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INTERNATIONAL ADVANCED LEVEL

Geography

Getting Started

Pearson Edexcel International Advanced Subsidiary in Geography (XGE01)

Pearson Edexcel International Advanced Level in Geography (YGE01)

For first teaching in September 2016
First examination June 2017

Issue 1

ALWAYS LEARNING

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Contents

A Getting started for teachers

Introduction

This Getting Started guide will give you an overview of the International Advanced Level (IAL) in **Geography** qualification and what it means for you and your students. This guidance is intended to help you plan the course in outline and give you further insight into the principles behind the content to help you and your students succeed.

Key principles

The specification has been developed with the following key principles:

Clear Specification

Clear guidance on what students need to learn, providing clarity for planning, teaching and assessment. The specification structure and overview is clearly outlined on page 3.

Progression, not repetition

The specification allows the development of understanding while at the same time avoiding repetition, ensuring students are engaged and thereby inspired to develop their knowledge.

Reflect today's global world

Building on the strengths of the previous Edexcel Advanced Level Geography qualification, the new IAL specification develops an understanding of current developments in Geography.

Clear assessments and command words

Clear and consistent use of command words across assessments and between series. Our approach to assessments, definitions for command words and how the use of command words can guide students in the level of response expected at different levels. The guide can be found in the Glossary.

Clear mark schemes

The new mark schemes provide a consistent understanding of the skills, and connections between these skills, required for each question type. Clear wording reflects how teachers and examiners describe the qualities of student work, so the expectations are clear for teachers and markers.

Skills for progression

The variety of content that will be found in the examination allows the student to demonstrate knowledge as well as its application, which are required elements for further study or progression into employment.

Support for delivering the new specification

Our package of support to help you plan and implement the new specification includes:

Planning – In addition to the relevant section in this guide, we also provide a course planner in the scheme of work that you can adapt to suit your department.

Teaching and learning – To support you in delivering the new specification, we are providing suggested resource lists and suggested activities in the scheme of work for each topic area in each unit.

Understanding the standard – Sample assessment materials will be provided.

Tracking learner progress – Results Plus
http://qualifications.pearson.com/en/support/Services/ResultsPlus.html provides the most detailed analysis available of your students' exam performance. It can help you identify topics and skills where students could benefit from further learning.

Subject Adviser support – Our Subject Advisor service, and online community will ensure you receive help and guidance from us as well as enabling you to share ideas and information with each other. You can sign up to receive e-newsletters from the Subject Adviser at TeachingGeography@pearson.com and keep up to date with qualification updates, and product and service news.

Qualification Overview

This section provides an overview of the course to help you see what you will need to teach. The overview gives a general summary of each of the examined units.

Specification and assessment overview

The chart below provides an overview of the course. The IAL Geography specification is modular and structured into four units with all units externally marked. The International Advanced Subsidiary consists of Units 1 and 2 whilst the International Advanced Level consists of Units 1, 2, 3 and 4

Unit 1 – Global Challenges	Unit 2 – Geographical Investigations
External assessment: written examination Total marks: 90 Weighting: 30% of the total IAL marks Examination time: 1h 45m	External assessment: written examination Total marks: 60 Weighting: 20% of the total IAL marks Examination time: 1h 30m

Unit 3 – Contested Planet	Unit 4 – Researching Geography
TExternal assessment: written examination Total marks: 90 Weighting:30% of the total IAL marks Examination time: 2 hours	External assessment: written examination Total marks: 60 Weighting: 20% of the total IAL marks Examination time: 1h 30m

Assessment objectives		%in IAS	%in IA2	%in IAL
AO1	Demonstrate knowledge and understanding of places, environments, concepts, processes, interactions and change, at a variety of scales	25.3	15.3	39–41
AO2	Apply knowledge and understanding in different contexts to interpret, analyse and evaluate geographical information and issues	12.7	28	39–41
AO3	Use a variety of relevant quantitative, qualitative, research and fieldwork skills to: • investigate geographical questions and issues • interpret, analyse and evaluate data and evidence • construct arguments and draw conclusions	12	6.7	18–20

Relationship of assessment objectives to units

	Assessment objective		
Unit number	**AO1**	**AO2**	**AO3**
Unit 1	20%	10%	0%
Unit 2	5.3%	2.7%	12%
Unit 3	10%	20%	0%
Unit 4	5.3%	8%	6.7%
Total for International Advanced Level	39-41%	39-41%	18-20%

Assessment unit availability and first qualification awards

Unit	June 2017	January 2018	June 2018
1	✓	✓	✓
2	✓	✓	✓
3	✗	✓	✓
4	✗	✓	✓
IAS award	✓	✓	✓
IAL award	✗	✓	✓

Unit Overview

The unit overview gives a summary of the content of each unit so that you can organise your teaching effectively.

IAS: Unit 1. Global Challenges	Unit code WGE01/01

Content summary

The meaning, causes, impacts and management of global challenges.
How we can influence global challenges through our own attitudes and actions.

There are two compulsory topics that form this unit:

Topic 1: World at Risk

Topic 2: Going Global

IAS: Unit 2. Geographical Investigations	Unit code WGE02/01

Content summary

A closer look at how physical and human issues influence lives and can be managed, at a local scale.
There are two compulsory topics that form this unit:

Topic 1: Crowded Coasts

Topic 2: Urban Problems, Planning and Regeneration

IA2: Unit 3. Contested Planet	Unit code WGE03/01

Content summary

Physical systems underpin the distribution and use of resources, and resource management is a key issue for geography in today's world. Consumption patterns highlight stark inequalities between regions, countries and groups of people. Many resources are finite, and rising consumption means that difficult decisions over the use of resources will have to be taken more frequently. This unit is divided into three sections:

Section A – compulsory topics:

- Topic A1: Atmosphere and Weather Systems
- Topic A2: Biodiversity Under Threat

Section B – optional topics:

- Topic B1: Energy Security **or** Topic B2: Water Conflicts

Section C – optional topics:

- Topic C1: Superpower Geographies **or** Topic C2: Bridging the Development Gap

IA2: Unit 4. Researching Geography	Unit code WGE04/01

Content summary

Options range from those with a strong physical geography focus, to those concerned more with environmental, social and cultural geographies. Students must select and study one of the following research options:

- Option 1: Tectonic Activity and Hazards
- Option 2: Feeding the World's People
- Option 3: Cultural Diversity: People and Landscapes
- Option 4: Human Health and Disease

Planning

Planning and delivering modular IAS and IAL Courses in Geography

The IAL in Geography qualification is modular, with assessments available at unit level. Please refer to the published scheme of work for each unit for suggested teaching plans.

