and meat consumption has risen by 513%.

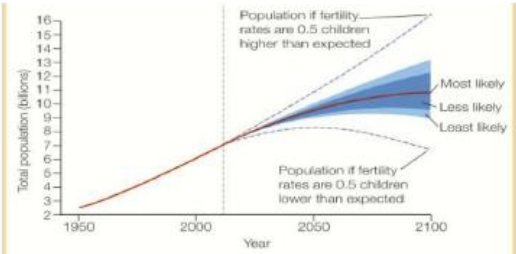
What are Boserup and Malthusian theories on resource use?

In 1798 Rev. Thomas Malthus thought the population would rise geometrically (1,2,4,8, 16) but food could only increase arithmetically (1,2,3,4) and so he argued that as it did we would run out of food. Natural checks such as war and famine would kill off the extra people.
In 1965 Esther Boserup argued that if we started to run out of food we would invent ways to create more e.g. GM crops or technology such as combine harvesters. She had a positive outlook.



Interpret a range of graphs including population projections.

The projections for the future vary greatly on the graph below as they are dependent on a variety of factors including access to food and water, healthcare, income and all other factors that affect birth rates and death rates worldwide.



▲ ***Figure 3*** *World population projections to 2100*

FURTHER LINKS

https://getrevising.co.uk/diagrams/people-and-the-biosphere http://www.bbc.co.uk/bitesize/higher/geography/physical/biosphere/revision/1/

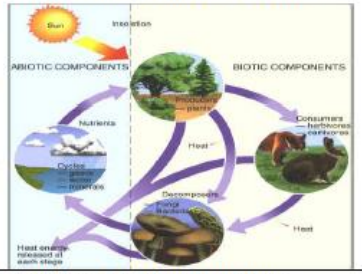
GEOGRAPHY – TOPIC 16 (page 95 – 100)

WHAT ARE THE THREATS TO THE TROPICAL RAINFOREST BIOME AND HOW CAN THEY BE REDUCED?

Most rainforests are found between 20 degrees north and south of the Equator as air here rises due to its location close to the sun and there is low pressure and lots of rainfall.

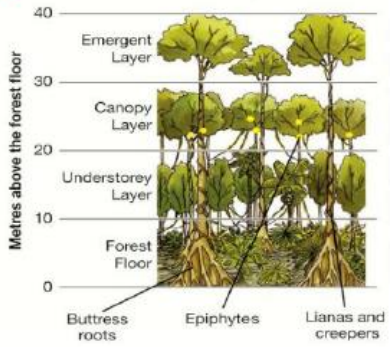
How are biotic (living) and abiotic (non-living) components of the rainforest interdependent?

1. Soil, rock and air are **abiotic** factors. Animals and plants are **biotic** or living factors.
2. In the rainforest **photosynthesis** through plants (biotic) removes **carbon dioxide** from the air (abiotic) and produce **oxygen.**
3. Animals (biotic) also produce **methane** which is a gas in the **atmosphere / air (abiotic).**
4. **Biological weathering** is where plants and animals (biotic) break down rock into smaller pieces (abiotic).



What is the structure the rainforest?

Figure 3 *The structure of a tropical rainforest*



Why do tropical rainforests have a high rate of nutrient cycling and biodiversity?

The nutrient cycle in rainforests

In tropical rainforests, nutrient cycling is rapid. Large volumes of nutrients move quickly between stores and via transfers. The nutrient cycle for a tropical rainforest, shown in Figure 1, is therefore different to the theoretical cycle. Key differences are:

- **Larger biomass store** – Layers of vegetation and huge trees store large amounts of nutrients.
- **Smaller litter store**, and **larger decay transfer** – In hot, wet conditions bacteria and fungi decay dead matter quickly, returning nutrients to the soil.
- **Larger growth transfer** –Plants grow all year, so draw nutrients up from the soil rapidly.
- **Larger weathering input** – Chemical weathering processes (e.g. solution) are faster in hot wet climates, so release nutrients into the soil from rocks.
- A **larger leaching output** – Heavy rainfall throughout the year brings in nutrients, but the constant flow of water through the soil removes them (leaching).

How have animals and plants adapted to live in the tropical rainforest?

Plant adaptations	Animal adaptations
Evergreen hardwood trees Mahogany, teak and ebony trees have tall slender trunks with no branches on them, but huge triangular buttress roots. The roots support the enormous weight of the trees: leaves and branches are only at the very top, where the sunlight is.	**Sloths** Huge claws allow sloths to hang upside down in the branches, while their fur grows away from their feet to help shed rain when upside down. Green algae growing in their fur helps camouflage them from predators.
Epiphytes These plants live in the canopy on trees and have evolved to get all their nutrients from water and air rather than the soil (which is ten metres below!), so their roots dangle in mid-air.	**Primates** Lemurs and monkeys have evolved to live in the canopy where most food is; their long tails are used for balance and most have strong claws to grip trees and branches.

Some plants have also developed 'drip tips' so that water can run off them and bacteria does not grow on them in the humid conditions.

What does the rainforest food web look like?

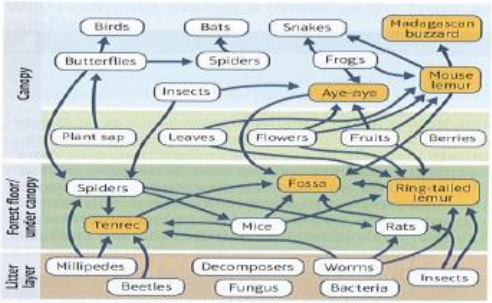
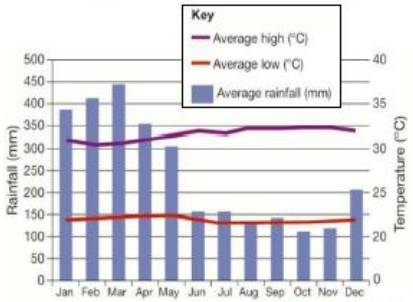


Figure 7 A food web for a Madagascan tropical rainforest ecosystem

High levels of biodiversity result in complex food webs!

What is the climate of the rainforest like?



The warm, moist conditions mean that fungi and other bacteria decompose the dead organic matter quickly – nutrient cycling is rapid!

What does the nutrient cycle look like?

