TOPICS/CONCEPTS –

Theme 1. Demographics and human movements

1.1 Population dynamics
1.2 Migration

Theme 2. Settlement and urban morphology

2.1 Settlements
2.2 Urbanization

Theme 3. Trade, aid and exchange

3.1 Resources and human development
3.2 Globalization
3.3 Trade
3.4 Aid
3.5 Tourism
3.6 Environmental risks of economic development

Theme 4. Dynamic Earth

6.1 Earth's Structure
6.2 Plate tectonics – Earthquakes and volcanoes

Theme 1. Demographics and human movements

Population dynamics

Reasons for recent rapid population growth ('population explosion'):

-improved medical care – vaccinations, hospitals, doctors, new drugs and scientific inventions
-improved sanitation and water supply
-improvements in food production (quality quantity)
-improved transport – moving food, doctors etc.
-decrease in child mortality

Population growth terms:

-**Migration**: the movement of people (or animals) from one country or region to another
-**Birth rate**: average number of live births in a year for every 1000 people
-**Death rate**: average number of deaths for every 1000 people

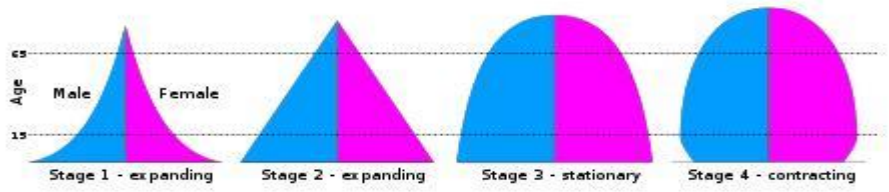
Population growth is related to the amount of resources available for example water, wood and minerals

Carrying Capacity – The number of people the environment can support without there being negative effects to the population.

Optimum Population – This is the amount of people that a region/country can ecologically support, usually less than carrying capacity.

Under-population – This is when country has declined too much that it can't support its economic system.
Overpopulation – Too much population of an area: overcrowding, depletion of resources.

Population pyramid general format:



Stage 1: high birth rate; high death rates; short life expectancy; less dependency (since there are few old people and children have to work anyway)

Stage 2: high birth rate; fall in death rate; slightly longer life expectancy; more dependency as there are more elderly

Stage 3: declining birth rate; declining death rate; longer life expectancy; more dependency

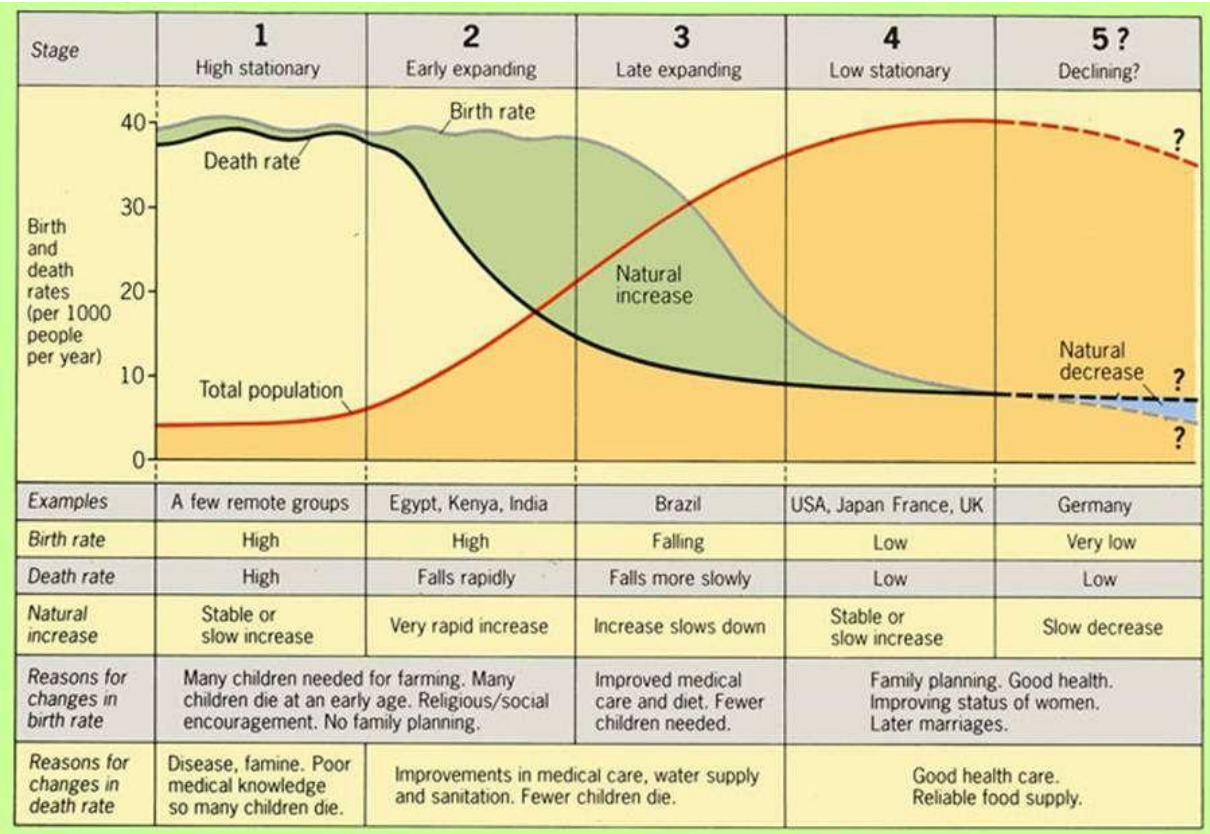
Stage 4: low birth rate; low death rate; highest dependency ratio; longest life expectancy

High death rates in LEDCs are caused by: poor health care/few hospitals/doctors/nurses/clinics; poor sanitation/poor hygiene/lack of toilets/dirty places; poor access to safe/clean water/water borne diseases; limited food supplies/malnutrition/starvation; HIV/AIDS; Natural disasters/drought/floods; Lack of vaccinations/medicines/cannot cure diseases; Lack of education about healthy lifestyles e.g. smoking/diet; Lack of provision for elderly e.g. pensions/old people's homes

Birth rates are low in MEDCs because:

availability of contraception/family planning/abortions;
educated re. contraception/family planning;
able to afford contraception/family planning/abortions;
traditionally small families/don't need to prove virility/not traditional to have large families;
expense of bringing up children/childcare/don't have to send children to work/can afford to bring up children; many women have careers/women are educated;
availability of pensions/do not need children to look after parents in old age; low infant mortality rate;
Lack of religious beliefs/don't object to contraception

The **Demographic Transition Model**:



Stage	1 High stationary	2 Early expanding	3 Late expanding	4 Low stationary	5? Declining?
Examples	A few remote groups	Egypt, Kenya, India	Brazil	USA, Japan France, UK	Germany
Birth rate	High	High	Falling	Low	Very low
Death rate	High	Falls rapidly	Falls more slowly	Low	Low
Natural increase	Stable or slow increase	Very rapid increase	Increase slows down	Stable or slow increase	Slow decrease
Reasons for changes in birth rate	Many children needed for farming. Many children die at an early age. Religious/social encouragement. No family planning.		Improved medical care and diet. Fewer children needed.	Family planning. Good health. Improving status of women. Later marriages.	
Reasons for changes in death rate	Disease, famine. Poor medical knowledge so many children die.	Improvements in medical care, water supply and sanitation. Fewer children die.		Good health care. Reliable food supply.	

Population distribution and density factors:

-Human: better housing opportunities, education, health, entertainment, retirement areas, -Physical: relief (for farming, defence), climate, water supply, resources
-Economic: ports, transport links, industrial areas, tourist areas, money available for high-tech industries Dependency ratio = non-economically active / economically active × 100 %

Human Movements

Migration: the movement of people (or animals) from one area to another, some types are:
Voluntary migration causes:
-find a job, or a better paid job -pioneers developing new areas -trade and economic expansion – territorial expansion -social amenities -be with friends/family

Forced migration causes:

-avoid religious/political persecution -avoid war

-slavery/forced labour as a prisoner of war -racial discrimination
-famine
-Natural disasters overpopulation

Problems for international migrants include:

lack of qualifications/skills/education/no experience/they have to do unskilled jobs/work informally; many are doing low paid jobs; poor working conditions/dirty jobs/long hours/exploitation by employers; many cannot speak the language;

some are unable to obtain employment/not enough jobs; can't afford education/health care/food/housing etc.; live in poor conditions/overcrowding/lacks sanitation; some may have to live away from their families; discrimination may occur/racism;

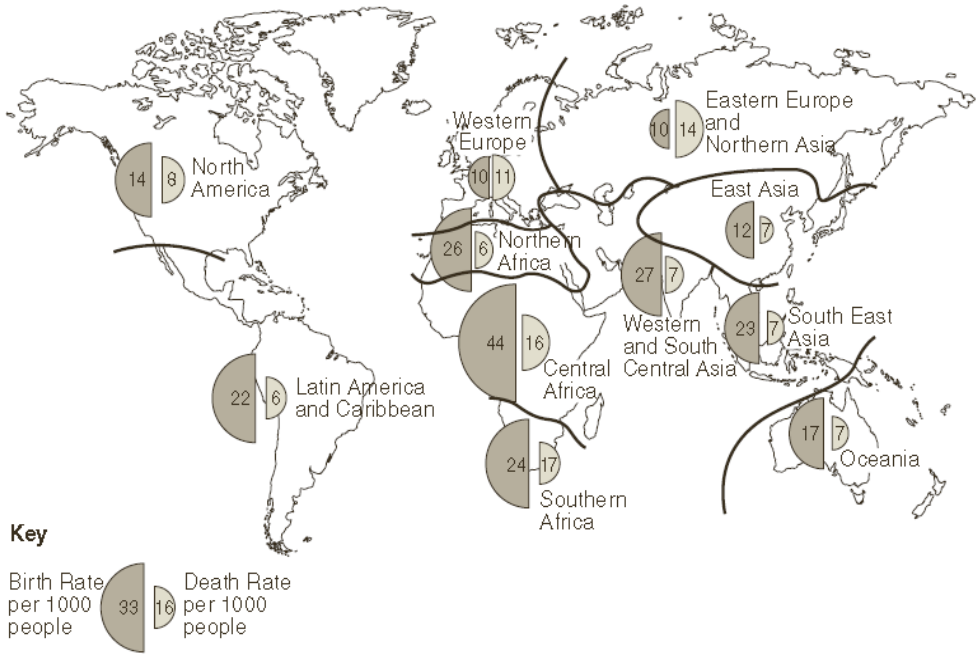
some may lack documentation/have to hide from authorities; trouble adapting to culture/religion etc.

Internal migration is within a country e.g. rural/urban depopulation, regional

External or **international** is between countries e.g. Negro slaves to America (forced) or Mexicans into the US (voluntary)
(There are other types: seasonal, daily, permanent, temporary, semi-permanent etc.)

Practice

(a) Study the map given below which shows birth and death rates in different parts of the world.



