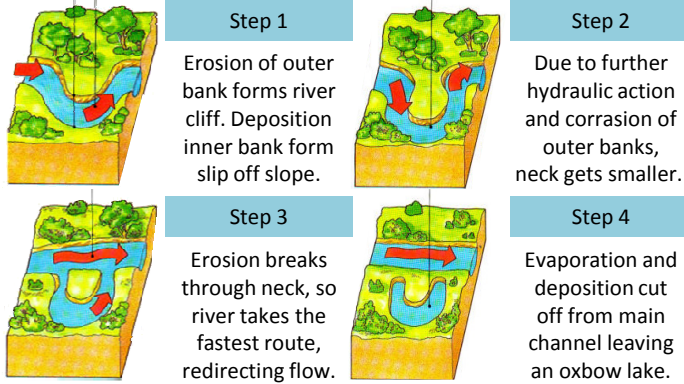


Formation of Oxbow Lakes



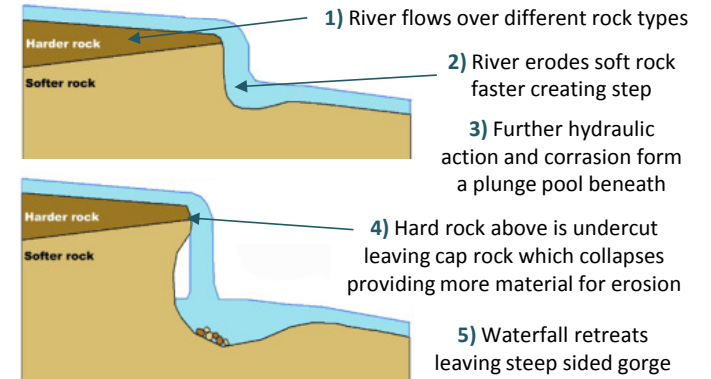
River Transport

Solution	Minerals dissolve in water and are carried along
Suspension	Sediment is carried along in the flow of the water
Saltation	Pebbles bounce along river bed (not enough energy)
Traction	Boulders roll along river bed by force of flowing water

River Erosion

Hydraulic Action	Sheer force of water washes away loose material
Corrosion	Acidic water dissolves rocks by attacking carbonates
Attrition	Angular rocks bash together to become smooth/small
Corrasion	Rocks bash into side of river bed, wearing it away

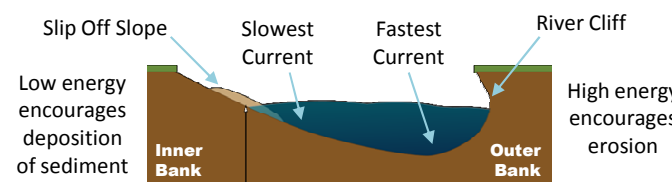
Formation of Waterfall



River Drainage Basin

Source	Where the river starts
Confluence	Where two rivers meet
Mouth	Where river enters sea
Tributary	Network of smaller streams, which join the main river
Watershed	High ridge of land separating different drainage basins

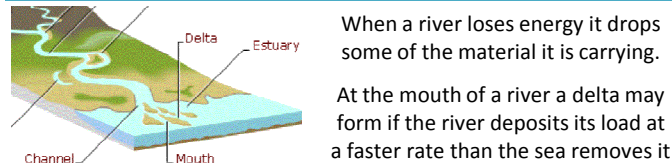
Cross Section of a Meander



Effects of Flooding - River Severn 2007

Social	Economic	Environmental
48000 without water	House Prices fall 1/3	Birds drowned
3 deaths	Lose tourists	Fish stranded on flood plains
Many homeless	Damage economy	Fresh water polluted
Diseases - sewage	Insurance pay out	

Deposition



Factors influencing Surface Runoff

Less Infiltration > More Surface Runoff > Shorter Lag Time > Flash Flood

Relief	Steep slopes mean water runs straight over land
Rocks	Non-Permeable rocks don't allow infiltration, so runoff
Farming	Ploughing up and down hillside (instead of sideways) forms channels for water to runoff faster into river
Roads	Impermeable can't soak up water, so it goes straight into drains, which are efficient at taking it to the river
Trees	Deforestation means less trees intercept, so ground saturates faster, water table fills up, so runoff increases
Cattle	Trample soil, compacting it, so less water infiltrates
Machinery	Heavy farming machines compact soil, less infiltration

Water

River Management Schemes

Soft Engineering	Hard Engineering
Afforestation - plant trees soak up rainwater, reduce flood risk	Straightening Channel - increases velocity to remove flood water
Demountable Flood Barriers put in place when warning raised	Artificial Levees - heightens river so flood water is contained
Managed Flooding - naturally let areas flood, protect settlements	Deepening or Widening River to increase capacity for a flood

Three Gorges Dam, River Yangtze, China

Scheme	Effects
Cost \$30 billion	Landslides and Seismic Activity
Dam/Reservoir in upper valley, stores water and controls flow	1.2 million people force relocate
	Flood risk 1 in 10yrs > 1 in 100yrs

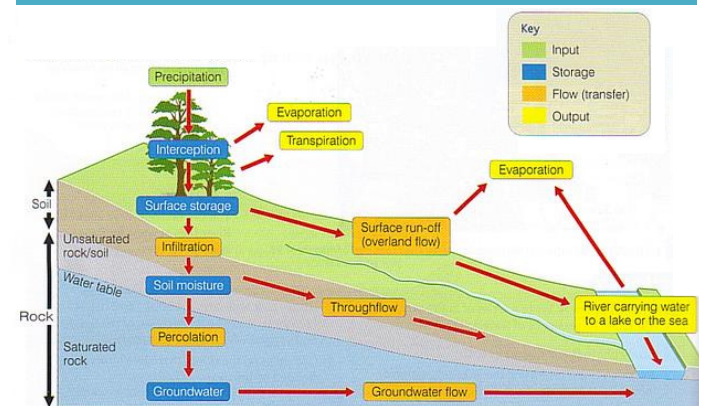
Impact of Rivers on People's Lives

Waterfalls - Niagara Falls	Floodplains
4m tourists/year Canadian side	Ideal for farming, as soil is fertile and nutrient rich from floods
Boost economy - more jobs	Flat land for building houses
Hydroelectric Power Station Generates 2.4m kW	

Formation of Natural Levees



Water Cycle

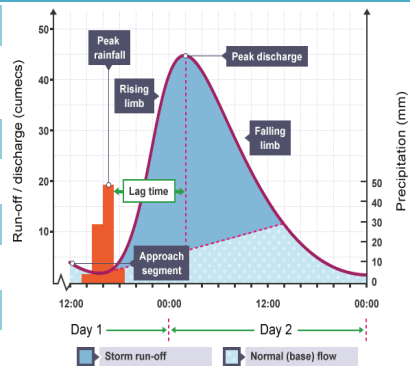


Effects of Flood Defences

Hard Engineering	Soft Engineering
+ Last a long time	+ Generally cheaper
+ People feel safe	+ Good for environment
+ Good control over river	+ Allow river to flow naturally
- Expensive to build	- Take time for maximum effect
- Sends flood water downstream	- Lose farmland

