Theme 3 – Economic development

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3.1 Development

Development - process of a country becoming more advance

Indicators of development
GNP per capita - total income of a country, including learning from abroad, per head of population
Literacy - % of ppl who can read & write
Life expectancy - average age of ppl in a country are expected to live

Explain why there is a relationship between GNP per capita and life expectancy. (5)
- ↑ GNP ↑ investment in health care
  - Better healthcare provided / more doctors, nurses
  - Education about preveting diseases from spreading
- Countries with high GNP
  - Ppl able to afford good diet → ↓ malnutrition
  - Ppl healthier → ↑productivity ↑output
- Low GNP countries → poor sanitation & water supply → die from water borne diseases

Human Development Index (HDI)
Explain why HDI is a useful indicator of development (3)
- It takes into account a variety of factors (GNI per capita, life expectancy & literacy rate)
- Easy to carry out comparisons between countries

Explain why there are inequalities in the levels of development between countries. (4)
- Variations in climate, relief or soil fertility
- Communications/accessibility/transport links
- Presence/absence of raw materials, water supply & ports
- Presence of TNCs
- Varying levels of education

Primary sector	Eg agriculture
Secondary sector	Eg construction
Tertiary sector	Eg education
Quaternary sector	Eg computing

Suggest reasons for the difference in employment structure between LEDCs and MEDCs (4)
- Better education in MEDCs
- Availability/exhaustion of natural resources
- More technology in MEDCs
- Demand for services
- Many people in LEDCs are farmers

Explain why there is a large reduction of the workforce in the primary sector as a country develops. (4)
- Movement of people to urban areas
- People become more educated
- Loss of farmland to urbanisation
- More or better pay, more reliable work in factories/services

Explain why many people in cities in LEDCs work in the informal sector. (3)
- Lack of education
- Quick way to earn cash
- Can work for themselves from a very young age

Explain why employment structure changes as a country develops. (5)
- Mechanisation of jobs in primary/secondary sector → reduces need for workers
- Some primary industries close coz exhaustion of resources
- Growth of secondary sector as technology improves / globalisation
- Rise in tertiary as education/ skills levels increase
- Demand for services e.g. medical / growth of tourism

Explain why % of population employed in manufacturing industry changes as country develops. (5)

Increases	Reduces
• Industrialisation occurs • Low skill work in factories means many ppl are employed	• Mechanisation of jobs in primary/secondary sector → reduces need for workers • Rise in tertiary as education/ skills levels increase • Manufactured goods are imported coz cheaper to import than manufacture

Explain why quaternary industry has become important in countries where economic development is rapid. (4)
- Make large amounts of profit
- Provide info technology services to support other businesses
- Many ppl have skills to be employed in these industries
- Investment in R&D allows other businesses to improve
- Enables innovation to take place

Globalisation - Process in which the world is becoming increasingly interconnected

Explain how the TNC shows evidence of globalisation. (3)
- Has links / factories in many countries
- Many Suppliers/raw materials in LEDCs
- Headquarters in MEDC

Explain why globalisation has occurred. (5)
- ↑ profit
- ↑ mobility of labour and capital due to advance in transportation
- Make trade cheaper and more efficient
- Improved technology eg communications → eg internet / transportation → ↑ efficiency
- Growth of TNCs ↓ national barriers eg European Union
- Cheaper labour and taxes in LEDCs

Describe the benefits and problems of the economic activity for local people.

Adv	Dis
• Employment • ↑ standard of living • Improved service provision eg healthcare • Development of transport network or infrastructure • Learn new skills	• Loss of farmland or culture • ↑ traffic • Pollutions eg visual, air, sound • ↑ prices • Litter

Suggest how the economic activity could damage the natural environment. (4)
- Atmospheric pollution from factory → greenhouse gases → global warming
- Water pollution
- Clearance of natural vegetation → loss of habitat → impact on ecosystem

Explain why many high technology industries have grown up in newly industrialised countries (NICs). (5)

- Low cost of land & labour
- Highly-skilled workers
- Good transport infrastructure → enables access to global market
- Lower taxes
- Less unions
- Lack of competition

Adv and Dis of tech

Adv	Dis
↑ efficient ↓ demand & cost of labour - Few skills required	- Loss of employment - High costs of repairs - Machines may break down

Case Study - Walmart

Basic info	- Name of country: Canada - Headquarter in USA - Owns 8000+ shops in many different countries eg UK
+ve impacts	- Provides job opportunities eg In Mexico, 150000ppl employed in Walmart - Donate millions to improve standard of living of local ppl - Businesses increase for local companies that supply to Walmart eg In Canada, 6000 Canadian suppliers creates US$10 billion of business every year
-ve impacts	- Closure of small local firms coz they struggle to compete with low prices & range of products Walmart sells - Evironmentally damaging factories to LEDCs eg China where there're less strict environmental laws → pollution - Some companies which supply Walmart have long working hours eg In Bangladesh, some workers work 80 hrs/week

3.2 Food production

Subsistence farming - producing things on farms for family only
Commercial farming - producing things on farms to sell

Explain why many ppl in LEDCs are subsistence farmers. (3)
- Lack of land, skills, tech, pesticides
- Need to feed their families
- Can't produce enough output for sell