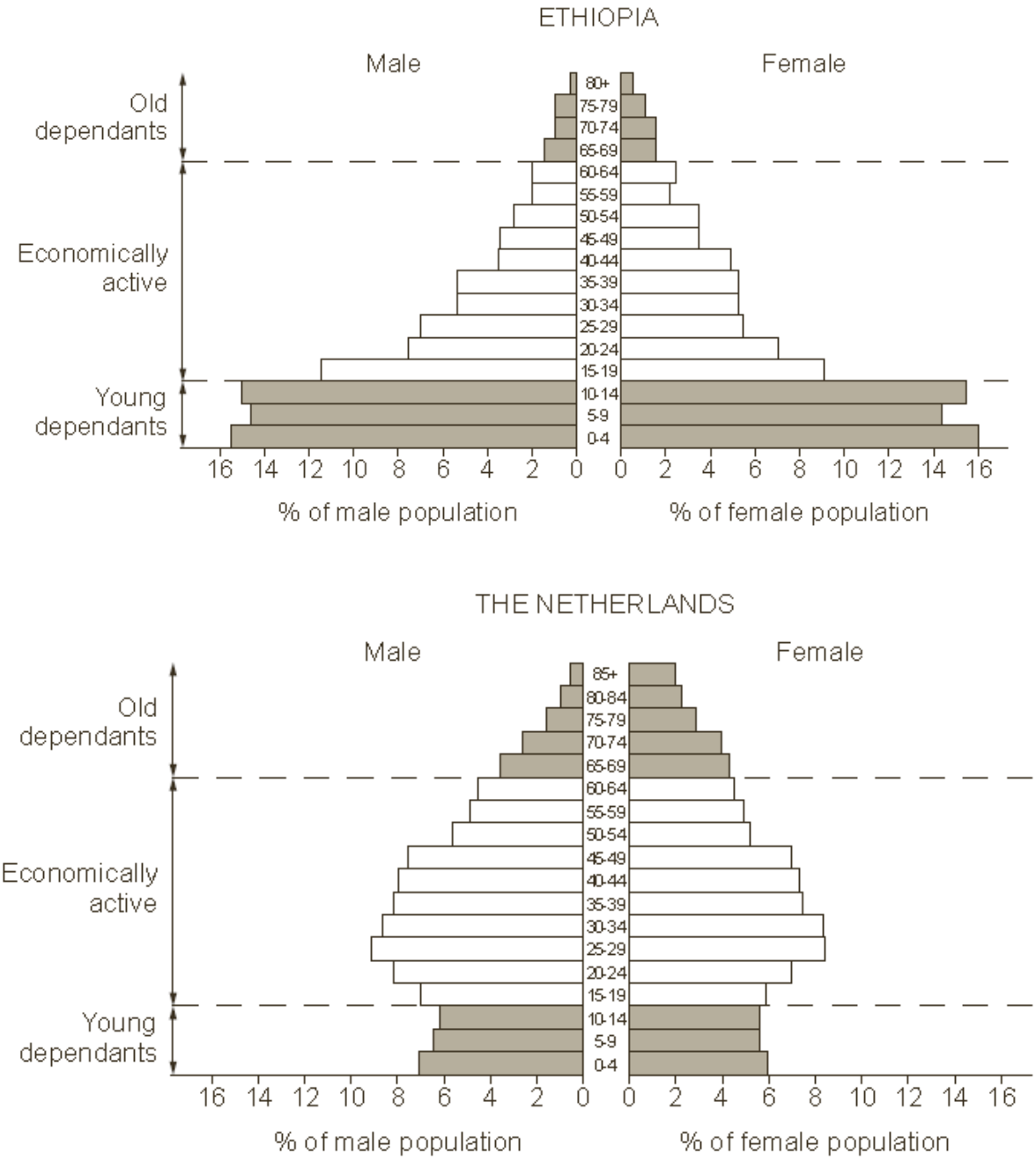
(i) What is meant by 'death rate'? **[1- Criteria A]**

(ii) Identify:
A the area with the highest rate of natural population increase,
B an area of natural population decline. **[2- Criteria A]**

(iii) Suggest reasons why:

- **a.** there are higher death rates in Western Europe and North America than in Latin America and the Caribbean **[2- Criteria D]**
- **b.** there are higher birth rates in Central and Southern Africa than in East Asia. **[2- Criteria D]**

(a) Study Fig. showing population pyramids of Ethiopia (an LEDC) and The Netherlands (an MEDC).



(i) Which age group in Ethiopia has the largest percentage of both males and females**? [1- Criteria A]**

(ii) What evidence in the population pyramids suggests that:

A. people in The Netherlands have a longer life expectancy than people in Ethiopia?
B. Ethiopia has a higher birth rate than The Netherlands? **[2- Criteria A]**

(iii) Describe the ways in which the dependent population is supported in LEDCs and MEDCs. **[4- Criteria C]**

(iv) How does the dependent population of Ethiopia differ from that of The Netherlands?

Support your answer with figures. **[3- Criteria D**]

(b) Study Fig. an extract about population growth in Japan.

Population crisis in Japan

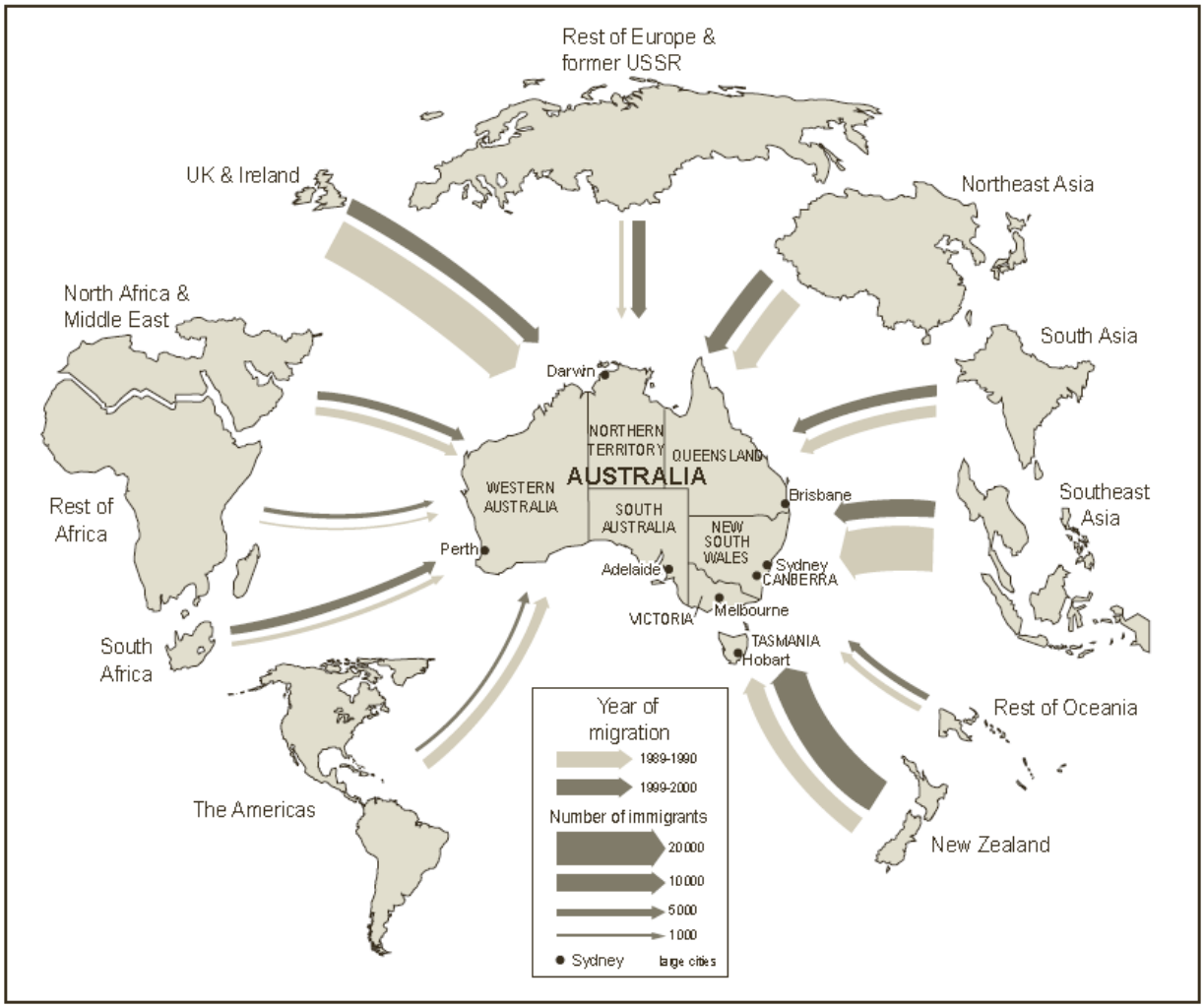
Japan's population growth has slowed to the lowest rate since the 1940s. In 1999, Japan's population grew by 0.16% to reach 126.7 million. Of that number, children under 14 made up about 14.8% of the population, a record low. By comparison, the same group in 1949 represented 35.5% of the population. A United Nations population report indicates that Japan's population is expected to fall to 105 million by 2050, with the average age expected to rise from 41 to 49. The proportion of the population 65 and older is expected to grow from 17% to 32% over the same period.

(i) Suggest reasons why Japan has an ageing population. **[3- Criteria D]**

(ii) Suggest the likely effects of this population trend on the Japanese economy by 2050. **[5- Criteria D]**

(c) Explain why the governments of some countries may be concerned by a rapid growth of population. You may refer to examples which you have studied. **[7- Criteria C]**

(a) Study Fig. information about the number of immigrants to Australia, an MEDC.



(i) What is meant by an *immigrant*? **[1 - Criteria A]**

(ii) Compare the number of immigrants in 1989-1990 with those in 1999-2000 and identify a
place of origin:
A which shows an increase in migration,
B which shows the largest decrease in migration. **[1 - Criteria D]**

(iii) Choose any area shown on Fig.above. Write down the name of the area which you have chosen and suggest **three** reasons why people migrate from there to an MEDC such as Australia. **[3 - Criteria C]**

(iv) Many migrants from other countries move to cities in Australia, such as Sydney and Melbourne. Describe the effects of international migration on cities such as these. **[3 - Criteria C]**

(v) A group of individuals conducted a survey to calculate population growth by interviewing people in a region. What type of data was collected? **[1- Criteria – B]**

Theme 2. Settlement and urban morphology

Settlement patterns:

Dispersed – an isolated, individual building or a group of two or three buildings, perhaps forming a hamlet, and separated from the next by 2 or 3 km.

Nucleated – Buildings are grouped together, initially for defence, or a common resource.

Linear – buildings are strung along a line of communication, for example a main road, a river valley, or canal or dyke

Factors that affect the position, size, growth and function of a settlement: -fuel supply: for heating and cooking
-food supplies
-nodal points: where routes converge

- **Wet point sites** - these have a good water supply. Many settlements grew around wet point sites, eg villages in the South Downs.
- **Dry point sites** - these are away from the risk of flooding, eg Ely in Cambridgeshire.
- **Defensive sites** - often found on higher ground so that in the past enemies could be seen from a distance, eg Corfe Castle, Dorset, or in the loop of a meander, eg Durham.
- **Aspect** - settlements are often found on the sunny side of a deep valley. This is common in settlements in the Alps.
- **Shelter** - from cold prevailing winds and rain.
- **Gap towns** - Lincoln is found in a gap between two areas of higher ground.
- **Resources** - important for industry, eg villages such as Aberfan in the Welsh valleys is close to coal reserves.
- **Bridging point** - settlements with 'ford' in their name often grew around a fording point or bridging point, eg Watford is found on the River Colne.
- **Trading centres** - often settlements grow where natural route ways and rivers meet, which helps the development of roads, railways and canals.