Hydrographs - show river discharge over period of time

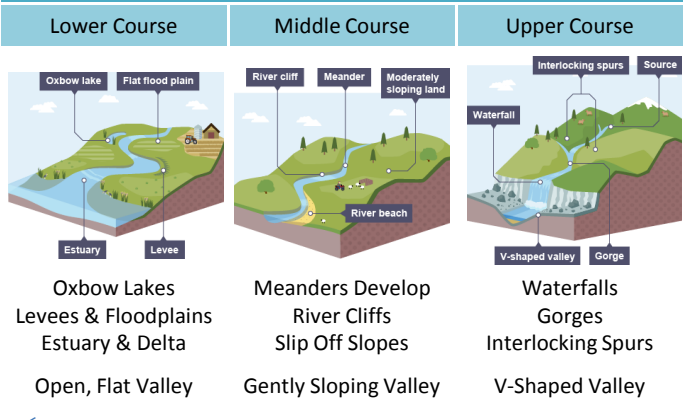
- Lag Time**
Time between peak rainfall and discharge
- Rising Limb**
Rising flood water in river
- Falling Limb**
Declining flood water
- Base Flow**
Normal discharge of river



Thames Barrier, London

Scheme	Effects
Cost £500 million High Tech Flood Barrier, prevent tidal surge, which may flood	Protects 1.5m people and area contributes £250bn to economy By 2030 obsolete - sea level rise

River's Changing Course



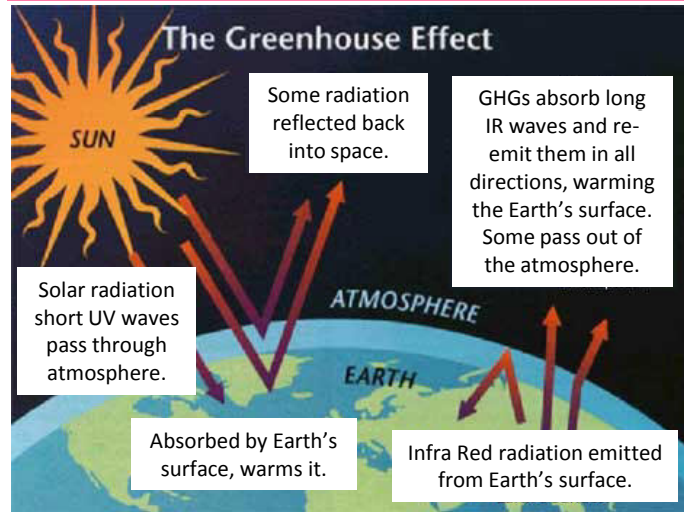
Channel becomes wider and deeper
 Amount of erosion decreases
 Amount of deposition decreases, as it more efficient
 Velocity and discharge of river increases
 More energy further downstream

Water Cycle Terms

Precipitation	Moisture falling from cloud as rain, snow, hail
Interception	Vegetation prevent water reaching ground
Surface Storage	Water held on the surface of the ground
Infiltration	Water absorbed into the soil from the ground
Soil Moisture Store	Water held in the soil layer beneath ground
Throughflow	Water flowing through the soil layer into river
Percolation	Water sinks through soil into deep rock
Groundwater Store	Water stored deep in the rocks
Groundwater Flow	Water flowing through deep underlying rock
Transpiration	Water lost through stoma in leaves of plants
Evaporation	Water lost to atmosphere as water vapour
Surface Runoff	Water flowing over surface of land into river
Water Table	The uppermost level of saturated ground

Effects of Climate Change	
Short Term	Long Term
Hurricanes - warmer waters	Business - more UK vineyards
Droughts - El Nino ocean pattern changes weather events	Disease - malaria spreads further
Storms - surge before hurricanes	Tourism - more UK staycations
Flooding - warmer atmosphere holds more moisture, more rain	Agriculture - hard to grow crops
	1/3 of Earth species risk extinction
	Sea Level Rise 1mm each year

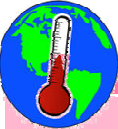
Greenhouse Effect



Renewable Energy - North Hoyle Wind Farm

Scheme	Impacts
30 offshore wind turbines	New Industry/Jobs in N.Wales
5 miles offshore from Rhyl	Noise/Visual Pollution (tourism)
Powers 1.5% of Wales' electricity	Laying cables damages fish life
Reduce CO ₂ emissions	Sea life colonises base of turbine

Causes of Climate Change	
Physical	Human
Volcanoes emit CO ₂ (GHG) and SO ₂ reflects sunlight so cools	Deforestation means less CO ₂ absorbed by photosynthesis
Solar Variations naturally change power output of the sun	Grazing Cattle release methane
	Traffic increases carbon emission
	Rice Paddies produce methane
MEDC Effects - French Alps	
Positives	Negatives



Chance to diversify economy, offer summer health breaks	Snowline rise 150m for every 1°C
Generating snow to add to slopes and extend season	Shorter skiing season, less jobs
	Tourism worth \$71bn economy
	Alpine plants retreat upslope

Climate Change

Traffic Management - Freiburg, Germany

Scheme	Impacts
Tram, Train and Cycle Networks	70% of journeys by tram
3000km of public transport lines	CO ₂ reduced by 10% per capita
Introduce "Play Safe Streets"	Lower Car Ownership
Reduce CO ₂ emissions	Link suburbs to inner city

International Agreement - Kyoto Protocol

- Set up in 1997, enforced in 2005
- Doha 2012 Amendment allowed carbon trading
- Each country has a quota of GHGs which can be traded
- If a country goes over their quota then they pay a fine

EU aims to reduce emissions by 18% by 2020, compared to the 1990 levels.



