

Case studies used in Year 12

<u>Population</u>	<u>Food supply issues</u>
<ol style="list-style-type: none"> 1. Newcastle –Scotswood inner city redevelopment, Castle Ward (rural/urban fringe) 2. UK population 3. Zimbabwe 4. Kerala – population movement and control 5. Iran’s Baby boom 6. HIV in sub Saharan Africa 7. China’s one child policy 8. Columbia – population change 9. Italy – ageing population 10. London 	<ol style="list-style-type: none"> 1. From FACE online– environmental stewardship 2. Kukri Mukri & Appropriate Technology Asia – appropriate technology - http://www.atasia.org.uk/web/default.aspx, plus Kenya from the website 3. Malaysia - Commercial plantation farming 4. China – collectivised farming 5. Brazil – recent changes in farming 6. India - Green Revolution and land reform 7. CAP in the European Union 8. Unilever – a TNC <p>Plus case studies from agriculture types presentations - Extensive commercial pastoralism in the Pampas, Irrigation agriculture in the Nile Valley, Intensive subsistence farming in the Ganges Valley Intensive commercial mixed agriculture in the Netherlands</p>
<u>Cold environments</u>	<u>Rivers and management</u>
<ol style="list-style-type: none"> 1. Alaska and Canada (Old Crow flats & 1002 lands in ANWAR) – periglacial development 2. The Southern Oceans and Antarctica – development of a fragile environment 3. Obruchev glacier - Glacial systems 4. Examples of landforms from the landforms presentations – the Lake District and Switzerland will do fine. 5. Gornergletscher Glacier – melt water example 6. Canada (including Fort St James British Columbia, Nunavut, Saskatchewan) – fluvio-glacial landforms. 7. Northern Canada and Western Greenland – periglacial features 	<p>Bangladesh flooding York – flooding and management River Breamish– changing river characteristics York – factors affecting drainage basins and hydrographs 3 Gorges dam – river management</p>

Bold and underlined – all of these cases studies are expected in the Specification, and as such will normally form the basis of an answer for the top mark questions – 8 to 15 marks

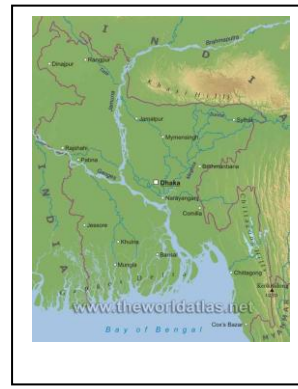
All of the others are supportive examples where you will not need as much detail about the case study, but where you will need them to access top marks on some of the questions. You could also use them in the longer questions to demonstrate a breadth of knowledge and offer variety in your response.

Also included in this guide are lists of past paper questions and some templates for revising these important case studies, plus an explained annotated 15 mark answer

Bangladesh (LEDC)

What it shows

1. Example of drainage basin influences and managing flood hazards.
2. Impact of river management on river processes.
3. Impact of rising sea levels on human use of the coastline.
4. How deltas are created.



Causes of flooding in Bangladesh:

1. Tectonic uplift of the Himalayas means that erosion rates of sediment increase as the rivers have more potential for vertical erosion as base level is changed. This mass of sediment is dumped in Bangladesh choking the river channels making them more inefficient and reducing hydraulic radius. Sediment is dumped and flooding can occur.
2. Monsoon rainfall – some parts of the Ganges basin receive 500mm of rainfall in a day during the monsoon.
3. Deforestation of the Himalaya – reducing interception rates which means shorter lag time and higher peak discharges.
4. Three massive rivers converge in Bangladesh – the Ganges, Brahmaputra and Meghna – massively swells discharges.
5. Cyclones from the Bay of Bengal cause and contribute to coastal flooding.

Effects:

Erosion of chars (islands) by flooding rivers causes landlessness amongst Bangladesh's poor; these people end up in major cities such as Chittagong and Dhaka.

Death – over 200,000 people died in a cyclone and flood in the 1970s.

Loss of agricultural land – a major problem in a country with high natural increase

The 2004 floods lasted from July to September and covered 50% of the country at their peak. At the time of the July 2004 floods 40% of the capital, Dhaka was under water. 600 deaths were reported and 30million people were homeless. 100,000 people alone in Dhaka suffered from diarrhoea from the flood waters. Bridges were destroyed, the death toll rose to 750 and the airport and major roads were flooded. This hampered relief efforts. The damage to schools and hospitals was estimated at \$7billion. Rural areas also suffered, the rice crop was devastated as were important cash crops such as jute and sugar.

Solutions

Flood action plan – a system of huge embankments along the coast and rivers reinforced by concrete. They increase channel capacity and hydraulic radius but stop floods replenishing fields with nutrients and can stop rainwater escaping into fields. It also causes erosion downstream of the defences and prevents deposition.

Improved drainage canals – the clearing of old canals had allowed a more efficient drainage system allowing water to drain away more efficiently.

SPARSO and flood satellite imaging systems – allow more warning to be given to Bangladeshis by monitoring cloud cover, hydrographs and rainfall patterns across the river basins.

In 2004 food supplies, medicines, clothing and blankets were distributed. Local people began to rebuild their homes but disease from contaminated and often stagnant flood water remained a threat. The United Nations launched an appeal to raise \$74million, but had received only 20% of this by September. Water Aid helped by bringing water purification tablets and education campaigns.

Sea level change:

If sea levels rise Eustatically and Bangladesh sinks Isostatically because of the loading of sediment on the delta there will be major impacts on the people of Bangladesh. A 1.5m rise in sea level would affect 17 million people and 22000km² of land (16%). Major fishing villages will be affected and agricultural land and rice paddies will suffer the effects of salinisation. Coastal cities such as Chittagong face inundation and ever greater threats from cyclones (hurricanes) (3,000people died in a cyclone on 16th November 2007).

York and the River Ouse

MEDC river process management, flooding, hydrographs, river regimes, drainage basin influences.

Location – Located in the north of England, this drainage basin covers most of the Yorkshire Dales and the Vale of York, the river eventually enters the north sea via the Humber estuary.

Drainage Basin Influences - There are 8 major influences on the discharge of the river Ouse. These could be transferred to any major drainage basin.

Physical factors


1. Relief – the relief of the upper course of the river basin in the Yorkshire dales is very steep. This promotes fast runoff from the slopes into the rivers and less soil infiltration.
2. Geology and Geomorphology – there are seams of Permian Limestone that allow water through its structure quickly. There is also a substantial amount of clays that are impermeable, this water cannot infiltrate the soil and hence gets into the river quicker – reducing lag time.
3. Vegetation – At high altitudes in the upper basin the vegetation is heathers and moor land that has low interception rates. There are areas of scattered coniferous trees with better interception year round, while deciduous trees offer good interception until they lose their leaves. Much of the lower basin is farmland offering little interception.
4. Soils – peat soils in the upper basin act like a sponge and absorb much of the summer precipitation, lowering peak discharge. From late autumn these stores are full and hence subsequent water finds its way into the tributaries.
5. Climate – The Ouse section of the basin is flat and receives about as much precipitation (640mm per year) as is lost through evapo-transpiration (540mm per year). The water that floods York hence comes from the Dales area which receives heavy rainfall, which ends up in York via the Swale, Ure and Nidd tributaries.

Human Factors

6. Farming – Upland areas are used for pastoral farming – the grasses the cattle etc feed upon offer little interception. Drainage of the uplands also speeds water into tributaries. Arable farming on the Vale of York has removed some trees and leaves fields exposed with no interception when crops are harvested.
7. Forestry - There has been some afforestation in the Ure catchment area.
8. Urban Developments – New housing areas, out of town shopping areas, industrial areas, the widening of the A1 have all created impermeable surfaces and drains carry storm water quickly and directly into the river Ouse. This has happened extensively to the North of York on Clifton moor, this could contribute to a rise in discharges.

IMPACTS – the 2000 floods

In November 2000 for example, despite continued improvements to York's flood defences, part of the central area of the city was flooded after a series of low pressure systems brought heavy rain to the north east and the worst flooding in Britain for 50 years. 3,000 York residents had to be evacuated from their homes, and the army was brought in to help. The big difference about this flood was that it affected areas previously thought to be at little risk. Ironically, only a month earlier York had hosted the first National Flood Forum, which aimed to give homes and businesses practical advice about defending property from flooding. In 2000 the floods broke previous records for flooding in York – in 1982 waters had risen to 16 feet 7 inches above normal. Due to its complex geography and the historic importance of the city, attempts to defend York against floods continue. So far this has cost approximately £10 million.