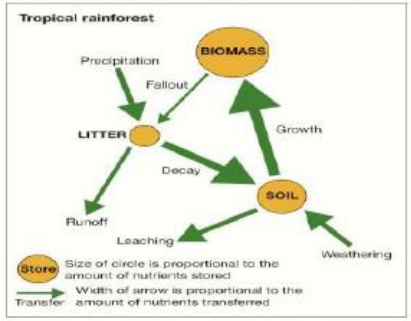
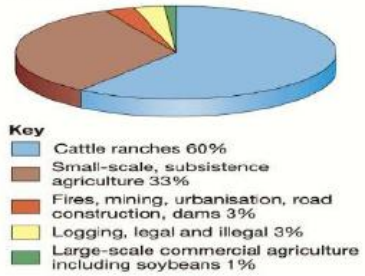


Figure 1 *The nutrient cycle in a tropical rainforest*

Dense vegetation and rapid plant growth mean the nutrients are rapidly taken up by plant roots.

What causes deforestation in the rainforest e.g. logging, agriculture, fuel and energy?

Figure 1 *Direct causes of deforestation in Amazonia*



Deforestation is a DIRECT threat to the rainforest.
In addition, the rainforest is being cut down to grow biofuels such as palm oil, to extract minerals such such as copper and to create HEP electricity by damming rivers and flooding acres of rainforest as a result.

What is the impact of climate change on the rainforest e.g. ecosystem stress?

Climate change is an INDIRECT threat to the rainforest as it doesn't involve deliberately cutting down trees, but still leads to damage of the ecosystem.

Drought: The Amazon rainforest has had 2 severe droughts in 2005 and 2010. The Amazon switched from absorbing CO_2 to emitting it as plants stopped growing. Rainforests are important carbon sinks (stores) and if damaged they no longer store it causing further global warming.

Ecosystem stress: The nutrient cycle is affected as the humus layer dries out, trees die out and this affects food supply for plants and animals. Fewer trees also means less rain as water is not stored in the plants or evaporated back into the air. *(Review topic 15 and how trees regulate the water cycle, nutrient cycle and carbon cycle).*

Loss of forest: Drought can often lead to forest fires, in which large areas of trees burn and are lost.

How effective are global actions (CITIES, REDD) designed to protect the rainforest?

Strategy	Adv +	Disadv -
CITIES: is a global agreement on to control trade of wild plants and animals.	Its global so countries work better together to stop illegal trade and educates people.	It protects species not their habitat so they could still die if their home is destroyed and not all countries are members.
REDD: rewards forest owners in poor countries for protecting them.	Deals with the cause of climate change directly and is relatively cheap to do so.	You can still cut down rainforest as long as you replace it with other forest e.g. palm oil. This may affect local communities who need the wood for fuel.

Can local, sustainable, management strategies protect the forest?

Kilum-Ijim – Cameroon, Africa. It is home to 35 communities from 3 tribes. In 19871 Birdlife International created a forest reserve in the area. 50% of this forest was cut down from 1958-88 but 8% has grown back since the forest reserve was put in place. They have a number of strategies which make it a sustainable project:

Economic: Agroforesty where crops are grown amongst the banana trees (under them rather than cutting the trees down so locals can still make money).

Social: Eco-tourism takes place here with small groups of tourists who are educated on the forest and do not damage it whilst there.

Environmental: Selective logging is practised so only certain trees are cut down leaving most of the plants and animals intact.

The best way to protect the rainforest may be to encourage alternative ways of living from it that don't involve deforestion such as Eco – tourism and Sustainable farming.

FURTHER LINKS

http://www.coolgeography.co.uk/GCSE/Year11/Weather,Climate/Location%20of%20World's%20Forests/locationforests.htm

GEOGRAPHY – TOPIC 17 (page 101 – 104)

What are the threats to the Taiga/ Boreal biome and how can they be reduced?

What is the structure of the Taiga forest and how do plants adapt to life there?

Figure 3 *Taiga forest and plant adaptations*

Why do Taiga forests have a low rate of nutrient cycling and biodiversity?

Nutrient cycles in the taiga

In the taiga, nutrient cycling is much slower than in rainforests (see Figure 4). There are smaller flows of nutrients between stores, and stores are smaller.

- Precipitation is lower and chemical weathering is limited by cold temperatures.
- Most nutrients are in the litter because pine needles decay slowly in cold temperatures and release nutrients slowly.
- The biomass store is small because trees grow for only a few months each year.

Net primary productivity (NPP) is a measure of how new plant and animal growth (biomass) is added to a biome each year.

NPP is around 800 grams per square metre in a year for the Taiga/Boreal forest. This is higher than 140 NPP in Tundra but 2200 in the tropical rainforest.

How do animals adapt to the Taiga forest?

Examples include the grizzly bear and Canada Goose.

Hibernates. It sleeps through winter (Torpor) and lives off its bodyfat. So it can avoid starvation in winter when food is limited.

Fly in a V shape. This means it can save energy. So it can fly up to 1500 miles in 24 hours and cover more distance.

Omnivore: This means it will eat plants and animals. So it will always have something to eat in the cold environment.

Migrates south. This means it can get food in the winter and breed in warmer areas. So it can still get access to food when temperatures drop.

What does the Taiga food web look like?

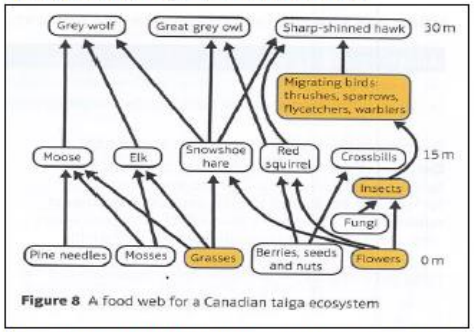
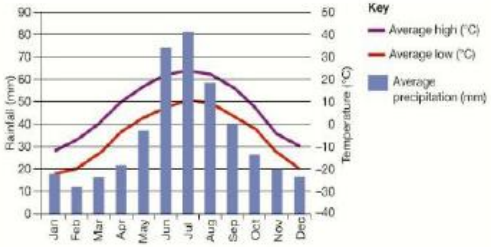


Figure 8 A food web for a Canadian taiga ecosystem

Low levels of biodiversity due to the cold climate, lead to fewer varieties of plant and animal species.

