



GCSE Geography Revision notes 2020/2021

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Settlements

Site and Situation

- The **Site** of a settlement describes the physical nature of where it is located.
- Factors such as water supply, building materials, quality of soil, climate, shelter and defence were all considered when settlements were first established.
- **Aspect** relates to the direction in which the land faces.
- A supply of water was probably the single most important factor in deciding where a settlement might be located.
- A dry point site is one which is slightly raised from the surrounding area.
- A wet point site refers to any site which has access to water, usually through being beside a river.
- In medieval times, defence was one of the most important factors influencing the site of a settlement.
- Anywhere where two routes meet has great potential for settlement.
- Many towns and cities have built up at points where it was easiest to cross a large river.
- The situation of a settlement is the description of the settlement in relation to the other settlements and physical features around it.

Urban Hierarchies

- **Settlements** can be described as being part of the urban hierarchy.
- Where they stand on the hierarchy depends on a number of factors, the main ones being population, the number of services a settlement has and its sphere of influence.
- The larger the population, the higher the settlement is placed on the hierarchy.
- The larger a settlement is, and therefore the higher it is on the urban hierarchy, the more services and functions it will have.
- The larger a settlement is the greater its sphere of influence is likely to be, as it has a wider range of services and functions to attract people to go there.
- There are two major ideas to consider when looking at the sphere of influence of a shop of service.
- These are called the **range** and **threshold population** of a good.

Settlement Functions

- The **function** of a settlement describes all the main activities that occur in it.
- These can be grouped into a number of headings, such as residential, recreational, retail, government, entertainment and industrial.
- Some settlements have one predominant function. Most settlements now are multi-functional, which means that they perform a range of different functions.
- Two good examples of the changing functions of a settlement can be seen in **Benidorm (Spain)** and the **South Wales mining towns**.

Urban Models

- **Burgess** based his model on the city of Chicago. At its core is the CBD, surrounded by a zone of transition and then the residential areas.

- Hoyt used transport routes to determine where his sectors would be located, still centred around a CBD.
- Harris and Ullman still have a central CBD, but they also have other smaller centres. Harris & Ullman also have business and industrial parks.
- Waugh's model for a developing world city has a central CBD surrounded by high class residences, and beyond them the shanty towns. Industry is found in sector along the main roads.
- By drawing a transect of a city, you can quite easily identify the different zones, in much the same way as Burgess and the other theorists did.
- The CBD is where shops will locate as they know it is the most accessible point for the people of the city.

Problems in CBD's

- Many British cities still have street plans that were laid down hundreds of years ago. The roads cannot cope with the ever increasing numbers of cars and other vehicles.
- CBD's are limited in their outwards growth by the fact that the city encompasses them.
- The major pollution seen in urban areas is air pollution, or smog.
- Some cities have encouraged the growth of out-of-town shopping centres to help traffic, land price and pollution problems.
- Solutions to the problems of the CBD include pedestrianisation, park and ride schemes, ring roads, and car sharing.

Inner Cities in MEDC's

- The inner city in the 19th Century would have been the centre of industry for most cities.
- The Victorian terraces built to house the factory workers remain in many inner cities, however in some they have been replaced by huge tower blocks.
- Recently inner city planning has centred around rejuvenating the area in alternative ways
- Good examples of Inner city development include Birmingham and London Docklands.

Shanty Towns in LEDC's

- **Shanty Towns** are the illegal squatter settlements that characterise most of the large cities in the developing world.
- They have occurred because of the huge numbers of people migrating from the rural areas to the cities.
- They are home to many diseases and can easily be affected by environmental disasters such as landslides and flooding.
- The Jhuggies of New Delhi occupy marginal land, usually beside transport routes or in hazardous areas.
- Many governments have bulldozed shanty towns to try to relocate the people, but this tactic hardly ever works.
- In Delhi schemes were introduced where the local community was closely involved in the planning and building of new houses.

The Rural-Urban Fringe

- The **Rural-Urban fringe** is the name given to the land the land at the edge of an urban area, where there is often a huge mixture of land uses.

- Greenbelts were established to prevent the continued growth of many of the largest cities of England and Scotland.

Populations

Global population distribution

- The term '**population density**' is used to describe the pattern of where people live in the world.
- There are many reasons for the differences in population density. They can be divided into physical factors and human factors.
- Physical reasons include accessibility, climate, relief, resource, soil and vegetation.
- Human reasons include economic factors, political factors and social factors.