Causes	Social Effects	Environmental Effects	Economic Effects	Responses
<p>Several depressions swept across Northern Britain bring lots of rain (35-40mm in 24 hours)</p> <p>Early November 2000</p> 	<p>3000 people evacuated, the army had to be called in</p>	<p>River 4.8 m above normal level</p> <p>York race course was completely flooded</p>	<p>No racing at the race course!</p> <p>One insurance company alone paid out £12.5 million in flood damage claims between 2000 and 2010 in York. 800 claims, at an average of £25,000 per flooded property.</p> <p>Cost the City of York Council £1.3m</p> <p>Protecting properties by sandbags and other means was the biggest single expense, at £394,000. Over £100,000 was paid to the fire service, and £41,000 to the army for the help they provided. The council has been able to reclaim almost half the total bill from the government. But the city still had to find £772,000 from its own resources.</p> <p>£10 million in lost income because it led to 200,000 fewer visitors coming to York, plus the economic consequences effects on the Selby to York railway line</p>	<p>John Prescott pledged a new national recovery team to help flood victims, with the promise of £51m extra funding for flood defences and warning systems.</p> <p>Mr Prescott added that he had asked insurance companies to speed up payments.</p> <p>Flood defences in the historic walled city were shored up with 15,000 sandbags in a huge weekend operation involving the emergency services, army and local people.</p> <p>Two rest centres were opened in the city for flood victims</p> <p>65,000 sand bags put into place by 500 army personnel</p>

Flood control schemes – From North to South along the River Ouse

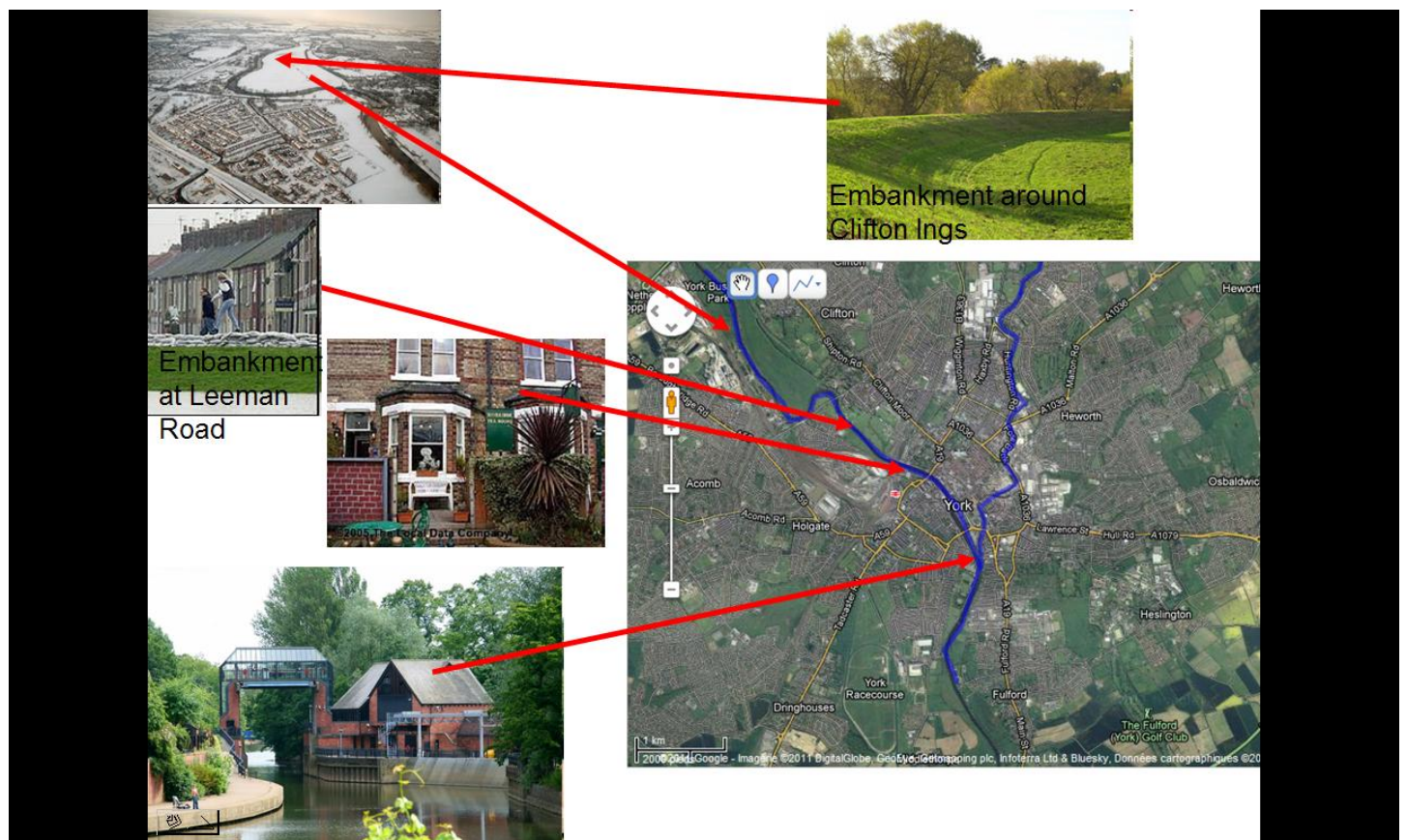
Clifton Ings – a flood washlands scheme, the land here is surrounded by embankments and is allowed to flood to save the city of York, it can hold 2.3million cubic meters of water.

Leeman road – Embankments have been built here from residue from the sugar beet factory. They are quite far away from the rivers edge to increase the channel capacity (it can thus hold more water).

Almery terrace – Concrete floodwalls with rubber sealed gates protect these houses. The walls are directly in front of the housing and offer just a little protection.

General Accident offices – the bottom floor is set aside for car parking so that nothing valuable is lost during a flood. This is a planning measure to limit flood damage.

Foss Barrier – This barrier stops the River Ouse water backing up the river Foss (a tributary) and causing damage to some of York's Most historical buildings. Water from the Foss is pumped into the river Ouse. Are these schemes effective?



Alaska and ANWAR - (Old Crow flats & 1002 lands in ANWAR) – periglacial development



The tundra is one of our most Northerly ecosystems and covers a huge tract of land running between latitudes of 50°N (where there is no modifying sea influence) to 80°N. Winters are long and cold, minimum temperatures are very low, with some mean monthly temperatures as low as MINUS 25°C, with little influence from the sea and ocean currents. In some areas because of the tilt of the Earth (23.5°) they don't receive any insolation throughout the winter months. Moisture levels are very low, precipitation levels are also low and much of the moisture is unavailable to plants because it is frozen. The resultant ecosystem contains stunted trees, mosses and lichens, and animals that can cover large ranges to forage or hunt for food or hibernate.

These areas are often wilderness areas that are extremely fragile, small perturbations within the system can have catastrophic effects. However, there is enormous mineral wealth in the tundra, and the potential for tourism, hunting and logging. It is for this reason that many of these areas are decidedly under threat from EXPLOITATION. The USA has the world famous Trans Alaska pipeline which traverses Alaska from its hugely valuable oil fields near

to Prudhoe bay next to the Beaufort Sea in the North of the State southwards to Valdez on the Pacific Ocean. In addition, North American tundra has reserves of gas, gold, silver, iron ore and copper.

The Case of the Old Crow Flats and the Vuntut Gwitchin

Old crow flats is in the north of the Yukon territories in Canada, right next to the Alaskan border. This means that any developments that occur in the USA can have a direct impact upon the people of the old crow flats area, the Vuntut Gwitchin. There are greater levels of environmental protection in the Ivvavik National Park in Canada than in the Arctic National Wildlife Refuge (ANWR) on the US side of the border. The land here is low lying and is composed of peat bogs, whereas to the north are some woodland covered mountains.