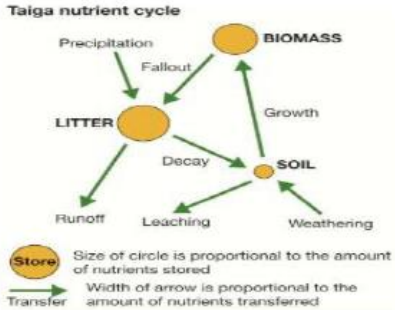
What is the climate of the Taiga like?



▲ ***Figure 2*** *Climate graph for Fort McMurray in Alberta, Canada, an area in a taiga biome*

The taiga has a cold and relatively dry climate. Precipitation will often fall as snow through the colder months.

What does the nutrient cycle look like?



Low temperatures mean that it takes a long time for the litter to be broken down. Therefore soil is not very fertile and plants grow slowly.

What are the DIRECT threats to the Taiga forest?

The taiga trees are cut down for their softwood which can be used to build housing and furniture. In addition, they are used for pulp and paper production. They are mined and areas flooded for HEP:

Athabasca Tar Sands – mining for oil. This covers an area of 150,000km2 and 500kms has been mined so far. It is est. to hold 1.7 trillion barrels of oil. The forest is cut down to access the oil and the surface is strip mined OR the tar is steamed so it melts and can be collected. Both damage the forest and toxic waste collects in ponds and kills wildlife. Mining also uses 2-4 tonnes of water for every tonne of oil produced and natural gas to heat water into steam.

James Bay HEP project, Canada – hydroelectric power. This is in Hudson Bay, Quebec. It is one of the largest HEP plants creating 16,500 MW of electricity. It was built between 1974 to 2012 and cost $20billion. During construction 11,000km2 of forest was flooded, mercury was released as the forests rotted in the water, polluting the Rupert River and getting into the food web and even local people who ate fish from the river. The roads and dams have disrupted the Caribou migration patterns.

What are the INDIRECT threats to the Taiga forest?

Pests and diseases: these are increasing in the Taiga. They reduce the value of wood, kill tree species and reduce biodiversity. The Spruce bark beetle has destroyed 2.5M hectares of spruce as the beetles burrow into the trees killing them. Normally they die in winter but winters are warmer now.

Wildfires: From May to June 2011 700, 00 ha of forest burnt down in Canada. This kills off trees that can't resist fires reducing biodiversity. This is due to hotter and drier summers, the pines act as fire kindling and the trees produce sticky resin which is flammable.

Acid rain: Rain is acidic when the pH is lower than 5.7. It forms as fossils fuels release sulphur dioxide e.g. cars which react with clouds to form sulphuric acid which is carried to earth in the form of precipitation. This damages pine needles reducing photosynthesis and creates acidic soils which release aluminium which damages tree roots.

Why are there conflicting views on protecting and exploiting forest and natural resources in the taiga?

Protection

1) Taiga forests store lots of carbon — deforestation will release some of this as CO_2, which causes global warming.
2) Some species are only found in taiga forests. Because they are adapted to the conditions, the destruction of the habitat could lead to their extinction.
3) Many indigenous people, e.g. the Sami people of Scandinavia, depend on the forest for their traditional way of life.

Exploitation

1) The demand for resources is increasing — people need the wood, fuel and minerals that the forests provide.
2) Forest industries, e.g. logging and mining, provide a lot of jobs (e.g. forestry and logging employ 25 thousand people in Canada).
3) The exploitation of the forest generates a lot of wealth for the countries involved (e.g. the forestry industry in Sweden is worth nearly US $15 billion each year).

What are the challenges of maintaining the Taiga?

National Parks Status: Wood Buffalo NP was created in 1922 to protect bison, lynx, moose and bears. It is north of the Athabasca Tar Sands. It is It became a World Heritage Site in 1983 and a RAMSAR wetland in 1982. National Parks can be set up to protect large areas which have a budget to be spent on conservation. People are allowed in but activities are regulated and commercial exploitation is banned.

Wilderness areas can be created that protect areas of untouched taiga. These have laws that ban motorised transport and all economic exploitation such as timber logging.

Sustainable forestry in Finland: Finland has 'everymans' law so anyone can use the forest so people respect and look after them. 8% of their forest is protected and it is increasing as more is planted. 95% of their commercial forests quality for the Finnish Forest Certification System so they are managed sustainably.

FURTHER LINKS

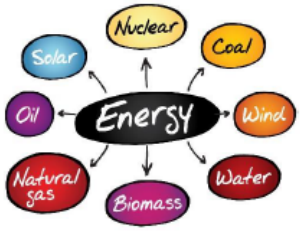
https://www.bbc.com/bitesize/guides/zwy7sg8/revision/1 http://www.coolgeography.co.uk/GCSE/Year11/Weather,Climate/Taiga/adaptations_of_taiga.htm

GEOGRAPHY - TOPIC 18 (page 106 – 114)
CONSUMING ENERGY RESOURCES

Non-renewable (fossil fuels) cannot be replaced once they are used e.g. coal, oil or gas. In the UK 60% of gas comes from the North Sea through a pipe from Norway.

Renewable energy won't run out and can be generated over and over (infinite) e.g. California has 16,000 wind turbines which created 6.9% of California's energy.

Recyclable energy provide energy from sources that can be recycled or reused such as biofuel or reprocessed uranium. For example biogas in India allows waste to ferment and produce gas. There are 2.5 million biogas plants in India.



What environmental impacts does mining and drilling cause?

Oil drilling, USA – In 2010 the Deepwater Horizon oil rig run by BP exploded in the Gulf of Mexico after a gas leak. It leaked oil for 87 days spilling 3.2M barrels of oil. The oil coated the ocean surface killing marine and bird life e.g. baby dolphins washed up in Alabama shores, it threatened endangered species such as Gulf Coral and Louisiana pancake batfish. BP were fined $13 billion.
Open cast coal mining, China – the Shengli quarry is an open cast surface mine in Xilinhot, Inner Mongolia. It is 37km2 and holds 2 billion tonnes of coal. The process uses a lot of water creating shortage and scars the landscape as it creates large craters, damaging habitats.