The demographic transition model

The population of the world grows according to two factors: birth rate and death rate. The relationship between these two is called the **natural increase**.

The relationship between birth rate and death rate has been used to create a four stage model of a country's population change, called the demographic model.

Stage One: High birth rate (BR) and high death rate (DR).

Stage Two: BR remains high, but DR falls by the end of the stage.

Stage Three: BR falls rapidly, and DR continues to slowly fall.

Stage Four: BR and DR low, at under 10 per 1000.

It has been suggested that a new fifth stage should be added to the model, due to some countries having higher DR than BR.

Population pyramids

- Different shaped **population pyramids** indicate the stage of development that a certain country has reached.
- Population pyramids can indicate the BR and DR of a country.
- Population pyramids can also show the percentage of the population, which is described as being "dependant".
- Population pyramids can be used to help planning for the future also, as they can be used to project the percentages of certain age-groups in the population over the next 50 years.

Migration

- **Migration** is defined as a permanent or semi-permanent change in where someone lives.

- Migrations fall into two groups, they can be voluntary (where the migrant decides to move) or forced (where the migrant has little choice but to move).
- The decision to migrate can be a very complex one, or could simply be for one reason. The migration normally involves considering the positive aspects of the move (called the **pull factors**) and the negative reasons for the move (called the **push factors**).
- **Push factors** are the things encouraging someone to move from a place.
- **Pull factors** are the things that entice someone to a new place.
- En-route factors, or intervening obstacles, are things that might hinder the migration.
- Refugee movement (forced migration). Example: The Kosovo Albanians: March 1999.
- The most common example of voluntary migration is the movement of people from rural areas to urban areas. This is called **rural to urban migration**.
- In LEDC's the movement to urban areas is even greater than in MEDC's. This is sometimes called "the bright lights syndrome".

Population growth

- **World population growth** is increasing, and is already causing many problems.
- The population growth in the LEDC's could lead to a range of problems including: urban areas will become increasingly overcrowded, the problem of massive unemployment will occur, as well as more pollution and traffic congestion.
- The drop in birth rates, as well as the increasing life expectancy of people in MEDC's, has led to problems in these countries also. As the percentage of elderly dependants increases, there will be less people of working age to support a larger dependant population. Health care resources will have to be increased.
- In 1798 Thomas Malthus produced an interesting theory on how population and food resources might continue. He said that as the population continued to grow at a geometric rate, it would slowly catch up the food supply, which only grew arithmetically.
- In 1965 Esther Boserup put forward a different theory claiming that humans will develop new technologies to increase food production whenever they need to.

Population issues in MEDC's

- Countries, such as Japan and the Netherlands have tried to increase the land available for their growing urban areas by reclaiming land from the sea and draining marsh lands.
- Some developed countries have tried to boost their declining populations by encouraging the in-migration of migrant workers.

Population issues in LEDC's

- Population policies have been introduced in some countries to try to curb the rapid growth.
- Education in contraception and family planning has become very important.
- Irrigation schemes have been vital in increasing the agricultural yields of many areas of the developing world.

Agriculture

The Farming System

- Any farm can be viewed as a system, with inputs, throughputs (or processes), outputs and feedback.
- Factors which affect the type of farming include: capital, choice, climate, labour, market, politics, relief and soils.

Commercial and Subsistence Farming

- **Commercial farming** involves farming for a profit. These farms can be arable (just growing crops), pastoral (just rearing animals) or mixed (both arable and pastoral).
- The arable farms of East Anglia are a good example of commercial farming, as are the cereal farms of the central United States and the Canadian Prairies.
- Subsistence farmers only produce enough to feed themselves and their family. This is the most common form of farming in LEDC's.
- Some of them are nomadic, meaning that they move around the country using a piece of land for a while and then moving on.

Intensive and Extensive Farming

- **Intensive farms** generally take up a fairly small area of land, but aim to have a very high output, through massive inputs of capital and labour.
- **Extensive farming** is the direct opposite of intensive farming. The farms are large in comparison to the money injected into it or the labour used on it.