Hierarchy:
Determining order of importance:
1)the population size
2)the range and number of services
3)the sphere of influence

NOTE: there are least number of capitals (1) and many hamlets.

Land use in towns and cities:

Central business district (CBD)

The land in urban areas is used for many different purposes:

- **leisure and recreation** - may include open land, eg parks or built facilities such as sports centres
- **residential** - the building of houses and flats
- **transport** - road and rail networks, stations and airports
- **business and commerce** - the building of offices, shops and banks
- **industry** - factories, warehouses and small production centres

The CBD in the city centre is where most business and commerce is located.

Features that identify the CBD

High/multi-storey buildings.

- Expensive land values.
- Department stores or specialist shops, like jewellers.
- Shopping malls and pedestrian precincts.
- Cultural/historical buildings, museums and castles.
- Offices, finance, banks, administration, town hall (business sector).
- Bus and railway stations (transport centres).
- Multi-storey car parks.

The CBD is located in the centre because it is:

- a central location for road/railways to converge
- the most accessible location for workers
- accessible to most people for shops and businesses

-**Residential areas**:

-old inner city area: The inner city is also known as the **twilight zone**. It is typically found next to the CBD and has mainly terraced houses in a grid like pattern. These were originally built to house factory workers who worked in the inner city factories. Many of these factories have now closed down.

-inner city redevelopment: still high density, more amenities, high rise flats, more modern, but there are dark corridors, built to improve on the old buildings.

-suburbia: the urban sprawl (outward growth of city) and rising popularity of owning cars led to the construction of well planned and spacious houses with normally garages, back and front gardens etc. Suburban houses are usually larger than inner city terraces and most have a garden. Typically, they are detached or semi detached and the roads around them are arranged in cul de sacs and wide avenues. Land prices are generally cheaper than in the CBD and inner city, although the desirability of housing can make some areas expensive.

-outer city estate: located on the fringes of cities with varied types of housing (low rise, high rise and single story), where people were relocated when the inner city was being redeveloped

The **rural urban fringe**: This is found at the edge of a town or city and is where town meets country. It is common for this area to have a mixture of land uses such as some housing, golf courses, allotments, business parks and airports.

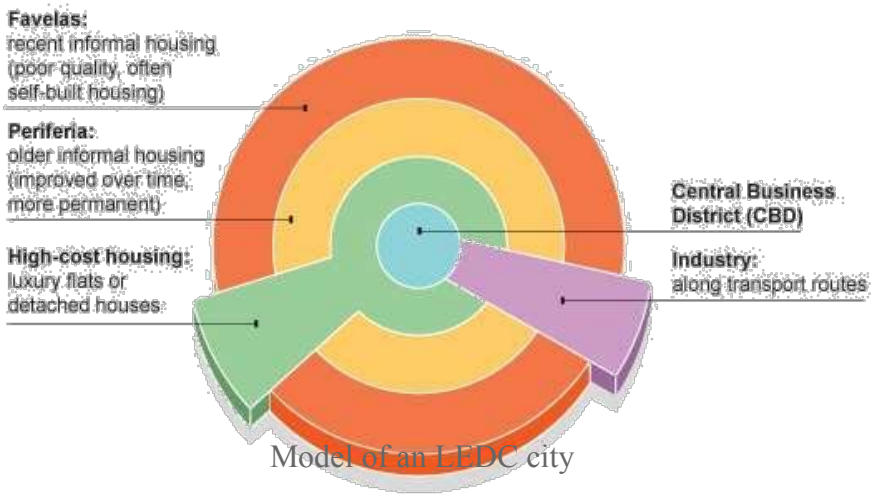
-**Industrial areas**: factories were built close as possible to the CBD but with enough space, next to canals and railways to transport materials, or rivers for cooling, power source or waste disposal and next to land where lots of workers could live.

-**Open spaces**: for a

relaxing atmosphere -
Transport routes

Land use in LEDCs

Although every *LEDC* city has its own characteristics, models can be used to illustrate a typical LEDC city.



Model of an LEDC city

Both *MEDC* and LEDC cities have a *CBD* - often the oldest part of the city.

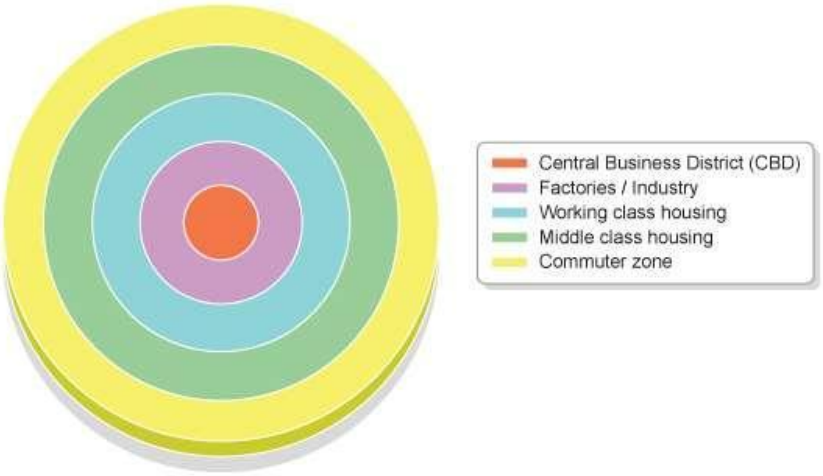
In LEDCs the poorest housing is found on the edge of the city - in contrast to MEDC cities whose suburban fringe is very often a place of high quality housing. The areas of poor quality housing found on the edge of cities in LEDCs are called **squatter settlements** or **shanty towns**

Land use in a MEDC

The Burgess and Hoyt model

Geographers have put together models of land use to show how a 'typical' city is laid out. One of the most famous of these is the **Burgess** or **concentric zone model**.

This model is based on the idea that land values are highest in the centre of a town or city. This is because competition is high in the central parts of the settlement. This leads to high-rise, high-density buildings being found near the **Central Business District (CBD)**, with low-density, sparse developments on the edge of the town or city.

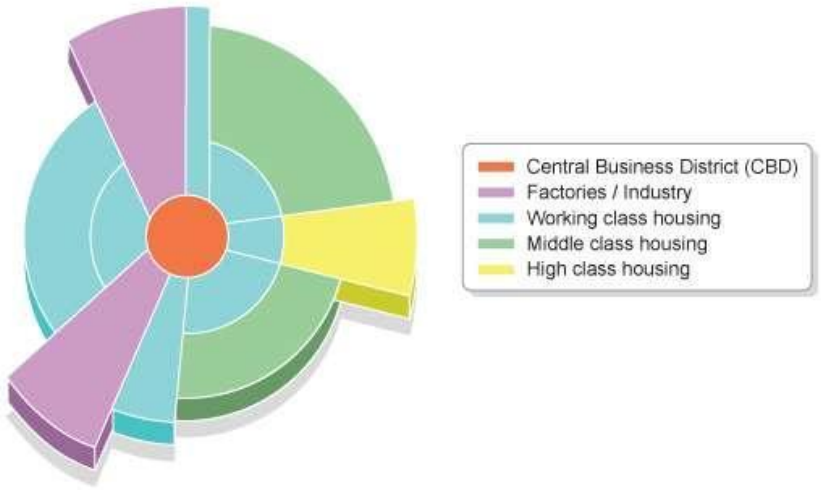


The Burgess model

However, there are limits to the Burgess model:

- The model is now quite old and was developed before the advent of mass car ownership. New working and housing trends have emerged since the model was developed. Many people now choose to live and work outside the city on the urban fringe - a phenomenon that is not reflected in the Burgess model.
- Every city is different. There is no such thing as a typical city.

Another urban model is the **Hoyt model**. This is based on the circles on the Burgess model, but adds sectors of similar land uses concentrated in parts of the city. Notice how some zones, eg the factories/industry zone, radiate out from the CBD. This is probably following the line of a main road or a railway.



Problems of urban growth for people: more crowded/overcrowded;

many people are unable to obtain jobs/more jobs are needed; work for low pay/cannot afford housing/work in informal sector; inadequate investment in housing stock/people live in squatter settlements/more housing is needed; pressure on schools/inadequate education provision; pressure on hospitals/inadequate medical care provision; increased crime rates or example; difficulties of waste/litter disposal; traffic congestion; noise pollution; spread of disease; food shortages; lack of sanitation/fresh water/poor hygiene; poor quality of life/standard of living; loss of farmland etc. Problems for environment: loss of vegetation/deforestation; loss of habitats; impacts on food chains; pollution of rivers; death of fish/other species; pollution of ground water/seepage of toxins from dumps; air/atmospheric pollution; rivers dry up due to water extraction/water table lowered etc.

Practice

a. Study Fig. which shows data about the quality of life in nine large urban areas.

(i) What is meant by *urban area*? **[Criteria A - 1]**
(ii) Use Fig. given below to name an urban area where:
A. housing is overcrowded,
B. air quality is poor. **[Criteria A - 2]**
(iii) Using **only information from Fig. 3**, identify three differences between the quality of life of people living in Shanghai and New York. **[Criteria A - 3]**
(iv) Using evidence from Photograph , describe the problems which are likely to be faced by people who live in New York. **[Criteria D - 4]**

Quality of life indicators for nine large urban areas

	Socio-economic indicators			Environmental indicators		
Urban Area	Persons per room	% homes with water & electricity	Murder per 100000	Levels of measured noise (1–10)	Mean traffic speed (km/h in rush hour)	Levels of measured air pollution (1–10)
Tokyo	0.9	100	1.4	4	44.8	4
Mexico City	1.9	94	27.6	6	12.8	9
Sao Paulo	0.8	93	26.0	6	24.0	4
New York	0.5	99	12.8	8	13.9	5
Shanghai	2.0	95	2.5	5	24.5	4
Los Angeles	0.4	100	12.4	6	30.4	7
Kolkata	3.0	60	1.1	4	21.3	10
Mumbai	4.2	83	1.1	5	16.6	7
Beijing	1.6	89	2.5	4	41.1	10

Note: where 1–10 scale is used 1 is low and 10 is high.

Photograph A (Insert), taken in New York, USA

(b) Study Fig. based on a newspaper article about traffic in Auckland, New Zealand.

No contest as bikes hit heavy traffic

TRANSPORT: Cars, buses and bikes raced to the city in rush hour challenge. Pedal power ruled.

Cyclists left car drivers behind yesterday as they pedalled their bikes through Auckland's slow traffic in the morning rush hour.