Delivery models

One of the first decisions that centres will have to make is whether they intend to offer a sequential or thematic approach. A modular A Level will offer a more flexible approach as topics can be selected in an order that meets the needs of t he students.

Suggested resources

To support the teaching and learning of the new specification, we have provided a comprehensive suggested resources list for each topic in each unit in the scheme of work.

Unit and topic guide

This section contains unit guides, links to teaching and learning resources for all the topics covered in the specification, to support effective delivery.

Unit 1: Global Challenges

This Unit provides students with the opportunity to investigate key global issues facing people in a range of countries at different levels of development. The Unit is divided into two topics: World at Risk is focused on physical geography and people-environment interactions, whereas Going Global is human geography in focus. Both topics should be studied from a global perspective to gain a broad understanding of the themes, supported by local examples where appropriate.

Topic 1 World at Risk overview

World at Risk considers the physical processes that cause natural hazards, as well as the relationship between 'hazard' and 'disaster'. A key theme is investigating the distribution of natural hazards and trends in both hazard events and disasters. Hydro-meteorological hazards are frequently linked to global warming, but this topic also allows for an in-depth study of natural climate change on longer timescales as well as a consideration of the consequences of, and responses to, a warming world today and in the future.

Topic 2 Going Global overview

Globalisation is a key theme within human and economic geography, but it is a complex process with multiple causes and contested consequences. This topic allows the causes to be explored in detail and the consequences to be considered in different places and for different groups of people. Closely linked to globalisation are patterns and trends in global migration, which present significant geographical challenges in some locations. Migration also helps fuel urbanisation and the topic includes an exploration of the consequences of urban growth, as well as the problems of providing resources to people in an increasingly globalised, urbanised, affluent world.

Topic 1: World at Risk

The title of this topic reflects its two interlinked strands:

1. spatial patterns and trends in global hazards

2. the causes, impacts and solutions to the context hazard of global warming (a short-term global challenge that relates to the longer-term hazard of climate change).

1 Global hazards

Enquiry question: What are global hazards and what causes them?

The concepts, processes and geographical terminology relating to global hazards and disasters should be studied by:

- Acquiring an understanding of the geophysical processes that cause hazards such as earthquakes, volcanic eruptions and tsunami as well as landslides and avalanches.
- Students should also understand that short term hydro-meteorological hazards are cyclones and floods whilst medium term hazards are those such as drought.
- Disaster risk can be explained by the relationship between hazards, vulnerability and capacity to cope which is shown in the disaster risk equation.

This is a continuation from International GCSE and students should develop their understanding of the physical processes that create hazards.

A key new concept is the risk equation shown below. Students should consider how Risk can be increased or decreased by examining different parts of the equation. Students could also consider which parts of the equation are increasing or decreasing.

$$\text{Risk} = \frac{\text{Hazards x Vulnerability}}{\text{Capacity}}$$

2 Global hazard distribution

Enquiry question: Which areas are affected by geophysical and hydro-meteorological hazards and disasters?

Key idea: The distribution of hazards is uneven, and related to both physical and human factors.

- The distribution of both hydro-meteorological and geophysical factors is uneven and some areas known as hotspots are particularly vulnerable to multiple hazard processes. Mega-disasters can be defined as those that affect more than one country and have unusually large human and economic impacts. This should be investigated by:

- Acquiring an understanding that the geographical distribution of natural hazards (hydro-meteorological and geophysical) can be related to both physical and human processes.
- Students are encouraged to map out the distribution of the major hazards using sites such as http://quakes.globalincidentmap.com/ and www.cyclocane.com and relate them to maps of causal factors such as plate boundaries, sea surface temperatures etc. Students must also understand that some locations are especially vulnerable to multiple hazard processes and are termed hazard hotspots, where the human and economic costs may have an effect on future economic development.
- Students are encouraged to use the hazard data-base such as http://www.grida.no/graphicslib/detail/natural-hazard-hotspots-by-risk-type_1465 to plot out areas with two or more hazards to assess the number of hotspots around the world. It is best to then focus on two (Philippines and California are good examples) to contrast the human and economic impacts.
- Rare, high magnitude disaster events can have regional or global significance and students should understand the concept of mega-disasters (tsunami, earthquakes, regional drought) which affect more than one country with unusually large human and economic impacts.
- Students are encouraged to explore the physical event›hazard›disaster›mega-disaster continuum to understand what a mega-disaster is. Although there are several key examples of tectonic mega-disaster (Indian Ocean 2004 Tsunami and Sendai 2011 Tsunami), students should also be encouraged to study slow onset mega-disasters such as the 2005 Sahalian drought – there may be less visual footage of the mega-disasters but the economic and social impacts are arguably greater.

3 Global hazard trends

Enquiry question: What are the global trends in hazard occurrence and disaster impacts?

Although some types of natural hazard are increasing in magnitude and frequency, there are complex global trends in terms of disaster occurrence and impacts. There are also differences in degree of predictability and effectiveness of hazard response. This should be investigated by:

- Researching evidence for trends in the occurrence of hydro-meteorological hazards and understanding that explanations for these trends include both physical and human factors.
- Students are encouraged to access hazard data bases such as www.emdat.be to plot out trends in hydro-meteorological hazards – are they increasing and what might be the causes? Students should also compare the trends both between hazards and regions – what might be causing these trends to vary?

- Students should also understand that disasters and their impacts can be defined and measured using data on economic losses, deaths and numbers affected which reveals contrasting trends for different disaster types as well as the need to account for rising economic losses, rising numbers of people affected but falling death tolls.
- Students should correlate the trends researched above with the trends in economic losses, people affected and death tolls from web sites such as https://www.unisdr.org/we/inform/disaster-statistics . It is recommended that absolute and relative economic costs are considered alongside which sections of society bear the brunt of hazards within a country or area. Students should also consider why in a world of rising populations and increasing hazards, death tolls for most hazards are decreasing.
- Prediction and monitoring technology can reduce the impact of some disasters such as volcanic eruptions, tsunami and cyclones, but not others such as earthquakes. Crucially, evacuation, hazard resistant design, community preparedness, land use zoning and aid can all reduce disasters impacts but are not universally available.
- Students are encouraged to visit sites such as http://www.volcanodiscovery.com/erupting_volcanoes.html and the Pacific Tsunami Warning Centre to understand how technology is reducing the impacts of some disasters.
- Students should also consider why despite a world-wide monitoring system such as http://earthquake.usgs.gov/earthquakes/map/ earthquakes cannot be successfully predicted but can be prepared for.

4. Climate change

Enquiry question: How and why has climate changed in the past and how significant is recent global warming?