Arable - growing crops
Pastoral - rearing animals
Mixed - combination of growing crops & rearing animals

Suggest the likely advantages to a farmer of mixed farming. (3)
- Variety of items to sell
- Easier to adapt to market changes
- Manure from animals used to fertilise crops
- Crop waste can used to feed animals
- Farmer has work throughout year

**Describe 2 characteristics of intensive farming. (2)**
- Small amount of land

- High yields
- High amount of inputs eg workers, fertilisers, machinery

Suggest reasons why many famers carry out intensive farming. (4)
- Make more profit
- Produce higher yield
- Small areas of land
- Can afford to buy fertilisers/machines/equipment
- Have access to many workers

Describe 2 characteristics of extensive farming. (2)
- Large amount of land
- Low yields (coz land not productive eg infertile soil
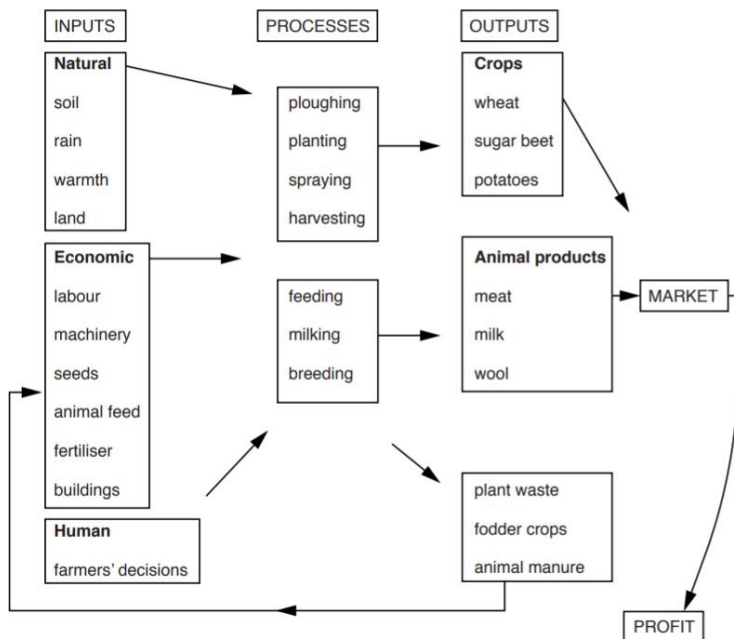
Define processes in an agricultural system. (1)
- Turing inputs on a farm into outputs

Define irrigated. (1)
When crops are watered artificially

Explain how natural environment (climate, relief & soil) influence agricultural land use. (3)
Climate (temp, rainfall, hrs of sunshine)
- Temp determines crops grown
- Warm - grow crops, cold - grazing sheep, mild climate - cattle ranching
- Sufficient rainfall
- Large amount of rainfall needed to grow rice
- Too much rainfall may flood crops
- Hours of sunshine - vines need sunshine for ripening

Relief
- Flat land - grow crops coz easier to mechanise, soils more fertile
- Steep slope - grazing sheep coz thin soils on steep slopes - poor crop yields

Aspect
- South facing slopes in northern hemisphere receive more sunshine & are useful for growing vines

Quality of soil
- Good soil - grow crops, poor soil - grazing sheep

Explain how political factors may influence agricultural land use. (5)

Gov can…
- Give incentives to grow some crops - by offer subsides
- Restrict amount produced of certain products - by using quotas
- Encourage use of new technology - by offering loans / subsiding
- Takes land from farming for settlement/industry/airports

Suggest reasons why farmers in countries are commercial farmers while others are subsistence farmers. (5)
- Amount of land owned
- Amount which can be produced
- Accessibility to export market
- Wealth of farmers
- Availability of labour supplies
- Level of education of farmers

Explain how commercial farmers have been able to increase their output (4)
- Mechanisation eg tractors
- Use of fertilisers, pesticides
- More irrigation
- Uses of greenhouses, hydroponic, aeroponics
- High yielding seeds eg GM crops
- Crop rotation

Describe different processes which take place in farming system. (3)
- Feeding of animals
- Digging/ploughing land
- Planting seeds
- Harvesting crops
- Spreading manure/fertilising the land

Explain how farming can cause soil erosion. (4)
- Overgrazing - make soil bare, washed away by rain
- Overcultivation - removes nutrients from soil
- Irrigation - makes soil salty
- Deforestation - roots no longer hold soil together
- Tractors/cattle - compacting soil

Explain how farmers can prevent soil erosion and maintain soil quality. (5)
- Use fertilisers
- Contour ploughing - soil not washed down slope when it rains
- Control deforestation
- Plant trees as windbreakers - reduce wind erosion
- Avoid overgrazing & overcultivation
- Crop rotation - allow soil to recover

Food shortage
Define malnutrition. (1)
- A condition that results from eating a diet in which nutrients are not enough such that it causes health problems

Explain why countries experience food shortages. (3)
- Overpopulation, poverty - can't afford fertilisers/pesticides, war
- Natural disasters eg flooding, tropical storms, drought
- Infertile soils