Evidence for Climate Change	
Temperature	Rose by 1°C in the last decade
Ice Caps Melt	Antarctica melting could cause 70m sea level rise
Seasonal Timings	Spring comes earlier and longer growing season
Wildlife	Migrate to cooler areas, so not to become extinct
Permafrost	When frozen soil melts, CO ₂ and CH ₄ are released
Albedo Effect	Less ice reflects sunlight, so oceans heat quicker
Hurricanes	More frequent and stronger, as warmer waters means more places have the 26°C -required

LEDC Effects - Bangladesh

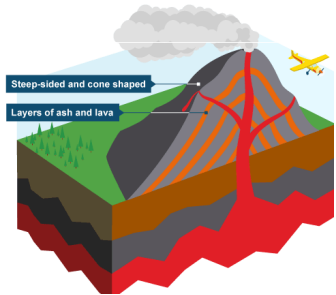
Social	Economic	Environmental
People migrate inland, cause over crowding and 20 million refugees	More intense monsoons from Bay of Bengal damage infrastructure	75% of mangrove forests become submerged, means no flood defence
50% of land is less than 1m above sea level, so high risk of flooding	Warmer ocean temperature will damage the shrimp industry	Crops die in rural areas, causing famine and food insecurity

Tackling Global Warming

Personal	Governmental
Energy Saving Appliances	Afforestation - trees absorb CO ₂
Public Transport or Walk	Invest in Renewable Energy
Use Renewable Energy Sources	Park and Ride Schemes
Choose Sustainable Companies	Improve Public Transport
Recycling - less landfill	Free Home Insulation Schemes
Insulation reduce energy loss	Join International Agreements

Effects of Volcanic Eruptions	
Primary	Secondary
Pyroclastic Flow - Fast flowing super heated ash and gas	Lahars - Fast mudflow, mixture of ash and melted snow/ice
Ash Clouds - thrown high into air, causing breathing problems	Fire - Broken gas pipes and electrical cables
Lava Flow - Molten rock, cause economic damage (buildings)	Crop Failure - Ash covers plants, so can't photosynthesise
Lava Bombs - Large pieces of rock and ash thrown into air	Earthquakes - Small tremors from eruption cause quake

Types of Volcanoes	
Composite	Shield

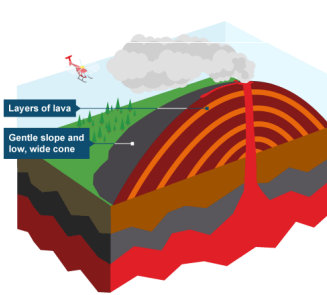


Destructive Plate Margins

Steep sided cone shape

Thick sticky lava cools quickly

Explosive release ash/lava bomb



Constructive Plate Margins

Gentle slopes, low wide cone

Runny lava flows long distances

Eruptions are oozing of lava

Predicting & Managing Volcanic Eruptions

Seismometers	Measure seismic activity before erupt (harmonic tr)
Tiltmeters	Monitor changes in shape of volcano as magma fills
Hydrology	Measure acidity of lakes/streams, as SO ₂ is produced
Gas Emissions	CO ₂ and SO ₂ rise to surface, can indicate eruption
Ultrasound	Detects the movement of magma beneath surface

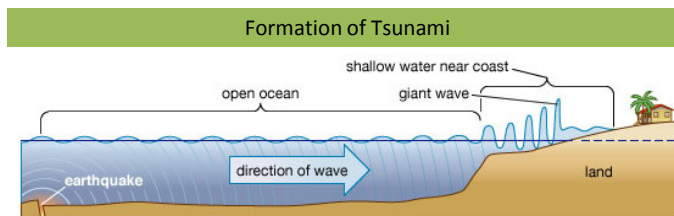
Case Study - Mt Etna Eruption 2002



- Gas emissions and hydrology are now monitored
- Dams of volcanic rock helicopted in place to redirect lava flows away from tourist bases - successful no towns were lost
- Remote sensors connected in real time to control centre in Catania
- Catania Airport forced to close causing disruption

States of Volcanoes

Active	Dormant	Extinct
Volcano has recently erupted	Has not erupted for a long time	No record of tectonic activity



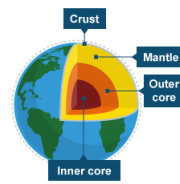
Plates shift, displacing water above epicentre. As wave travel towards continental shelf @ 500mph, wavelength reduces, so height increases

Predicting Earthquakes

Seismometers	Measure vibrations in Earth's crust before quake
Laser Beams	Detect plate movement beneath the ground
Radon Gas	Escape from cracks in ground, increase = quake

Structure of the Earth

Crust	Solid made of tectonic plates
Mantle	Convection currents from radioactive decay in asthenosphere drive movement of plates above
Core	Solid due to pressure from above



Living in an Active Zone

Plate Boundaries - point where two tectonic plates meet

Constructive	<ul style="list-style-type: none"> Plates move apart, magma rises surface forming new crust Overproducing magma forms ridge either side of margin As plate move apart, crust thins leaving rift valley
Destructive	<ul style="list-style-type: none"> More dense oceanic plates subducts under continental Oceanic crust melts, magma rises causing volcanic eruptions Continental crust compresses to form fold mountains Friction causes earthquakes
Conservative	<ul style="list-style-type: none"> Plates slide past each other Plates may lock together, when the friction is released and plates slip free and cause an earthquake e.g San Andreas Fault, USA

Earthquake Impacts

Primary	Secondary
Buildings Collapsed	Tsunami tidal waves
Damaged roads/transport links	Fire - broken electrical cables etc
Deaths and Injuries	Disease - lack of clean water
	Weaker Economy - no tourism
	Pressure on hospitals/schools
	Liquefaction - Water rises above soil particles, surface flows liquid



Case Study - Boxing Day Tsunami, 2004

- 9.1 Magnitude Earthquake btwn Eurasian and Indo-Australian plates
- Approximately 250 000 deaths across 14 countries, £7bn aid offered
- Only 2 houses left standing in Banda Aceh, Indonesia

Earthquake Response - L'Aquila, Italy 2009

Background	Preparations
5.8 Magnitude cause 291 deaths 11 000 buildings collapsed	Volunteer Force in place Education awareness plan
Short Term Response	Long Term Response
Red Cross 10 000 meals/day 11 000 Volunteers 161 tents set up for homeless Thermal Cameras and Sniff Dogs	Building regulations in place Update seismic risk map Introduce early warning system Government will rebuild 100%

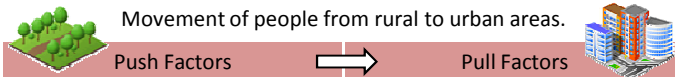
Preparing for Earthquakes

Education	Training people e.g "California Shake Out"	
Aid Kits	Emergency Kits for essentials - tinned food, blankets etc	
Infrastructure	Roads/Bridges designed to withstand earthquakes	
Communicate	Use technology to send messages e.g Japan	
Buildings	<ul style="list-style-type: none"> Shock absorbers at base absorb tremors of quake Cross bracing reinforces walls using steel beams Shear walls reduce rocking movements 	

Reasons People live in Hazard Zones

Agriculture	Nutrients from ash = fertile soil to grow lemons Naples
Materials	Mine for minerals e.g gold/silver to sell - Mt St Helens
Energy	Hot rocks = geothermal power, Iceland 17% electricity
Tourism	Scenery attracts visitors - Yellowstone 3m/yr 3500 jobs
Apathy	People don't want to move, as seismic events are rare

Urbanisation (LEDCs)



Movement of people from rural to urban areas.