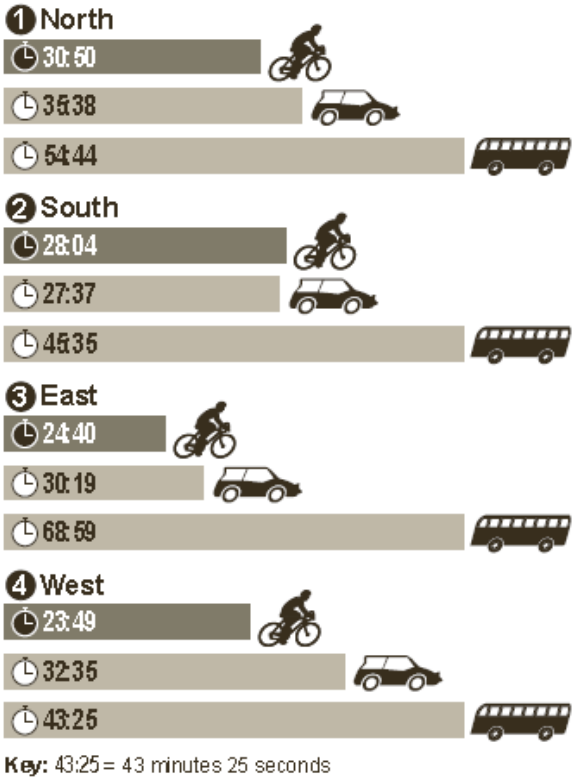
In the Auckland Commuter Challenge four sets of cyclists, car drivers and buses raced into the centre of Auckland.

The cyclists were quickest with an average time of 26 minutes 51 seconds. This is the latest demonstration of Auckland's traffic crisis, says Cycle Action Auckland, which organised the event.

About 6 per cent of commuters travel by bike or foot, 7 per cent by public transport and the rest in their cars.

Traffic congestion is getting worse as 3 per cent more cars each year are using roads that have not been significatly improved.

Tuesday's announcement of a $1.6 billion funding package to improve the road network is hoped to get Auckland moving.



(i) How do the results of the 'rush hour challenge' reported in Fig. show that there is traffic congestion in Auckland? **[Criteria D - 2]**

(ii) Write an essay to explain why traffic congestion is a problem in many large urban areas. **[Criteria C - 5]**

(c) In all large urban areas attempts have been made to solve the problems faced by the people who live there. These include problems such as:
traffic congestion,
squatter settlements,
housing shortages,
urban sprawl

Choose **either** one of these problems **or** any other problem faced by people who live in urban areas. For a named urban area, describe the attempts which have been made to solve the problem which you have chosen. **[Criteria C - 7]**

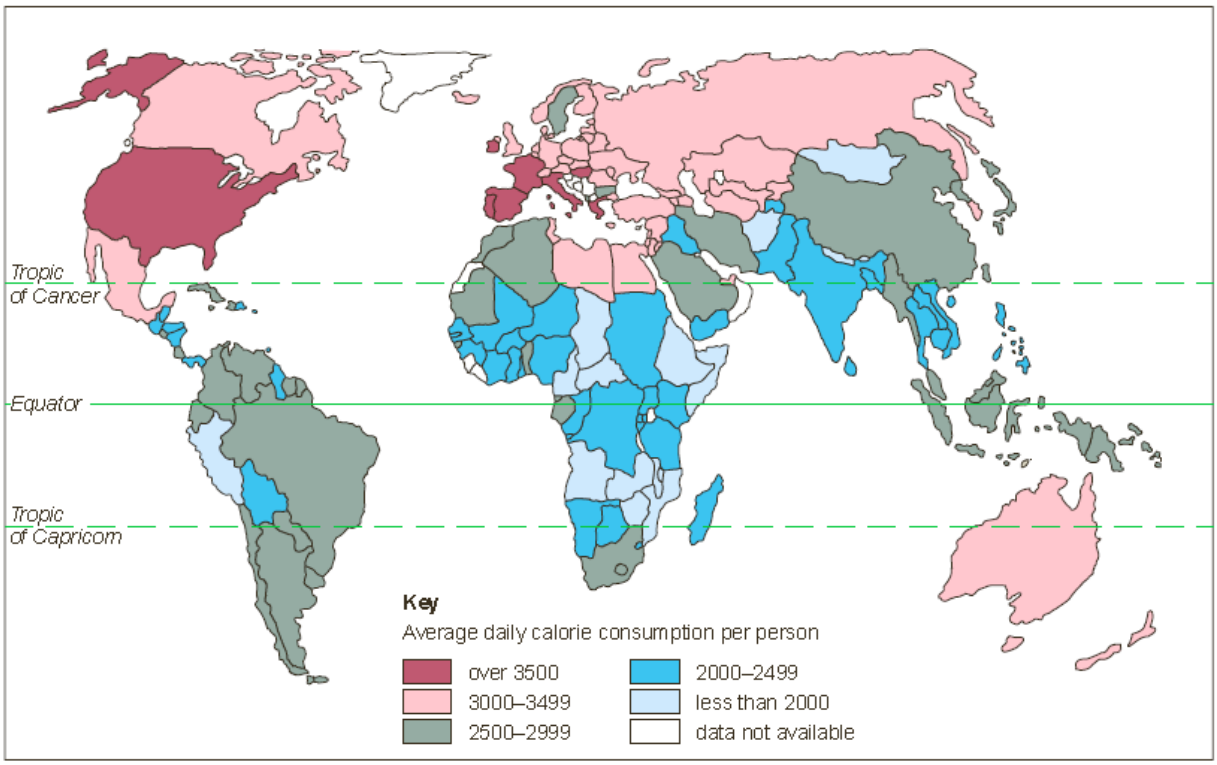
(d) Criterion B – Total 18 marks.
i. Formulate a clear and focused research question to investigate the statement of inquiry: "Urban areas can be better managed when local people are involved." **(4 marks)**
ii. Justify the relevance of your research question to the statement of inquiry. **(4 marks)**
iii. List two individuals or groups who might have an interest in your investigation. **(2 marks)**
iv. Justify why **one** of the individuals or groups you listed in part (iii) would have an interest in your investigation. **(2 marks)**
v. State one method of primary information/data collection you would use to help investigate your research question. **(1 mark)**
vi. Outline how the method* of primary information/data collection stated in part (v) would help you investigate your research question. **(2 marks)**
vii. State one source of secondary information/data you would use to help investigate your research question. **(1 mark)**
viii. Outline how the source of secondary information/data you stated in part (g) would help your investigation. **(2 marks)**

Theme 3. Trade, aid and exchange

Resources and human development
Globalization
Trade
Aid
Tourism
Environmental risks of economic development

Practice

(a) Study Fig. a map showing information about food consumption in different parts of the world.

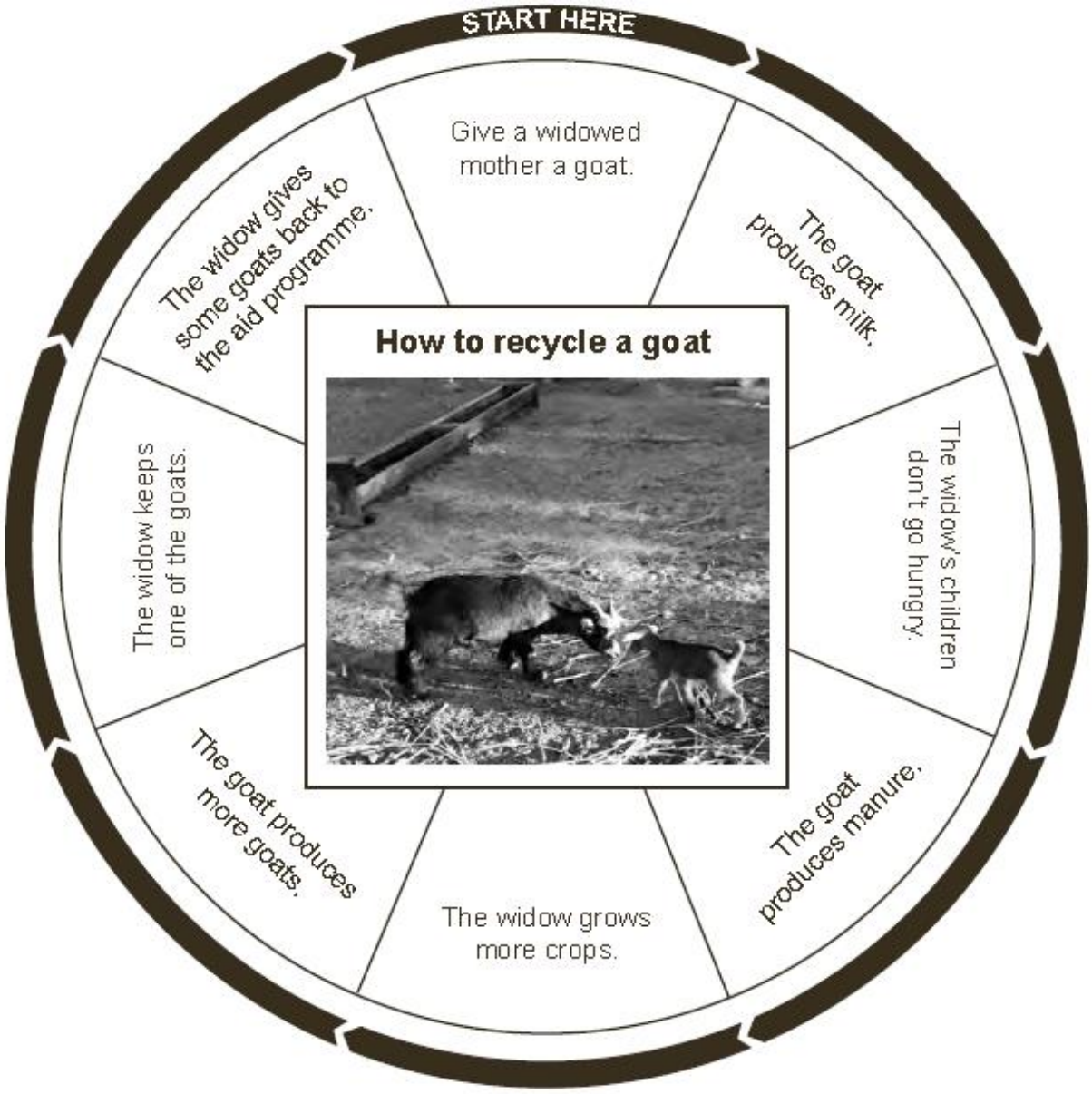


(i) Name a continent where most countries have an average daily consumption of more than 3000 calories per person. **[Criteria A - 1]**

(ii) Countries with a low average calorie intake may suffer food shortages. Describe the distribution of countries which have an average daily consumption of less than 2500 calories per person. **[Criteria A - 2]**

(iii) Write an article to explain how food shortages can be caused by:
A the natural environment,
B economic and political factors. **[Criteria C - 5]**

(b) Study Fig. which shows information about a recent aid programme in Burundi, an LEDC in Central Africa.