The [Vuntut Gwitchin](#) have adapted to this harsh environment, they number 300 people in the settlement of Old Crow and some 7500 in total across the whole community. They are a traditional community, and originally they survived by hunting and gathering. They trap Muskrat for their furs in the off season but their main activity is to hunt in sustainable numbers the porcupine Caribou herd, so called because they cross the Porcupine river at Old Crow. This occurs every spring and autumn as the Caribou travel to and from their feeding and breeding grounds in Northern Yukon and Alaska. This area is perfect for the caribou because it is flat so they can see predators and a sea breeze clears Mosquitoes which form during summer. You can visit the Vuntut Gwitchin First Nation homepage [here](#).

In winter the herd moves south to forage for mosses and lichens in the less deep snow that exists in these locations. The Vuntut Gwitchin use these animals for;

1. Meat
2. Hides for clothing and tents
3. Bones and antlers for soups and tools

Original hunting methods are sometimes still used, including using fences and herding the herd into shaped traps. However, this traditional life is changing;

The Vuntut Gwitchin are no longer nomadic, but are sedentary at a strategic river crossing point of the Caribou migration.

They use rifles not bows and arrows

They use snow mobiles not sledges

Other economies do exist in the area, but these are limited to limited market economies and service jobs for the Vuntut Gwitchin Council (a first nation government) including construction, water and fuel delivery etc.

A quarry for gravel was started in 2003. The gravel has many uses including shoring up river bank erosion, and road building. The quarry is in the side of Crow mountain 6 km from the village and employs 12 men. Many young people have moved away from the area in search of employment.

Oil exploration

The Arctic National Wildlife Refuge (ANWR) is home to 250 species of animal, including grizzly bears, caribou, wolves and millions of migratory birds. It covers 8 million hectares and was established in 1960 to preserve the area. The northernmost part of the refuge is an area known as the 1002 lands - a coastal plain between the Brooks range and the Beaufort sea that is not covered by wilderness designated protection. It could hold valuable oil and gas reserves, but is also a key calving ground for the Caribou. In January 2008 a proposal was put forward to open the lands up for petroleum exploration and development. This would seriously impact the livelihood of the Vuntut Gwitchin, and could seriously damage the environment

The Southern Oceans and Antarctica – development of a fragile environment



Antarctica is a large continent bigger than continental Europe that is approximately centred on the South Pole. The area is composed of huge ice sheets, continental ice masses, Nunataks (mountain peaks with no ice on them) and ice shelves (areas of floating sea ice). Some of the ice sheets are thousands of feet thick and it is fair to say that on average it is the coldest, windiest and driest place on planet Earth (under 200mm of precipitation per year°).

The area has no permanent residents but a number of governments maintain scientific research stations. The number of people living in Antarctica varies from 1000 in winter to 5000 in the summer. The area has long been an area of intrigue for humankind, and the race to the South pole saw British explorer Captain Scott battle with Norwegian Amundsen to be the first to reach the South Pole at the start of the 20th century.

Despite the harsh climate there is a large amount of life on Antarctica and in the Southern Ocean. Lichens and mosses inhabit the land, and penguins, seals, Krill and a host of other sea life is found in the oceans. Krill are hugely important to the ocean food chain as they are the main source of food for many other sea creatures. They are a 4-5cm long crustacean that are semi transparent. They drift around in huge swarms and some observed swarms can have as much as 2 million tonnes of Krill in them.

Protection

Antarctica is one of the last wildernesses on planet Earth and is protected by international law. The Antarctic treaty, signed in 1959, put an end to many claims of sovereignty and set aside Antarctica as a scientific preserve where military activity was banned. The Madrid Protocol of 1998 went one step further, and banned all mining activities in Antarctica. This will be reviewed in 2048 and deposits of gold, iron ore, coal and oil have been discovered, although they are currently uneconomic to mine.

Exploitation and development

Tourism

Tourism is the boom industry in Antarctica and threatens to damage many parts of this fragile environment. Numbers of tourists who mainly arrive by boat are on the increase and pose a threat to the continent. Indeed, tourist numbers have gone from 9,000 in 1992-93 to 46,000 in 2007-8 with over 100 companies being involved. Visitors are mainly from rich nations (39% American, 15% British) and tend to fly to New Zealand or Chile or Argentina and set sail from there.

Few visitors go on the ice as it is too hazardous, however, there are some very accessible sites and boats tend to stop there preferentially. These are Honey pot sites and the animals get disturbed from their usual feeding and breeding routines. In addition, many ships have run aground and had accidents and oil spills are an increasing hazard. Waste from tourist boats is also a problem, and by law ships are required to discharge waste well away from the edges of Antarctica.

Whaling

Whaling and sealing have taken place for centuries in Antarctica and the Southern Oceans. The British and Americans used South Georgia Island as a base and in summer the population there could rise to 1000 people. These animals were hunted for their fur meat and blubber, and products such as soap, margarine and oils were derived from whale oil. A pre hunting population was estimated at 275000 whales prior to the 19th century, but this had declined to fewer than 2000 whales by 1964.

Solutions

A ban on whaling has allowed whale numbers to rise. However, Iceland, Japan and Norway would like a return to whaling and already have the right to whale under the current ban for "scientific purpose"

The Antarctic is protected in many ways, but people are concerned that tourism and its increasing numbers could become unsustainable.

The [IAATO](#) (International Association of Antarctic Tour Operators) is an organisation which rules the companies and tries to be environmentally friendly. They regulate the boat companies and try to ensure a sustainable future for the ice continent.

Indeed, Boats are limited to 500 passengers which should reduce the impact of tourism.

- In addition, Tourism has to follow the rules of the Antarctic treaty, signed in 1961, where many countries promised to demilitarize Antarctica, to establish it as a zone free of nuclear tests and the disposal of radioactive waste, and to ensure that it is used for peaceful purposes only;
- to promote international scientific cooperation in Antarctica;
- To set aside disputes over territorial sovereignty.

Visitors cannot visit SSSIs or Sites of Special Scientific Interest which often contain vulnerable wildlife, again reducing the impact of tourism.

Permits must also be obtained to go, and these permits include sections on waste management, risk management and how the applicant will minimise their Environmental Impact whilst in Antarctica. The Antarctic Act of 1994 is a UK act which supports the Antarctic Treaty of 1961 and makes environmental damage in Antarctica by any British citizen punishable by law.

Newcastle – Scotswood (inner city redevelopment), Castle Ward (rural/urban fringe)

Settlement and population characteristics case studies and the IMPLICATIONS for social welfare

These case studies are all about how the social welfare (well being of the people) of populations is influenced by where they live within a settlement. The characteristics of a settlement area affects the environment in which people live and hence their lifestyles, and local governments have to respond to any issues that result. These case studies focus on Scotswood (Inner city ward currently undergoing regeneration of its brownfield sites) and Castle Ward (rural/urban fringe in the Greenbelt on Greenfield sites). These are 2 very different settlements within Newcastle Upon Tyne, a city which has transformed itself from a ship building city to a Science City in recent years

Background to the areas

Scotswood

This is an old industrial area of West Newcastle that has been in serious decline since the loss of secondary armament and engineering jobs in the 1960s and 1970s. This area has suffered serious decline, dereliction of buildings, seriously low academic attainment and unemployment higher than the city wide average

Castle Ward

This area includes North Gosforth and Newcastle Great Park, a new high tech industrial and housing estate in the greenbelt of Newcastle designed to create employment.

Census 2001 and field visit revealed that;

Overall environmental quality scores that we took were far higher for Castle ward than Scotswood, indicating a much better environment with less litter, graffiti, wasteland etc.

Building quality surveys also showed that there were more problems with paint peeling, broken windows, tiles missing, unkempt gardens etc in the buildings in Scotswood than in Castle Ward.