There is substantial evidence that the global climate has changed significantly in the past. This natural climate change has a number of causes both for short-term and long-term climate change and so recent global warming needs to be set within this longer climate context. This should be investigated by:

- Understanding that tree rings, ice and ocean sediment cores provide evidence for long-term changes to the earth's climate during the Quaternary period, with repeated glacial and interglacial cycles. Students could also research the evidence for medium-term, smaller climate fluctuations such as the Little Ice Age or the Medieval Warm Period through a range of sources such as pollen records, historical sources and art.
- Students should access web-sites such as http://climate.nasa.gov/evidence/ to put recent climate change into context. They should also understand the advantages and disadvantages of using a variety of more contemporary temperature proxies and the controversy that this has created by visiting sites such as: www.livescience.com/topics/global-warming/

- Students should also understand that Milankovitch Cycles provide an explanation for long term climate cycles whereas variations in solar output (11 year and longer sunspot cycles) and the impact of volcanic emission can provide an explanation for medium and short term climate changes.
- Students are encouraged to overlay their data from climate change data sites with glacial cycles from sites such as https://www.ncdc.noaa.gov/paleo/abrupt/data2.htm, sunspot activity and volcanic eruption data to understand how the present changes are unprecedented in the last 800,000 years
- Reconstructed past climate temperature records should be compared with climate warming since 1960 in terms of magnitude and pace of change. Students should, however, question the reliability, geographical coverage and accuracy of past and more recent climate data and predictions.
- Recent climate change is still controversial and students should consider the validity of both sides of the debate by visiting sites such as www.sciencedaily.com/terms/global_warming_controversy.htm to understand that the unprecedented climate change is still a source of controversy.

5. The impacts of global warming

Enquiry question: How significant are the current and future impacts of global warming in contrasting locations?

Rising emissions of greenhouse gases are widely blamed for contemporary global warming of 1.5C since the dawn of the industrial age. Yet there are large uncertainties about the future climate in terms of the actual temperature and precipitation changes as well as the spatial variability of these changes. Global warming will therefore be a significant risk in some locations. This should be investigated by:

- Studying changes in the atmospheric concentration of greenhouse gases such as CO2, CH4, NOx since 1960. These changes should be linked to variations in the source of these emissions by economic activity as well as countries and should also acknowledge the recent rapid rise of emissions from so called BRIC countries both in total and per capita emissions.
- Students should access web sites such as www.epa.gov/climatechange/science/indicators/ghg to plot out rising concentrations of greenhouse gases – they should consider that these changes are anthropogenic by linking them to human activities and map world emissions by using sites such as www.globalcarbonatlas.org/?q=en/emissions
- Students should also investigate the range of projections of future global warming and sea level rise and understand that the uncertainties of these projections are due to factors such as uncertainties over future population growth as well as economic development. There is also uncertainty over physical feedback mechanisms such as the ice albedo feedback which are climate tipping points where climate change becomes rapid and unstoppable.

- Projections are available at https://www.ipcc.ch/publications_and_data/ar4/wg1/en/spmsspm-projections-of.html and students should research why there is so much uncertainty and answer the question- Is it therefore right to expend so much resources tackling climate change or are there other more serious world issues?
- Sea-level rise is one predicted outcome of future global warning and represents a major risk to some low-lying countries which are physically and economically vulnerable to the **eustatic** rise of sea level. These will have a global impact, particularly on low-lying coastal areas including deltas (e.g. 80% of the land area of Bangladesh) and coral atolls such as the Maldives (known as the 'Canaries in the coal mine' [IPEC]). Shifts in the location of climate belts will also represent risks to farmers in terms of precipitation levels, especially in rain-fed, low-income locations such as the Sahel.
- Students are encourage to assess the risk of future climate change and consider who is most at risk and whether this is fair? They should also consider how this risk might cause unprecedented waves of migration and so link with the migration component in Going Global.

6 Managing global climate risk

Enquiry question: How can the risks from global warming be managed globally and locally?

The two ways of managing global climate risk have, not so far, been proved to be effective in reducing this risk. Mitigation of emissions has a mixed record of success with some local schemes showing clear reductions in greenhouse gas emissions but other global schemes failing to reduce or even slow global emissions. Whilst adaptation to future climates is possible, this carries significant risks, particularly for the more vulnerable parts of the world. Yet attitudes to global warming vary, and some may see it as an opportunity. This should be investigated by:

- Investigating why action to mitigate carbon emissions has happened at a national scale (renewable energy, carbon taxes, recycling) in some but not all countries. Global actions (Montreal, Kyoto, Copenhagen) have had variable success both in terms of reaching agreement and actual emissions reductions.
- Students should assess the tensions between rich and poor nations and understand why some such as the US and Australia failed in 1997 to sign up to the Kyoto Protocol to reduce greenhouse gas emissions. The rapidly industrialising giants of China and India (China is now the largest producer of greenhouse gases) also failed to sign up to the original Kyoto Protocol but are on board for the Paris resolution. Yet they remain concerned not to lose the momentum of economic growth. What actions will they be willing to commit to?
- Students should also understand that adapting to rising sea levels and increased flood risk requires costly engineering which is possible in some

locations but unaffordable in others. Farming adaptations (irrigation, crop changes, drought-resistant crops) require investment that may not be available to subsistence producers.

- Students should review the options for adaptions detailed in sites such as http://ec.europa.eu/clima/policies/adaptation/index_en.htm and then assess the extent to which poorer countries can also adapt.
- Sites such as http://www.unep.org/climatechange/adaptation/ will aid he debate – can poor countries follow the same path as more developed countries?
- Globally, and within countries, attitudes to global warming vary between different groups and organisations, including governments, businesses, non-governmental organisations (NGOs), environmental pressure groups, communities and individuals. On a national and international scale, governments develop strategies and these are carried out on a local scale (e.g. via the UN's Agenda 21). Global warming may provide new economic opportunities in some high-latitude locations, and is not universally accepted as 'real' or a threat.
- Students should investigate the views of different pressure groups such as Greenpeace and TNC such as BP to understand the differing views held about climate change – the Arctic is an area of immense vulnerability but also of vast economic potential. Students are encouraged to research the debate over the Arctic as an example of the issues surrounding the impacts of climate change.

Topic 2: Going Global

1. Globalisation, networks and trade

Enquiry question: Why are global economic connections increasing?