(i) State **three** outputs from the system. **[Criteria A - 3]**

(ii) Explain how the aid programme is likely to improve the quality of life of the people who live in Burundi. **[Criteria C - 5]**

Leisure activities and tourism

Tourism has increased because:

-greater affluence: higher salary + holiday with pay -greater mobility: increase in car ownership + more aircraft -improved accessibility and transport facilities:

-better roads

-larger airports, online reservation, package holidays

-more leisure time: longer vacations, shorter working hours, people work from home, more elderly -changing lifestyles: changing fashions, earlier retirements

-change in recreational activities

-advertising of holiday destinations: TV and interwebz -green tourism

Advantages of tourism: -growth in income

-an increase in foreign exchange -employment opportunities

-the development of infrastructure and facilities which may be used by the local population -the encouragement of other developments to take place in an area

-cultural advantages

Disadvantages of tourism:

-seasonal unemployment

-under-use of facilities at certain times of the year (ski-towns in summer) -increased congestion, pollution (the Lake District)

-a shortage of services e.g. water supplies -social/cultural problems

-damage to the physical landscape

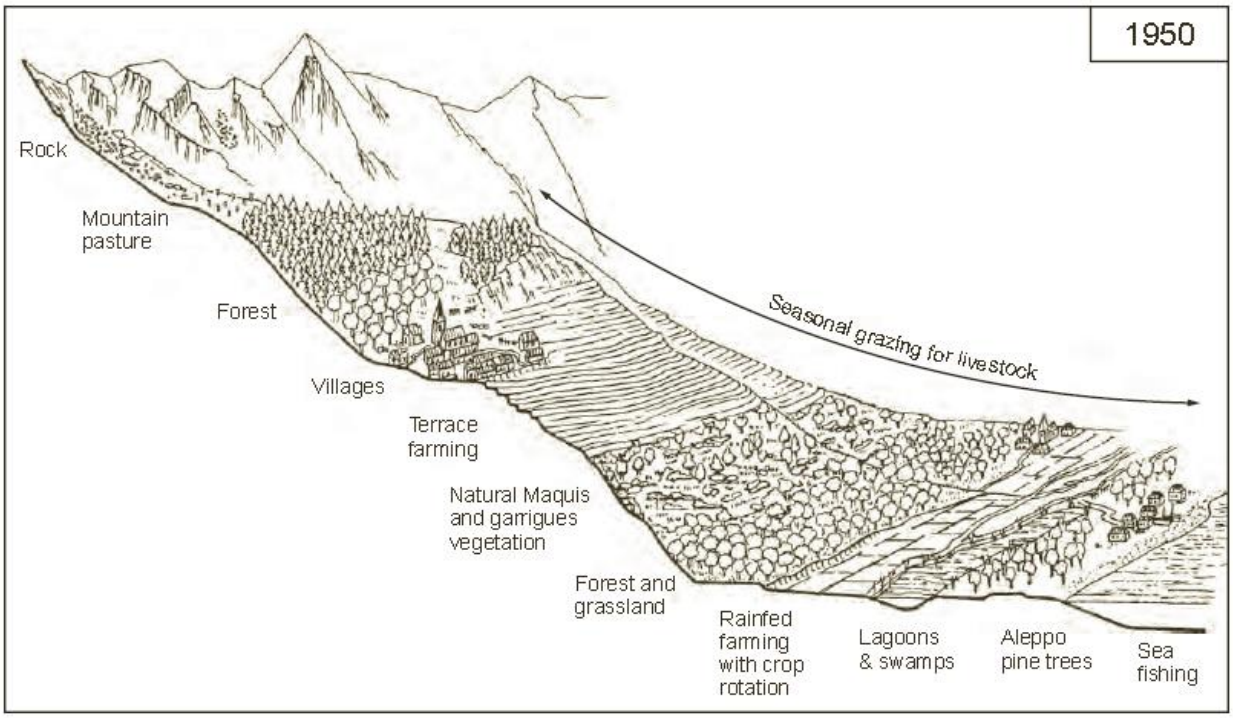
Practice

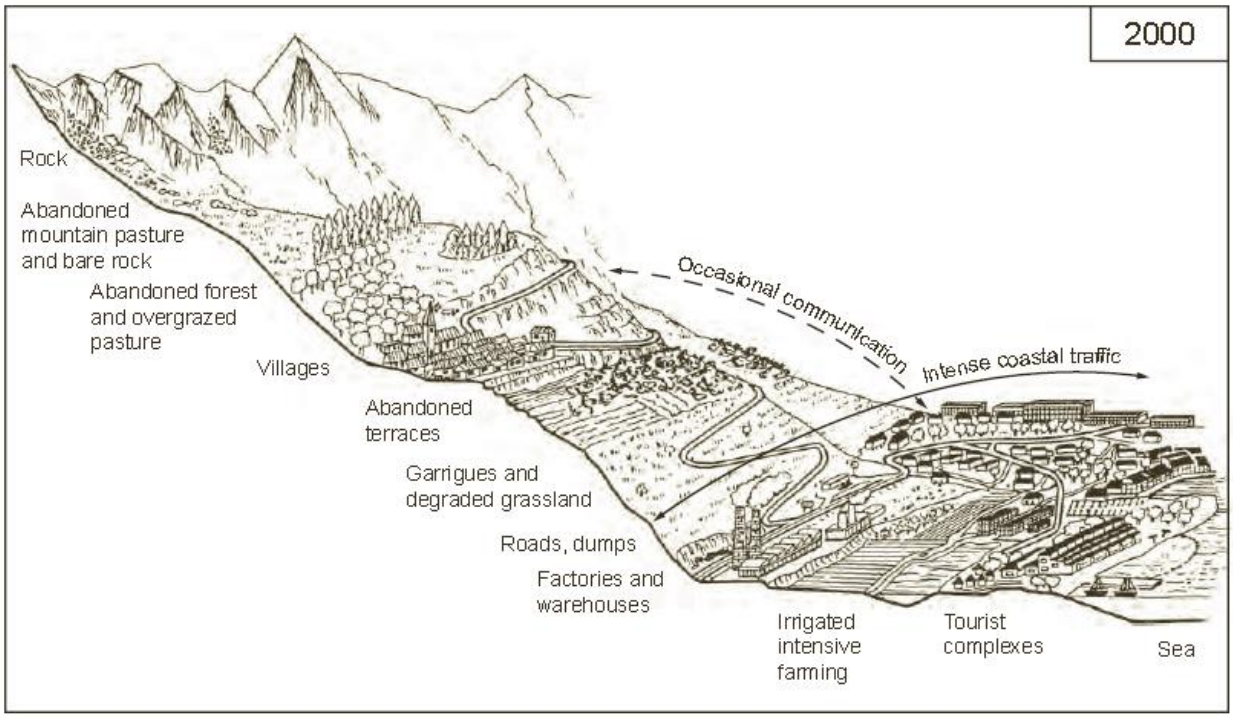
(a) Study Fig. which shows information about the jobs created by the growth of tourism in an
LEDC in Africa.

Jobs	Local people	People from abroad
Hotels - high paid jobs	1%	4%
Hotels - low paid jobs	52%	1%
Tour operators - high paid jobs	2%	3%
Tour operators - low paid jobs	15%	1%
Other jobs	20%	1%

(i) State the percentage of jobs in hotels created by the growth of tourism. **[Criteria A - 1]**
(ii) What does Fig. suggest about the difference in jobs created by tourism for local people and people from abroad? **[Criteria D - 2]**
(iii) Write an essay on the benefits, as well as the creation of jobs for local people, which tourism brings to an LEDC. **[Criteria C - 5]**

(b) Study Fig. which shows the changes which have taken place over a 50 year period in an area where tourism is important, along the Mediterranean coast in southern Europe.





(i) Using **only evidence from Fig.** describe three changes which have taken place in the area as a result of economic development. **[Criteria A - 3]**

(ii) Suggest reasons why some people are worried about the continued growth of the tourist industry in areas such as the one shown in Fig. **[Criteria D - 5]**

(iii) Tourism is important in many countries. How can it be developed so that it is sustainable? **[Criteria D - 5]**

(c) For a named area which you have studied, write an article to explain why the tourist industry is important. You should refer to the area's physical and human attractions. **[Criteria C - 7]**

Energy and water resources

Types of resources

Non-renewable resources: These are finite. Fossil fuels were initially produced by photosynthesis. In theory they are renewable, but it takes millions of years for them to form. E.g. coal, oil, gas, (uranium).

- Renewable resources: These are continuous e.g. solar, wind, water, geothermal. They are therefore sustainable.

Non-renewable resources:

Fossil fuels (coal, oil and natural gas) used mainly by MEDCs Uranium for nuclear energy

Fuel-wood non-commercial source of energy in MEDCs but important in LEDCs; women have to walk long distances each day to collect wood. They cook over open wood fires or wood burning stoves.

Renewable energy supplies:

-reduce dependence upon fossil fuels alleviate the world's energy crisis

-offer opportunities for the development of alternative energy sources -they do not pollute

-they do not add to Global Warming -the source lasts forever

Renewable energy supplies are: -geothermal wind -solar
-bio fuel (since photosynthesis equals the amount of CO_2 from combustion) -hydroelectric
-tidal

Thermal power stations:

- In a thermal power station, fuel (coal or natural gas) is burned in a boiler to convert water to steam.
- The high-pressure steam is directed into a turbine, which turns the turbine shaft.
- This shaft, connected to an electrical generator, produces electricity as it turns.
- A condenser converts the spent steam from the turbine back to water that is reused in the boiler.
- The condenser cooling water comes from the reservoir and is returned for reuse.

They need:

- A large area of flat land
- A water source
- A rail link
- Isolated area for nuclear
- Cooling towers

Resource	Advantages	Disadvantages
Coal	Lasts 300yrs, now become more efficient, needed to make coke	Cost of production high, produces lot of GH gases, dangerous, open cast = visual pollution, costly to transport, acid rain
Oil	More efficient than coal, easier to transport, diversity of uses, petro-chemicals	Lasts only 50-70yrs, oil spills, releases GH gases, prices fluctuate, refineries use lot of space, acid rain
Gas	Cleanest of fossil fuels, cheaper than oil and is easier to distribute.	Releases methane, explosive, prices fluctuate,

Positioning a power station should be known.