Farming in the UK

- The main types of farming that you would find in the UK are arable, dairying and hill farming. All of them are commercial.
- The Common Agricultural Policy and other regulations have encouraged arable farming more than dairying or hill sheep farming, and this has led to many farms becoming mixed farms.
- Most farming in Britain tends to be intensive although some of the hill farms of Wales and Scotland could be described as extensive.

Agricultural Policies

- The **Common Agricultural Policy** was a policy brought in by the EU in 1962.
- It aimed to increase agricultural production in member countries.
- It aimed to improve the standard of living experienced by farmers.
- It aimed to maintain prices and supplies of food at a reasonable cost to the consumers.
- The Common Agricultural policy established minimum prices for agricultural produce that the farmer was guaranteed to receive.
- It led rapidly to the establishment of huge surpluses in many agricultural products, such as beef, butter, cereals, milk and wine.
- In 1992 the policy was reformed with far less subsidies and more concern for the natural environment.

Agriculture in MEDC's

- Between the end of the war in 1945 and 1995 over 60% of hedgerows in England and Wales had been removed.
- The loss of hedgerows also increases the chance of soil erosion occurring as they shelter the land from wind, helping the soil to bind together.
- The increased use of pesticides and fertilisers has led to air and water pollution.
- Fertilisers in water can cause rapid algae growth, which can cause eutrophication to occur.

Agriculture in LEDC's

- Food production is one of the most important industries in most LEDC's and agriculture is often still their main source of employment.
- Strategies have been introduced, aimed at helping the farmers become firstly self-sufficient and then begin to allow them to make a profit.
- The Green Revolution and irrigation schemes have both led to increased agricultural yields in developing world countries.

Development

Contrasts in development

- The most common indicator of development is to look at the wealth of a country, and compare it to others, using the **Gross National Product**.
- Using GNP an alternative map of the world can be created, showing the developed (North) and developing (South) countries.
- Many different indicators can be used to assess the development of a country. Some include infant mortality rate, literacy rate, life expectancy and daily calorie intake.
- The **Human Development Index** was devised by the United Nations in 1990 and uses a number of indicators of development to give each country in the world a development score.

Environmental hazards

- Water is essential for life and yet nearly one third of the population of the world do not have access to safe drinking water.
- Aid agencies have establishing safe water resources as one of their primary targets when they give aid to a country.
- Food shortages are also common throughout the developing world.
- Disease such as bilharzia, cholera and malaria threaten huge numbers of people in the developing world.
- Natural hazards such as earthquakes and volcanoes have a devastating effect on developing countries. A weak earthquake in a developing country can cause far more damage and destruction than a more powerful one in a developed country.
- Floods and drought also commonly affect countries of the developing world.

The Brandt report

- The Independent Commission on International Development Issues published a report called "**North-South: a programme for survival**" which outlined how developed and developing world countries must work together to face the problems that faced the world.
- Twenty years on and some of the proposals have been implemented successfully, some partially and some seem rather dated.

Interdependence

- **Interdependence** means that LEDC's and MEDC's actually rely on each other, and without one the other would not be able to survive.
- There is a balance of trade between the countries of the developed North and the developing South. However not everyone agrees that it is particularly fair.
- Developed countries tend to earn more money from their exports than they spend on imports, meaning they have a trade surplus and will become richer.
- Many developing countries import more than they export, meaning they have a trade deficit and so become poorer, and fall greater into debt.

- Some countries have grouped together in an attempt to make trade cheaper and easier between them, whilst increasing taxes on products brought in from outside the bloc. Examples include the European Union, Mercosur and NAFTA.
- Many of the developing countries of the world rely on one or two main industries to sustain them.

Types of aid

- Charities such as Oxfam, Comic Relief and Save the Children raise huge amounts of money for projects in developing countries.
- **Conditional aid** is given by a donor country (MEDC) to a receptor country (LEDC) to finance projects in that country. In return the receptor country usually has to agree to buy other products from the donor country.
- **Long-term aid** aims to help the country develop in the future, by introducing schemes to help things like health care, education and food production.
- This form of aid involves the developed countries giving money to central international organisations such as the World Bank and the World Health Organisation.
- Charities and governments send short-term aid after a natural disaster to help the country recover.
- The main disadvantage of all forms of aid is that many developing countries have become dependent upon it for their survival.

Industry

The industrial system

- Any industry can be viewed as a system, with **inputs, throughputs** (or **processes**), **outputs** and **feedback**.
- A very good example of an industrial system is the car manufacturing industry, like the **Rover factory** at Longbridge in Birmingham.

