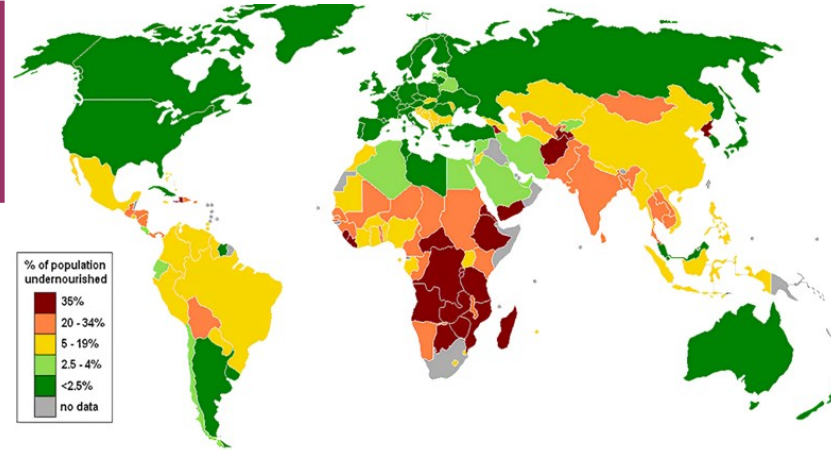
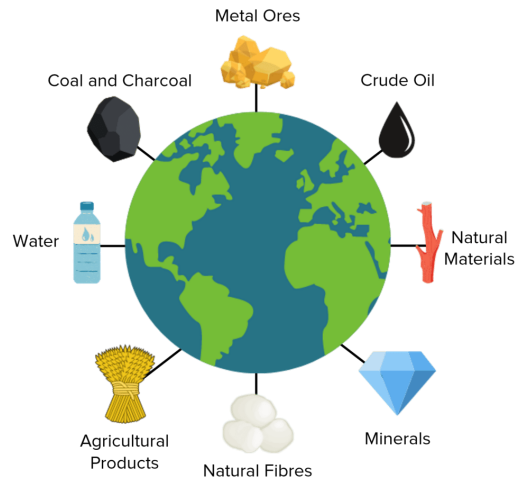


GEOGRAPHY 9.3 Resources & Issues

1. Resources are anything that we use to meet our wants and needs

We all consume resources on a constant basis as we go about our daily lives. Some are essential—such as food, water and energy, whilst others are important for economic reasons as they are valuable. Resources are useful for a massive variety of reasons depending on what they are.

Water, for example, is used for drinking, washing, sanitation, energy production, clothes manufacturing, cement and concrete making, agriculture, leisure, fishing, heating, transport... and so on!



2. Uneven global access to resources

The distribution of resources is very uneven across the world. For example, some countries have huge reserves of energy resources such as coal and oil, whilst others rely on importing it from others. The choropleth map above shows the % of country's population who are undernourished; this means the amount of people who have an insufficient amount and/or quality of food to be healthy. You will notice that the wealthier countries (see North America or western Europe) have no issues with undernourishment, whilst the poorest countries of the world (see sub-Saharan Africa) clearly do not have the wealth to access the basic resources—such as food in this case.

3. 4. & 5. Environmental impacts

Air Pollution (CLIMATE CHANGE)

Deforestation for human use of land clearance, is changing the natural balance of life on Earth. The removal of vast forested areas changes biodiversity, changes the composition of the atmosphere, and changes the local and global climates of Earth.



Water Pollution (OCEAN HEALTH)



Industrial areas in many LICs and NEEs can create major river pollution when chemicals used in factories is dumped into the rivers. In other cases, rivers after often treated by people as places to dispose of their waste. Ultimately, pollution ends up in the sea. 6% of the world's plastic waste ends up in the oceans. In addition, climate change is causing stress to the fragile marine environment—especially coral reefs.

Land degradation (DESERTIFICATION)

Desertification means to make an area of land (usually on the fringes of existing deserts) become a desert. Desertification is not a natural process, but as a result of human activity; degrading the soil to the point of ecological failure by over grazing, poor land management, over cultivation and deforestation for fuel wood.