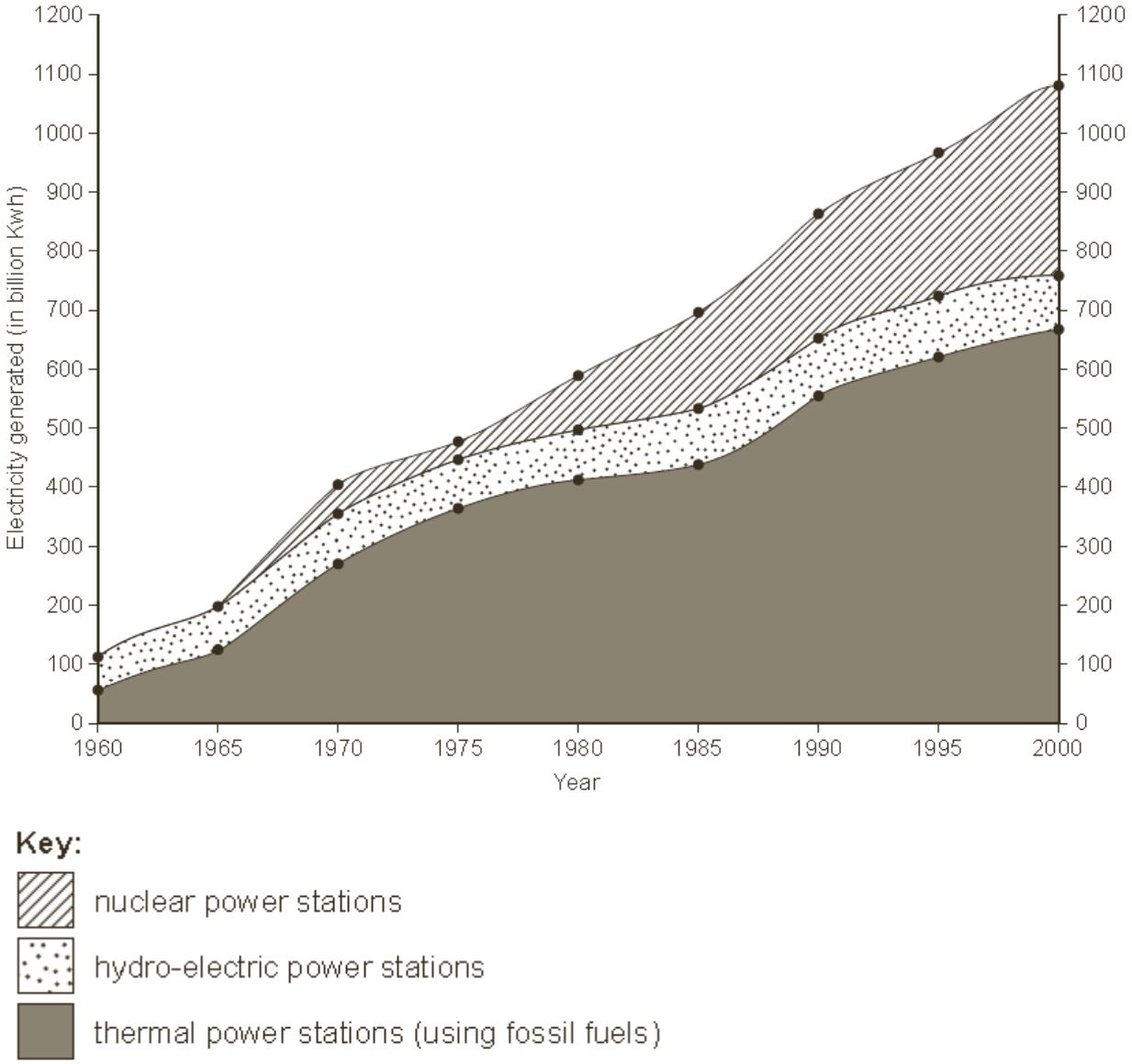
Water uses:

-Agriculture: to water the plants etc. -Domestic: cooking, cleaning and drinking

-Industrial: heated to make steam in order to turn turbines, and for cooling down reactors

Practice

Study Fig. which shows the changes in the importance of different types of power station used to generate electricity in Japan between 1960 and 2000.
Briefly describe the changes in the importance of different types of power station in Japan between 1960 and 2000. [3]

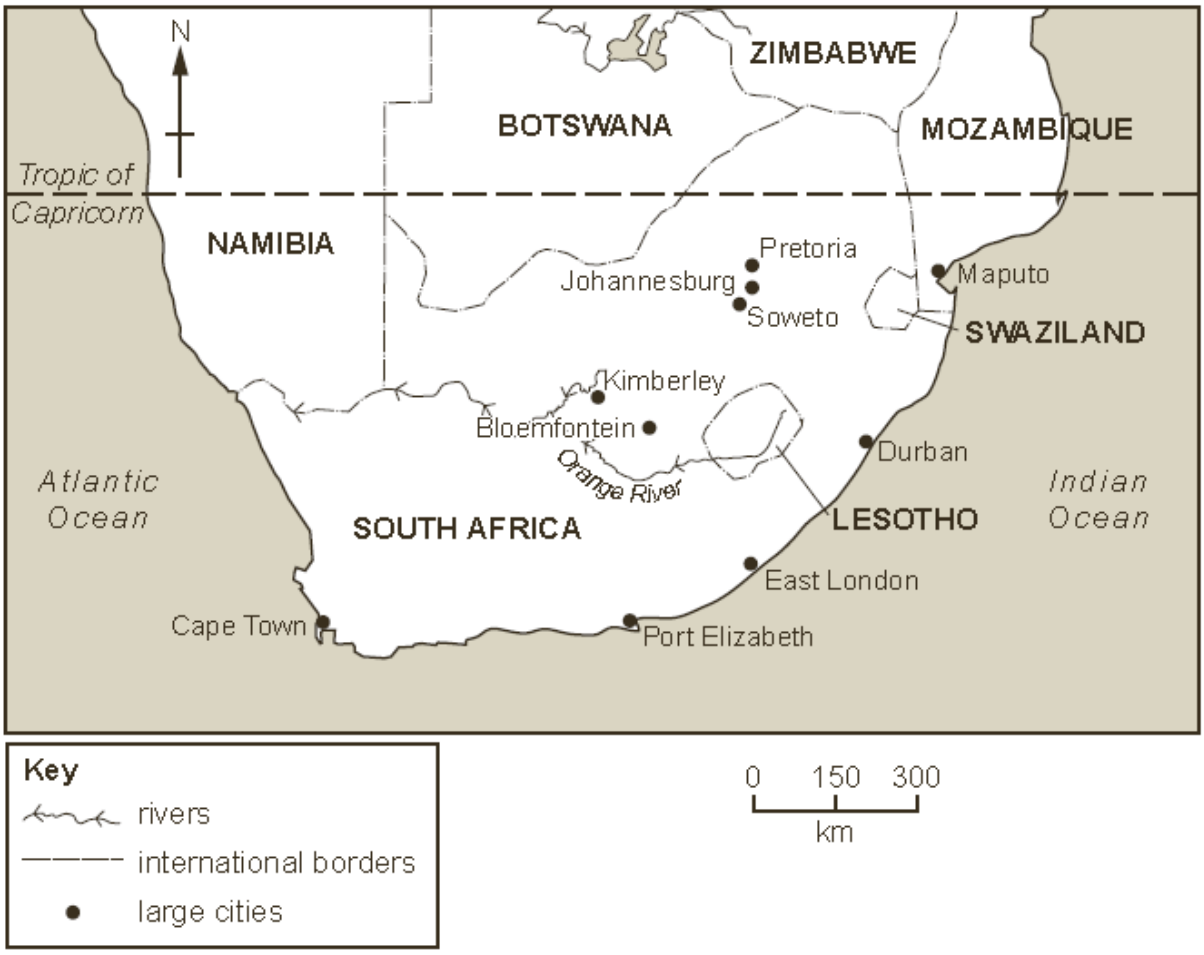


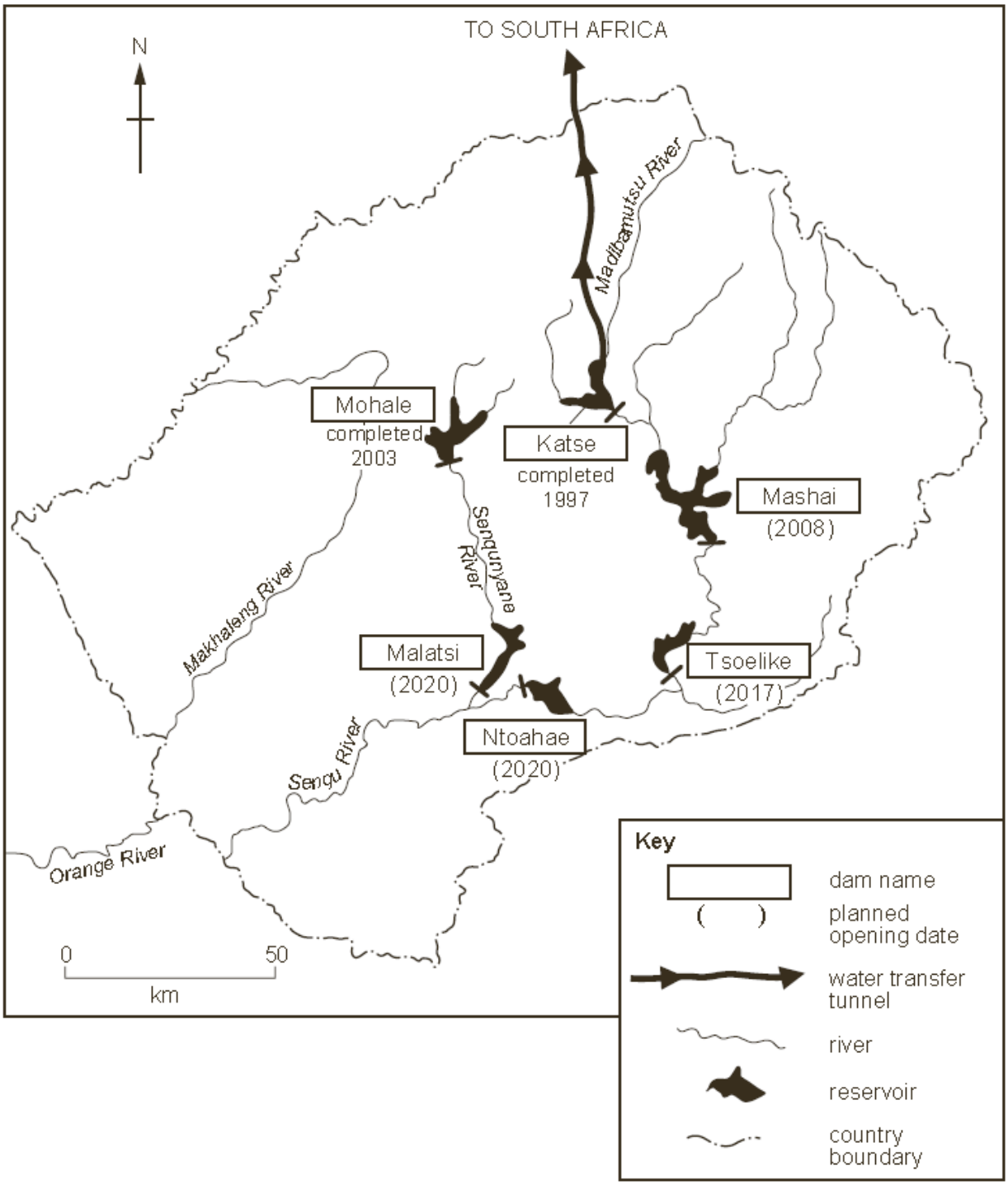
(c) For any **one** type of power station, describe and explain the factors which influence its siting. **[Criteria A - 4]**

(d) Identify a form of energy and describe how its use threatens the natural environment. You may refer to named areas which you have studied. **[Criteria C - 5]**

(a) Study Figs A, B and C, which show information about the Lesotho Highlands Water Project.