What are the landscape impacts of renewable energy?

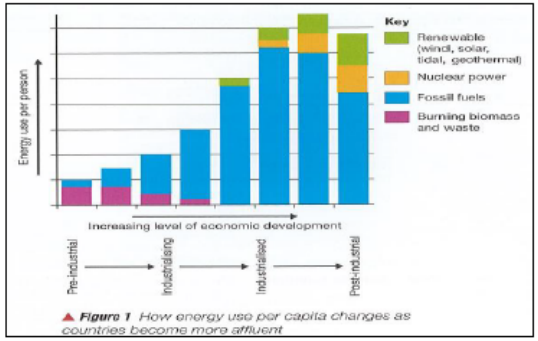
(HEP), Brazil – The Belo Monte Dam, Para state will be one of the world's largest dams. In Brazil 6% of energy comes from renewables and HEP provides 85% of all electricity. However this dam will flood 400km2 of Amazon forest killing animals/ plants and changing fish migration. A build up of sediment can block sunlight. Causing river plants and algae to die.
Solar energy, UK – heat reflected from mirrors can kill wildlife. When built on the ground they can disturb animal habitats.
Wind energy, Germany – Large amount of turbines are needed to produce significant energy, which takes up a lot of space. They produce a constant humming noise (noise pollution). The spinning blades can kills or injure birds and bats.

What is the global pattern of energy consumption use?

The map shows total energy consumption (in tonnes of oil equivalent) by country in 2014.

Developed countries e.g. Australia, Norway, Uk consume lots of energy per person as they can afford it. Economic development is increasing weath in **emerging** countries such as China, so people are buying more things. **Developing** countries such as Chad, consume less energy as they are less able to afford it.

Why is global energy consumption, unevenly distributed?



▲ **Figure 1** *How energy use per capita changes as countries become more affluent*

- Their consumption depends on their **economic level** as explained in the box above.
- Consumption also depends on reliance of **trading fuels:** Some countries such as those in Sub Saharan Africa, cannot afford to extract their own energy sources and so sell them to TNC's to extract instead, *e.g. Shell in Nigeria.*
- Lastly, consumption also depends on the **demand** in that country from **different economic sectors:** Manufacturing industries in developed and emerging countries rely on huge amounts of energy being used, whereas in developing countries, primary industry such as agriculture uses very little.

Why does access to energy vary?

Technology: not all countries can access expensive technology e.g. Niger has uranium but no technology for nuclear power plants.

Geology: fossil fuels come from sedimentary rocks but not all countries have this. Some countries have geothermal power e.g. Iceland as they are on a plate boundary.

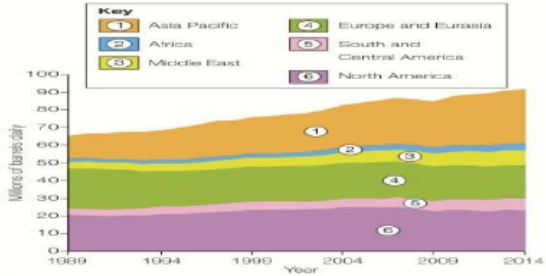
Accessibility: permafrost prevents drilling for oil and other areas are protected so accessing resources is banned.

Climate: solar power requires lots of sunlight so warmer climates nearer the equator e.g. Spain or California can produce more power.

Landscape: hydro-electric power uses lots of water and steep slopes for the water to flow down. Wind power needs a steady, reliable source e.g. on high ground or along the coast.

What are the main causes of oil consumption changing over time and space?

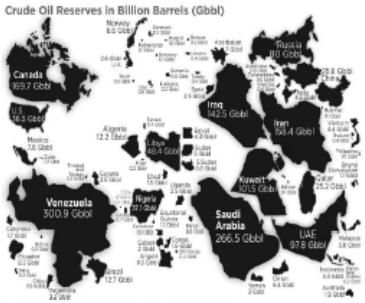
1. Rising GDP per capita – increased demand for electrical items.
2. Rapid industrialisation – particularly in emerging and developed countries,
3. Emerging economies – rise in manufacturing, increasing affluence, increasing consumerism.



▲ **Figure 4** *Global consumption of oil by region, 1989–2014*

What factors affect oil supply and price over time?

Oil reserves and oil production are unevenly distributed.



RESERVES refers to oil that could be extracted using today's technology
PRODUCTION refers to the process of extracting and refining the oil.
Most of the world's major oil reserves are found in the Middle East.
Oil PRODUCTION depends on a variety of factors including:
Infrastructure – the right equipment and technology.
Domestic demand – Saudi Arabia relies on oil to meet its own energy needs.
Shrinking reserves – oil production from the North Sea has declined as the supply is used up.

How do economic change and international relations affect oil prices?

Graph to show changes in global oil prices from 1976 – 2016.

International relations means how countries work together.

- **Conflict** – can disrupt oil supply so it is reduced and prices rise e.g. during the Iraq war in 2000s.
- **Diplomatic relations** – tensions may rise between oil producing countries e.g Saudi Arabia and Iran creating uncertainty over supply.

Economic factors means relate to wealth and jobs.

- **Recession** – e.g. the global financial crisis of 2008 lowered demand for oil as business slowed down as people lost jobs. This causes the price to fall.
- **Economic booms** – oil prices rise during high growth as demand for oil rises but supply stays the same.
- **Supply** – If the supply is low, but demand is high, the price will increase.

What are the economic benefits and costs of developing new CONVENTIONAL oil and gas sources in ecologically sensitive areas?

Conventional oil and gas reserves are being exploited in sensitive areas.

Economic benefits:

- Countries with oil save money by relying less on importing from other oil producers.
- These countries can make money themselves by exporting their energy.
- Oil and gas extraction brings jobs and investment into an areas.

Environmental costs:

- In order to reach new reserves, land may be cleared to make wasy for pipelines and roads.
- Exploring offshore reserves in the oceans can have a big impact on marine life and vibrations can disturb animals who rely on sonar.
- Opening up isolated areas with roads and pipelines can pollute soils and water, as well as damaging habitats.

FURTHER LINKS

http://www.geographyalltheway.com/igcse_geography/gcse-energy/energy_resources.htm

http://www.bbc.co.uk/schools/gcsebitesize/geography/energy_resources/

GEOGRAPHY - TOPIC 18 continued...