Classifying industry

Industry can be classified using a four-way division:

- **Primary industries** produce raw materials.
- **Secondary industries** are manufacturing industries.
- **Tertiary industries** provide services.
- **Quaternary industries** are involved in research and development.

You can use the percentage of people working in each sector to help describe how developed a country is. This is called the **Employment structure**.

The more developed a country becomes the more it will rely on secondary and, in particular, tertiary industries.

The location of industry

- **Location factors** are easily divided into two sections: Physical factors and Socio-economic (human) factors.
- **Physical factors** include accessibility, climate, land, power and raw materials.
- **Socio-economic factors** include capital, communications, government policy, labour supply and markets.
- A general rule is that the physical factors were the primary influence over the location of the old industries in Britain, whilst the economic ones are increasingly important in industrial location now.

Example industries

- South Wales has experienced both growth and decline as an industrial area. In 1860 there were over 30 iron works in the valleys of South Wales. By the 1990's only two steelworks were left in South Wales.
- South Wales is experiencing something of a recovery again, thanks to being at one end of the **M4 Corridor**.
- New industrial regions in Britain have tended to grow up along main communication routes. These industries are described as being footloose.
- The best example of this is the "**Sunrise Strip**", which takes in the area around motorways such as the M11, M23, M3 and, most importantly, the M4.
- **Science Parks** are areas of industry that have grown up on Greenfield sites outside of major cities around the world.
- They usually have very close links to a major research institution, probably a university.

- In Britain a very good example is the **Cambridge Science Park**.
- **The Ruhr Valley** is the industrial heartland of Europe.
- The region is served by two of Europe's largest rivers, the Ruhr and the Rhine.
- Its central location makes it a perfect place for industry, as export to the whole of Europe is very easy.
- Over the past half century the car manufacture industry has also grown massively in the area, as well as food processing and oil refining.

Newly industrialised countries

- There are a number of countries around the world that can be accurately described as Newly Industrialised Countries (NIC's).
- There are three stages to the development of an NIC: Traditional Society, Import substitution industry, and export orientated industry.
- NIC's include South Korea, Hong Kong, Singapore and Taiwan.

Multi-national companies

- **Multi-national** or **Trans-national** companies are ones which locate their factories throughout the world.
- The headquarters of the company remains in its original country, usually one of the most developed countries in the world.
- The companies bring much needed money into the country.
- They create jobs for the local population.
- The wages paid to local workers are often low.

Tourism and Resources

Natural Resources

- The 6 billion population of the world put pressure on the resources of the world, which in some cases are insufficient, and in some cases are rapidly running out.
- Resources can be easily divided into two sections: **Renewable** and **Non-renewable**.
- **Renewable resources** are ones that will never run out, either naturally or through good management.
- Examples include forests, fish, animals, water and the sun.
- **Non-renewable resources** are ones that will eventually run out. They are described as being finite.
- Examples include oil, gas, coal, and minerals.

Managing Resources

- The level of development that a country has reached can directly affect which natural resources they use.
- Most of the major population growth has occurred in developing countries in places like Africa, where the pressure on food resources is intense.
- **Management** of resources can include methods such as producing alternative forms of energy (HEP, wind power, solar power, geothermal power), conserving resources (forestry, fishing quotas), resource substitution, recycling and pollution controls.

National Parks in Britain

- **Dartmoor** is one of the 12 designated National Parks in England and Wales.
- They aimed to preserve and enhance the natural beauty of the area and promote the enjoyment of the area by the general public.
- Dartmoor plays host to over 8 million visitors every year.
- Conflicts can occur between visitors, farmers, local residents, environmentalists and the army, all of whom have different ideas over how the land should be used.

Tourism in LEDC's

- In many developing countries tourism is seen to be the answer to their economic problems.
- However, as increasing numbers of people flood into places like Kenya, they are finding that tourism brings with it a range of environmental, cultural and social problems.
- The increase in tourism has led to economic growth and the creation of many jobs for local people.
- There are many problems caused by the massive numbers of tourists, such as environmental damage, cultures being lost and a reliance on the tourist industry.

Ecotourism

- **Ecotourism** or Green Tourism is aimed at allowing people to visit naturally beautiful environments whilst protecting them for the future at the same time.
- Ecotourism also aims to benefit the local people directly. One country to try this new form of tourism is Belize, on the Caribbean coast of Central America.