Push Factors

Pull Factors

Farm Mechanisation = less jobs

Higher employment/wages

War

Political Stability

Famine (crop failure)

Better Standard of Living

Natural Disasters e.g flooding

Less risk of natural disasters

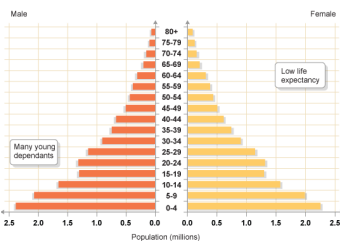
Lack of Services

Better Services

Case Study: Shanty Towns in Kolkata, India

- Overcrowding and not enough houses cause slums in city outskirts
- No sanitation/sewage system - disease e.g TB 10x higher in slums
- Lack of amenities, cramped conditions and jobs in informal sector
 - ½ of shanty towns are not legally recognised

LEDC Youthful Population



Population Structure

- High birth and death rate
- Many young dependents
- Increasing economically active
- Short life expectancy
- Few elderly dependents

Benefits

Drawbacks

Large workforce for future

Pressure on education

Provides large tax base in future

Lack of housing (bigger families)

Growing market for manufactured products

Lack of jobs in future

Strain on food supplies



Solution: China One Child Policy

Policy set up in 1979 after rapid population increase in 1940s - famine
In 1984 policy relaxed for rural areas and 2nd generation only children
Fewer children better economy, by 2016 economy greater than USA
70,000 children kidnapped and traded on the black market
Since established population growth reduced by 300 million

HIV/AIDS in Sub-Saharan Africa Effects

Economic

Social

Affects workers - loss in taxes

Occupy over ½ of hospital beds

9% business negatively affected

Affect education - ill teachers

Future

Environmental

ART wider access - less deaths

Decline in agricultural workforce

Restricting development

Less crops for food = famine

Factors affecting Population Density



Number of people living in a square kilometre

Densely

Sparsely

Relief

Low and flat, easy to build

Mountainous e.g Nepal

Climate

Temperate - grow crops

Extreme e.g Amazon

Soil

Rich, fertile e.g Europe

No soil to grow e.g Sahara

Resources

Raw materials - coal/oil

No access to water

Politics

Fair government

Unstable gov = migration

Jobs

Industrialised areas

Few opportunities

Changing Populations

International Migration: Poland to UK



Push Factors



Pull Factors



Unemployment (40%)

High skill job vacancies e.g NHS

Housing Shortages

Higher wages

Advantages

Disadvantages

Baby boom offset ageing popul.

Wages sent back to Poland

UK Economic Growth +1% 2006

36000 dependents, strain NHS

Fill gaps in UK labour market

Pressure on housing/education

Positive Multiplier Effect +\$2.5bn

Social Friction

Factors affecting Birth Rates

High Birth Rate - LEDCs

Low Birth Rate - MEDCs

Religion against contraception

People marry later in life

Children provide labour

Women go into professional careers, delay starting a family

No knowledge of contraception

High cost of living means it is expensive to raise children

Women lack education, expected to raise families

High infant mortality rate, encourages large families

Contraception and birth control are easily available

Number of births per 1000 people per year

HIV/AIDS in Sub-Saharan Africa Facts

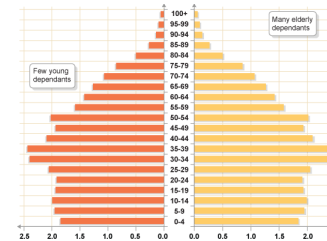
½ of world sufferers live in this region

Affects 1 in 4 school children

ART = Anti Retroviral Treatment

Debswana Diamond Factory offer workers and family free HIV tests

MEDC Ageing Population



Population Structure

- Low birth and death rate
- Few young dependents
- Decreasing economically active
- Long life expectancy
- Many elderly dependents

Benefits

Drawbacks

Adds experience to workforce

Pressure on health care

Growing market leisure products

Strain on pension funds

Construction boom in popular retirement locations

Pressure on care homes

Pressure on meals on wheels



Solution: Germany

- By 2030 Germany have 7m less working age but 8.5m more retired
- Up retirement age to 67 from 65 and work incentives for elderly
- Chemnitz remove cobble pushchair friendly to increase birth rate
- 1 in 3 Chemnitz locals are over 65, Low marriage rate 6.1 per 1000
- Encourage migration to Germany and introduce Pro-Natal Policy
- Singapore "3 or more policy" incentives to have kids, incr birth rate

Counter-Urbanisation (MEDCs)



Movement of people from urban to rural areas.



Push Factors



Pull Factors

Traffic Congestion

Quiet Country Life

Air Pollution

Sense of Community

High Crime Rates

More Second Homes

Noise Pollution

Technology = work from home

Increasing House Prices

High car ownership = easy access

Case Study: St Ives, Cambridgeshire

- 25% of population commute to London every day, 50mins on train
- Popular for London workers, as houses more affordable, higher QoL
- Higher end shops develop (e.g boutiques) better jobs and economy
- Young locals priced out of the market by rich city workers - lose out

Factors affecting Death Rates

Decreasing Death Rate

Increasing Death Rate

Better health care/sanitation

Increasing number of elderly people

Developing cures for diseases

Education on health/hygiene

HIV has an increasingly significant impact on death rates in LEDCs

Higher income = more food

Number of deaths per 1000 people per year

Effects of Globalisation	
Positives	Negatives
Growth of economy	Lose cultural diversity
Products cheaper for consumers	Migration causes social tension
Better awareness of global issues	Profits sent back to MEDCs
Share cultures creates social mix	MNCs outcompete local business
Migration of people fills labour and skill shortages	MNCs cause unemployment if they shut factories and relocate
MNCs provide jobs for people, positive multiplier effect	Environmental problems, as MNCs operate in less strict LEDCs

Trade Basics	
Trade	Buying and selling of goods between countries
Imports	Goods bought in from other countries
Exports	Goods sold to other countries

Balance of Payments

Difference btwn money earned form exports and spent on imports

Deficit	Cost of imports is greater than the money made from exports (e.g MEDCs)
Surplus	Money made from exports is greater than cost of imports (e.g LEDCs/NICs)
Benefits of Trade Surplus	<ul style="list-style-type: none"> Invest in infrastructure Improve quality of life No loans needed to fund projects/services Develop industry and maintain competitiveness, by offering grants and subsidies

Tomato Trade Ghana vs EU

1/3 of world tomato production from EU. €5million profit/yr.