Globalisation is an old process that has, however, accelerated dramatically in recent years. Transport and communications are a key part of causing the process of globalisation to accelerate. Trade patterns reveal broad and deep global connections. This should be studied by:

- Globalisation involves the widening and deepening of global connections and flows such as commodities, capital, information, migrants and tourists. The degree of globalisation varies by country. Students should research the degree of globalisation by using measures such as the AT Kearney index, (KOF index).
- Globalisation indexes are available at https://www.atkearney.com/. Students should research the globalisation Index of a variety of countries such as the US, China and sub-Saharan African countries to understand the variation in globalisation that exists.
- Students should also understand that developments in transport and trade in the 19th century such as railways, telegraphs, and steam-ships accelerated in the 20th with the development of jet aircraft as well as containerisation which have contributing to a 'shrinking world'. There have been recent 21st century developments such as mobile phones, the internet and fibre optics that have furthered time-space compression in some countries but not in all due to a combination of physical and human factors.
- Students should then consider the reasons why the countries they have chosen have a higher or lower globalisation index. A useful exercise is aircraft accessibility – how easy is it to reach their chosen country from their own country? How long would it take? From how many other airports aside from those in the capital are there direct flights? Consider the role of telecommunications and the desire of some countries such as China and India to produce low cost smart-phones.
- Students should also recognise that the growth of free trade, the global shift of industry from MEDC to Asia, as well as economic growth in the developing world and have also promoted globalisation. Students are therefore encouraged to research patterns of global trade in commodities, goods and services to show the nature and importance of global trade connections between developed, emerging and developing countries.
- Students are encouraged to visit the WTO web site and research the pattern of trade in their chosen countries at https://www.wto.org/ . Does this also help to explain their index of globalisation? It is also recommended that students research trade in different economic sectors such as primary products (coffee), manufactured goods (electronic equipment) and services to develop their understanding of trade patterns.

2 Global organisations

Enquiry question: Which organisations are involved in globalisation and what are their roles?

Although the developments in communications have facilitated globalisation, there are key organisations that have either taken advantage of such developments or allowed globalisation to increase or have encouraged globalisation. In particular students should be aware of the contrasting roles of TNCs, government policies and IGOs in promote and developing a liberal model of economic development and so developing globalisation.

This should be studied by:

- Students should acquire a knowledge that TNCs both contribute to globalisation both through the development of global production networks and localisation which then develops new markets. They should also realise that TNCs take advantage of economic liberalisation through both outsourcing and offshoring. Students are then encouraged to evaluate the social, economic and environmental impacts of TNCs on emerging and developing countries.
- The impacts of TNC are highly debated – do they bring wealth and employment or do they exploit poorer countries. Students should explore this debate by visiting sites such as http://unctad.org/en/Docs/iteiit20051a2_en.pdf to understand the extent of TNC activity and numerous sites which oppose the growth of TNC.
- Students should also understand that national governments are key players in developing globalisation as they promote free trade blocs such as the EU, ASEAN and TTIP. Governments also develop policies such as free-market liberalization as well as the privatization of key services which also encourages the development of TNCs. Governments have also encouraged globalisation through the development of special economic zones as well as through government subsidies. Governments have also had positive attitudes to FDI, particularly through allowing both mergers and acquisitions. All of these strategies and policies have contributed to the spread of globalisation into new emerging global regions.
- Students are encouraged to return to the countries they have already investigated and research the policies if the government. Do they seek to promote globalisation or hinder it? Mapping out the locations of SEZ available for ASEAN countries at https://www.unido.org/fileadmin/.../UCO_Viet_Nam_Study_FINAL.pd would also be a useful exercise in understanding those countries which are more open to globalisation.
- Students should also recognise that political and economic organisations such as the IMF and the World Bank have contributed to globalisation through the promotion of economic liberalisation and free trade. In particular students are encouraged to research the effects of the series of world trade negotiation rounds since the 1950s and assess the extent to which barriers to free trade and protectionism still exist in the 21st century.

- The role of the World Bank and the IMF are deeply controversial – do they help or hinder poorer countries economic development? Students should explore this debate by visiting sites such as http://www.worldbank.org/ to understand the extent of their activities as well as numerous sites which oppose the actions of these organisations.

3 Globalisation's impact on development

Enquiry question: How far does globalisation produce winners and losers, and switched-on and switched-off places?

The impacts of globalisation are unequal both within countries and between countries. In developed countries globalisation has different impacts on a range of groups such as consumers as well as workers. Yet on a global scale the benefits of globalisation are unequally distributed with some countries being 'switched–on' and benefitting from the forces of globalisation whilst others are 'switched-off' and are being left behind. Asia, in particular is at the centre of 21st century globalisation – students are expected to evaluate the impacts of globalisation on such as key region. This should be studied by:

- Students should understand that global consumers have benefited from low-priced consumer goods and the growth of global brands yet also recognise this has come at a social and environmental cost to other people in the developed world. In particular deindustrialised regions in developed countries face social and environmental problems as a result of economic restructuring such as dereliction, depopulation, crime and high unemployment.
- Students are encouraged to debate the costs and benefits of the mobile phones that they have – is the benefit that they have accrued worth the social and environmental cost? They should also be encouraged to debate how some people in countries such as the UK have benefited from cheaper consumer products but other communities have suffered hardship as a result of job losses through deindustrialisation.
- Students should also understand that there are physical, political and cultural reasons why some developing locations are weakly connected to the wider global economy such as many countries in sub-Saharan Africa, which has social and economic implications for their populations. Students should also recognise that other locations such as world cities and global hubs as well as global elites exhibit multiple economic, transport and population connections and benefit disproportionately from globalisation.
- Sub-Saharan Africa has vast potential but also faces numerous challenges. Students are encouraged to research the region and assess the reasons why many countries have not yet fully integrated into the wider global economy. The lives of people in this area can then be compared with those in global cities and hubs by comparing human and social development data available from http://data.worldbank.org/data-catalog/world-development-indicators.

- The movement of the global economic centre of gravity to Asia, particularly China and India has benefited that region (poverty reduction, waged work, infrastructure investment, education and training) in terms of development. Yet this has environmental impacts globally in terms of carbon emissions and locally in terms of air, water and land pollution, especially in outsourcing locations.
- Students are encouraged to compare the economic development of China and India by comparing relevant development indicators available at http://data.worldbank.org/data-catalog/world-development-indicators. They should seek to understand whether all groups in these countries have benefitted from this rapid economic growth. They should also consider the impact of globalisation on the environment by investigating environmental indicators for the planet as a whole, as well as their chosen research countries using sites such as http://www.worldwatch.org/bookstore/state-of-the-world and https://www.gov.uk/government/organisations/environment-agency

4 Global population trends

Enquiry question: What are the impacts of global and regional population trends on resources and wellbeing?