8. Mitigation or Adaptation?

The concept: Why do we put a seatbelt on in a car? Well, it won't prevent a crash, but it will reduce the impact of one. This is how **mitigation** works; it is the act of reducing the (negative) impacts of an event. **Adaptation** is knowing an event is happening (or going to happen) and adjusting what we do to prevent the event or, change the way we operate because it is having an impact.

Take climate change for example; it is happening in the present, and will continue to do so into the future. Therefore we need to **mitigate** against the causes of climate change by switching energy sources away from fossil fuels to renewable sources, and go about a global afforestation scheme. Meanwhile, countries particularly at risk to sea level rise (as a result of climate change) have to **adapt** their landscapes to cope with higher future sea levels by defending the coastline.

The Enhanced Greenhouse Effect

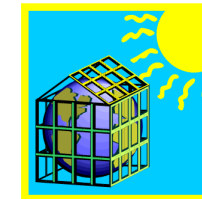
The thin atmosphere around Earth acts like the glass on a greenhouse. Incoming UV radiation passes through the glass and outgoing IR radiation (heat) does not. The outcome is heat gets trapped inside the greenhouse. This process happens naturally thanks to the greenhouse gases such as CO₂ (Carbon Dioxide) and CH₄ (Methane) being in the atmosphere absorbing heat (like the glass prevents heat from leaving the greenhouse). The process is becoming more **enhanced** due to human activity changing the balance of these gases; the consequence is climate change.

Sources of greenhouse gases from Human Activity (Economic Sector):

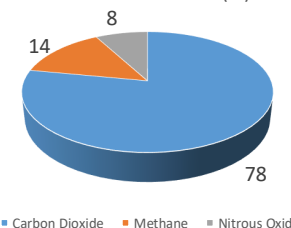


Our demand for fossil fuels for energy, transport and industry lead to vast amounts of CO and NO_x being released into the atmosphere. At the same time, our use of the land through agriculture, water use and forestry create huge amounts of emissions in CH—as well as the other two key greenhouse gases. It is our resource use that is changing the concentration of these gases in the atmosphere; thus changing the climate in the shortest time ever recorded.

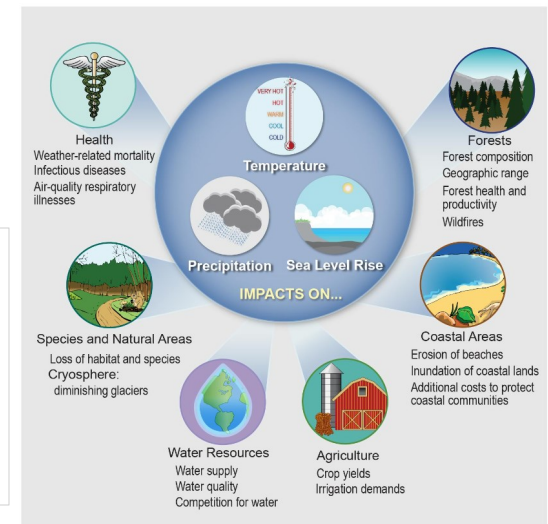
6. Human Activity is creating climate change



Greenhouse Gas Pollutants (%)



7. Impacts of climate change



GEOGRAPHY 9.2. Africa

2. Relief Map of Africa

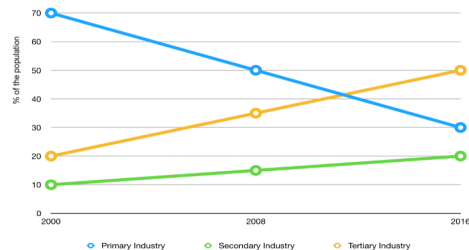


7. Lagos, Nigeria - case study

Lagos City is Nigeria's largest city and its economic capital.