- Lack of transportation to rural areas

Explain why war may cause food shortages. (3)
- Farmers have to fight in army - reduced labour force
- Crops destroyed, animals killed
- Gov investment in farming - spend money on army
- Shops & transport links destroyed - unable to transport food
- Increased food prices

Explain how economic & political factors may cause food shortages in a country. (4)
- Lack of investment in agriculture
- Food, aid is poorly distributed
- Many farmers produce crops for export rather than food for ppl who live there
- Ppl can't afford food coz unemployment
- High cost of inputs for farming eg machines
- War

Describe impacts of food shortages. (4)
- Death from starvation
- Malnutrition - health problems eg marasmus, scurvy, kwashiorkor, rickets
- Ppl weak, easily get diseases
- Increased food prices, crime rate

Explain how different strategies can be used in short-term & long-term to provide solutions to problem of food shortage in LEDCs. (5)
- Emergency famine relief / food aid
- Improve transport network
- Use more land for food crops for local ppl rather than export of crops
- Gov subsides on seeds / machinery
- Anti-natalist policy
- (above)

Case study

Describe & explain the land use of a farm or agricultural system in a named area you have studied. (7)

Type of farm or agricultural system - Mixed commercial farm

Name of area - Adney Farm, Shropshire, UK

Natural input	2.2km2 flat land - Temperate climate - Moderate rainfall - 700mm per year - Temp: warm summer (16°C), 3 cold months (<5°C) - 9 month growing season - Fertile soil from flooding of River Severn
Human input	- Capital intensive eg tractor - low labour input - High tech machinery eg tractor - Chemical fertilisers & pesticides used - Large barns for storage
Output	- Summer wheat - cereal production - Winter wheat - animal feed - Oil seed rape - biofuels & cooking oils - Sell bulls - dairy farm breeding
Reasons for different land use on the farm	**Arable** - Located near River Severn - fertile soil - Oil seed rape - high output rotation crop - rotate with wheat - keep soil fertilized

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| | **Pastoral** |
| | ● Land rented from National Trust - rule: left as grassland |

3.3 Industry

Define

Input	● Things needed for production to take place
	● Eg capital, land labour, raw materials, machinary
Processes	● Things which are done to convert raw materials to products
	● Eg packaging, assembling components, transporting
Output	● Finished products which are produced
	● Eg finished products, profit, waste materials
Raw materials	● Materials used to produce a product
Manufacturing / processing industry	● Where raw materials are turned into finished products
Assembly industry	● An industry where components produced by different suppliers are put together
Market	● Place where finished products are sold

Explain how factors are likely to influence location of industries. (4)

Land	● Flat land - easy to build settlements
	● Large areas of land - for expansion
Labour supply	● Cheap / skilled
	● Processes require workforce
Near uni	● Skilled labour
	● Provide labs for R&D
Near transport links	● Reduce transport cost
	● Esp bulky & perishable materials / goods
	For example
	● Road / railways - transport raw materials / goods
	● Ports - import / export goods
	● Airport - business travel abroad
Near market	● Reduce transport costs
	● Esp bulky & perishable goods
Political factors	● Gov incentive may attract industry to an area
	● Eg reduce taxation / subsidies / investment in infrastructure
	● Gov legislation on pollution / political stability eg war
Agglomeration	● For econ of scale
	● Share services to reduce costs & increase amount offered to potential customers

Suggest reasons to explain why factory is located near to its raw materials. (3)
- Several manufacturing industries are located close to their raw materials
- Reduce transport costs - less distance for transportation
- Raw materials are bulky / perishable - gets to factory while still fresh
- Finished products cheaper to transport than raw materials

Explain how cost of transport influences the location of different types of industry. (4)
- Industries aim to keep transport costs as low as possible
- If raw materials are bulky, factories located close to source

- If power supplies eg coal are heavy, factories located close to them eg mines
- If finished products are bulky, factories located close to market

Explain why many large companies have located high tech industries in LEDCs. (5)
- Low labour, land, transport cost
- Limited trade union activity - workers work long hours
- Gove incentive - low taxation
- Lack of gov restrictions on pollution

What is meant by labour costs? (1)
- Payment for workers

Suggest reasons why labour costs are higher in some industries than others. (3)
- Some industries are less mechanised than others
- Some jobs have to be done by hand, cannot be done by machinery

Suggest how growth of high tech industry may benefit ppl & economy. (5)
- Create job opportunities, skilled gained
- High salaries - increase standard of living, personal spending eg housing
- Increase GNP
- More exports - more money earned through taxation
- Healthcare / education improved
- Infrastructural development

Explain why manufacturing industries remain important in some areas even though the original advantages of those locations no longer exist. (4)
- Geographical/industrial inertia
- Area has reputation
- There's skilled labour force
- Cost of relocation may be expensive
- Gov policy

Explain how TNCs can bring both advantages & disadvantages to LEDCs. (5)

Adv	Dis
- Employment ↑ standard of living - Learn new skills - Development of transport network or infrastructure - Encourages econ growth - Gov taxes	- Low pay - Profits not kept locally - Pollution - Traffic congestion - Competition with local industry - Can pull out at any time

Suggest ways in which factories may threaten local natural environment. (4)
- Air pollution - greenhouse gases
- Water pollution - acid rain pollutes water
- Deforestation - loss of habitats - loss of food sources - disrupt food chain - threat species extinction
- Industrial waste