In the 21st century the global population has continued to rise and is predicted to reach at least 10 billion by the middle of the century. This increase in population will create varying population structures, with an ageing population structure in many MEDC and a youthful population structure in LEDC. These will bring different economic and social challenges to countries at different stages of development. For some countries, the increasing population has implications for resources and future population growth. This should be studied by:

- Students should investigate global population projections that suggest rising numbers until 2050 or even 2100. They should understand that there is uncertainty and large differences between global regions. Students should also analyse population pyramids to assess demographic data such as birth, death, infant mortality and fertility rates as well as to project future population numbers and structure.
- Although all authors are agreed that global population is set to rise, there is much disagreement by how much. Students should investigate this by accessing sites such as http://ourworldindata.org/data/population-growth-vital-statistics/future-world-population-growth/
- These projections should then be viewed alongside changing population pyramids available at http://populationpyramid.net/ to seek reasons for the variations in these projections.
- The World Bank development section also has key present demographic data.
- Students should also understand that some countries face the challenges of

an ageing population such as health and social care as well as shortages of workers and an increasing dependency ratio. Other countries with youthful populations may experience a future demographic dividend but will also have a high demand for education, housing and health services.

- Whilst some countries such as Japan face demographic problems associated with an ageing population, others such as Niger face those of a youthful population. Students are encouraged to use http://populationpyramid.net/ to track the changes in such countries and then compare and contrast the challenges they face – Are the challenges actually comparable and are their ways in which these challenges can be met?
- Students should also recognise that the relationship between population and resources has been extensively debated by authors such as Malthus, Boserup and the Club of Rome) but the exact nature of the relationship is still not resolved. Students should also be aware that in the future rising population and affluence may lead to shortages of water, food and energy in some places but technology may mitigate these.
- The debate over population and resources dates back to at least 1798 and for many has still not been resolved – can a planet with finite resources cope with infinite population growth and resource consumption? Students are encouraged to research the views of Malthus, Boserup and the Club of Rome at sites such as http://arxiv.org/pdf/1108.2585.pdf and then consider their activities on assessing future population changes – what is likely to be the outcome of this debate by 2100?

5 Global migration

Enquiry question: Why are numbers of internal and international migrants rising?

As globalisation has gathered pace in the 21st century so has international migration. Yet this unprecedented flow of people has both costs and benefits for both the source and the host countries. It therefore represents one of the key political challenges faced by many MEDC. This should be studied by:

- Students should investigate the patterns of major global migration flows including major legal and illegal migration flows as well of those of refugees. Students should also recognise that globalisation encourages rural–urban migration and also the international migration of high-skilled elites as well as low-skilled workers especially to global hubs and megacities.
- Migration and the response of developed countries is likely to be one of the biggest challenges faced by developed countries, particularly those in Europe, in the coming decade. How many is too many? And should all those who seek to move be allowed to move to where they want to? Students should research patterns of migration from sites such as https://www.iom.int/world-migration and assess the extent of the issue. Migration is also a key driver of

the success of many global hubs and megacities. Students are encouraged to research global hubs and mega cities such as Dubai, Mumbai and Shanghai to understand the different dynamics of migration that have driven the economic success of these hubs.

- Students should also evaluate the costs and benefits of migration to both host and source locations with particular reference to filling skills gaps and pressure on services as well as remittances, and the impact of the 'brain drain'. Students should also recognise that attitudes to migration vary from country to country, for economic, cultural and political reasons.
- There is debate on the impacts of migration on both source and host countries with often diametrically opposed views in the host country – has migration benefitted countries such as the US, Canada and the UK? These views have become sharply crystallised in Europe recently with the attacks in Paris and the heightened security in many other European countries. Students are encouraged to research a balanced view of the debate and come to their own conclusion.
- Students should understand that managing migration in a globalised world with fewer borders is increasingly difficult, which has led to a variety of contrasting policies such as 'closed' and 'open' door as well as skill based points systems. Students should also recognise that migration from conflict zones is a major challenge for destination countries.
- Migration policies vary between countries with some such as Germany having almost an open door policy whilst others such as Australia having a far stricter points based system. Students are encouraged to research different migration policies and understand why the country has chosen that policy. They should also recognise that their obligations to accept refugees often conflicts with its existing views of and attitudes towards migration.

6 World urbanisation

Enquiry question: What are the consequences of an increasingly urban world?

In the 21st Century the majority of the world's population now live in urban rather than rural areas. In addition the rate of urbanisation continues to increase. This presents numerous challenges to city planners but perhaps the most acute is providing suitable housing for all urban dwellers. Megacities (those cities with a population over 10 million) in particular present management challenges. This should be studied by:

- Students should research global trends in urbanisation since 1980 and contrast regional trends and their causes such as demographic and economic. They should also consider projections of urbanisation to 2050. Students should be aware that urbanisation has implications for the surrounding rural areas in terms of supplying cities with human and physical resources.

- Trends in world urbanisation rates can be accessed from http://morphocode.com/global-trends-urbanisation/ . Students should then select a variety of countries both from the developed world and poorer countries to firstly explain these trends as well as assess the implications for the surrounding rural areas.
- In addition, students should understand that rapid urban growth caused by net migration and internal growth caused by natural increase in some developing and emerging megacities creates challenges in terms of housing supply as city authorities cannot cope with the rising demand for housing. In many cities often the result of this is the growth of slums. Students should recognise, however that joint working between NGOs, community self-help groups and city government can help meet these housing needs.
- Students are encouraged to research the problems in the megacities they have already researched using sites such as https://uclast203-2010.wikispaces.com/Housing+Issues+in+Mega-Cities Students should consider why these problems have arisen and if they can be resolved.
- Students should investigate the changing number, distribution and growth rates of megacities (population over 10 million) and the demographic and economic causes of these changes. They should also be aware that in many mega cities there are common issues of urban air pollution and service provision which have consequences for human and environmental health.
- Students are encouraged to map out the distribution of mega cities for a number of years using sites such as http://www.mapsofworld.com/world-top-ten/world-top-ten-largest-cities-map.html and then explain the growth of these contrasting migration in some with natural increase and migration in others. The issues faced by megacities should be explored using sites such as https://ec.europa.eu/programmes/horizon2020/en/news/reducing-environmental-impact-megacities and students should debate the question - Are megacities sustainable?

Unit 2: Geographical Investigations

Topic 1: Crowded Coasts, which involves a detailed study of the physical processes and systems in coastal environments.

Topic 2: Urban Problems, Planning and Regeneration, which considers the challenges of living and working in cities.

Both of these topics have a local-scale focus, which should be reinforced through the use of local geographical investigations, including both fieldwork and research. Fieldwork is the first hand collection of primary data (either individually or in groups), whereas research is a desk-based review of data / and or information which helps inform and contextualise the fieldwork focus.

Students must carry out a geographical investigation that includes both research and fieldwork, in relation to Topic 1 or Topic 2. This will be assessed in Sections B and C of Unit 2.