Reasons EU is Successful	Impacts on Apowungo, Ghana
S.Europe gets £250m subsidy/yr	Priced out of the EU market
Protected from LEDCs by taxes	Farmers overproduce, get debt
Process products (tinned) makes more profit, as secondary sector	Factories owned by Italian company, profits go back to Italy

China's Change in Industry

30 yrs ago	Main economy was based on agriculture (primary)
1978	Reformed to focus on manufacturing (secondary) 1978 = 4000 TVs sold 2004 = 75million TVs sold
2000s	Made special zones offering tax incentives for MNCs
Recently	Manufacturing fallen, due to less demand. MNCs are leaving China for cheaper labour e.g Bangladesh

Apple in Shenzhen, China	
Social Impacts	Economic Impacts
In 2010 14 workers took suicide	Young people migrate to urban, shortage in agricultural sector
Exploit workers 12hr days	
12 people sleep in a room, so low standard of living	Pegatron factory employs 80,000 workers (+PME)

Expansion of the European Union

	What
	In 2004 the A8 countries joined the EU, including Czech Republic, Lithuania, Latvia, Estonia, Poland Hungary, Slovakia and Slovenia
	Effects
	Increase trade between member countries within the EU bloc
	Easier to travel btwn countries causing migration and tourism

Globalisation

Types of Trade

Free Trade	Buying and selling of goods between countries without import taxes, quotas or subsidies
Protectionism	Countries impose tariffs/quotas on import of cheap products from abroad to protect own industry

Protectionism Trade

Tariffs	Taxes imposed on cheap imports from abroad, so that LEDCs are priced out of the market.
Quotas	Limit on the amount of goods imported, so LEDCs can't make as much profit.
Subsidies	Grants of money given by government to maintain the price of a product (e.g to farmers), so goods can be sold cheaper to compete with imported goods.

Factors leading to Globalisation

Increase in the flow of goods, services, people and capital across national borders to create a more interdependent world economy.

Transport	People and goods can be moved quicker around the world e.g low cost airlines
Technology	Real time communication helps businesses and use of the internet allows instant money transfers
Mass Media	Information is shared easier, more global adverts

Coca Cola in Kerala, India	
Positives	Negatives
\$10m funded into community programmes e.g safe water	Water table decrease 1m/yr, so less crops could cause famine
Positive Multiplier Effect: for every Coke job 10 more created	Less traditional fruit vendors, so local economy is weaker
Invest water harvesting schemes	Working 12hr shifts for 50 cent

Trading Blocs

Group of countries which have an agreement to export and import goods from each other without tariffs.

Benefits	Drawbacks
Free trade within bloc, no taxes paid, so products sell cheaper	More efficient producers outside of bloc can't compete
Create more jobs, as MNCs move to UK to be inside EU bloc	Retaliation - Trade dispute btwn EU and US beef producers
Economies of Scale - wider EU market to sell to, not just UK	Loss of Benefits - countries now equal in bloc, but before could outcompete others to benefit
Add tax levy to imports outside EU, protect companies in bloc	

Polish Migration to the UK

Advantages	Disadvantages
Fill gaps in UK labour market	Bring 36,000 dependants
Baby boom offset ageing popul.	Pressure on school, NHS, housing
Add 1% to UK growth in 2006	Wages go back to Polish families
Positive Multiplier Effect adds \$2.5bn to UK economy	Polish Brain Drain, less doctors
	Social Tensions

Factors attracting MNCs to a Country

Cheap Labour	Lower minimum wage in LEDCs and NICs
Raw Materials	Close access to them reduces transport costs
Government	Friendly policies offer tax incentives/free zones
Prohibit Strikes	So money is not lost as employees stop working
Health & Safety	Relaxed regulations in NICs means less overheads
Working Hours	Less strict rules, means more products made a day
Selling Market	Close access to where goods sell reduces transport

Impacts of Globalisation on Countries

Call Centres Abroad	Localised Industrial Regions
Improvements in technology allow calls abroad, and labour costs are cheaper for companies	Better transport and technology allow industries to develop in a region but still have global links

Measures of Development	
Social	Economic
Literacy Rate: % read and write	GDP: value of goods in country
Life Expectancy: health care	GNP: GDP + income from abroad
Birth Rate: births per 1000 per yr	% of Primary Employment
Mortality Rate: deaths under age of 1 per 1000 births per year	TV Owners per 1000 people: indicates disposable income
Human Development Index: literacy rate, life expectancy, GDP/capita	

Factors for Development	
Social	Environmental
Education = better jobs/earnings	Natural hazards = rebuild costs
Safe water = less ill more work	Poor climate = less food eat/sell
Women have better jobs	No raw materials = less to sell
Economic	Political
Primary industry = little income	War = lose money and buildings
Poor trade links = less money	Corrupt gov = get rich illegally
Debt = money made is paid back	Unstable gov no invest in NHS/sch

Regional Inequality - Ghana

North - Periphery (Hinterland)

Low rainfall means less food to eat and crops to sell, so less money
 Land-locked, so less trade routes, thus less exports to make money
 70% live on less than \$1/day, so less spenders, so economy weaker
 Shortage of teachers means less kids educated, fewer jobs/earners

South - Core

Accra is wealthier so more developed healthcare, infrastructure etc.
 Long wet seasons allow farmers to grow cash crops e.g cocoa



Coast attracts tourists, so more developed jobs in tertiary sector and better trade routes/oil rigs bring in more money to develop

28% live on less than \$1/day, so more spending power, more money in economy to develop

1 in 5 people migrate to the south for a better quality of life.

Millennium Development Goals

In 2000 the UN set 8 goals aimed to reduce global development gap

Sub-Saharan Africa

Good progress where there is stable government and aid is received

- 6 Now have wider access to ART drugs to prevent HIV/AIDS
- Recently resources have transferred to Ebola patients in W.Africa - less focus on malaria and HIV/AIDS to achieve MDG
- 4 Little progress, 1/3 of world's child deaths were here in 2008
- Due to wide malnutrition and little access to safe water
- 2 Girls need education, as female enrolment is less than males

South Asia

Development has not been spread fairly in countries, as some still live in poverty (shanty towns), others have money from global businesses

- 1 Miracle Rice (GM crop) grown with more Vitamin A has more nutritional value. Poverty rate fall by 40% over 25yrs in S.E Asia
- 4 Free school meals for children reduces malnutrition in India
- Education raises awareness of disease and how to prevent it

Development

Brandt Line - Global Development

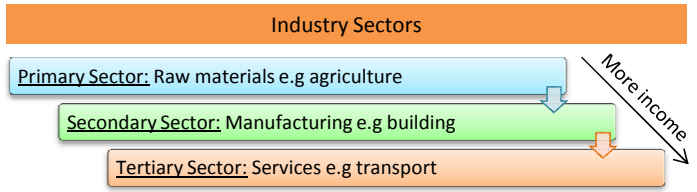
Types of Aid

Transfer of resources (money, equipment) to poor countries in need

Short Term	Provided after or during disaster (emergency)
Long Term	Improve Quality of Life; develop communities
Voluntary	Funded by charities (NGOs) e.g Oxfam
Bilateral	Strings attached e.g buy resources from donor
Multilateral	Aid pooled together, as an international effort

Aid: For or Against?