It is located on Africa's Atlantic Ocean coastline. It is the 7th fastest growing city in the world. It has a population of 21 million. The population grows at an annual rate of 2 to 3 %. Unlike other states dependent on oil revenues, Lagos has a diversified economy with prosperous manufacturing, transport, construction, service, wholesale, and retail sectors. Lagos State generates \$90 billion in goods and services annually. If it were a country, the Lagos State economy would be the 7th largest one in Africa. Two-thirds of the population in Lagos are slum dwellers. Crime is also a problem in the city. Kidnappings, extortion, carjacks, assaults, armed muggings, and burglaries are common in the city.

6. Changing Economic Structures in Nigeria



2. Africa is the second largest continent on Earth (after Asia), occupying about 20% of the total land area on Earth. Much of the interior of Africa is fairly high altitude—with the East Africa Highlands reaching thousands of metres above sea level down the length of the east. It is here that the great Rift Valley is located, created by tectonic processes.

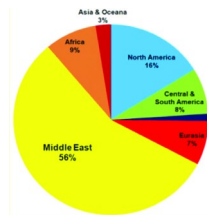
8. The Middle East case study

The Middle-east is a trans-continental region of the world mainly in western Asia.

The Middle East generally has a hot, dry climate, with several major rivers providing irrigation to support agriculture in limited areas such as the Nile Delta in Egypt, the Tigris and Euphrates watersheds of Iraq, Kuwait and eastern Syria.



Most of the countries that border the Persian Gulf have vast reserves of **crude oil** (see pie chart) with the countries of the Arabian Peninsula in particular benefiting economically from petroleum exports.



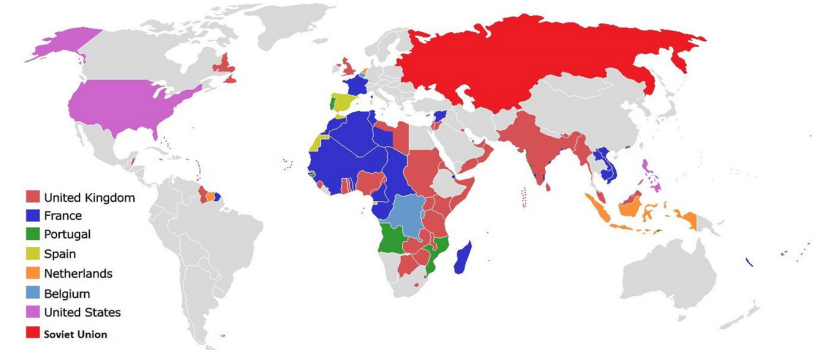
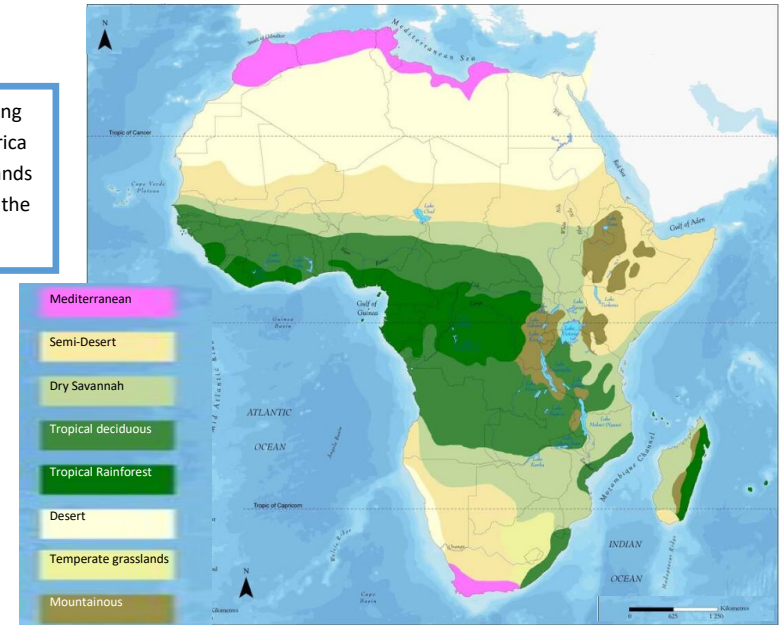
Generally, wealth and life expectancy in the region has improved massively in recent decades but continued political unrest has led to uneven development. Unemployment is particularly high in the young adult population—raising tensions in numerous countries

The most stable countries in the region have developing banking and tourism industries to spread out the economic activity from the oil industry.

