



# GCE TEACHERS GUIDE

New Specifications:  
for teaching from September 2008

## Geography (Part 2)

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## GCE AS and A Level Geography (PART 2) Teachers' Guide

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# 1. INTRODUCTION

## Key Features of A2 Level

- Increased emphasis on teacher and student selection of their route to A2 Geography.
- The opportunity for student-centred, teacher-guided learning.
- Studies of selected topics in depth thus providing challenging investigations.
- Breadth of contemporary themes in both assessments.
- G3 is worth 120 UMS and G4 is worth 80 UMS.
- Links well with modern University Geography.
- Some research themes relate closely to other topics at A2 and University e.g. Crime (Criminology/Sociology), Environmental Psychology (Psychology), Disease (Medically related disciplines) and Small scale ecosystems (Biological Sciences).
- Both Modules available for assessment in January and summer series of examinations.

## Key Features of the A2 Unit G3

The specification and its assessment is divided into two distinct sections.

### Section A, Contemporary Themes

Choice of **one** '*physical*' Contemporary Theme from:

- (1) **Extreme Environments,**
- (2) **Landforms and their Management and**
- (3) **Climatic Hazards**

and choice of **one** '*human*' Contemporary Theme from;

- (4) **Development,**
- (5) **Globalisation and**
- (6) **Emerging Asia**

- each theme is worth 40 UMS (Total 80 UMS).

1. Two **Extreme Environments**; Deserts, and Arctic and Alpine Tundra enable common threats and strategies to be studied.
2. A choice of **either Glacial Landforms and their Management or Coastal Landforms and their Management**: they both examine processes and their impact and how people manage the changing environments.
3. **Climatic Hazards** develops from the global pattern of climates to an assessment of hazards and peoples' responses to the hazards.
4. The Development Gap is the underpinning concept of the **Development** theme.
5. **Globalisation** and global shift underpin an assessment of the impact of globalisation on economies, cultures and politics.
6. **Emerging Asia** is studied **either** through the case of **either China, or of India**: the focus is on economic changes and the resultant challenges for those countries.

## Section B Research Themes

- The third part of the assessment is the choice of **one 'Research' theme** (40 UMS) from ten research areas;
  - (1) **Geography of Crime,**
  - (2) **Deprivation,**
  - (3) **Geography of Disease,**
  - (4) **Environmental Psychology,**
  - (5) **Leisure and Recreation,**
  - (6) **Microclimates,**
  - (7) **Atmospheric and Water Pollution,**
  - (8) **Geography of Retailing,**
  - (9) **Rivers, and**
  - (10) **Small scale Ecosystems**
- Candidates are guided through the research enquiry process on a pre-issued topic.
- Opportunity for centres to offer choice of research theme suited to candidate preferences.

## Key Features of the A2 Unit G4

- Sustainability studied through four themes;  
**Sustainable Food Supply,**  
**Sustainable Water Supply,**  
**Sustainable Energy and**  
**Sustainable Cities.**
- Emphasis on attitudes and values of a range of groups.
- Pre-release resources used in assessment.
- Themes examine the current position, changing demands and pressures and assess the solutions to the challenges of sustainability.

## 2. DELIVERING THE SPECIFICATION

### 2.1 Models of possible delivery patterns

#### Model A – Entries in January and June in year 13

TIME OF ASSESSMENT	UNIT
January Year 13	G3 Contemporary Themes and Research in Geography <b>OR</b> G4 Sustainability
Summer Year 13	G4 Sustainability <b>OR</b> G3 Contemporary Themes and Research in Geography
<p><b>Advantages:</b>            Concentrated focus of teaching on a single Unit.            Research themes can be developed after AS for either pattern.            Allows for immediate teaching of teacher specialisms.            Allows maximum time for fieldwork and investigation if G3 sat in summer.            Sequencing can be arranged to suit existing knowledge and skills of cohort.            All January assessments can be retaken in the summer. Caters for the 'surprise' result.            Presents opportunity to sit G4 in January as a practice run. Those who succeed will have marks in the bank.</p>	
<p><b>Disadvantages:</b>            G3 a very large specification for January assessment, especially demands in Section B.            Requires tight organisation and timing of investigation and fieldwork            Students not able to be synoptic enough for G4 in January.</p>	

#### Model B - June assessment in year 13

TIME OF ASSESSMENT	UNIT
January Year 13	No assessment
June Year 13	G3 Contemporary Themes and Research in Geography G4 Sustainability
<p><b>Advantages:</b>            Less disruption of Centre/department with no January exams.            Students are assessed when theoretically at most mature for each award.            G4 taken when understanding of the synoptic links at maximum.</p>	
<p><b>Disadvantages:</b>            Greater revision pressure.            Pressure could be more if G3 and G4 are close in assessment timetable.            Resit opportunities are less because no first effort in January.</p>	

## 2.2 Amplification of content – columns 1 and 2 of the Specification

*The notes below are not intended to be a definitive elaboration of the specification. Other approaches and exemplar materials are equally valid and tutors are encouraged to develop their own approaches to the specification that best suit the needs of themselves, the students and the location of the centre. **The paragraph numbers relate to the Key Question sections in Column 1 of the specification.***

### Theme 1 – Extreme Environments

- 1.1 The objective here is to provide students with a knowledge and understanding of the physical characteristics of the hot desert environment. An understanding of the interrelationship between these physical characteristics is needed to appreciate why the environment is classed as extreme. Students should gain a knowledge of the climatic characteristics found in deserts and be able to explain why they occur. An exhaustive knowledge of the biotic make up of deserts is not required and a study of one desert region should provide the opportunity to explain the linkage between flora, fauna and climate. In any study of soils students will need a general grasp of soil characteristics and the soil forming processes but detail only need be applied to desert soils.
- 1.2 Students should examine the concept that the desert biome is under threat from a variety of human pressures. There are a large number of pressures but students are only required to study four: population growth, mineral exploitation, farming and tourism. The aim of this section is to provide an understanding of how these pressures arise and the impact they have on desert environments. The impacts can be seen as effects on the physical environment and people. This can be done by an examination of topics using one or more case studies for each one or by exploring one desert region that demonstrates the impacts from all four pressures. Students should be encouraged to see impacts as both positive and negative.
- 1.3 The aim in this section is to examine the strategies that are used to manage human activity. This can be done as continuation of impacts of human activity studied in 1.2 to give a sequence of study that examines the source of pressure – the impacts of pressure – the methods that have been used to overcome the pressure. This approach must ensure that the strategies studied are seen within the context of the classification of strategies that attempt to conserve the desert environment, alleviate the impacts human activity, control the use of the desert environment and monitor the impacts of human activity. Another approach is to take this classification of strategies and illustrate them with one or more case studies. In both approaches there needs to be an explanation of how the strategy can manage the environment. An assessment of the success of the strategy would be an appropriate conclusion to the unit. Students should also understand that strategies are initiated and directed by groups at a local, national and international level although this need not be covered for every strategy

- 1.4** The objective here is to provide students with a knowledge and understanding of the physical characteristics of the tundra environment. An understanding of the interrelationship between these physical characteristics is needed to appreciate why the environment is classed as extreme. Students should gain a knowledge of the climatic characteristics found in tundra and be able to explain why they occur. An exhaustive knowledge of the biotic make up of Arctic and Alpine Tundra is not required and a study of one arctic and alpine tundra region should provide the opportunity to explain the linkage between flora, fauna and climate. In any study of soils students will need a general grasp of soil characteristics and the soil forming processes but detail only need be applied to tundra soils.
- 1.5** The aim of this section is to determine the level of human threat to the tundra environment with reference to both latitude and altitude. The threats identified are those from tourism, global warming, mineral exploitation and airborne pollution. It is not expected that all of these are considered in the context of latitude *and* altitude but both areas should be addressed in their study. As with the desert environment the threats and impacts should be examined to obtain an understanding of the reasons why they occur and what are their effects on the physical and human environment. This provides an opportunity to link with work done at AS on climate change. Students should again be encouraged to see the impacts of human activity from a positive as well as negative viewpoint. The approach to study can be regional by investigating two areas such as arctic Canada and the Alps or thematic by looking at the threats individually.
- 1.6** The aim in this section is to examine the strategies that are used to manage human activity. This can be done as continuation of impacts of human activity studied in 1.5 to give a sequence of study that examines the source of pressure – the impacts of pressure – the methods that have been used to overcome the pressure. This approach must ensure that the strategies studied are seen within the context of the classification of strategies that attempt to conserve the tundra environment, alleviate the impacts human activity, control the use of the tundra environment and monitor the impacts of human activity. Another approach is to take this classification of strategies and illustrate them with one or more case studies. In both approaches there needs to be an explanation of how the strategy can manage the environment. An assessment of the success of the strategy would be an appropriate conclusion to the unit. Students should also understand that strategies are initiated and directed by groups at a local, national and international level although this need not be covered for every strategy.



## Theme 2 – Landforms and their Management

### Theme 2a – Glacial Landforms and their Management

#### 1.1 What is a glacial system and what are the dynamics of glacial environments?

- The objective here is to provide students with an introduction to glaciers as a system. Students need to appreciate that the inputs to and outputs from a glacier are not constant, but vary continually over both short and long timescales. The glacier system constantly adjusts to changes in the balance between accumulation and ablation and this is reflected in the **mass balance** of a glacier. If accumulation exceeds ablation a glacier gains mass (positive mass balance). If there is more ablation than accumulation a glacier has a negative mass balance.
- Students need to know and understand that glaciers have shown periods of expansion and retreat as **climate changes** have shifted the net balance to either positive or negative. This provides students with the opportunity to review material covered at AS level in Key Questions 1.2 and 1.3 from Theme 1.
- Glacial landforms can be linked to global events that changed climate. An example of this relationship can be understood through the study of the 'Younger Dryas', a short lived, but substantial, temperature fluctuation at the end of the last glacial cycle. This was probably driven by a massive influx of cold fresh water into the N Atlantic due to recession of American ice and release of ice-dammed lakes, resulting in the re-growth of glaciers in upland Britain producing cirque moraines such as Cwm Idwal, Brecon Beacons.
- Students need to know and understand that glaciers can be classified as **cold-based** or **warm-based** depending on whether they are frozen to the underlying bedrock or not. Cold polar glaciers tend to be cold based, but outside of the Polar Regions most glaciers are warm-based. However large glaciers can be cold-based in their upper regions and warm-based near their margins when they extend across different climatic zones. Slow rates of accumulation and ablation associated with glaciers in cold, continental climates result in a smaller imbalance between the zone of accumulation and zone of ablation and slower ice movement. Glaciers in temperate-maritime climates have greater snowfall in winter and experience more rapid ablation in summer, therefore glacier ice moves more rapidly towards the ablation zone to maintain the equilibrium slope angle. There is much more erosion under warm-based compared with cold-based glaciers.

**1.2 What are the processes of glacial weathering and erosion and what are the resultant landforms?**

- Students need to know and understand the weathering and erosion processes operating in the glacial zone. Weathering Processes – the relatively high humidity combined with relatively low temperatures oscillating above and below freezing make frost shattering and freeze thaw weathering predominant – the low temperatures make chemical weathering less important. Generally frost action contributes to angular features in the landform e.g. arêtes and steep cliff slopes. Mass movement – frost shattering in situ on slopes produces rock slides leading to screes, but higher temperatures in summer may lead to mud flows and soil creep – solifluction is an important but slow mass movement process contributing to particular landforms e.g. pingo and patterned ground. Frost shattering and mass movement of scree and other debris contribute directly to the various types of moraines and provide erosion agents with the abrasive material needed for these agents to be effective. Erosion - because of heavy snowfalls and long periods of below freezing temperature the main erosion agent is moving ice – leading to the familiar but distinctive glacial landform features such as corries/cwms, u shaped valleys, roche moutonees, etc. The processes of erosion can be divided into three categories: glacial abrasion, glacial plucking and glacial meltwater erosion.
- Students need to recognise and understand the formation of macro-scale landforms including cirques, arêtes, pyramidal peaks, glacial troughs, hanging valleys, truncated spurs and crag and tail; meso-scale landforms including roche moutonees and subglacial meltwater channels and micro-scale landforms including striations.

**1.3 What are the processes of glacial transport and deposition and what are the resultant landforms?**

- Students need to know and understand that the transportation of load is dependent on: the depth of the ice; the amount of load carried; and the temperature and pressure conditions which affect the 'fluidity' of the ice slope gradient and that transported material can be classified as either supraglacial, englacial or subglacial debris. Subglacial debris is most altered during transport and the results of transportation and related erosion during transportation of debris are evident in both erosion and deposition features. Students also need to know and understand that deposition is dependent on changes in the levels of energy in relation to the load carried by the transportation process and that this may be affected by changes in atmospheric processes e.g. in shorter periods of higher temperature and less snowfall or interglacial periods ice movement may be reduced leading to lower energy levels and more deposition. Students need to appreciate that the processes by which glaciers deposit material are complex. Lodgement results in lodgement till and ablation results in ablation till.
- Students need to recognise and understand the formation of landforms of glacial deposition including sub glacially formed moraines such as drumlins and till plain and ice-marginal moraines such as terminal, recessional, lateral and medial moraines. In periods of higher temperature when ice and snow melt occurs fluvio glacial deposition is important e.g. eskers, kames and outwash gravels. Kettle holes or lakes may also occur when the ice beneath melts.

#### 1.4 What are the effects of deglaciation on the landscape?

- Students need to know and understand the effects of deglaciation on the landscape including the retreat of periglacial processes and landforms to higher altitudes and latitudes. On areas of low relief important periglacial processes are frost heaving and thrusting and associated periglacial landforms are pingos and patterned ground. On slopes important periglacial processes are freeze-thaw weathering and solifluction and associated periglacial landforms are blockfields, scree slopes and solifluction lobes and benches. Relevant geomorphological processes include mass movement processes (modifying valley profiles largely created by glacial erosion), fluvial processes (resulting in the infilling at the head of ribbon lakes), or weathering processes (breaking down glacial and fluvio-glacial deposits). Since the last glaciation the change to milder humid temperate conditions, together with changes in base level due to isostatic adjustment, have significantly modified glacial landforms e.g. cwm and tarn and river action within a glaciated valley. Raised erosion surfaces in glaciated uplands and rejuvenation features within glaciated valleys are other examples of the influence of isostatic adjustment.

#### 1.5 Why are glacial environments important?

- Students need to know and understand that glacial landforms (in areas that are currently experiencing glaciation and in formerly glaciated areas) provide opportunities and present constraints for human activity in terms of tourism, water supplies and energy, agriculture, mining and quarrying and settlement. Students also need to appreciate that glacial processes impact on human activity because of the high incidence of avalanches, rock falls and other forms of mass movement such as landslides and glacial outburst floods. The case study of Galtur in Austria provides students with an appreciation of the relationship between avalanches and their effect on human activity, especially tourism. The case study of melting glaciers in the Himalayas can be found in the teaching/learning section of this guide for Theme 2 a. For periglacial environments students may investigate how freeze-thaw in the active layer damages structures.
- Students need to know and understand some of the following impacts of human activities on glacial environments: leisure activities – winter sports activities including associated infrastructure – buildings, road access etc; logging activities leading to the removal of vegetation cover accelerating weathering and mass movement processes; the damming of glacial lakes and use as reservoirs for H.E.P. schemes; pollution and permafrost degradation and anthropogenic climate change leading to the net ablation of glaciers worldwide.
- Students need to know and understand the opportunities for human activity presented by the shift of the permafrost limit including settlement and the development of mining and oil extraction industries: limitations for human activity include freeze thaw in the active layer damaging structures and leading to ground subsidence.

**1.6 What are the methods used to manage glacial environments and how successful are these strategies?**

- The aim of this section is to examine methods used to manage the impacts of glacial processes on human activity including prevention or control by soft and/or hard engineering strategies such as constructing strong, resistant buildings; avalanche barriers on the mountain slopes; planting trees which in themselves break the flow of an avalanche. A useful case study on Galtur, Austria can be found at <http://www.channel4learning.com/support/programmenotes/geog/nathazards03.htm>. Students need to appreciate that the choice of strategy is dependent on the nature of the human activity taking place, the density of human settlement, the nature of the impact, frequency of occurrence and degree of intensity of impact, loss of life and injury and the damage caused to property and infrastructure.
- The aim of this section is to examine methods used to manage the impacts of human activities on glacial environments including prevention of access and bans on certain or all use of the area under impact – control of occupation and character of land use through planning controls and zoning affecting access, location and design of buildings and infrastructure and land use. A useful case study on the impact of human activities in glacial environments can be found at <http://www.eryri-npa.gov.uk/>.
- Students need to be able to make an assessment of the success of strategies for managing **either** glacial processes **or** human activities. The assessment may include a financial cost/benefit basis; an analysis of the extent to which the strategy(ies) achieves its aims in controlling or lessening the undesired impact(s); the projected life of management strategy(ies) or the extent to which each involved agency or body feels the implemented strategy(ies) has achieved the objectives as perceived by each agency and body directly and indirectly involved or affected. Having considered the interests of the different participants and the actual evidence 'on the ground' students need to make a summary evaluation as to extent the strategy (ies) has been successful.

Glacial and Periglacial Environments – David Anderson, Access to Geography Hodder & Stoughton

Geography Review – May 2001 – Earth's Giant Bulldozers – Glacial Legacy

Geo Facts – September 2000 – Glaciation in the Berwyn Mountains (Wales)

Geofile – September 2003 – Glacial Erosion in Lowland Areas

Glacial

Geo Facts - January 2003 – Avalanches and their Mitigation

Geofile – April 2004 - Impact of Human on Landscape – Glacial Changes

## Theme 2b – Coastal Landforms and their Management

### 1.1 What is a coastal system and what are the dynamics of coastal environments?

- The coastal system is one of inputs and outputs. There are two systems: the **cliff system** with *inputs* of the sub-aerial processes of weathering and the atmospheric process of wind erosion; a *throughput* of cliff mass movement of falls, slips and slumps and an *output* of sediment at the base of the cliff which either piles up or is transported by marine processes.

The **beach system** has an *input* of sediment from longshore drift, the cliff and offshore, a *throughput* of longshore drift and an *output* of longshore drift and destructive waves carrying sediment offshore.

- Coastal sediment cells are areas of coast usually defined by headlands within which marine processes are largely confined with limited transfer of sediment from one cell to another.  
<http://www.geographypages.co.uk/ascoasts.htm>
- The relationship between inputs and outputs is constantly changing, i.e. it is dynamic, and the system is designed to achieve an equilibrium position where inputs equal outputs. To this end erosion, transport and deposition occur: thus the concept of *dynamic equilibrium*.
- Destructive and constructive waves have different characteristics and occur in different places due to the local configuration of the coastline and/or prevailing wind conditions: storm surges, for example. The duration of any type of wave will depend on the vagaries of the weather and fetch. Characteristics of waves can be studied including frequency. Wave refraction is also relevant.

### 1.2 What are the processes of coastal erosion and what are the resultant landforms?

- The processes of coastal weathering and erosion need to be distinguished: weathering would include physical disintegration by such processes as freeze-thaw, salt crystallisation and wetting and drying whereas chemical decomposition would include solution and carbonation. The variety of inter-tidal organic life encourages biotic weathering ranging from the roots of seaweed to the acid secretions of limpets, barnacles and seagulls. Erosional processes would include corrosion, hydraulic action, abrasion and attrition.
- Landforms of coastal erosion would include the description and explanation of the formation of cliffs, wave-cut platforms, caves, arches, stacks and stumps.
- Landforms created with rises of sea level could be associated with eustatic rise after a glacial retreat such as the Flandrian transgression or local areas of subsidence such as the south east of England. Landform features would include those associated with marine erosion and the submergence of the land by an encroaching sea such as rias, fiords and estuaries.

**1.3 What are the processes of marine transport and deposition and what are the resultant landforms?**

- Transport process of longshore drift will need to be considered along with likely areas where transported material will be deposited such as in any sheltered spot in a bay.
- Landforms of coastal deposition need to be described and the reasons for their formation investigated. These would include spits, hooked spits, double spits, tombolos, barrier beaches, bay-head beaches, off-shore bars and cusped forelands. The origin, type and size of beach sediment would make relevant studies.
- Sea level rises will create coastlines of submergence. Eustatic rises in sea level are associated with glacial retreats and give rise to inundation of low lying areas by the sea. Estuaries will be created which at low tide expose mud flats and deposited material in sheltered localities within the estuary.

**1.4 What is the role of geology in the development of coastal landforms?**

- Geology can be a major factor in coastline shape and landform creation. Beach material is often made up of locally eroded rock, this will condition beach characteristics, sandy and/or pebbles and gradient. Rock type influences differential weathering and mass movement as well as the rate of erosion, cliff angle, and whether caves, arches, stacks and stumps have a propensity to be created. Sedimentary rocks will be eroded more quickly and, dependent upon slope-foot condition, may give rise to steep or shallow angle cliffs. If the sea processes are vigorous at the base of a clay cliff for instance, then a steeply angled cliff is possible such as Alum Bay, Isle of Wight. Clay cliffs in particular suffer from mass movement of slumps. Geological conditions can conspire, however, to produce rotational slips such as at Ventnor, Isle of Wight.
- Geological structure incorporating bedding planes, faults and cracks can add distinctive features to coastal cliff-lines such as the shape that caves take and local features such as blow holes, and geos.

The orientation of the geology with the coastline is very relevant in conditioning coastal landforms. If the geological trend is concordant, parallel to the coast, then coves and solid rock bars, a Dalmatian coastline, is created. A discordant coastline with differential geology at right angles to the coast will result in a coastline with bays and headlands. A very classic area to cover both of these coastal types is the Isle of Purbeck in Dorset.

Igneous rocks, such as granite, erode more slowly and tend to naturally produce steep sided cliffs such as those at Land's End.

### 1.5 Why do coastal environments need to be managed?

- Coastal processes affect human activity.  
For example, the processes of weathering and mass movement, such as the Holbeck Hall hotel collapse south of Scarborough, North Yorkshire.  
Marine erosion will cause cliff collapse often endangering buildings such as at Happisburgh, Norfolk  
Transport of material will silt up estuaries and make harbour entrances more difficult to navigate such as Poole Harbour in Dorset and the Newhaven Ferry terminal on the River Ouse estuary in West Sussex.  
Deposition creates beaches used for tourism purposes.
- The impact of landforms on human activity  
Tourism is encouraged by beautiful and dramatic coastal scenery and / or the active leisure that can be pursued at a coastline The Pembrokeshire coast has many examples of both types of coastal tourism.
- Human activities impact upon the coast by using coastal land in several ways.  
*Agricultural land* is often next to the coastline.  
*Large-scale industry* using much space such as steel works, Port Talbot; oil refineries, Milford Haven; power stations, Wylfa; gas terminals, Easington, North Yorkshire. Such installations will reshape the coastline to serve the industry, jetties, seas walls and docks will be created which will alter local tidal currents and influence local erosion and deposition.  
Visual pollution may be perceived for the large factory installations often emitting large quantities of waste gases into the atmosphere. Sellafield nuclear waste reprocessing plant in Cumbria may have contaminated the sea with waste radioactive material.  
*Communications:* Coastal roads and bridges: Severn Bridge.  
*Residences* in towns and villages and especially for retirement: Eastbourne, West Sussex  
*Fishing.*  
*Ports* for trade.  
*Tourism* will have a great impact on processes where local authorities build sea walls, promenades and groynes to hold onto and build up a sandy tourist beach.  
Holbeck Hall hotel could have been instrumental in its own downfall as the extra weight of the structure could have made the underlying clay rather more susceptible to slumping.

**1.6 What are the methods used to manage coastal environments and how successful are these strategies?**

- Management of the impacts of coastal processes and landforms on human activity  
Erosion (process) versus residences (human activity): Holderness, Happisburgh  
Erosional landform versus tourism: southern coast Isle of Purbeck, Dorset  
Erosional process versus agriculture: Holderness  
Depositional process silting versus ports: Newhaven ferry port.  
Depositional landform beaches versus tourism: any beach resort has to manage tourism on the beach: e.g. Llandudno, Gwynedd  
Depositional landforms: sand dunes versus tourism: Harlech.
- Management of the impacts of human activities on coastal environments  
Large-scale industry using much space, visual pollution and possible water and air pollution.  
Coastal conservation areas to manage tourism: National Trust, Formby and Merseyside.  
Often human impacts on the coast can be seen in coastal management terms when humans attempt to control the coastal processes.
- The success of strategies for managing the interaction between coastal processes/landforms and human activity may not be entirely apparent, yet different people will judge success differently.  
Local residents,  
Local politicians,  
Local business people,  
Environmentalists,  
Tourists,  
Defra,  
Regional, National, even global interests.  
So schemes should be viewed from the standpoint of different groups of people with different values and attitudes.

Much of the coastal specification can be found in standard Textbooks such As David Waugh Geography An Integrated Approach  
For more up to date relevant case studies Geofactssheets and Geofile are excellent.



Geofactsheets at [www.curriculum-press.co.uk](http://www.curriculum-press.co.uk) especially:

8	<u>Coastal Management</u>
29	<u>Sea level change</u>
100	Coastal management at Selsey
124	Salt Marshes
129	The impact of structure and lithology on coastal landforms
141	Coastal management - case study of the Holderness coast
145	Coastal Deposition
195	The Future for N E Norfolk
224	Storm Surges

<http://www.nelsonthornes.com/wps/portal/geofile>

388	Coastal erosion: Back to nature
338	Coastal management – some issues
388	Coastal erosion – Back to Nature
409	North Norfolk coast – Management Issues
420	Human impact on the Dorset coastline a DME
449	Post-glacial sea-level changes and resulting coastal landscapes
427	Coastal management - A New Perspective
472	Coastal management – A new perspective
527	The Coastline of S.Iceland

<http://aa.nelsonthornes.com/secondary/geography/geofile/s25/GF527.pdf>

<http://aa.nelsonthornes.com/secondary/geography/geofile/s26/issue1/GF551.pdf>

537 North Norfolk Coast Shoreline Management Plan

Coastal Fieldwork a case study of a particular beach in the UK

<http://www.philipallan.co.uk/content.aspx?page=HOME>

Geography Review

Sept 1996 Managing the Wessex coastline

Mar 1997 The Chesil Sea Defence Scheme

Jan 2005 Coastal Management: Sea Palling Norfolk

Nov 2002: Managing the Jurassic Coast

Sept 2003 Managed Retreat of the Essex Coast

An excellent source of up to date coastal management issues is:

<http://news.bbc.co.uk/>

Just type in the search box for a section of coast and invariably a relevant issue regarding management can be found

<http://www.bbc.co.uk/coast/>

The BBC series **Coast** is a very useful resource.

<http://www.soton.ac.uk/~imw/Lulworth.htm>

Detailed information on Lulworth cove area

**Landmark Geography — LANDFORM SYSTEMS [Second edition] Robert Prosser**

4. Coastal processes    5. Coastal landforms    6. Managing Britain's coasts

Rivers & Coasts

Bob Hordern

Rivers & Coasts

Bob Hordern

Coastal systems

Coastal landforms and processes

Coastal sand dunes

People and coasts

Coastal management

Hodder & Stoughton Michael Hill Coasts and Coastal Management

**Amplification of content**

**Theme 3 – Climatic Hazards**

**1.1 How does global atmospheric circulation give rise to global climatic zones?**

The objective here is to provide students with knowledge of global atmospheric circulation in order for them to understand the basic factors influencing the formation and location of global climatic zones.

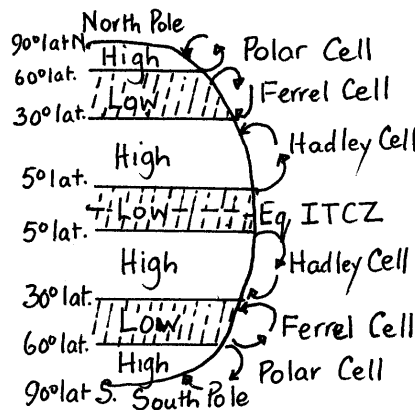
Solar energy (insolation) 'powers the atmospheric system and the energy circulations within it' - the amount of solar energy (heat budget) received varies with latitude. The tropics have an energy surplus as they gain more from insolation than is lost by radiation. But the higher temperate and polar latitudes have an energy deficiency losing more by radiation than is gained by insolation. This imbalance in energy distribution sets up a transfer of heat energy from the tropics to higher latitudes.

This Global Transfer of Energy is the basis of Global Atmospheric Circulations which gives rise to the low and high pressure belts and the planetary wind systems associated with the earth's major convection cells – the Hadley, Ferrel and Polar Cells illustrated below:

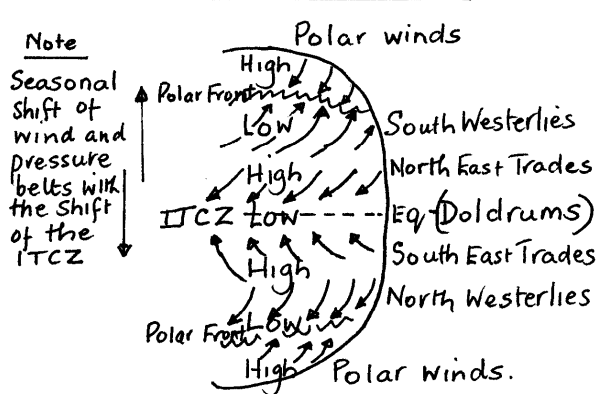
Diagram (a) Convection Cells and Diagram (b) Pressure Belts

SUB-UNIT GGHb) - GENERALISATION A

a) CONVECTION CELLS AND PRESSURE BELTS



b) PRESSURE BELTS AND ASSOCIATED WIND SYSTEMS



## 1.2 Why do seasonal and periodic variations of climate occur?

Students should know and understand the reasons for seasonal variations of climate as follows: the seasonal movement of the ITCZ and pressure and wind belts associated with the movement of the sun's overhead position over the year together with; the effects of the warm and cool ocean currents and temperature differences between the continental land masses and neighbouring ocean waters.

Students may refer to one climatic type from either a tropical or temperate region. For the tropical region seasonal changes are far more marked in savanna and monsoon climates and for the temperate region seasonal changes are more pronounced for the continental interior and east coast margin, but most candidates will probably take the British western margin type.

Reference should be made to temperature, precipitation, winds and pressure change. It would be pleasing to see students offering some supporting statistics in relation to temperature and precipitation changes, but if not, candidates should use qualified descriptive statements.

For the tropical region the most important factor is the effect of the apparent seasonal migration of the overhead sun and the associated migration of the ITCZ and movement of pressure and wind belts. Other significant factors include the effects of land and sea distribution, ocean currents and orographic influences vis-à-vis prevailing winds.

For the temperate region, the movement of global pressure and wind belts should be included as an important factor. In addition, the movement of the jet stream further south in winter and the relative seasonal significance of the various air masses should be referred to as important influences.

Students also need to be aware of periodic variations in climate over both the long term and short term. Knowledge and understanding of long term changes such as glacials and interglacials and short term changes such as El Nino/La Nina will allow students to appreciate periodic variations in climate.

## 1.3 What are the world's major climates?

The objective here is to provide students with a broad knowledge and understanding of the world's major climates as shown below. However, detailed reference needs to be made to **one** climatic type only chosen from **either** a tropical **or** temperate region.

The distribution of the main climate types for the tropics and temperate latitudinal belts are indicated in the diagram below.

TROPICS AND TEMPERATE LATITUDINAL BELTS

DISTRIBUTION OF MAIN CLIMATE TYPES

	<u>WEST MARGIN</u>	<u>CENTRAL</u>	<u>EAST MARGIN</u>	
<u>TEMPERATE</u>	Cool West Margin (European type)	Continental	Cool East Margin	60°N
	Warm West Margin (Mediterranean)		Warm East Margin	30°N
<u>TROPICS</u>	Hot Desert	Savanna	Monsoonal	
	-----		Equatorial	-----
	Hot Desert	Savanna	Monsoonal	
<u>TEMPERATE</u>	Warm West Margin	Continental	Warm East Margin	30°S
	Cool West Margin		Cool East Margin	60°S
OCEAN	← LAND MASS →			OCEAN

## **Tropical Region – Summary Explanatory Descriptions of Main Climate Types**

### **Equatorial – 0-5 degrees latitude**

Weather mainly influenced by the 'overhead sun' all year and dominance of the ITCZ zone. High insolation all the year – no distinctive season – average temperature 30 degrees Centigrade – low pressure – high humidity – heavy convectional rainfall all year averaging 200 cms. – some tendency to higher rainfall at the equinox in March and September when the sun is directly overhead.

### **Savanna Type – 5-20 degrees latitude either side of the Equatorial belt**

As insolation is high, high temperatures prevail all the year – 35 to 25 degrees centigrade – this climate type is distinguished by a hot wet and a cooler dry season – humidity highest in the wet season – evaporation rates remain high during the cooler dry season. Rainfall occurrence is associated with the movement of the ITC zone towards the tropic in association with the apparent movement of the overhead sun's position – as this occurs low pressure prevails with moist in blowing winds and rising air currents leading to convection rainfall during the hot season – amounts are most reliable towards the equatorial latitudes averaging 80 cms. – becoming less reliable towards the hot desert margins averaging 30 to 40 cms. (In some years persistence of high pressure over the outer margins of the Savanna e.g. the Sahel zone prevents the ITCZ and in blowing moist winds from extending into these marginal areas leading to drought conditions. The variation from the normal seasonal weather patterns is partly linked to deviations in the path of Jet Streams in the higher atmosphere. Global warming is a further contributory factor.

The cooler dry season in the savanna belt occurs as high pressure and dry out blowing winds prevail when the overhead sun and ITCZ move away to extend beyond the Equator towards the other tropics.

### **Monsoon Type – occurs mainly on the eastern side of the continental land masses in the Tropics extending approximately across 5 – 20 degrees of latitude.**

The climate is marked by a *distinct hot wet and a cooler dry* season which is determined by the annual movement of the ITCZ between the Tropics and associated movement of pressure belts and the seasonal reversal of winds consequent upon this. The Monsoon climate regime is most clearly seen over India but exists in other regions north and south of the Equator on the eastern edge of continents e.g. East Africa.

*The wet monsoon season* occurs with the movement of the ITCZ into the region bringing an area of low pressure and drawing in hot moist winds from off the ocean. Rainfall is increased by orographic uplift where these moist winds are drawn over uplands e.g. the Western Ghats in India. Temperatures are high averaging 30 degrees centigrade and humidity is also very high - average rainfall is around 200cms decreasing with distance inland. Cyclones and hurricanes are frequent towards the end of the rainy season.

*The cooler dry season* coincides with the extension of continental high pressure as the ITCZ moves back towards the Equator and across into the tropics beyond. With high pressure dominating there is air subsidence and out blowing winds are dry. Temperatures remain relatively high at 25 plus degrees centigrade in lowland areas and evaporation rates are also high. But the weather is much more severe in mountain areas.

**Note**

The Monsoon climate regime is best analysed via annotated climate sketch maps see e.g. 'Geography – An Integrated Approach' D. Waugh and associated text explanation.

**Hot Desert Climate Regime – occurs in continental areas/western side beyond the Savanna belt approximately between 20 - 30 degrees latitude.**

It is characterised by high insolation rates, subsiding air and high pressure conditions with out blowing winds. These conditions result in generally clear skies, very high insolation and evaporation rates with temperatures in the day time averaging over 40 degrees centigrade and exceptionally dry conditions. On the western land margins cold ocean currents deprive in blowing marine winds of their moisture before they reach land thus contributing to the exceptionally dry conditions and leading to fog conditions offshore as e.g. off northern Chile and Namibia.

Occasional incursions of the ITCZ into desert latitudes may allow the penetration of moist winds bringing very heavy but short lived convectional downpours of rain. Average precipitation is 10-20 cms. but effective rainfall is less due to the very high evaporation rates. Diurnal contrasts are more significant than seasonal variations as rapid radiation at night due to clear skies can result in below freezing temperatures and heavy morning dew in contrast to temperatures of 40 degrees plus and very low humidity conditions during the day time.

**Note**

**The main influence on climates in the tropics are –**

1. The overhead or near overhead position of the sun giving high insolation throughout the year.
2. The position and seasonal movement of the ITCZ together with the tropical pressure belts and wind systems.
3. The path of the upper jet streams affecting the path of low pressure systems.
4. Differential heating of land masses and oceans in the tropics affecting air pressure patterns and seasonal wind directions.
5. The effects of offshore cold currents on western land margins and warm currents on eastern margins.
6. The position of mountain ranges and their effects on incoming moist winds off the ocean.

## **Temperate Region –Summary Explanatory Description of Main Climatic Types**

### **Maritime West Margin European type-mid latitude 35 to 55 degrees**

Relatively mild temperatures average seasonal range 5 – 20 degrees Centigrade – humidity is generally relatively high and precipitation occurs all the year round – average amount 60 cms. but significantly higher over upland areas e.g. Welsh Uplands in the face of the prevailing moist westerly winds coming off the ocean but conversely low in rainfall shadow areas e.g. lowland East Anglia.

The temperatures and precipitation are mainly influenced by the mid latitude position, low pressure belt and the mild westerly prevailing winds which are warmed by warm currents on the west margin of land masses e.g. the Gulf Stream and California Current.

The weather is strongly influenced by the position of the Polar Front and the passage of westerly moving depressions along it with intervening spells of anticyclonic conditions. These are linked to the position and extent of the main air masses influencing the continental west margins in mid latitudes i.e. the Polar Continental, Polar Maritime, Arctic Maritime, Tropical Maritime and Tropical Continental Air Masses (see 'Geography – A Integrated Approach' D. Waugh and accompanying text).