- The main aim is to achieve sustainability, which means that the environment is not in any way damaged by the tourists.
- All that is being attempted in Belize is building towards the goal of continuing to benefit from tourism, whilst protecting and nurturing the natural environment.

The impacts of tourism

- Tourism has both positive and negative impacts for an area.
- Tourism brings much needed investment into an area.
- Tourism provides employment for many local people.
- Income from tourism may be used to help conserve the natural environment.
- Tourism may help to preserve local cultures and communities.
- The jobs for the locals are often badly paid, with very poor working conditions.
- The environment could easily be damaged by the huge number of tourists coming to see it.
- Increasing numbers of tourists brings problems such as littering, pollution and footpath erosion.
- Local cultures could be devalued by tourism.

Tectonics

Tectonic Plates

- The Earth's crust is made up of seven principal tectonic plates and numerous other smaller plates.
- The plates move due to convection currents in the mantle.
- There are two different types of plate: oceanic (dense, thin) and continental (light but thick)

Plate Boundaries

- **Destructive plate boundaries** cause violent volcanoes and earthquakes, as well as deep-ocean trenches and fold mountains.
- **Volcanoes** and **earthquakes** do occur on constructive plate boundaries. They also cause mid-ocean ridges to form.
- The main effects of a conservative plate boundary are earthquakes, which can be fairly violent and frequent.
- At collision plate boundaries the two plates push into each other forcing material to be folded up into huge mountain ranges.

Volcanoes

- **Volcanoes** are formed along two types of plate boundary: destructive and constructive boundaries.
- There are three main volcanic cones: acid lava cones, composite cones and basic lava cones.

Examples: Mt. St. Helens (USA) & Mt. Pinatubo (Philippines)

Earthquakes

- **Earthquakes** occur along faults, caused by the sudden jerking movements of the fault, either laterally or vertically.
- Earthquakes are measured in two ways; The Richter Scale and the Mercalli Scale
- The point at which an earthquake actually begins, deep below the earth's surface is called the focus.
- The point directly above the focus, on the earth's surface, is called the epicentre.
- The effects of an earthquake are described as being primary or secondary.

Examples: Kobe (Japan); Izmit (Turkey).

Fold Mountains

- Form along both destructive and collision plate boundaries, in other words where two plates are pushing towards each other.
- The best examples are the Himalayas, the Rockies, the Andes and the Alps, all of which are huge fold mountain ranges caused by the collision of two plates.
- Humans use **Fold mountains** for a wide variety of purposes, including farming, tourism, forestry industry and hydro-electric power production:

The Impact of Natural Hazards

- **Natural hazards** will affect More Economically Developed Countries (MEDC's) in a differing way to those which occur in Less Economically Developed Countries (LEDC's).

Rocks and Landscapes

Rock Classifications

- **Igneous Rocks** are Fire formed. They originate from the magma in the mantle of the Earth. They can be extrusive or intrusive.
- Over millions of years the actions of rivers, glaciers and the wind produce large amounts of small particles called sediments. These accumulated on sea floors in layers, and due to the pressure of material above they were compressed to form sedimentary rocks.
- Rocks which have been changed in shape or form, usually by heat or pressure, are called metamorphic rocks. They begin as either igneous or sedimentary rocks.
- Igneous, sedimentary and metamorphic rocks together form the **rock cycle**.

Weathering Processes

- **Freeze-thaw** occurs when water enters cracks in the rock during the day. Overnight the temperature drops and the water freezes. As it freezes, it expands, cracking the rock.
- In hot, dry climates exfoliation occurs due to the heating and cooling of the rock.
- **Hydrolysis** attacks rocks which include feldspar crystals. It dissolves them and disintegrates the rock.
- **Carbonation** occurs when Calcium carbonate in the rocks reacts with acidic water and dissolves leaving behind calcium bicarbonate.

Granite

- It is a hard, crystalline rock, which is very resistant to erosion.
- The main processes which affect it are freeze-thaw and hydrolysis.
- A good example area to use in Great Britain is Dartmoor.
- The main granite landforms are tors.
- Because granite is impermeable, and the soil is poor, areas such as Dartmoor are ideal sites for reservoirs.
- Historically granite areas were mined, especially in the South-West, for things such as copper, tin and arsenic.
- Tourism is increasingly becoming important in granite areas.