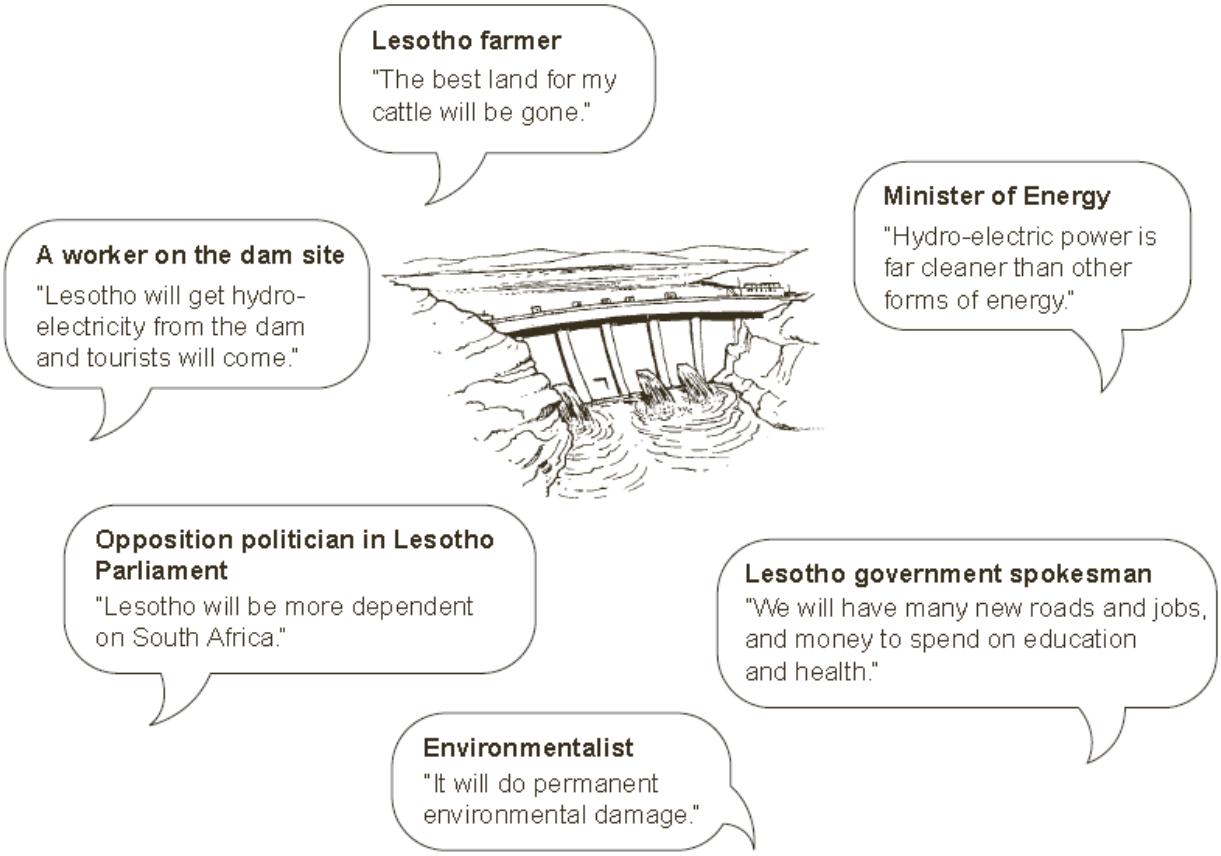
Lesotho is an LEDC in the mountains of southern Africa. It aims to build a series of dams. These will collect and store water to sell to South Africa, its richer neighbour. Water will also be used at the dams to generate hydro-electric power (HEP).





(i) Suggest reasons for the increasing demand for water in South Africa. **[Criteria D - 5]**
(iv) Suggest reasons why Lesotho has enough water to be able to sell to South Africa. **[Criteria D - 5]**

(b) Study Fig. which shows the opinions of selected people about the Lesotho Highlands Water Project.



(i) Describe the advantages of using hydro-electric power (HEP), rather than other sources of energy. **[Criteria C - 3]**

(c) Water and air may be polluted by human activities.
Formulate a research question based on the above statement of inquiry. [Criteria B – 2]

Environmental risks and benefits: resource conservation and management

Problems with development:

Soil erosion: occurs in farms, where the rainforest is cleared – soil is washed away by rain because there are no tree roots to retain it. In the Amazon rainforest, eroded soil goes into rivers and pollutes the drinking water.

Global warming: the greenhouse effect is when infrared radiation passes through the atmosphere, and some is absorbed and re-emitted in all directions by greenhouse gas molecules. The effect of this is to warm the Earth's surface and lower atmosphere. Global warming happens as a result of too much greenhouse gases in the atmosphere.

Greenhouse gases are:

-CO_2 from burning fossil fuels or wood in power stations, cars and homes
-methane from decomposing organic matter and waste gases from digestion – cows farting haha

-CFCs or chlorofluorocarbons from aerosols, air conditioners, foam packaging and refrigerators (now banned) -nitrous oxide from car exhausts, power stations and agricultural fertiliser

Air pollution: cars (transport) and power stations (energy production)

Carbon monoxide – incomplete combustion of carbon-containing substances causes oxygen starvation Sulphur dioxide – combustion of fossil fuels causes respiratory problems and acid rain

Nitrogen oxides – nitrogen and oxygen from air combine in a hot environment (hot furnace or car engine) same effect as sulphur dioxide

Lead oxide: damages nervous system, from burning leaded petrol/diesel

Water pollution:

-industrial waste because it is cheap, does not take up land (as opposed to a land-fill site), and people favour economic growth over the protection of the environment

-soil in rivers due to soil erosion (as shown in the Amazon)

-nitrates from fertilisers and phosphates from manure cause eutrophication -oil spilling into the sea

-acid rain lowers pH (increases acidity) of lakes/ponds and leaches aluminium out of the soil causing: -the fishes gills to be damaged eventually killing them, fixed by adding calcium hydroxide (slaked lime)

-destroys the top of the trees and the aluminium damages tree roots = dead tree, important nutrients leached away -health hazards for humans

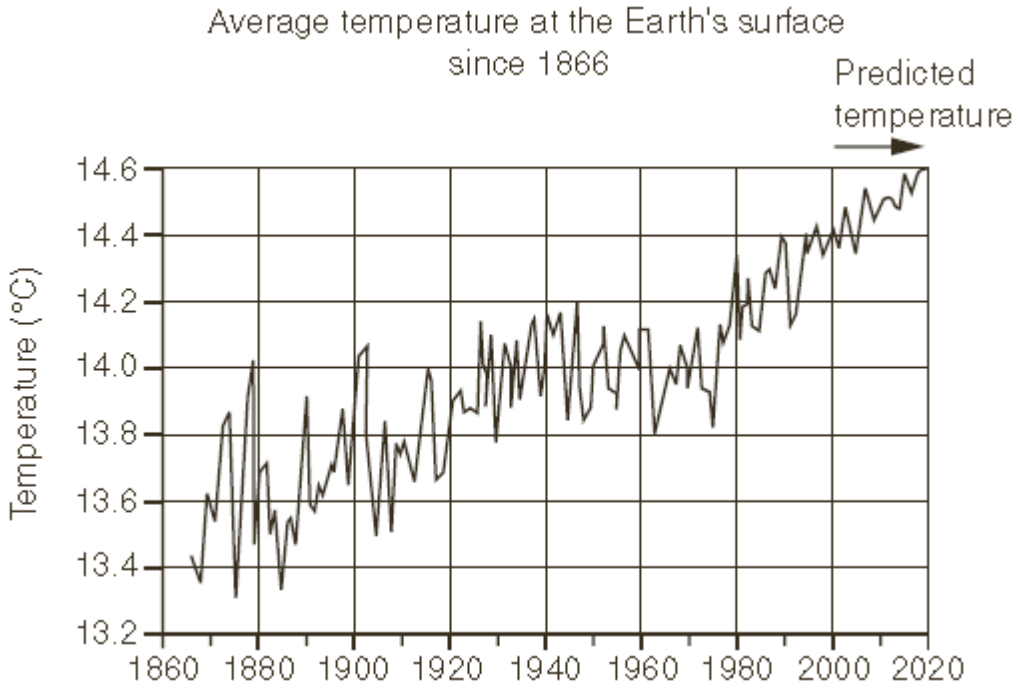
-damages limestone buildings and sculptures -fewer crops can be grown on an acidic field

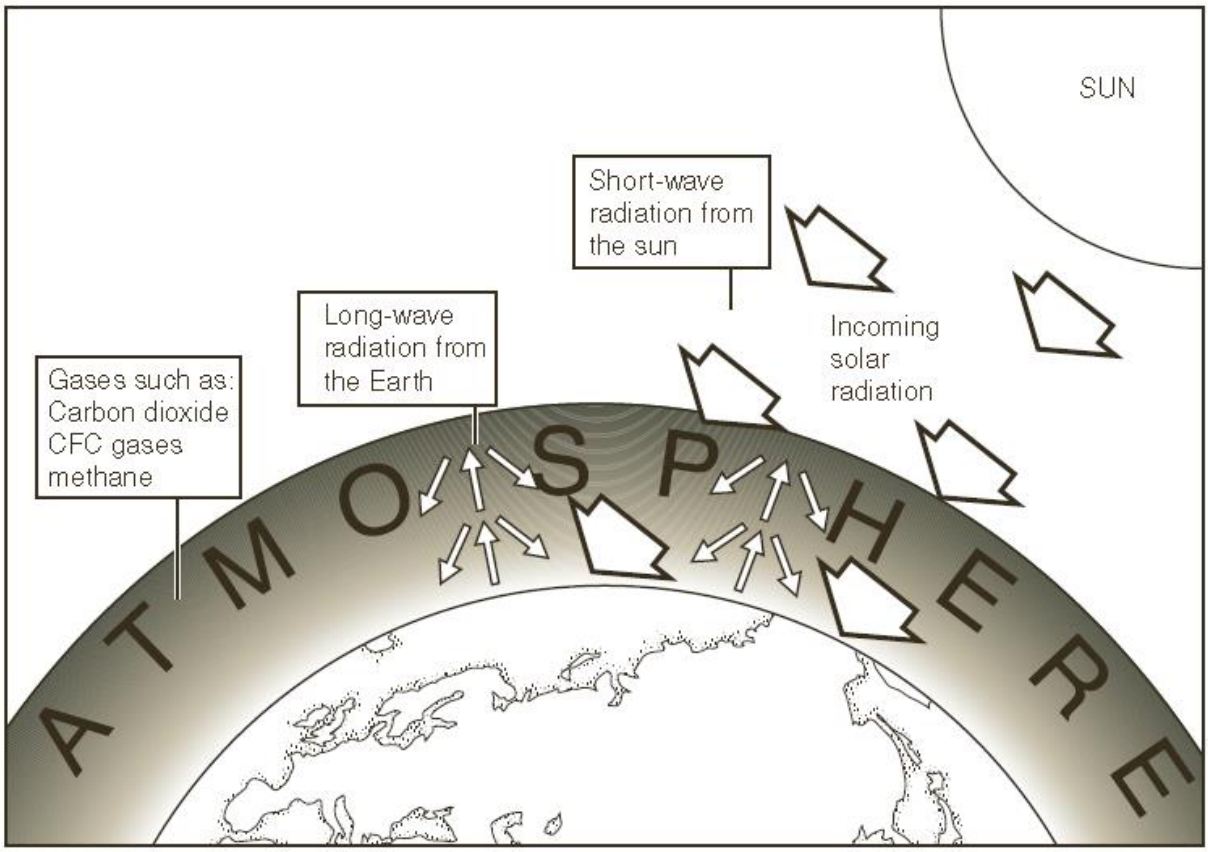
Visual pollution: all those things are ugly compared to unspoiled nature

Noise pollution: vehicles (including planes) – transport, tractors – agriculture, mining or quarrying (Lake District) probably produces noise, noisy tourists who stay up late partying, music – tourism.