What are the environmental costs of developing new UNCONVENTIONAL oil and gas sources?

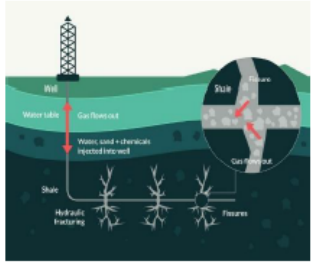
Tar sands are naturally occurring mixes of sands, clay, and water with a type of petroleum called bitumen.

Benefits: it provides 500,000 local jobs, there are few opportunities in this area for young people that pay so well – people earn up to $1000 per week. The First Nation Indians benefit from these jobs. The Canadian government earn tax from companies like Shell and use that money to pay for services e.g. schools or hospitals.

▲ **Figure 1a** Location map of the Canadian tar sands

Costs: 6 barrels of water used to produce 1 barrel of oil. The sands are surface mined so all vegetation (Taiga) is cleared which destroys wildlife habitats. Fossil fuels are burned to remove the oil from the tar sands so the process releases 15% more CO2 than traditional crude oil. Toxic waste leaks into local rivers e.g. est. 11 million litres reaching the Athabasca river daily.

What are the environmental costs of developing new UNCONVENTIONAL oil and gas sources?



Fracking removes oil or gas from shale rock. Shale gas is trapped in impermeable rock so normal drilling methods cannot be used.

Benefits: In e USA 39% of their gas came from fracking in 2014 so it can meet demand. In creating supply it is reducing the cost so energy bills have fallen and it has created over 2 million jobs in the USA. The USA no longer depends on other countries for gas so it is becoming self-reliant and gas produces half the carbon emissions of coal.

Costs: Water, sand and chemicals are forced down into the rock to release the gas and the chemicals can contaminate the water supply. There is an increase in traffic as trucks bring in water causing air and noise pollution. It also causes subsidence (ground sinks) as the water disturbs the rocks which can cause gas to enter people's homes through water taps.

What are the costs and benefits to alternatives to fossil fuels?

Ivanpah Solar electric system, California: this area has a warm Mediterranean climate and long hours of sunlight making it ideal for solar power. There are 400,000 small scale solar projects and the world's largest solar thermal plant which cost $2billlion. It is subsidised by the government so costs money to run.

Toyota Hydrogen technology: Hydrogen can be separated from others elements e.g carbon and used to power cars. The Toyota Prius (electric hybrid) uses hydrogen fuel cells as does the Myria. This car converts hydrogen in the cell to electricity to power the cars four motors (one for each wheel). It can travel 312 miles per cell but the cars are expensive and it takes energy to remove hydrogen from other elements. The government are also subsidising the cars with $30,000 to keep the price low enough people will buy it.

You could also refer to the Sardar Sarovar Dam in India here or the use of biofuel (biogas) in India as well.

Review page 112 of the revision guide for a fully comprehensive list and range of different energy sources.

How can we be more energy efficient and conserve more energy?

There are three key aims we need to work towards in our home and transport to enable us to be more efficient and conserve more energy:

1. Reduce demand
2. Help finite energy supplies last longer
3. Reduce carbon emissions

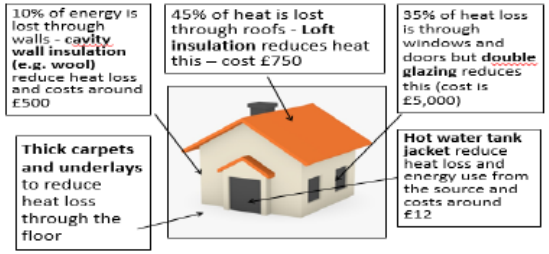
Energy conservation means changing our behaviour as consumers. E.g. driving less, drying clothes outside or on airer etc.

Energy efficiency means that something does the same job as another electrical item but uses less energy than it. E.g. a low energy lightbulb.

Transport and the home are two areas where we can all effectively work to reduce our demand. Specific ideas on how to do this are outlined in the next couple of boxes.

How can we increase energy efficiency in the home (domestic?)

The UK gov. offers the Green Deal which loans money to pay for improvements and is repaid through energy bills. Some people can also get grants to pay directly to install energy saving improvements e.g. insulation.

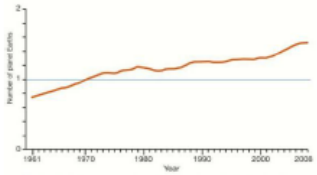


How can we increase energy efficiency and conservation in cities?

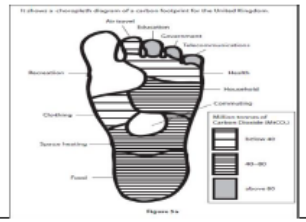
1. London Hybrid buses, introduced in 2012, produce 40% more fuel efficient. This means that less fossil fuels will be used and less CO2 will be emitted.
2. Twelve new cycle superhighways which are blue and 1.5m wide have been built. This means that more people will cycle so there will be less cars on the road so less fuel will be burnt.

3. 6000 Santander hire bikes were introduced to the city in 2010 and can be hired from 400 locations. This means that people will cycle shorter journeys again reducing the amount of vehicles on the road and reducing congestion.

How can we measure our energy use and impact?



▲ **Figure 3** A line graph to show humanity's ecological footprint



Ecological footprint is measured in global hectares (gha) and shows the amount of land and water needed to produce resources for each country.

If people live within the earth's supply of resources their eco footprint is 1. The higher the figure, the more space is needed.

Carbon footprint is the total GHGs produced per person, household or region. Directly created by fossil fuels or indirectly created by owning a product or disposing of one.

What does the future of energy look like?

Two possible scenarios are likely in the future

1. **Business as usual** – the world will continue to rely of fossil fuels and production will rise.
2. **A sustainable future** – renewables will increase, with greater energy mixes to reduce CO2.

The international Energy Agency have set out their 450 scenario to limit GHG to 450 parts per million of CO2 in order to stop temperatures rising by 6degrees. A major issue is that is assumes countries will tax fuel using a carbon tax to make fuel more expensive.