Benefits	Drawbacks
Saves many lives in disasters	Can become dependent on aid
Improve infrastructure, services, health care, education, QoL	Makes further debts to repay
	Corruption: may not reach needy



Sunny Solutions: Solar Cookers - Kenya

	Before	After
	Cookers burned wood releasing smoke causing deaths, global warming and deforestation.	Solar cookers made from local materials (card and foil) can be used 345 days/yr - direct sunlight
Effects	<ul style="list-style-type: none"> ✓ No smoke, reduce GHGs ✓ Only costs \$5 each × No good when cloudy 	<ul style="list-style-type: none"> ✓ 23 women jobs in selling/making ✓ Sterilise water - 40% less diarrhoea × Some won't change traditions

NGO - Camfed in Zambia

Female literacy rate is 10% lower than male, as less women are enrolled in school. No schools in rural areas, as only 2% of GDP spent on education.

Why was it set up?

- Women marry into new family, so investment is lost
- Males provide for family, worth educating them
- Women look after kids and home, needs no school

Why are less female enrolled?

- Grants to start business and train teachers in rural
- Support women in education - fees, uniform, books
- Improve employment prospects - earn 25% more

How do they help?

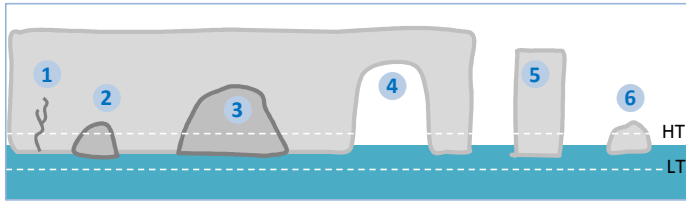
Women with better education get better jobs, which earn more. So their kids (male or female) will get education, as their parents can fund them.

How does it benefit both girls and boys?

Camfed
When You Educate a Girl, Everything Changes

193,000 children in 646 schools supported

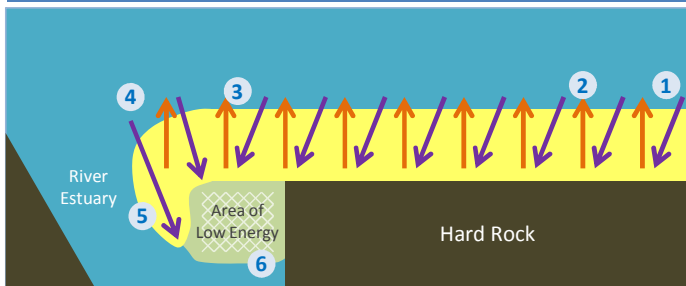
Formation of Coastal Stack - Erosion



Example: Old Harry Rocks, Dorset

- 1) Hydraulic action widens cracks in the cliff face over time
- 2) Corrosion forms wave cut notch (undercuts) between HT and LT
- 3) Further corrosion widens wave cut notch to form a cave
- 4) Caves from both sides of headland break through to form an arch
- 5) Weathering above/erosion below - arch collapses leaving stack
- 6) Further weathering and erosion leaves a stump

Formation of Coastal Spit - Deposition



Example: Spurn Head, Holderness Coast

- 1) Swash moves up the beach at the angle of the prevailing wind (SW)
- 2) Backwash moves down beach at 90° to coastline, due to gravity
- 3) Zigzag movement (Longshore Drift) transports material along beach
- 4) Deposition causes beach to extend, until reaching a river estuary
- 5) Change in prevailing wind direction forms a hook
- 6) Sheltered area behind spit encourages deposition, salt marsh forms

Hard Engineering Defences

	Wood barriers prevent Longshore drift, so the beach can build up.	<ul style="list-style-type: none"> ✓ Beach still accessible ✗ No deposition further down coast = erodes faster
	Concrete walls break up the energy of the wave and have a lip to stop waves going over.	<ul style="list-style-type: none"> ✓ Long life span ✓ Protects from flooding ✗ Curved shape encourage erosion of beach deposits.
	Cages of rock/boulders absorb the waves energy, protecting the cliff behind.	<ul style="list-style-type: none"> ✓ Cheap ✓ Local material can be used to look less strange ✗ Will need replacing
	Slats of wood laid on top of beach, to stop sand being eroded.	
	Often built in deep water to protect harbours, very expensive.	

Erosion

The break down and transport of rocks - smooth, round and sorted

Attrition	Angular rocks bash together to become smooth/smaller
Solution	Salt water dissolves rocks by attacking carbonates
Corrasion	Rocks hurled at base of cliff btwn H/LT = wave cut notch
Hydraulic Action	Water enters cracks in the cliff, air compresses, causing the crack to expand. Water leaves with pop (cavitation).

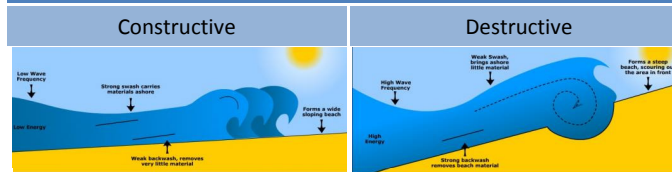
Weathering

The break down of rocks in situ - angular, unsorted and varied size

Physical	<ul style="list-style-type: none"> ○ Freeze-Thaw Action. Water enters cracks in rocks, expands by 9%, ice then thaws, part of rock breaks off.
Chemical	<ul style="list-style-type: none"> ○ Acid rain breaks down bonds holding rocks together ○ Spray from sea salt cause reactions breaking down
Biological	<ul style="list-style-type: none"> ○ Animals burrow down into the rocks wearing it away ○ Plant roots grow into cracks in the rock

Our Changing Coastline

Waves



Deposition - builds up beach	Erosion - destroys beach
Strong swash, weak backwash	Strong backwash, weak swash
Low energy/frequency	High energy/frequency
Long wavelength, low height	Short wavelength, tall

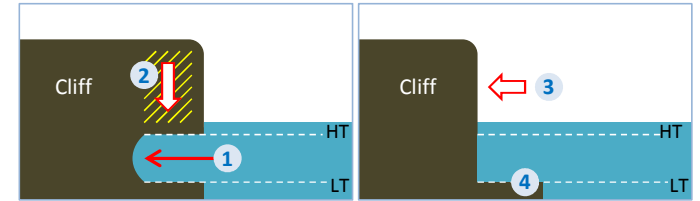
Created when wind blows over sea, break on reaching shallow water.