4. The Akie people: Hunter-gatherers

The dangers of hunting they collect honey, which involves 'steaming' out the bees, making it possible for to reach into the hive and grab the honey—a task requiring nerves of steel, and the ability to cope with brutal stings from the bees. Due to competition for land with the dominant Maasai people, they have recently been more reliant on growing maize, although this rarely produces enough food to last year around.

1. Biomes of Africa



3. Historical events in Africa

3. Historical events have shaped modern Africa. In the past, powerful European countries established colonies all over the world (see map above)—especially in Africa—taking control of them. The colonised countries were exploited by the dominant Europeans, leaving a legacy of challenges in present day Africa.

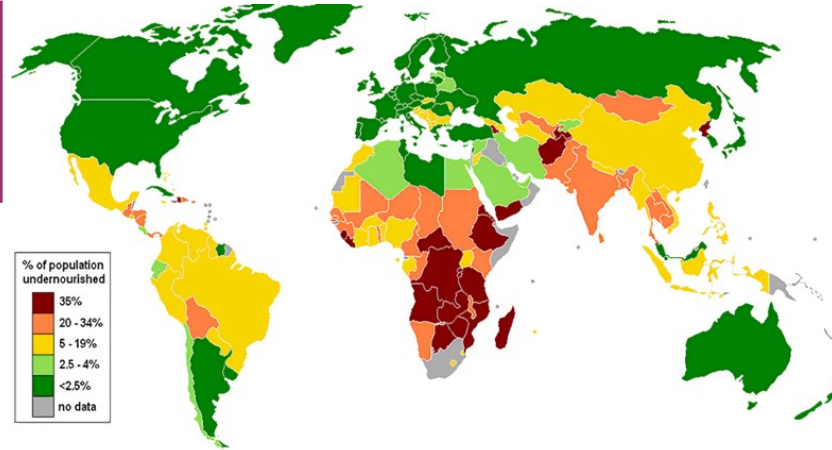
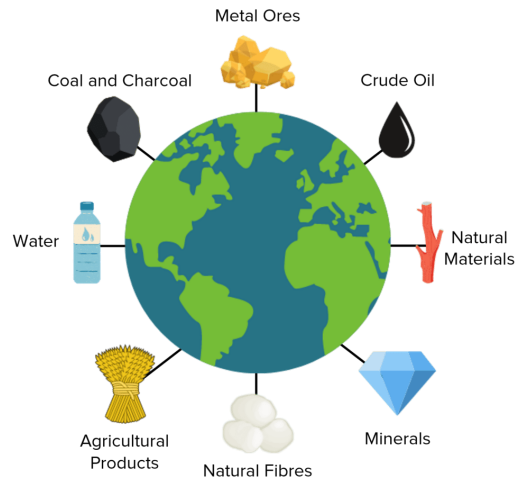


GEOGRAPHY 9.3 Resources & Issues

1. Resources are anything that we use to meet our wants and needs

We all consume resources on a constant basis as we go about our daily lives. Some are essential—such as food, water and energy, whilst others are important for economic reasons as they are valuable. Resources are useful for a massive variety of reasons depending on what they are.

Water, for example, is used for drinking, washing, sanitation, energy production, clothes manufacturing, cement and concrete making, agriculture, leisure, fishing, heating, transport... and so on!



2. Uneven global access to resources

The distribution of resources is very uneven across the world. For example, some countries have huge reserves of energy resources such as coal and oil, whilst others rely on importing it from others. The choropleth map above shows the % of country's population who are undernourished; this means the amount of people who have an insufficient amount and/or quality of food to be healthy. You will notice that the wealthier countries (see North America or western Europe) have no issues with undernourishment, whilst the poorest countries of the world (see sub-Saharan Africa) clearly do not have the wealth to access the basic resources—such as food in this case.