Suggest reasons why some gov may not want to solve the problems. (5)
- Solutions are expensive
- Legislation too complex
- Gov more concerned about development than ppl

- Gov don't want to risk industry moving out of country - reduce employment, trade

Suggest 3 ways in which environmental impacts of producing & transporting this manufactured product could be reduced. (3)
- Transport materials in bulk
- Produce raw materials close to factory
- Use less packaging
- Use renewable energy sources

Case study - Airbus factory

Basic info	- Location: Toulouse, France - Type of industry: Hi-tech industry - Airbus A380 - double deck jet airliner manufactured by Airbus
Processes	- Have over 400 suppliers - Various parts are built all over Europe - Wings (aluminum) - Broughton, north Wales - Fuselage (titanium alloy) - Hamburg, Germany - Horizontal stabilizer (aluminum alloy) - Madrid, Spain - Final assembled in Toulouse, France
Output	12 A380 per year 20 A220 49 A330 1000 wings per year
Location	- Near main roads eg A66 - connects to rest of France - Near University of Toulouse - supply many skilled labours & provide labs for R&D - Attractive areas to live eg Mediterranean coast - attract workers - Gov research facilities eg British Aerospace - share technological expertise which support R&D of new tech - Hi-tech firms group together & share services - reduce costs & increase amount offered to potential customers (agglomeration economies)
Adv	- Over 100000ppl employed - Develop skilled labour - Airbus offer trainings to increase skill level of labour force - Airbus has strong reputation - attract investment from hi-tech industries to locate in region - Airbus use local industries & suppliers - benefit local business

3.4 Tourism

Define tourist. (1)
- A person who is visiting a place for leisure or holiday

Define domestic tourist (1)
- A person who is visiting a place for holiday from same country

Define international tourist (1)
- A person who is visiting a place for holiday from another country

Explain why international tourism has increased (4)
- Development of transportation - more airports
- Package holidays, cheaper air travel - more affordable
- More advertising

- Investment in tourism facilities
- More travel agencies

Define tourist industry (1)
- Business of providing services eg entertainment for visitors

Choose two different types of landscape and explain why they attract tourists. (4)
- Beaches - tourists can sunbathe / watersports
- River valleys - scenery is attractive
- Mountain areas - suitable for hiking / skiing

Suggest reasons why no of tourists to Kenya from different parts of world varies (3)
- Distance - fewer tourists from further away
- Level of development - more tourists from richer countries
- Transport links - ease of access

Suggest reasons why no of tourists varies from year to year. (3)
- Variations in weather
- Competition
- Political issues eg war, natural disasters eg earthquakes
- Hotels / resorts / amusement parks built
- Restricting / boosting tourist no by gov eg investment

Explain why seasonal changes in number of tourists cause problems. (4)
- Seasonal employment - income inconsistent
- Hotels full at some times & under-used at others
  At busiest times
- Traffic congestion - air pollution
- Visitor attractions - overcrowded

Explain how tourists are attracted to an area. (5)
- Historical buildings eg castles - learn history
- Shopping centres - entertainment
- Art galleries / museums
- Restaurants
- Theme parks
- Hotels

Explain how growth of international tourism encourages development of economy & infrastructure in country. (5)
- Increase job opportunities / employment - earn money
- Increase market - more goods / services - increase GDP
- Improved transport network eg roads/airports - more accessible
- Increase tax - increase gov revenue - investment for infrastructure
- Improve provision of electricity and running water
- Better infrastructure to attract more tourists

Suggest benefits of tourism for local. (4)
- Increase job opportunities eg sell food, souvenirs, jobs in hotel - earn money
- Increase income for local businesses
- Improved transport network eg roads / airports - more accessible
- Increase tax - increase gov revenue - investment for education / healthcare
- Cultural exchange - learn new language

Suggest how tourism may cause problems for local ppl. (5)
- Noise

- Litter - visual pollution spoils view
- Traffic congestion - air pollution - breathing difficulties
- Overcrowded shops - local cannot use
- Increase in prices - inflation
- Impact of behaviour of tourists eg racism, fighting

Explain how tourist industry can have positive impacts on natural environment (5)
- Money earned used to protect environment
- Create National Parks conserves species
- Careful management preserves natural environment - prevent extinction

Suggest ways in which tourist industry is likely to threaten the natural environment. (5)
- Deforestation - loss of habitats - loss of food sources - disrupt food chain - threat species extinction
- Water pollution - kills sea animals, damage coral
- Air pollution from vehicles
- Noise disturbs wildlife
- Overfishing
- Feed animals makes them dependent on humans / inappropriate diet

Explain how creation of game reserves & national parks is likely to help tourism to be sustainable. (5)
- Ensure preservation of wildlife - protects habitats
- Game reserves & national parks will still be there for future generations
- Creates employment or income for local ppl eg ppl look after reserves
- Money earned - invest in more tourist facilities
- Cultures retained - tribal groups still exist in future

Explain how creating a National Park helps to maintain, conserve or improve quality of natural environment. (5)
- Protects environment
- Control no of visitors to area
- Some areas fenced off - leave time so species can recover
- Visitors educated - less damage to environment
- Control no of buildings - less vegetation lost to development