The interaction between these air masses along the Polar Front together with the associated upper Jet Stream and Rossby waves influence the occurrence and development of depressions along the Polar front.

Persistence of one of the continental air masses across these western margins can bring long spells of dry summer weather but in winter 'anticyclonic gloom' conditions may occur. In contrast the passage over the area of a deep fast moving depression can bring storm conditions with gale force winds and heavy rainfall.

### **Continental Interior type – mid latitude 35 – 55 degrees**

The Continental type is marked by a large seasonal range of temperature averaging 25 to –5 degrees centigrade but towards the latitude margins extremes are greater than this. Winters are dominated by the continental high pressure with subsiding air and light precipitation usually snowfall. Winds are out blowing and the interior is too remote and cut off from moderating maritime influences.

In the summers occasioned by the higher angle of the sun and longer daylight hours together with the differential heating of the land compared to the oceans, temperatures are warm 25 to 35 degrees. Low pressure conditions allow the incursion of the occasional depression and convectional rainfall but the average precipitation is moderate around 40 cms. Intermontane basins may be cut off from incoming depressions leading to temperate desert conditions as in the Gobi Desert of Central Asia and the Great Basin in the Western United States. Here climatic conditions are similar to the hot deserts but the seasonal range of temperature is greater, on average 0 degrees to 35 degrees Centigrade.

**East Margin Maritime – latitude 35 – 55 degrees e.g. North East United States, Japan, South East Australia.**

Low pressure generally prevails and temperatures on average range from 30 degrees to 0 degrees centigrade – precipitation occurs all the year round but tends to a summer maximum - average annual amount around 60 cms.– summer inward deflection of prevailing winds along ocean margins brings the area under some depressions – relatively high humidity in summer.

But winters are influenced by the cold continental interior conditions conveyed by winds coming from the interior – temperatures also lowered in the more northerly latitudes by cold currents off shore – occasional incursion of depressions in winter can bring heavy snowfall in the higher latitudes.

**Note**

**Main basic influences on Temperate Region climates are**

1. Mid latitude position.
2. Generally under influence of the mid latitude low pressure belt and the atmospheric conditions along the Polar Front and the influence of the upper jet stream – except for continental areas in winter.
3. Seasonal shift of the pressure and wind belts.
4. The position and interaction at the margins of the different air masses affecting areas in temperate latitudes.
5. Differential heating of the continental interior and ocean margins.
6. The effects of ocean currents and the air above these.
7. Location of upland ranges vis-a-vis prevailing winds.



#### 1.4 What are the causes of low-pressure and high pressure hazards?

The objective here is to provide students with knowledge of the role of jet streams and Rossby waves in controlling the formation of weather systems. Linked to this, students need to have knowledge and understanding of the term 'hazard' and the causes of low-pressure and high pressure hazards in **either** tropical **or** temperate climates.

##### Definition of a climatic hazard

Extreme climatic/weather event(s) causing harm and damage to people, property, infrastructure and land uses. It includes not only the direct impacts of the climate/weather event itself but also the other (secondary) hazards 'triggered' by that event e.g. land slides 'triggered' by torrential rain.

##### The Impact is dependent upon –

1. The severity of the event and also the path/track and spatial extent of that weather event.
2. The density distribution of the people and density and types of human activity in the areas affected.
3. The preparedness and capacity of the authorities and people to cope with the impact of the event.

##### Nature of the Event and Causes

###### In the Tropics Region

1. ***In Low Pressure Systems – Hurricanes and Cyclones with Torrential Rain and High Winds.***

**Causes – these hazard conditions are generated in exceptionally deep fast moving depressions** generated usually towards the end of the hot season (September and October in the Northern Hemisphere) over oceans off the east margins of continents in the tropics and sub tropics.

**Triggering secondary hazards** of flooding, tidal waves and sea incursions, landslides, mudflows and wind borne debris.

2. ***In High Pressure Systems - Low Rainfall, High Evaporation Rates, Drought and sometimes High Winds.***

**Causes – these hazards are associated with anticyclonic conditions** which are due to the continued persistence of the sub tropical high pressure over continental areas limiting the ITCZ zone to lower latitudes (nearer the Equator) than is normal for the time of the year. Global warming is now recognised as also a contributory factor.

**Triggering secondary hazards** of a falling water table, loss of vegetation, wild fires, soil erosion – desertification.

## In the Temperate Region

1. ***In Low Pressure Systems – Severe storms heavy rainfall/snowfalls and gale force winds.***

**Causes – these conditions are generated in exceptionally deep and fast moving depressions** which are most likely to occur in autumn and spring and be generated along the Polar Front.

**Triggering secondary hazards** of flooding, sea insurgences (especially where the deep depression coincides with a time of very high tides) – landslides and wind borne debris.

2. ***In High Pressure Systems – Low rainfall – drought and in winter frost and fog.***

**Causes – these conditions are associated with a persistent stationary anticyclone** which in summer is usually associated with the extension into higher latitudes of the sub tropical high pressure. In winter the conditions are usually associated with the extension of the continental high pressure towards the coastal margin of the land masses.

**Triggering secondary hazards in summer** of falling water tables and loss of vegetation. **In winter secondary hazards may include** temperature inversion with air pollution intensifying the fog conditions.

### 1.5 What are the relationships between human activity and climate?

Students should have knowledge of both the short-term and long-term effects of low pressure climatic hazards on human activity. These should be studied with reference to at least one specific low pressure event in **either** a tropical **or** temperate climate.

Students should also have knowledge and understanding of the short-term and long-term effects of high pressure climatic hazards on human activity. These should be studied with reference to at least one specific high pressure event in **either** a tropical **or** temperate climate

There may be reference to demographic effects at both time scales such as deaths and long-term migration. Economic effects may analyse losses in the short term such as cessation of production and costs of damage in the long term, such as the effects on economic activity and infrastructure. Social effects may include observations on health, homelessness and bereavement. There may also be consideration of the effects on the physical environment such as landslides, deforestation and salinisation.

Students can use the NGfL Wales website to revise the green house effect and the impact of human activity on climate that was studied for G1.

### **1.6 What strategies are used to reduce the impact of climatic hazards?**

When discussing the strategies taken to reduce the impacts of hazards associated with low-pressure and high pressure systems, students may present logically sequenced points progressing from monitoring, prediction and warning of future hazards, immediate response to lessen the impact once it has occurred to long-term planning. Students should display a grasp of a number of these, but do not expect all to be considered as students may choose to use examples that enable only a limited number of strategies to be discussed.

Management of the tropical cyclone hazard and drought is covered effectively in Chapter 5 of 'Hazards and Responses' by Victoria Bishop, Collins Educational.

Strategies available to address the impact of human activity on climate have been implemented at international level, by government action and by pressure groups and individuals. Students should re-visit relevant material covered at AS level.

### **An Assessment of the Strategies Implemented**

- May be assessed on a monetary cost benefit basis- i.e. cost of implementing strategies against savings and other benefits. The cost may be assessed in terms of the probability of the hazard event occurring again over a particular period of time and its likely severity. For example, the cost of insurance may be more than the assessment of the damage likely to be caused. Again, for example, it may be considered cheaper to exclude people and human activities from certain vulnerable areas than to implement strategies to reduce a hazard impact in that area. But whilst strategies concerned with the likely material losses resulting from a hazard impact may be assessed on a monetary cost/benefit basis, the same monetary assessment cannot be made where human lives are at risk - moral considerations have to be taken into account.
- Strategies may be evaluated on the basis of the extent to which these can be adjudged to meet the needs in terms of –
  1. Reduction in vulnerability to the hazard event.
  2. Strengths and weaknesses of the emergency measures in place in the event of the hazard occurring.
  3. Immediate reconstruction measures and restoration of basic services.
  4. Strategies in place to ensure long-term reduction of the impact of an event.

What are the 'yardsticks' by which the strategies may be evaluated?

1. Balance of coverage of the different stages – prevention, immediate emergency measures, reconstruction and restoration of services, long-term measures.
2. Evaluation on the basis of the finances and human resources available to the agencies involved in the formulation and implementation of strategies at community/local, regional, national and in some cases international level.
3. On the basis of advances in strategy policies and implementation of them compared to those in place prior to the last hazard event.
4. By comparison with strategies in place elsewhere to meet a similar hazard event e.g. comparison on an area-to-area basis or on a wider scale - strategies in lesser-developed countries may be relatively weak when compared to those implemented in developed countries.
5. Effectiveness on the evidence of how well strategies in place reduced the impact of an actual event.

## **RESOURCES FROM GEO FACTS, GEOFILE AND GEOGRAPHY REVIEW**

### **Temperate Climatic Regions**

Geo Facts – January 1999 – Guide to Air Masses  
Geo Facts – April 2003 – Depressions  
Geofile – April 1997 – Interaction of Jet Streams and Ground Weather Patterns  
Geofile – April 1999 – Anticyclonic Weather in the UK – Its Many Variations  
Geography Review – September 1999 – The October 1998 Shrewsbury Floods Part 1  
Geography Review – March 2000 – Flooding in Shrewsbury- Management Part 2  
Geography Review – September 2000 – Flooding on the River Derwent  
Geography Review – March 2001 – Flood Warning system in the UK  
Geo Facts – April 1999 – Floods and Management  
Geo Facts – April 2002 – Flooding in Shrewsbury  
Geofile – September 2000 – Recent Floods in the UK  
Geofile – April 1999 - Fog Formation and Hazards  
Geo Facts – January 2001 - Anticyclones – A Potential Hazard

### **Tropical Climatic Regions**

Geofile – April 1997 – Interaction of Jet Streams and Ground Weather Patterns  
i.e. Weather Systems  
Geo Facts – January 1999- El Nino Explained  
Geo Facts – January 1999 – Hurricane Mitch  
Geo Facts – January 2004 No.162 – Can Hurricanes be Predicted?  
Geofile – January 2001 – Hurricane Hazard – A Decision Taking Exercise  
Geography Review – January 2000 – Drought Response in Zambia  
Geographical Review – March 2000 – Desertification  
Geographical Review – November 2003 – Desertification in Southern Africa  
Geo Facts – September 2000 – Environmental Issues in the Sahel  
Geofile – September 1998 – Drought in the Sahel  
Geofile – April 2003 – Drought and Desertification in India and Pakistan

## Theme 4 - Development

### 1.1 What is Development and what is the Development Gap?

- It is self-evident that different countries throughout the world are at different stages of development, but different groups of people mean different things by development. Although there may be considerable consensus about the level of development of countries, particularly in contrasting high with low, precisely what indicators are key to identifying the levels may differ considerably. Even where indicators exist in common, the weight given to a particular indicator may differ between observers. So whilst we all know generally what we mean by development, it is very hard to tie down in detail. Initially development was equated with economic development but more recently it has been defined in terms of quality of life, equity and sustainable development.
- Whatever measures of development are used, it is clear that there are groups of countries that share common characteristics. Some of these groupings are very polarised, leading to ideas of a development gap. And whilst it is true that massive contrasts occur, no matter what indicators are selected, there are always countries that score at intermediate levels, leading some to conclude that a development continuum rather than a gap exists. The idea of a continuum may tend to obscure the extent of extremes and many prefer to continue to refer to a gap.
- Even without careful definition of precise indicators, it is still meaningful to refer to the North and the South as suggested by Brandt. 'Third World' is frequently used to describe countries, although reference to 'first' and 'second' world countries is far less common. Few people would struggle to understand books or articles referring to DCs (Developed Countries, or More Economically Developed Countries (MEDCs)), or LDCs (Less Developed Countries, or Less Economically Developed Countries (LEDCs)). And while NIC (Newly Industrialised Country) is fairly widely understood, divisions such as RIC (Recently Industrialised Country), or emerging economies, might introduce some doubt, especially as to where they lie in relation to DCs and LDCs.

## 1.2 How can development be measured and how useful are these measures?

- Most observers would agree that economic wealth underpins levels of development, and that other indicators that can be used depend on spending power of governments and individuals. So the size of an economy, its Gross Domestic Product (GDP) and more importantly, its magnitude in relation to the size of the population (GDP per capita) is usually at the heart of measures of development. Many would argue that just the money alone is not a good guide, but instead the effectiveness of spending the money. In those cases, single indicators such as literacy rates, doctor/patient ratio, life expectancy and access to clean water, amongst many others, give a better indication of people's experience of development and wealth.
- As single indicators only reflect one aspect of life, composite measures are more favoured, particularly by many global institutions with an interest in development. The best known of these is the Human Development Index, which uses life expectancy, adult literacy, enrolment in education and GDP/capita. This has been developed under the direction of the United Nations, and reports and up-to-date statistics are published annually. The United Nations also uses the Human Poverty Index (HPI). Other compound measures include the Physical Quality of Life Index (PQLI) and Gender-related Development Index (GDI – see later note).
- Qualitative indicators attempt to measure more subtle aspects of development such as democracy, freedom of speech, environmental sensitivity and sustainability amongst others. The most successful of these is the Happy Planet Index (HPI) developed by the New Economics Foundation (NEF) and Friends of the Earth (FOE), and is based on measures of life satisfaction, life expectancy and ecological footprint. Qualitative indicators are more problematic but reflect more accurately the ways in which development is now viewed.
- All indicators suffer from the weaknesses of over-generalisation. Some countries are very large and considerable variations in standards of living and wellbeing may occur from one region to another. This is particularly so where strong urban-rural contrasts exist in relatively recently developing countries. There is also the generalisation that development is evenly spread throughout all levels of society. Averages can hide situations where there is an extremely wealthy minority whilst the majority of the population live in extreme poverty. The availability and reliability of statistics vary widely between countries.

### 1.3 What factors have led to contemporary differences in development?

- The level of development is often similar within global regions. Most European countries are well developed; most African countries are at low levels and many parts of Asia developing rapidly. Economic integration with neighbours is an important factor. But within regions of the world there are also variations dependent on resource endowment, government policy and a large range of other factors.
- The opportunity to develop and the rate at which development has been taking place has been much influenced by globalisation of the world economy. The largest aspect of this has been outsourcing manufacturing from developed countries into other parts of the world. This has in turn encouraged home-grown manufacturing in areas surrounding the focus of this activity. Tertiary activity has moved out also. Much of this has been low-level call centre work, but there are higher end activities, such as software design, that have also moved. Greater economic integration, such as between Mexico and the USA has stimulated development. Huge reserves of money generated by newly industrialised economies, in the form of sovereign wealth funds, has made capital available to stimulate the establishment of new economic activities. The increased scale of the world economy has stimulated the extraction of raw materials and energy sources, increasing their prices, and injecting income into economies that have previously shown little sign of beginning to grow.

### 1.4 How and why are development patterns changing?

- The World Bank classifies economies by their Gross National Income (GNI) per capita. 209 economies are classed as low income, lower middle income, upper middle income or high income. The classification is updated each year and so keeps pace with change. This is usually regarded as the most up-to-date measure of development throughout the world. The above measure, although keeping up with information, is not necessarily the most important. The weight given to different priorities changes from time to time. For example, many now give importance to gender related development issues. The UN Development Report has tables to show a Gender-related Development Index (GRDI). Changing definitions of development towards considerations of quality of life, equity and sustainability have also led to changing patterns.
- Rapid economic growth can produce dramatic changes in development. South Korea moved from a middle ranking to a high-ranking nation between 1975 and 2005. This is not always the case. Despite being one of the most developed countries in Africa, South Africa has changed little. It is useful to identify small and large changes in HDI and investigate the circumstances of these countries.



### 1.5 What hinders the closing of the development gap?

- The greatest obstacle to development for an individual country is indebtedness. Countries that were at a low level of development in the past were loaned money through the World Bank and International Monetary Fund. Money that was generated had firstly to be spent on paying interest on the loan before repaying the debt, and reinvestment in the economy was impossible. Such countries became caught in a poverty trap. They became the Heavily Indebted Poor Countries (HIPC). Special arrangements to relieve this debt have been developed by richer nations, such as the Multilateral Debt Relief Initiative (MDRI) but many believe this is still not enough to allow real development to take place.
- Countries have often come together to create trading blocs which greatly benefits each member of the bloc. Countries outside the bloc may face quotas or tariffs that make it almost impossible to sell the commodities they have to offer. Within blocs, regulations often make it possible for producers, particularly of food crops, to generate huge surpluses. The surpluses are then sold, way below cost price, on world markets (dumping). Countries outside the blocs find that the commodities being 'dumped' are the ones they have to sell, and below the price that would give them any profit. So their only means to economic development is undermined.
- Gender inequality is often a barrier to development in general. If only half the population can gain from development, any benefit is diluted across the whole of society, making the overall impact less. Countries with a low GRDI tend to have their overall HDI depressed. These differences can be found in the tables that accompany annual HDI Reports.

## 1.6 What types of strategies exist for reducing the development gap and how effective are these strategies?

- One method of trying to overcome a low level of development is by giving aid. Not all aid is intended to stimulate development. Emergency aid is directed to providing relief after a disaster. One country may directly help another, bilateral aid, often when a former colonial power assists a former colony after independence. More widely based assistance is usually termed multilateral aid. The aid may be monetary, but can be equipment, education programmes and expertise. If it is specifically directed at promoting development, it is often termed structural aid.
- It has been noted how economic blocs can hinder trade that could generate income and development. So removing barriers and promoting trade can allow development to take place. The governments of well-developed economies are often reluctant to give up their position of advantage, and removing barriers is not as simple as it sounds. There are campaigns to promote fair trade, where producers are paid a reasonable price even when it is possible to drive the price down. Such trade encourages safe and non-exploitative working conditions, and avoids the use of child labour. Discussions of the World Trade Organisation (WTO) are worth following.
- The UN has set targets for development through the Millennium Development Goals. Regular updates on progress are given. These have been very good at highlighting issues, but success on achieving them has been limited.
- Development has taken place extensively when manufacturing industry is introduced. Governments of countries lacking development work hard to make conditions attractive to overseas companies to build assembly or manufacturing plants. Infrastructure and basic education help, as do labour and environmental laws favouring the manufacturer. In establishing a plant, some degree of direct investment takes place. This may be arranged between governments but has most impact when a transnational corporation is attracted and establishes a large plant. This encourages other companies providing raw materials, services, transport and communications which often promotes rapid development. There can be a serious downside if a TNC moves on before a self-perpetuating multiplier has been established. Very often pollution occurs, and traditional attitudes and values come under great strain.
- As debt has been such a massive handicap to development, ways of eliminating debt have become important. Rescheduling can make repayment easier, but there is a strong lobby for debt cancellation. The HIPC Initiative currently identifies 41 countries, most of them in Sub-Saharan Africa, as potentially eligible to receive debt relief. One solution that achieves a second objective, is in debt-for-nature arrangements. A debt, or a portion of it is written off, and the money that would have been paid in interest on the debt is used to pay for conservation measures. Such arrangements can be made by governments, or by non-governmental organisations purchasing the debt to allow conservation.
- One example of a narrowing of the development gap is Vietnam. Here FDI, improvements in trade (membership of ASEAN 1995 and WTO 2006) together with aid (DFID £50 million/year), have operated to improve human development indicators and economic growth rates significantly since the 1980s.

## **Bibliography**

### **G3 Theme 4 - Development**

In addition to texts recommended for AS level, the following have extensive coverage relevant to this theme.

*New Patterns: Process and Change in Human Geography*, by Michael Carr, Nelson, 1999

*Development*, by Garrett Nagle, Hodder and Stoughton, 2005

*Economy and Development*, by David Burtenshaw, Philip Allen, 2006

*Geographies of Development*, by Robert Potter, Tony Binns, Jennifer Elliott, David W. Smith, Pearson, 2004

Much useful information can be found in *developments*, produced by the Department for International Development of the UK government.

This can be ordered free from [www.developments.org.uk](http://www.developments.org.uk)

## Theme 5 – Globalisation

### 1.1 What is globalisation and global shift?

*“Globalisation is the generic term for the process of integration in the realms of trade, economic relations and finance (it is broader, including social relations, knowledge culture and politics) and it is not new. It has been aided by the ICT revolution that has destroyed distance and indeed time. Brands are known the world over and are potentially destroying local diversity”*  
 Source: Financial times quoted in “Economy and Development” by David Burtenshaw: Philip Allan

A definition is a good place to begin with some background as to how the world has arrived at today's position. Chapter 3 in the book above does this particularly well as does Geo Factsheet 172. [www.curriculum-press.co.uk](http://www.curriculum-press.co.uk).

It may be useful to introduce the topic by defining the economic system of primary, secondary, tertiary and quaternary development.

- Cultural (world media), economic (Trans National Corporation growth and dominance), environmental (global warming) and political globalisation (G8, UN) are defined in the two resources already mentioned.
- Stages in the development of globalisation are well catalogued in the resources already mentioned.
- Global shift involves the movement of economic activity from MEDCs, originally to NICs (Newly Industrialising Countries) then to RICs (Recently Industrialising Countries) and LEDCs. Initially the shift involved labour intensive manufacturing, but increasingly it has involved all sorts of manufacturing and services, especially tourism.

Introductory scene setting may be in order with brief introductions to development ideas including Rostow's Model of temporal economic development, and the spatial development concept of core/periphery. Also ideas about unequal world development including Brandt and the issue of debt could be introduced. These need only be brief and introductory in order to give a base of appreciation upon which to develop the concept of globalisation with more authority.

## 1.2 What factors have led to current economic globalisation?

- Financial factors such as Foreign Direct Investment (FDI) by companies in different countries than the home country. This investment has been made in order to lock into cheaper production costs due either to cheaper labour, cheaper raw materials, and cheaper operating costs other than labour and cheaper environmental costs. Another reason for investment overseas is that such companies have sought to circumvent import restrictions such as quotas and tariffs on their goods. One reason for Nissan, a Japanese company, establishing a factory in Sunderland was in particular, to supply the European market with vehicles and thus preventing the payment of import duties into the EU. Several LEDCs have courted investment as a way of developing their economies and providing a boost to their national income as well as improving local expenditure on education, communications and health care. The Asian tigers of Singapore, Taiwan, South Korea, Malaysia and the Philippines are good examples of LEDCs which are now NICs.
- Computer Technologies and the world wide linking of computers with associated communication technologies such as the World Wide Web speeded up the flow of information and communications. Such speed of communications has enabled business deals to be completed more efficiently and far more quickly than before the emergence of the world wide web.
- Transport and communications technologies.

Transport technology has enabled the physical movement of goods and people to travel ever further, ever cheaper and in ever improving comfort and convenience.

Air travel in particular has benefited from deregulation as well as technological advancements in airframe and engine construction enabling greater fuel efficiency and considerable reduction in noise. The advent of no-frills airlines and the economies of scale brought about by the ever increasing size of aircraft, such as the A380, have also reduced the cost of air transport. Also, the cost the airlines pay for fuel has not been subject to the swingeing taxes that governments put on domestic fuel supplies.

Rail travel has become faster due to an investment in new technology such as the French TGV and the Channel Tunnel link from St. Pancras.

Road travel has, until recently, (mid 2008) become cheaper as new motor vehicles have become cheaper to buy and more fuel efficient. One reason for cheaper vehicles is that vehicle manufacturers are moving production to cheaper labour countries: e.g. Peugeot from Coventry to Slovakia. A further reason for the reduction in the cost of vehicles is that the sourcing of vehicles via the internet has reduced the differential pricing that once existed in neighbouring countries, particularly in Europe. Note that both of these reasons are due to globalisation.

Sea transport costs have reduced due to the rise of the container ship and bulk carrier transporting a wide variety of commodities from crude oil to wheat. Such vessels reduce their operation costs so much by taking advantage of economies of scale.

So, the reduction in the price and increase in the speed of physical communications has simply meant that goods and people can travel further, cheaper and faster than at any time in history. This has reduced the friction of distance in the world and enabled companies to look beyond the confines of their own nations in order to locate more economically and to be able to take the product to the market wherever it is in the world using extremely cheap and efficient transport modes. The tourism industry in particular has benefited tremendously from this reduction in the friction of distance.

Communication technologies such as broadband, the World Wide Web, video conferencing and email have speeded up the flow of information and communications. This has been made possible by the replacement of copper wire with fibre optic cabling and by the use of satellite communications. Such speed of communications has enabled business deals to be completed more efficiently and far quicker than before computers.

- The role of the World Trade Organisation has been one of trying to negotiate fair trade between nations and to reduce anti-competitive tariffs and quotas which restrict the integration and the flow of goods and services between countries. There is an economic theory which is the *law of comparative advantage* which states that the most economically efficient location to produce a good or provide a service is in a place which has the greatest comparative advantage, either physical and/or human, and then be transported to where the demand for that good or service exists. So, different areas will specialise in producing goods and services for which they are best suited and adapted to produce. Individual countries, however, often want to protect their own inefficient production of goods and services for fear of competition, unemployment and economic disaster. The WTO has been working towards breaking down barriers. It has also worked at reducing government subsidies which are seen as unfair trading terms when a government subsidy enables one country to undercut the price of another country for the same good purely based on the domestic policy of state support for that industry. The Common Agricultural Policy of the EU is a good example of government intervention in the free world flow of trade in certain agricultural products.

Excellent information can be found at <http://www.wto.org/>

- Trade blocks such as the European Community wield much global power in trading matters. The very existence of trading blocks is a factor which itself is symptomatic of the process of globalisation.

### 1.3 How have companies globalised and shifted locations?

Geofile 464 Globalisation mini case studies  
Examples in Burtenshaw

This section is perhaps best completed by considering a few individual examples of manufacturing companies and service sector companies which exhibit globalisation traits. World locations can be studied with the reasons for those locations.

#### **Manufacturing**

Wimbledon Tennis Balls

Nike

Intel

Dell

Airbus

Volkswagen (Geo Factsheet 138 Changes in the European Car Industry)

#### **Tertiary**

Wal-mart

Citi-group

Call centres to India

Tourism is a tertiary industry the growth of which is both a cause and an effect of globalisation. Tourism has infiltrated all parts of the planet including remote areas such as the Amazon Rainforest, Alaska and Antarctica. A travel company long haul brochure or internet search will soon reveal the myriad of exotic location now on offer relatively cheaply.

- The impact of outsourcing and offshoring is simply more profitable returns for the companies which participate in these activities thus they can maintain employment in the quaternary jobs in the home country and in the manufacturing/service jobs in the production countries.

#### 1.4 Who wins from the global shift and globalisation?

- Global development indicators

Geofile 528 Development indicators

<http://aa.nelsonthornes.com/secondary/geography/geofile/s25/GF528.pdf>

Case studies of Malaysia, India and China are outlined in Burtenshaw

#### 1.5 Who loses from global shift and globalisation?

- Negative effects of being a newly industrialising county can be **environmental**: with a lack of environmental control factories are free to pollute the air, water and land. This aspect was one of the attractions of location as the company would have to pay for their own environmental waste in a MEDC. Specific pollution issues could be useful to study: Bhopal, India for example.

**Socially** the working conditions of the workforce are often reported to be unhygienic, very long hours, lack of union representation, no sick pay and none of the social benefits enjoyed in MEDCs.

**Economically** the workers are not paid a high wage, again one of the attractions of this location.

**Politically**, the workers may become resentful and cause political unrest.

- Factors leading to deindustrialisation are mainly associated with MEDCs that have lost high cost industry to a lower cost country. The North East of England has lost out at least twice to globalisation issues. Economic issues of unemployment leading to social issues of crime, violence and vice and, in addition, environmental issues of dereliction, abandonment and a scared unattractive environment existed. Such issues forced governments to address the situation as part of their regional policies and actively recruit global companies back to an MEDC. Some regions within MEDCs have natural advantages for attracting global companies, the M4 corridor for example.

See Geofile 439 Industrial Change in the North East Region

South Wales steel, coal and shipbuilding industry.

The Saarland region of Germany (Burtenshaw)

Geofactsheet 49: Transnational corporations - the problem or the solution?



### 1.6 What are the causes and effects of political and cultural globalisation?

	Political Globalisation	Cultural Globalisation
Cause	MEDCs establishing businesses in LEDCs.	MEDCs establishing businesses in LEDCs.
Effect	Neo-colonialism! Individual TNCs demonstrate more wealth and power than the LEDC countries in which they locate branch plants and can, therefore, to some extent, act like a colonial power with empire and super power status to negotiate advantageous terms of business with local politicians.	The world is increasingly displaying a lack of local cultural diversity. People in the very remotest villages in rainforests, in high mountains and in Arctic conditions appear to wear increasing similar garments often styled by American fashion: tee shirts, baseball caps, jeans and trainers with brand logos. Coca Cola is the drink of choice with the promise of a Big Mac or Pizza Hut meal.
	<p>A criticism of globalisation is often that because of it, the rich are becoming richer and the poor are becoming poorer. An investigation as to the efficacy of this statement is appropriate. The G8 and UN are concerned, and some debt cancelling has occurred due, not in a small part, to the "Make Poverty History Campaign". The World Bank provides many statistics to aid this analysis</p> <p><a href="http://www.worldbank.org/">http://www.worldbank.org/</a></p>	<p>The rise and re-emergence of other cultures and cultural integration.</p> <p>There is a real sense that there will be a loss of cultural identity unless positive action by politicians is taken to prevent this. The concept of multiculturalism, celebrating different cultural traits is practiced, especially in the UK and is thus restricting the development of a diminution of traditional cultural identity. Tourism, in particular, is guilty of transferring customs and cultures to all parts of the world, but individuals and groups in many areas are determined to preserve what they can of their traditional cultural identities with sustainable tourism projects. Eco tourism in Kenya for example.</p> <p><a href="http://www.ecotourismkenya.org/index.php">http://www.ecotourismkenya.org/index.php</a></p> <p>Managers of TNC operations are usually from MEDCs and find themselves having to live in different cultural environments. So choose to live in enclaves of like-minded and like-cultured people. Exactly the same as any culturally different community living in any "alien" cultural environment.</p> <p><a href="http://www.globalpolicy.org/globaliz/cultural/globcult.htm">http://www.globalpolicy.org/globaliz/cultural/globcult.htm</a></p>

Many resources have been incorporated in the text

A textbook which covers much of the unit is "Economy and Development" by David Burtenshaw Philip Allan.

Also very useful for self contained examples and updates are:

Geofile <http://aa.nelsonthornes.com>

Geo Factsheets [www.curriculum-press.co.uk](http://www.curriculum-press.co.uk)

Geography Review  
<http://www.philipallan.co.uk/content.aspx?PAGE=PROD272:&SUB=10>

The BBC News website <http://news.bbc.co.uk/>

Classroom Video has a good section of DVDs on this topic  
<http://www.classroomvideo.co.uk/Search.aspx?sub=105>

**Theme 6 - Emerging Asia**

**Theme 6a - China**

[See Appendix 1.](#)

**Theme 6b - India**

[See Appendix 2.](#)

## **APPROACHING UNIT G3 SECTION B**

The approach a centre will take to Unit G3 Section B will partly depend on the strategy that the centre adopts for delivering all of A2. However, there are some general principles that might help centres achieve a smooth transition to this form of teacher - guided self-learning. Because of the variety of Research Themes it will pay to give careful consideration to the process well ahead of the commencement of the A2 curriculum.

### **Factors to be taken into consideration when developing the Section B programme**

1. The size of the group taking A2.
2. The interests of the students including their other A2 subjects.
3. The actual and potential academic capabilities of the teaching team.
4. The existing academic support materials available.
5. What support materials are out there (ignoring cost at this stage!).
6. When will students be entered for Unit G3? This might include consideration of the centre's attitude to commencing A2 immediately after AS examinations.
7. How much time can be realistically given to this section of Unit G3 alongside the requirements of Unit G3A?
8. Is it possible to build fieldwork (either group or individual) into the programme of work?

The answers to these factors should guide the centre's approach. Some considerations are listed below.

- The bigger the group size the greater the opportunity to permit students to range widely across the themes.
- There are obvious linkages. 'Geography of Crime', or 'Deprivation' might attract sociologists, for example, whereas psychologists could be attracted to 'Environmental Psychology' or 'Geography of Retailing' or 'Leisure and Recreation'. Physicists might be inclined to 'Microclimates' and chemists to 'Atmospheric and Water Pollution'. However, some will not want to make that kind of link and should be encouraged to study what interests them.
- Single teacher centres might have to be more restrictive in their coverage; whereas experience has shown that centres with three or more teachers whose expertise complements one another are able to offer almost all of the range.
- You know what books are available but it might pay to look back through those Geographys, Geography Reviews and Geographicals gaining dust in the cupboard! Searches using Amazon or Blackwells might reveal other gems.

- No doubt the students will turn to the web so get one step ahead and develop a web source handbook.
- If you are entering students for Unit G3 in January the approach has to be more structured from the outset because a June start to the work will be imperative. June entries have more time but it might still pay dividends in the long run to begin the process in June of the preceding year.
- Time depends on the approach adopted by the centre. Because this Section is intended to be teacher-guided self-learning the timetable requirements ought not to be rigid.
- Can some existing fieldwork be reworked or would it be better to take the themes and look at the fieldwork opportunities on an annual basis?

### Delivery and Assessment Timeline

The chart below is a suggested time line for the 2010 assessments.

	<b>January Assessment</b>		<b>June assessment</b>	
December 2008	Topic Areas for 2010 issued on the WJEC website		Topic Areas for 2010 issued on the WJEC website	December 2008
March 2009	Department decisions		Department decisions	March 2009
April-May	Resource preparation		Resource preparation	April-May
June-July 2009	Formal introduction & teaching		Formal introduction & teaching	June-July 2009
July 2009	Student research confirmed		Student research confirmed	September or December 2009
September 2009	Research time		Research time	October – December 2009 or January – February 2010
October-November 2009	Teaching time, organising the report		Tutoring time, organising the report	February- April 2010
December 2009	Internal assessment that report ticks all the boxes on p27 of specification		Internal assessment that report ticks all the boxes on p27 of specification	April-May 2010
December 2009	Topic Areas for 2011 issued			
January 2010	First G3 examination		June G3 examination based on the January 2010 Topic Areas but new questions	June 2010
March 2010	Resit advice for all G3 - Improve Topic Area	Unlikely resit needed. New Topic Area issued for 2011	December 2009	
June 2010	New questions in examination			

## **Formal Introduction and Teaching**

This is the key stage because it sets the context for the students' work. The departmental selection of Themes should be presented to the students and any potential choices discussed. The students could be issued with a departmental timetable which details key dates in the process besides a departmental version of the specification.

There are two key elements to the introductory tutorials. The first is to establish the academic background to the Theme and Topic Area. This could take time if there are several topic areas being attempted. This could take the form of some required reading from textbooks and journals besides some teacher input on the topic.

The second element is to tutor students so that they comprehend the sequence of enquiry and the investigative structure needed for their research. At this stage students will obviously be encouraged to develop their own research topic that fits the theme. Ideally this should come from the student but in reality some will need further guidance and in some cases, having the topic allocated. Topic allocation is to be discouraged because it often results in less student enthusiasm for the topic. It creates an attitude of "they will tell me what to do and I can do little until told". The most dangerous approach is to give all the students the same topic area and more dangerously, the same research theme. By all means get students to cooperate in a topic area but tweak the studies to engender enthusiasm. Topics have to be manageable and tutor time will be taken up making sure that the topic is manageable in the time and at this level.

The next stage is to get the students to do their own reading and researching the literature. This is an ideal point for introducing the area of biased literature and data, especially in the media and on the web.

The final stage of the introductory phase is the development of a methodology that will enable the correct primary and secondary data to be collected that addresses the detailed research topic area that the student has agreed with the tutor. At this stage attention needs to be paid to issues such as location(s), health and safety, scale of the projected research, rigorous approval of any questionnaires, any ethical issues and teamwork if needed.

## **Teaching time, organising the report**

Once the data and evidence has been collected a new phase begins. Students should be organised ideally into groups that cover each of the Research Themes being taught. In the case of the maverick student, they can be attached to one of the other groups.

The Research Theme groups can meet at different times. Their purpose is to get the students to organise their data and evidence in a manner that addresses the research that they undertook. A seminar/presentation format could work because the students will learn from each other and from the teacher input.

Once the data has been satisfactorily collected the students should be asked to draw tentative conclusions from the data; what does it show and how certain are they of the validity of their conclusions. This evaluative phase is essential and should be related to the knowledge and understanding that they acquired when they first started investigating the theme and the topic area.

### **Writing up the report**

Although a written report is not a compulsory element of the assessment, it does have the benefit of drawing together all of the elements in the research investigation. It is the final stage in the sequence of enquiry. By writing up a report of 2,000 to 2,500 words the candidate will have produced both a completed study and most importantly, a revision document for the forthcoming examination. It is the report that will become the source of knowledge, understanding, application and skills used in the formal examination's assessment objectives. It is also an exercise in writing continuous prose, which could take the form of a headed report with maps, diagrams, tables, photographs and even text boxes. The general rule is that any of the above, or indeed appendices do not count as words. Appendices, the inclusion of vast data appendices, should be avoided. Any internal assessment of the report should be formative in its guidance for the forthcoming examination. Show them good reports from the past or articles which have the format that you wish to see (e.g. Geographical Review).

Both teaching time and writing up should direct students to potential questions on the topic area that relate to both the methodology of the research study and the findings of the candidate's own research.

### **Some Don'ts**

- Do not teach to stereotypical answers because they might not address the question set and the assessment objectives.
- Do not restrict theme selection so that it misses the research interests of the students.
- Do not just leave the students to their own devices.
- Do not let them plagiarise – be aware of lifting from the net.
- Do not predict questions especially in the initial examinations.