Coastal Management - Holderness Coast

Location	Between Flamborough Head and Spurn Head
Key Facts	2 metres of coast lost each year, due to erosion of soft boulder clay material.
Strategies in Mablethorpe	<ul style="list-style-type: none"> ➢ 61,500 tons of rock armour ➢ 2 Groynes ➢ Sloping Revetment ➢ Roll Back Policy - sites moved 400m from coast



Formation of Wave Cut Platform

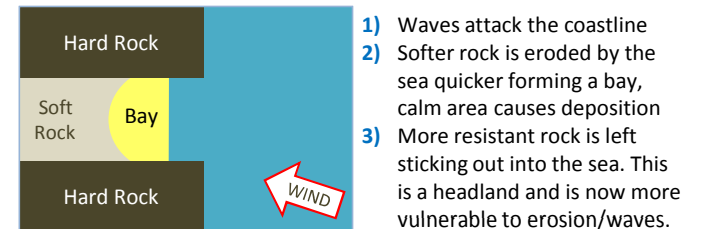


- 1) Between HT and LT rocks are hurled at the base of the cliff. Corrosion undercuts the cliff, forming a wave cut notch.
- 2) Cliff above becomes unstable and collapses, providing more material for corrosion.
- 3) Process continues and over time the cliff retreats back.
- 4) This leaves behind a wave cut platform, which can only be seen at low tide.

Soft Engineering Defences

Beach Nourishment	Beaches built up with sand/shingle, so waves have to travel further before eroding cliffs.	<ul style="list-style-type: none"> ✓ Cheap ✓ Beach for tourists ✗ Storm = needs replenish ✗ Offshore dredging cause erosion further down coast
Managed Retreat	Low value areas of the coast are left to flood and erode naturally.	<ul style="list-style-type: none"> ✓ Reduce flood risk ✓ Creates wildlife habitats ✗ Compensation for land

Formation of Bays and Headlands



- 1) Waves attack the coastline
- 2) Softer rock is eroded by the sea quicker forming a bay, calm area causes deposition
- 3) More resistant rock is left sticking out into the sea. This is a headland and is now more vulnerable to erosion/waves.

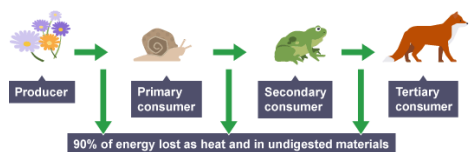
Impacts on People living on the Coast

Landscape	Flood defences disturb view = conflict residents/council
Land	Farm land lost due to flooding - salt reduces soil fertility
Housing	Erosion means houses may collapse, people homeless
Tourism	Landforms attract visitors, better jobs in tertiary sector
Wildlife	Salt marshes (spits) attract birds and plants colonise
Business	Lose money - forced to close and relocate e.g campsites
Flooding	Cause deaths and sewage/salt pollutes water supplies

Factors affecting Size of Waves

- Strength of the wind
- Fetch - distance the wave can travel uninterrupted

Energy Flows



Energy lost btwn Trophic Levels:

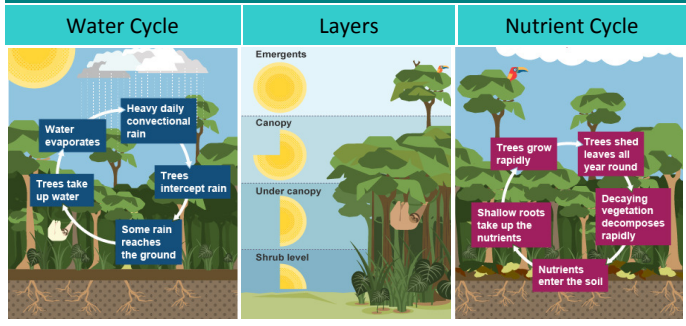
- Excretion
- Movement
- Respiration
- Decomposition

As you go up trophic levels, biomass decreases, as less energy available, so smaller number of organisms.

Types of Organisms

Producer	Makes their own food using energy from sunlight
Consumer	Get energy by eating other organisms
Decomposer	Break down dead material i.e bacteria, fungi
Herbivore	Consumers that eat producers i.e plants
Carnivore	Consumers that eat other consumers i.e meat
Omnivore	Consumers that eat producers and other consumers

Tropical Rainforest Ecosystem



Sustainable Management - Tropical Rainforest

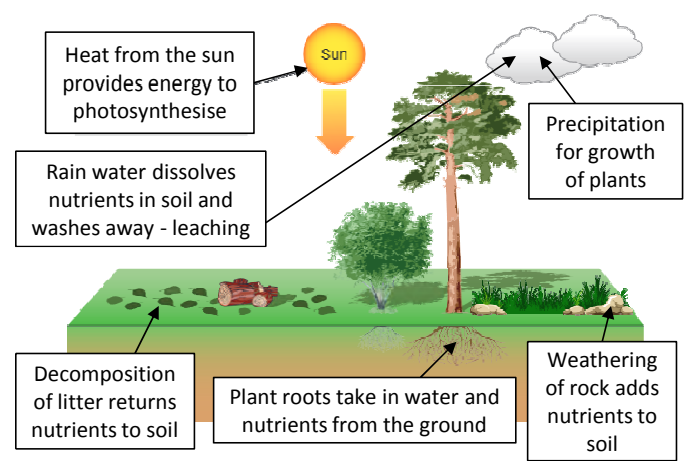
Afforestation	Replace trees to maintain forest canopy
Education	Raise public awareness of their impacts in MEDCs
Agro-Forestry	Grow trees and crops together, so shelter from canopies prevent soil erosion - crops get nutrients
National Parks	Protect areas of forest from being exploited, but cause tensions between tribes (Baka) - hunting
Selective Logging	Only fell trees at certain height, allow young trees to grow. Forest Stewardship Council ensures timber comes from managed areas
Eco-Tourism	Stop slash and burn in Nam Ha, Laos - use nature to generate income, improve life of locals
Shifting Cultivation	Tribes burn small areas of land providing nutrient for soil - grow crops. When soil fertility worn out, tribes move to next area, allows original to restore nutrients from surrounding plants.

Evidence for Unsustainable Use

Millennium Ecosystem Assessment began 2005 - identify 6 problems

River Pollution	Fertilisers cause eutrophication, so fish life die
Destruction	Pollution from boats and oil spills damage reef
Fish Stocks	85% of world stocks over exploited and trawler nets catch unwanted species - can't recover
Droughts	Water resources decline by 30% in areas = poverty
Fresh Water	Lake Chad shrunk by 95% - agriculture, irrigation
Climate Change	Global Warming cause problems for ecosystems

Physical Environment interacts with Living Things



Living Things

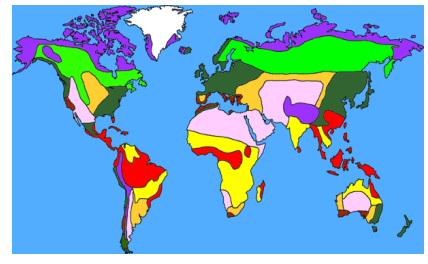
Sustainable Eco-Tourism: Nam Ha, Laos

Scheme	Facts
Stopped "slash and burn"	8% income fund community proj
Live with locals - no hotels	44% local live below poverty line
Use river as transport - no vehs	33 tribe groups, 288 bird species

Climate affects Ecosystems

High Latitude e.g Arctic	Low angle of incoming sunlight	Solar energy hits Earth at a low angle, so spread out over larger area - gentle heating.
Central Latitude - Equator	Sunlight strikes most directly	Solar energy hits Earth at a right angle, so concentrated in a small area - strong heating.