Topic 1: Crowded Coasts

2.3.1 Coastal processes

The coastal zone is one of the world's most densely populated areas because of favourable location factors, yet it is an area of immense environmental value. Coastal areas have a rich and complex geography; this topic allows students to carry out detailed studies of the physical geography that controls coastal landscapes and landforms, as well as coastal ecosystems and the complex geography surrounding their management.

Importantly:

- Coasts represent a boundary zone where land and sea meet, and where marine and terrestrial processes operate and interact.
- Coasts experience extreme events, including tropical cyclones, storms tsunami, which although rare can cause significant, rapid change.
- Human development on coasts is very varied (ports and transport, industry locations, residential and tourism land uses) and constantly changing.

1) The littoral zone - landscapes and features

The littoral zone is the wider coastal zone, including adjacent land areas and shallow parts of the sea, just offshore.

The littoral zone can be divided into a number of subzones as shown in **Figure 1**. The backshore zone, above high tide level, is only affected by waves during exceptionally high tides (often called spring tides) and during major storms.

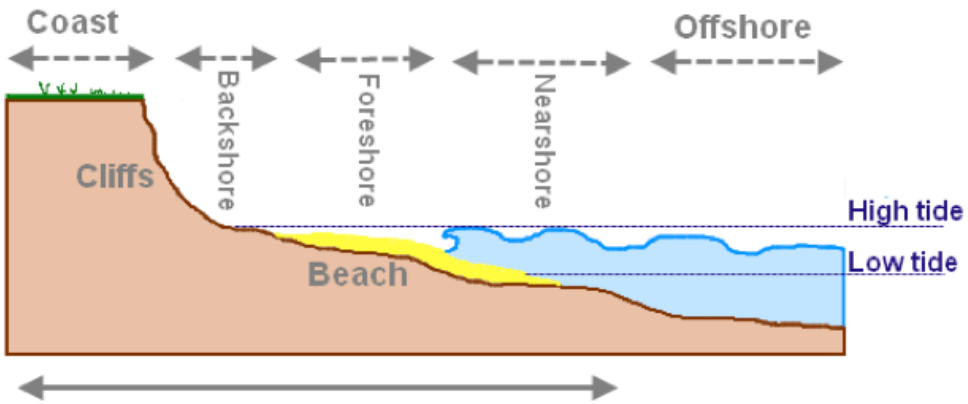


Figure 1

Wave processes are normally confined to the foreshore between the high and low tide marks. Shallow water areas to land are termed the nearshore. This zone is often one of intense human activity, such as fishing and other forms of recreation, but also forms part of the physical system of the coastline through transfers of sediment by currents close to the shore.

Different coastlines have different **landscape characteristics** – but there are two main types, principally controlled by geology:

- rocky and cliffed coastlines, with variable rock hardness
- coastal plains or alluvial coasts dominated by mudflats and or sand dunes

These can also include estuarine coastlines found at the mouths of rivers. Other classifications might be based on different and interlinked factors, although geology often plays a key role – see **Table 1**.

Wave energy	Low energy sheltered coasts with limited fetch and low wind speeds resulting in small waves. High energy exposed coasts, facing prevailing winds with long wave fetches resulting in powerful waves.
Coastal formation	Primary coasts are dominated by land-based processes such as deposition at the coast from rivers or new coastal land formed from lava flows. Secondary coasts are dominated by marine erosion or deposition processes.
Sea level change	Submerging coasts are being flooded by the sea, either due to rising sea levels and/or subsiding land. Emerging coasts where the coasts are rising relative to sea level, for example due to tectonic uplift.
Tidal range	Tidal range varies hugely on coastlines, meaning coasts can be: Microtidal coasts (tidal range of 0–2 m) Mesotidal coasts (tidal range of 2–4 m) Macrotidal coast (tidal range great than 4 m)

Table 1

Erosion resistance of cliffs is an important control of rates of erosion and linked weathering processes. This will be dependent on rock structure (cracks, fissures, bedding plains etc. – **see below**), rock type (e.g. sedimentary vs crystalline igneous) and resistance to chemical and physical attack by weathering (calcite in limestone being especially vulnerable).

2) Role of geological structure on coastal landscapes

Geological structure has three main components: (1) faulting, (2) deformation, and (3) layers and strata. All of these components of geological structure influence coastal landscapes and the development of landforms, often as much as the specific lithologies (rock types) at the coast. Geological structure in turn controls the formation of two distinct types of coast:

(a) **Concordant**. Here the geology / rocks run parallel to the coastline, normally hard and soft bands. Breaches in hard rock create features such as coves.

(b) **Discordant**. Here geology varies along the coast – they rock bands are perpendicular to the coast. This differential erosion creates headlands and bays along discordant coastlines.

Rocks tend to form in layers of different rock types known as beds. These beds are subjected to tectonic forces that tilt and deform them so they dip at an angle. The angle the beds dip at affects how they are eroded and the profile of the resulting cliffs.

Cliff profiles are influenced by resistance of rock as well as the dip (angle) of rock in relation to the coastline. However other geological factures linked to structure can come into play and determine coastal morphology:

1. Faults represent major weaknesses within rock layers. Either side of a fault line, rocks are often heavily fractured and broken and these weaknesses are exploited the local processes of erosion.

2. Joints occur in most rocks, dividing rock strata up into blocks with a regular shape. The characteristics (e.g. spacing) of joints impacts on rock strength.

3. Fissures are much smaller cracks in rocks but they are also weaknesses that erosion and weathering can exploit leading to denudation and recession.

The location of smaller micro features found within cliffs (e.g. small caves and wave-cut notches), are often controlled by the positioning of faults and/or structural weaknesses, e.g. where there is a high density of joints and fissures.

A useful interactive world geology map can be found here:
http://portal.onegeology.org/OnegeologyGlobal/

3) Controls of rates of erosion, recession and cliff stability.

Lithology is the main control over cliff stability and longevity. The three main rock types have very different erosional characteristics. See **Table 2**.

Igneous	Extremely resistant and very slow rates of erosion	Granite Dolerite Basalt
Sedimentary	Variable resistance, but generally moderate to fast erosion rates	Shale Limestone Sandstone
Metamorphic	Resistant with slow rates of erosion.	Marble Slate Gneiss

Table 2

Rocks of all strengths can be cut back by erosion to form cliffs, but weaker rocks generally fall more readily and so form sloping cliffs with angles from 20º to 40º, whereas erosion resistant rocks are more likely to form near vertical cliffs. In the more resistant rocks, the details of bedding and jointing commonly influence cliff form, both in plan and profile; thus seaward dipping rocks are likely to suffer slide failure as basal erosion persists, leading to gentler slopes than on horizontal or landward dipping strata.