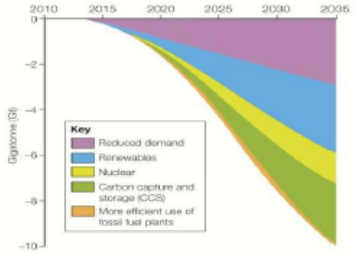


Figure 2 Possible reasons why CO_2 emissions might fall by 2035

How do attitudes to energy and environmental issues vary?

Journalist, Matt Ridley, is a climate 'lukewarmer' who thinks global warming is 'real, mostly man made and will continue' but that it isn't as dangerous as often stated. He believes fossil fuels should still be used but phasing out coal is a good long term solution.

TNC, Shell, argue that 'a range of resources will be needed to supply energy and up to 30% of energy could come from renewable'. They want to find ways to provide cleaner energy and reduce bills for customers.

UK Gov, Dept. for Energy and Climate change, are trying to tackle CC and keep energy bills low for customers. The gov believe solutions will come through technology and invention. Cutting GHG emissions are vital now as it is inevitable in the future.

Climate scientist, Prof. Mike Hulme, has studied climate since 1981 and believes there are '5 lessons of CC' including it is 'a relative risk not an absolute one', it is serious, the world has development needs, the current energy mix is not sustainable and engineering the planet to cope will not work.

Env. Campaign group, Greenpeace, argue that 'it's about getting the world from where we are now to where we need to be... cutting CO2 emissions whilst ensuring energy security'. They want an energy 'revolution' which phases out fossil fuels and invests more in renewables.

EXAM Q: Assess the reasons why people's views differ about energy futures (8)

GEOGRAPHY – TOPIC 19

MAP AND GRAPH SKILLS, COMMAND WORDS

What is the command word asking me to do?

Command word	No of marks	What the command word means	Example of a question
Identify/State/ Name	1	Find (e.g. on a photo), or give a simple word or statement	Identify the landform shown in the photo. Or Name city X on map 2.
Define	1	Give a clear meaning	Define the term 'fertility rate'.
Calculate	1 or 2	Work out	Calculate the mean depth of the river shown in Figure 2.
Label	1 or 2	Print the name of, or write, on a map or diagram	Label two features of the cliff in Figure 4.
Draw	2 or 3	As in sketch or drawing a line	Draw a line to complete the graph in Figure 3.
Compare	3	Identify similarities or differences	(referring to a graph) Compare the rate of population growth in city x with city y.
Describe	2 or 3	Say what something is like; identify trends (e.g. on a graph)	Describe the trend shown in Figure 1.
Explain	2, 3 or 4	Give reasons why something happens	Using examples, explain the rapid growth of a megacity you have studied.
Suggest	2, 3 or 4	Give a well-reasoned guess to explain something. Usually relates to a geographical resource such as a photo that you have not seen before.	Suggest reasons why along this river (in the photograph) flooding has become more frequent in recent years.
Assess	8	Weigh up which is most/least important	Assess the need for coastal management along a stretch of coast you have studied.
Evaluate	8	Make judgments about which is most or least effective	Evaluate the methods used in collecting data in your fieldwork.
Select and justify (used only in Paper 3)	12	Give evidence to support your case	Select and justify the best option for the future of xxxxxx.

How do I use map scale to calculate distances?

Map scale and distances

Scale is normally written as a ratio (e.g. 1:25000) – it means that the map is 1/25000 of real size on the ground. Maps used in GCSE use one of two scales:

- 1:50000 – where 1 cm = 50000 cm on the ground. Put more easily, 2 cm on the map equals 1 km.
- 1:25000 – where 1 cm = 25000 cm on the ground. Put more easily, 4 cm on the map equals 1 km.

The smaller the number, the larger the size of each feature on the map.

To measure distances:

a) Measure the distance between two points – e.g. 14 cm.

b) Divide by the number of cm to 1 km. So, on a 1: 25000 map, where 4 cm = 1 km, 14 cm is 3.5 km.

You Might have to Work Out the Distance Between Two Places

To work out the distance between two places on a map, use a ruler to measure the distance in cm then compare it to the scale to find the distance in km.

Q: What's the distance from the bridge (482703) to the place of worship (489707)?

A: They're 2.2 cm apart on the map...

...which means they're 1.1 km apart in real life.

Scale 1:50 000
2 centimetres to 1 kilometre (one grid square)
Kilometres

2.2 cm x 50 000 = 110 000 cm
= 1.1 km

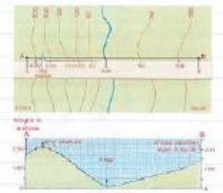
How can I determine the height and shape of the land?

Cross sections and relief

A **cross section** is a visual representation of the landscape from an OS map. You may be asked to draw, label or annotate one, or comment on how you would complete it.

Drawing a cross section

1. Place a strip of paper along the given transect line.
2. Mark off the points where the major (brown) contour lines meet the transect line.
3. Mark the location of other features such as rivers, roads or high points.
4. Draw a line on the grid paper to be the x-axis of your cross section. Line the strip of paper up with this x-axis.
5. Mark off the height of each contour line using a neat cross. Join up the crosses with a ruler and a sharp pencil.

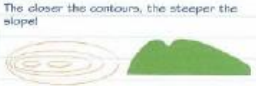


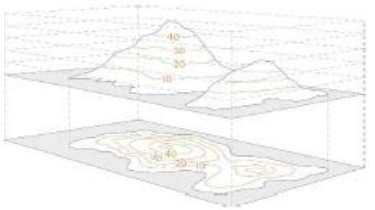
Slopes

The closer the contours, the steeper the slope!

There are different types of slope:

* concave slope
* convex slope





How should I describe distributions and locations on a map?

Describing Distributions on Maps — Describe the Pattern

1) In your exam you could get questions like, 'use the map to describe the distribution of volcanoes' and 'explain the distribution of deforestation'.
2) Describe the general pattern and any anomalies (things that don't fit the general pattern).
3) Make at least as many points as there are marks and use names of places and figures if they're given.
4) If you're asked to give a reason or explain, you need to describe the distribution first.

Q: Use Figure 1 to explain the pattern of population density in Britain.