There are more services in Scotswood than in Castle Ward

The census shows that;

1. In Scotswood 25% are listed as having a limiting long term illness whereas in Castle ward it is only 17%
2. In Scotswood the median age is 36 whereas in Castle ward it is 40
3. In Scotswood there are higher %s of Pakistani, Indian and Bangladeshi populations.
4. In Scotswood 20% of the population are on benefits or unemployed whereas in Castle ward it is only 11%
5. In Scotswood 7% are in higher managerial posts whereas in Castle ward it is 23%
6. In Scotswood 50% have NO qualifications, whereas in Castle ward it is 25%
7. In Scotswood 3X more people rent from the council

Management of Implications for Social welfare

1. John Marley centre – opened by the WECC to encourage community cohesion and improve education standards in the West end
2. Excelsior academy – a brand new school with state of the art facilities has been built to raise academic standards
3. £265 million redevelopment project in West End – creating 1,800 high quality, eco-friendly family homes with new neighbourhood and commercial facilities, parks and public open spaces over the next 15 years.
4. Few services for people in NGP and Castle ward – apart from a shop and the new primary school little else is in the offing
5. A new primary school for NGP – to limit the impact of children from NGP on neighbouring primary schools
6. Cycle lanes and bus routes for NGP
7. A local shop has opened in the NGP estate – probably too limited to satisfy all demands so locals are tied to their cars
8. Landscaping in NGP – for recreation and drainage issues (there are reed beds and Sustainable Urban Drainage Systems (SUDS))
9. Employment – the new redevelopment in Scotswood will create construction jobs and there are plans for commercial premises as well. NGP created 3 new businesses including software firm Sage with over 1,000 jobs

Despite this there are many unresolved issues including the poor service provision in NGP and Castle Ward, and huge deprivation in Scotswood

UK population

Context

The UK has a declining birth rate within its indigenous population BUT has a birth rate above replacement rate within its migrant population, particularly mothers who were born in India, Pakistan and Poland. Therefore, on balance the UK has a slow growth birth rate. Life expectancy is increasing and has done so for many decades. This means that the UK has a slowly ageing population and the potential for decline in the working population creating a higher dependency ratio and potential problems.

Birth rate trends and management

The Total Fertility Rate (TFR) in the UK reached 1.96 children per woman in 2008, the highest level since 1973.

The last three decades have seen strong upward trends in the fertility of UK women in their thirties and forties. Women aged 30-34 have experienced the greatest absolute increase in fertility over this period, with rates rising from 64.1 births per 1,000 women in 1978 to 113.1 in 2008. As a consequence, women aged 30-34 have had the highest fertility of any age group since 2004.

In 2008, the mean age for giving birth in the UK was 29.3 years, while in 1978 the mean age was almost three years lower (26.7 years).

Managing Birth rates in the UK.

The first set aims to promote fertility and maintain an economically BALANCED population, most of these tend to be financial incentives to parents to have children;

1. **Child Trust Fund** – Every child In the UK is given £250 to invest in a savings account or shares at birth, plus at least another £250 when they reach the age of 7. The parents of the child can also save £1,200 into that account TAX FREE. Gone under the new government
2. **Child Benefit** – this benefit was available to all parents but from April 2012 will be restricted to lower income families, around £80 a month
3. **Child Tax Credits** – parents below a certain threshold of income can claim tax back in the form of child tax credits. This is designed to allow people to have children but also continue to work – improving the dependency ratio.
4. **Childcare vouchers** – This scheme allows parents to remove £243 of salary a month before they pay any tax on it – thereby saving money. This money is given to the parent as a child care voucher, which can be used to pay for child care. This can save up to £1,000 a year in tax payments. The government is planning to phase these out by 2011.
5. **Statutory Maternity and Paternity Leave** – this is time off for new parents, a woman can take 52 weeks and a man 2 weeks, the woman can receive money as well during her time off (statutory maternity pay) of around £100 a week.

Restricting birth rates

These strategies are all about controlling the age of conception and spacing births so that mothers are healthy.

The 1967 abortion act – this legalised abortion in the UK for the first time, in the past abortion was illegal and carried the death penalty (under the Ellenborough Act of 1803). 195,000 abortions were carried out in the UK in 2008.

The NHS has numerous schemes designed to restricting the numbers of births and targets particular age groups. Teenagers are targeted and a range of contraceptive advice is given. Condoms, the pill, injections etc are amongst some of the methods freely available to allow would be parents the power to choose when conception takes place.

Religion used to promote a higher birth rate, but the influence of this has fallen within the UK as congregation numbers and religious beliefs falter.

Death rate trends, life expectancy and management

Over the past 3 centuries communicable diseases and fatalities from starvation have fallen, life expectancy has gone up, and death rates have fallen and finally stabilised. However, many people still die of either life style diseases or cancers, and it is these that the government of the UK targets.

The NHS was created in 1948 – unifying all of the doctors and hospitals into one nationwide service in the UK for the first time. Life expectancy has gone from 66 to 77 for men in the period since, and when the NHS was born, there were 34.5 deaths for every 1,000 live births. Today there are just five. The current budget for the NHS is £11 billion.

Various campaigns have been run to improve public health including anti-smoking campaigns. In 1948, 65 per cent of Britain's male population smoked. By 2008 that number had dropped to just 25 per cent. Taxation on smoking is also huge, in an attempt to cut consumption, and there are age restrictions on who can smoke. Various other campaigns have been run such as encouraging men to check for testicular cancers, whilst immunisations are freely available and encouraged. A recent drive has been on to immunise teenage girls against Cervical Cancer (HPC).

Inequalities in Life expectancy do exist across the UK however.

Migration patterns and laws

It is predicted by Migration Watch that immigration will raise the population of the UK by 7million over the next 20 years. The UK legally accepts any member of an EU country who wants to work in this country, which led to the mass immigration of Polish people when they were allowed entry into the EU in 2004. The UK is also committed to assisting genuine asylum seekers under the Nationality, Immigration and Asylum Act 2002

However, the UK is not open to everybody and has committed to keeping out illegal immigrants and those that do not meet entry criteria. The UK legally accepts any member of an EU country who wants to work in this country, which led to the mass immigration of Polish people when they were allowed entry into the EU in 2004. The UK is also committed to assisting genuine asylum seekers under the Nationality, Immigration and Asylum Act 2002

There is also a citizenship test, called the “Life in the UK test”, which was introduced in 2005. I failed this test.

TOP NON-UK BIRTH PLACES 2001

Republic of Ireland: 494,850

India: 466,416

Pakistan: 320,767

Germany: 262,276

Caribbean: 254,740

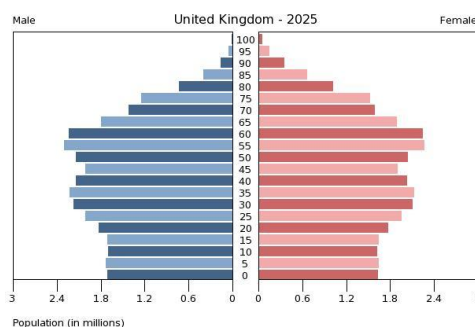
USA: 155,030

Bangladesh: 154,201

South Africa: 140,201

Kenya: 129,356

Italy: 107,002



Zimbabwe

Context

Zimbabwe was once regarded as one of the most progressive countries in Africa. Following Zanu PF's election after a gruelling civil war massive investments were made into improving health care and reducing birth rates. However, decades of government corruption, mismanagement and underinvestment have ruined a once glowing picture. This is coupled with problems in food supply in the country due to a disastrous land reform program.

Birth rate trends and management

ZIMBABWE'S fertility rate — at 3.6 children per woman in the 1992 census — is roughly half the rate seen at independence and seems set to continue dropping further towards the replacement levels of an average of a little over two children born to each woman.

Fertility rates in Zimbabwe were close to eight children per woman in the 1960s and had dropped marginally to around seven by independence and then started falling fast, to 5.4 by the early 1990s and to 3.6 by 2002, in the last census. The major reason for this drop is seen as a result of measures taken soon after independence to ensure all children, including all girls, had access to a full education coupled with the development of a wide and effective primary health care network.

These two requirements, plus giving women legal equality, have been found around the world to be the precursors to drops in birth rates.

Zimbabwe was a pioneer in Africa of all three.

The latest census appears to back up the proposition that the more educated a woman is, the more likely she is to have a smaller family.

While women, who had no education or only primary education had a fertility rate of four or more, those with secondary education had a rate of around three children.

Death rate trends, life expectancy and management

In 2009 the BBC revealed that Zimbabwe's women have an average life expectancy of 34 years and men on average do not live past 37. The World Health Organisation report said women's life expectancy had fallen by two years in the last 12 months. Zimbabwean women have the lowest life expectancy of women anywhere in the world, according to the report. Women in the country are also more likely than men to be infected by the HIV virus.

According to the BBC's Africa editor, David Bamford, the latest figures are extraordinary for a country like Zimbabwe, which until 20 years ago, had a relatively high standard of living for Africa.