Major World Biomes



Biomes	Large scale ecosystems
Biotic	Living factors e.g plants
Abiotic	Non living e.g climate

Human Use of Ecosystems - Tropical Rainforest

Mining	400% increase recently e.g Grand Carajas Project scars landscape, roads to transport material
Hydroelectric	Belo Monte Dam risk extinction of 1/2m tribes and damage river system - still water no longer flowing
Urbanisation	Cities spread into rainforest, build roads e.g Trans-Amazon Highway, so less water infiltrates into soil
Agriculture	Grow Soya Beans and Brazil Nuts (27,000 tons export each year) - use slash and burn to get land
Cattle Ranching	91% deforested areas use for beef farming, cause desertification by trampling, so damaging topsoil
Logging	Sold to worldwide TNCs, but causes deforestation

Effects of Unsustainable Use - Deforestation

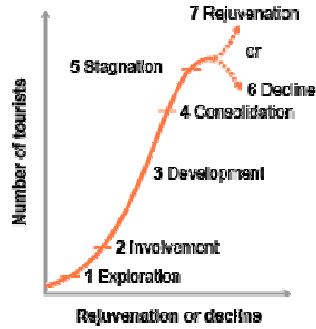
	Local	Global
Desertification - wind blows off topsoil, damages it, now infertile	As cities expand people won't know how to live	50% of world species live in TRFs - lose 50,000 species per year
Lose tribes people	Lack of food may cause famine	Less medicines - 25% of western pharmaceuticals come from TRF
		Global Warming - GHGs from burning trees and less CO ₂ absorbed for photosynthesis

Football pitch size lost every second around the world

Coral Reef Ecosystem

Abiotic Factors	Salinity Levels of 30 PSU and water depth must be less than 25 metres	 1/3 of world reefs dying
Tourism	Souvenirs and pollution from boats	
Deforestation	More runoff = sediment wash into sea	
Fishing	Trawler nets drag along sea bed	
Ice Caps Melt	More freshwater, diluting salt levels - reef die out	
Sea Level Rise	7m Greenland, 70m Antarctica - put 25m at risk	
Starfish	Crown of Thorn and pollution cause 40% of losses	

Tourist Resort Model	
1	Small number of tourists, few tourist facilities, unspoilt
2	Locals provide some facilities, tourist season emerges
3	Area develops and advertised as a tourist destination
4	Continues to attract tourists, some local conflicts develop
5	Peak number of tourists, over crowded, facilities run down
6	Tourists seek new, unspoilt destinations, so tourist jobs are lost
7	Investment and modernisation cause tourist number to increase



Growth of Tourism in Costa del Sol	
1950	Tourists explore fishing village of Benidorm. It became first seaside town in Spain to allow bikinis. (Stage 1)
1960	Tower blocks, chip shops and pubs began to thrive along the coast. Large numbers of tourists visit. (Stage 3)
2000	Areas are overcrowded. Buildings show age and shops close - economic crash. (Stage 5)
2010	Reinventing area through high end boutiques and spas, trying to become eco-friendly. (Stage 6/7)

MEDC Tourism - Yellowstone, USA	
Attractions	Negatives
“Old Faithful” Geyser Caldera Volcano	Constant need to fix damaged paths (erosion), causes closures
9 Visitor Centres and Museums	Bear Attacks
Sustainability	Positives
National Park protects landscape	3500 seasonal jobs (+PME)
Protect endangered species in the park e.g grizzly bears	Money improves infrastructure e.g widening roads more tourists
No Transport System - drive	3 million tourists every year

Factors attracting Tourists	
Human	Physical
Culture / Religion	Landscape / Scenery
Heritage	Climate
Food and Drink	Ecosystems
Transport Links	Wildlife
Activities / Facilities	Sea / Beaches

Factors contributing to Growth of Tourism	
Time	More leisure time and early retirement
Income	Higher salaries, so more disposable income to spend
Flights	Cheaper flights to more destinations e.g Ryanair
Internet	Allow people to book their own travel arrangements
Media	Makes places seem more attractive e.g TV adverts

Tourism

Ways of Developing Sustainable Tourism	
Park & Ride	Lake District - leave cars outside national park
Footpaths	Lay down geotextile mats to protect soil beneath
Honeypot Sites	Places which attract tourists in large numbers e.g Castleton, can be developed (car parks, shops) so that tourists are concentrated in one area, and problems such as litter can be easily managed.

Tourist Conflicts	
Tourists v Wildlife	Dogs off lead scare grazing cattle and animals
Tourists v Farmers	Walkers leave gates open so animals escape
Tourists v Farmers	Parked cars mean machinery can't fit past
Tourists v Locals	More tourist shops, less amenities for locals
Tourists v Locals	Tourists buy 2 nd home, young locals priced out
Tourists v Locals	Narrow lanes cause heavy congestion

Effects of Tourism		
Social	Economic	Environmental
✓ Improve services and infrastructure	✓ Employment in tertiary sector	✓ Protect natural landscapes through national parks and English Heritage
✓ Develop skills of locals - jobs (+PME)	✓ Boost economy and businesses	✓ Conserve wildlife and habitats
✓ Maintain cultures and traditions	✗ Jobs are only seasonal	✗ Traffic causes air and noise pollution
✗ Commercialisation devalues areas	✗ Fickle industry areas can decline	✗ Footpath Erosion and gullying
✗ Pressure on local services	✗ Profits leak abroad foreign companies	✗ Disturb wildlife and grazing cattle
✗ House prices rise, more 2 nd homes	✗ Big chains take business from locals	

Types of Tourism	
Tourism	Activity where a person voluntarily visits a place away from home
Domestic	Visiting places within your own country
International	Visiting countries outside of your own
Eco-Tourism	Sustainable travel to natural areas, which conserves the environment and improves wellbeing of local areas and people
Others	City Breaks, Package Holidays, Cruises, Heritage

LEDC Sustainable Tourism - Nam Ha, Laos	
Attractions	Negatives
Ethically diverse - 33 tribes	Culture may be devalued
Wildlife - 288 bird species	Increase materialism (begging)
Activities - kayaking, trekking	Footpath Erosion
Sustainability	Positives
Stopped “Slash and Burn”	8% income fund community proj
River used as transport - no vehs	Money made helps improve locals QoL, as 44% of population live below poverty line
Live with locals - no hotels	
Small Scale - niche market	Improve healthcare/sanitation