### **Do**

- Encourage self-learning
- Place boundaries on their ambition

## UNIT G4 SUSTAINABILITY

### Introduction to all four units

A Resource Folder, which will be used for the G4 examination for that session, will be published about six weeks before the date when the G4 examination itself will take place. Each centre entered with WJEC for G4 will receive a copy. The Resource Folder will also be published in pdf format on the WJEC website. It can be viewed, and/or downloaded and/or printed out from this source. There will be no limit placed on the access, use or reproduction of this file. Each candidate will be provided with a copy of the Resource Folder, for use in the examination, at the same time as the question paper is issued at the beginning the examination on the day set for the paper. Copies of the Folder printed earlier with added notes, or notes from research carried out in the previous six weeks may not be taken into the examination.

The paper itself will be marked out of 80. One 25 mark question will be set on material not included in the Resource Folder. It will be based on other sections of the specification for G4 not covered by the Resource Folder. The 55 marks available on the other questions will relate directly to materials provided in the Folder. Some questions may be confined to information provided only on the Resource Folder. In other questions, candidates will need to show, not only an understanding of the materials in the Resource Folder, but also evidence that they have extended their studies beyond what is given in the Folder.

Candidates can extend their studies in several ways. The original source of materials used in the Folder will be given. This may, in some cases, be a book, journal or other publication, but in many cases will be websites where the original source can be viewed. Additional information from these sources would be a useful extension of studies. Candidates may also extend their studies by exploring examples other than the ones used in the Resource Folder, but covering comparable ground. These may be alternative case studies at other locations or times, or if one country has been the focus of attention in the Folder, similar material one or more different countries would be useful.

It is appreciated that in between the time of writing the Resource Folder and its publication and use by candidates, that some of the sources cited may no longer exist in the original form. However, as all of material will have been taken from authoritative, established sources, comparable documents will be available. In most cases, the original documents used are likely to be still accessible, but updated versions and later information may well be present. Awareness of these will also give candidates legitimate opportunities to extend their studies.

**It is important to remember that many organisations and sources of information have particular aims, and may well wish to promote a particular point of view or policy.**

Whilst information will be accurate, it may have been chosen selectively in order to support a particular standpoint. It will be useful for candidates to consider whether materials presented are providing a full and neutral picture of a particular topic, or whether only partial information has presented to enhance one particular point of view. It would be worth looking at other sources of similar material.



During the six weeks available for study before the examination, it would be helpful if candidates could have the opportunity not only to read the resources, but also to discuss its content with teachers, and if appropriate, other candidates. Similarly, it would be useful if candidates had the opportunity to discuss any further information that they might find whilst extending their studies.

Some of the questions set on the G4 paper will ask candidates to evaluate information or points of view. Some experience of discussion of the issues involved should prove particularly useful as preparation for such questions.

## UNIT G4 SUSTAINABILITY

### G4 Theme 1 – Sustainable Food Supply

#### 1.1 What is the global pattern of food consumption?

- This section is intended to provide a sound knowledge base in order to give a world wide perspective of where food supplies are adequate, of where supplies are low and/or subject to deficiencies in either amount or quality, and regions where the abundance of food is leading to ill health amongst a proportion of the population. Throughout the theme, students should link the information to their knowledge and understanding of other parts of the AS and A2 specification.
- Food consumption can most easily be measured by daily calorie intake. Most regions of the world fall within an acceptable range which allows normal health. Some areas have a normal calorie intake which is on the lower margins for good health and may lead to ill health. Other areas may suffer from the lack of a vital component of diet, or may have an over-dependence on one source of food. These, and other areas under special circumstances such as the disruption of food supply when military conflict or civil unrest occurs, may experience shortages that can lead to a predictable range of more serious medical conditions from time to time. Deaths may occur, especially amongst the young and elderly. Low rainfall conditions are the most common cause, but the causes involved in individual case studies would constitute acceptable evidence.
- In other areas of the world daily calorie intake is high and considerable proportions of the population become overweight or obese. Once again, ill health occurs, but presenting a different set of medical conditions, several of which may lead to premature death. In areas of deficiency there is often a dependence on local sources of food, but in areas of high intake, foodstuffs are often sourced many thousands of kilometres from the area of consumption.

#### 1.2 What factors promote or hinder food production?

- The main factors involved are physical (temperature, rainfall, soils, growing season etc), economic (subsistence or commercial - for the latter, market price, retailer power, subsidies, tariffs, world trade conditions such as dumping etc), political, which will overlap with some economic (self sufficiency, conservation, laws related to GMOs, supranational organisations such as EU etc.), and technological (irrigation, mechanisation, polytunnels, greenhouses, genetic engineering, agrochemicals etc).
- Some areas are naturally rich and fertile and capable of very high output even with fairly low-level inputs. These have become densely populated areas. They may be capable of even greater output with modern methods. Other areas are capable of more limited output and may be susceptible to output being reduced by low or erratic rainfall, poor or degrading soils or difficulties related to relief. Some food sources which can normally have very high output can be severely disrupted by natural events, such as the Peruvian fisheries under El Nino conditions.

- Currently foodstuffs are moved around the globe, sometimes almost as far as movement is possible around the planet. Concern over 'food miles' is growing. Agribusinesses are increasingly controlling the growth, processing, distribution, marketing and retailing of food. Output often depends on the amount and quality of inputs. The ability to afford inputs varies enormously from one part of the world to another. One area may depend on manure whilst another may receive complex chemical fertilisers.
- Subsidies and tariffs are determined by both national governments and supranational organisation such as the EU. Their policies are influenced by a range of concerns, for example, prices in shops, returns to farmers or environmental concerns.
- The amount of food produced often depends on the level of technological input available. Many areas still depend on animal or human power whilst others have sophisticated machinery with satellite guidance for the application of fertilisers. Controlled environments under glass are often monitored by computer.

### 1.3 Can food production be sustainably increased?

- There are many ways in which food production can be increased. With almost all, there are questions about sustainability. Some knowledge of how each way produces an increase should be known. The arguments over whether the method is sustainable or not should be known. Four ways are suggested in the content. These should be studied, but additional ways and their potential for sustainability will always have relevance. For example, if intensive methods have a limit, then extending agriculture into new areas can increase food production. These areas may well be the last preserve of threatened species. Can such areas be used when there may be a priority to designate them as National Parks or other form of reserve?
- Technological advances can increase food production enormously. Hydroponics and aeroponics can provide high output of clean, disease-free food, but have very high demands for energy inputs. Is the output of CO<sub>2</sub> acceptable? Are there sufficient sources of energy for these methods to become widespread?
- Natural stocks of fish and other marine foods are threatened in many of the world's oceans. The Blue Revolution, largely based on various forms of fish farming, has massively increased output in many areas. Problems develop in all areas where it becomes large scale, ranging from pollution of nearby waters to destruction of mangrove forests.
- GMO crops and other forms of genetic engineering are possible. But apart from huge increases in output there are environmental, economic and political concerns, such as the power over food supply by such a small number of multinationals that control GMOs.
- Massive increases in food production were achieved through the Green Revolution. Some politicians are speaking of a 'New' Green Revolution, for dry and marginal areas that were unable to benefit from the first green revolution. These would involve better credit facilities and dissemination of knowledge to marginal farmers. These methods may have less environmental impacts than huge inputs of fertilisers and irrigation schemes.

#### 1.4 Can a sustainable food supply be maintained in the future?

- On a local or regional scale, this depends on population change. With stable or slowly growing populations traditionally supplied locally few problems arise. Rapid growth in low-technology areas frequently leads to shortage.
- Increasing aridity and rainfall unreliability can jeopardise even stable populations. These problems frequently occur in areas of rapid population growth.
- On a global scale current population trends demand increases in production. So far this demand has been met. This has been possible through huge energy inputs in chemicals, machinery and transport of food.
- Besides having a sound knowledge and understanding of food supply, students should be able to show an ability to evaluate. This should be particularly directed towards the sustainability of current and emerging food issues. It is not so much the ability to reach a conclusion or make a stand on an issue that is important, but to show understanding of two (or sometimes more) sides to an argument. Points of view should be based on evidence. Some forms of evidence can be given greater weight than others. Awareness of these assessment issues will be tested.

## UNIT G4 SUSTAINABILITY

### G4 Theme 2 – Sustainable Water Supply

#### 2.1 What physical factors determine the supply of water?

- In this section students should have a good background on the part of the water cycle involving precipitation, evapotranspiration, runoff and groundwater transfers. Although each of these can be considered in isolation, it is often the interconnections between them that determine supply. Areas of high precipitation and plentiful water supply often do not coincide with areas of demand.
- Precipitation varies greatly from place to place in amount, seasonal distribution, variability and reliability. Similar amounts under different temperature regimes may result in quite different availability of supplies.
- High relief may promote rapid runoff, but may also provide greater opportunities for storage. Low relief may reduce precipitation and make storage difficult. A combination of high relief and suitable geology can create lakes that provide natural storage.
- Impermeable rocks are likely to produce rapid runoff, but they may also help retain water in storage schemes. Porous rocks may naturally provide underground storage, and give an even supply throughout the year, despite uneven distribution and variability of rainfall.

#### 2.2 How do human activities influence water supply and demand?

- Societies vary considerably in their demand for water. For a given pattern of usage, increases in population generate greater demand. As a society becomes more developed, demand for water also increases. It is common for both pressures on water supply to grow at the same time. Major problems can occur when national boundaries cut across drainage basins. Agreement has to be made between countries over amounts of extraction and the quality of water put back into the system for consumers downstream. A river may have adequate supplies for all consumers along its length, but if an upstream nation extracts too much and returns contaminated water to the system, disputes and conflict may arise.
- Population increase leads to greater demand. This may be because the population is growing by natural increase, or that people are migrating to a particular area, or both are taking place. There are areas where the numbers of people are causing severe pressure on supplies.
- Economic development causes very large increases in demand per person. Domestic demand goes up as washing machines and dishwashers use many times more water than manual cleaning. There is a greater awareness of personal hygiene and baths and showers are more frequent. If homes have gardens, water is used for keeping lawns green and flowers well watered. As industries grow, water for cooling and processing is needed. In agriculture there is more frequent irrigation and regulations on cleanliness mean more frequent washing. In semi-arid areas, agriculture can raise the salinity of water supplies. With economic development, lifestyles change; e.g. car ownership increases and there is greater demand for car washes. With development, more piped water is available, and consumers respond by finding new ways to use water.

### 2.3 How can water supply and demand be managed sustainably?

- When demand for water is approaching the capacity of existing supplies, there are two responses that can help manage the situation. The most common is to explore ways to increase supply. The other way is to try to reduce demand, or more often and realistically, to slow down the rate at which demand is increasing. There are a range of ways of achieving each of these. In a particular area, not all the ways may be available.
- The most common way of trying to increase supply is to build new storage capacity. This is not possible in areas of lowland with existing dense and widespread population. In places where it is possible it may lead to environmental damage, economic disruption and relocation of communities.
- It may be possible to transfer water from an area where there is surplus to one where deficit may occur. Distance is an important factor here. Transfer is usually expensive to build. Whether it goes ahead is likely to depend on the funding a government has available, and to a lesser extent, on how critical it is to increase supply.
- In areas where past development is limited, it may be possible to develop groundwater sources. In developed countries these are usually already fully utilised. Over use of groundwater resources can lead to contamination of the water underground. This is particularly the case in coastal areas where saltwater contamination is a threat.
- A solution that is only available to rich economies that have access to the sea is desalination. It is hugely expensive and has very large demands for energy. The technology involved has scope for development. It is difficult to see how this method can be developed as countries are attempting to reduce their carbon emissions.
- Recycling is a promising route and is already well developed in some places. Used water can be treated to remove contamination and bacteria and be put back into the supply. Water that cannot be restored to drinking quality can still be reused for washing, cleaning and cooling. In some areas there is resistance to using water that may recently have been flushed through a toilet.
- In some areas, water falling on rooftops has been collected. This is amongst sources classed as 'grey' water. Drinking water can be conserved, and this lower grade water used for purposes such as flushing toilets.
- Reducing demand for water is not easy. Metering supplies and using price to induce restraint is one approach. Campaigns and generally raising awareness about wastage is another approach. If consumers do not reduce demand voluntarily, rationing may be considered by governments.

## **2.4 Can sustainable water supplies be maintained in the future?**

- Whether supplies can be increased or demand reduced often depends on the level of technology and/or funding available.
- Supply may be increased, or demand reduced, but this may have social implications that are unacceptable
- Other solutions may have environmental impacts that outweigh any benefits.
- At international level, political agreement is needed and this may often not be possible.
- As with food supplies, as well as having a sound knowledge and understanding of water supplies, students should be able to show an ability to evaluate. This should be particularly directed towards the sustainability of present day water supplies, and ways of managing supply and demand in the future. It is not so much the ability to reach a conclusion or make a stand on an issue that is important, but to show understanding of two (or more) sides to an argument. Points of view should be based on evidence. Some forms of evidence can be given greater weight than others. Awareness of these assessment issues will be tested.

## UNIT G4 SUSTAINABILITY

### G4 Theme 3 – Sustainable Energy

#### 3.1 What problems are associated with the supply of energy?

- This is a topic that was not previously in GG5. Producing energy gives rise to problems in societies at all levels of development. The topic has strong links with many other aspects of the specification but in particular G1/1. A good deal of the material from that section should be understood and applied here.
- One major problem with energy is its cost. Fossil fuels are finite. Many believe peak oil production has been reached. With increasing demand and diminishing supplies prices must increase. Alternative forms of energy need massive investment in research and development, and almost all forms seem expensive to build. These costs put a strain on developed and emerging economies, and may be beyond countries with limited economic development. Fuelwood is still a major source of heating and cooking energy in developing countries. Wood burning in confined domestic spaces is one of the greatest sources of ill health. Impaired lung capacity and cancer from smoke particles often lead to very low life expectancy.
- Traditional forms of energy almost all depend on fossil fuels and lead to carbon output. Carbon capture is in its infancy and prohibitively expensive. But the global environment cannot withstand current levels of carbon emission. Almost all alternative measures have environmental implications.
- Hardly any country is self-sufficient in all the forms of energy it needs. Most governments worry about depending on sources from other countries in case political disputes threaten supplies. Governments need to harmonise actions to limit CO<sub>2</sub> output, but finding agreement is not easy, and implementing policies can make them unpopular with their electorates.
- There can be ways of producing power to meet future demands but most of the technology needed has yet to be developed. Only the most developed countries have the numbers of educated people, the research facilities and the funding to develop new technologies. Ideas for the technological solutions seem few at present, and many are untested and may prove to be unfeasible or misguided.



### 3.2 How and why is the demand for energy changing?

- For all countries, no matter what their present stage of development, demands for energy are rising. Economic growth depends on energy, leisure and social activities very often require energy, and the number of appliances and gadgets owned in the world increases daily, all needing energy. Underlying all these are needs for transport, cooking, heating, air conditioning and lighting.
- All economies are increasing their demands for energy. This is especially true of newly emerging economies, especially the very large countries of Brazil, Russia, India and China (BRIC) where energy for manufacturing is the main growth. In order to be successful, all economies (including those already developed) need to grow each year. In one way or another, that growth needs energy. Countries that experience a low level of development need to grow so that large proportions of their populations can rise out of poverty.
- In developed economies, as well as getting to and from work, people want to travel to see friends, enjoy pastimes and go on holidays. Entertainment, even staying at home and watching TV, requires energy. To make life easier and free up time for leisure, labour saving devices are needed.
- For many of the social reasons above technology has produced equipment that requires energy. The list is enormous. There are several major areas. Car ownership grows continuously throughout the world. Growing international trade has led to the transport of goods by air, sea and all forms of land transport. Around the home, washing machines, vacuum cleaners, TVs, computers, games consoles, sound systems, mobile phones have developed. Electronic gadgets are found in almost all activities.

### 3.3 How can the demand for energy be managed sustainably?

- Even if the use of energy does not increase, new non-polluting sources of energy will be needed, if the demand continues to grow, they will be needed more and in greater quantities. There is undoubtedly much wasted energy. It might be possible to continue as we are but use our energy more efficiently. Others argue that the kind of lifestyle developed in the late twentieth century in western societies is not sustainable, and that moves need to be made to reduce demand.
- At present, most energy is carbon based. Suitable alternatives are essential. Nuclear is a major supplier world wide, but generates debate. It produces long lasting dangerous waste, it could fall into the hands of terrorists, it may be converted to producing nuclear weapons. However, there have been few leaks and containment is improving, and otherwise produces clean and plentiful energy. Wave and wind power have relatively little damaging impact but much of their potential is yet to be developed. Some HEP schemes have led to the release of methane, more powerful as a greenhouse gas than CO<sub>2</sub>. Biofuels lead to destruction of rainforest and use of agricultural land needed for food. Geothermal, tidal and solar sources of power have few drawbacks, but the range of locations where they can be exploited is limited.

- A good deal of energy that is generated is wasted. Heat escapes from poorly insulated homes, newer light bulbs use a tenth of the energy of traditional ones, lights are left on when not needed, the list goes on. It is estimated that carbon emissions could be stabilised just by greater efficiency.
- Demand reduction can be achieved in many ways. Some are linked to greater efficiency. Walking or cycling instead of using a car is a direct reduction. Using public transport also achieves reduction, but by the fact that it takes less energy to transport people in large numbers on one vehicle than for them all to use their own cars. Modern telecommunications can make travelling to attend meetings redundant.

### **3.4 Can a sustainable energy supply be maintained in the future?**

- Using current sources of power is unsustainable in terms of the environment, and they will run out.
- Alternatives are developing, and although none is the answer, in combination and with real demand reduction, a sustainable usage may be possible.
- A study of the points above, along with case studies that incorporate them will provide a sound knowledge and understanding of energy supply. Students should be able to show an ability to evaluate issues related to these areas. They should be able to debate the sustainability of present day energy supplies, and the ways of managing supply and demand in the future. It is not so much the ability to reach a conclusion or make a stand on an issue that is important, but to show understanding of two (or more) sides to an argument. Points of view should be based on evidence. Some forms of evidence can be given greater weight than others. Awareness of these assessment issues will be tested.

## UNIT G4 SUSTAINABILITY

### G4 Theme 4 – Sustainable Cities

#### 4.1 How can cities throughout the world be classified?

- To discuss cities as one class of entities with a high degree in common is itself a debatable point. Cities vary from one another a great deal, and differences between different types may be so great that it is not possible to generalise. However, there are cities that share a great deal in common. It might be possible to identify common problems that may lend themselves to common solutions. Cities can be classified by various criteria, some of which are helpful in finding common ground for finding sustainable solutions to problems.
- The size of cities may lead to finding common ground between them. Clearly cities in a 100 000 to 200 000 range are likely to more in common with one another than with cities of over 10 million. In the larger cities, it may not be their population size that is important but the area of land over which they extend. Bangkok and Dhaka have similar populations but Bangkok covers an area over eight times larger than Dhaka.
- In developed countries many of the major cities have maintained a fairly stable population for a long time, growing only slowly, or even losing population over certain periods. These contrast with cities in rapidly developing parts of the world where urban growth is rapid from both rural-urban migration and natural increase. Problems related to rapid growth are likely to be quite different to those experienced in more stable cities.
- Amongst developed countries, some cities evolved over centuries and are very different from those in countries that developed recently. New forms of cities are emerging in developed countries as a result of high levels of affluence, personal transport and communications with massive decentralisation and no core. Other cities have developed extensive international functions which distinguishes them as world cities. These contrast with cities in the developing world which may have high proportions of the population living in informal settlements.

#### 4.2 What pressures currently confront cities and how are they changing them?

- Cities throughout the world share many problems. The nature and extent of the problems differ between different types of city. Although their basis is the same, the problems faced by developed country cities are usually less severe and less extensive than in the developing world.
- As cities grow in size and develop more economic functions, transport of goods and people increases. This puts enormous strain on systems in almost all cities. Improved communications through broadband, cable and wireless systems are reducing the need for transport through developments such as video conferencing, but are requiring totally new ideas of infrastructure.
- In all cities there are disparities in wealth. In developed countries this may be between socially deprived regions and enclaves of the super rich, whilst in developing countries between abject poverty and an emerging middle class. The extremes may be very different.

- Some cities, severely constrained by available land, have built upward extensively producing very high population densities. In others sprawl and ribbon development have met with little control and produced huge urban areas often with relatively low densities. In some countries there have been concerns about areal extent, which may clash with the need for economic growth and provision of housing.
- Many cities with high levels of transport experience poor air quality. This is exaggerated in cities with large amounts of manufacturing capacity and power generation. In developing economies, air pollution similar to that of developed countries in the past is a growing problem. Disposal of waste is an issue in all cities, but its nature and scale may vary considerably between developed and developing cities. Poorer parts of developed cities may have old buildings in need of renovation with graffiti and litter but appear far better than poor areas of developing cities lacking sanitation with makeshift buildings.

#### **4.3 What attempts have been made to find sustainable solutions to problems faced by cities?**

- For each category of problems, solutions have been attempted, often with success, in certain cities throughout the world. Some of these can be replicated in other locations, but the unique circumstances of some cities prevent the transference of solutions. In some cities the financial resources needed are just not available, or the scale of the problem is so much greater that the idea just will not work. Cities in long established developed countries often have extensive historic cores that cannot be adapted and conserved at the same time.
- Road pricing, congestion charging and cheap public transport offer some transport solutions. New transit systems are easy to install as new cities grow, but impossible to implement in older cities. Park and ride schemes may work well in developed countries but be meaningless in very poor cities.
- Public housing is affordable in developed countries, often in partnership with the private sector. Extremes are not so great, and a basic minimum standard can be achieved for all. The scale of sub-standard housing is so extensive in some developing cities that the limited financial resources of authorities means very little can be done. Extremes remain polarised, with a high proportion of the population falling below acceptable standards. Run-down areas are improved in developed cities. Developing cities struggle with any improvement and often rely on the work provided by inhabitants and funding from charities to achieve anything.
- In developing countries there have been numerous efforts to divert growth away from rapidly expanding centres into 'growth poles' of various sizes in relatively deprived areas. These have had mixed success in both stimulating growth elsewhere and limiting expansion of successful centres. In the developed world attempts have been made to restrict growth by creating bands around cities where no growth is allowed. These have often worked for the city itself, but with affluence and personal transport, areas beyond these bands have experienced increased growth.

- Air quality has improved in many ways in developing countries by establishing emission standards from vehicles and deindustrialisation having taken place. Soot, smoke and large particulates have lessened, but low level ozone and fine particulates have increased. Many developing cities have similar problems to those of developed cities in the past, with the added complication of vehicle exhausts. Disposal of waste is an issue in all cities, but its nature and scale may vary considerably between developed and developing cities. Poorer parts of developed cities may have old buildings in need of renovation with graffiti and litter but appear far better than poor areas of developing cities lacking sanitation with makeshift buildings.

#### **4.4 How sustainable are cities?**

- It is questionable whether any of the forms of city are sustainable. All rely on forms of transport that are not sustainable beyond a few decades.
- Different types of city are unsustainable for different reasons.
- LEDC cities need to house their inhabitants and provide them with clean water.
- MEDC problems are linked to rural sustainability as massive outflows of homes, work places, retail and entertainment leapfrog green belts and establish new forms of urbanisation in rural areas.
- A study of the points above, along with case studies that incorporate them will provide a sound knowledge and understanding of the sustainability of cities. Students should be able to show an ability to evaluate issues related to these areas. They should be able to debate the sustainability of present day cities of most major types, and the ways of managing their problems in the future. It is not so much the ability to reach a conclusion or make a stand on an issue that is important, but to show understanding of two (or more) sides to an argument. Points of view should be based on evidence. Some forms of evidence can be given greater weight than others. Awareness of these assessment issues will be tested.

### **Bibliography**

#### **G4 Theme 1 – Sustainable Food Supply**

In addition to texts recommended for AS level, the following have extensive coverage relevant to this theme.

*New Patterns: Process and Change in Human Geography*, by Michael Carr, Nelson, 1999

*Earthscan Reader in Sustainable Agriculture*, ed. Jules Pretty, Earthscan 2005

*Philip's Modern School Atlas*, updated each even year.

*Developing Sustainable Agriculture*, by Ian Bowler in *Geography* July 2002

Many of the web sites cited have comprehensive coverage for the aspects of the theme that they cover.

## **Bibliography**

### **G4 Theme 2 – Sustainable Water Supply**

In addition to texts recommended for AS level, the following have extensive coverage relevant to this theme.

*New Patterns: Process and Change in Human Geography*, by Michael Carr, Nelson, 1999

*Philip's Modern School Atlas*, updated each even year

*Exploring Environmental Issues An Integrated Approach* by David D Kemp, Routledge, 2004

Many of the web sites cited have comprehensive coverage for the aspects of the theme that they cover.

## **Bibliography**

### **G4 Theme 3 – Sustainable Energy**

In addition to texts recommended for AS level, the following have extensive coverage relevant to this theme.

*New Patterns: Process and Change in Human Geography*, by Michael Carr, Nelson, 1999

*Renewable Energy Power for a Sustainable Future*, edited by Godfrey Boyle, Oxford 2004

Many of the web sites cited have comprehensive coverage for the aspects of the theme that they cover.

## **Bibliography**

### **G4 Theme 4 – Sustainable Cities**

In addition to texts recommended for AS level, the following have extensive coverage relevant to this theme.

*The Future of the City - Cities of the Future* by Michael Pacione, found in *Geography* October 2001

*World City* by Doreen Massey, Polity 2007

*Networking the City* by Richard G Smith in *Geography* Summer 2005

Many of the web sites cited have comprehensive coverage for the aspects of the theme that they cover.

## **3.** **APPROACHES TO TEACHING/LEARNING PLANS**

Section 3 gives examples of planning for some of the G3 Themes in Section A. The first two columns of the plans are taken from the specification. The third gives the approaches and resources suggested for each Key Question. The format of each of these examples is different in order to emphasise the variety of ways to approach the teaching and learning and to emphasise that illustration is the choice of individual centres. Examples of web-based resources and texts are **in no way compulsory**.

### Theme 1 – Extreme Environments

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
1.1 What are the characteristics of a desert environment that make it extreme?	<ul style="list-style-type: none"> <li>• Location of hot deserts</li> <li>• Climatic characteristics of desert regions</li> <li>• Biotic characteristics of desert regions</li> <li>• Soil characteristics and processes of desert ecosystems</li> </ul>	<b>Mapping the major desert regions of the world</b> <b>Analysis of desert climograph</b> <b>Tabulation of desert flora and fauna to explain adaptations to climate</b> <b>Annotation of desert soil profile to explain their link to climate and vegetation</b>
1.2 How is human activity causing pressures on the desert environment?	<ul style="list-style-type: none"> <li>• The causes of the following in desert regions:                Population growth                Growth of mineral extraction                Changing agriculture                Growth of tourism</li> <li>• How the above have can provide threats in desert regions</li> <li>• Human activity can have positive and negative impacts</li> </ul>	<b>Class divided into groups to research the pressures caused by human activity in deserts. Each group to present a report</b>  <b>Series of detailed flow diagrams to show the impacts of the four pressures</b>  <b>Tabulation of the positives and negatives of human activity in deserts</b>
1.3 What are the strategies that can be used to manage human activity in deserts?	Understand how the following can manage pressure on the desert environment: conserve the desert environment; alleviate the impacts of human activity; control the use of the desert environment; monitor the impacts of human activity.	<b>Essay planning exercise to examine the management methods of National Parks – a comparison of a number of National Parks</b> <b>Shelter belts in Xinjiang, China</b> <b>Combating desertification in Burkina Faso</b>  <b>Research the role of local, national and international groups in the management of the desert environment</b>



<b>Key Question for investigation</b>	<b>Content</b>	<b>Teaching/learning approaches and resources – bold statements give the student activity</b>
<p>1.4 What are the characteristics of the arctic and alpine tundra environment that make it extreme?</p>	<ul style="list-style-type: none"> <li>• Location of alpine and arctic tundra regions</li> <li>• Climatic characteristics of tundra regions</li> <li>• Biotic characteristics of tundra regions</li> <li>• Soil characteristics and processes of tundra ecosystems</li> <li>• Altitudinal factors that influence the distribution of tundra</li> </ul>	<p><b>Mapping the major tundra regions of the world</b></p> <p><b>Analysis of tundra climograph</b></p> <p><b>Climograph analysis of stations at different altitudes</b></p> <p><b>Tabulation of tundra flora and fauna to explain adaptations to climate</b></p> <p><b>Annotation of tundra soil profile to explain their link to climate and vegetation.</b></p>
<p>1.5 How is human activity causing pressures on the alpine tundra environment?</p>	<ul style="list-style-type: none"> <li>• Causes of the following in tundra areas: mineral exploitation; airborne pollution; global warming; tourism.</li> <li>• How the above cause threats to the latitudinal and altitudinal tundra</li> <li>• Analysis of impacts on people in tundra areas</li> <li>• Human activity can have positive and negative impacts in tundra regions</li> </ul>	<p><b>Group work analysis of different threats to the tundra environment. Each threats taken by different groups – directed research by groups and report back.</b></p> <p><b>OR</b></p> <p><b>Production of conference style poster for two tundra regions to show threats to the physical and human environment.</b></p> <p><b>Conflict analysis of pressures on located tundra region</b></p>
<p>1.6 What are the strategies that can be used to manage human activity in alpine tundra environments?</p>	<p>Understand how the following can manage pressure on the tundra environment:</p> <p>conserve the tundra environment; alleviate the impacts of human activity; control the use of the tundra environment; monitor the impacts of human activity.</p>	<p><b>Structured report to demonstrate how different areas combat the threats to the tundra environment.</b></p> <p><b>Rank order the strategies used with group discussion to justify rank orders developed.</b></p> <p><b>Research the role of local, national and international groups in the management of the tundra environment.</b></p>

<http://www.terrace.qld.edu.au/library/grade8/sose/desert.htm> - good resource section

<http://www.desertknowledge.com.au/symposium/program.htm> - lots of resources - big files

<http://mefeedia.com/taqs/desert/>

[http://www.ourplanet.com/imgversn/171/full\\_pdfs/Our\\_Planet\\_17.1\\_english.pdf](http://www.ourplanet.com/imgversn/171/full_pdfs/Our_Planet_17.1_english.pdf) - human use of deserts

<http://www.unep.org/PDF/Tunza/TunzaV4N1-DesertsDrylands.pdf> - kids version of above

## **Desert Biomes**

<http://www.usyd.edu.au/su/SCH/school/sciweek/2006/dryoz.html> - lots of resources on Australian deserts

[http://www.saalnrn.sa.gov.au/portals/6/pdf/Australian%20Deserts%20\(3%20factsheets\).pdf](http://www.saalnrn.sa.gov.au/portals/6/pdf/Australian%20Deserts%20(3%20factsheets).pdf) –

Desert. Learn about Hot and Dry, and Cold Deserts. Most Hot and Dry Deserts are near the Tropic of Cancer or the Tropic of Capricorn. Cold Deserts are near the Arctic part of the world.

Desert Animals & Wildlife from Desert USA. Desert Animal Survival. Desert Plants & Wildflowers. Desert Environment & Geology: Rocks, Gems & Minerals. People & Cultures of the Southwest.

Desert Biome. Deserts are areas that have experienced extreme droughts leaving large bodies of sand and rock. They occupy about 20% of the Earth's surface and can be found on all continents.

Desert Biome - Earth Observatory Experiments. Desert biomes are the driest of all the biomes. In fact, the most important characteristic of a desert is that it receives very little rainfall.

Desert Biomes. Site provides information on Hot Deserts and Cold Deserts. Includes A Food Web in the Desert Biome.

Desert Biomes. Information on Arid, and Semi-Arid Desert, as well as Coastal and Cold Deserts. Includes Map of World Biomes, and Images of Desert Biomes.

The Desert Biome. Deserts have a varied species of animals that have adapted to the harsh climate of the desert. Topics covered: Climate, Animals, Plants, and Health Issues.

Desert Topics. What is a desert like? Types of deserts. What causes deserts? Deserts of the world. Desert plants. Desert animals. Desert at night. Plus desert links.

Deserts. Deserts cover about one fifth of the Earth's surface and occur where rainfall is less than 50 cm per year.

How Droughts Affect Us. Drought also causes environmental losses because of forest fires; soil erosion; damage to plants, animals, and their habitat; and air and water quality decline. Impacts of Drought - Environmental Impacts - Damage to animal species.

Sahara Crosser's Corner. Art Gallery - a glimpse of what the Sahara looks like.

### Impacts of human activity

<http://www.unep.org/geo/gdoutlook/index.asp> - global desert outlook. Plenty of case study material

[http://www.outbackholidays.info/shadomx/apps/fms/fmsdownload.cfm?file\\_uid=942AAB5B-F55D-FC88-6FAB-815D9CF7CBF3&siteName=rtn2](http://www.outbackholidays.info/shadomx/apps/fms/fmsdownload.cfm?file_uid=942AAB5B-F55D-FC88-6FAB-815D9CF7CBF3&siteName=rtn2) – desert tourism in Australia

[http://www.desertknowledge.com.au/dka/index.cfm?attributes.fuseaction=national\\_outback](http://www.desertknowledge.com.au/dka/index.cfm?attributes.fuseaction=national_outback) – outback Australia

<http://www.unep.fr/shared/publications/pdf/DTIx0794xPA-TourismDesertEN.pdf> - managing tourism in deserts

<http://www.icrtourism.org/Publications/finalbusinessbrief.pdf> - positives of tourism

<http://www.nacoma.org.na/Issues.htm#August07> – quad biking in Namibia

<http://atlas.aaas.org/pdf/188-89.pdf> - population and conservation in the Sonoran Desert

<http://atlas.aaas.org/pdf/83-86.pdf> - mineral extraction

<http://atlas.aaas.org/pdf/IssuesDesertmargin.pdf> - farming the desert margins

<http://atlas.aaas.org/pdf/155-58.pdf> - population and ecosystems polar

<http://atlas.aaas.org/pdf/131-34.pdf> - population and ecosystems desert

<http://atlas.aaas.org/index.php?sub=intro> Atlas of Population and Environment – includes above sources

<http://alic.arid.arizona.edu/sonoran/general.html> - Sonoran desert

<http://www.fws.gov/Endangered/bulletin/2002/03-06/16-17.pdf> - Chihuahuan Desert Diversity at Risk

[http://www.wildlife.state.nm.us/conservation/comp\\_wildlife\\_cons\\_strategy/documents/ch5\\_c\\_hihuahuan\\_desert.pdf](http://www.wildlife.state.nm.us/conservation/comp_wildlife_cons_strategy/documents/ch5_c_hihuahuan_desert.pdf) - Chihuahuan Desert

### National Parks

<http://www.nps.gov/cany/photosmultimedia/thisfragiledesert.htm> - video clips Canyonlands National Park, USA

<http://www.npca.org/stateoftheparks/zion/zion.pdf> - Zion National Park

<http://www.npca.org/southwest/national-parks-in-the-southwest-region.html> - USA

### Mining

<http://www.latimes.com/news/nationworld/nation/la-na-navajo19nov19.0.1645689.story> – impacts of uranium mining USA

<http://www.sric.org/uranium/index.html> - uranium impact USA

<http://www.world-nuclear.org/sym/2004/pdf/souley.pdf> - uranium in niger

### **The Tainted Desert: Environmental Ruin in the American West (Paperback)**

by [Valerie Kuletz](#) (Author)    **Paperback:** 336 pages    **Publisher:** Routledge (April 1998) **ISBN-13:** 978-0415917711

[http://www.npca.org/darkhorizons/pdf/Dark\\_Horizons\\_Report.pdf](http://www.npca.org/darkhorizons/pdf/Dark_Horizons_Report.pdf) - coal mining and power stations in USA National Parks - Badlands

### Farming

<http://na.unep.net/posters/Toshka.pdf> - greening the desert in Egypt

<http://googlesightseeing.com/maps?p=374&c=&ll=24.160309,23.440018&spn=0.387268,0.506744&t=k&hl=en> – farming Libyan desert photo

<http://www.desertagriculture.org/sustain.html> - middle east

<http://www.un.org/esa/sustdev/csd/csd16/LC/presentations/gadiel.pdf> - power point agriculture Arava Israel

### Controlling the desert

<http://www.desertcontrol.com/how.htm> - turning the desert into farmland


<http://www.fao.org/ag/aql/agll/drylands/index.htm> - UN Food and agriculture organization Drylands Management

## **Tundra Biomes**

[Alaska's Arctic](#), [Arctic Circle](#), [Maps of the Arctic Area](#), [Arctic Links](#), [Arctic Animals](#).

[The Amazing Animals of the Tundra](#). A Hotlist of Animals on the Alaskan Tundra: Bald Eagle, Beaver, Black Bear, Caribou, Dall Sheep, Red Fox, Golden Eagle, Grizzly Bear, Ground Squirrel, Lemming, Loon, Lynx, Moose, Mosquito, Pika, Porcupine, Ptarmigan, Wolf. Include Latin name, photo, and online resources for each animal or insect.


[The Amazing Plants of the Tundra](#). A Hotlist of Plants on the Alaskan Tundra.


 [Archaeology in Arctic North America](#). Topics covered: The Arctic Environment - characteristics, Doing fieldwork in the Arctic, Archaeological Sequence of the Arctic, Recent research in southern Baffin Island, and more.

[The Arctic](#). View a beautiful slide-show of large color photos of Arctic animals, Arctic scenery, and people. Contents include: Arctic Information, Arctic History & Culture, Arctic Fauna & Flora, Arctic Lifestyle, Arctic Today, plus Q&A about Arctic cruising and related cruise information.