Case studies
Explain how tourism is managed in order for it to be sustainable (7)
Explain how negative impacts of tourism are managed. (7)
Explain how it has both +ve and -ve impacts on local ppl (7)
Describe problems caused by tourism for local ppl & natural environment (7)
Describe an economic activity which takes place & explain how this is threatening local natural environment. (7)
Describe its natural & human attractions. (7)
Dubai, United Arab Emirates

Basic info	• Population: 2.8 million ppl • Developed country – high GNI per capita: $25,000 • HDI: 0.84 (rank 41st) • Economy – export of oil & natural gas, tertiary industry: tourism, retail & trade
Tourism info	• In 2015, 9 million ppl visited, • Earns $4 billion a year (25% of Dubai's GDP) • Tourist no ↑ by 10% each year (global average: 4%)
Physical tourist attraction	• Easily accessible from Europe by air with 120 airlines flying there including the national airline Emirates • Major hotel developments including 6* hotels e.g. Burj as Arab • Highly developed tourism infrastructure and leisure facilities including golf courses, ski dome and water parks

	• High end shopping malls with tax free shopping • Traditional culture: opportunities to see historic buildings e.g. mosques and spend time in desert with traditional people
Human tourist attraction	• Easily accessible from Europe by air with 120 airlines flying there including the national airline Emirates • Major hotel developments including 6* hotels e.g. Burj as Arab • Highly developed tourism infrastructure and leisure facilities including golf courses, ski dome and water parks • High end shopping malls with tax free shopping • Traditional culture: opportunities to see historic buildings e.g. mosques and spend time in desert with traditional people
Economic impacts	• Causes demand-pull inflation coz ↑ demand → general prices of goods & services ↑ • ↑ seasonal unemployment during off season eg ski instructors unemployment is likely to be higher in the summer coz no snow • Become too dependent on tourism eg in Dubai, tourism sector accounts for 25% of the Emirate's annual GDP → risky coz tourist numbers can fall dramatically due to natural disaster or pandemic eg COVID-19
Social impacts	• Ppl displaced from their homes to build tourist infrastructures eg hotels • ↑ in pressure on water and energy coz ↑ population • Fresh water is abundantly used in swimming pools or to irrigate golf courses for tourists → to produce more fresh water to meet the demand, desalination is used which is expensive • Traditional culture may be abandoned coz local people copy tourists' culture in terms of their clothes or behaviour

Environmental impacts	• Extensive use of air conditioning coz hot temp uses a lot of electricity (produced by burning fossil fuels → increase CO_2
	• Lack of water → use desalinated water to produce fresh water
	  - Uses a lot of fossil fuel
	  - Creates a concentrated saline waste → deposited & pollutes the sea
	• Fresh water is abundantly used to irrigate golf courses & swimming pools
	  - Waste of resource in desert environment
	• Reclamation of land to create developments e.g. The World, the Palms causes environmental damage to marine ecosystem coz sediment is deposited on coral reefs → destruction
	• Flying to Dubai has ↑ CO_2 produced from burning jet fuel

3.5 Energy

Non-renewable

Types	Adv	Dis	Site
Fossil fuels (coal, oil & natural gas)	• Relatively cheap - low running costs • Reliable supply of electricity • High power output	• Non-renewable - will run out eventually • Fluctuating price - expensive • High transport costs • Burning of fossil fuels • Release CO2 → global warming - melting of ice caps • Release SO2 → acid rain	• Plenty of flat, cheap land - for construction of large building & further expansion • Near river - water supply to produce steam & cool machines • Road transport - for coal deliveries & taking waste away • Close to population - for workforce

		• Thermal pollution of rivers from power station - sudden change in temp decrease O2 supply & affects ecosystem composition • (Natural gas) Problems of damage to pipeline - leak - explosions •	• Near source of raw material eg coalmine - to reduce transport costs • Solid foundations - due to weight of power station
Nuclear power	• (All of the above) • No atmospheric pollution & contribution to global warming • Use small quantities of uranium - will last many centuries • Uranium has no other uses / uranium reserves last 1000s years	• High set up cost • Produce radioactive waste → long-lasting, dangerous - risk of cancer • Difficult to dispose nuclear waste • Public opposition of threat • Land cannot be used after closure for many years	• Plenty of flat, cheap land - for construction of large building & further expansion • Near coast - water supply to cool reactor & safe transportation of nuclear waste • Road transport - for coal deliveries & taking waste away • Close to population - for workforce • Isolated area - away from ppl from radiation leakage & avoid public opposition of threat (protests)

Explain why relying on imports of natural gas could cause problems (5)
- Non-renewable
- Fluctuation of prices - expensive - increase balance of payment deficit
- Impacts on natural environment eg air pollution
- Supply may be restricted if there are political disputes
- Problems of damage to pipeline - leak - explosion

Renewable

Types	Adv	Dis	Site
Solar	• Renewable - won't run out • Cheaper running cost • No atmospheric pollution • No waste products • Don't depend on imports (When construction…) • Creation of employment for construction/maintenance	• Unreliable • Low power output • Only small amount of energy can be generated relating to initial cost • High set-up costs (When construction…) • Deforestation - loss of habitat - disrupt ecosystem • Land can be used for other purpose	• Lots of sunshine • Large areas of land • No shelter by buildings • By using solar panels