Carboniferous Limestone

- Formed from the remains of organic matter, usually seashells and plants. It was formed under the sea 220-280 million years ago.
- The main processes which affect it are carbonation and solution.
- The two best areas of carboniferous limestone in Britain are the Yorkshire Dales and the Peak District.
- **Carboniferous limestone** produces distinctive karst scenery.
- The tourist industry is a very important source of income to limestone areas.
- Limestone is an excellent building stone, and has been used in some very well-known buildings, such as the Houses of Parliament.

- It is used as an industrial cleanser, farmers use it as fertiliser and it forms an important ingredient in cement making.

Chalk and Clay

- **Chalk** is an example of a porous rock, as it has pore spaces, which can store water. It does not have joints and bedding planes like carboniferous limestone.
- **Clay** is porous, but becomes impermeable when wet, as the particles expand and fill the pore spaces.
- The main areas of chalk and clay in this country are in the South and East of the country. Places like the North and South Downs are good examples.
- Chalk and Clay landforms centre around escarpments and include dry valleys, bournes and clay vales.
- Clay is very fertile, but must be drained first. Once that has been done farming includes dairying, sheep grazing, and some arable farming. On the chalk escarpments the main agriculture is sheep grazing.
- Chalk is a main ingredient in cement making, and is quarried for that purpose. Clay can be used in pottery.

Quarrying

- **Quarrying** is one of the biggest industries in the areas where granite, limestone, chalk and clay are found.
- Quarries provide much needed employment.
- The increased income means that more money is likely to be put into the local economy.
- Noise pollution from the blasting needed to extract rock.
- Noise and dust pollution from the many heavy lorries that will be travelling to and from the quarry every day.
- Wildlife habitats are initially lost when the quarry opens.
- Possible solutions include using trains rather than lorries, using trees to screen off the quarry and landscaping the quarry once production has ceased.

Rivers

The Drainage Basin System

- The **drainage basin** acts as an open system, with a number of inputs, outputs, stores and transfers.
- The drainage basin system forms an important part of the overall water cycle.
- As water flows downhill into rivers it can create a number of different drainage patterns. These are called centripetal, dendritic, parallel, radial and trellis patterns.

River Profiles

- The **long profile** of a river looks at its full length. It is steep in the upper stages, a more gentle slope in the middle section and almost flat in the lower reaches.
- The **cross profile** of a river looks at the shape of the river channel. In the upper reaches it is narrow and not very deep. In the middle stages it is widened but is still not particularly deep. By the lower stages it is very wide and deep.

Fluvial Processes

- **Fluvial erosion** occurs vertically and laterally, using the processes of attrition, abrasion, corrosion and hydraulic action.
- Which type of erosion occurs depends upon where in the river you are looking at.
- Fluvial transportation occurs through the processes of traction, saltation, suspension and solution.
- Which type of transportation occurs depends on where in the river the material is.
- **Fluvial deposition** occurs when the water slows down, losing energy and causing it to drop what it is transporting.

Fluvial Features

- Erosional features include interlocking spurs, meanders, ox-bow lakes, V-shaped valleys and waterfalls.
- Depositional features include deltas, flood plains and levees.

River Basins

- For thousands of years rivers have been the focal point of people's activities, including fishing, as a source of drinking water, for dumping waste, for navigation and for power production.
- As humans have increasingly used and abused river basins so management and planning of them has become increasingly important.
- **Flooding** is the most common thing to have to plan around.
- Rivers are used for the dumping of waste, such as sewage, agricultural waste, chemicals and oil, causing water pollution, which may affect the natural environment and humans.

Hydrology

- A river regime is the difference in the discharge of the river throughout the year.
- Flooding occurs due to a sudden increase in the amount of water travelling down a river.

- The discharge of a river is shown on a graph called a flood or storm hydrograph. By looking at the peak rainfall and comparing it with the peak discharge you can work out the lag-time (the time between the two peaks). Flood hydrographs are very important in predicting how a certain river will behave in a time of intense rainfall.

Coasts

Waves

- A **wave** is formed by the wind blowing across the surface of the water, creating ripples, which then grow into waves.
- The **Fetch** determines how powerful a wave may be. It is the distance that the wave has travelled.
- **Destructive waves** have a much stronger backwash than swash, allowing them to remove material from the beach.
- Destructive waves create a steep narrow beach.
- **Constructive waves** have a stronger swash than backwash, causing the beach to be built up by the deposited material.
- Constructive waves create a wide, gently sloping beach.