Practice

Study Figs A and B. Fig. A shows changes in average global temperatures and Fig. B shows how the greenhouse effect works.





(i) According to the prediction in Fig. , what will be the average global temperature in 2010? **[Criteria A - 2]**
(ii) Use Fig.A to describe the changes in average global temperatures between 1960 and2000. **[Criteria A - 2]**
(iii) Use Fig. B to help explain how the greenhouse effect works. **[Criteria A - 3]**
(iv) Explain how human activities may increase the greenhouse effect to produce higher global temperatures. **[Criteria C - 4]**

(b) Study Fig. a newspaper article written in 2004 about the likely impacts of global warming.

Tuvalu's tides revive global warming debate

It is predicted that the Pacific atoll nation of Tuvalu will disappear under the waves today, and become the first victim of rising global sea levels.

High tides will sweep onto Tuvalu, just 26 km^2 of land scattered over nine atolls, none of it more than 4.5m above sea level.

"We are not quite sure what will happen but we expect most of the areas will be flooded by the sea for an hour or so," Hilia Vavae, of the Tuvalu Meteorological Office said.

Tuvalu has long said it is at risk from a rise in sea levels caused by global warming. During negotiations on the Kyoto Convention on global warming a decade ago, the prime minister warned "the world's first victims of climate change" would be the 11,500 Tuvaluans.

Prime Minister Saufatu Sopo'aga says his Government is thinking of suing Australia and the United States for their carbon emissions.

Ms Vavae said most homes in Funafuti, which consists of 30 islets populated by 4000 people, would be flooded, along with her office and perhaps the airport.

(i) Explain why Tuvalu is at risk from global warming. **[Criteria A - 3]**
(ii) Explain why people in Tuvalu may have different attitudes towards global warming from people living in Australia and the United States. **[Criteria C - 4]**
(c) Human activities often pose a threat to the natural environment.
These include economic activities such as:
– tourism,
– agriculture,
– manufacturing industry,
– mining.
Name an area which you have studied where the environment is at risk from human activities.
Describe the human activities causing the risk and explain how they have affected the natural
environment of your chosen area. **[Criteria C-7]**

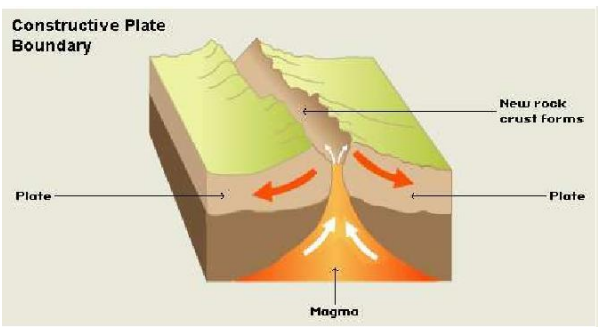
Theme 4. Dynamic Earth

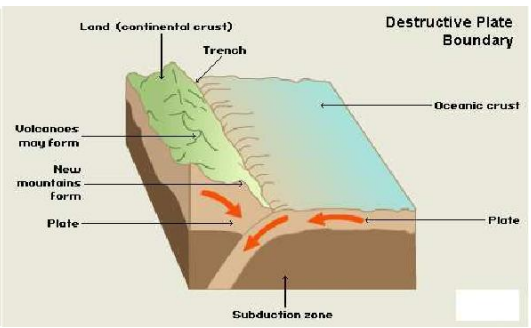
Plate tectonics

Oceanic crust: younger, heavier, can sink and is constantly being destroyed and replaced **Continental crust**: older, lighter, cannot sink and is permanent

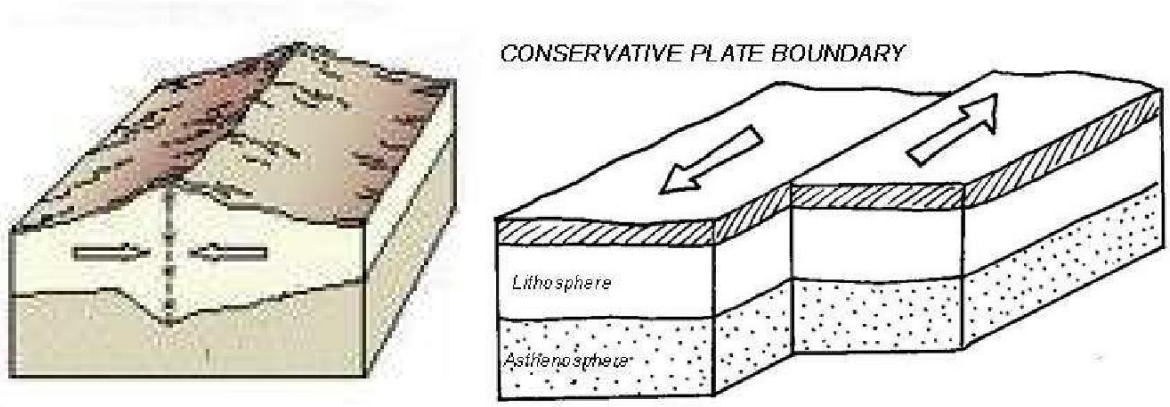
Earthquake, volcano and fold mountain distribution:

	Plate Boundary	What happens	Volcanoes?	Earthquakes?	Fold mountains?
A.	Constructive margins	2 plates move away from each other forming new oceanic crust	Gentle	Gentle	No
B. i)	Destructive margins	Oceanic crust moves towards continental and sinks under it, and is destroyed	Violent	Violent	Yes
B. ii)	Collision zones	2 continental crusts collide, neither can sink so forced upwards	None	Yes there is	Yes
C.	Conservative margins	2 plates move sideways past each other	none	violent	no



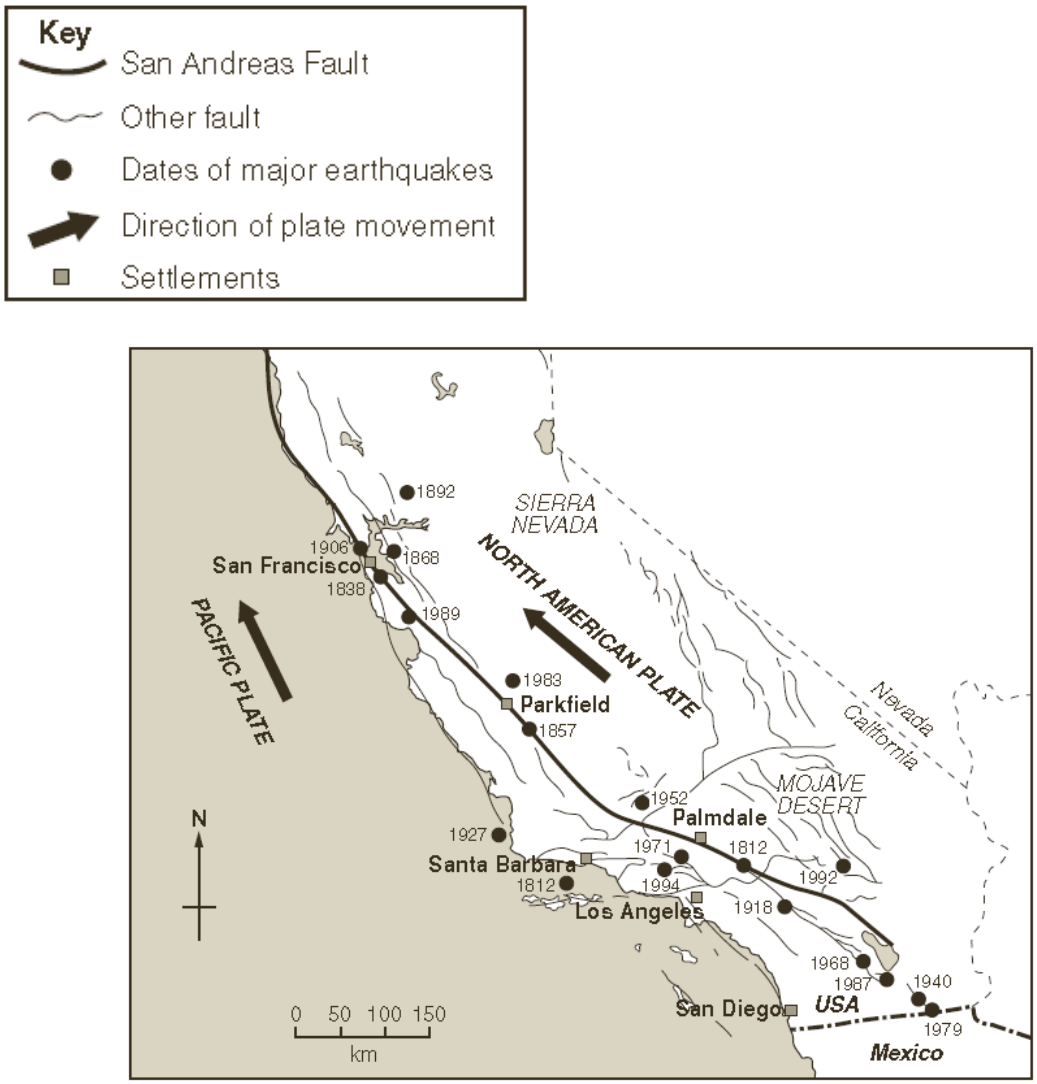


Collision zones:



Practice

Study Fig. which shows where major earthquakes have taken place in California, USA.



(i) How many earthquakes took place on the San Andreas Fault? **[Criteria A - 2]**
(ii) San Francisco was affected by an earthquake in 1989.

What was the distance and direction of this earthquake from San Francisco? **[Criteria A - 2]**

(iii) Explain briefly why earthquakes take place on or close to major faults, such as the San Andreas Fault. **[Criteria C- 3]**

(b) San Francisco is still at risk from earthquakes. Study Photographs A, B and C, which were taken in San Francisco.

(i) Suggest **three** likely impacts of a major earthquake on the areas shown in the photographs. **[Criteria D - 3]**

(ii) The Transamerica Pyramid is marked by an 'X' on Photograph C. In the 1989 earthquake it shook for more than a minute but the building was undamaged and no one was seriously injured.
What measures can be taken to protect people from earthquakes? **[Criteria D – 4]**

(iii) Explain why many people continue to live in areas at risk from natural hazards. **[Criteria D - 5]**

(c) In many parts of the world the natural environment presents hazards to people.
Choose an example of **one** of the following:

- a volcanic eruption
- a tropical storm
- a drought

For a named area, describe the short-term and long-term effects of the example which you have chosen on people living in the area. **[Criteria C - 7]**