1. The HIV/Aids epidemic sweeping across southern Africa is one reason for this. The HIV infection rate in Zimbabwe was estimated to be 20.1% for people aged 15–49 in 2006. UNESCO reported a decline in HIV prevalence among pregnant women from 26% in 2002 to 21% in 2004
2. The key reason behind the drop in Zimbabwe's average life expectancy is the fall in the standard of living, triggered by an economic crisis. Zimbabwe's economy has shrunk by an estimated 40% in the last seven years under President Robert Mugabe.
3. Another reason is the collapse of food production, caused by Zimbabwe's controversial land reform program.
4. Infant mortality has actually risen from 5.9% in the late 1990s to 12.3% by 2004, after previously being low!

China's Population

Context

China has been the world's most populous country for centuries and today makes up one-fifth of the world's population. The country's population of 1.3 billion in the early 2000s is projected to grow by another 100 million by 2050. China covers about the same geographic area as the United States, although its population is nearly five times greater. In addition, because of rugged mountains in the west and vast desert areas in central China, the population is concentrated within a surprisingly small area along the East and South.

Birth rate trends and management

Fertility rates have been slashed in China in one of the most ambitious state attempts to control population growth. The government feared a looming crisis in the 1960s where every 3 years another 55million people were added to the population. The government feared a Malthusian crisis where population growth would completely outstrip resource availability. They launched into China's now famous one child policy in 1979, after Chinese demographer Liu Zeng calculated China's OPTIMUM population at 700million. The government set the limit at one child per family – a total fertility rate of 1! The state offered inducements for having only one child such as;

Free education

Priority housing

Pension

Child care

Family benefits

They also had a rigorous range of punishments if the one child rule was flouted including;

Losing all of the benefits listed above

Fines of up to 15% of the families income

In addition, couples could only marry at 22 for a man and 20 for a woman, and had to apply to the state for permission to first marry and then have a child. This reduces the reproductive "lifespan" of that couple.

The policy courted lots of controversy, and China's imbalance in male to female ratio is evident in the figures about China's population. It was claimed in the South China post that once couples knew the sex of a baby some would abort if it was a girl. This is known as female infanticide. This is because the Chinese value males in their society more than females because they carry the family name.

It has been documented that some women were forced into having abortions if they conceived a second child, and persistent offenders were offered sterilisation. The local factories and communities also had the granny police – who monitored and spied on prospective mothers. This policy was not enforced in the same manner across China, and in some areas it was possible to have more than one child, particularly in rural areas where children were needed to work on farmers.

This policy has had huge social ramifications for China – yes it has reduced the population growth, but there have been many secondary problems emanate from the policy. One, it has led to the phenomenon of "Little Emperors", spoilt single children who get everything they want! It has also destroyed some family way of life, no brothers or sisters, no Aunts and Uncles. It also has future ramifications for China's dependency ratio – one single child to look after 2 elderly grandparents! This means that many Chinese simply don't work in the formal economy but work to look after their ageing parents. This means that they are not contributing to the economy and in the past China has relaxed the one child rule. In certain cities today it has been completely abandoned as cities search for economic growth and a workforce that can supply it in the future. The last impact has been to create an army of bachelors, competing for the lower number of females available.

Death rate trends, life expectancy and management

Life Expectancy has increased considerably in China, especially since the cultural revolution of China and the creation of the Peoples Republic of China.

Historical change

China's mortality has declined dramatically over the past 50 years, especially in the early years of the People's Republic. The official death rate in 1953 was 14 deaths per 1,000 people, but it was probably much higher because mortality was chronically underestimated. The official death rate had dropped below 8 by 1970 and below 7 by 2000. China's mortality fell in part thanks to land and other resources to help ensure access by even the poorest citizens. The new government also began to develop massive public health programs. Early programs focused on relatively inexpensive goals and campaigns—such as local environmental clean-up programs and training programs for local health personnel—that contributed to lower mortality. In 1958, the Chinese government

launched the **Great Leap Forward**, a massive effort to rapidly increase agricultural and industrial production. The program was a colossal failure and, ironically, caused one of the largest famines in human history. The Chinese government kept the details of the era secret for many years, releasing some data only in the 1980s. Demographers and others who pieced together the available information have estimated that more than **30 million people died between 1958 and 1961 as a result of the Great Leap Forward**. Infants were especially vulnerable. Infant mortality rates spiked in 1958 and again in 1961. Adult mortality surged in 1960. As the country recovered, mortality levels declined and life expectancy at birth increased—from 35 years in 1949 to 72 years in 2001. China's entry into the Free Trade system and market reform has further increased access to medical care and has built on state systems such as "barefoot doctors" who helped in rural districts, and immunisation against polio and measles.

Recent change

The average life expectancy of Chinese increased to **73 in 2005**, 1.6 years more than in 2000, according to the Chinese Ministry of Health. **Life expectancy was only 36.5 years in 1949** when the People's Republic of China was founded.

The infant death rate decreased to 1.53 percent last year, down from 2.55 percent in 2003.

The reasons for this are multiple, but much can be attributed to;

1. **Massive investment in Health Care provision** - the number of health organizations jumped to 315,000 while the government spent 1.05 trillion yuan (**US\$144.27 billion**), or 4.82 percent of China's gross domestic product, on health care.
2. **Investment in stemming the potential AIDS epidemic** - about 1.8 billion yuan of the central government's budget was devoted to AIDS treatment in 2007 as the number of people estimated to be living with HIV on the mainland may have risen to 700,000 in the same year.
3. 30 million people were estimated to have joined the country's **medical insurance** network by the end of 2007 after a basic medical insurance trial program was launched in July.
4. In addition, the rural cooperative medical insurance system, initiated in 2003 to offer farmers basic health care, covered 730 million rural residents, or 86 percent of the rural population, by the end of September

Migration patterns and laws

Towards the end of the 20th century, it was estimated that there were some 33 million ethnic Chinese living outside China, Taiwan, and Hong Kong. Large though this figure might appear, it is small compared with the total population of China itself, representing only 2.5 percent of a figure that presently exceeds 1.3 billion.

The three southern coastal provinces of Guangdong, Fujian, and Zhejiang have dominated the emigration, and within those provinces, a limited number of districts and even villages. These areas were marginal to the Chinese state and weak in terms of their resource base. However, most importantly, these areas were the earliest and most intensively affected by the seaborne expansion of European colonial powers, which linked them to a wider global system. The 33 million estimate at the end of the 20th century for the number of Chinese overseas had increased from around 22 million in 1985, and from 12.7 million in the early 1960s.

In the past and until the 1960s, China was characterized by high fertility that generated a "surplus" population that was available to migrate from certain parts of the country.

With the establishment of the People's Republic of China in 1949, emigration from China became strictly controlled, almost a return to Qing policies of the 16th century. The migration from China that did occur was primarily of students to the then Soviet Union and of specialist workers to certain developing countries such as Tanzania. Any remaining migration was within the Chinese sphere. Over one million migrants, mainly supporters of the defeated nationalist Guomindang Party, fled to Taiwan around the time of the formation of the People's Republic. An equal number of migrants went to Hong Kong at the same time, followed by a continuous, if fluctuating, flow to the British colony over the subsequent three decades. Almost half a million entered Hong Kong between 1977 and 1982, for example.

Once China began to open up after the economic reforms implemented from 1979, increasing numbers of Chinese began to go overseas, in small numbers at first, but in significant numbers from the mid-1990s.

The figures on Chinese going overseas as immigrants provide only part of the picture. Large numbers go abroad temporarily as students or skilled workers. Students from China make up the most important group of foreign students in Canada and the second most important group in the United States in the early 21st century.

There is also large scale internal migration in China, particularly since industrialisation and urbanisation took hold.

China's Changing approach to Food supply

China's approach to food supply has changed massively over the past 30 years. The Communist party conference of 1978 declared Deng as leader, and he declared a period of reform. He wanted China's economy to catch up with the West inside 20 years, in agriculture, industry and technology. His first challenge was to feed the peasants.

Chairman Mao, Deng's predecessor, instigated People's Communes in agriculture, where people worked together as one community and shared the produce with the state and between them. This had not always worked and the **great famine of 1960 killed more than 13million people and 20 years later people were still going hungry** – and population was increasing.