Coastal Processes

- Processes of coastal erosion include attrition, corrasion, corrosion, hydraulic action, wave pounding and sub-aerial processes.
- There are a number of factors which affect the rate of this erosion: rock type, jointing, coastal rock arrangement and rock angle.
- Processes of coastal transportation include long-shore drift, traction, saltation, suspension, and solution.
- **Coastal deposition** occurs when the waves lose energy.

Coastal Features

- **Erosional features** include headlands, bays, cliffs, wave-cut platforms, stacks, stumps, arches and caves.
- **Depositional features** include beaches, spits, bars and tombolos.

Sea-level Change

- Caused by water freezing during the Ice-Age.
- Features of sea level change include raised beaches, rias and fjords.

Management of Coasts

- Many strategies have been tried around the world, and these can be divided into two main groups, hard and soft engineering.
- Hard engineering techniques include sea walls, wooden groynes, gabion groynes and rock armour.
- Soft engineering techniques include beach replenishment.
- The final method of coastal management is of course to do nothing and allow the sea attack the coastline naturally.
- Most of the solutions are very costly, and in many places questions are being asked as to whether they are actually worth the money.

Glaciers

The Glacial System

- Just as a river could be seen as a system of inputs, outputs, transfers and storage, so can a glacier.
- Glaciers originate from heavy snowfalls over a prolonged period of time.
- During a single year a valley glacier may well both grow and retreat, depending on the rate of **accumulation** compared to the rate of **ablation**. This is called the ice **budget or glacial budget**.
- In general glaciers around the world are retreating at the moment as the climate slowly warms up and they melt slightly every year.

Glacial Erosion

- **Glacial erosion** occurs through three main processes
- **Plucking** involves the ice picking up boulders by freezing around them
- **Abrasion** is the scouring of the rock on the valley floor by rocks being carried by the glacier.
- **Freeze-thaw** occurs where water freezes and expands in cracks in the rock

Glacial Transport and Deposition

- Glaciers carry a huge amount of material. These rocks are called moraine and can be carried great distances by a glacier.
- Glaciers will always reach a point when they will start to melt, mainly due to the rise in temperature as they descend in height down the valley. As the ice melts it cannot carry as much material and so this is deposited.

Glacial Landforms

- The main erosional features of a glacier include aretes, corries, glacial troughs, hanging valleys, pyramid peaks, ribbon lakes, truncated spurs, and the distinctive U-shaped valleys.
- The main depositional features of glaciers are boulder clay, drumlins, erratics and moraines (terminal, lateral, medial, ground and recessional).

Human Uses of Glacial Areas

- Human uses of glacial areas include agriculture, tourism, recreation and hydro-electric power schemes.
- Management is needed in glacial areas to cope with many demands and pressures.

Weather and Climate

Global Climate

- **Climate** describes the temperature, precipitation, and other weather conditions of a certain area.
- **Weather** describes the day to day changes in temperature, wind and precipitation.
- Many factors affect the climate of different areas around the world, including altitude, aspect, distance from the sea, latitude, ocean currents and the prevailing winds.
- The prevailing (most common) wind in the United Kingdom comes from the South West.

Climate Graphs

- **Climate Graphs** are very useful in comparing the annual temperature and rainfall of places around the world.
- Plot on the rainfall as a bar chart, coloured blue. Plot on the temperature as a line graph, coloured red.

Rainfall Types

- There are three common types of rainfall, all of which occur in the United Kingdom.
- All have the common theme of air being forced to rise.
- **Convective rainfall** occurs when the warm land surface heats the air above it, causing it to rise, cool and condense.
- **Frontal rainfall** occurs when two air masses meet, with the warmer air being forced to rise over the cooler air. The rising air cools and condenses.
- **Relief rainfall** occurs when moist air reaches the coast and is forced to rise over mountains and hills. The rising air cools and condenses.