[Arctic Animals](#). Each printout includes labels for body parts, brief description of the animal where relevant, e.g. fur, skin, anatomy, diet, classification, etc. Arctic Animals covered: Alaskan Malamute, Arctic Fox, Arctic Hare, Arctic Tern, Arctic Wolf, Beluga Whale, Dall Sheep, Ermine, Greenland Shark, Harp Seal, Killer Whale (Orca), Lemming, Moose, Musk Ox, Narwhal, Northern Fur Seal, Polar Bear, Puffin, Reindeer, Short-tailed Weasel, Snow Goose, Snowy Owl, Walrus, Wolverine, Woodland Caribou, and Zooplankton.

[Arctic Circle: Natural Resources](#). Articles about the Arctic for the more advanced students. Titles include: Conserving the Caribou, The 'Lost' Reindeer of Arctic Alaska, The Nuuk Declaration - September 16, 1993, with links to CAFF (Conservation of Arctic Flora & Fauna) a Working Group of the AEPS (Arctic Environmental Protection Strategy).

 [Arctic Cordillera Ecozone](#) - "Arctic Rockies" from Environment Canada. This ecozone occupies the northeastern fringe of the Northwest Territories and Labrador. Contents include: Ecosystem Overview, Landforms and Climate, Wildlife, Plants, and Human Activities.

 [The Arctic Ecosystem](#). In Canada, the Arctic Ecosystem consists of the Arctic Cordillera, Northern Arctic and Southern Arctic terrestrial ecozones, the Arctic Basin, Arctic Archipelago, and Northwest Atlantic marine ecozones. Site provides detailed information for each Arctic region on its Landforms and Climate, Plants, Wildlife, Human Activities, plus maps and links.


[Arctic Theme Page](#). A rich resource of data, graphics, forecasts, and other information about the Arctic from research institutions around the world. Includes selected essays by Arctic experts. FAQ section includes such questions as: Where is the Arctic? Where is the North Pole? Why should we study the Arctic? How do conditions in the Arctic impact human life? Who lives in the Arctic? Site is sponsored by the Arctic Research Office of the NOAA (National Oceanic and Atmospheric Administration), U.S.A.

[Arctic Wildlife - Birds](#), [Mammals](#), and [Sea Mammals](#) from Arctic Studies Center, a U.S. government program, established in 1988.

[Arctic Wildlife Photos](#), and [Antarctic Wildlife Photos](#).

[Awesome Arctic](#). Where is the Arctic? How cold is it? What animals live there?


[BrainPOP.com: Tundra](#). Watch a movie from Brain POP on the two types of Tundra: Arctic Tundra and Alpine Tundra. While waiting for the movie to load, play a quiz game to see how much you know about the Tundra Biome.


 [Canada's Arctic](#). [Canada's Polar Environments: Inland Waters, Land, Marine Waters, Sky \(Optical Phenomenon\), Climate, Maps, Canada's Polar Environments - Images: Ground Images, Satellite Images, Video, Images of Life: Freshwater Gallery, Marine Gallery, Terrestrial Gallery](#), and great related [Links](#).

[CANTTEX - Canadian Tundra and Taiga Experiment](#). The goal of CANTTEX is to increase our capability to detect and predict large-scale tundra and taiga ecosystem response to climate change.


[The Land of the Midnight Sun: Exploring the Alaskan Tundra](#) from iwebquest.com. Why it stays light late into the night during Alaska's summers, Is the ground really frozen solid just a few inches below the soil? How do plants and animals survive the cold weather of the tundra?

[Life in a Deep Freeze: How do animals survive the Arctic's c-c-cold winters?](#) from National Geographic Explorer (Student Magazine).

 [Northern Arctic Ecozone](#) from Environment Canada. The Northern Arctic ecozone extends over most of the non-mountainous areas of the Arctic Islands, and portions of northeastern District of Keewatin and northern Quebec. It incorporates the coldest and driest landscapes in Canada. Contents: Ecosystem Overview, Landforms and Climate, Plants, Wildlife, and Human Activities.

 [Northwest Territories Wildlife & Animals](#). Photos: Bison, Cariboo, Goldeneye, Grizzly Bear and Cubs, Lynx, Moose Calf, Musk Oxen, Peregrine Falcon Chick, Polar Bear, Raven, Red Squirrel, Seal, Sheep, Sicsic (Camouflaged), and more.

[Polar Ice Cap Biome: Antarctic Peninsula, Antarctica](#). Student project from Cobourg District Collegiate Institute West. Includes abiotic site description, plant and animal data.

 [Southern Arctic Ecozone](#). The Southern Arctic region is the largest of the three arctic terrestrial ecozones, and has the highest species diversity. Contents: Ecosystem Overview, Landforms and Climate, Plants, Wildlife, and Human Activities.

[The Tundra](#). The Tundra Biome provides examples of adaptation to extreme conditions. About a fifth of the land surface of the earth is tundra. The tundra biome is found next to the icy zones in the arctic. See also [A Food Web in the Tundra Biome](#) and [An Energy Pyramid in the Tundra Biome](#).

[Tundra](#). Where is the Tundra Located? Tundra Facts. Tundra Plants. Tundra Animals. Tundra Gallery. Tundra Links.

[Tundra](#). The tundra is a vast and treeless land. It is usually very cold, and the land is pretty stark. Tundra comes from the Finnish word "tuntuna", which means a treeless plain. It has permafrost that never thaws.

[Tundra](#). There are two types of tundra in the world, Arctic and Alpine. The Arctic Tundra is at the top of the world around the North Pole. The tops of tall cold mountains are Alpine Tundra. Contents: Animals, Vegetation, Climate and Location, and Health Issues.

[Tundra](#) from TeachersFirst.com. Brief description of a tundra biome plus links to Web resources, e.g. Virtual Fieldtrip to Antarctica, CyberZoo: Tundra Biome, and Enchanted Learning: Tundra.

[Tundra: The Not-So Barren Land](#). Tundra is the coldest of all the biomes.

[The Tundra](#). The tundra is the simplest biome in terms of species composition and food chains.

[Tundra Animal Printouts](#). Animals include: Arctic Fox, Arctic Hare, Arctic Tern, Arctic Wolf, Bighorn Sheep, Caribou, Dall Sheep, Ermine, Grasshopper, Hare, Lemming, Moose, Mosquito, Musk Ox, Polar Bear, Quoll, Reindeer, Short-Tailed Weasel, Snow Goose, Snowy Owl, Squirrel, Wolf, Wolverine, Woodland Caribou, and Woolly Rhinoceros.

[Tundra Biome](#). The winters in the tundra can be as low as -57 degrees Celsius (-126 degrees F).

[Tundra Biome - Earth Observatory Experiments](#). The tundra is the coldest of the biomes. It also receives low amounts of precipitation, making the tundra similar to a desert. Tundra is found in the regions just below the ice caps of the Arctic, extending across North America, to Europe, and Siberia in Asia.

[Tundra Biomes](#). Tundra, the "ice desert", "frozen prairie", the cold plains of the Far North get their name from the Finnish word "tunturia", which means barren or treeless land. Information on Arctic Tundra and Alpine Tundra. Includes Images of Tundra Biomes.

[Tundra-Cam](#). From Institute of Arctic & Alpine Research (INSTAAR). Tundra-Cam is a LIVE and INTERACTIVE webcam located at an elevation of 11,600 feet in the Colorado Front Range in U.S.A. The camera is above timberline on Niwot Ridge, about 25 miles west of Boulder. The peaks at the head of the ridge form the Continental Divide.

[Wild Arctic Activities](#). Site includes mazes, puzzles, games and activities about the Arctic. Contents: Vocabulary, Arctic Adaptations, Polar Profiles, Arctic Adventure Maze, Arctic Explorers Activity, Land of Ice Activity, Cultural Carvings Activity, Crossword Fun, Polar Picture Puzzle, Sledge for Survival Activity, and Arctic Word Search.

### General

<http://www.arcticstat.org/index.htm> - lots of statistics

[http://www.investyukon.com/index.php?option=com\\_content&task=view&id=12&Itemid=33&form=21](http://www.investyukon.com/index.php?option=com_content&task=view&id=12&Itemid=33&form=21) – regional Yukon

[http://www.ulapland.fi/home/vies/ajankohtaista/kide/Kide4\\_2000/Forbes.htm](http://www.ulapland.fi/home/vies/ajankohtaista/kide/Kide4_2000/Forbes.htm) - human impacts tundra

### **The Physical Geography of Northern Eurasia**

By Maria Shahgedanova Published 2003 [Oxford University Press Physical geography/ Eurasia](#)

571 pages ISBN:0198233841

## Tourism

[http://www.biodiversity.ru/coastlearn/tourism-eng/casestudies\\_arctic.html](http://www.biodiversity.ru/coastlearn/tourism-eng/casestudies_arctic.html) - tourism in the arctic – issues

[http://www.arctictourism.net/best\\_company/1.htm](http://www.arctictourism.net/best_company/1.htm) - sustainable arctic tourism

<http://www.travelsignposts.com/Finland/Finland-videos/video-theme/1/finland+tourist.html> – videos need sifting

<http://www.metla.fi/julkaisut/workingpapers/2004/mwp002-38.pdf> - impacts tundra tourism

<http://www.grida.no/publications/tourism-polar/page/1417.aspx> - tourism in the arctic

## Tourism in Alpine Tundra

<http://www.unep.fr/shared/publications/pdf/DTIx0957xPA-MountainsEN.pdf> - managing tourism in mountains

## Air Pollution

[http://books.google.co.uk/books?id=8CFiT3qbN5UC&pg=PA490&lpg=PA490&dq=air+pollution+tundra&source=web&ots=6VjdTK-vml&sig=6\\_fvlgFiP\\_S\\_7jH-o4KQhvjv-Cmo&hl=en&sa=X&oi=book\\_result&resnum=6&ct=result#PPA452,M1](http://books.google.co.uk/books?id=8CFiT3qbN5UC&pg=PA490&lpg=PA490&dq=air+pollution+tundra&source=web&ots=6VjdTK-vml&sig=6_fvlgFiP_S_7jH-o4KQhvjv-Cmo&hl=en&sa=X&oi=book_result&resnum=6&ct=result#PPA452,M1) – detailed source

**UNIT G3**  
**Section A**  
**Contemporary Themes and Research in Geography**

**Either, Theme 2(a) – Glacial Environments and their Management**

Key Question for investigation	Content	Teaching/learning approaches and resources
<p>1.1 What is a glacial system and what are the dynamics of glacial environments?</p>	<ol style="list-style-type: none"> <li>1. Glacier mass balance.</li> <li>2. The impact of climatic change on glacier budgets.</li> <li>3. The relationship between climatic fluctuations and the geomorphological work done by ice.</li> <li>4. Cold and warm based glaciers, their types and rates of movement.</li> </ol>	<p><b>Mass Balance</b></p> <ol style="list-style-type: none"> <li>1. The National Snow and Ice Data Center is now offering data in a more visible and interactive form to help people better understand the cryosphere.  <a href="http://nsidc.org/data/google_earth/">http://nsidc.org/data/google_earth/</a> provides further links to the site 'Greenland annual surface melt, 1979 – 2007'.</li> <li>1. A graphical comparison of the mass balance of three glaciers <a href="http://ak.water.usgs.gov/glaciology/">http://ak.water.usgs.gov/glaciology/</a></li> </ol> <p><b>Climate Change</b></p> <ol style="list-style-type: none"> <li>2. &amp; 4. An animation of the changing extent of the British &amp; Irish Ice Sheet from 38,000 to 10,000 years B.P (before present). <a href="http://gra.org.uk/British_Irish_animation.wmv">http://gra.org.uk/British_Irish_animation.wmv</a> <i>The colour shading indicates surface ice overlain with contours of the ice sheet surface . The red &amp; yellow hatching indicates basally decoupled <b>zones of fast flow</b> and ice streaming... It is these relatively short lived but highly dynamic phases of ice-streaming and fast-flow that are mainly responsible for the rich glacial geomorphological legacy that can be observed today.</i></li> <li>2.1 Maps of changing Icelandic glaciers  <a href="http://web.ges.gla.ac.uk/Breida/Breida.htm">http://web.ges.gla.ac.uk/Breida/Breida.htm</a> and  <a href="http://web.ges.gla.ac.uk/Breida/thoris.htm">http://web.ges.gla.ac.uk/Breida/thoris.htm</a></li> </ol>



Key Question for investigation	Content	Teaching/learning approaches and resources
		<p>2.2 The NASA Earth Observatory site always has some glacier related links. <a href="http://earthobservatory.nasa.gov/">http://earthobservatory.nasa.gov/</a></p> <p>2.&amp; 4. The NOAA web site, which is huge, provides basic information and much visual and video material. eg: education page <a href="http://nsidc.org/cryosphere/allaboutcryosphere.html">http://nsidc.org/cryosphere/allaboutcryosphere.html</a></p> <p>3. Glacial landforms can be linked to global events that changed climate. Eg: <b>The 'Younger Dryas'</b>, a short lived, but substantial, temperature fluctuation at the end of the last glacial cycle, probably driven by a massive influx of cold fresh water into the N Atlantic due to recession of American ice and release of ice-dammed lakes. Cooling was very rapid and resulted in re-growth of glaciers in upland Britain producing cirque moraines eg; Cwm Idwal, Brecon Beacons. Younger Dryas, The Ice Age's last big blast – BBC h2g2 <a href="http://www.bbc.co.uk/dna/h2g2/A760240">http://www.bbc.co.uk/dna/h2g2/A760240</a></p>
<p>1.2 What are the processes of glacial weathering and erosion and what are the resultant landforms?</p>	<p>1. Weathering and erosion in the glacial zone.</p> <p>2. Landforms of glacial erosion to include macro-scale, meso-scale and micro-scale landforms.</p>	<p>2. A great teaching tool is provided by the BRITICE project, which aimed to bring together all of the geomorphological evidence for <b>glaciation in Britain</b>: <a href="http://www.sheffield.ac.uk/geography/staff/clark_chris/britice.html">http://www.sheffield.ac.uk/geography/staff/clark_chris/britice.html</a> BRITICE - The British Ice Sheet – A compilation Geomorphological Map and GIS database of glacial landforms and features related to the last British Ice Sheet</p> <p>2. <b>Fieldwork to study combined 'landform-sediment assemblages'</b> (other examples of source material, techniques/skills and virtual field tours given below) Case study using <b>Snowdonia</b> Snowdonia National Park Authority Education Services <a href="http://www.eryri-npa.gov.uk/">http://www.eryri-npa.gov.uk/</a></p>
<p>1.3 What are the processes of glacial transport and deposition and what are the resultant landforms?</p>	<p>1. Transport and deposition in the glacial zone.</p> <p>2. Landforms of glacial and fluvioglacial deposition.</p>	<p>2.1 Background information on the location of many glacial features throughout the Snowdonia NP. This could be used for an initial planning to develop a field visit. <b>Glaciation – past and present effects.</b></p> <p>2.2 Virtual Field visit to Snowdonia Cwm Idwal virtual tour uses photographs, maps and background text to explore the glacial and post-glacial landforms of the Cwm Idwal area.</p>

Key Question for investigation	Content	Teaching/learning approaches and resources
<p>1.4 What are the effects of deglaciation on the landscape?</p>	<p>3. The effects of deglaciation on the landscape to include periglacial, fluvial and sub-aerial processes.</p>	<p>3. <b>Paraglaciatiion concept</b> - Glaciers change the landscape dramatically. When they melt the whole landscape is unstable and changes very rapidly, oversteepened slopes collapse [S Wales, Snowdonia etc.] Also there is a vast amount of loose, unvegetated debris. It is very quickly remobilized by processes like debris flow forming terraces and fans.</p> <p><b>Case study</b> eg: Glacial valley profiles, landslides in the <b>Rhondda</b>. Brabham, P.J., 2004. The Rhondda Valleys: Using GIS to visualize a variety of geological issues .. (Details below)</p> <p><b>Or</b> <b>E Anglia</b>. Word doc in geology_blakeneyEskerVI.2 <a href="http://www.bgs.ac.uk/education/blakeney/BlakeneyEsker.htm">http://www.bgs.ac.uk/education/blakeney/BlakeneyEsker.htm</a></p> <p><b>Or</b> Investigation of meltwater channels, <b>Swansea, Pembs, Lleyn</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources
<p>1.5 Why are glacial environments important?</p>	<ol style="list-style-type: none"> <li>1. The impact of glacial processes and landforms on human activity.</li> <li>2. The impact of human activities on glacial environments.</li> <li>3. Opportunities and limitations for human activity presented by the shift of the permafrost limit.</li> </ol>	<ol style="list-style-type: none"> <li>1. <b>Impact on humans</b> Glaciers feed some of the major rivers of the world. Glacial melting can <b>cause floods</b>. Case Study <b>Danube</b> Spring 2006. <a href="http://news.bbc.co.uk/1/hi/world/europe/4910126.stm">http://news.bbc.co.uk/1/hi/world/europe/4910126.stm</a> describes the impact through text, photos and video news report. It gives further links to follow. Case study. Melting glaciers in the <b>Himalayas</b> are creating moraine-dammed lakes and the sudden catastrophic drainage of these is creating great problems to settlements in Himalayan valleys. <a href="http://www.st-andrews.ac.uk/~dib2/research/ngozumpa.htm">http://www.st-andrews.ac.uk/~dib2/research/ngozumpa.htm</a> <a href="http://www.climatechange-gis.co.uk/glof.html">http://www.climatechange-gis.co.uk/glof.html</a> <b>Global</b> examples, tables, photos, block diagrams of types of <b>glacial hazard</b>. Economic consequences and threats to development. Risk management guidelines <a href="http://www.geologyuk.com/mountain_hazards_group/pdf/Chapters_1_4.pdf">www.geologyuk.com/mountain_hazards_group/pdf/Chapters_1_4.pdf</a></li> <li>2. <b>Impact and management of human activities</b> <b>Case study using</b> Snowdon on impact and management of human activities in glacial environments Snowdonia National Park Authority Education Services <a href="http://www.eryri-npa.gov.uk/">http://www.eryri-npa.gov.uk/</a> 2.1 <i>Facts about</i> Leisure and tourism impacts on Snowdonia' 2.2 Text and photographs of the effects and management of 'Footpath erosion in Snowdonia' 2.3 Background to conflicts that have arisen and analysis of different resultant management strategies within the Snowdon NP 'Glaciation – past and present effects'. 2.4 'Cwm Idwal' virtual tour gives background information and poses a real decision-making exercise. How should Snowdonia National Park manage the large numbers of Geography students visiting the area for fieldwork?</li> <li>2. <b>Alpine skiing</b> – shrinkage of glaciers, strategies for maintaining skiing/activities in ski resorts Facts on glacial shrinkage, strategy of wrapping glaciers. Link to Swiss academy of science – gives NBC video of Alps and strategy. <a href="http://www.verbinet.com/environment/glacial-meltdown">http://www.verbinet.com/environment/glacial-meltdown</a> An environmental evaluation of the use of snow cannons. <a href="http://www.independent.co.uk/travel/europe/where-has-all-the-snow-gone?">http://www.independent.co.uk/travel/europe/where-has-all-the-snow-gone?</a> Links to video of glacier wrapping, OECD report of economic consequences in ski resorts <a href="http://news.bbc.co.uk/1/hi/world/europe/4533945.stm">http://news.bbc.co.uk/1/hi/world/europe/4533945.stm</a></li> <li>3. <b>Permafrost</b> Effects and global map of projected reduced arctic permafrost by 2010 <a href="http://news.bbc.co.uk/1/hi/sci/tech/4120755.stm">http://news.bbc.co.uk/1/hi/sci/tech/4120755.stm</a>  The website for Global Terrestrial Network for Permafrost contains maps of monitoring sites <a href="http://www.gtnp.org/location_e.html">http://www.gtnp.org/location_e.html</a> The study of permafrost in Canada and includes information on methane hydrates <a href="http://gsc.nrcan.gc.ca/permafrost/index_e.php">http://gsc.nrcan.gc.ca/permafrost/index_e.php</a> <a href="http://news.bbc.co.uk/1/hi/world/6925853.stm">http://news.bbc.co.uk/1/hi/world/6925853.stm</a> The rush for the Arctic has become frenzied because the melting of parts of the polar ice cap will allow easier exploration for new sources of oil and gas. <a href="http://www.independent.co.uk/environment/climate-change/exclusive-">http://www.independent.co.uk/environment/climate-change/exclusive-</a> <a href="http://cires.colorado.edu/news/press/2004/04-12-13.html">http://cires.colorado.edu/news/press/2004/04-12-13.html</a> permafrost was a major factor in building the new railway across Tibet.</li> </ol>

Key Question for investigation	Content	Teaching/learning approaches and resources
1.6 What are the methods used to manage glacial environments and how successful are these strategies?	<ol style="list-style-type: none"> <li>1. Management of the impacts of glacial processes and landforms on human activity.</li> <li>2. Management of the impacts of human activities on glacial environments.</li> <li>3. Assessment of the success of strategies for managing either glacial processes/landforms <b>or</b> human activities.</li> </ol>	

## Resources

### General Texts

Many of the following suggestions, in addition to some of the teaching ideas mentioned above, are given by Danny McCarroll, Professor of Physical Geography, Swansea University.

The 'Big Bible' of glacial studies is now **Benn and Evans**, Glaciers and Glaciation, Arnold. A new edition is being written at the moment. It is too big to use as a text but teachers should certainly have a copy if they teach glacial studies at A level. It is packed full of examples. Good edited volumes, but again reference rather than class use: **Knight, P.G.** (ed.) 2006 Glacier Science And Environmental Change, Blackwell, Oxford. 512p. ISBN: 1405100184

Aimed at students **Knight P.G.** 2005 Glaciers And Glacial Landscapes, Geographical Association, Sheffield ISBN: 1 84377 097 0 '*Glaciers and glacial landscapes explores the relationships between the changing global environment, the characteristics of glaciers, and the impact of glaciation on both landscapes and human activity. Identifying the important processes in glaciology and glacial geomorphology, it encourages students to recognise the linkages both between global systems and local conditions and between past environments and present-day landscapes. The study of glaciers is increasingly important in the context of environmental change, and recent developments in the subject have seriously challenged traditional approaches. Glaciers and glacial landscapes not only reviews our basic understanding of glaciers within the global system, but also identifies ways in which that understanding is changing in response to new scientific research.*'

Peter Knight also has a website dedicated to teaching about glaciers, and it is all available free: <http://www.petergknight.com/glaciers/>

Mike Hambrey from Aberystwyth also is linked to a set of web resources for teachers at: <http://www.swisseduc.ch/glaciers/>

For practical work on sediment see

**Evans, D. J. A. & Benn, D. I.** 2004. A Practical Guide to the Study of Glacial Sediments. Arnold. ISBN: 0-340-75959-3

And for a modern view on glacial landform sediment assemblages: **Evans, D. J. A.** 2003. Glacial Landscapes. Hodder Arnold. ISSN/ISBN: 0-340-80665-6 (hbk), 0-340-80666-4 (pbk)

GIS

**Brabham, P.J.**, 2004. The Rhondda Valleys: Using GIS to visualize a variety of geological issues in an intensely mined area. p222-233. In: NICHOL, D., BASSETT, M.G., and DEISLER, V.K. (eds) Urban Geology in Wales,

## Background for Regional Fieldwork

The best guides for teachers are probably those produced by the **Geographical Association**:

[http://www.geography.org.uk/shop/shop\\_section.asp?section=5](http://www.geography.org.uk/shop/shop_section.asp?section=5) Some of these are a bit old now, but those for Skye, Assynt, Brecon Beacons and Snowdonia are very good and focused on glaciers.

The **Quaternary Research Association** publishes field guides associated with field trips, the web site and a list of guides is below. Most of the guides will include something glacial. One of the QRA technical guides is on describing Quaternary sediments. <http://qra.org.uk/> Price £10-20

<a href="#">North of Ireland</a>	2008	Whitehouse <i>et al.</i>
<a href="#">Brecon Beacons</a>	2007	Carr <i>et al.</i>
<a href="#">Somerset</a>	2006	Hunt & Haslett
<a href="#">Isles of Scilly</a>	2006	Scourse
<a href="#">Rossendale Forest &amp; Greater Manchester</a>	2005	Crofts
<a href="#">Central Western Ireland</a>	2005	Coxon
<a href="#">Mammals of Southern &amp; Eastern England (EuroMam)</a>	2004	Schreve
<a href="#">Nene Valley</a>	2004	Langford & Briant
<a href="#">Central Grampian Highlands</a>	2004	Luckas, <i>et al</i>
<a href="#">Isle of Man &amp; North West England</a>	2004	Chiverrell, <i>et al</i>
<a href="#">Glen Affric and Kintail</a>	2003	Tipping, R.M.
<a href="#">Western Highland Boundary</a>	2003	Evans, D.J.A.
<a href="#">South West Ireland</a>	2002	Harrison & Mighall
<a href="#">Central Germany (Thuringia)</a>	2002	Meyrick & Schreve
<a href="#">East Yorkshire and North Lincolnshire</a>	2001	Bateman <i>et al</i>
<a href="#">West Wales</a> (field meeting held in 2002)	2001	Walker & McCarroll
<a href="#">Norfolk and Suffolk</a>	2000	Lewis <i>et al</i>
<a href="#">Banffshire Coast and Buchan</a>	2000	Merritt
<a href="#">Dumfries &amp; Galloway</a>	1999	Tipping
<a href="#">West Cornwall</a>	1999	Scourse & Furze
<a href="#">North East England</a>	1999	Bridgland <i>et al.</i>

<a href="#">Kent &amp; Sussex</a>	1998	Murton, Whiteman <i>et al.</i>
<a href="#">Islay &amp; Jura</a>	1997	Dawson & Dawson
<a href="#">South Midlands &amp; Welsh Marches</a>	1997	Lewis & Maddy
<a href="#">Devon &amp; East Cornwall</a>	1996	Charman, Newnham & Croot
<a href="#">Cairngorms</a>	1996	Glasser & Bennett
<a href="#">Cumbria</a>	1994	Boardman & Walden
<a href="#">Central East Anglia &amp; the Fen Basin</a>	1991	Lewis, Whiteman & Bridgland
<a href="#">Beaulieu to Nairn</a>	1990	Auton, Firth & Merritt

No.7 <a href="#">Description &amp; Analysis of Quaternary Stratigraphic Field Sections</a>	1999	Jones <i>et al.</i>	£8.00	£14.00
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**Specifically for Wales see:**

**Lewis, CA and Richards, AE**, 2005, 'The glaciations of Wales and adjacent areas' Logaston Press, ISBN 1 904396 36 4

**Walker, M.J.C. and McCarroll, D.** (eds) 2001. The Quaternary of West Wales. Field Guide. Q.R.A. London.

**Snowdonia National Park** Case study material

Snowdonia National Park Authority Education Services

<http://www.eryri-npa.gov.uk/>

[http://www.tonya.me.uk/Marine/oxg2011\\_fieldtrip%20report.asp](http://www.tonya.me.uk/Marine/oxg2011_fieldtrip%20report.asp)

**The Quaternary of Wales**, a virtual field course <http://www.staffs.ac.uk/schools/sciences/geography/staff/harrist/quatuk/quatvirtualtop.htm>

is written for University students but teachers could pick out local areas, each of which have a discussion of current issues associated with the glacial areas of:

[Day 1 - North Wales](#)

[Day 2 - Mid-Wales](#)

[Day 3 - Pembroke](#)

[Day 4 - Gower](#)

[Day 5-Brecon](#)

[Ice Age Britain](#)

**Lake District**

**Smith, Alan**, 2008, The Ice Age in the Lake District, The landscapes of Cumbria no3, publisher Rigg side, ISBN 0-9544679-2-2

<http://www.riggside.co.uk/>

**Other Examples of Virtual fieldtrips**

**Lake District**

<http://www.intute.ac.uk/sciences/cgi-bin/fullrecord.pl?handle=20080629-20320528>

An interactive virtual fieldtrip of Bowscale Tarn and Bannerdale created by the Geography Department at the University of Nottingham. It includes an interactive map with various viewpoints showing terrain and geology and a video walk through. The site also provides a glossary of key terms and a help section.

**Glacier National Park, US**

[http://www.uwsp.edu/geo/faculty/lemke/gnp\\_vft/home.html](http://www.uwsp.edu/geo/faculty/lemke/gnp_vft/home.html)

An interactive virtual fieldtrip aimed at students, using photos, maps and sets of student activities.

**Esker – Blakeney, Norfolk**

<http://www.bgs.ac.uk/education/blakeney/BlakeneyEsker.htm>

In addition to the fieldtrip, word files include the origins and examples of many aspects of the glacial landscapes of E Anglia eg geology\_blakeneyEskerVI.2

**UNIT G3**  
**Section A**  
**Contemporary Themes and Research in Geography**

**Either, Theme 2(b) – Costal Environments and their Management**

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.1 What is a costal system and what are the dynamics of costal environments?</p>	<ul style="list-style-type: none"> <li>• The costal system.</li> <li>• Coastal sediment cells.</li>   <li>• The state of dynamic equilibrium in the coastal system.</li> <li>• Wave types and characteristics and their variations over space and time.</li> </ul>	<p><a href="http://www.bbc.co.uk/coast/archive/">http://www.bbc.co.uk/coast/archive/</a> is a useful introductory resource to coasts. Use the numbered links to view programme details</p> <p>Revise the concept of landforms as a system (G1 Key Question 2.4). Students to draw the costal system and identify inputs, flows, stores and outputs.</p> <p>Identify the eleven main littoral cells of England and Wales, making detailed reference to one sediment cell. See the end of the PowerPoint presentation in the A level resources section of:</p> <p><a href="http://www.geographyonthemap.com">http://www.geographyonthemap.com</a></p> <p><b>Students to work in pairs to make a presentation that describes and explains the movement of sediment in and characteristics of cell boundaries of a chosen sediment cell.</b></p> <p>A general model covering the concept of dynamic equilibrium can be found in Landform Systems by Bishop and Prosser, Collins Educational.</p> <p>Summary notes on wave types and characteristics can be found at: <a href="http://revision-notes.co.uk/A_Level/Geography/Waves/index.html">http://revision-notes.co.uk/A_Level/Geography/Waves/index.html</a> and <a href="http://www.geographypages.co.uk/ascoasts.htm">http://www.geographypages.co.uk/ascoasts.htm</a></p> <p>A useful worksheet can be found in the A level resources section of: <a href="http://www.geographyonthemap.com/">http://www.geographyonthemap.com/</a></p>





Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.3 What are the processes of marine transport and deposition and what are the resultant landforms?</p>	<ul style="list-style-type: none"> <li>• Transport and deposition in the coastal zone.</li> <li>• Landforms of coastal deposition.</li> <li>• Sea level rises and deposition.</li> </ul>	<p>A summary of coastal deposition can be found at:  <a href="http://revision-notes.co.uk/A_Level/Geography/Physical_Geography/Coastal_Geography/index.html">http://revision-notes.co.uk/A_Level/Geography/Physical_Geography/Coastal_Geography/index.html</a></p> <p><b>Students to use OS maps to identify landforms of coastal deposition.</b>  Support mapwork with photographic resources.</p> <p>A useful PowerPoint can be found in the A level resources section of:  <a href="http://www.geographyonthemap.com/">http://www.geographyonthemap.com/</a></p> <p><b>Students to draw diagrams of the following depositional features and annotate the diagrams to identify the processes responsible for the formation of:</b></p> <ul style="list-style-type: none"> <li>• Bay-head beaches</li> <li>• Spits, hooked spits, double spits</li> <li>• Off shore bars</li> <li>• Barrier Beach</li> <li>• Tombolo</li> <li>• Cuspate forelands</li> </ul> <p><b>Students to work in pairs to produce a presentation on the characteristics and processes responsible for <u>one</u> named and located landform of coastal deposition.</b></p> <p>A summary of sea level change can be found at:  <a href="http://revision-notes.co.uk/A_Level/Geography/Physical_Geography/Coastal_Geography/index.html">http://revision-notes.co.uk/A_Level/Geography/Physical_Geography/Coastal_Geography/index.html</a></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.4 What is the role of geology in the development of coastal landforms?</p>	<ul style="list-style-type: none"> <li>• Lithological controls on the development of coastal landforms.</li>   <li>• Structural controls on the development of coastal landforms</li> </ul>	<p>A detailed case study of Lulworth Cove which exemplifies the lithological and structural controls on the development of coastal landforms can be found at <a href="http://www.soton.ac.uk/~imw/Lulworth.htm">http://www.soton.ac.uk/~imw/Lulworth.htm</a>.</p> <p><b>Students to examine a variety of cliff profiles (cliffs with horizontal strata, rocks dipping gently seawards, rocks dipping steeply seawards, rocks dipping inland, rocks dipping inland but with joints at right angles to bedding planes) to describe and explain how geological structures can affect the form of a cliff. Students to place these cliff profiles in rank order of susceptibility to erosion and give reasons for ordering selected.</b></p> <p>Diagrams can be found in Landform Systems by Bishop and Prosser, Collins Educational.</p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
1.5 Why do coastal environments need to be managed?	<ul style="list-style-type: none"> <li>• The impact of coastal processes and landforms on human activity.</li>   <li>• The impact of human activities on coastal environments.</li> </ul>	<p>Introduce and explain the threats and opportunities of human activity associated with coastal erosion, coastal deposition and coastal landforms. <b>Students to research an example of coastal erosion causing cliff collapse e.g. Happisburg, Norfolk. <a href="http://www.happisburgh.org.uk/">http://www.happisburgh.org.uk/</a> coastal deposition making harbour entrances more difficult to navigate such as Poole Harbour in Dorset and coastal landforms attracting tourism such as the Pembrokeshire coast.</b></p> <p><b>Students to use OS map extracts of a coastal area (e.g. Jurassic coast) to identify different land uses including: agriculture, industry, communications, residential, recreation, leisure and conservation and undertake a role play exercise to debate the negative and positive impacts of human activities on the environment selected. A conflict matrix could be constructed.</b></p> <p>Or:</p> <p><b>Students to select 2 coastal areas (e.g. Lulworth Cove – see 1.6 below) and using the following criteria: biodiversity of area, aesthetic value, amenity value and vulnerability to human impacts score each area from 0 (no value) to 5 (high value). Identify ways in which both areas are threatened by human activities and evaluate the degree of environmental damage. Compare scores.</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.6 What are the methods used to manage coastal environments and how successful and how successful are these strategies?</p>	<ul style="list-style-type: none"> <li>• Management of the impacts of coastal processes and landforms on human activity.</li>   <li>• Management of the impacts of human activities on coastal environments.</li>   <li>• Assessment of the success of strategies for managing either coastal processes/landforms or human activities.</li> </ul>	<p><b>Students to look at a range of coastal management options through photographs and diagrams:</b>  <a href="http://www.geography-site.co.uk/pages/physical/coastal/defences.html">http://www.geography-site.co.uk/pages/physical/coastal/defences.html</a>  <a href="http://www.pupilvision.com/yearten/coastalimages2.htm">http://www.pupilvision.com/yearten/coastalimages2.htm</a>  <a href="http://www.georesource.co.uk/coastman.htm#L1">http://www.georesource.co.uk/coastman.htm#L1</a>  <a href="http://www.slideshare.net/fozzie/coastal-management-482930">http://www.slideshare.net/fozzie/coastal-management-482930</a>  <b>A useful free download on coastal management at Barton on Sea can be obtained from:</b>  <a href="http://www.curriculum-press.co.uk/demo/Web%20updates%20Jun09/Geog%20FS%20samples/207%20Coastal%20Management.pdf">http://www.curriculum-press.co.uk/demo/Web%20updates%20Jun09/Geog%20FS%20samples/207%20Coastal%20Management.pdf</a></p> <p><b>A useful article about the Management of Lulworth Cove can be found at:</b>  <a href="http://www.geographyteachingtoday.org.uk/fieldwork/resource/jurassic-coast-fieldwork-weekend/lulworth-cove-and-durdle-door">http://www.geographyteachingtoday.org.uk/fieldwork/resource/jurassic-coast-fieldwork-weekend/lulworth-cove-and-durdle-door</a></p> <p><b>Students to develop a case study which shows various types of strategies to manage coastal processes/landforms or human activities and the potential conflicts these can bring. Evaluate the success of strategies (economic, political, environmental, social). Discuss the role of sustainable and integrated approaches to coastal management SMPs and ICZM.</b></p>