The distribution of resources is very uneven across the world. For example, some countries have huge reserves of energy resources such as coal and oil, whilst others rely on importing it from others. The choropleth map above shows the % of country's population who are undernourished; this means the amount of people who have an insufficient amount and/or quality of food to be healthy. You will notice that the wealthier countries (see North America or western Europe) have no issues with undernourishment, whilst the poorest countries of the world (see sub-Saharan Africa) clearly do not have the wealth to access the basic resources—such as food in this case.

8. Mitigation or Adaptation?

The concept: Why do we put a seatbelt on in a car? Well, it won't prevent a crash, but it will reduce the impact of one. This is how **mitigation** works; it is the act of reducing the (negative) impacts of an event. **Adaptation** is knowing an event is happening (or going to happen) and adjusting what we do to prevent the event or, change the way we operate because it is having an impact.

Take climate change for example; it is happening in the present, and will continue to do so into the future. Therefore we need to **mitigate** against the causes of climate change by switching energy sources away from fossil fuels to renewable sources, and go about a global afforestation scheme. Meanwhile, countries particularly at risk to sea level rise (as a result of climate change) have to **adapt** their landscapes to cope with higher future sea levels by defending the coastline.

The Enhanced Greenhouse Effect

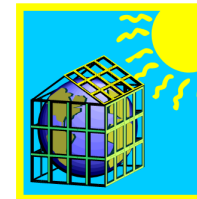
The thin atmosphere around Earth acts like the glass on a greenhouse. Incoming UV radiation passes through the glass and outgoing IR radiation (heat) does not. The outcome is heat gets trapped inside the greenhouse. This process happens naturally thanks to the greenhouse gases such as CO₂ (Carbon Dioxide) and CH₄ (Methane) being in the atmosphere absorbing heat (like the glass prevents heat from leaving the greenhouse). The process is becoming more **enhanced** due to human activity changing the balance of these gases; the consequence is climate change.

Sources of greenhouse gases from Human Activity (Economic Sector):

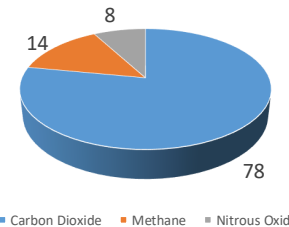


Our demand for fossil fuels for energy, transport and industry lead to vast amounts of CO and NO_x being released into the atmosphere. At the same time, our use of the land through agriculture, water use and forestry create huge amounts of emissions in CH—as well as the other two key greenhouse gases. It is our resource use that is changing the concentration of these gases in the atmosphere; thus changing the climate in the shortest time ever recorded.

6. Human Activity is creating climate change



Greenhouse Gas Pollutants (%)



3. 4. & 5. Environmental impacts

Air Pollution (CLIMATE CHANGE)

Deforestation for human use of land clearance, is changing the natural balance of life on Earth. The removal of vast forested areas changes biodiversity, changes the composition of the atmosphere, and changes the local and global climates of Earth.



Water Pollution (OCEAN HEALTH)



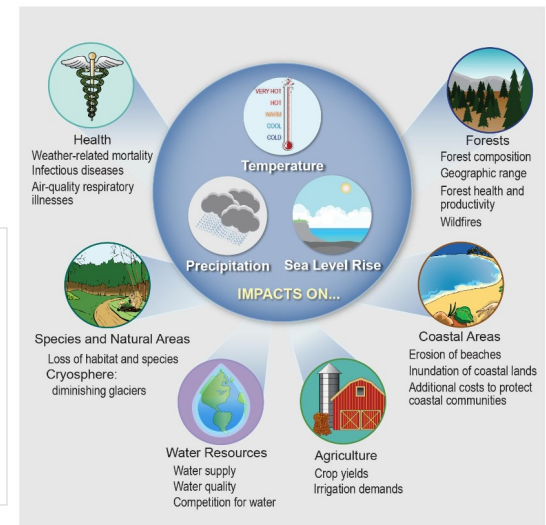
Industrial areas in many LICs and NEEs can create major river pollution when chemicals used in factories is dumped into the rivers. In other cases, rivers after often treated by people as places to dispose of their waste. Ultimately, pollution ends up in the sea. 6% of the world's plastic waste ends up in the oceans. In addition, climate change is causing stress to the fragile marine environment—especially coral reefs.