People in Anhui had instigated an **illegal** private farming system that had **increased productivity by 3 times**. In Xiaogang people got together and divided up their land along private lines, but were worried about reprisals. However, Deng approved, saying "*it doesn't matter if a cat is black or white – if it catches mice it is still a good cat*". He meant whatever worked he would adopt. Many people within the Communist party were against privatisation of farming, but Deng instigated private farming through the Household Responsibility System. It was successful, and many areas of China became self sufficient in food production. Farmers had to produce fixed quotas for the government and the rest was theirs for sale. This allowed markets to develop and cash to start to flow through rural peasant communities. It also allowed a lot more freedom of choice - a profound change in Chinese mentality.

Russia's Collective system

Russia's food production system under Communism offers a completely different model to the capitalist free market system in which we have grown up. When Stalin came to power with Communist rule Russia had a huge area of land but its farms were very small, run by peasants and generally did not produce enough food to feed the whole country. The Communist response to this was **collectivisation**. Land was seized and farms sizes increased as farms were joined together. Organized on a large scale and relatively highly mechanized, the Soviet Union was one of the world's leading producers of cereals, although bad harvests (as in 1972 and 1975) necessitated imports and slowed the economy.

Women were encouraged to work on farms and the farm workforce was educated in more modern farming methods. Areas were pulled together and people given COLLECTIVE responsibility for the production of food, and technology was improved. Tractors and other technologies were used across the country in an attempt to raise production. In addition, the government controlled what was grown and could order areas to produce and give certain quantities of food to the state. It used Terror to ensure that this happened. This huge level of government control is very different from our system. There are debates as to how successful Communism was in relation to raising agricultural efficiency.

India - Green Revolution and land reform

The Green Revolution is the term used to describe the transformation in agricultural practices in many parts of the developing world between 1940 and the 1960s. This revolution sought to eradicate famine in many nations and massively increase food production, by effectively ending subsistence agriculture and replacing it with commercial agriculture. The idea was to transplant many of the systems, ideas and technology of Western farming into (mainly) Asian agriculture, whilst researching and utilising the resources Asian countries had. It was largely funded by the Rockefeller foundation, the Ford foundation and some other major agencies.

The Rockefeller and Ford Foundations established the IRRI (International Rice Research Institute) in the 1960s. This institute developed new High Yielding Varieties of various crops, which spread through the more democratic countries of the region such as Indonesia, Pakistan, India, parts of South America and North Africa. USAID became involved by subsidising infrastructure developments and fertiliser shipments.

There were three basic elements in India with regards to the Green Revolution:

1) Continued expansion of farming areas

The area of land under cultivation was being increased right from 1947. But this was not enough in meeting with rising demand. Other methods were required. Yet, the expansion of cultivable land also had to continue. So, the Green Revolution continued with this quantitative expansion of farmlands.

2) Double-cropping existing farmland

Double-cropping was a primary feature of the Green Revolution. Instead of one crop season per year, the decision was made to have two crop seasons per year. The one-season-per-year practice was based on the fact that there is only natural monsoon per year. So, there had to be two "monsoons" per year. One would be the natural monsoon and the other an artificial 'monsoon.'

The artificial monsoon came in the form of huge irrigation facilities. Dams were built to arrest large volumes of natural monsoon water which were earlier being wasted. Simple irrigation techniques were also adopted.

3) Using seeds with superior genetics

This was the scientific aspect of the Green Revolution. The Indian Council for Agricultural research was re-organized in 1965 and then again in 1973. It developed new strains of high yield value (HYV) seeds, mainly wheat and rice but also millet and corn. The most noteworthy HYV seed was the K68 variety for wheat.

Gains

Yield per unit of farmland improved by more than 30 per cent between 1947 (when India gained political independence) and 1979

Crop areas under high-yield varieties needed more water, more fertilizer, more pesticides, fungicides and certain other chemicals. This spurred the growth of the local manufacturing sector.

The increase in irrigation created need for new dams to harness monsoon water. The water stored was used to create hydro-electric power. This in turn boosted industrial growth, created jobs and improved the quality of life of the people in villages.

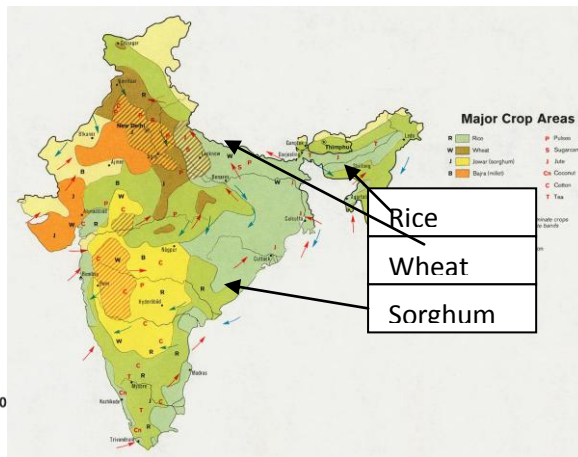
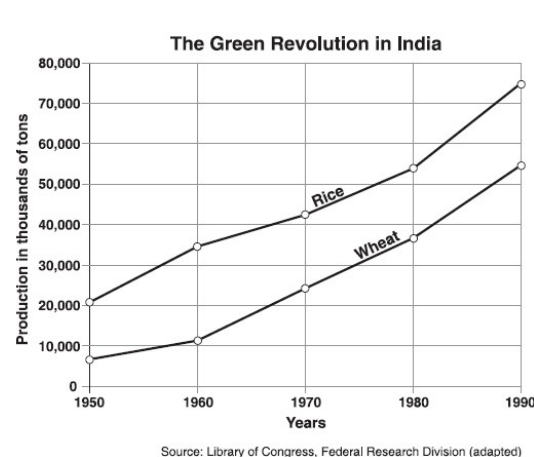
India transformed itself from a starving nation to an exporter of food.

Limitations

Even today, India's agricultural output sometimes falls short of demand.

India has failed to extend the concept of high-yield value seeds to all crops or all regions. In terms of crops, it remain largely confined to food grains only, not to all kinds of agricultural produce.

There are places like Kalahandi (in India's eastern state of Orissa) where famine-like conditions have been existing for many years and where some starvation deaths have also been reported. Of course, this is due to reasons other than availability of food in India, but the very fact that some people are still starving in India (whatever the reason may be), brings into question whether the Green Revolution has failed in its overall social objectives though it has been a resounding success in terms of agricultural production.



CAP in the European Union

The European Union is a political and economic union of individual member countries or states. Essentially the EU is a trading bloc, that has emerged since WW2 to ensure peace in the union, to encourage trading between member states and to ensure certain standards of living for the people of member states.

The EU has many social policies and development policies, but one of the biggest policies and best funded policies was directly linked to food supplies. This was known as the **Common Agricultural Policy or CAP**.

CAP was set up shortly after the second World War. In World War 2 Britain and Europe's vulnerability in terms of food security became clear. For a long time Britain had failed to be self sufficient in food production, relying upon food imports from other countries to make up the deficit. When German ships and U-boats started to torpedo and attack our supply ships, our food supply and hence security was put under incredible pressure. The government was forced to look at alternatives in the short term, with land girls (women working on farms to help to increase production), Dig for Victory (grow your own!) and rationing of the most difficult to get products used. Post World War 2 in the 1950s the amalgamation of small farms and commercialisation and industrialisation of farming was used as a longer term solution. The goals of CAP fit in with this and were to massively increase production to avoid these variations in food security across Europe.

The original aims of CAP were as follows:

- To raise food production levels across the European Union
- To keep European agricultural market stable
- Keep food prices stable and fair in Europe
- To maintain agricultural employment in the European Union
- To maintain Farmers incomes across the Union.

Some of these aims are clearly contradictory, because if improvements in technology means mechanisation then people will lose jobs, thereby lowering agricultural employment!