UK Climate

- The United Kingdom has a **temperate maritime** climate.
- We have relatively cool summers and not particularly cold winters
- The prevailing winds in the United Kingdom come from the South West
- Temperatures in the United Kingdom are dictated by latitude, particularly in the summer.
- Although the prevailing wind is from the South West, there are four other directions from which air does travel to Britain, bringing differing climatic characteristics.
- **Depressions** are areas of low pressure that bring clouds and rain to the United Kingdom. They originate over the Atlantic.
- **Anticyclones** are areas of high pressure. They bring warm, stable conditions, with clear skies and lots of sunshine.

The impact of weather on human activity

- Britain doesn't tend experience extremes of weather too often.
- **Droughts** are times when there has been below average rainfall for a period of time, causing water supplies to dry up and run out.

- In some less developed countries the threat of drought is a very dangerous one that could result in millions of people starving to death.
- **Fog** can cause great problems when it occurs in the United Kingdom.
- **Tropical storms** are known as hurricanes, cyclones, typhoons, and willy willies. They are very intense areas of very low pressure which produce very strong winds, torrential rain and storm surges.

Example: Hurricane Floyd (USA)

Environmental Problems

- **Sulphur dioxides** and **nitrogen oxides** emitted from power stations are carried by the wind. This falls as acid rain. Lakes and rivers have been contaminated killing fish and plant life.
- The release of greenhouse gases into the atmosphere allows the radiation from the sun to enter the atmosphere but then does not allow enough of it to leave, causing the atmosphere to heat up. This is called Global Warming.
- **Ozone** is the gas in the atmosphere that prevents harmful ultra-violet rays from affecting us. Holes in the ozone layer have been found over both Poles. The primary effects to humans are the increased danger of skin cancer, and a possible reduction in immunity from disease.

Ecosystems

The Overview of Ecosystems

- **Ecosystems** are entire living communities of plants and animals that, although diverse in nature, share common characteristics.
- Ecosystems can be split into two main sections, **abiotic** and **biotic** elements.
- Climate, soils and vegetation interact closely to produce the characteristic nature of an individual ecosystem.

Coniferous Woodlands

- The temperature in the summer varies between 12 and 18°C, with temperatures falling below freezing for the winter months.
- The total precipitation amount will be approximately 500mm.
- The main soil found in coniferous forests is called a podsol.
- **Coniferous trees** are evergreen, meaning that they have leaves all year round, and therefore can always photosynthesise.
- The trees are extensively used as timber and for paper making

Deciduous Woodlands

- The summer temperatures range between 15 and 20°C, whilst the cool winters don't generally drop below zero.
- Rainfall is moderate, usually between 1000 and 1500mm.
- The typical soil of a British deciduous woodland is a brown earth.
- **Deciduous trees** are ones which drop their leaves in the autumn.
- One of the primary reasons for the clearance of many of the deciduous woodlands around Britain was to use the area for agriculture.

Deserts

- Temperature often remains above 30°C for long periods.
- They tend to receive an average of less than 300mm of rain each year.
- Desert soils are alkaline, and are very dry with little humus.
- Plants have to cope with very little water in the hot desert. Species such as cacti have evolved to reduce water loss to a minimum.
- Many plants have seeds that only germinate when the rains come.

Mediterranean Woodlands and Scrub

- The **Mediterranean** experiences hot, dry summers, with temperatures usually between 20 and 25°C.
- There is moderate rainfall, of around 800mm, which falls mainly in the winter.
- Mediterranean soils are a mixture between brown earths in the wetter areas and desert soils in the dry places.
- The Mediterranean hillsides were once covered in dense deciduous and coniferous forests.

- Where the forests have been removed a dense shrubland has replaced them.
- Forest fires are very common in the Mediterranean area, and this has helped to destroy much of the original woodland.

Tropical Rainforests

- Hot throughout the year, with temperatures ranging between 25 and 30°C.
- There also is a massive level of precipitation, usually between 2000 and 3000mm each year.
- Rainforest soils are called **latsols**.
- **Tropical rainforests** boasts a huge variety of vegetation and animal life.
- They can be divided into five simple layers, from the canopy to the forest floor.
- Humans use the rainforests for logging, ranching, dam projects, subsistence farming, and mining.

Management of Ecosystems

- The main method of management is called **sustainability**. This means that the forests are used, but in a way which does not affect their long term growth.
- By removing the trees, humans have also removed the main source of nutrients in the soil in the rainforests.
- By chopping down vast areas of both the rainforests and deciduous woodlands, less carbon dioxide can be processed, meaning that there is more in the atmosphere.



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