Wind	• (same)	• (See above) • Visual impact - can be seen for many miles - ruins the view • Puts tourists off - loss of tourism • Noise pollution • Birds flying into turbines • Can interrupt radio/TV signals	• Lots of strong winds • Mountainous / offshore areas • Large areas of land • No shelter by buildings • By building wind turbines
Hydro-electric power	• (same) • Control flooding • Reservoirs provide water for domestic & agricultural use • High power output	• Flood large area to build dams → affect ecosystem • Expensive • Need suitable location • May collapse & cause devastating flooding • Drought result in not enough water to create electricity **Dam construction problems** • Water held back by dam • Lower river flows • Less sediment carried by river - loss of soil fertility - decreasing yields - less water for farming - less food	• High precipitation • Steep slopes • Fast flowing river with reliable flow • Narrow valley - steep sided & narrow valley, easier to build dam across river coz shorter, use less material • Impermeable rock - provide solid foundation to build dam • Large areas of land which can be flooded • Sparsely populated - less opposition / don't have to relocate many ppl
Wave / Tidal	• (same)	• Unreliable • Low power output	• In coastal areas
Biofuel	• (same) • Made from crops	• Limited by location • Cause flooding → affect ecosystem	
Geothermal	• (same) • Comes from underground	• Limited location • Expensive	• In volcanic areas • By sending water down into hot rocks
Fuelwood	• Cheap • Easily accessible • Renewable	• Time wasted when cutting woods • Carrying woods cause health problems eg back injury • Child labour - children lack education • Environmental impact - deforestation	

Suggest why % of electricity generated from renewables can reduce from time to time (3)
- Period of calm stops generation of electricity by wind
- Strong wind stop generation of electricity by wind
- Solar power reduces in cloudy periods & at night
- HEP stops if river freezes / drought
- Biofuel is seasonal

Explain why there is a relationship between GDP per person and the use of electricity per person (5)
- Electricity availability tends to increase with development
- In many countries with low GDP, many rural areas are not connected to grid
- Countries with higher GDP likely to use energy in workplaces & have more home appliances
- Higher GDP will enable investment in power stations/supply infrastructure

Suggest reasons why the importance of different sources of energy varies from country to country (5)
- Availability of reserves of fossil fuels
- Level of tech available
- Gov policy / attitude towards the environment
- Environmental conditions eg opportunity to use solar power
- Expense in development

Explain why in many countries only small amounts of alternative energy sources are used (5)
- Few alternative energy sources are available
- Some in early stages of development
- Limited tech in many areas
- High set-up cost
- Limited by environmental factors eg lack of sunshine
  Much of industry/transport geared up to fossil fuels
- Gov doesn't priorities renewable energy

Explain why there is variation in the amounts of energy used in different parts of the world (5)
- Varying pop size
- Some countries have more energy resources eg oil, coal
- Some countries can't afford to develop energy supplies
- Lack of tech
- Using more electronic devices / home appliances eg air conditioning
- Some countries are more industrialized - have more factories eg manufacturing industry is likely to use large amounts of energy

Explain why many countries are planning to use a greater % of renewable energy in the future (3)
- Exhaustion of non-renewable resources eg fossil fuels
- Fluctuating prices - expensive
- Attempts to reduce reliance on imported fuels
- Reduce atmospheric pollution - worries about global warming

Suggest reasons why many MEDCs want to reduce the amount of energy which they import (3)
- Importing energy is expensive coz prices of oil are fluctuating
- To reduce transport costs & balance of payments deficit
- To be self sufficient so still have energy supplies in case of political disputes eg war
- Increase renewable energy sources

Explain why the percentage of energy generated from renewable sources is low in many countries. (4)
- Unreliable & low power output - can't meet demands
- High set up cost of power stations - can't afford
- Some are still in early stages of development
- Limited tech in many areas
- Limited by siting factors eg wind not strong enough
- Fossil fuels are cheaper
- Much of industry & transport is geared up to using fossil fuels - don't want to abandon it

Case study

For more help, please visit our website www.exampaperspractice.co.uk

Dubai, United Arab Emirates

Energy consumption	• Uses 8000kg of oil equivalent per person per year
Why is energy use so high?	• Highly developed city with wealthy pop & high no of tourists • High car ownership encourages high use of petrol • Hot desert climates with high temp encourages high use of air conditioning • Low rainfall & insufficient underground water supplies encourages use of desalinisation plants which use lots of energy • Has own fossil fuel reserves & can buy oil cheaply from neighbouring country eg Abu Dubai - cheap transport cost •
Energy mix for electricity production	• In 2010, 99% natural gas • In 2020, 75% natural gas, 13% nuclear power plant, 7% solar farms • Aim in the future - 100% nuclear, solar & other renewables • (explain how electricity is generated using natural gas, nuclear power plant & solar farms) **Why?** • To be self sufficient, don't rely on Abu Dhabi - so still have energy supplies in case of political disputes eg war • Reduce greenhouse gases emission **Explain energy mix** • Dubai hasn't diversified their energy mix coz UAE has large reserves of oil & natural gas - so Dubai uses natural gas for electricity generation & oil for transport
Problems with energy mix	• Use of oil & natural gas is increasing steadily at 4% per year • Dubai is 6th highest producer of CO2 • Dubai too reliant on natural gas - running out - Dubai become net importer of natural gas from Abu Dhabi • Energy too reliant on fossil fuels with pressure on its oil & natural gas reserves which are running out • Thermal power station close to city - atmospheric pollution
Jebel Ali Dubai (power station)	• Located along the shore of the Arabian Gulf, within the Jebel Ali Power Plant & Desalination Complex • Accommodates 6 other stations & produces 7800MW of electricity to serve 1 million households • Have 8 multi-stage flash desalination units