The aims of CAP were met through mainly protectionist measures and they included;

Guaranteed prices and intervention buying - where farmers were guaranteed a minimum price for their product and if they could not sell the product on the open market the EU would buy the product from them. This was designed to stop the impacts of price fluctuations and allow income security for farmers.	Export and production Subsidies - where farmers were paid money on exporting their products so that it could be sold at a cheaper price on the World market. This allowed EU goods to undercut the price of other countries, a massive benefit to EU farmers. Production subsidies also encouraged farmers to produce food stuffs that the EU decided was in short supply, so the EU could control what was grown to meet demand.	Import Tariffs were taxes placed on foreign goods from outside of the EU, to raise their price relative to the EU products. This meant that EU consumers would choose cheaper EU products.	Investment grants were available to commercialise agriculture. The goal was to allow small farmers to amalgamate their small holdings into bigger units so that they were more productive and could take advantage of economies of scale. Grants were also available for investment in fertilisers and machinery to improve technology levels in agriculture.
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The impact of all of these policies was to massively raise production across the EU and to force small holders out of farming. Bigger and more competitive farms simply bought out smaller less economic holdings. Farmers became so productive that in the 1970s news stories hit the press about European Butter and grain mountains, wine lakes and Olive oil excesses. The EU had to pay out lots of money to store this food and also courted controversy because the excesses were used as food aid or dumped on poor countries markets at massively reduced prices. This undercut local farmers in poor countries and removed their markets. To control these excesses the EU had a quota system where farmers could only produce a certain amount of a produce or face a fine. However, it was clear that by 1990 that the CAP needed changing, despite vocal protest from agricultural EU nations which had benefitted massively from CAP such as Greece, Italy, Spain and France. The General Agreement on Tariffs and Trade also deemed subsidies to be against the spirit of Free Trade. The CAP absorbed a huge proportion of the EU's budget and led to the intensification of farming using chemical fertilisers, pesticides and insecticides. It also massively increased the energy use and hence carbon footprint of farms. The use of chemicals sparked fears of a "silent Spring", with fears over widespread pollution of water courses, chemical residue on food stuffs and eutrophication.

The MacSharry Reforms

The MacSharry reforms (after Ray MacSharry 1992) sought a much more environmental and lower intensity type of farming. Some of the main policies are;

The removal of price support to bring grain meat and dairy prices closer to world prices.

Set a-side - farmers were paid to not produce on 10% of their land to reduce production and allow for nature conservancy.

Environmental stewardship The slow removal of subsidies - this was for all sectors of farming, and has hit dairy and meat producing farmers in marginal areas (such as British hill farmers) hardest.

Money was redirected to Eastern Europe so that they could adjust to the EUs market economy

In 1993 the General Agreement on Tariffs and Trade (GATT) meant that even these reforms did not go far enough, and that the EU must falling line with the rules of international trade. In other words, the PROTECTIONIST system used by the EU was wrong and would have to stop. The GATT also demanded the decoupling of financial aid from food production.

The new reforms then had 9 aims;

Decrease the use of artificial fertilisers
Increase organic production
Encourage Extensive forms of agriculture
Maintain "environmental goods" in the form of woodlands, wetlands and heathlands
Decrease stock intensities of sheep and cattle
Maintain abandoned farmland and woodland
Encourage breeding of endangered and local breeds
Encourage long term set-aside of land
Increase public access to recreational use of the countryside.

The UK within the European Union

The UK food production is only 60% of UK consumption

Food exports from the UK are worth around £6.5bn - with cereals and fish making the largest contribution [12].

Food imports are worth almost £20bn, vegetables and fruit being the largest category.

The origin of UK food is (2006, based on unprocessed farm-gate prices):

49% UK
29% Europe (EFTA)
6% Africa
5% Asia
5% N. America
4% S. America
3% other

Intermediate Technology

Intermediate or appropriate technology is a middle way between high tech and low tech farming methods. It was founded by Dr E.F. Schumacher as an alternative path for development for poorer people. He founded his Intermediate Technology Development Group (ITDG) in 1966 and published his ideas in a book "small is beautiful" in 1973. His argument centred around the old proverb

"Give a man a fish and you feed him for a day, teach him how to fish and you feed him for life"

Appropriate/intermediate technology is usually;

- A) Labour intensive - utilising and creating employment for local labour.
- B) Using sustainable technology and tools/knowledge of local people.
- C) Uses newly developed technology that are low cost and local which local people can manage and control rather than IMPORTED techniques and technologies.
- D) In harmony with the local environment.

Kukri Mukri - a small island in the Ganges delta of Bangladesh. This is a rice farming subsistence area with poor access to local markets. Action Aid worked with these people on many ways, but one of those was to provide classes in literacy, duck breeding, introducing new crops and intermediate technology pumps. This involved drilling tube wells for villages that did not have access to fresh water. Once the wells were drilled down to unpolluted ground water layers the technology to raise the water is simple and robust. The pump can be run without expensive water supplies and maintenance can be done by local people. Spares are cheap.

Kenya - The Intermediate Technology Development Group (ITDG) is a British Charity which has worked in Rural Kenya. It aims to help people meet their basic needs of food, clothing, housing, energy and employment. It use local knowledge, training and finance to help people become more self sufficient. In Kenya the ITDG has;

Used soil as a local building source - as it can be compressed and it absorbs heat well. It can be stabilised against erosion using lime and natural fibres. Soil bricks stabilised with concrete are replacing more expensive industrially produced bricks.

The previously Nomadic Maasai herdsmen are being forced to become sedentary. ITDG is helping them find affordable housing, helping them repair roofs with small amounts of cement, and by incorporating guttering and water collection jars into housing women are being spared the job of walking long distance to collect water.

Kenyan women rely on wood for cooking. This can take rural women a long time to collect. An improved cooking stove (jiko) has been developed that reduces the amount of wood and charcoal needed and is based on a traditional design and constructed using scrap materials.

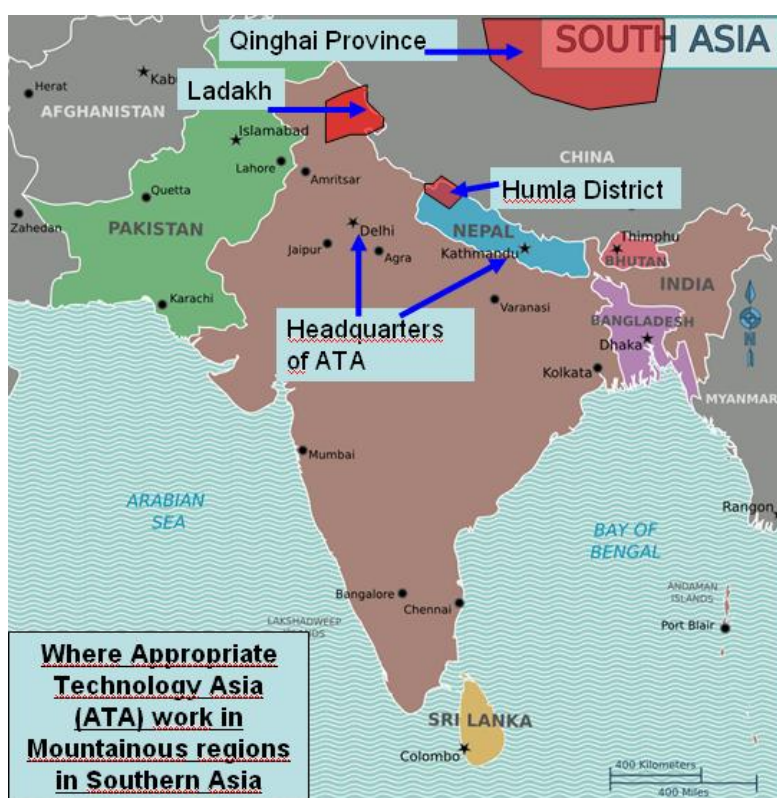
Asian Mountainous areas with Appropriate Technology Asia – Nepal, China and India

Agriculture practiced in many mountain areas is increasingly influenced by western agricultural techniques. This has led to a gradual introduction of monoculture cropping techniques. These practices reduce resistance to pest damage and increase evaporative water losses from the soil. In many mountain areas, where water availability is a severe limiting factor, this has significant effects on overall productivity. ATA, a charity, seeks to develop new interpretations of traditional practices, to develop integrated, sustainable farming systems that meet the hopes of local communities.

In many of the areas where ATA works, farming communities are under ever-increasing pressure: dwindling agricultural productivity, increasing population and shifting climatic patterns. In China for example, most families in Hualong County produce only 6 months of their annual food requirements and rely on loans and shifting migratory labour to make up the balance. In the very high Himalaya of Nepal and India, local farmers rely on often insecure handouts of government grain.