## Theme 3: Climatic Hazards – Teaching and Learning Guide

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.1 How does global atmospheric circulation give rise to global climatic zones?</p>	<ul style="list-style-type: none"> <li>• Atmospheric movement.</li> <li>• The tri-cellular model: the Hadley, Ferrel and Polar cells.</li> <li>• The patterns of winds and the world's pressure belts.</li> </ul>	<p><b>Use the website:</b>  <a href="http://www.s-cool.co.uk/alevel/geography/introduction-to-weather-and-climate/atmospheric-circulation-and-motion.html">www.s-cool.co.uk/alevel/geography/introduction-to-weather-and-climate/atmospheric-circulation-and-motion.html</a>  <a href="http://geographyforone.wordpress.com/global-atmospheric-system/">http://geographyforone.wordpress.com/global-atmospheric-system/</a>  <a href="http://www.geography-revision.co.uk/circulation.htm">http://www.geography-revision.co.uk/circulation.htm</a>  for an overview of atmospheric circulation and the tri-cellular model.</p> <p><b>Students to draw their own diagram of convection cells and pressure belts</b> and superimpose (using tracing paper or acetate overlay) on the diagram the associated patterns of winds.</p>
<p>1.2 Why do seasonal and periodic variations of climate occur?</p>	<ul style="list-style-type: none"> <li>• Seasonal variations in the position of the Inter-Tropical Convergence Zone (ITCZ), the associated migration of the heat equator and movement of wind and pressure belts, the effects of warm and cool ocean currents and temperature differences between continental land masses and oceans.</li> <li>• Seasonal changes in precipitation, temperature, winds and pressure levels.</li> <li>• Periodic changes in climate.</li> </ul>	<p><b>Use the website:</b>  <a href="http://geographyforone.wordpress.com/itcz-and-africa/">http://geographyforone.wordpress.com/itcz-and-africa/</a>  to see an excellent animation of the ITCZ over Africa. Students can see how the ITCZ moves over Africa and the resulting seasonal variations in rainfall. Students can click on individual towns and cities to see climate graphs which also show you how rainfall and temperature varies with the seasons.</p> <p><b>Use the video and animations to help you understand the short term effects of El Nino</b> <a href="http://www.guardian.co.uk/flash/0,,641890,00.html">http://www.guardian.co.uk/flash/0,,641890,00.html</a></p> <p><b>Use the 'Hockey stick' graph to describe climate change over the last 1000 years.</b> International Panel for Climate Change [IPCC]  <a href="http://www.grida.no/climate/ipcc_tar/vol4/english/075.htm">http://www.grida.no/climate/ipcc_tar/vol4/english/075.htm</a></p> <p><b>Use the graphs in</b> <a href="http://www.ace.mmu.ac.uk/resources/gcc/5-3-1.html">http://www.ace.mmu.ac.uk/resources/gcc/5-3-1.html</a>  <b>to contrast the level and speed of climate change in the last 1000 years with that during the Quaternary Glaciation.</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.3 What are the world's major climates? What are the distinctive climatic characteristics of one chosen climatic type?</p>	<ul style="list-style-type: none"> <li>The main climatic types in tropical regions.</li> <li>The main climatic types in temperate regions.</li> <li>A chosen climatic type displays distinctive characteristics of temperature, precipitation, winds and pressure.</li> </ul>	<p><b>Use the website:</b> <a href="http://www.geography.learnontheinternet.co.uk/topics/climatezones.html#factor">http://www.geography.learnontheinternet.co.uk/topics/climatezones.html#factor</a> for an overview of world climate zones.</p> <p><b>Describe and compare the distribution of global climates using an atlas e.g. <i>WJEC Atlas</i></b></p> <p>Students need a broad knowledge and understanding of the world's major climates. However, detailed reference needs to be made to one climatic type only chosen from <b>either</b> a tropical <b>or</b> temperate region. Use standard A level texts such as 'Geography – An Integrated Approach' D. Waugh and associated text explanation.</p>
<p>1.4 What are the causes of low-pressure and high pressure hazards?</p>	<ul style="list-style-type: none"> <li>The role of jet streams and Rossby waves in controlling the formation of weather systems.</li> <li>Low pressure system formation and associated hazards of storms, tropical cyclones and tornadoes.</li> <li>High pressure system formation and associated hazards of drought in tropical climates or drought, frost and fog in temperate climates.</li> </ul>	<p><b>Use the website</b> <a href="http://www.s-cool.co.uk/alevel/geography/introduction-to-weather-and-climate/atmospheric-circulation-and-motion.html">www.s-cool.co.uk/alevel/geography/introduction-to-weather-and-climate/atmospheric-circulation-and-motion.html</a> for an overview of jet streams and Rossby waves</p> <p><b>Use the following to research the formation of Hurricane Katrina</b> <a href="http://serc.carleton.edu/research_education/katrina">http://serc.carleton.edu/research_education/katrina</a> (includes a PowerPoint presentation)</p> <p><b>Use the website:</b> <a href="http://www.geography.learnontheinternet.co.uk/topics/tornadohurricane.html">http://www.geography.learnontheinternet.co.uk/topics/tornadohurricane.html</a> to investigate the difference between a tornado and a hurricane.</p> <p><b>Use the following to research the formation of drought in Australia</b> <a href="http://www.skwirk.com/p-c_s-57_u-479_t-1306_c-5026/qld/sose-geography/disasters/natural-hazards/drought-and-drought-in-australia">http://www.skwirk.com/p-c_s-57_u-479_t-1306_c-5026/qld/sose-geography/disasters/natural-hazards/drought-and-drought-in-australia</a></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.5 What are the inter-relationships between human activity and climate?</p>	<ul style="list-style-type: none"> <li>• The short-term and long-term effects of low pressure climatic hazards on human activity.</li> <li>• The short-term and long-term effects of high pressure climatic hazards on human activity.</li> <li>• The impacts of human activity on climate in both the short and long term.</li> </ul>	<p><b>Tropical:</b>  <b>Use the following to research the short and long term effects of Hurricane Katrina</b>  <a href="http://serc.carleton.edu/research_education/katrina">http://serc.carleton.edu/research_education/katrina</a></p> <p><b>Use the following resource data to show how increased drought is affecting SE Australia.</b>  <i>WJEC A level Geography GG5 2004 – Murray Darling Basin</i>  <a href="http://www.independent.co.uk">http://www.independent.co.uk</a> The Epic Drought. Australia</p> <p><b>Temperate:</b>  <b>Use the website:</b>  <a href="http://www.geography-revision.co.uk/climatic_events.htm">http://www.geography-revision.co.uk/climatic_events.htm</a> for coverage of the <b>Great Storm of 1987 and the drought of 1976.</b>  <b>Use the NGfL Wales website to revise the green house effect and the influence humans have on this process.</b>  <a href="http://www.ngfl-cymru.org.uk/cc-greenhouse-effect-mainpage.htm">http://www.ngfl-cymru.org.uk/cc-greenhouse-effect-mainpage.htm</a></p> <p>Also use:</p> <ul style="list-style-type: none"> <li>• <a href="http://www.ukcip.org.uk/resources/publications/documents/UKCIP02_briefing.pdf">http://www.ukcip.org.uk/resources/publications/documents/UKCIP02_briefing.pdf</a> p5 summarises why scientists think recent climate change is due to human factors of greenhouse gas emissions.</li> <li>• <a href="http://www.drroyspencer.com/global-warming-natural-or-manmade/">http://www.drroyspencer.com/global-warming-natural-or-manmade/</a></li> <li>• An inconvenient truth. Al Gore. 2006, Bloomsbury. Book and film written to maximise impact of the issue of climate change. DVD circulated to all Welsh schools, WAG July 2007</li> </ul>



Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.6 What strategies are used to reduce the impact of climatic hazards?</p>	<ul style="list-style-type: none"> <li>• Strategies to reduce the impact of low-pressure climatic hazards.</li> <li>• Strategies to reduce the impact of high-pressure climatic hazards.</li> <li>• Strategies to reduce the impact of human activity on climate.</li> <li>• Assessment of the success of strategies for reducing <i>either</i> low pressure <i>or</i> high pressure climatic hazards.</li> </ul>	<p>See Chapter 5 'Atmospheric hazards' in 'Hazards and Responses' by Victoria Bishop, Collins</p> <p>Students' investigation into legislation at the national and international (Kyoto Treaty, Montreal Protocol) scales to control atmospheric pollution and emissions. What is their contribution to reducing emissions?</p> <p>(i) <b>Use the block diagram TS1 to describe the possible future ways of reducing CO<sub>2</sub></b> 2005 IPCC <a href="http://www.ipcc.ch/present/graphics.htm">http://www.ipcc.ch/present/graphics.htm</a></p> <p><b>Describe the Kyoto protocol.</b> <a href="http://en.wikipedia.org/wiki/Kyoto_Protocol">http://en.wikipedia.org/wiki/Kyoto_Protocol</a></p> <p><b>Research G8 Climate change strategies.</b></p> <p>(ii) <b>Complete a real decision making exercise addressed by the Welsh Assembly Government.</b> <b>Meeting the Kyoto Targets in Wales.</b> <a href="http://www.ngfl-cymru.org.uk/cc_as.htm">http://www.ngfl-cymru.org.uk/cc_as.htm</a> &gt; Activity: An A level enquiry question <b>OR</b> <b>What local government policies exist to reduce global warming in my area? How successful are these strategies?</b></p> <p><b>Evaluate</b> Channel 4 Dispatches – 'The great green smoke screen', July 2007 – a critical look at trading carbon emissions with LEDCs</p> <p>(iii) <b>In groups, choose a <i>Pressure group</i> you relate to, e.g.</b></p> <ul style="list-style-type: none"> <li>• Live Aid</li> <li>• Climate change Camps, Heathrow Aug 2007</li> <li>• Friends of the Earth <a href="http://www.foe.co.uk">http://www.foe.co.uk</a></li> <li>• Wales consumers <a href="http://www.wales-consumer.org.uk">http://www.wales-consumer.org.uk</a> 'CLIMATE CONCERN, Attitudes to climate change and wind farms in Wales' Sept 2004</li> <li>• WWF and Wildlife Trust 'Turning the Tide – <b>power from the sea</b> and protection for nature in Welsh waters'. March 2003 Marine update no. 54.</li> <li>• The Carbon Trust <a href="http://www.thecarbontrust.co.uk">http://www.thecarbontrust.co.uk</a></li> <li>• <a href="http://www.ourworldfoundation.org">http://www.ourworldfoundation.org</a>.</li> </ul> <p><b>Investigate the strategies they suggest for tackling climate change. How successful are the strategies? After reporting back hold a class debate to argue the best strategies.</b></p>

## Theme 4 – Development

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
1.1 What is Development and what is the Development Gap?	<ul style="list-style-type: none"> <li>• Changing definitions of development.</li> <li>• Conventional development divides. The development gap/continuum.</li> </ul>	<p>A general background to 'first', 'second' and 'third' world can be found at:  <a href="http://developmentgap.org/index.html">http://developmentgap.org/index.html</a></p> <p>The attempt to classify countries, and identify a divide, as in the Brandt Report, and follow up work based upon it, can be found at:  <a href="http://www.stwr.net/content/view/43/83/">http://www.stwr.net/content/view/43/83/</a></p> <p>An overview of the development gap, and supporting information can be found at:  <a href="http://developmentgap.org/index.html">http://developmentgap.org/index.html</a>  Determine how large a gap exists between selected countries at the extremes</p> <p>An up-to-date division of the world into developed areas, and various groupings of countries where development is still needed, can be found in the UN Millennium Development Goals reports, for example, for 2007 from  <a href="http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2007/UNSD_MDG_Report_2007e.pdf">http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2007/UNSD_MDG_Report_2007e.pdf</a></p> <p><b>Compare contemporary classifications of countries with current UN assessment.</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.2 How can development be measured and how useful are these measures?</p>	<ul style="list-style-type: none"> <li>• Simple and composite indicators used to measure development.</li> <li>• Qualitative indicators.</li> <li>• Limitations of indicators.</li> </ul>	<p>Reliable, up-to-date single indicators for countries can be obtained from the World Bank at: <a href="http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/">http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/</a>  <b>Use single indicators to compare countries identified at the extremes in the section above</b></p> <p>How the Human Development Index is calculated, and the most recent available data (years can be changed in address) can be found at: <a href="http://hdr.undp.org/en/media/hdr_20072008_tables.pdf">http://hdr.undp.org/en/media/hdr_20072008_tables.pdf</a>  <b>How well do single indicators reflect composite measures?</b></p> <p>An excellent alternative can be found at: <a href="http://www.economist.com/media/pdf/QUALITY_OF_LIFE.pdf">http://www.economist.com/media/pdf/QUALITY_OF_LIFE.pdf</a>  <b>Which measure describes development best?</b></p> <p>The Happy Planet Index, a qualitative indicator to give an indication of how it 'feels' to live in particular countries, can be found at: <a href="http://www.happyplanetindex.org/">http://www.happyplanetindex.org/</a>  <b>Is this a better way of identifying the quality of life within a country?</b></p> <p>In order to appreciate some of the limitations of indicators used to examine development, <b>complete the activity found at:</b> <a href="http://www.bized.co.uk/educators/16-19/economics/development/activity/indicators.htm">http://www.bized.co.uk/educators/16-19/economics/development/activity/indicators.htm</a></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.3 What factors have led to contemporary differences in development?</p>	<ul style="list-style-type: none"> <li>Physical, economic, social, political and cultural factors affecting the rate and nature of development.</li> <li>The globalisation of economic activity and the rise of NICs/RICs and oil rich countries.</li> </ul>	<p>A good summary of a range of views on development, including Rostow and Myrdal can be found in <i>New Patterns: Process and Change in Human Geography</i>, by Michael Carr, Nelson, 1999</p> <p><b>List factors that have historically favoured or hindered development</b></p> <p>Alternative views about poorly developed countries emphasising dependency as a more important force than development are summarised in:  <a href="http://www.revision-notes.co.uk/revision/619.html">http://www.revision-notes.co.uk/revision/619.html</a></p> <p><b>Assess whether countries are poor because of a lack of development or because of over dependency.</b></p> <p>The globalisation of economic activity, and a wealth of supporting data, is very clear from the OECD:  <a href="http://www.realinstitutoelcano.org/materiales/docs/OCDE_handbook.pdf">http://www.realinstitutoelcano.org/materiales/docs/OCDE_handbook.pdf</a></p> <p><b>On a world map, identify regions where major changes in employment and economic development are taking place.</b></p> <p>Useful information on globalisation and the limited development of most parts of Africa can be found at:  <a href="http://www.postcolonialweb.org/africa/akindele1b.html">http://www.postcolonialweb.org/africa/akindele1b.html</a></p> <p><b>Explain why most of Africa has experienced limited development</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.4 How and why are development patterns changing?</p>	<ul style="list-style-type: none"> <li>• Contemporary global development divisions.</li> <li>• Development issues in a changing world to include sustainable development and the status of women.</li> <li>• Economic change resulting in differentiation between different groups of countries.</li> </ul>	<p>A clear and innovative view of the current state of development throughout the world can be found at:  <a href="http://www.sasi.group.shef.ac.uk/worldmapper/posters/worldmapper_map173_ver5.pdf">http://www.sasi.group.shef.ac.uk/worldmapper/posters/worldmapper_map173_ver5.pdf</a>  <b>Compare this division of world countries, and the method of portrayal, with earlier methods of world classification.</b></p> <p>Other ways of viewing development, such as from the gender equality perspective can be viewed from the same source:  <a href="http://www.sasi.group.shef.ac.uk/worldmapper/posters/worldmapper_map173_ver5.pdf">http://www.sasi.group.shef.ac.uk/worldmapper/posters/worldmapper_map173_ver5.pdf</a></p> <p>Detailed data on gender equality can be found in the annual UN human development reports, e.g.:  <a href="http://hdr.undp.org/en/reports/global/hdr2007-2008/">http://hdr.undp.org/en/reports/global/hdr2007-2008/</a>  <b>How important is gender equality as a measure of development compared to other indicators?</b></p> <p>Sustainable development in China is outlined in  <a href="http://www.iisd.org/pdf/2004/measure_sdsip_china.pdf">http://www.iisd.org/pdf/2004/measure_sdsip_china.pdf</a>  <b>Compare the sustainability of development in China with that of an established developed economy of either North America or Western Europe.</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.5 What hinders the closing of the development gap?</p>	<ul style="list-style-type: none"> <li>• The burden of Third World Debt.</li> <li>• Trade blocs.</li> <li>• Social constraints and cultural barriers.</li> </ul>	<p>The causes of Third World debt, and the impact it can have on countries can be found at: <a href="http://www.globalissues.org/TradeRelated/Debt.asp">http://www.globalissues.org/TradeRelated/Debt.asp</a></p> <p>The complexities of debt, and their consequences are made clear at: <a href="http://www.wdm.org.uk/campaigns/debt/debt4.htm">http://www.wdm.org.uk/campaigns/debt/debt4.htm</a></p> <p><b>Describe the origins of debt for indebted countries, and outline the handicap that debt presents for achieving development.</b></p> <p>An excellent introduction to world trading blocs and the impact and their benefits is outlined at: <a href="http://news.bbc.co.uk/1/hi/business/3077494.stm">http://news.bbc.co.uk/1/hi/business/3077494.stm</a></p> <p><b>Explain how trading blocs stimulate growth and development for their member countries.</b></p> <p><b>What impact do they have on economies outside the bloc?</b></p> <p>Some of the barriers to development created by social and cultural constraints can be seen from the Gender Related data in the Human Development reports <a href="http://hdr.undp.org/en/">http://hdr.undp.org/en/</a></p> <p><b>How far is gender inequality a constraint on development?</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.6 What types of strategies exist for reducing the development gap and how effective are these strategies?</p>	<ul style="list-style-type: none"> <li>• Different types of aid: bilateral, multilateral and emergency aid.</li> <li>• Free trade and fair trade.</li> <li>• Foreign direct investment and the role of TNCs.</li> <li>• Debt rescheduling, debt abolition and debt for conservation swaps.</li> </ul>	<p>A guide to the types of aid that are possible is given at:  <a href="http://www.scalloway.org.uk/adobe/1aid.pdf">http://www.scalloway.org.uk/adobe/1aid.pdf</a>  <b>How does emergency aid differ from structural aid?</b></p> <p>The Highly Indebted Poor Countries initiative is a major programme to develop very poor countries. A good starting point to identify them, and to find supporting information is at;  <a href="http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTDEBTDEPT/0,,contentMDK:20260049~menuPK:64166739~pagePK:64166689~piPK:64166646~theSitePK:469043,00.html">http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTDEBTDEPT/0,,contentMDK:20260049~menuPK:64166739~pagePK:64166689~piPK:64166646~theSitePK:469043,00.html</a>  <b>Compare the effectiveness of the HIPC initiative with the Make Poverty History campaign.</b></p> <p>The UN Millennium Development Goals can be found in Economy and Development by David Burtenshaw, Philip Allan, 2008. Progress can be checked at;  <a href="http://www.undp.org/mdg/">http://www.undp.org/mdg/</a>  <b>Identify the goals and check on progress</b></p> <p>The impact of EU dumping of sugar, and solutions to the problem are detailed in:  <a href="http://www.maketrade.com/en/assets/english/bp61_sugar_dumping.pdf">http://www.maketrade.com/en/assets/english/bp61_sugar_dumping.pdf</a></p> <p>Making trading terms equal on all sides can help development. The Fairtrade Foundation gives details at:  <a href="http://www.fairtrade.org.uk/what_is_fairtrade/default.aspx">http://www.fairtrade.org.uk/what_is_fairtrade/default.aspx</a>  <b>Assess whether aid or trade is the best way of overcoming poverty and bringing about development.</b></p> <p>Directly investing in countries both by other governments or MNCs very often stimulates economic development once past a 'take off stage'. Detailed information at:  <a href="http://eng.ifez.go.kr/guide/org/foreign-direct-investment.asp">http://eng.ifez.go.kr/guide/org/foreign-direct-investment.asp</a>  Identify examples where FDI has brought about economic development, and where early withdrawal caused problems.</p> <p>Various forms of international debt management can be found at:  <a href="http://www.derby.ac.uk/geography/jollyfranc/third_world_debt.htm">http://www.derby.ac.uk/geography/jollyfranc/third_world_debt.htm</a></p> <p>Both governments and NGOs have become involved in removing debt in exchange for environmental protection, see  <a href="http://www.worldwildlife.org/conservationfinance/swaps.cfm">http://www.worldwildlife.org/conservationfinance/swaps.cfm</a>  Assess the relative merits of debt cancellation, debt rescheduling and debt-for-nature exchanges.</p>

## Theme 5 – Globalisation

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.1 What is globalisation and global shift?</p>	<ul style="list-style-type: none"> <li>• Concepts of cultural, economic, environmental and political globalisation.</li> <li>• The evolution of globalisation – stages in its development.</li> <li>• • The global shift as the movement of economic activities.</li> </ul>	<p><b>Write the words “globalisation” and “global shift” on the board and ask students to contribute definitions.</b> Use the following resources to provide them with a definition: Part 3 in “Economy and Development” by David Burtenshaw: Philip Allan; Chapter 1 in “Globalisation” by Paul Guinness: Hodder &amp; Stoughton; Geo Factsheet 172. <a href="http://www.curriculum-press.co.uk">www.curriculum-press.co.uk</a>. Page 15 in “Economy and Development” by David Burtenshaw: Philip Allan introduces concepts of cultural, economic, environmental and political globalisation.</p> <p><b>Use the website:</b> <a href="http://www.geographyalltheway.com/ib_geography/ib_globalization/definitions_globalization.htm">http://www.geographyalltheway.com/ib_geography/ib_globalization/definitions_globalization.htm</a> Use the cartoon to examine students’ concepts of globalisation. Use the outline on the tasksheet and ask students to draw what they are wearing. For each item of clothing, accessories and 'attachments' (mobile phone, mp3 player, watch) find out where it was made and mark that information on the image. Fill in the countries that students have visited and then click 'go' to produce a world map to show their travels. How much 'more' global are they than their classmates and their teachers?</p> <p><b>Class debate on ‘when did globalisation begin?’</b> Three hypotheses have been proposed: (i) the process has operated since the dawn of history with sudden and recent acceleration; (ii) the process is contemporaneous with modernisation and the development of capitalism; (iii) the process is a recent phenomenon use p.10-17 of “Globalisation” by Paul Guinness: Hodder &amp; Stoughton. Students to identify which hypothesis they support and give reasons.</p> <p><b>Use the website for a brief appreciation of Rostow’s model as a basis for developing the concept of globalisation:</b> <a href="http://www.geographyalltheway.com/ib_geography/ib_development/ib_development_models.htm">http://www.geographyalltheway.com/ib_geography/ib_development/ib_development_models.htm</a> to place Kenya into the correct stage of Rostow’s model. Use the overview of the history, politics and economy sections of <a href="#">Wikipedia</a>* to try and determine which stage of the Rostow Model other countries are in. Try <a href="#">Sri Lanka</a>, <a href="#">India</a>, <a href="#">Pakistan</a>, <a href="#">Bangladesh</a>, <a href="#">Mauritius</a> and <a href="#">Guatemala</a>.</p> <p><b>Investigate briefly the validity of the Brandt line</b> Are there countries in Brandt’s ‘North’ that should be in the ‘South’ and are there countries in the ‘South’ that should be in the ‘North’? Prepare the case for the ‘promotion’ or ‘demotion’ of one country. Does a ‘different’ North/South divide exist?</p> <p><b>Use Figure 11 on page 15 in “Economy and Development” by David Burtenshaw to illustrate the stages of global shift.</b> Compare the factors that have influenced the global shift in two regions of North East England (local scale) and Taiwan (global scale)</p>



Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.2 What factors have led to current economic globalisation?</p>	<ul style="list-style-type: none"> <li>• Financial factors such as investment.</li> <li>• Computer technologies.</li> <li>• Transport and communication technologies.</li> <li>• The role of the World Trade Organisation.</li> <li>• Trade Blocs</li> </ul>	<p><b>Each student or group of students to research one factor responsible for current economic globalisation from the following:</b>                      financial factors; computer technologies; transport and communication technologies; the role of the WTO ; Trade Blocs <b>and present their findings.</b>                      A summary of some of these factors can be found in the amplification of Theme 5 in this guide and on p.14 of “Economy and Development” by David Burtenshaw; information on computer technologies on p.50 of “Globalisation” by Paul Guinness: Hodder &amp; Stoughton; information on WTO at <a href="http://wto.org/">http://wto.org/</a> . Use also Geo Factsheet 172. <a href="http://www.curriculum-press.co.uk">www.curriculum-press.co.uk</a></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.3 How have companies globalised and shifted locations?</p>	<ul style="list-style-type: none"> <li>• Global companies - TNCs/MNCs.</li> <li>• The patterns of global manufacturing shift.</li> <li>• Location factors for the global shift.</li> <li>• Service sector shifts.</li> <li>• The impact of outsourcing and offshoring</li> </ul>	<p><b>Use a world map to indicate the HQ distribution and type of the 20 major global companies</b> listed in the Global 500 Report shown in Table 5 in “Economy and Development” by David Burtenshaw. This can be updated annually from FT Global 500.</p> <p>Geofile 464 Globalisation mini case studies Examples in Burtenshaw and Guinness</p> <p>This section is perhaps best completed by considering a few individual examples of manufacturing companies and service sector companies which exhibit globalisation traits. World locations can be studied with the reasons for those locations.</p> <p><b>Manufacturing</b> Wimbledon Tennis Balls Nike Intel Dell Airbus Volkswagen (Geo Factsheet 138 Changes in the European Car Industry)</p> <p><b>Tertiary</b> Wal-mart Citi-group Call centres to India</p> <p><b>Use p. 60-66 of “Economy and Development” by David Burtenshaw and Figure 35 to make up a ranking table</b> to show the top 5 countries in terms of their offshore location attractiveness costs, business environment and people skills/availability. Video link: Outsourcing and offshoring <a href="http://www.youtube.com/watch?v=5ZwCDYLCIPM">http://www.youtube.com/watch?v=5ZwCDYLCIPM</a></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.4 Who wins from the global shift and globalisation?</p>	<ul style="list-style-type: none"> <li>• Global development indicators that identify NICs and RICs.</li> <li>• The rise of the NICs/ Asian Tigers.</li> <li>• Benefits of being an NIC, and benefits to investing countries.</li> <li>• The rising superpowers India and China.</li> </ul>	<p><b>Use Table 8 in “Economy and Development” by David Burtenshaw and list the development indicators of one NIC and one RIC and compare them with comparative indicators for the UK.</b> Reliable, up-to-date single indicators for countries can be obtained from the World Bank at: <a href="http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/">http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/</a>. <b>Use also Geofactsheet 243 ‘Measuring Globalisation’ <a href="http://www.curriculum-press.co.uk">www.curriculum-press.co.uk</a></b></p> <p><b>Use Case Study 4 in “Economy and Development” by David Burtenshaw to document the rise of Malaysia, a second-generation NIC</b></p> <p><b>Students to divide a piece of paper into 2 columns: benefits to NICs and benefits to investing countries and use p 66/67 of “Economy and Development” by David Burtenshaw to list the costs and benefits of globalisation for RICs such as India.</b></p> <p><b>Use Case Study 5 in “Economy and Development” by David Burtenshaw to document the rise of India and China</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.5 Who loses from global shift and globalisation?</p>	<ul style="list-style-type: none"> <li>• The negative effects of being an NIC socially and environmentally.</li> <li>• Factors leading to deindustrialisation.</li> <li>• Changing employment in MEDCs.</li> <li>• The environmental effects of globalisation.</li> </ul>	<p><b>Complete the worksheet ‘Is globalisation Good or Bad’ from:</b>  <a href="http://www.geographyalltheway.com/ib_geography/ib_globalization/imagesetc/ib_globalization_good_or_bad.doc">http://www.geographyalltheway.com/ib_geography/ib_globalization/imagesetc/ib_globalization_good_or_bad.doc</a></p> <p><b>Research, find, read, print and annotate two news articles related to Globalization</b> - one with a positive view and one with a negative view. See also Geofactsheet 49: Transnational corporations - the problem or the solution? <a href="http://www.curriculum-press.co.uk">www.curriculum-press.co.uk</a>.</p> <p><b>Use Case Study 3 of Saarland in “Economy and Development” by David Burtenshaw to make notes</b>  or Geofile 439 Industrial Change in the North East Region</p> <p><b>Use Figure 19 in to describe and explain employment trends</b> in coal mining and iron and steel production in the Saarland 1950-2002.</p> <p><b>Use the question and mark scheme</b> for Specimen Question 5.2 in the Specimen Assessment Materials at <a href="http://www.wjec.co.uk/uploads/publications/1795.pdf">http://www.wjec.co.uk/uploads/publications/1795.pdf</a> and ‘Using case studies 7’ in “Economy and Development” by David Burtenshaw to apply your case studies.</p> <p><b>Use the question and mark scheme</b> for Specimen Questions 5.1 in the Specimen Assessment Materials at <a href="http://www.wjec.co.uk/uploads/publications/1795.pdf">http://www.wjec.co.uk/uploads/publications/1795.pdf</a></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.6 What are the causes and effects of political and cultural globalisation?</p>	<ul style="list-style-type: none"> <li>• Empires and super power status.</li> <li>• Westernisation.</li> <li>• The rise and re-emergence of other cultures.</li> <li>• Cultural integration.</li> <li>• Globalisation and the Development gap.</li> </ul>	<p><b>Use the website:</b>  <a href="http://www.geographyalltheway.com/ib_geography/ib_globalization/definitions_globalization.htm">http://www.geographyalltheway.com/ib_geography/ib_globalization/definitions_globalization.htm</a>            Watch the video clip and ask students to note down eight global facts that have either economic, cultural or political implications.</p> <p><b>Use the table found in the amplification of Theme 5 in this guide to produce spider diagrams to identify the:</b>  <b>(a) causes and</b>  <b>(b) effects of</b>  <b>political and cultural globalisation –</b></p> <p><b>Use p.131 of “Globalisation” by Paul Guinness: Hodder &amp; Stoughton; to debate the tensions between globalisation and religious fundamentalism.</b></p> <p><b>Research different lifestyles in</b>  <a href="http://www.geographyalltheway.com/ib_geography/ib_globalization/first_contact.htm">http://www.geographyalltheway.com/ib_geography/ib_globalization/first_contact.htm</a>            to undertake a detailed investigation into the impact of globalization on the culture of an indigenous population.  <a href="http://www.geographyalltheway.com/ib_geography/ib_globalization/indigenous_popn_project.htm">http://www.geographyalltheway.com/ib_geography/ib_globalization/indigenous_popn_project.htm</a>            to undertake a detailed investigation into the impact of globalization on the culture of an indigenous population. The investigation will lead students to understand the forces that lead to changes and the consequences of those changes.</p> <p><b>Use also <a href="http://www.ecotourismkenya.org/index.php">http://www.ecotourismkenya.org/index.php</a> to investigate the preservation of traditional cultural identities</b> in the face of changes brought about by tourism in Kenya.</p>

[Wikipedia](#)\* – students need to be made aware that this source may contain inaccuracies.

## TEACHING/LEARNING PLANS FOR G3 Theme 6 – Emerging Asia

## Theme 6a – China

Key question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
1.1 What are the main physical and demographic characteristics of the country of China?	<ul style="list-style-type: none"> <li>• A brief overview at the national scale of patterns of:               <ul style="list-style-type: none"> <li>(i) climate</li> <li>(ii) relief, drainage and water availability</li> <li>(iii) natural resources</li> <li>(iv) population distribution</li> <li>(v) regional differences in levels of development</li> </ul> </li> </ul>	<p>These maps of China illustrate the variation in physical characteristics across the country. Look particularly at distances and the differences between regions.</p> <p>Physical regions <a href="http://www.worldatlas.com/webimage/countrys/asia/cnlarge.htm">http://www.worldatlas.com/webimage/countrys/asia/cnlarge.htm</a></p> <p>Transport <a href="http://www.lib.utexas.edu/maps/middle_east_and_asia/china_pol01.pdf">http://www.lib.utexas.edu/maps/middle_east_and_asia/china_pol01.pdf</a></p> <p>Resources <a href="http://www.lib.utexas.edu/maps/middle_east_and_asia/china_fuels_83.jpg">http://www.lib.utexas.edu/maps/middle_east_and_asia/china_fuels_83.jpg</a></p> <p>For a clickable map of the Provinces see <a href="http://hua.umf.maine.edu/Chinese/maps/chinese_map.html">http://hua.umf.maine.edu/Chinese/maps/chinese_map.html</a></p> <p>For a wide selection of population and social indices for China and the provinces refer to the Human Development Report National Report on China. See pages 148 to the end for data tables.  <a href="http://hdr.undp.org/en/reports/nationalreports/asiathepacific/china/china_2005_en.pdf">http://hdr.undp.org/en/reports/nationalreports/asiathepacific/china/china_2005_en.pdf</a></p>

Key question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.2 Why and how is the economy changing?</p>	<ul style="list-style-type: none"> <li>• Changes in economic policies.</li> <li>• New industries in the changing economy.</li> <li>• Factors affecting the growth of new industries and the contrast between coastal areas and the interior.</li> <li>• Impact of the changing age structure on the economy.</li> </ul>	<p>See NGfL Cymru for an overview of the Chinese economy.</p> <p>For an overview of China's history, economy and politics look at <u>The Economist Country Briefings</u>. These are regularly updated and include fact sheets and economic data.  <a href="http://www.economist.com/countries/China/">http://www.economist.com/countries/China/</a></p> <p>See also <u>China Today</u>, a source of many links to the economy and other aspects of Chinese life. <a href="http://www.chinatoday.com/">http://www.chinatoday.com/</a></p> <p>Newspapers such as <u>China Daily</u> offer accessible articles and news about the Chinese economy. <a href="http://www.chinadaily.com.cn/china/">http://www.chinadaily.com.cn/china/</a></p> <p>The nature of the changing economy is shown in the <u>Newsnight</u> video in China: reports on China's economic health.  <a href="http://www.bbc.co.uk/mediaselector/check/player/nol/newsid_5090000/newsid_5098800?direct=5098878.stm&amp;news=1&amp;nbwm=1&amp;bbwm=1&amp;bbram=1&amp;nbram=">http://www.bbc.co.uk/mediaselector/check/player/nol/newsid_5090000/newsid_5098800?direct=5098878.stm&amp;news=1&amp;nbwm=1&amp;bbwm=1&amp;bbram=1&amp;nbram=</a></p> <p>See the World Bank site for an overview of China's economy and its development projects  <a href="http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,contentMDK:20771332~isCURL:Y~menuPK:318981~pagePK:1497618~piPK:217854~theSitePK:318950,00.html">http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,contentMDK:20771332~isCURL:Y~menuPK:318981~pagePK:1497618~piPK:217854~theSitePK:318950,00.html</a></p> <p>World Bank Country Brief on China at  <a href="http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,menuPK:318960~pagePK:141132~piPK:141107~theSitePK:318950,00.html">http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,menuPK:318960~pagePK:141132~piPK:141107~theSitePK:318950,00.html</a></p>

Key question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.3 What are the economic and social challenges facing rural communities?</p>	<ul style="list-style-type: none"> <li>• Changes in the organisation of agriculture and rural economic activities.</li> <li>• The effect of population policies in rural areas.</li> <li>• The impacts and challenges for rural areas of migration.</li> <li>• Social welfare services such as health and education.</li> <li>• Sustainable development.</li> </ul>	<p>See NGfL Cymru for an introduction to rural</p> <p>Rural development in China from the World Bank  <a href="http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,contentMDK:20534329~isCURL:Y~menuPK:318981~pagePK:1497618~piPK:217854~theSitePK:318950,00.html">http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,contentMDK:20534329~isCURL:Y~menuPK:318981~pagePK:1497618~piPK:217854~theSitePK:318950,00.html</a></p> <p>For a short paper on Population dynamics and vulnerability in rural China see the IDS paper  <a href="http://www.id21.org/society/s5cnm1g4.html">http://www.id21.org/society/s5cnm1g4.html</a></p> <p>Poverty, inequality, and social disparities during China's economic reform are discussed at  <a href="http://www.eldis.org/go/country-profiles&amp;id=32129&amp;type=Document">http://www.eldis.org/go/country-profiles&amp;id=32129&amp;type=Document</a> This is a summary of a World Bank paper on China.</p> <p>The impact of China's economic boom on family life means that some families are under threat in China.  China's economic boom has fractured family life with millions of people moving to the city for work. A look at rural-urban inequalities.  <a href="http://www.bbc.co.uk/mediaselector/check/player/nol/newsid_7070000/newsid_7079200?redirect=7079248.stm&amp;news=1&amp;nbram=1&amp;bbram=1&amp;bbwm=1&amp;nbwm=1&amp;asb=1">http://www.bbc.co.uk/mediaselector/check/player/nol/newsid_7070000/newsid_7079200?redirect=7079248.stm&amp;news=1&amp;nbram=1&amp;bbram=1&amp;bbwm=1&amp;nbwm=1&amp;asb=1</a></p> <p>Economic growth puts pressure on rural villages. Industrialisation brings development and wealth but also conflicts with traditional rural life. In White Horse village in a remote part of China, villagers continue their fight against plans that could wipe out their community. Economic and social problems facing the rural communities. (21 min)  <a href="http://www.bbc.co.uk/mediaselector/check/player/nol/newsid_7050000/newsid_7050000?redirect=7050079.stm&amp;news=1&amp;nbwm=1&amp;bbwm=1&amp;bbram=1&amp;nbram=1">http://www.bbc.co.uk/mediaselector/check/player/nol/newsid_7050000/newsid_7050000?redirect=7050079.stm&amp;news=1&amp;nbwm=1&amp;bbwm=1&amp;bbram=1&amp;nbram=1</a></p>



Key question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.4 What are the economic and social challenges facing urban communities?</p>	<ul style="list-style-type: none"> <li>• Changes in the organisation of economic activities in urban areas.</li> <li>• Migration to urban areas and increasing social inequality.</li> <li>• Social welfare services such as health, education and housing.</li> <li>• Increasing rural-urban inequalities</li> <li>• Sustainable development in towns and cities.</li> </ul>	<p>See notes on NGfL Cymru</p> <p>Millions of Chinese are moving from the countryside to China's new mega-cities as the economic boom continues.  <a href="http://www.bbc.co.uk/mediaselector/check/player/nol/newsid_5400000/newsid_5408300?redirect=5408330.stm&amp;news=1&amp;bbwm=1&amp;nbram=1&amp;bbram=1&amp;nbwm=1">http://www.bbc.co.uk/mediaselector/check/player/nol/newsid_5400000/newsid_5408300?redirect=5408330.stm&amp;news=1&amp;bbwm=1&amp;nbram=1&amp;bbram=1&amp;nbwm=1</a></p> <p>The World Bank has a number of resources on urbanisation in China. Start with <a href="http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,contentMDK:20456117~isCURL:Y~menuPK:318981~pagePK:1497618~piPK:217854~theSitePK:318950,00.html">http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,contentMDK:20456117~isCURL:Y~menuPK:318981~pagePK:1497618~piPK:217854~theSitePK:318950,00.html</a> and there are further links.</p>
<p>1.5 What are the effects of globalisation on China?</p>	<ul style="list-style-type: none"> <li>• The role of foreign firms in changing and developing the economy.</li> <li>• The importance of exports and the role of the WTO.</li> <li>• The economic and political impacts of China's trade with the rest of the world.</li> </ul>	<p>For a comprehensive discussion of China in the world see 'China's new role in Africa and the South. This is a substantial book of articles with a clear and useful list of contents.  <a href="http://www.fahamu.org/downloads/china_2.pdf">http://www.fahamu.org/downloads/china_2.pdf</a></p> <p>China and the WTO <a href="http://www.businessweek.com/2000/00_23/b3684109.htm">http://www.businessweek.com/2000/00_23/b3684109.htm</a></p> <p>See pages 3 – 12 summary of China in WTO 2007  <a href="http://www.ustr.gov/assets/Document_Library/Reports_Publications/2007/asset_upload_file625_13692.pdf">http://www.ustr.gov/assets/Document_Library/Reports_Publications/2007/asset_upload_file625_13692.pdf</a></p>