Land degradation (DESERTIFICATION)

Desertification means to make an area of land (usually on the fringes of existing deserts) become a desert. Desertification is not a natural process, but as a result of human activity; degrading the soil to the point of ecological failure by over grazing, poor land management, over cultivation and deforestation for fuel wood.



7. Impacts of climate change



GEOGRAPHY 9.4. Urbanisation

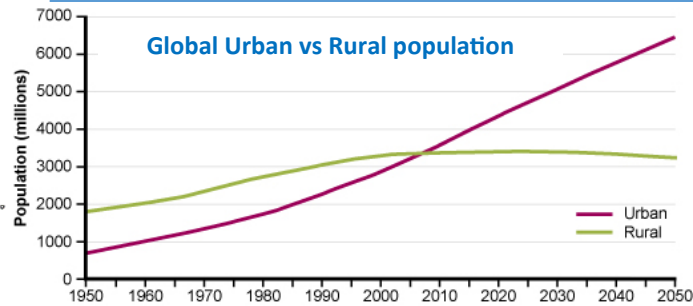
Topic-relevant countries



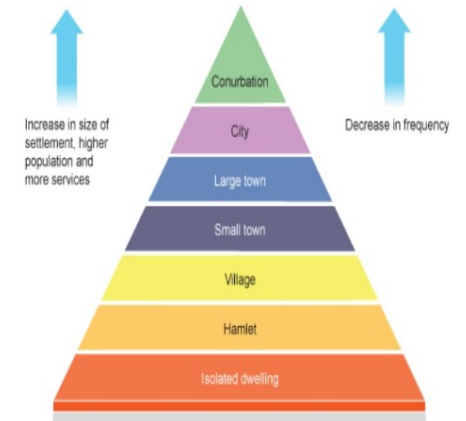
- Key:
1. UK
 2. India
 3. Kenya
 4. Nigeria

1. Global trends of urbanisation

Urbanisation is the proportion of population that live in cities. Cities then predominantly grow horizontally or vertically. In 2007 a critical change happened; more people now live in urban areas compared to those that remain in the countryside. Urban living is the future for most humans.



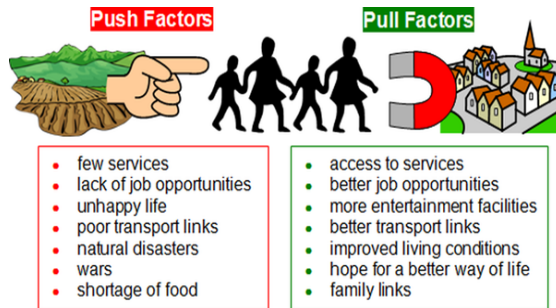
3. Settlement hierarchy



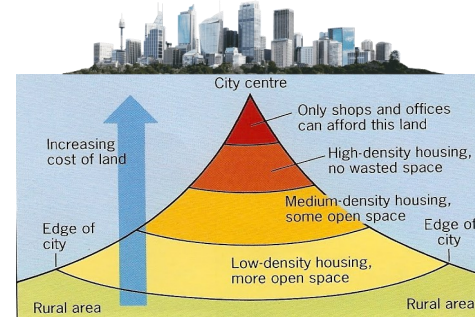
2. Migration: Causes of urbanisation

Urbanisation key terms

urban rural population urbanisation
 hierarchy urban sprawl expansion density
 urban fringe suburbs hamlet village
 town city conurbation megacity com-
 muter redevelopment regeneration gentri-
 fication slum NEE (Newly Emerging Economy)



City land use and land value



4. Settlement Interdependence

Settlements rely on each other; this relationship is called interdependence. For example, cities draw in huge amounts of workers—who live in neighbouring towns and villages—who commute to work daily in the city. However, a village may well be in a National Park for example, and attract city residents as tourists who want to get away from the city.