The solutions:

Intercropping	Bee-Keeping	Solar Agriculture	Livestock Management
<p>The simultaneous cultivation of different crops on the same piece of land. Intercropping reduces the chances of the farmer losing everything to pests, drought, or disease. If one crop fails, the other may survive and will compensate for the loss or provide at least some food or earnings. Another advantage of intercropping is that it often makes more efficient and intensive use of available labour. Encouraging year-round vegetative cover, and by careful research and selection of species for inter-cropping during the growing season, minimises or eliminates the periods when the soil surface is exposed to wind and water erosion. In addition, retaining crop residues in the soil, rather than using them for fodder or fuel is an important method of reducing nutrient leaching from the soils during the winter.</p>	<p>Bee keeping is common in many Himalayan regions. The bees are used for the production of honey, and the beeswax is used for candles and traditional medicines.</p> <p>In terms of food security, bees are also indispensable pollinators, and maintaining healthy strong bee colonies can have a significant effect on overall crop productivity. According to Partap (1999), assisted pollination, as opposed to self-pollination, increases seed production in mustard by 131%, onion by 178%, carrot by 500% and sunflower by 635-3600%. In addition, many vegetable crops and fruit varieties, including apple and some apricot varieties, are dependent on assisted pollination. By improving bee husbandry practices, ATA works to remove the risk of disease, increases the cold-tolerance of the hives and promotes the productive utilisation of indigenous honey-bee species to increase crop production through improved pollination.</p>	<p>Imagine there was a way to cheaply and quickly extend the growing season in cold mountain climates by several months.</p> <p>In contrast to traditional glasshouses, which usually consist of a fully glazed structure, cold-climate specific greenhouses must include additional climate-buffering elements to shield the plants from extreme night-time temperatures. Our greenhouses comprise a freestanding structure in two parts, a thick masonry shelter with a roof to provide both insulation and residual heat during the night, and a receiver surface of either glass or polythene sheeting, which abuts this structure. This design is ideal for the extreme climate above 2,700m, as the heat stored in the earth wall reduces the risk of frost damage to the plants during the night. The introduction of solar agricultural glasshouses provides a source of fresh vegetables that are currently unavailable in many remote areas during the winter months, and they also provide an income generating opportunity for local people.</p>	<p>Many mountain communities rely totally on native trees, shrubs and grasses for the fuel, fodder and construction materials they need.</p> <p>However, in many areas the livestock that provide crucial supplies of milk, butter and wool, play an important role in depleting these forests and rangelands. By promoting stall feeding rather than free-range grazing of livestock, together with training in livestock nutrition and care, and the production and management of fodder crops, ATA works to better integrate livestock management with fragile mountain ecosystems, while improving the economic benefits of livestock husbandry. We also work to improve local natural ecosystems by working with local communities to protect and manage their local environment.</p>



Brazil

Brazil wants to become the world's number one food producer. Can Brazil show us how to feed the world? Within one generation Brazil has become one of the great food producing nations of the world. These notes explain why and are adapted from Jimmy's Global Harvest, a BBC series

Mato Grosso, Sapezal, in the interior, and much of the landscape is not great farmland. It is **Savannah**, and used to cover ¼ of Brazil, it could not be farmed. All of the plants are stunted because the soil is of poor quality and the savannah has adapted to this poor soil, unfertile for plants. But scientists have created an agricultural area 1/3 the size of Europe here, that they think can expand in future. Andre Magi built this farming dynasty, and the family own one of the largest farming businesses in the world. This area is farmed commercially and one farm is cultivated using 50 huge combined harvesters (costing \$20million from John Deere), they use economies of scale to harvest soy beans which go into 60% of processed foods and goes into animal feed. Without it, millions would starve. Brazil is second only to the USA for Soy production. The region produced 18 million tonnes in one year, enough to feed half of Europe. However, to do this they have **reduced the acidity of the soil**, which naturally has a pH of 4-5. This acidic soil mixed with high levels of aluminium and released it to **contaminate the water supply and poison the plants, reducing their ability to take up water and nutrients**. The Brazilians **mixed lime into the soil** to solve this problem and allow the farmers to grow plants in the Savannah. They can harvest twice a year and seeding takes place straight after harvest. Chemical fertilisers go into the soil, automatically with the seeds. **The downside is that these fields are monocultures, losing diverse habitat and increasing the use of chemicals**.

Juazeiro, Bahio state

One of the driest parts of Brazil in the North East, but irrigation has allowed farmers to transform the area. The food produced is fruit and vegetables for the global market. The farmers try to meet the demand for all year round fruit, even out of season. There is a mango farm here renowned for innovation, it produces 3 million kilos of mangos per year for Europe, the US and Canada. There is so much sun they have to spray lime to protect the fruit in the consistent sunshine. The natural cycle is for the mango trees to produce fruit for only 3 months a year, which doesn't meet market demand. They use PBZ, a chemical to **block the growth hormone of leaves and instead allow flowers to grow**. Once the flowers grow the trees are sprayed with Ammonium Nitrate to stimulate the tree and encourage flowers (within 3 weeks) and then fruit growth (in 3 months). Both PBZ and Ammonium Nitrate can pollute water supplies, whilst PBZ can carry health risks. They have almost doubled the output of mangoes from this farm. The UK is Brazil's biggest market for **Mangoes**, and we demand them all year round.

Coruripe, Alagoas

An example of a pioneering production of a crop that could help with the world's energy crisis. **It is a sugar based fuel used in 50% of Brazil's vehicles**. They have made fuel from sugar for 30 years and refine on site. The sugar cane is harvested using traditional methods, using a huge burn of the sugar cane at night. The fire gets rid of the snakes and sharp leaves of the sugar cane plants leaving only the stalk which survives the fire. The cane is then harvested by hand by people on low pay. The workers have to warm up before the cut! The cane is sticky and has to be cut low down as the sugar is low down on the stem. **Brazilian sugar cane produces more fuel per hectare than any other crop in the world**. The farm has its own laboratory and research the best ways to turn the cane into fuel. The secret is fermentation, using pulped, mashed and squeezed sugar cane. They have researched into yeast, and developed super yeast that divides and multiplies as they feed and give off ethanol as a bi-product. High concentrations of ethanol usually kill yeast cells, but the new strain of yeast has strong membrane walls that keep out the ethanol and so the yeast can continue to ferment until nearly all of the ethanol is produced. Only 0.5% of the sugar remains unused, producing 170million litres of ethanol a year on this farm alone. Using 1% of Brazil's arable land the farmers can replace half of Brazil's petrol use.

Caceres, Mato Grosso

A Cayman farm, a small native alligator of Brazil, farmed for their meat and skins. They have 15,000 animals a tank, in 8 tanks. The eggs for the Cayman come from the natural environment, a wetland called the Pantanal, a wetland 20 times the size of the Everglades. As many as a million Cayman a year were killed in the past by hunters. Farmed Cayman has helped to eliminate the poaching. The eggs are laid on higher ground less likely to flood, and the farmers take all of the eggs from a nest or none at all. The eggs are collected from the wild as it reduces the cost of breeding in captivity. This actually allowed the Cayman population to grow; they take 20,000 eggs, only 8% of the total in the area. This allows the Cayman populations to remain stable. As many as 20million Cayman now live in the Pantanal.

Southern Amazon Basin, Bom Jesus do Araguaia, Mato Grosso

Cattle ranchers have transformed the Amazon, an area over 3 times the size of the UK has been destroyed in 30 years for cattle ranches. There are over 70million cattle in the Amazon region, as Brazil strives to be the biggest exporter of beef in the world. John Carter wants to farm cattle sustainably. There are problems with lawlessness, squatters and illegal deforestation. Landowners clear huge areas of forest for cattle ranching; this is because beef brings in good money. John's solution is to have grasslands and allow the forests to regrow next to those grasslands. 60% of his land is now forest, and he charges a premium for his eco friendly beef. He also gets money from a European bank, which pays for the tree growth for carbon offsetting.

Case study revision CRIB SHEET

Case study name –	
Location – short sentence and sketch map	Key facts to remember (include at least 5 – dates, names of places, figures etc)
Key Geography Terminology associated with case study	
What the case study is about in 5 sentences 1. 2. 3. 4. 5.	
Questions I could be asked: Common Command words to help – Describe, Compare, Contrast, Explain, Justify, Assess, Argue, Discuss, Analyse, Account for, Examine, Interpret, Evaluate	

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