Key question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.6 What are the environmental challenges and solutions facing China?</p>	<ul style="list-style-type: none"> <li>• The causes and consequences of               <ol style="list-style-type: none"> <li>(i) soil erosion</li> <li>(ii) industrial pollution</li> <li>(iii) sustainable use of water resources</li> <li>(iv) the need for energy supplies</li> </ol> </li> <li>• The balance between economic growth and sustainable development.</li> </ul>	<p>A comprehensive World Bank overview is found at <a href="http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,contentMDK:20266322~isCURL:Y~menuPK:318981~pagePK:1497618~piPK:217854~theSitePK:318950,00.html">http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,contentMDK:20266322~isCURL:Y~menuPK:318981~pagePK:1497618~piPK:217854~theSitePK:318950,00.html</a></p> <p>Rapid economic growth and mass migration are seriously affecting China's water supplies. There is a severe water crisis in urban areas. <a href="http://www.bbc.co.uk/mediaselector/check/player/nol/newsid_6330000/newsid_6336500?redirect=6336531.stm&amp;news=1&amp;bbram=1&amp;nbram=1&amp;bbwm=1&amp;nbwm=1">http://www.bbc.co.uk/mediaselector/check/player/nol/newsid_6330000/newsid_6336500?redirect=6336531.stm&amp;news=1&amp;bbram=1&amp;nbram=1&amp;bbwm=1&amp;nbwm=1</a></p> <p>For a review of the energy consumption habits of a family in Shanghai see 5 Carbon Lives: China <a href="http://www.bbc.co.uk/mediaselector/check/player/nol/newsid_7130000/newsid_7137200?redirect=7137233.stm&amp;news=1&amp;bbwm=1&amp;bbram=1&amp;nbwm=1&amp;nbram=1&amp;asb=1">http://www.bbc.co.uk/mediaselector/check/player/nol/newsid_7130000/newsid_7137200?redirect=7137233.stm&amp;news=1&amp;bbwm=1&amp;bbram=1&amp;nbwm=1&amp;nbram=1&amp;asb=1</a></p>

**TEACHING/LEARNING PLANS FOR G3 Theme 6 – Emerging Asia**

**Theme 6b – India**

<b>Key questions for investigation</b>	<b>Content</b>	<b>Teaching/learning approaches and resources – bold statements give the student activity</b>
<p>1.1 What are the main physical and demographic characteristics of the country of India?</p>	<ul style="list-style-type: none"> <li>• Variations in climate (temperature and rain fall throughout India</li> <li>• Patterns of relief, drainage and water availability</li> <li>• Distribution of natural resources in India</li> <li>• Population distribution and key statistics</li> <li>• Differences in levels of development between states</li> </ul>	<p>General introductory maps of India.</p> <p><a href="http://www.worldatlas.com/webimage/countrys/asia/lqcolor/incolor.htm">http://www.worldatlas.com/webimage/countrys/asia/lqcolor/incolor.htm</a></p> <p><a href="http://www.worldatlas.com/webimage/countrys/asia/indiansub.htm">http://www.worldatlas.com/webimage/countrys/asia/indiansub.htm</a></p> <p>Look at FAO Country Profiles and mapping Information System. <a href="http://www.fao.org/countryprofiles/maps.asp?iso3=IND&amp;lang=en">http://www.fao.org/countryprofiles/maps.asp?iso3=IND&amp;lang=en</a></p> <p>These maps of India illustrate the variation in physical characteristic, resources and population across the country. Look particularly at the differences between regions.</p> <p>Background to India's population <a href="http://infochangeindia.org/200310045940/Population/Backgrounder/Population-Background-Perspective.html">http://infochangeindia.org/200310045940/Population/Backgrounder/Population-Background-Perspective.html</a></p> <p>Details of India's population . India's Population reality: <a href="http://www.prb.org/pdf06/61.3IndiasPopulationReality_Eng.pdf">http://www.prb.org/pdf06/61.3IndiasPopulationReality_Eng.pdf</a></p> <p>Poverty in India: Social development Report <a href="http://infochangeindia.org/200602065997/Governance/Books-Reports/Poverty-in-India-increasingly-region-group-specific-says-Social-Development-Report.html">http://infochangeindia.org/200602065997/Governance/Books-Reports/Poverty-in-India-increasingly-region-group-specific-says-Social-Development-Report.html</a></p>

Key questions for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.2 Why and how is the economy changing?</p>	<ul style="list-style-type: none"> <li>• Factors affecting changes in traditional agriculture in India</li> <li>• The role of agribusiness</li> <li>• The growth of service and financial industries</li> <li>• Factors affecting the growth of manufacturing industries</li> <li>• The need for major developments in infrastructure throughout India</li> </ul>	<p>For a range of articles on agriculture see <a href="http://infochangeindia.org/Agriculture/">http://infochangeindia.org/Agriculture/</a>  For most recent data and economic overview see:  <a href="https://www.cia.gov/library/publications/the-world-factbook/geos/in.html">https://www.cia.gov/library/publications/the-world-factbook/geos/in.html</a> i  Traditional agriculture:  <a href="http://www.iccoa.org/pdf/OrganicFarmingIndianContext.pdf">http://www.iccoa.org/pdf/OrganicFarmingIndianContext.pdf</a>  Agriculture in India:  <a href="http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0..contentMDK:21462712~pagePK:141137~piPK:141127~theSitePK:295584.00.html">http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0..contentMDK:21462712~pagePK:141137~piPK:141127~theSitePK:295584.00.html</a>  Power point presentation by an agri firm –some useful slides and perspectives:  <a href="http://www.icrier.org/pdf/30april07/3_S_Sivakumar_Agribusiness_Investments_in_India_ICRIER_30_Apr_2007.pdf">http://www.icrier.org/pdf/30april07/3_S_Sivakumar_Agribusiness_Investments_in_India_ICRIER_30_Apr_2007.pdf</a>  For a description of what is produced by agribusiness see:  <a href="http://www.ukibc.com/content.php?contentid=42&amp;sectionid=6">http://www.ukibc.com/content.php?contentid=42&amp;sectionid=6</a>  On agriculture  <a href="http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/EXTSAREGTOPAGRI/0..contentMDK:20273764~menuPK:548214~pagePK:34004173~piPK:34003707~theSitePK:452766.00.html">http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/EXTSAREGTOPAGRI/0..contentMDK:20273764~menuPK:548214~pagePK:34004173~piPK:34003707~theSitePK:452766.00.html</a>  Monsanto – Mahyco BT cotton  <a href="http://www.hindu.com/2007/12/07/stories/2007120757550400.htm">http://www.hindu.com/2007/12/07/stories/2007120757550400.htm</a>  Pharmaceutical companies in India  <a href="http://business.mapsofindia.com/india-company/pharmaceutical.html">http://business.mapsofindia.com/india-company/pharmaceutical.html</a>  On India and the knowledge economy:  <a href="http://web.worldbank.org/WBSITE/EXTERNAL/WBI/WBIPROGRAMS/KFDLP/0..contentMDK:20552872~menuPK:461238~pagePK:64156158~piPK:64152884~theSitePK:461198.00.html">http://web.worldbank.org/WBSITE/EXTERNAL/WBI/WBIPROGRAMS/KFDLP/0..contentMDK:20552872~menuPK:461238~pagePK:64156158~piPK:64152884~theSitePK:461198.00.html</a>  Sustaining India's services industry:  <a href="http://siteresources.worldbank.org/INTSARREGTOPINTECOTRA/34004324-1147911358368/20855402/ExecutiveSummary.pdf">http://siteresources.worldbank.org/INTSARREGTOPINTECOTRA/34004324-1147911358368/20855402/ExecutiveSummary.pdf</a>  For an overview of manufacturing see  <a href="http://www.ibef.org/economy/manufacturing.aspx">http://www.ibef.org/economy/manufacturing.aspx</a>  This report has some excellent information: <a href="http://www.kpmg.ca/en/industries/cib/industrial/documents/ManufacturingInIndia.pdf">http://www.kpmg.ca/en/industries/cib/industrial/documents/ManufacturingInIndia.pdf</a>  Business Week 'The trouble with India' <a href="http://www.businessweek.com/print/magazine/content/07_12/b4026001.htm?chan=q">http://www.businessweek.com/print/magazine/content/07_12/b4026001.htm?chan=q</a>  The Economist 21.February 2004 Special Report  Business Week 19 March 2007 The trouble with India  Developments magazine Issue 39 2007  Business Week 16 April 2007 Mittal and Son. India's steel industry  Manufacturing in India  <a href="http://ibef.org/download/KPMG_Manf_06.pdf">http://ibef.org/download/KPMG_Manf_06.pdf</a>  India's infrastructure  <a href="http://www.business-in-asia.com/asia/infrastructure_india.html">http://www.business-in-asia.com/asia/infrastructure_india.html</a>  Rural roads:  <a href="http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0..contentMDK:21479699~pagePK:141137~piPK:141127~theSitePK:295584.00.html">http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0..contentMDK:21479699~pagePK:141137~piPK:141127~theSitePK:295584.00.html</a>  Rural water supply  <a href="http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0..contentMDK:21479627~pagePK:141137~piPK:141127~theSitePK:295584.00.html">http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0..contentMDK:21479627~pagePK:141137~piPK:141127~theSitePK:295584.00.html</a></p>

Key questions for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.3 What are the social and economic challenges facing rural communities?</p>	<ul style="list-style-type: none"> <li>• The traditional socioeconomic characteristics of rural India.</li> <li>• The impacts and challenges for rural areas of migration</li> <li>• The challenge to provide infrastructure and social welfare services in rural areas</li> <li>• The challenge of food production and combating hunger after the Green Revolution</li> <li>• The relationship between population growth, hunger and sustainability In rural India.</li> </ul>	<p>For an overview of migration see this report. Comprehensive but useful data at the end.  <a href="http://www.livelihoods.org/hot_topics/docs/Dhaka_CP_2.pdf">http://www.livelihoods.org/hot_topics/docs/Dhaka_CP_2.pdf</a></p> <p>Rural support from Tata Corporation  <a href="http://www.synergos.org/globalgivingmatters/features/0503tatagroup.htm">http://www.synergos.org/globalgivingmatters/features/0503tatagroup.htm</a></p> <p>Video: Firms tap into rural markets  <a href="http://news.bbc.co.uk/player/nol/newsid_6980000/newsid_6984200/6984280.stm?bw=bb&amp;mp=rm&amp;asb=1&amp;news=1&amp;bbcws=1">http://news.bbc.co.uk/player/nol/newsid_6980000/newsid_6984200/6984280.stm?bw=bb&amp;mp=rm&amp;asb=1&amp;news=1&amp;bbcws=1</a></p> <p>Video: rural-urban divide widens in India  <a href="http://uk.youtube.com/watch?v=xybF8VQz8Vs">http://uk.youtube.com/watch?v=xybF8VQz8Vs</a></p> <p>Video : Another green revolution in India.  <a href="http://uk.youtube.com/watch?v=iWhaW6TnsLA">http://uk.youtube.com/watch?v=iWhaW6TnsLA</a></p> <p>Video: Food security and food crisis  <a href="http://uk.youtube.com/watch?v=hnAvloV_7yM&amp;NR=1">http://uk.youtube.com/watch?v=hnAvloV_7yM&amp;NR=1</a></p> <p>Video: Food prices punish rich and poor in India  <a href="http://uk.youtube.com/watch?v=0egHlobqGtQ">http://uk.youtube.com/watch?v=0egHlobqGtQ</a></p> <p>India and hunger:  <a href="http://infochangeindia.org/200612255217/Agriculture/News/India-ranks-93-out-of-119-countries-on-Global-Hunger-Index.html">http://infochangeindia.org/200612255217/Agriculture/News/India-ranks-93-out-of-119-countries-on-Global-Hunger-Index.html</a></p> <p>Video: Land reform in India  <a href="http://news.bbc.co.uk/player/nol/newsid_7060000/newsid_7066200/7066245.stm?bw=bb&amp;mp=rm&amp;asb=1&amp;news=1&amp;bbcws=1">http://news.bbc.co.uk/player/nol/newsid_7060000/newsid_7066200/7066245.stm?bw=bb&amp;mp=rm&amp;asb=1&amp;news=1&amp;bbcws=1</a></p>

Key questions for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.4 What are the economic and social challenges facing urban communities?</p>	<ul style="list-style-type: none"> <li>• Changes in the type and organisation of economic activities in urban areas</li> <li>• The challenges of migration to urban areas and the inter-dependence of rural and urban populations</li> <li>• The challenges of delivering modern infrastructure and social welfare services such as health, education and housing</li> <li>• The impact of increasing inequalities within urban areas; the informal sector and urban poverty</li> <li>• The challenge of sustainable development in towns and cities</li> </ul>	<p>Urban management  <a href="http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXT/N/0..contentMDK:21207992~pagePK:141137~piPK:141127~theSitePK:295584,00.html">http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXT/N/0..contentMDK:21207992~pagePK:141137~piPK:141127~theSitePK:295584,00.html</a></p> <p>Delhi Human Development Report  <a href="http://data.undp.org.in/shdr/delhi/complereport.pdf">http://data.undp.org.in/shdr/delhi/complereport.pdf</a></p> <p>Video: Skills shortage in India  <a href="http://news.bbc.co.uk/player/nol/newsid_7090000/newsid_7094500/7094557.stm?bw=bb&amp;mp=rm&amp;asb=1&amp;news=1&amp;bbcws=1">http://news.bbc.co.uk/player/nol/newsid_7090000/newsid_7094500/7094557.stm?bw=bb&amp;mp=rm&amp;asb=1&amp;news=1&amp;bbcws=1</a></p> <p>Chennai Development Plan  <a href="http://listika.wordpress.com/2007/04/14/chennai-metropolitan-development-authority-draft-master-plan-2/">http://listika.wordpress.com/2007/04/14/chennai-metropolitan-development-authority-draft-master-plan-2/</a></p> <p>Commonwealth games in Delhi 2010.  <a href="http://ecoworldly.com/2008/07/06/commonwealth-games-delhi-2010-a-threat-to-the-commonwealth/">http://ecoworldly.com/2008/07/06/commonwealth-games-delhi-2010-a-threat-to-the-commonwealth/</a></p> <p>Urban Poverty in India: World bank report.  <a href="http://www.worldbank.org/html/fpd/urban/forum2000/papers/india.pdf">http://www.worldbank.org/html/fpd/urban/forum2000/papers/india.pdf</a></p> <p>Video: Mega cities slums  <a href="http://uk.youtube.com/watch?v=xoo4YKqwFbM">http://uk.youtube.com/watch?v=xoo4YKqwFbM</a></p>

Key questions for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.5 What are the effects of globalisation on India?</p>	<ul style="list-style-type: none"> <li>• There are conflicting views of the benefits of globalisation for India.</li> <li>• The impacts of global trade on the national economy</li> <li>• The growth of Indian TNCs</li> <li>• The effects of the 1991 debt crisis and consequent policies of structural adjustment in India</li> <li>• The impact of globalisation on India's poor</li> </ul>	<p>Video: Uncertainty for China's and India's farmers  <a href="http://news.bbc.co.uk/player/nol/newsid_5150000/newsid_5152100/5152118.stm?bw=bb&amp;mp=rm&amp;news=1&amp;bbcws=1">http://news.bbc.co.uk/player/nol/newsid_5150000/newsid_5152100/5152118.stm?bw=bb&amp;mp=rm&amp;news=1&amp;bbcws=1</a></p> <p>Benefits of globalisation  <a href="http://yaleglobal.yale.edu/display.article?id=5333">http://yaleglobal.yale.edu/display.article?id=5333</a></p> <p>India's foreign trade policy  <a href="http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/EXTSARREGTOPINTECOTRA/0,,contentMDK:20592520~menuPK:579454~pagePK:34004173~piPK:34003707~theSitePK:579448,00.html">http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/EXTSARREGTOPINTECOTRA/0,,contentMDK:20592520~menuPK:579454~pagePK:34004173~piPK:34003707~theSitePK:579448,00.html</a></p> <p>Video: India's focus on food security  <a href="http://uk.youtube.com/watch?v=uNEymFp-xc0">http://uk.youtube.com/watch?v=uNEymFp-xc0</a></p>

Key questions for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.6 What are the environmental challenges and solutions facing India?</p>	<ul style="list-style-type: none"> <li>• The causes and consequences of deforestation and soil erosion</li> <li>• The causes and consequences of industrial pollution in major cities such as Delhi, Kolkata, Chennai</li> <li>• The challenge of the sustainable use of water resources</li> <li>• The challenge of providing energy supplies</li> <li>• The balance between economic growth and sustainable development; the role of People's Movements</li> </ul>	<p>India Environment Portal: <a href="http://www.indiaenvironmentportal.org.in/node/26109">http://www.indiaenvironmentportal.org.in/node/26109</a> Links to all environmental issues in India            UNEP The State of the Environment India 2001 part 1 executive summary <a href="http://www.rrcap.unep.org/reports/soe/indiasoe.cfm">http://www.rrcap.unep.org/reports/soe/indiasoe.cfm</a></p> <p>Deforestation: <a href="http://www.wrm.org.uy/deforestation/Asia/India.html">http://www.wrm.org.uy/deforestation/Asia/India.html</a></p> <p>For web sites which relate to soil erosion see: <a href="http://www.bestindiansites.com/nature/soil-erosion-conservation.html">http://www.bestindiansites.com/nature/soil-erosion-conservation.html</a></p> <p>Ganga Action Plan <a href="http://www.cag.gov.in/reports/scientific/2000_book2/gangaactionplan.htm">http://www.cag.gov.in/reports/scientific/2000_book2/gangaactionplan.htm</a></p> <p>Yamuna River project <a href="http://sesdu.17.forumer.com/a/story-of-yamuna-cleaning-project-and-its-future_post150.html">http://sesdu.17.forumer.com/a/story-of-yamuna-cleaning-project-and-its-future_post150.html</a></p> <p>Video: Water and energy – the security challenge of Karnataka <a href="http://uk.youtube.com/watch?v=KkdyKS7YvnM">http://uk.youtube.com/watch?v=KkdyKS7YvnM</a></p> <p>Video: Raising the height of the Narmada dam. <a href="http://news.bbc.co.uk/player/nol/newsid_4910000/newsid_4913300/4913354.stm?bw=bb&amp;mp=rm&amp;news=1&amp;bbcws=1">http://news.bbc.co.uk/player/nol/newsid_4910000/newsid_4913300/4913354.stm?bw=bb&amp;mp=rm&amp;news=1&amp;bbcws=1</a></p> <p>Power supplies: <a href="http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0..contentMDK:20660353~pagePK:141137~piPK:141127~theSitePK:295584,00.html">http://www.worldbank.org.in/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/INDIAEXTN/0..contentMDK:20660353~pagePK:141137~piPK:141127~theSitePK:295584,00.html</a></p> <p>For a range of articles on People's movements see: <a href="http://infochangeindia.org/Search.html?searchphrase=exact&amp;searchword=people%27s+movements">http://infochangeindia.org/Search.html?searchphrase=exact&amp;searchword=people%27s+movements</a></p> <p>Chipko Movement <a href="http://www.iisd.org/50comm/commdb/desc/d07.htm">http://www.iisd.org/50comm/commdb/desc/d07.htm</a></p>

### Other Resources

World Bank India's growth and economy: analysis and quick facts

World Bank India - Inclusive growth and service delivery. Building on India's success. Development Policy Review May 2006

State Development Reports (for different Indian states) [www.academicfoundation.com](http://www.academicfoundation.com)

National Human Development report (India) 2001 <http://planningcommission.nic.in/reports/genrep/nhdrep/nhdreportf.htm>



**UNIT G4 - SUSTAINABILITY**

**TEACHING/LEARNING PLANS FOR G4 Sustainability**

**G4 Theme 1 – Sustainable Food Supply**

<b>Key Question for investigation</b>	<b>Content</b>	<b>Teaching/learning approaches and resources – bold statements give the student activity</b>
<p>1.1 What is the global pattern of food consumption?</p>	<ul style="list-style-type: none"> <li>• Global pattern of low calorie intake.</li> <li>• Pattern of high food consumption.</li> </ul>	<p>A good background to the issues involved nutrition can be found in chapter 20, <i>Diet and Health: Diseases and Food</i>, of the <i>Earthscan Reader in Sustainable Agriculture</i>, ed. Jules Pretty, Earthscan 2005.</p> <p>Food intake for individual countries can be found in the latest edition of The World Social and Economic Statistics in <i>Philip's Modern School Atlas</i>, updated each even year.</p> <p>Use the website  <a href="http://www.fao.org/NEWS/1998/981204-e.htm">http://www.fao.org/NEWS/1998/981204-e.htm</a>  to <b>identify areas and countries of very high and very low intake of calories/day</b></p> <p><b>Identify the causes and consequences of a food shortage in an area of the world, for example the Wajir district of Kenya</b>  <a href="http://www.timesonline.co.uk/article/0,,3-1990723,00.html">http://www.timesonline.co.uk/article/0,,3-1990723,00.html</a></p> <p><b>Extract information from Power Point presentation on the growth of obesity in the USA 1985 - 2006 from</b>  <a href="http://www.cdc.gov/nccdphp/dnpa/obesity/trend/maps/index.htm">http://www.cdc.gov/nccdphp/dnpa/obesity/trend/maps/index.htm</a></p> <p><b>Determine what a balanced diet should consist of from</b>  <a href="http://www.health.gov/dietaryguidelines/dga2005/document/default.htm">http://www.health.gov/dietaryguidelines/dga2005/document/default.htm</a></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.2 What factors promote or hinder food production?</p>	<ul style="list-style-type: none"> <li>• Physical</li> <li>• Economic</li> <li>• Political</li> <li>• Technological</li> </ul>	<p>Background to agriculture and examples of many agricultural systems can be found in Section 4 of <i>New Patterns: Process and Change in Human Geography</i>, by Michael Carr, Nelson, 1999</p> <p>A contemporary case study of difficulties and supports for rice production in Laos can be found at  <a href="http://www.adb.org/Evaluation/case-studies/LAO/Evaluation-Synthesis-on-Rice.pdf">http://www.adb.org/Evaluation/case-studies/LAO/Evaluation-Synthesis-on-Rice.pdf</a>  <b>List factors promoting and hindering rice production in Lao PDR</b></p> <p>Problems for agriculture resulting from soil degradation in Zimbabwe can be located at  <a href="http://www.ess.co.at/GAIA/CASES/ZIM/soils.html">http://www.ess.co.at/GAIA/CASES/ZIM/soils.html</a>  <b>Outline causes and consequences of soil degradation</b></p> <p>The impact of large retailers on food production, and their influence on farmers is summarised by a code of practice in the UK. This can be examined at  <a href="http://www.foe.co.uk/resource/briefings/farmers_supermarket_code.pdf">http://www.foe.co.uk/resource/briefings/farmers_supermarket_code.pdf</a>  and farmers responses can be seen at  <a href="http://news.bbc.co.uk/1/hi/scotland/4599867.stm">http://news.bbc.co.uk/1/hi/scotland/4599867.stm</a>  <b>Assess the impact of supermarkets on farmers' decision making</b></p> <p>Governments attempt to influence food production. The most recent reforms of the EU Common Agricultural Policy can be read at  <a href="http://ec.europa.eu/agriculture/capreform/index_en.htm">http://ec.europa.eu/agriculture/capreform/index_en.htm</a>  <b>List the ways the CAP promotes and hinders food production</b></p> <p>World Trade Organisation rules are considered unfair to some countries  <a href="http://www.actionaid.org.uk/doc_lib/51_1_agreement_agriculture.pdf">http://www.actionaid.org.uk/doc_lib/51_1_agreement_agriculture.pdf</a>  but others see them in a more positive light  <a href="http://ec.europa.eu/agriculture/external/wto/newround/full.pdf">http://ec.europa.eu/agriculture/external/wto/newround/full.pdf</a>  <b>Assess the impact of WTO rules on agriculture</b></p> <p>Environmental concerns may constrain farming activities. The current UK policy can be seen at  <a href="http://www.defra.gov.uk/erdp/pdfs/cssnews/060CSSIntro.pdf">http://www.defra.gov.uk/erdp/pdfs/cssnews/060CSSIntro.pdf</a>  <b>How far do environmental concerns influence food production?</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>1.3 Can food production be sustainably increased?</p>	<ul style="list-style-type: none"> <li>• Hydroponics and aeroponics.</li> <li>• The Blue Revolution.</li> <li>• Genetic modification.</li> <li>• The Second Green Revolution.</li> </ul>	<p>A good background to sustainability in agriculture can be found in <i>Developing Sustainable Agriculture</i>, by Ian Bowler in <i>Geography</i> July 2002</p> <p>Details of hydroponics and aeroponics can be found at <a href="http://ag.arizona.edu/PLS/faculty/MERLE.html">http://ag.arizona.edu/PLS/faculty/MERLE.html</a>, and <a href="http://www.aerogreentech.com.sg/what_is_aeroponics.htm">http://www.aerogreentech.com.sg/what_is_aeroponics.htm</a></p> <p><b>Identify how hydroponics and aeroponics increase food production</b></p> <p>Fish farming gives more food but sustainability is questionable, see <a href="http://www.fao.org/docrep/field/003/AB910E/AB910E00.htm">http://www.fao.org/docrep/field/003/AB910E/AB910E00.htm</a></p> <p><b>Assess the sustainability of prawn farming</b></p> <p>Both sides of the GM crops debate, and further links can be found at <a href="http://www.newscientist.com/channel/opinion/gm-food/">http://www.newscientist.com/channel/opinion/gm-food/</a></p> <p><b>Identify the arguments for and against GM crops</b></p> <p>The Prime Minister of India expects food production to increase through a second green revolution</p> <p><a href="http://pib.nic.in/release/release.asp?relid=34357">http://pib.nic.in/release/release.asp?relid=34357</a></p> <p><b>How sustainable is a second green revolution?</b></p>
<p>1.4 Can a sustainable food supply be maintained in the future?</p>	<ul style="list-style-type: none"> <li>• Draw together the above ideas to critically assess attitudes towards the sustainability of food supplies.</li> </ul>	<p><b>Identify links between topics above and other parts of the specification</b></p> <p><b>For all studies, identify both desirable outcomes and disadvantages of issues</b></p> <p><b>Develop writing frames that encourage assessment and evaluation, e.g.</b></p> <p>'In the short term ..., but in the long term ...'</p> <p>'This benefits interest group A in that ..., but for interest group B ...'</p> <p>'The effect in the local area is ..., but globally ...'</p>

## TEACHING/LEARNING PLANS FOR G4 Sustainability

## G4 Theme 2 – Sustainable Water Supply

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
2.1 What physical factors determine the supply of water?	<ul style="list-style-type: none"> <li>• Climate</li> <li>• Relief</li> <li>• Geology</li> </ul>	<p>A good outline guide to the topic of water supply can be found on pages 415 - 420 of <i>New Patterns: Process and Change in Human Geography</i>, by Michael Carr, Nelson, 1999; with two useful case studies on pages 425 - 429.</p> <p>A variety of rainfall and temperature regimes can be found in <i>Philip's Modern School Atlas</i>, updated each even year.</p> <p>Difficulties of obtaining water in a difficult climate can be found at <a href="http://www.slcgov.com/Utilities/NewsEvents/pdf/salt_lake_city_gis_waterwrites_05.pdf">http://www.slcgov.com/Utilities/NewsEvents/pdf/salt_lake_city_gis_waterwrites_05.pdf</a></p> <p>Water supplies from an aquifer are well documented in <a href="http://www.environment-agency.gov.uk/commondata/acrobat/gw_report_june2007_1831580.pdf">http://www.environment-agency.gov.uk/commondata/acrobat/gw_report_june2007_1831580.pdf</a></p> <p>Rainfall and water supply in Norway can be viewed at <a href="http://www.un.org/esa/agenda21/natlinfo/countr/norway/waterNorway04f.pdf">http://www.un.org/esa/agenda21/natlinfo/countr/norway/waterNorway04f.pdf</a></p> <p><b>Identify the main natural controls on water supply</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>2.2 How do human activities influence water supply and demand?</p>	<ul style="list-style-type: none"> <li>• Demographic</li> <li>• Economic</li> </ul>	<p>A clear background to threats to water supply can be found in Chapter 8 of <i>Exploring Environmental Issues An Integrated Approach</i> by David D Kemp, Routledge, 2004</p> <p>The growth of demand and the stresses produced on water supply in south-east England are outlined in  <a href="http://www.environment-agency.gov.uk/commondata/acrobat/grid_1464452.pdf">http://www.environment-agency.gov.uk/commondata/acrobat/grid_1464452.pdf</a>  <b>Determine the impact of demographic change on water supply</b></p> <p>The competition for declining water supplies in the Murray-Darling Basin in Australia are provided in  <a href="http://www.wac.ihe.nl/dialogue/Basin/Murray-Darling/documents/Murray-Darling%20Report.pdf">http://www.wac.ihe.nl/dialogue/Basin/Murray-Darling/documents/Murray-Darling%20Report.pdf</a>  <b>Identify the pressures on water supply from competing economic activities in the Murray-Darling Basin</b></p> <p>Some water sources need to be shared between different countries, each with its own demands  <a href="http://www.sam.gov.tr/perceptions/Volume1/June-August1996/WATERISSUESBETWEENTURKEYSYRIAANDIRAQ.pdf">http://www.sam.gov.tr/perceptions/Volume1/June-August1996/WATERISSUESBETWEENTURKEYSYRIAANDIRAQ.pdf</a>  <b>How might water usage between Turkey and Syria be resolved?</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>2.3 How can water supply and demand be managed sustainably?</p>	<ul style="list-style-type: none"> <li>• New storage capacity.</li> <li>• Water transfers.</li> <li>• Groundwater sources.</li> <li>• Desalination.</li> <li>• Recycling.</li> <li>• 'Grey' water.</li> <li>• Reducing consumption.</li> </ul>	<p>Although new dams can be built, and storage greatly increased, their sustainability has been questioned  <a href="http://www.gisdevelopment.net/application/environment/water/ma04240.htm">http://www.gisdevelopment.net/application/environment/water/ma04240.htm</a>  <b>Identify problems caused by the Three Gorges Dam</b></p> <p>Transferring water from an area of surplus to one of deficit is possible  <a href="http://www.swpao.water.ca.gov/transfers/#PageTop">http://www.swpao.water.ca.gov/transfers/#PageTop</a>  <b>Are water transfers sustainable?</b></p> <p>Desalination has been suggested as a solution to water shortages, details from  <a href="http://assets.panda.org/downloads/desalinationreportjune2007.pdf">http://assets.panda.org/downloads/desalinationreportjune2007.pdf</a>  <b>How feasible is it to obtain water supplies by desalination?</b></p> <p>A brief introduction to greywater and recycling of water can be found at  <a href="http://www.deus.nsw.gov.au/Publications/greywater_reuse.pdf">http://www.deus.nsw.gov.au/Publications/greywater_reuse.pdf</a>  <b>Identify the benefits and problems of greywater</b></p> <p>NEWater is an advanced recycling system described in  <a href="http://www.pub.gov.sg/NEWater_files/newater_tech/index.html">http://www.pub.gov.sg/NEWater_files/newater_tech/index.html</a>  <b>How acceptable is recycled water?</b></p> <p>It is possible for consumers to reduce their demand, Anglian Water suggests  <a href="http://www.anglianwater.co.uk/index.php?sectionid=84&amp;parentid=30&amp;contentid=156">http://www.anglianwater.co.uk/index.php?sectionid=84&amp;parentid=30&amp;contentid=156</a>  <b>How likely are consumers to reduce water usage voluntarily</b></p> <p>Reducing demand by including cost and metering are considered in Australia  <a href="http://www.waterforlife.nsw.gov.au/_data/assets/pdf_file/0018/1458/06mwp_chapter_6.pdf">http://www.waterforlife.nsw.gov.au/_data/assets/pdf_file/0018/1458/06mwp_chapter_6.pdf</a>  <b>Is it necessary for authorities to take measures to compel consumers to reduce water consumption?</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>2.4 Can sustainable water supplies be maintained in the future?</p>	<ul style="list-style-type: none"> <li>• Draw together above ideas to critically</li> <li>• assess attitudes towards the sustainability of water supplies.</li> </ul>	<p><b>Identify links between topics above and other parts of the specification</b></p> <p><b>For all studies, identify both desirable outcomes and disadvantages of issues</b></p> <p><b>Develop writing frames that encourage assessment and evaluation, e.g.</b></p> <p>'In the short term ..., but in the long term ...'</p> <p>'This benefits interest group A in that ..., but for interest group B ...'</p> <p>'The effect in the local area is ..., but globally ...'</p>

## TEACHING/LEARNING PLANS FOR G4 Sustainability

## G4 Theme 3 - Sustainable Energy

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
3.1 What problems are associated with the supply of energy?	<ul style="list-style-type: none"> <li>• Economic</li> <li>• Environmental</li> <li>• Political</li> <li>• Technological</li> </ul>	<p>An outline background to energy issues can be found in chapter 27 of <i>New Patterns: Process and Change in Human Geography</i>, by Michael Carr, Nelson, 1999; along with six useful case studies</p> <p>A very attractive Power Point presentation on 'peak oil' and dwindling fossil fuel reserves can be downloaded from  <a href="http://www.peakoil.com/downcat8.html">http://www.peakoil.com/downcat8.html</a></p> <p><b>Identify how long fossil fuel supplies may last</b></p> <p>As reserves dwindle, the cost of fossil fuels rise,  <a href="http://www.wtrg.com/prices.htm">http://www.wtrg.com/prices.htm</a></p> <p><b>Graph the rising cost of a fossil fuel over the last 30 years</b></p> <p>Political disputes may arise over use of energy, both Syria and Turkey claim rights to use the Euphrates for HEP, see  <a href="http://www.pet.hw.ac.uk/ea/pdfs/bn1_windpower.pdf">http://www.pet.hw.ac.uk/ea/pdfs/bn1_windpower.pdf</a></p> <p><b>Outline how political pressures may limit exploitation of an energy source</b></p> <p>The environmental impacts of fossil fuels are well outlined at  <a href="http://archive.greenpeace.org/climate/science/reports/fossil.pdf">http://archive.greenpeace.org/climate/science/reports/fossil.pdf</a></p> <p><b>Add extra examples to previous AS studies</b></p> <p>New forms of energy have environmental risks, for nuclear power  <a href="http://www.foe.co.uk/resource/briefings/nuclear_power_climate.pdf">http://www.foe.co.uk/resource/briefings/nuclear_power_climate.pdf</a>        and for wind power  <a href="http://www.pet.hw.ac.uk/ea/pdfs/bn1_windpower.pdf">http://www.pet.hw.ac.uk/ea/pdfs/bn1_windpower.pdf</a></p> <p><b>Note objections to two alternative sources of energy</b></p> <p>Some promising alternative sources, such as wave power, have many technological problems yet to be solved, see  <a href="http://www.energylinx.co.uk/water.htm">http://www.energylinx.co.uk/water.htm</a></p> <p><b>Outline the technological problems of developing an alternative source of energy</b></p>



Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>3.2 How and why is the demand for energy changing?</p>	<ul style="list-style-type: none"> <li>• Economic</li> <li>• Social</li> <li>• Technological</li> </ul>	<p>China's rapid economic growth and increase in demand for energy is very well covered in <a href="http://www.iie.com/publications/papers/rosen0507.pdf">http://www.iie.com/publications/papers/rosen0507.pdf</a> Extract figures on economic growth and increases in energy demand for China</p> <p>The growth in demand for energy in London during the 21st century is given in great detail in <a href="http://www.london.gov.uk/mayor/environment/energy/docs/powering-london-21st-century.pdf">http://www.london.gov.uk/mayor/environment/energy/docs/powering-london-21st-century.pdf</a> <b>Graph the expected rise in energy demand for London from 2010 to 2025</b></p> <p>A good deal of the growth comes from social and domestic sources <a href="http://www.energysavingtrust.org.uk/uploads/documents/aboutest/Riseofthemachines.pdf">http://www.energysavingtrust.org.uk/uploads/documents/aboutest/Riseofthemachines.pdf</a> Identify items which have increased home energy consumption in the last 40 years</p> <p>Transport, particularly private vehicles, has increased over time. Growth of all types of transport in the UK can be found in <a href="http://www.dft.gov.uk/162259/162469/221412/217792/2214291/TSGB2007Final_linksV12.pdf">http://www.dft.gov.uk/162259/162469/221412/217792/2214291/TSGB2007Final_linksV12.pdf</a> Extract data to show the growth of one type of transport in the UK over the last 40 years.</p> <p>Many new technologies have huge energy demands for example <a href="http://www.foe.co.uk/resource/press_releases/top_garden_centre_to_ban_p_04042007.html">http://www.foe.co.uk/resource/press_releases/top_garden_centre_to_ban_p_04042007.html</a> <b>Identify arguments for and against new technologies</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>3.3 How can the demand for energy be managed sustainably?</p>	<ul style="list-style-type: none"> <li>• Alternative sources</li> <li>• Greater efficiency</li> <li>• Demand reduction</li> </ul>	<p>A very thorough coverage of alternative energy sources is given in <i>Renewable Energy Power for a Sustainable Future</i>, edited by Godfrey Boyle, Oxford 2004</p> <p>A very detailed review of alternative sources of energy, advantages and problems can be found at  <a href="http://www.mtpc.org/renewableenergy/public_policy/DG/resources/2002-09_MA_PQ-Report_Primen-MTC.pdf">http://www.mtpc.org/renewableenergy/public_policy/DG/resources/2002-09_MA_PQ-Report_Primen-MTC.pdf</a>  Identify advantages and problems associated with two forms of alternative energy</p> <p>The Stern Report outlines ways of managing energy demands sustainably, a summary can be downloaded from  <a href="http://www.hm-treasury.gov.uk/media/4/3/Executive_Summary.pdf">http://www.hm-treasury.gov.uk/media/4/3/Executive_Summary.pdf</a>  and further details can also be found  <b>Identify one way carbon emissions may be reduced</b></p> <p>The report is not universally accepted. Dissenting views can be seen at  <a href="http://www.fcpp.org/pdf/CritiqueofSternReport.pdf">http://www.fcpp.org/pdf/CritiqueofSternReport.pdf</a>  <b>Summarise objections to the Stern Report</b></p> <p>A guide to using energy more efficiently from the USA can be found at  <a href="http://www1.eere.energy.gov/consumer/tips/pdfs/energy_savers.pdf">http://www1.eere.energy.gov/consumer/tips/pdfs/energy_savers.pdf</a>  Select one way energy efficiency may be improved, and why it may not receive widespread adoption</p> <p>One way of reducing demand by smart metering is outlined in  <a href="http://www.energywatch.org.uk/uploads/Smart_meters.pdf">http://www.energywatch.org.uk/uploads/Smart_meters.pdf</a>  <b>What objections to smart metering can be identified?</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources – bold statements give the student activity
<p>3.4 Can a sustainable energy supply be maintained in the future?</p>	<ul style="list-style-type: none"> <li>• Draw together above ideas to critically</li> <li>• Assess attitudes towards the sustainability of energy supplies.</li> </ul>	<p><b>Identify links between topics above and other parts of the specification</b></p> <p><b>For all studies, identify both desirable outcomes and disadvantages of issues</b></p> <p><b>Develop writing frames that encourage assessment and evaluation, e.g.</b></p> <p>‘In the short term ....., but in the long term .....</p> <p>‘This benefits interest group A in that ....., but for interest group B .....</p> <p>‘The effect in the local area is ....., but globally .....</p>

## TEACHING/LEARNING PLANS FOR G4 Sustainability

## G4 Theme 4 - Sustainable Cities

Key Question for investigation	Content	Teaching/learning approaches and resources - <b>bold statements give student activity.</b>
4.1 How can cities throughout the world be classified?	<ul style="list-style-type: none"> <li>• Size</li> <li>• Rate of growth</li> <li>• Level of development</li> </ul>	<p>An recent approach to classifying cities can be found in <i>Geography</i> October 2001, <i>The Future of the City - Cities of the Future</i> by Michael Pacione</p> <p>An excellent source of data to help classify cities, and give background to urbanisation can be downloaded from  <a href="http://www.un.org/esa/population/publications/wup2001/wup2001dh.pdf">http://www.un.org/esa/population/publications/wup2001/wup2001dh.pdf</a>  select the 24 largest cities and classify them by rate of growth and one other criterion</p> <p>Download the Dashboard, and the City Development Index from  <a href="http://esl.jrc.it/dc/cdi_joef/">http://esl.jrc.it/dc/cdi_joef/</a>  <b>and examine various measures of development for selected cities</b></p> <p>Extract information from  <a href="http://geography.about.com/od/urbaneconomicgeography/a/edgecity.htm">http://geography.about.com/od/urbaneconomicgeography/a/edgecity.htm</a>  and <b>identify another possible edge city</b></p> <p><i>World City</i> by Doreen Massey, Polity 2007 is an easy read, and describes London as a world city, and discusses other cities that can be classed as world cities</p>

Key Question for investigation	Content	Teaching/learning approaches and resources - <b>bold statements give student activity.</b>
<p>4.2 What pressures currently confront cities and how are they changing them?</p>	<ul style="list-style-type: none"> <li>• Transport and communications</li> <li>• Disparities in wealth</li> <li>• Areal extent</li> <li>• Quality of environment</li> </ul>	<p>Transport problems of a developed and a developing city can be extracted from <a href="http://www.urbantransport-technology.com/projects/barcelona/">http://www.urbantransport-technology.com/projects/barcelona/</a> and <a href="http://www.buet.ac.bd/arc/UrbanTransport.pdf">http://www.buet.ac.bd/arc/UrbanTransport.pdf</a>  <b>Compare transport problems of developed and developing cities</b></p> <p>A brief background to extremes of wealth in some cities can be found at <a href="http://www.iss.nl/ISS-55th-Anniversary/Cities-of-Extremes/Conference-background">http://www.iss.nl/ISS-55th-Anniversary/Cities-of-Extremes/Conference-background</a>  <b>Extract information to demonstrate extremes of wealth in some cities</b></p> <p>Population densities of major cities can be inspected at <a href="http://www.citypopulation.de/World.html">http://www.citypopulation.de/World.html</a>  <b>Identify extremes of population density of cities</b></p> <p>Growth in area covered by European cities can be examined at <a href="http://reports.eea.europa.eu/briefing_2006_4/en/eea_briefing_4_2006.pdf">http://reports.eea.europa.eu/briefing_2006_4/en/eea_briefing_4_2006.pdf</a>  <b>What is the extent of sprawl in developed countries?</b></p> <p>Environmental quality varies between major cities in the world e.g. <a href="http://www.theicct.org/documents/Molina_Mexico_Strategy_2004.pdf">http://www.theicct.org/documents/Molina_Mexico_Strategy_2004.pdf</a> and <a href="http://www.london.gov.uk/mayor/strategies/air_quality/docs/highlights.pdf">http://www.london.gov.uk/mayor/strategies/air_quality/docs/highlights.pdf</a>  <b>Compare the problems of air quality in developed and developing cities</b></p>

Key Question for investigation	Content	Teaching/learning approaches and resources - <b>bold statements give student activity.</b>
<p>4.3 What attempts have been made to find sustainable solutions to problems faced by cities?</p>	<p>Strategies to deal with</p> <ul style="list-style-type: none"> <li>• transport and communications;</li> <li>• disparities in wealth;</li> <li>• areal extent;</li> <li>• quality of environment.</li> </ul>	<p>One solution to transport in cities has been electronic road pricing, e.g. <a href="http://www.jgames.co.uk/title/Electronic_Road_Pricing">http://www.jgames.co.uk/title/Electronic_Road_Pricing</a>  <b>Compare this with congestion charging in London</b></p> <p>Communications within and between cities are increasingly important. <i>Networking the City</i> by Richard G Smith in <i>Geography</i> Summer 2005 gives some background. For how Norwich became wireless see <a href="http://news.bbc.co.uk/1/hi/technology/5297884.stm">http://news.bbc.co.uk/1/hi/technology/5297884.stm</a>  <b>How important to modern cities are good communications?</b></p> <p>The scale of the poverty gap, attempts to overcome it and their success are extremely clear in <a href="http://www.ucl.ac.uk/dpu-projects/Global_Report/pdfs/Rio.pdf">http://www.ucl.ac.uk/dpu-projects/Global_Report/pdfs/Rio.pdf</a>  <b>Assess the success of attempts to overcome extremes of wealth</b></p> <p>Attempts to limit the areal extent of Seoul are given in <a href="http://www.ecologyandsociety.org/vol11/iss1/art3/ES-2005-1504.pdf">www.ecologyandsociety.org/vol11/iss1/art3/ES-2005-1504.pdf</a>  <b>Assess the success of London and Seoul's green belts</b></p> <p>Some cities have very clear goals for improving the environment, e.g. <a href="http://www.seattle.gov/environment/Documents/CleanGreenFleetAP.pdf">http://www.seattle.gov/environment/Documents/CleanGreenFleetAP.pdf</a> and <a href="http://www.iied.org/human/eandu/documents/EU_17_1_boonyabanacha_pages_21_46.pdf">http://www.iied.org/human/eandu/documents/EU_17_1_boonyabanacha_pages_21_46.pdf</a>  <b>Compare the difficulties of improving the environment in developing and developed cities</b></p>
<p>4.4 How sustainable are cities?</p>	<ul style="list-style-type: none"> <li>• Draw together above ideas to critically</li> <li>• Assess attitudes towards the sustainability of cities.</li> </ul>	<p><b>Identify links between topics above and other parts of the specification</b></p> <p><b>For all studies, identify both desirable outcomes and disadvantages of issues</b></p> <p><b>Develop writing frames that encourage assessment and evaluation, e.g.</b></p> <p>'In the short term ..., but in the long term ...'</p> <p>'This benefits interest group A in that ..., but for interest group B ...'</p> <p>'The effect in the local area is ..., but globally ...'</p>

## APPENDIX 1: Theme 6a – China

### Key question 1.2

#### Why and how is the economy changing?

##### Introduction

China's economy took a major change in direction after Mao's death in 1976 and arrest of Gang of Four. In 1978 the new Open Door policy was introduced by Deng Xiaoping in order to overcome China's isolation from the world economy, and to also the negative effects of the Great Leap Forward and the Cultural Revolution, both of which set the country back economically. The country was in dire financial straits and the leadership was increasingly aware that the world, and South East Asia in particular, was developing and leaving China behind.

Deng developed an 'Open Doors' policy. Gradual reform and an improvement in economic results were vital. People had to see the evidence that such a change in economic direction would pay dividends. The opening up of the economy to global activities would make the country more efficient. Central planning was ineffective at directing farmers, workers and consumers. There were too many tiers of responsibilities for directives to get through to implementation. In the 1980s industry replaced agriculture as the leading growth sector. State Owned Enterprises (SOEs) were retained but not privatised, hence China moved towards a **socialist market economy**.

Today, China's 21<sup>st</sup> century leaders are able, educated and have less ideological baggage than those of the 1980s so are more easily convinced of the need for economic reform. They are tough, focused and determined on economic growth at all costs, but on China's terms.

A number of principles set out the priorities for change:

- Resources were allocated on the basis of achieving maximum benefit from any investment.
- Contractual relationships were made more transparent so that people understood their commitment and responsibility to workshops, enterprises, factories, corporations and government as part of the plan for economic growth.
- Decentralisation was essential in such a large country. Cadres (local political leaders) had to take responsibility for local economic initiatives. The benefit of this was that the cadres improved their management skills and expertise. The downside that such a policy also enabled much corruption and poor planning.

There was a particular need for investment in infrastructure especially banking; enforceable consistent laws to overcome corruption issues; and strong, transparent financial controls. Sustained economic growth depends on a well-regulated banking system. In China lending was out of the control of the regulatory authorities. Some huge loans were outstanding and likely never to be repaid. While industrial reform is also essential, the current, although rather slow, reform of the finance sector is required at every level in the hierarchy so that people trust and use the banking system.

## New industries in the Chinese economy

There are three types of Chinese enterprise:

1. TVEs                      Town and Village enterprises. Marketised firms. Collectively owned.
2. Private firms          Mainly family owned.
3. SOEs                      State Owned Enterprises. Non-marketised firms.

During the Mao years the regime aimed to bring economic and social life under the control of the state. By the late 1970s it was clear that state control and initiatives had failed to provide for sustained economic development. There was a decline in the proportion of capital investment controlled by central government, accompanied by less tax revenue going to central government.

The privatisation of businesses was never an option for the Chinese government. The political influence of big industry and industrial ministries prevented the privatisation of state-owned industry. Ironically this 'conservatism' led to a market economy because the state could not supply sufficient services for a modern economy or enough consumer goods. There is a huge market for small scale services such as taxis, buses, hotels, catering, hairdressers, retailing, furniture, bedding etc.

It was inevitable that the state had to support a growing private economy and tried to regulate it by controlling the amount of goods which could be sold in the private sector. State work units rented out unused space; local governments were instructed to support new ventures and banks gave a proportion of their credit to sound private projects.

An additional motivation for encouraging private enterprise was widespread under-employment. A rising population who were entitled to work had forced urban and rural enterprises to have workers they didn't need. The reforms of the 1980s enabled enterprises to assess their labour needs and take action against idle or absent workers so that they could become more competitive and efficient.

### State Owned Enterprises SOEs

- Mainly heavy industries – oil, chemicals, power, iron and steel
- State controls circulation of goods
- State fixes prices
- Strong links with high level state officials
- Heavy reliance on subsidies. 1/3 are loss-making. 1/3 have unpaid debts

The 1980s focus on increased productivity of the workforce forced SOEs towards reform. It was the expansion of non-state enterprises that forced often reluctant SOEs towards market-orientated behaviour. Before 1982 the profits which SOEs accrued went directly into state funds. This profit-transfer was replaced by taxes and enabled SOEs to keep some of their profits. This was a real incentive and impetus towards independence in a market economy. Large SOEs improved their management, smaller SOEs eventually privatised. Instead of the 'revolutionary committees' set up during the Cultural Revolution, each firm or work unit has a director/manager with a clear, individual and responsible role.

The key to this transition was the *pace* of change. Reforms happened slowly so that firms had time to adjust.



Ownership is still an issue for SOEs. Ownership by 'all the people' in reality meant a sense of ownership by none of the people. There is still much government intervention and SOE objectives are only partially market orientated. If managers do what government officials want, and things go wrong, the losses are made up with bank loans which don't have to be repaid.

**Hollowing out** - an important phrase which describes how the state sector now sub-contracts some of the core activities to non-state firms. Many firms now collaborate successfully through joint ventures having accepted the management style and business strategies of global firms.

Initially there were no bankruptcies for inefficient firms, but eventually the state was forced to stop supporting firms with:

- Poor structures
- Old technologies
- Uneducated workers
- Poor training
- Poor management
- And which produced things people didn't want

National and Provincial governments were also concerned about the ruthless effects of unemployment. Housing, health services, education were all provided via the workplace. Those outside of work would have no access to welfare or housing and there was minimal unemployment benefit.

### **The future for SOEs**

To make SOEs properly integrated into the open market there needs to be further institutional reform:

- Non-negotiable taxes
- Transparent regulations, a legal and enforced framework with a clear set of accounting rules. This would ensure that bankrupt firms are not protected
- A Worker-welfare system which separates the responsibility for firms to provide housing, health, education and income in retirement.

Other changes include;

- There are fewer barriers to collaboration with foreign partners
- More opportunities for using consultants and contract workers – good for firms, less so for job security of the workforce.
- New mechanisms for enforcing contracts and resolving disputes
- Patent and copyright legislation
- Increased commercialisation of scientific and technological research
- Increased competition from rival firms in different provinces *within* China
- Increased productivity
- More SOEs gaining ground in global markets
- More innovation
- More high-end production
- A gradual move towards 'corporate organisation' in SOEs.
- SOEs are establishing new activities especially in services. Labour is transferring to these new areas and relieving the problem of redundancy as established firms become more efficient.

## Special Economic Zones - SEZs

The 1978 Open Door Policy of Deng Xiaoping aimed to attract foreign technology and foreign investment and to open foreign markets to Chinese goods.

SEZs were created as enclaves of very fast development, the first being Guangdong and Fujian.

They had:

- A special set of economic regulations, institutional frameworks and infrastructure planning
- Reduced restrictions on land, labour, wages, taxes, planning regulations
- Higher wages than elsewhere in China but cheaper than elsewhere in the world

China and the foreign firms had contrasting perspectives on the aims of SEZs. China hoped for high tech investment and increased exports accompanied by major technology transfer which would trickle down to indigenous firms.

Foreign firms just wanted cheap labour and access to a huge internal market. They had no interest in high technology investment in areas where there was no tradition of engineering. Investment was fairly modest, mainly assembly-type jobs using unskilled, female labour. Two thirds of the products were sold in China.

Despite this, the SEZs were successful and expanded along the east coast of China.

## Changing age structure

By 2030 China will have taken only 50 years to move from a very young population to a very old one. These demographic changes have an impact on economic dependency and affect the changing patterns of production and consumption. At high levels of dependency, people consume more than they produce. The divergence between production and consumption interacts with the population age structure to produce a demographic dividend.

There are two types of demographic dividend.

1. Positive. Where there are more people of productive age, a low dependency ratio. This brings an increase in the growth rate of income per capita as dependents consume the production of the productive population.
2. Negative. Where fewer people have to provide for more dependents eg in retirement. This decreases the growth rate of income per capita.

Clearly the demographic dividend changes over time and the key consideration is the extent to which the population dividend coincides with economic growth. The first dividend may have long-lasting effects if governments use the opportunity to re-invest the increased income into physical / human capital and institutional development.

The first dividend is transitory and for China it happens to coincide with an economic boom which creates an extraordinarily large dividend. The economy was growing for its own reasons but combined with the impact of population growth has led to exponential economic growth. However, although output per capita will rise by 10% 1982 - 2050, this is not due to increased output per worker, which is not rising. These are the warning signs that although China's economy is growing it is not becoming more efficient. Some observers reflect on the

influence of the Cultural Revolution whereby a generation of middle class intellectuals were forced into rural work and missed the opportunity for education and training. This may impact on China's economic growth in future.

The second dividend is associated with the severe process of ageing and will soon affect China.

Changes in the age structure can influence the processes that lead to the creation of wealth. As a population ages there is a rapid accumulation of capital as people have already acquired consumer goods and therefore increase their savings. A capital intensive economy is one which becomes mechanised, raises labour productivity and output per worker. As retirement becomes longer people have to either accumulate wealth or face a reduction in their standard of living in old age. People therefore accumulate wealth.

Alternatively people transfer their wealth to contribute to public pension plans or families have to look after their elderly. This transfer of wealth does not necessarily increase output and economic growth. Much depends on how pension funds invest their monies. In China's case, following the socialist society, there is no history or culture of saving for retirement. In addition there are concerns over the security and fragility of the financial sector in China.

**Key question 1.3****What are the economic and social challenges facing rural communities?****Changes in Agriculture**

This was the first sector to be reformed because low agricultural productivity posed problems of food security for the Chinese. Grain prices were raised by 20% and the prices of inputs to agriculture were lowered. This raised farmers' incomes, raised rural purchasing power and created incentives to raise productivity. Additionally, rural collectives were guaranteed ownership rights for 30 years. This security gave farmers confidence to invest and manage land more effectively. The reforms revitalised the rural economy, gave peasants confidence to challenge corrupt and exploitative cadres.

**Land Reform**

Issues of land reform and land ownership continue to beset much of China. Before the Communist Revolution in 1949 most land had been held by corrupt and absentee war lords. In 1949 all land came into communal ownership under the guidance of the state. As private enterprise was encouraged the issue of land ownership within communities had to be addressed.

In the **1983 consensus**, the commune system of 20 – 30 families ceased. Land of these production brigades was divided between households, the 'Household Responsibility System', by which households were given a 3 – 5 year contract to farm land. By 1984 this was extended to 15 years. All agricultural production was the responsibility of individual households.

Non- land assets were either auctioned off or managed under contract. This encouraged the exponential growth of small businesses (up to 8 employees) run by the most successful peasants. Thus a new entrepreneurial class began to emerge.

**Grain policy**

The early rapid increase in productivity slowed down dramatically during the 1980s. At first farmers used their initiative and energies to raise yields, but this stabilised. Agricultural investment by the government in the late 80s was aimed at raising productivity through draining and soil improvements, irrigation, hedgerow planting and use of new technology. All this still did not solve the basic problem that the state could not afford to pay for grain at the agreed prices. There were also concerns about inheritance rights on farmland which ultimately reduce the rate of increase of yields. Even today, farmers who want to migrate try to hold on to land. They use their spare time, or relatives, to farm, simply to maintain their farming rights.

**Town and Village Enterprises - TVEs: rural industrialisation**

The TVEs developed rapidly as collectively owned enterprises during the rapid period of rural industrialisation in the 1980s. They form the backbone of China's economic growth.

There was a significant risk of migration of unemployed / underemployed to urban areas so rural industrialisation was encouraged.

- They are mainly manufacturing units.
- They were originally rural collective enterprises which handed profits to the people's communes/production brigades.
- People belong to an enterprise, often by dint of place of residence.
- They rely heavily on local government intervention, particularly in terms of networks and acquiring contracts. Guanxi is very significant.
- The growth and profitability of TVEs is very important for local government income and therefore local government provision of services.

By the late 1980s there was a variety of independent styles of enterprise – individual, joint, co-operative, private, village-owned, township-owned, neighbourhood committees etc. Ownership of enterprises remains an issue and may be local government, cadres, banks or individuals.

<b>Rural enterprises</b>	
Small restaurants	Bicycle repair shops
Distribution companies	Household appliances
Theme parks	Cement factories
Soft drinks factories	Mining equipment
Clothing factories	Travel agents
Furniture makers	Engine manufacturers

The lack of state regulation of TVEs has led to significant corruption such as false registrations to acquire bank credit and the pirating of ideas, videos and pornography. This may be partly a result of the shock of uncultured and uneducated peasants becoming rich.

### **Reasons for rural industrial growth**

- When the production brigades were disbanded, peasants could use their time as they saw fit. Rural poverty led to a strong profit motive.
- New markets developed for agricultural and non-agricultural goods and activities. Peasants exploited niche markets
- New businesses had low start-up costs. The state provided housing; there was plenty of cheap labour; there was low capital investment.
- Rural enterprises were supported because they contributed to the rural communal economy.
- There was a symbiotic relationship with urban SOEs. Villages supplied land and labour, urban enterprises provided technology, ideas and marketing outlets. Urban enterprises had spare profits and could invest in rural businesses.

**A hukou** is the residency permit issued in the People's Republic of China which officially identifies a person as a resident of an area. Access to social and welfare facilities and benefits are only available in the area of your designated hukou. People who migrate to urban areas cannot access state health, education or housing if their hukou states their home town. It is very difficult for rural migrants to obtain an urban hukou. Migrants without the correct official hukou are termed 'the floating population' because they cannot stay permanently in a new location. There are large numbers of floating population in urban areas, without access to welfare and services.

## Migration

Migration is having a significant impact on the characteristics rural and urban populations. Rising agricultural productivity encourages rural out-migration accompanied by the demand for industrial products and services in urban towns. Most migrants head for eastern seaboard cities of Beijing, Tianjin, Tangshan, Shanghai, Changjiang and the Zhujiang delta. There is also growth in provincial capitals.

## Social welfare reform

The same issues of reforms apply to both urban and rural areas. China has a history of cradle-to-grave security. There was an 'entitlement' offered by state socialism. In practice welfare benefits were limited in coverage. Most attention was given to the elderly and to maintain public services, with some concentration on privileged and vulnerable groups. In general there has been increased insecurity due to market reforms and increased inequality. Local communities have had difficulty in controlling the change in welfare availability. There is increased inequality between urban workers who enjoy social insurance schemes and the rural population who have often been excluded.

Mao's China left a legacy of the 'iron rice bowl' in which everyone had a guaranteed job and welfare from cradle to grave. SOEs were the main form of economic organisation and had a dual function: - to deliver the state responsibility and a corporate obligation for welfare. Benefits were available to both employees *and* dependents. Each SOE acted as a mini-'welfare state' and provided health education etc with its own business. This produced a very fragmented provision.

In 1986 the State introduced unemployment insurance. In 1988 there was reform of medical care scheme in workplaces *and* patients had to pay medical fees.

1993 saw the introduction of basic medical insurance and insurance for serious illness, and in 1994 the beginning of privatising the public housing owned by Workplaces. The two pillars of full employment and life-long contracts were destroyed.

In rural areas there is limited social insurance and few subsidised services. There is a minimal safety net for orphans, childless elderly and vulnerable individuals, with heavy dependence on family support networks. The poor are guaranteed clothing, shelter, medical and burial expenses, subsidies for social services, and aid for establishing income-generating activities. However it the income generation which is priority and therefore receives most funding.

There are schools, clinics, homes for elderly but users withdraw because of the cost. This contrasts with coastal township and village governments where there is more financial availability.

In terms of education a key question is, is it fit for purpose? The function of education needs to change. There was specialisation at early age in rural areas but this resulted in poor middle managers and a population with inflexible skills. The style and approach to learning has changed and modernised more rapidly than in rural areas.

The health systems set up by Mao supported rural communities with a strong preventive focus with nationwide immunisation and a system of 'barefoot doctors' who travelled between rural communities. After 1980 there was a strong urban bias – towards health with a curative focus and an increase in private medical provision. Only 3.8% of GDP is spent on health, and the rising costs prevent many of the rural poor from accessing treatment.

The provision of pensions in China is a significant problem. People have not had to save or provide for themselves before. With a growing population and decline in the number of people attached to SOEs, the huge cost of providing for the elderly is a huge challenge. This is compounded for the single children having to look after two ageing parents as well as a more dispersed migrant population.

**Key question 1.4****What are the economic and social challenges facing urban communities?**

Urbanisation is an indicator of the modernisation of a country but China's pattern of urbanisation is different from that of other countries. A unique characteristic of China is its rapid industrialisation *without* a parallel growth of its urban population. By 2050 China is likely to have established a more 'conventional' pattern of urbanisation.

There are a number of challenges facing the urbanisation of China:

- Physical expansion of urban areas – sprawl
- Availability of and pressure on resources and energy provision
- The amount and quality of water supply
- Provision of housing due to privatisation of industries and privatisation of house building
- Social inequality
- Sustainability of cities and SEZs (Special Economic Zones)

Some of these are familiar to all cities but others reflect China's recent history. The scale of the problems is another unique characteristic.

	<b>% of China's population which is urban</b>
1976	17.4
1983	21.6
1995	30.0
2003	41.0
2050 estimate	70.0
Proportion of world population which is urban: 46%	

Several factors are driving such rapid urbanisation:

- Continuing, but slowing, population growth
- Rural to urban migration, especially as residence registration changes
- Structural shift in employment
- Decline in farm employment
- Foreign trade and foreign investment especially in eastern coastal cities
- Restructuring of SOEs and the growth of private enterprises
- Development of the urban infrastructure

**Migration**

Migration was tightly controlled in the pre-reform period to avoid unmanageable growth and chaos in cities. The household registration system, hukou, controlled access to basic needs such as housing, welfare, employment, and was not transferable between districts / communities. Once registered with a rural hukou, that was permanent. Since the 1990s, demand for unskilled and semi-skilled labour in cities has led to rural migrants being given a temporary urban hukou which enables them to have access to some housing and basic welfare in cities. This requires annual renewal so that the authorities can control the number of migrants in any one place. Temporary hukou sets the migrant population apart and has increased inequality of access to services in cities. Because of their semi-permanent residential status, many women return to their rural homes to marry and have their (one) child.

Social inequality is increasing between the growing middle class in urban areas and the poor and migrant population. Access to welfare, health and education provision is much better for those residents with permanent urban residential status (hukou). Housing inequality reflects many of the welfare problems facing urban China.

### **Housing Reform**

Urban housing for low/middle income populations is seen as one of the keys to future economic growth across the country. The change from a socialist to capitalist economy has been slow and steady and within that housing needs have increased dramatically. The privatisation of housing since the late 1990s is one of the most important elements of economic reform, but it seems that current reforms are increasing social inequalities.

During the Mao years, there was little change in rural areas where traditional family homes remained owner-occupied. The post-1949 reforms in urban areas gave work units (Danwei) and SOEs the major role in allocating state housing and shelters for the poor. In urban areas a person's employment classification set the social status for urban residents. Cadres (the government and party leaders at all levels), plus academics, were rewarded with the best housing provision, followed by skilled then unskilled workers. Rents were low and seen as part of the wages of workers.

Housing was not regarded as an economic good but as a social good, to which all citizens had a right. The financing of housing was therefore the sole responsibility of the State through central government funding, with no expectation of return from any investment. This funding was provided through work units, departments and local government.

In 1949, the focus was on industrialisation and economic growth, ie production not consumption, and housing was seen as the non-productive sector. It therefore had low priority in terms of investment. Rents for housing were so low they did not cover housing management or maintenance so the more housing the government built, the greater the economic burden became. Housing quality was also related to the wealth of the work units. Those with better resources and better economic performance provided better housing than work units which made less money.

The 1970s saw growing government deficits in the central housing budget and a housing crisis. There was widespread discontent with the huge sums being put into heavy industry and so little money spent on social facilities such as housing. The state-dominated housing finance system became unaffordable and provided an excuse for reform. The immediate needs to address were housing quality, the severe housing shortage, unequal and corrupt distribution, and inefficient maintenance.

A major achievement of the 1988 Housing Reform has been the progress in enabling people to buy their own homes. It was extremely difficult to get people to buy when they had lived in highly subsidised housing, had no or limited savings, and did not see housing as a store of wealth and savings.



### **Serious problems in housing remain**

- Rents in the public sector have increased gradually to cover repair, management and building. Many workers have been laid off from SOEs and further rent increases would affect living standards and social instability. They see no incentive to buy a house when the mortgage is greater than the housing subsidy they receive.
- People below the poverty line have been housed in old or unsaleable public, often rent-free housing
- Commercial builders have produced too many luxurious houses, beyond the means of ordinary families, and which remain unsold.
- There is insufficient housing for the increasing number of retired people.
- There is a lack of affordable housing
- Housing reform still includes allocation through work units. This provides government and core groups with housing in high status zones and places low status families in poor housing.
- Since local authorities have a large number of employees and are responsible for paying the housing subsidies, this puts further pressure on finding funds at local level to provide housing.

### **But:**

Overall, houses and flats are bigger and of better quality, and there is more living space. In 1999 66% of official urban residents owned their own homes. This makes housing reform the largest and most significant privatisation programme in China.

### **The challenge of urban sprawl**

In general there is more urban sprawl where there are several urban governing authorities with control over land use and land zoning regulations. Many regulatory authorities do not co-ordinate activities. Many work in opposition to one another, in particular the central and local authorities.

In China, government has been responsible for sprawl by deciding what types of development occur where. There is conflict between the central state which has less influence on local life, and local bureaucracies which have unpredictable and inconsistent approaches to development. In addition, many local interest groups within the public sector have an influence on sprawl. Sprawl means less cultivated land. There has been a 33% per capita loss of rural land over 50 years. This raises the question: will China be able to feed itself?

New estates have been built in a suburban ring around the edge of cities. These separate home and work for most people and the necessary transport infrastructure is expensive for local authorities to provide.

Contrasting perspectives on urban development

Since less money is being given to local areas from the state budget, there is some pressure for local government to extract money from land development. Economic development is essential, especially through foreign investment, and the availability of land is crucial in attracting investors.

Central government is concerned to preserve cultivated land and ensure food provision and food security. This contrasts with developed countries where the limitation of sprawl is concerned with environmental protection, especially of open space. State public expenditure includes food import programmes and farm conservation so the agriculture ministries, land bureau and planning bureau try to limit sprawl.

A third group interested in land use change are the revenue collection departments who want to raise more revenue from land development. They tend to ignore state instructions for conservation. Departments such as Transport and Health want to increase income from land revenue to pay for major national infrastructure projects.

The central Planning department thinks that some expansion is necessary because China's cities are overcrowded and air pollution is severe. Rural migrants, the 'floating population', need houses and basic services and this requires land.

Peasants in peri-urban areas also long to become 'urban' residents because of the benefits enjoyed by those with urban hukou. They sell their land for development although there is no guarantee that their hukou status will change quickly.

The lack of consensus about sprawl between different departments and different levels of government gives ample opportunities for corruption. Officials in charge of land acquisition and land leasing may gain 'profit' through doing deals. Control of sprawl is still a distant goal despite legislation

### **Urban renewal**

Urban renewal and housing displacement has changed the ring of estates of mixed housing and factories. People have better quality homes in the suburbs but few facilities, job opportunities and a reduced kinship network. This change in land use pattern is akin to the western-style land use segregation in cities and its attendant social exclusion.

A further complication for Chinese households is that many urban families have diverse economic activities and informal jobs. The new flats and multi-storey buildings are not suitable for running food stalls and small scale selling such as shoe repairs, cutting keys, selling jewellery. In a survey in 2002, Y Ping Wang concluded that housing reform is still not reaching the very poor, and remains focused on cadres, government officials and public sector employees (which include those in SOEs).

Urban renewal should be targeting the worst housing areas, but developers prefer areas with good land value, low population density and straightforward land, property and tenancy agreements. Several renewal schemes have demolished perfectly good housing. Families who are displaced may have to pay more to move back in to their area, but they cannot borrow money because they are too poor.

The most vulnerable of all are the 'unofficial poor' - those rural migrants who are left out of the housing reform.

### Key question 1.5

#### What are the effects of globalisation on China?

China's integration into the global economy has been a key strategy in its modernisation process, but not without its economic and social costs. Competition from abroad will help the Chinese to raise levels of efficiency and force the large SOEs (State Owned Enterprises) to either modernise or dismantle. The entry of China into the WTO in 2001 continues to be a driving force in the opening of China to both imports and exports. Keeping up to date with China's economic progress is, at the least, challenging. The combination of inward investment and cheap labour has led to the exponential growth in exports, and a more recent consolidation of the domestic economy by both Chinese and foreign firms. The emerging market of 1.3 billion Chinese for goods and services provides huge opportunities for global investors, including firms such as Walmart and Tesco.

A consistent goal of China's industrial policy has been to construct globally powerful companies that can compete with global firms.

#### Developing the global connections

China began its assault on the global economy by supporting its national 'team' of large manufacturing firms. These include:

AVIC:	aerospace industry
Sinopec, CNPC:	oil and petrochemicals
Sanjui, Dingbei and Shandong Xinhua:	pharmaceuticals
Yiqi, Erqi, Shanghai	cars
Datong, Yanzhou, Shenhua:	coal mining

The Chinese government has given active support for these firms through government procurement, preferential state loans and government selection of major joint ventures. Joint ventures have been vitally important for China. Key features of JVs have been the requirement for technology transfer and an insistence that subcontract work is given to selected domestic firms.

Recent investment successes have hidden earlier failures. There is small scale evidence from case studies which suggests that many of China's industrial policies in the 1980s and 90s have failed.

- Until recently, China has had few global players in significant industries with global brand names, a global market or global procurement.
- There have been huge problems in downsizing of the workforce to make firms more efficient.
- In 2000 not one Chinese company was listed in the world top 300 for research and design; no Chinese company in 'Business Week's top 100 brands.

The lack of a global presence forced China to aggressively seek to acquire leading global firms by acquisitions rather than wait for its own indigenous firms to develop.

## China's exports

Since Deng Xiaoping opened China to foreign trade there has been unprecedented economic growth in the country. Millions of Chinese have been lifted out of poverty; there have been real improvements in health, education, and standard of living. However this development has occurred mainly at the east coast and to a lesser extent in provincial cities. It is fair to say that this growth would have happened to some degree anyway, even if China had remained closed. But the impact of trade has significantly affected the *rate* of change.

Economic growth occurred in China *before* the accession to the WTO – which required China to address all these issues, and on which China has responded only slowly.

China's export 'basket' consists of a mixture of labour intensive and high level goods – untypical of country with low GDP. There are labour intensive exports such as toys, clothes, electronics assembly but also more sophisticated products which are more typical of a country with a much higher GDP / capita. Labour productivity in China's consumer electronics industry is unusually high, equivalent to Mexico where the PPP is twice as high. The joint ventures between foreign and Chinese firms, located in clusters in SEZs / EPZs, are a critical source of technology and technology transfer, and dominate exports. China is developing a supply chain of components to support assembly production. The government insists on firms sourcing from local suppliers so that there can be some technology transfer and trickle down from foreign investors. This is an unusual scenario in NICs and emphasises the key purpose of the government's Open Door policy i.e. economic growth at all costs.

## International Relations

A key question is whether China will fulfil its commitments to the WTO. Currently there is much mistrust about China's motives for its international policies. An advantage if China does deliver is more leverage in other international affairs. The economic interests of western multi-nationals in China will also add to her economic influence in MDCs.

Within ASEAN (Association of South East Asian Nations) there is some fear of the influx of Chinese goods into their markets. For the least developed nations, the challenge remains to find any comparative advantage against China. Many of the Asian economies have developed on the same premise of cheap labour producing low-end goods. There is particular competition from Chinese exports of textiles and clothing as the Multi-Fibre Agreement has expired. Countries cannot compete with China and must find alternative strategies in order to sustain what economic development has been achieved. There were concerns that China would absorb most of the FDI flowing into the Asia region. However there is some evidence now that as the volume of trade within ASEAN increases, there is more interest in FDI across the region. If exports are complementary to China's they will benefit e.g. India can export computer software and IT services as well as textiles and chemicals to China. Asian NICs have also invested heavily in China and may benefit from that overseas investment.

China's trading partners are concerned about 'dumping' of exports. Partners can impose restrictions on Chinese imports based on 'market disruption' or 'threat of..' If one country takes action, other countries can too in order to prevent diversion of those Chinese exports to other countries.

## China and Africa

One of the major international developments of the early 21<sup>st</sup> century is the relationship between China and Africa. In November 2006 Beijing hosted a Sino-African summit during which it consolidated its trade and aid commitments to the continent. This relationship is causing some consternation among developed nations who question to motives of Chinese involvement with states whose governance is questionable.