7. Tiverton's EUE

Eastern Urban Expansion

With the completion of the new junction near Gornhay Cross off of the A361, the Tiverton Eastern Urban Expansion (EUE) will begin in the Autumn 2019.

- Over 2000 new homes
- Community Centre
- Local shops
- Primary School (420 places)
- New employment land

Regeneration	Economic revival of a city centre
Redevelopment	The demolition and rebuilding of brownfield sites (sometimes combined with gentrification)
Gentrification	Modernising a building/area to meet expectations
Mixed Use	Combining urban retail with hospitality and entertainment
Urban Sprawl	The outward expansion of urban areas from new developments being built on the rural-urban fringe.
CBD	The Central Business District

5. Urban Redevelopment—Exeter City Centre's Princesshay

Exeter	Buildings and Land use	Transport
Before 2007	The Princesshay area of Exeter was originally redeveloped in 1950 after bomb damage during WW2. Shops were small and over time, the buildings began to suffer 'concrete cancer' and fall apart. By 2005, most shops were empty and the area was economically dead.	1950s Princesshay was the first pedestrianised shopping area in the UK—a revolution at the time. However, the High Street was still heavily used by buses.
Exeter In 2019	The hugely successful regeneration of Princesshay was opened in 2007 containing new buildings (redeveloped) with larger shops combined with restaurants, cafes and accommodation to broaden the appeal to meet modern expectations of retail, leisure and urban living. Some buildings were 'gentrified' (given a make-over) to bring them up to standard and blend the older with the new. Most however, were flattened and rebuilt. John Lewis gentrified the former Debenhams tower and moved into the city in 2012.	Transport Pedestrian shopping is still key to modern Princesshay and the High Street remains a bus route—although much restricted. Exeter's bus station is the latest phase of urban change currently underway in the city.

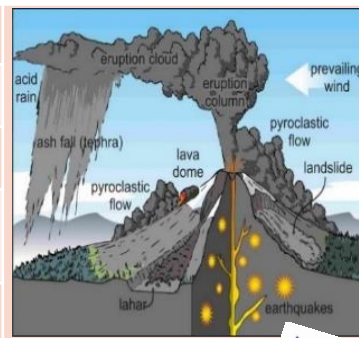


The structure of the Earth

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

Volcanic Hazards

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



Managing Volcanic Eruptions

Warning signs	Monitoring techniques
Small earthquakes are caused as magma rises up.	Seismometers are used to detect earthquakes.
Temperatures around the volcano rise as activity increases.	Thermal imaging and satellite cameras can be used to detect heat around a volcano.
When a volcano is close to erupting it starts to release gases.	Gas samples may be taken and chemical sensors used to measure sulphur levels.
Preparation	
Creating an exclusion zone around the volcano.	Being ready and able to evacuate residents.
Having an emergency supply of basic provisions, such as food	Trained emergency services and a good communication system.

Convection Currents

LIC -CS: Nepal Earthquake 2015



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

Causes
On a destructive plate margin, involving the Indo Australian and Eurasian plates. The **magnitude 7.9 earthquake** was **50 miles** to the north west of Nepal's capital Kathmandu. The plates are colliding at about **45mm** per year. .

Effects
9000 people died and 8 million affected. Many **emotionally affected**. **3 million homeless**. **7000 schools destroyed**. **Avalanche on Mt Everest** killed at least 19 people along with **landslides**

Management
Search and rescue teams inc. helicopters for those trapped on Mt Everest. **Hall a million tents**. **300 000 people migrated** to Kathmandu. June 2015 International conference to discuss rebuilding.