A: The London area has a very high population density (600 to 5000 per km²). There are also areas of high population density (400 to 599 per km²) in the south east, the Midlands and north west of England. These areas include major cities (e.g. Birmingham and Manchester). More people live in and around cities because there are better services and more job opportunities than in rural areas. Scotland and Wales have the lowest population densities in Britain (less than 199 per km²)...

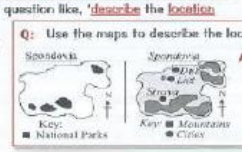
Figure 1 — Population density of Britain

Describing Locations on Maps — Include Details

1) In your exam you could get a question like, 'describe the location of cities in ...'.
2) When you're asked about the location of something say where it is, what it's near and use compass points.
3) If you're asked to give a reason or explain, you need to describe the location first.

You could be given two maps to use for one question — link information from the two maps together.

Q: Use the maps to describe the location of the National Parks.



A: The National Parks are found in the south west and north east of Spondovia. They are all located in mountainous areas. Three of the parks are located near to the city of Strava.

How do I use grid references to locate places?

Grid references

The lines drawn across OS maps are called **grid lines** (see Figure 1). Each line is numbered; lines running left to right (west to east) are called eastings, because numbers increase to the east. Similarly, lines running across the map are called northings. The squares formed by grid lines are 1 km².

Grid lines are used to locate places – either a whole square (4-figures), or a point within a square (6-figures). Eastings are always given before northings.

- To give a **4-figure reference**, give the numbers of grid lines that cross at the bottom left (or south-west) corner of the square. Point B in Figure 1 is 2164.
- To give a **6-figure reference**, imagine each grid square is divided, like decimals except that you omit the decimal point. Easting 20 becomes 200, one tenth of the way across becomes 201, then 202 and so on. Point C in Figure 1 is at easting 230 and northing 640 – written as six figures (i.e. 230640). Look at Figure 1 and work out how to locate points D (245635) and E (232627).

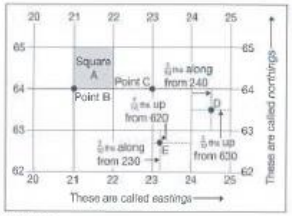
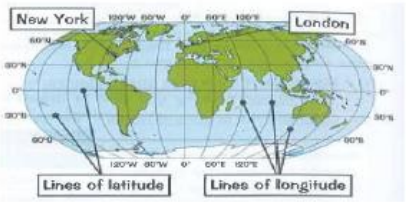


Figure 1 *Grid references*

How do I use longitude and latitude to locate places?

1) The position of anywhere on Earth can be given using coordinates if you use latitude and longitude.
2) Lines of latitude run horizontally around the Earth. They measure how far north or south from the equator something is.
3) Lines of longitude run vertically around the Earth. They measure how far east or west from the Prime Meridian (a line of longitude running through Greenwich in London) something is.
4) Latitude and longitude are measured in degrees.
5) For example, the coordinates of London are 51° N, 0° W. New York is at 40° N, 74° W.



FURTHER LINKS

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GEOGRAPHY – TOPIC 20

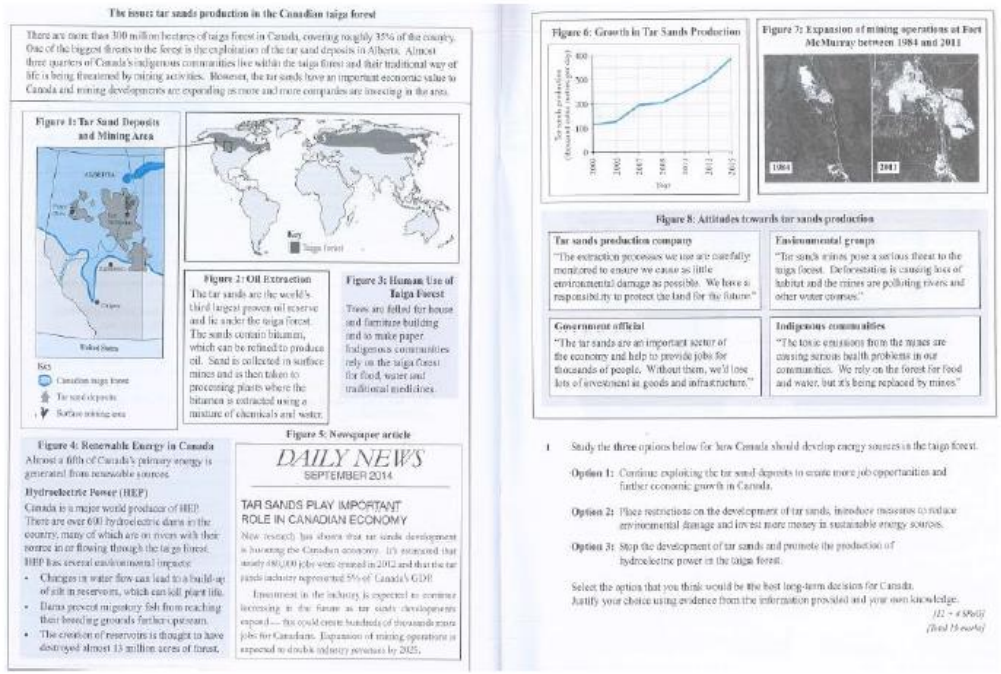
PRACTICE QUESTIONS AND TOP TIPS!