There are exceptions to the general order of resistance to erosion. Some limestones, are erosion resistant, as are ancient sandstones that have been compressed and compacted over geological time. Recently erupted volcaniclava flow rocks and layers of volcanic ash or tephra tend to be weak and easily eroded.

2.3.2 Coastal landscapes and landforms

1) Marine processes and their influence on coastal development

Waves are a crucial element on any coast as they directly influence erosion, transport and deposition, and shape the coastline. Waves are caused by friction between wind and water, with some energy from the wind being transferred into the water. The force of wind blowing on the surface of water generates ripples, which grow into waves if the wind is sustained. Wave size depends on a number of factors: the strength of the wind, the duration the wind blows for, water depth and wave fetch. See **Table 3**.

Table 3

Constructive waves	• (spilling or surging) have a low wave height (less than 1 m) and long wave length (up to 100 m). • They are gentle, flat waves with a strong swash but weak backwash. The strong swash • pushes sediment up the beach, depositing it as a ridge of sediment at the top of the beach. • They form a relatively gentle beach profile with steep berm at the top of the beach which means that most of the backwash percolates into the beach, rather than running across the surface.
Destructive waves	• (plunging waves) have a wave height of over 1 m and a wave length of around 20 m; they are common during storms. • These waves have a strong backwash that erodes beach material and carries it offshore, creating an offshore ridge or bar.

Coasts should be seen as systems. Positive feedbacks amplify the initial change, whereas negative feedbacks tend to dampen. See **Figure 2**.

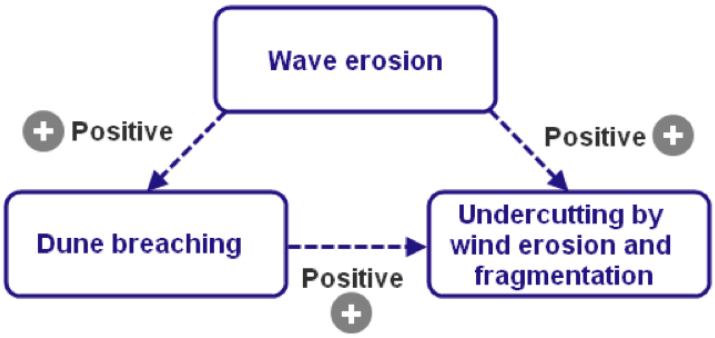


Figure 2

Over longer or seasonal periods **beach profiles** may change because of variations in sediment supply, e.g. coastal management. Also, beach profiles generally change between summer and winter, when constructive and destructive waves dominate respectively. Even during the course of a day a beach profile may change, as plunging storm waves give way to swell waves as a storm passes. In the longer term climate change may also impact with an increasing frequency of stormier destructive waves.

Waves cause erosion but this is a complex and dynamic system. Most erosion occurs with large, high magnitude storm events. **Table 4** outlines the three main coastal erosional processes and their linkage to geology.

Table 4

Process	Detail	Geological considerations
Hydraulic action	Air trapped in cracks and fissures is compressed by the force of waves hitting the cliff face. Pressure forces cracks open, meaning more air is trapped and greater force experienced in the next cycle of compression. The process repeats and eventually dislodges blocks of rock from the cliff.	Heavily jointed/fissured sedimentary rocks are vulnerable to this process. In very hard igneous rocks (basalt, granite) hydraulic action on cooling cracks may the only erosive process operating
Abrasion	Sediment picked up by breaking waves is thrown against the cliff face. The sediment acts like a tool on the cliff, notching and scoring the surface and slowly wearing it down by removing small rock particles.	Most sedimentary rocks are more vulnerable than hard igneous ones, especially when heavily jointed. For abrasion to be effective, loose sediment has to be available, for example shingle or pebbles.
Attrition	This process acts on already eroded sediment. As sediment is moved around by waves, the numerous collisions between particles slowly chip fragments off the sediment. Sediment gets both smaller and more rounded with time.	This process is not directly responsible for the modification of cliff profiles, but indirectly material from attrition can form beaches, which, for example, protect cliffs.

2) The formation of coastal erosional landforms

There is a classic "suite" of landforms that are found on some coasts where there is a combination of sedimentary geology and rocks which have both horizontal bedding planes and well-defined vertical joints. See **Figure 3**.

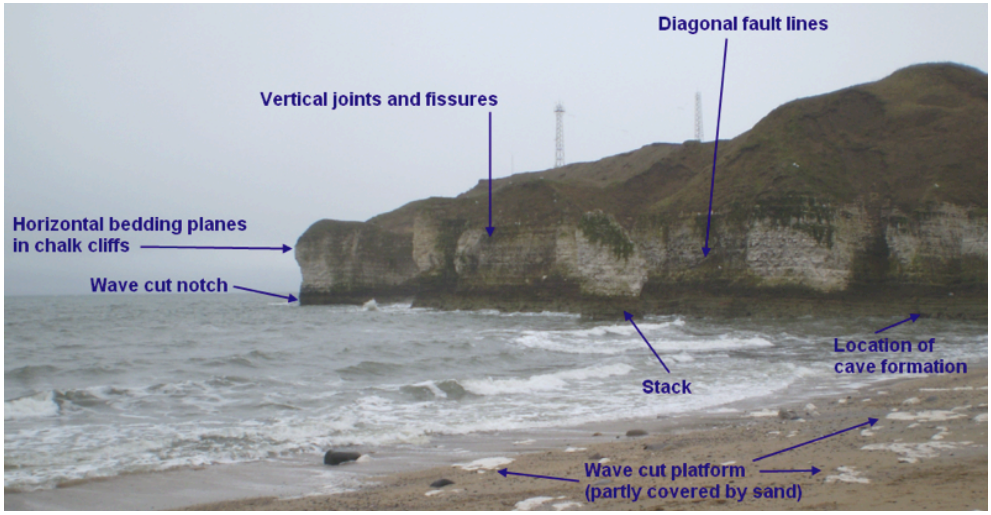


Figure 3

These features are formed through a series of well-documented sequences, e.g. **cave-arch-stack-stump**. Structural geology nonetheless remains important – allowing "geos" or fault-guided gullies to form which are clear structural weaknesses.

Subaerial processes include a collection of **weathering** and **mass movements** that modify landforms and landscapes. The dominance of mechanical vs biological vs chemical weathering will be a function of geological structure as well as climatic inputs. Places with colder climates and large diurnal shifts will encourage freeze thaw for example, whereas wetter and warmer climates trend to favour both biological and chemical forms of attack. In terms of mass movements, falls, topples and rotational slides for instance are common at the coast but will again be heavily controlled by structural and solid geology as well as climate and land-use. Where weak rocks underlie stronger ones, landslides are likely to occur.