Developed countries (US / EU in the main ) express a number of concerns which affect China's interest in Africa:

1. Imports from China to African nations are mainly cheap products. These may displace local producers in sectors such as textiles, leather, clothing, footwear and some white goods. African exporters of textiles and clothing are vulnerable to Chinese competition. Even before a fledgling clothing industry was established, there were factory closures and lay-offs in Kenya and Lesotho.

African fabric is of poorer quality than Asian. Often Asian fabric is imported into Africa to make African textiles. Asian cloth is also only one third of the price of African cloth. Africa has niche markets for cloth which could be developed but these are not strong enough to survive a major onslaught from China. There is also a need for African labour to become more skilled – sewing machinists, middle managers – so that local technologies can be upgraded to produce higher value-added products.

2. China has a huge demand for natural resources and has entered into many long term agreements to help African countries exploit their resources in return for development aid.

The Chinese state petroleum companies, CNOOC and CNPC, are actively exploring oil reserves in several African countries.

3. Where the West has held back from supporting and financing projects on the basis of poor governance, corruption and inadequate human rights, China has stepped in with both aid and trade agreements. It's argument is that the internal affairs of a country are not China's business, and that where there is a mutual need to exploit and utilise natural resources that need should be addressed. There is a huge measure of frustration that while the West urges African nations to improve its governance with the carrot of aid packages, China offers support without strings attached.
4. African countries need to avoid becoming simply primary product suppliers if they are to develop sustainable economies. Countries need to make effective use of the sale of their resources to China. It is important that they develop export opportunities as well as protect low-level manufacturing.
5. China is supporting major infrastructure projects which appear to offer limited economic development potential e.g Olympic stadia in West Africa; the new Presidential Palace in Kinshasa, an extended rail network in Tanzania; the Merowe Dam project on the River Nile in northern Sudan.
6. There are geo-political repercussions of China's interests in Africa. For instance China is financing transport infrastructure development in Sudan and buying most of Sudan's oil. Coincidentally it exercises its veto in the UN Security Council over censure of the Sudanese government's position regarding claims of genocide in Darfur.

**References:**

The Economist Saturday 28 October 2006 *Never too late to scramble*

The Guardian Saturday 28 October 2006 *China's Goldmine*

The Independent Saturday 8 May 2004 *Why all the world feels China's growing pains*

The Times Thursday 2 November 2006 *Beijing hosts its biggest diplomatic party as it joins scramble for Africa*

## APPENDIX 2: Theme 6b – India

### Key question 1.2

#### Why and how is the economy changing?

India has undergone major changes in economic policy. After Independence in 1947 and Partition, India's aim was to develop economically without the participation or influence of foreign capital. The socialist governments pursued a command and control model of development and there was a high level of state control of key industries which in turn led to excessive bureaucracy. This still exists as a real hindrance and cost to business.

The current government understands the need for India to fully embrace the global economy, but anti-globalization in India is historically rooted, as governments, unions, and businessmen have traditionally emphasized national / home-grown industrialization and self-sufficiency.

The high levels of inequality in India and the highly politicised economy presents many opportunities for conflicting economic policies between state and federal governments. Over the last fifteen years economic growth in India has been characterised by increased inequality between states - average incomes in Punjab, Gujarat, and Maharashtra are four times that of Bihar.

Urban areas are more wealthy than rural. Some rural areas in Bihar, Jharkand, Uttar Pradesh and Orissa are officially destitute. 70% of India's population live in 550,000 villages. In addition, unemployment and *underemployment*, about 10% of the workforce in 2008, adds to another dimension to this expanding economy.

Year	Unemployment rate	Percent Change	Date of Information
2003	8.80 %		2002
2004	9.50 %	7.95 %	2003
2005	9.20 %	-3.16 %	2004 est.
2006	8.90 %	-3.26 %	2005 est.
2007	7.80 %	-12.36 %	2006 est.
2008	7.20 %	-7.69 %	2007 est.

**Definition:** This entry contains the percent of the labor force that is without jobs. Substantial underemployment might be noted.

**Source:** [CIA World Factbook 2008](#)

#### Characteristics of changing employment:

- An increase in real agricultural wages but disparities between States
- Diversification of employment in rural areas to non-farm activities, although no reduction in *unemployment*
- Growing use of casual labour
- Growing unemployment in factory sector. 2 million jobs lost 1996-2001
- Increased productivity, but little increase in wages
- Higher wages in informal sector in urban than rural areas
- Informal sector wages in urban areas are much lower than in formal sector
- Urban informal sector has better access to health, education than rural informal sector
- Growing links in *urban* areas between formal and informal sectors

## Agricultural economy in India

Agriculture in India is characterised by unequal productivity across the country. Highest yields are found in Punjab and Haryana and lowest in the NE states of Bihar and Orissa.

In the 1960s India was highly dependent on imported food. 10 – 11 million tonnes of food grain were imported per year. At one point in 1966, India had sufficient food for only two weeks.

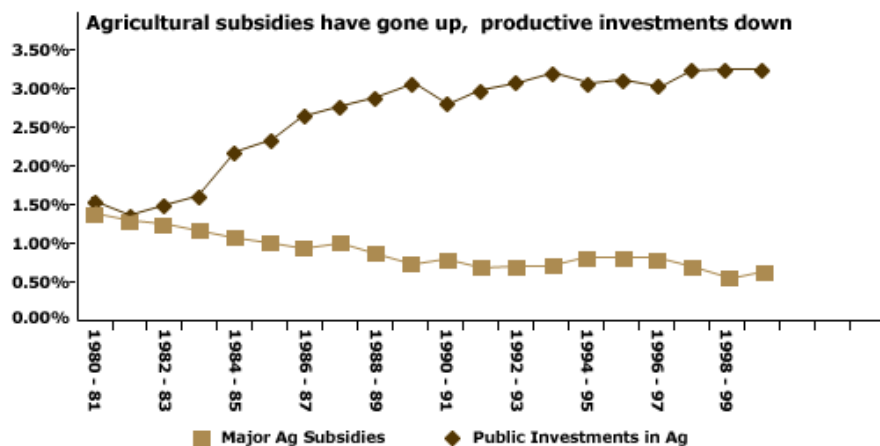
The Green Revolution had a major impact on Indian food production. The area of HYV wheat crops increased from 4ha in 1963 to 4 million on 1971. The wheat revolution was followed by rice, cotton, sugar, millet and oilseed. For the first time for several decades, food production exceeded population growth.

The Green Revolution was extremely successful in raising incomes for farmers on naturally fertile soil but one consequence of this was an increase in inequality between wealthy farmers with well-endowed land and poorer farmers on more marginal land.

Today the agricultural sector still faces challenges:

- Declining yields
- The rising population has led to fragmentation of farms
- An increase in the number of landless peasants
- A focus on agri-business, agri-exports and cash crops, such as the rubber, coffee, coconut
- A fall in commodity prices

Agricultural productivity is declining and average agricultural growth has fallen from 3.2% in 1980-92, to 1.3% in 2005 although the national target was 4% a year. The agricultural markets are heavily regulated by government and this tends to reduce competitiveness, and discourages private investments. (World Bank 2008)



Notes: Agricultural subsidies include GOI foodgrain and fertilizer subsidies, state government power and irrigation subsidies.

Source: Ministry of Agriculture, Acharya and Jogi 2004. / World Bank



The decline of Indian agriculture is taking place due to the following factors:

- Decline in the land available for agriculture due to ever expanding cities and industries and SEZ's.
- Decline in land fertility due to poor use and application of fertiliser.
- Reduction in effectiveness of irrigation
- Poor economic condition of the farmers resulting in use of low quality seeds, fertilisers etc.
- Small farms - successive division of land amongst the family members leading to very small area.
- Environmental pollution resulting in green house gases and unpredictable climate changes

### **Agribusiness**

Agri-businesses play an increasingly significant role in agricultural exports and in food security. Agribusinesses control much of the chain from seeds, fertilizers, finance, distribution and marketing. Environmentalists and pro-poor groups claim that companies encourage poor farmers to borrow money for seeds etc and as a result farmers get into debt and many commit suicide. Commercial interests point to the rapidly increased output from new, large farms in India which helps to maintain food security. Demand is rising from middle class families who see agri-businesses as producing higher quality and safer food. Many farmers use HYV and GM seeds and fertilizers; for instance there are over 200,000 hectares under BT cotton mainly in western India.

Fertiliser companies now compete with each other to cut costs and attract more farmers. Rural credit has become popular and fertiliser giants such as Monsanto and IFFCO offer a range of financial products to their customers. Agribusinesses are also involved in supply chain organization and aim to establish a fair and transparent system so that the farmer gets a reasonable price for his produce.

The widespread use of mobile phones in agriculturally prosperous regions is bringing better prices to the farmer and ushering in a fairer pricing system. Dairy farmers in Baramati, near Pune use computers while selling milk. At the collection centres, a sample of the milk is analysed by computer and this determines the price of the milk.

Production of processed foods and food retailing is increasing in specific cities and some local supermarkets. They have started retailing fruits and often vegetables too. These perishables are available at competitive prices and the quality is often better. Fruits such as apples and many exotic fruits are now available.

India is being studied as a sourcing base for crops such as table grapes. Indian grapes are sold at a Tesco store in the UK when Chilean grapes are not available.

### **Manufacturing Sector**

India has struggled to reform its industries. Bureaucracy has been a huge burden, but generally Indian business is noted for its transparency and reliability.

Key issues to resolve:

- Too many regulations and restrictions
- Variations between states – questionable validity, border taxes
- Labour legislation –very rigid. Most large manufacturing firms overstaffed
- Inspections from health, safety, environment officials - huge 'compliance' burden

After a decade of reforms, the manufacturing sector is now growing rapidly. Many multinationals have invested in India since 1991 when foreign direct investment (FDI) was permitted. Companies in the manufacturing sector have consolidated around their area of core businesses by linking with foreign companies to acquire new technologies, management expertise, and access to foreign markets. The cost benefits associated with manufacturing in India has made it an attractive destination for manufacturing and sourcing for global markets.

### **Financial Sector**

An extensive financial and banking sector supports the rapidly expanding Indian Economy. India has a wide and sophisticated banking network. The sector also has a number of national and state level financial institutions. These include foreign and institutional investors, investment funds, equipment leasing companies, venture capital funds, etc. There is a well-established stock market, comprising 23 stock exchanges, with over 9,000 listed companies. The Indian capital markets are rapidly moving towards a modern market including derivative trading and internet based trading, etc.

### **Services Sector**

The services sector contributes 41 per cent to GDP. There are a whole range of services from financial services, software services to accounting services, all of which provide a major impetus to the economy.

India is becoming a major force in the Information Technology sector. According to the National Association of Software and Service Companies (NASSCOM), over 185 Fortune 500 companies use Indian software services. The world's software giants such as Microsoft, Hughes and Computer Associates who have made substantial investments in India are increasingly tapping this potential. A number of multi-nationals have invested in India to make use of the relative cost advantage and highly skilled manpower base available, and have established shared services and call centres in India to cater to their worldwide needs.

The software industry was one of the fastest growing sectors in the last decade with a compound annual growth rate exceeding 50 per cent. Software service exports increased from US\$ 4.02 billion in 1999-2000 to US\$ 6.3 billion in 2000-01 - a growth of 57 per cent. India's success in the software sector can be largely attributed to the industry's ability to use a high level of knowledge and expertise through intensive R&D and apply that knowledge in commercially viable technologies.

### **The IT sector**

- 50% annual growth since 1991
- Software exports \$6.3billion
- Domestic sales \$2.5 billion
- 2008 revenue estimate \$87billion
- Exports to 95 countries, 61% to US & Canada
- Over 1/3 Fortune 500 companies outsource their software requirements to India
- Contributes 7.5% of GNP
- 35% total exports
- 2.2million jobs by 2008
- \$4 – 5billion of FDI

**Industrial Growth Rates: Use-Based**

SECTORS	Weight	1995-96	1996-97	1997-98	1999-00	2000-01	2001-02	Apr-June 2002*
All Industries	100	13	6.1	6.7	6.7	5	2.8	4
Basic Goods	35.57	10.8	3	6.9	5.5	3.9	2.8	5.1
Capital Goods	9.26	5.3	11.5	5.9	6.9	1.8	-3.9	1.6
Intermediates	26.51	19.4	8.1	8	8.8	4.7	1.6	1.1
Consumer Goods	28.66	12.8	6.2	5.5	5.7	8	6	6.5
(a) Durables	5.36	25.8	4.6	7.8	14.1	14.5	11.5	0.5
(b) Non-Durables	23.3	9.8	6.6	4.8	3.2	5.8	4	8.7

Source: mapsofIndia

**Infrastructure**

Issues for India's Infrastructure:

- Road and rail networks lack investment
- 25% firms say infrastructure is key obstacle to growth
- Difficult to have regional distribution centres therefore many small manufacturing units replicated across the country – inefficient
- Adds 2 – 5% to costs of doing business compared to China
- Congestion is expensive. Real estate costs also high. Firms looking elsewhere outside the 6 main cities.

Transport issues:

- Huge delays in distribution and in ports 7.1 days in Karnataka, 9.6 days in Delhi
- Severe bottlenecks, overcrowding – send goods well ahead of export date
- Rail - 63,000kms, 4000 mill passengers /year.
- 2 gauges - narrow and 1m
- Very unpredictable
- Needs for \$200billion of new ports, roads & other infrastructure
- \$50 billion to modernise 40,000kms roads
- Problem – state and federal governments often in opposition

The road transport sector has been declared a priority and will have access to loans at favourable conditions.

The National Highways Act has been modified to help the reduction of tolls on national motorways, bridges and tunnels. Calcutta's Howrah Bridge is the world's busiest with a daily flow of 57,000 vehicles and innumerable pedestrians. Private participation in the energy sector has been encouraged with the reduction of import duties, a five-year tax exemption for new energy projects and a 16% return on equity.

The government is also following a new telecommunications policy that aims to improve the quality of its telecommunication systems.

Motorway network	3.3 m km- 1,448,629 Km
No. Goods transport vehicles	1,600,000
Railways	62,486 Km
No. Railway stations	7,000
Produce transported by rail (1992-93)	350,000,000 tons
No. International airports	5
No. National airports	90
No. large ports	11
No. small and medium ports	139
Goods travelling through ports	166,610,000 tons
Merchant fleet	443 ships
No. Post offices (2001)	155,000
Energy production capacity (91-92)	78,000 Mw
Energy generated (2000)	547.12 billion kWh

### Key question 1.3 What are the social and economic challenges facing rural communities?

#### Socio-economic characteristics

The diverse ethnic, linguistic, geographic, religious and demographic characteristics are reflected in both its history and its future. The 16 official languages hide a multitude of others. The rapidly growing and economically powerful urban areas contrast with traditional and often remote villages which somehow manage to still dominate Indian life. Only a small fraction of Indians are at present benefiting from the economic growth of industry and IT / service sectors. While India is rapidly becoming a middle class country with western lifestyles, it also remains a rural country embedded with social and religious traditions.

Although our impression of India is of overcrowded cities, most Indians live in villages and are farmers of some kind. *'India lives in its villages'* Registrar General, 2005.

In 2001, the average Indian lived in a settlement of 4,200 people. 72% of the population is classed as rural and 58% of people are farmers. Only 11% of India's population live in cities of over 1 million people.

Many Indians are classed as living in rural areas which are densely populated because they are dependent on agriculture and lack the high densities designated for 'urban'. In India urban = 5000 people, population density of 400 / km<sup>2</sup> and less than 25% of male workforce engaged in agriculture.

Most rural Indians have lower educational levels, higher mortality and fertility, greater poverty, and fewer services and amenities than urban dwellers. Rural-urban migration, although important for city growth, is actually much less than in other regions. Most Indians live their whole lives in a relatively limited geographic area.

#### Rural and urban population 1901 – 2001

Census year	Population ('000s)		Change over decade ('000s)		% Urban
	Urban	Rural	Urban	Rural	
1901	25,855	212,541			10.8
1911	25,948	226,145	93	13,604	10.3
1921	28,091	223,230	2,143	-2,915	11.2
1931	33,463	245,515	5,317	22,285	12.0
1941	44,162	274,498	10,711	28,984	13.9
1951	62,444	298,644	18,282	24,146	17.3
1961	78,937	360,298	16,493	61,654	18.0
1971	109,114	439,046	30,177	78,748	19.9
1981	159,463	523,867	50,349	84,821	23.3
1991	217,611	628,810	58,148	104,943	25.47
2001	286,120	742,618	68,509	113,808	27.8

Source: Census of India

There are very strong inter-relationships between religion, language, culture, education, wealth, the role of women and politics in India. These sometimes flare up into conflict but at all times are fundamental forces in Indian life. In 2001 80% of Indians were Hindu, 13% Muslim and the remaining Sikh, Christian, Jains, Buddhists and Parsis.

Demographics changes fuel distrust between Hindu and Moslem particularly in the context of control of state governments. The higher fertility rate of Muslims has a political impact in states such as Kerala, Assam and Uttar Pradesh where the proportion of Muslims is increasing.

### **The Caste system**

However, despite the relatively small demographic changes, Hinduism is deeply rooted in India's culture particularly through the caste system which has its origins in ancient Hindu texts such as the Vedas.

There are four main divisions, each of which is further subdivided into an extremely complex hierarchy:

1. Brahmin (priests, teachers)
2. Kshatriya (kings, warriors)
3. Vaishya merchants, landowners, craftsmen)
4. Shudra (labourers, artisans)
5. Untouchables (Dalits, 'The Oppressed') are the lowest caste who perform menial tasks. Gandhi tried to remove their discrimination by referring to Dalits as *Harijans*, Children of God, but the discrimination has been very difficult to remove.

The Indian government has tried to reduce discrimination by ensuring that a percentage of public sector jobs are reserved for certain castes of Dalits. They are called the Scheduled Castes (SCs). Another group, the Scheduled Tribes (STs), also have reserved jobs and university places on the grounds that they have suffered discrimination, poverty and have low educational attainment.

The reservation policy is controversial because there are claims that STs and SCs are not adequately prepared or competent to be at university or have administrative posts. Most SC and ST young people have difficulty competing with other better educated students. Over 20% of university places remain unfilled in Delhi University while India is desperately trying to expand the number of qualified graduates. Another group, the Other Backward Classes, OBCs, are seeking similar provisions as STs and SCs.

### **Migration**

Indian cities with over 1 million people are integrated into the global economy but smaller cities tend to look towards the local economy. Rural-urban links in India are strong. Journeys of 20-30kms into Mumbai, Kolkata and Chennai are not uncommon. Family members return to rural homes to help with harvest; money sent by urban dwellers to rural areas makes a significant contribution to poverty reduction despite increasing urban poverty. The reverse also happens – rural families send money to urban relatives to help students or to support men seeking work.

Migration to cities is essentially due to a lack of opportunities in rural areas. This push factor affects the sustainability of urban growth which has become a real concern for state and national governments. Development of rural areas can do much to stem internal migration and take pressure from urban centres.

A key issue for India now is not just the *rate* of growth and level of urbanisation, but the real *numbers* of people. India faces problems typical of other developing nations. While the metropolitan areas contribute to the economic output of the whole country, they are in crisis because their physical and living environment is deteriorating - uncontrolled growth of slums, poor provision of services, high levels of pollution, ineffective government and poverty.

## Welfare

Facts and figures:

- 60% workforce is in agriculture. Produces 25% GDP. Of that 2/3 are cultivators, remainder are agricultural workers.
- 1985 – 2005: 10% decline in rural workforce. 15% decline in contribution of agriculture to GDP.
- 18% workforce in industrial sector. Produces 27% GDP. (Mining, manufacturing, utilities)
- 1985 – 2005: 2% increase in workforce. 3% increase in contribution to GDP.
- 40% of Indian population work. 28% of them are women workers.
- Decline in participation of children in workforce but still concentrations in selected industries e.g. textiles.

India divides its workforce into the Organised sector and Informal sector.

### *Organised sector*

- < 10% workforce. Produces 20% GDP. Mainly industry, services. 66% of organised work is public sector

### *Unorganised sector (informal)*

- Huge - 70% of workforce is rural. Agric / subsistence base.

Employment trends:

- Increase in real agricultural wages but disparities between States
- Diversification of employment in rural areas to non-farm activities, although no reduction in *unemployment*
- Growing use of casual labour
- Growing unemployment in factory sector. 2 m jobs lost 1996-2001
- Increased productivity, little increase in wages

Welfare Concerns

- Wages are too low in unorganised / informal sector and too high in organised sector
- Informal workers – below subsistence level, abysmal working conditions, no income security or social security. No safety nets.
- Formal/organised – rising wages, improving growing political influence
- working conditions, secure jobs, Rigidity in formal sector believed to be holding up policy reforms to encourage more FDI & export of labour intensive manufactures
- Problem – how to provide minimal social & income security for unorganised workers (including agriculture) and get more flexibility in organised labour market

Education is a challenge in many rural areas, particularly that of girls.

- Drop-out rates are a big issue – knock-on effect to future prosperity
- Even if parents are keen, attendance may still be poor
- Poorer agricultural households have the worst attendance, especially in migration and harvest seasons

Why do children not go to school?

- Children's household work. Girls do boy's work but boys would never do girl's work
- Children refuse to attend – fear of teachers, lack of interest
- Parental attitudes – education seen as way out of farming. Education makes children unfit to be farmers. Girls marry young therefore not worth educating

**Key question 1.4****What are the economic and social challenges facing urban communities?**

City dwellers in India increased by only 60 million between 1991 and 2001, along with 113 million more rural dwellers. There is a crisis in urban infrastructure due to these 60 million but also due to the aspirations of the middle classes for private cars and a higher consumption lifestyle. The poor compete with the middle class for land to build homes, transport installations and retail malls.

**Housing**

The availability of housing has been a problem since before Independence. It is the role of the State to provide housing but much of the finance comes from central government.

In the 1980's the perception of the housing problem changed from one of numbers to concern about housing quality – the construction of homes and the provision of services. The post-1991 reforms encouraged more privatisation, owner-occupied homes and expansion of houses for rent, accompanied by increased availability of housing finance and improvements in housing amenities. The challenge has been to manage the changing responsibilities for providing housing, allocating resources and creating finance systems. National government has passed responsibility for these to city governments. One persistent problem has been the separation of departments providing housing services – sanitation, water, lighting etc – which currently show very little coordination of planning.

Key challenges for housing:

- Substandard building construction
- There was very little finance for local people to buy housing, or for city governments to build public housing.
- Lack of public housing therefore migrants were forced on to bus shelters, parks, school / hospital buildings. In 1991, 14.5 million families lived in dilapidated structures; 0.5 million lived on pavements, roadways, central reservations.
- The housing market was unorganised. Private developers were not controlled and they charged exorbitant prices for houses. Some developers bought land and waited 10 -15 years before developing it.
- House building was not co-ordinated with providing clean drinking water, sewerage etc.
- Rent controls protected tenants against exploitative landlords but discouraged the availability of rented property because there was too much bureaucracy for the landlords.
- Deprived sections of the community had no access to land

**Low cost housing**

There has been some improvement of existing slums but significant further financial reorganisation is required to improve housing quality. National government has incentive schemes, using tax and excise duty, to use recycled materials for building. These include the use of industrial, agricultural and domestic wastes to make new building materials that are affordable, sustainable, and environmentally friendly.

One particular low-cost solution is unpopular. Flats have been built with public money but they were expensive and often badly built. People did not want to live in flats because they lacked the space for gardening and growing food and were generally thought to be insecure.



Substandard housing, i.e. those built without cement, iron, bricks or sand, is still a real problem in most cities. The incidence of substandard housing doubled between 1991 and 2001 from 7 million to 16.8 million. The shacks do not provide year round shelter and may collapse. As people make money, they make their homes more secure and permanent.

#### Health services

- Free at point of delivery
- Huge differences in health indicators between rich and poor
- Main issues = malnutrition, under nutrition, birth practices, underfed mothers
- Focus on maternal and child health
- No universal immunisation
- Problem of infrastructure – needs political and admin will
- HIV/AIDS will become main cause of death. Treatment needs political will + money. Problem – politicians have short time-horizons
- Plus need to combat malaria, TB, hepatitis, bronchial diseases
  
- Infrastructure & staffing depends on population distribution
- Staff concentrate in urban areas where there are maximum facilities
- National government sets policies, norms, standards - 30% funding. State implements – 77% funding
- Weak capacity throughout, poor management, much duplication
- Weakness = over centralised, supply-led system. No delegation of financial & admin powers to districts. Complex financing system.
  
- Private sector important in curative medicine & hospital provision. Urban bias.
- Primary health care correlates with income levels
- 45% health resources go into hospitals. 30% to promote health and prevention schemes
- Main problem is the high salaries for medics.

#### Education

Inequality exists here also as the growing number of middle class families seek high quality education in English for their children in the many private fee paying schools. State schools provide basic education for the poor. Teaching is in English, but for most of the poor this is their second language.

#### Schools

- Private sector – very important role
- Government aided
- Government schools
  
- Finance from central government, state government, local people pay fees, Aid agencies
- At lowest level - 600,000 villages + slums where 'free and compulsory' education is really only basic literacy instruction from partly qualified 'para-teachers'
- Need for food, livelihood and health improvements for the poor to overcome the disadvantaged circumstances (i.e. poverty, malnourishment, debilitating health)

Key challenges:

- Improving access & quality at all levels of education
- Increased funding, especially HE
- Improving literacy rates
- Raising low achievement levels
- India will have a young population – but only a benefit if it is educated
  - 35% population under 15
  - 4% GDP spent on education
  - 92% enrolment rate

### **Sustainable Cities Programme SCP**

Five Indian cities are included in the global programme: Chennai, Bangalore, Hyderabad, Delhi, Kolkata

Major elements are:

- Environmental sustainability e.g. infrastructure projects, initiatives from community & private sector
- Social equity e.g. rights movements
- Economic growth & redistribution e.g. housing, shelter programmes, community based poverty alleviation
- Political empowerment – urban governance decentralisation, NGO-led capacity building

The role of the Government of India:

- Major role in framing policies & programmes because the Sustainable Cities concept is multi-sectoral, multi-departmental, comprehensive
- But Government of India sees SCP only in environmental terms.
- SCP does not address poverty, disempowerment, poor services.
- There are many protest / resistance movements but they have limited impact locally and affect only a small percentage of the population. They tend to be fragmented therefore potentially ineffective

Urban development & economic growth in India are regarded as synonymous. People-centred approaches to growth are overlooked.

The key development issues for the Sustainable cities are:

- Secure housing rights
- Provision and access to civic amenities
- Provision and access to public health, education, safe & secure drinking water, food security
- Freedom from violence & intimidation
- Adequate social security programmes

### **Key question 1.5**

#### **What are the effects of globalisation on India?**

Globalization of the Indian Industry took place in various sectors such as steel, pharmaceutical, petroleum, chemical, textile, cement, and retailing. The government of India made changes in its economic policy in 1991 by which it allowed direct foreign investments in the country. Since then globalisation of the Indian Industry took place on a major scale.

Beneficial effects:

- Foreign investments into pharmaceutical, petroleum, and manufacturing industries. Significant boost the Indian economy
- Provides employment.
- Contributes to reduction in the level of unemployment and poverty.
- foreign companies bring advanced technology helping to make the Indian Industry more technologically advanced.

Negative effects:

- increased competition in the Indian market between the foreign companies and domestic companies – mainly in the pharmaceutical, manufacturing, chemical, and steel industries.
- consumers preferred to buy the foreign goods.
- Advanced technology required less labour especially in heavy manufacturing - pharmaceutical, manufacturing, chemical, and steel industries.

See links to particular sectors

#### **Globalization and the Indian Manufacturing Sector**

<http://business.mapsofindia.com/globalization/india-industry/manufacturing-sector.html>

#### **Effects of Globalization on Indian Steel Industry**

<http://business.mapsofindia.com/globalization/india-industry/effects-steel-industry.html>

#### **Globalization and Indian Textile Industry**

<http://business.mapsofindia.com/globalization/india-industry/textile-industry.html>

**Key question 1.6****What are the environmental challenges and solutions facing India?**

The challenges of addressing poverty as well as managing the environment sustainably remain significant. After the UN Conference on Human Environment 1972, India created a National Committee on Environmental Planning and Coordination, NCEPC. Environmental issues were then included in the national 5-year Plans. In the 1980s a Ministry of Environment & Forests was created and now there are numerous autonomous agencies, offices and institutions set up by government at both national and state levels.

There is a will to have environmental improvement, but often this conflicts with other demands and, in common with most other countries, puts government departments at odds with each other.

**Forests**

After Independence India's forests were exploited commercially for pulp and paper and they continue to be over-exploited. Huge areas have been deforested, accompanied by serious soil erosion.

There are a number of reasons for forest degradation.

- Over-exploitation by local communities for subsistence, fuel, fodder
- Over-grazing
- Population growth and an increase in cattle / head of population
- State agencies extraction of timber
- Unregulated urbanisation
- Rapid industrialisation
- Submergence for dams
- Fire
- Conversion of forest to agriculture

There was pressure from local rural communities to use forests for food, fuel and grazing. The government response was to approve the 1988 National Forest Plan which provides for local forest management and protection against illegal logging and encroachment. Illegal logging still occurs and the needs of herders, grazers, low caste groups and women are also unmet.

There has been significant replanting by state forestry departments, but this has been primarily of commercial timber – eucalyptus, teak and pine. Although the forested area is increasing, the loss of biodiversity is not really sustainable.

**Industrial pollution; Ganga Action Plan**

The Ganga River which has great spiritual and emotional significance is seriously polluted. In 1984, the Department for the Environment established an action plan to reduce pollution. Instigated in 1986, the GAP 1 aimed to intercept, divert and treat 882 MLD (Million litres per day) of wastewater,

68 'gross polluters' were identified along the Ganga River. This occurred through:

- Industries discharging their effluents directly into Ganga
- Industries having toxic substances in their effluent.
- Industries having a BOD concentration of more than 100 mg per litre in their effluents.
- Industries discharging more than one million litre per day (1 MLD) of effluent.

Bureaucracy has held up progress. There were technical design flaws, a mismatch of the schemes and their components, problems in land acquisition, contract mismanagement, lack of adequate maintenance, and a lack of support from the States and their implementing agencies. The Hindu, in August 2004, reported that pollution levels were higher than ever, despite sewage treatment works. There was erratic power supply, faulty engineering and maintenance problems.

### **Water resources**

India has both too much and too little water. The areas which flood in the monsoons, and the population which is affected, increase every year. Increased demand in rural areas results from the demands of agriculture, rising standards of living and rural industrialisation. The unpredictability of rainfall in many semi-arid areas is increasing because of failed monsoons and climate change.

Depletion of groundwater reserves is linked to land use changes. Although only 20% of India's farms are commercial they are having a significant impact on water resources. Changing middle class diets require meat, dairy and milk products which make major demands on water. As cities expand and use groundwater resources, the water table falls. City authorities are now importing water on tankers from groundwater wells at the rural-urban fringe. This inevitably affects farmers who supply cities with food.

The traditional techniques of rain water harvesting (RWH) are being revived as India attempts to meet its water deficit. Increased water demand from industries and urban areas is placing rural water supplies under stress. More and more rural communities are adapting RWH to increase water availability, raise agricultural yields, recharge wells and raise levels of groundwater. The problem is the level of bureaucracy which slows the pace of change, and claims that policy makers have a 'blinkered vision' and a half-hearted promotion of water conservation.

**Water pollution** in India has several origins.

1. Many industries have obsolete pollution control technology. Manufacturing industries have no in-built pollution prevention.
2. Excess water withdrawal for irrigation, industry, and domestic use lowers discharges and concentrates levels of pollutants. This is particularly acute in the dry season.

Natural drainage and water transfers are part of big dam projects and water abstraction. Reduced river flows provide less natural cleansing

### **Irrigation and water engineering**

India has an ancient and sophisticated irrigation system which is not maintained properly and works at 35% of capacity. The area irrigated by canals is decreasing in some states including Andhra Pradesh and Tamil Nadu. Some lost water recharges the groundwater but much is evaporated or is causing water-logging of soil, a problem that forces salt to the surface and consequent salinisation.

India has a number of large water engineering projects. Many rivers have a network of dykes /embankments and canals to contain flood water. However the embankments decreased the fertility of the flood plains by restricting flood waters, and also cut off drainage from the surrounding areas *into* the rivers, leading to waterlogging of flood plains. There is now a dam-building programme which could deliver power generation, irrigation and flood control. The challenge is to achieve all three. Dams need to be full to the top to create efficient HEP, but only half full to act as water storage.

India has over 400 large dams over 15m high. They have an important role in increasing farm productivity as well as providing HEP and industrial water supplies. However there are also social and environmental effects particularly on the displaced peoples, tribes, scheduled castes and the extreme poor. Each dam in India has submerged over 500ha of forest (World Commission on Dams report 2006). Most of the schemes were not required to minimise environmental impacts. Many are linked to irrigation schemes but most dams make heavy losses. The Narmada Valley project has been one of the major environmental battles in recent years in India.

### **Energy Resources**

India faces a critical challenge to meet a rapidly increasing demand for energy. India is sixth in the world in terms of energy demand. While there are significant reserves of coal, there are limited oil and gas resources.

The oil fields offshore Mumbai and onshore in Assam have potentially 5.9 billion barrels of oil. India imports approximately 70% of its oil, much of it from the Middle East while also seeking oil outside the Gulf. This diversification could bring India in direct competition with fellow Asian countries like China and Malaysia.

The government is trying to develop more sustainable energy policies:

- Increased fuel efficiency (except some household necessities such as kerosene and cooking gas which receive the up to 40% subsidy to benefit the poor.)
- Shift to natural gas and LNG.
- Increased domestic production:
- Increased utilization of clean coal technology. The country is the third largest coal producer with 7% of global reserves of coal. Coal provides 56% of India's commercial energy supply.
- Increased use of renewable sources of energy: ethanol and bio-diesel, solar, wind and hydroelectric power

<http://library.fes.de/pdf-files/iez/global/04809.pdf>

### **Economic growth and sustainable development**

Everyone recognises India's huge strides in terms of rapid industrialisation, consumerism and materialism but much of this 'progress' has not reached everyone. Many people are worse off than in 1991 especially the adivasi, the Scheduled Tribes and indigenous communities, the landless peasants, marginalised farmers and also the Scheduled Castes.

'Environmentalists' hold the view that this increased inequality is due to:

- Export-led development
- A free-for-all attitude to development which ignores the impact on the environment
- State governments who use natural resources to attract commercial and industrial development
- National government directives to reduce spending affect social and environmental sectors in particular
- Unequal international trade relationships which encourage over-exploitation of resources
- A lack of social responsibility by companies, often multi-nationals
- A wasteful attitude to consumer goods in this rapidly expanding consumer market

India's long history of democracy enabled people's movements to raise the profile of environmental issues. The Chipko Movement is a classic example of peasants protesting against the exploitation of the resources need for their livelihoods.

### **Chipko Movement**

The forests of India are a critical resource for the subsistence of rural peoples throughout the country, but especially in hill and mountain areas, both because of their direct provision of food, fuel and fodder and because of their role in stabilising soil and water resources. As these forests have been increasingly felled for commerce and industry, Indian villagers have sought to protect their livelihoods through the Gandhian method of satyagraha non-violent resistance.

In the 1970s and 1980s this resistance to the destruction of forests spread throughout India and became organised and known as the Chipko Movement.

The first Chipko action took place spontaneously in April 1973 and over the next five years spread to many districts of the Himalaya in Uttar Pradesh. The name of the movement comes from a word meaning 'embrace': the villagers hug the trees, saving them by interposing their bodies between them and the contractors' axes, thus becoming the environmental movement's first tree huggers.

From their origins as a spontaneous protest against logging abuses in Uttar Pradesh in the Himalayas, thousands of supporters of the Chipko movement, mainly village level women, have won bans on clear felling in a number of regions and influenced natural resource policy in India.

The Chipko protests in Uttar Pradesh achieved a major victory in 1980 with a 15-year ban on green felling in the Himalayan forests of that state by order of India's then Prime Minister, Indira Gandhi. Since then the movement has spread to Himachal Pradesh in the North, Kamataka in the South, Rajasthan in the West, Bihar in the East and to the Vindhya in Central India. In addition to the 15-year ban in Uttar Pradesh, the movement has stopped clear felling in the Western Ghats and the Vindhya and generated pressure for a natural resource policy which is more sensitive to people's needs and ecological requirements.

The Chipko Movement is the result of hundreds of decentralised and locally autonomous initiatives. Its leaders and activists are primarily village women, acting to save their means of subsistence and their communities. Men are involved too, however, and some of these have given wider leadership to the movement. Prominent Chipko figures include: Sunderlal Bahuguna, a Gandhian activist and philosopher, whose appeal to Mrs. Gandhi results in the green-felling ban and whose 5,000 kilometre trans-Himalaya footmarch in 1981-83 was crucial in spreading the Chipko message. Bahuguna coined the Chipko slogan: 'ecology is permanent economy'.

*Source: Chipko Information Centre*

## Video links

<http://www.youtube.com/watch?v=kEuFWJjwdTg>

Outsourcing and offshoring

<http://www.youtube.com/watch?v=5ZwCDYLCIPM>

Infrastructure

[http://www.youtube.com/watch?v=00\\_XnISNOOn0](http://www.youtube.com/watch?v=00_XnISNOOn0)

<http://www.youtube.com/watch?v=Fi9T8LIM7BQ>

SEZs

<http://www.youtube.com/watch?v=00DUZL5F0t8>

Agriculture – cotton

<http://www.youtube.com/watch?v=DPGcryNfqlo>



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