Earthquake Management



PREDICTING

Methods include:

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

PROTECTION

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

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

HIC - CS: Chile 2010



Causes

Formed on a destructive plate boundary involving the Nazca and South American plate. **The magnitude was 8.8** on the Richter scale. **The earthquake struck just off the coast of Chile** causing a tsunami warning to be issued.

Effects

Around **500 people** killed. **12 000 injured** and **800 000 people** affected. **220 000 homes** and **4500 schools** destroyed. Cost of **US\$30 billion**. **1500 km** of roads destroyed. **Several coastal towns devastated by tsunami waves.**

Management

Emergency services quick to act. **Temporary repairs happened within 24 hours**. Power restored to **90% of homes** in 10 days. **Helping reconstruction plan to help 200 000 homes** affected. Strong copper economy rebuilt without foreign aid.

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

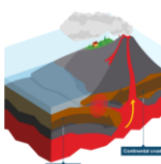
Unit 1a



The Challenges of Natural Hazards

Types of Plate Margins

Destructive Plate Margin



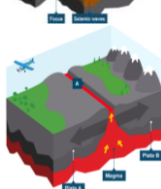
When the denser plate subducts beneath the other, friction causes it to **melt and become molten magma**. The magma forces its way up to the surface to form a volcano. This margin is also responsible for **devastating earthquakes**.

Constructive Plate Margin



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

Conservative Plate Margin



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

What is a Natural Hazard

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

Geological Hazard

These are hazards caused by land and tectonic processes.

Meteorological Hazard

These are hazards caused by weather and climate.

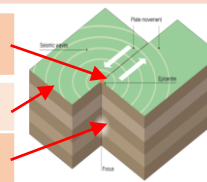
Causes of Earthquakes

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

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

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

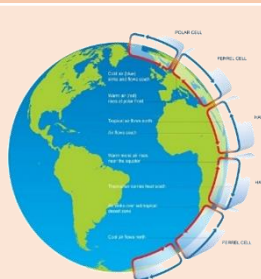
The point at which pressure is released is called the **FOCUS**.



Global pattern of air circulation

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

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



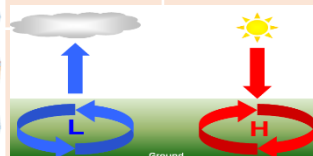
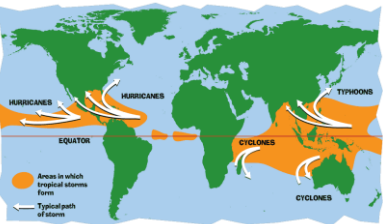
Distribution of Tropical Storms.

High and Low Pressure

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

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

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



Formation of Tropical Storms

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

Changing pattern of Tropical Storms

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

Management of Tropical Storms



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

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

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

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

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

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

Primary Effects of Tropical Storms

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



Secondary Effects of Tropical Storms

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

Case Study: Typhoon Haiyan 2013



Causes

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

Effects

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

Management

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

Case Study: Somerset Levels 2014



Causes

Wettest January on record (since 1910) caused by a succession of depressions over the Atlantic Ocean. 350mm rain fell in Jan and Feb 100mm more than average. High tides and storm surges in the Bristol Channel. Rivers had not been dredged in 20 years.

Effect

- Over 600 house flooded.
- Many people cut off from supplies.
- Cost of the flood **£10 million**
- 1000 livestock evacuated.
- Floodwater heavily contaminated with pollutants.
- Local roads and railway blocked.

Management

- Villages cut off were accessed by boats.
- £20 million flood action** planned by Somerset County Council – To include: 8Km of river Tone and Parret dredged; Road levels raised; River banks raised; by 2024 consideration will be given to a tidal barrage at Bridgewater.

What is Climate Change?



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

Recent Evidence for climate change.

Global temperature

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

Ice sheets & glaciers

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

Sea Level Change

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

Enhanced Greenhouse Effect



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

Evidence of natural change

Orbital Changes

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

Sun Spots

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

Volcanic Eruptions

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

Managing Climate Change

Carbon Capture

This involves new technology designed to reduce climate change.

Planting Trees

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

International Agreements

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

Renewable Energy

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