3.6 Water

Define domestic use of water (1)
- Use of water at home / for household, personal use

Suggest reasons for differences in domestic use of water in MEDCs & LEDCs (4)

MEDCs	LEDCS
• Washing machines • Greater access to flush toilets at home • More water used overall as more homes have easy access to piped water • Showers/baths in most homes so more used for washing	• Less available • More use for drinking

Define average daily water use per capita (1)

- How much water each person uses on average per day

Explain how water will be used for agricultural, domestic & industrial purposes
- Agricultural - irrigation / for livestock to drink
- Domestic - washing / cooking
- Industrial - for manufacturing processes / cooling, cleaning of machines / HEP

Suggest different ways in which rivers may become polluted (4)
- Disposal of waste from factories
- Pesticides, fertilizers, animal waste from farms washed from land
- Ppl throw litter into river, wash clothes in river
- Acid rain

Methods of water supply (dams, wells & boreholes, desalination)
Describe 3 features of a dam (3)
- Large, very high, built of concrete, large reservoir behind it, road along dam, power station at base of dam, in rural area

Define reservoir (1)
- An area behind a dam which stores water

Suggest reasons for location of reservoirs (3)
- Impermeable land
- Valleys are easy to dam/surrounded by high land
- Large catchments, amounts of precipitation
- Rural area

Suggest benefits & problems of increasing height of dam for ppl living in the area (5)

Benefits	Problems
- Increase storage of water - so less likely to be shortages - Employment in construction - Generate HEP - may attract more manufacturing industry & foreign investment - increase GDP - Improved flood protection for area downstream - reduce damage - Water available for local farmers - increase yield - increase commercial production	- Loss of farmland - Deforestation for fruit or firewood - Greater visual impact of dam - Flooding of settlements - ppl displaced - Atmospheric & noise pollution during construction - Costs a lot so taxes increased

Describe methods other than reservoirs which can be used to supply ppl with enough safe water (5)
- Digging wells & boreholes - access groundwater in aquifers
- Desalination - boil salt water to separate fresh water from salt by distillation or reverse osmosis
- Provide emergency water supplies eg bottled water & water trucks
- Recycle water - treat dirty water to grey water to irrigate gardens but not for drinking
- Import water from other countries
- Use pipelines to transfer water from one part of the country to another
- Pollution controls
- Rainwater harvesting - collecting rainwater in roof tanks

Define recycling (1)
- Treated & reused

Suggest reasons for differences in % of water used for different purposes in Germany (MEDC) & Egypt (LEDC) (5)

MEDC	LEDCS
• More manufacturing • used for cooling / processes • To generate electricity to use in factories • Homes have piped water so more water used domestically • More ppl have home appliances eg washing machines • More ppl can afford water	• Greater % of pop rely on agriculture - greater need for irrigation

Why water is important for ppl to survive (2)
- Prevents ppl suffering from dehydration - can be fatal
- To water crops / for livestock to stay hydrated

Explain why women in LEDCs spend many hours each day carrying water (3)
- Many don't have piped water supplies in their home
- Long way to water sources eg rivers / wells
- No transport - have to walk to get water
- Ppl carry small amounts - lots of journeys
- Loads heavy - slow journeys

Describe 4 ways in which water supplies can be increased in a country (4)
- Dams/reserviours
- Use of aquifer/underground water/wells/boreholes
- Desalination
- Import of water
- Use pipelines to transfer water from one part of the country to another
- Cloud seeding
- Colllection in rooftop tanks
- Purification of water sources

Explain why it's important to increase clean drinking water supplies in LEDCs (4)
- Water is essential for survival / prevents dehydration
- Health of pop will improve / reduce disease eg waterborne disease
- Life expectancy increase
- Less money spent on treating disease
- Ppl improve hygiene
- Ppl stronger, reduce time collecting water - able to work more - earn more money
- Water used for cooking & washing food

Explain why water shortages cause more problems in LEDCs than in MEDCs (4)
LEDCs...
- Depend on agriculture - subsistence famers will starve if no food produced
- Invested less in water storage than MEDCs
- Less able to transfer water to areas where there are water shortages
- Don't have water storage / have few reserviors
- Cannot afford to import water
- Ppl drink polluted water - get water-borne disease

Explain why many ppl in LEDCs die from waterborne diseases (4)
- Ppl using dirty water - which carries disease

- Lack of water infrastructure eg no piped water
- Few water treatment plants - water not filtered or purified
- Poor healthcare - cannot afford to treat disease
- Lack of education about how to purify water / consequence of drinking dirty water
- Can't afford to buy clean water