Topic	Paper 1 (90 mins, 94 marks, 37.5% of your GCSE)	Topic	Paper 2 (90 mins, 94 marks, 37.5% of your GCSE)	Topic	Paper 3 (90 mins, 64 marks, 25% of your GCSE)
1	'Past climate change helps scientists to predict how climate will change in the future.' Assess this statement. (8 marks)	8	Suggest two ways that human activity may shape the physical landscape. (4 marks)	15	Explain how changes to the biosphere may change the composition of the atmosphere. (3 marks)
2	Referring to **a developed** country assess the effectiveness of the preparation methods used in reducing the impacts of tropical cyclones. (8 marks + 4 SPAG)	9	Explain how Integrated Coastal Zone Management can offer a sustainable approach to protecting the coastline. (4 marks)	16	Explain two ways that trees in the emergent layer are adapted to their environment. (4 marks)
3	Evaluate the effectiveness of the methods of response to a tectonic hazards in a named **developing** country.	10	Explain two ways in which human activities can affect storm hydrographs (4 marks)	17	Explain the benefits of creating a national park. (4 marks)
4	Explain the disadvantages of 'top – down' strategies for the recipient country. (4 marks)	11	Explain how the governments immigration policy has changed the UK's diversity (4 marks)	18	Other than rising affluence, explain why sustainable energy use has been increasing in developed countries. (4 marks)
5	Evaluate the positive and negative impacts of development on different groups of people in an **emerging** country you have studied. (8 marks)	12	For a named UK city, explain two reasons why the function of the inner city have changed in recent years. (4 marks)	Useful websites and extra resources: 1. Free 30 day trial: https://www.educake.co.uk/geography 2. Full glossary for the course: http://www.hodderplus.co.uk/myrevisionnotes/gcse-geography/Edexcel-B/MRN-Edx-Geog-Glossary.pdf 3. https://www.bbc.com/bitesize/examspecs/zsytxsg 4. https://www.senecalearning.com/blog/gcse-geography-revision/	
6	Explain why the population is growing rapidly in a megacity in an **emerging or a developing** country you have studied. (4 marks)	13	FOR YOUR OWN COASTAL FIELDWORK: Assess the role of secondary data sources in your investigation. (8 marks)		
7	For a named **megacity,** assess the different strategies used to improve sustainability. (8 marks + 4 SPAG)	14	FOR YOUR OWN URBAN FIELDWORK: Assess the suitability of the sites you chose for your data collection. (8 marks)		

GEOGRAPHY – TOPIC 20

PRACTICE QUESTIONS AND TOP TIPS!

- ✓ In each exam there will be one question with an extra 4 SPAG marks attached to it.
- ✓ In paper 2, you will choose from answering a fieldwork question on a river or **coastal fieldwork** you went on and on a rural or **urban fieldwork** you went on.
- ✓ In paper 2, one of the fieldwork questions will be about YOUR fieldwork and the other question will ask you to review the data/ information from a 'made up' fieldwork the exam board have made for you, then ask you to assess/ evaluate the data/resource/findings/method/sampling/conclusions etc.
- ✓ Each exam will include a range of resources which you will be asked questions on including; photographs, graphs in a variety of formats, data sets, GIS images, OS maps (and associated map skills) at a variety of scales, news reports, statistical tables of information. Use topic 19 to help you practice these skills.
- ✓ You should use the revision guide and white work-booklet in addition to this SP. Each topic, clearly shows where to find further information on each topic in the revision guide.
- ✓ You should also use SENECA learning to help you to quiz yourself on basic geographical knowledge and understanding.
- ✓ Revision sessions/ drop ins are available for all – please use these as an opportunity to get extra support or advice with either exam technique or homework pieces.



The issues tar sands production in the Canadian taiga forest

There are more than 300 million hectares of taiga forest in Canada, covering roughly 35% of the country. One of the biggest threats to the forest is the exploitation of the tar sand deposits in Alberta. Almost three quarters of Canada's indigenous communities live within the taiga forest and their traditional way of life is being threatened by mining activities. However, the tar sands have an important economic value to Canada and mining developments are expanding as more and more companies are investing in the area.

Figure 1: Tar Sand Deposits and Mining Area

Figure 2: Oil Extraction

The tar sands are the world's third largest proven oil reserve and lie under the taiga forest. The sands contain bitumen, which can be refined to produce oil. Sand is collected in surface mines and is then taken to processing plants where the bitumen is extracted using a mixture of chemicals and water.

Figure 3: Human Use of Taiga Forest

Trees are felled for house and furniture building and to make paper. Indigenous communities rely on the taiga forest for food, water and traditional medicines.

Figure 4: Renewable Energy in Canada

Almost a fifth of Canada's primary energy is generated from renewable sources.

Hydroelectric Power (HEP)

Canada is a major world producer of HEP. There are over 600 hydroelectric dams in the country, many of which are on rivers with their source in or flowing through the taiga forest. HEP has several environmental impacts:

- Changes in water flow can lead to a build-up of silt in reservoirs, which can kill plant life.
- Dams prevent migratory fish from reaching their breeding grounds further upstream.
- The creation of reservoirs is thought to have destroyed almost 13 million acres of forest.

Figure 5: Newspaper article

DAILY NEWS
SEPTEMBER 2014

TAR SANDS PLAY IMPORTANT ROLE IN CANADIAN ECONOMY

New research has shown that tar sands development is boosting the Canadian economy. It's estimated that nearly 440,000 jobs were created in 2012 and that the tar sands industry represented 5% of Canada's GDP.

Investment in the industry is expected to continue increasing in the future as tar sands developments expand — this could create hundreds of thousands more jobs for Canadians. Expansion of mining operations is expected to double industry revenues by 2025.

Figure 6: Growth in Tar Sands Production

Figure 7: Expansion of mining operations at Fort McMurray between 1984 and 2011

Figure 8: Attitudes towards tar sands production

Tar sands production company

"The extraction processes we use are carefully monitored to ensure we cause as little environmental damage as possible. We have a responsibility to protect the land for the future."

Environmental groups

"Tar sands mines pose a serious threat to the taiga forest. Deforestation is causing loss of habitat and the mines are polluting rivers and other water courses."

Government official

"The tar sands are an important sector of the economy and help to provide jobs for thousands of people. Without them, we'd lose lots of investment in goods and infrastructure."

Indigenous communities

"The toxic emissions from the mines are causing serious health problems in our communities. We rely on the forest for food and water, but it's being replaced by mines."

1 Study the three options below for how Canada should develop energy sources in the taiga forest.

Option 1: Continue exploiting the tar sand deposits to create more job opportunities and further economic growth in Canada.

Option 2: Place restrictions on the development of tar sands, introduce measures to reduce environmental damage and invest more money in sustainable energy sources.

Option 3: Stop the development of tar sands and promote the production of hydroelectric power in the taiga forest.

Select the option that you think would be the best long-term decision for Canada. Justify your choice using evidence from the information provided and your own knowledge.

(12 + 4 SPaG)
(Total 16 marks)

Notes page

Notes page

Notes page

Y11 GCSE Exam Dates

Y11 Mock(s): _____

Y11 PPE(s): _____

Final GCSE(s): _____

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Success Programme Sessions:

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Revision Guide (if applicable):

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Notes

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