Explain why providing a reliable supply of clean water may increase life expectancy (4)
- Reduction of waterborne disease eg cholera
- Water is essential for survival - without water ppl die
- Water needed for cooking of food - less malnutrition
- Water needed to irrigate crops / for livestock
- Less need to carry water for long distance - less time wasted - ppl grow more crops

Water supply management (in LEDCs)

	Adv	Dis
Collect rainwater		- Dirty water - not safe for drinking - waterborne disease - Not reliable water supply - Lack of availability of building storage tanks - Water could evaporate from storage tanks
Well	- Low cost - Can do it themselves - Low maintenance - Won't take long	- Unhygienic - Won't provide water all the time - Dangerous to young ppl - Stagnant water
Borehole	- Clean - Won't dry up - reliable - Large amounts of water provided - Mechanised - no need for manual pumping	- Expensive - High maintenance - Cost of electricity - Power cuts
Pipes from springs / rivers	- Clean - Won't dry up - reliable - Low cost - Naturally flows downhill	- Stagnant water in tank - Cost - Pipes cross ppl's land

Explain how sanitation can be improved in LEDC (3)
- Build water pipes / sewage treatment
- Educate ppl about hygiene eg use soap when showering

The conservation of water is becoming increasingly important. Describe methods which can be used to conserve water (5)
- Treatment of waste water
- Regulations on pollution of rivers
- Educate ppl about careful use of water
- Turn off taps when not being used
- Take shorter showers
- Use of roof-top tanks to collect rainwater
- Recycle water

Suggest 2 reasons why conflicts may occur when river flows through more than one country (2)
- Arguments over use of its water
- Damming of river upstream reduces downstream supply
- Country upstream may pollute it & make it useless for country downstream
- One country using more reduces availability of it in another

Explain how water can be used in a sustainable way (5)
- Treatment of waste water
- Regulations on pollution of rivers & strict enforcement
- Educate ppl to use water more carefully
- Take short showers
- Turn off taps when not in use
- Use water meters as paying for water makes ppl more careful
- Roof top tanks - collect rainwater

Describe how water treatment works (3)
- Water pumped into treatment through pipes
- Chemicals added to water
- Sediment allowed to settle

Explain benefits to local ppl of water treatment works (5)
- Employment in construction - improve quality of life
- Clean water available
- Used for domestic purposes
- reduce in diseases eg waterborne disease - less money spent on hospital care

Case study
Dubai, United Arab Emirates

Basic info	• Uses 500L per person per day
Uses of energy	• Highly developed city with wealthy pop & high no of tourists - high demand • Hot desert climates with high temp encourages high use of air conditioning • Low rainfall - agriculture irrigation •
Energy mix for electricity production	• Agriculture: 67% • grow crops in hot, arid climate • Irrigation methods inefficient - 30% lost to evaporation when water spray on crop • Industrial use: 9% • To cool & clean machines • Limited industry located in Dubai • Service (tourism): 24% • Eg Atlantis Aquaventure Waterpark **Why?** • To be self sufficient, don't rely on Abu Dhabi - so still have energy supplies in case of political disputes eg war • Reduce greenhouse gases emission
Methods to obtain water	• Groundwater: 72% - agriculture (2 freshwater aquifers) • Desalinisation (distillation, reverse osmosis, solar powered desalinisation plant): 21% - drinking water • Retreated or recycled water: 7% - irrigate gardens

Problems with water mix	- Highest per capita water consumption but fresh water scarce - Rainfall less than 250mm per year, no surface water eg river - Aquifer running out - Desalinisation requires lots of energy - damage environment eg salt waste disposed back to sea - Pop & no of tourists (4% a year) grow rapidly - increase demand - Misuse limited water supply for gardens + fountains - Water infrastructure ageing, pipelines corroded / leaking - waste water - Currently not enough water is recycled. But plan to use new techniques to irrigate agriculture using drip irrigation & plant drought resistant crops eg millet which require less water

3.7 Environment risks of economic development

Global warming

Explain why greenhouse gases are increasing in the atmosphere. (5)
- Burn fossil fuels & coal - generate electricity, in industry
- Petrol in transportation / air travel
- Deforestation - less trees absorb CO2
- Cattle grazing - releases methane

Explain how greenhouse gas emission may cause an increase in global temp (4)
- Build up in atmosphere
- Let sun's rays through
- Reflects from earth's surface
- Do not allow heat to escape
- Insulates / acts like a greenhouse

Explain how economic activities are causing global warming. (3)
- CO2 & methane are released by burning fossil fuels in industry
- It builds up in atmosphere
- Heat from sun passes through atmosphere
- Some heat energy absorbed by earth
- Some re-emitted from Earth
- Heat is trapped by layer of greenhouse gases

Explain why global warming is a threat to natural environment. (5)
- Melting of ice caps - ↑ sea level - flooding of low lying islands
- Loss of habitats - loss of food sources - disrupt food chain - threat species extinction - ↓ biodiversity
- Coral bleaching - warming of sea water
- ↑ drought - rising temp make dry areas drier - water evaporates quickly
- ↑ flooding - rising temp make wet areas wetter - warm air absorbs more water - heavier rainfall