3) Sediment transport and deposition

Material eroded from cliffs is transported by the sea as sediment, and this material is usually transported along coastlines by currents. This is the process of **longshore drift**. When wave crests approach the coast at an angle (rather than at 90° to the coast) the swash from the breaking waves, and the subsequent backwash, follow different angles up and down the beach in a zigzag pattern. The result is net sediment transport along the beach and a longshore flow of sediment. Wave direction is caused by wind direction and so the dominant prevailing wind (and fetch) determines the direction of longshore drift.

Sediment transport produces a variety of coastal landforms: **deltas**, **spits**, **barrier beaches** and **bars**.

Longshore drift has a crucial role in the coastal **sediment cell** and sediment transport. The coast, like other natural environments, has been regarded as a holistic system with identifiable sources (inputs) transfers and sinks (outputs). The boundaries of natural systems such as the coast are not always easy to either define or establish. Coastal systems are made up of many sub-systems. It is important to understand, for example, how sediment moves in order to plan an integrated approach to large-scale coastal management, taking account of sediment cells.

2.3.3 Coastal ecosystems and environments

This is to be studied through local place contexts, on one or more stretches of coastline. There is a good opportunity here to link examples with places where fieldwork might be undertaken to improve students' overall understanding and depth of knowledge. This type of study in particular lends itself to quantitative data and the subsequent data processing and analysis skills.

1) Plant succession and stabilisation

Rocks and sediment play a significant part influencing the shaping of the coastal landscape, but vegetation is also important. Many coastlines are protected and buffered from erosion by the stabilising influence of plants helping to secure unconsolidated material. This includes:

- coastal sand dunes and salt marshes
- coastal mangrove swamps (found on tropical coastlines)

The vegetation stabilizes sediment through binding the sediment particles together with the roots of plants, making them harder to erode. Under water, plants growing in sediment provide a protective layer so the surface of the sediment is not directly exposed to moving water and therefore erosion. Plants also protect sediment from erosion by wind by reducing wind speed at the surface due to friction with the vegetation.

Plant succession is a process which can provide additional stability if the coastal ecosystem is allowed to change and grow over time. Succession refers to the changing structure of a plant community over time as an area of initially bare sediment is colonised by plants. The process is especially important on coasts because of its role in coastal accretion. A sand dune ecosystem is referred to as a **psammosere**, whereas a saltmash is called a **halosere**.

Both mangrove swamps and coral reefs provide important **ecosystems services**, especially locally. Coral ecosystems are a source of food for millions; protect coastlines from storms and erosion; provide habitat, spawning and nursery grounds for economically important fish species; provide jobs and income to local economies from fishing, recreation, and tourism; are a source of new medicines, and are hotspots of marine biodiversity. They also are of great cultural importance in many regions around the world, particularly Polynesia.

Mangrove swamps are important in both flood control and groundwater refill. They also help with sediment and nutrient retention and export, as well as water purification. Often they act as "reservoirs of biodiversity" and are significant for recreation and tourism. On a global scale they are an agent of climate change mitigation and adaptation.

2) Coastal ecosystems are threatened by people

Coastal ecosystems are at risk from a number of local factors – these are often linked to resource development and increasing pressure at the coast

Table 5

Coastal development and pollution	As coastal populations grow, offshore waste dumping and coastal pollution increase. This additional dumping increases the possibility of improper waste disposal polluting the coastal environment. Living coral reefs are particularly vulnerable to pollution, but other coastal environments suffer as well.
Unsustainable fishing practices	As many as three billion people depend on marine and coastal areas for their livelihoods, including for fishing, tourism, trade, transport and energy. About 85 per cent of global fish stocks are under pressure from overfishing and aquatic **alien** (invasive) species are also expanding.
Coastal tourism and industrial development	The activities of tourists can affect the marine ecosystem directly, through boat and anchor damage to coral reefs, and indirectly by increasing demands for cleared land for development, collection of shells for souvenirs etc. Coastal areas are also damaged by local mining and drilling operations

Global threats include rising sea levels and ocean acidification. Sea levels are rising globally today and most scientists attribute this to the impact of global warming. The current rate of rise is about 1-2 mm per year (IPPC 2014). Sea level risk can increase coastal erosion risk (which may be coupled to increased storminess, another climate change risk for some places). Coastal flooding associated with rising sea level is also a worrying risk. Many people live on low-lying coasts that are only a few metres above sea level. These areas include:

- coastal plains, such as the east coast of the USA
- estuaries, such as those of the rivers Thames, Severn and Tees in the UK
- river deltas, such as the Nile and Mississippi.
- SIDs (Small Island States) such as the Maldives

There is also the risk of storm surges, especially those places in the path of tropical cyclones. Impacts are worsened by the destruction of coastal ecosystems, e.g. mangroves in coastal areas of Bangladesh.

Ocean acidification is the ongoing decrease in the pH of the Earth's oceans, caused by the uptake of carbon dioxide (CO2) from the atmosphere. Increasing acidity is thought to have a range of possibly harmful consequences, such as depressing metabolic rates and immune responses in some organisms, and causing **coral bleaching**.

3) Economic development costs and benefits

Tourism relies heavily on the coastal zone, not just for beach sites for development, but for food and as a leisure area for tourists. Yet this is in conflict with rapid coastal urbanisation. Since 1995 it is estimated that there has been over a 35% increase in the population of people living on the coasts. The coast offers a number of benefits for developers including high amenity and recreational value; it has been especially attractive for housing developers. Development tends to

result in economic gains, but income levels for those people who live at the coast are often below the national average.

In other places land reclamation has led to considerable environmental conflict.

> Development of new land, e.g. Hong Kong International (Chek Lap Kok) Airport in the 1990's was as the result of an ambitious building project. The reclamation contract made Hong Kong home to the largest commercial dredger fleet ever assembled. Marine operations moved the equivalent volume of an Empire State building every five days. Around 347 million cu m of material (rock and sand) was moved in preparing the site.

Over the past 20 years, at least 2,000 hectares of dolphin habitat in Hong Kong alone has been damaged or destroyed through dredging, dumping and reclamation works. The construction associated with the third runway will reclaim 650 hectares of the sea. During the construction phase an additional 981 hectares will also be heavily impacted.

For many areas land reclamation has had considerable economic benefits, but this needs to be assessed carefully through consideration of local and wider environmental concerns. Fragile coastal ecosystems and marine species are especially at risk.

2.3.4 Managing coastal change

Once again, this final section provides strong links to fieldwork opportunities as coastal management needs to be studied in a local context. Students can study one or more stretches of coastline; places which offer contrasting in terms of different coastal management approaches will likely generate the most interesting data and information for analysis.

1) Hard and soft engineering approaches

Over the last 200 years, land near the coast has seen many changes in land-use. A range of high value developments (tourism, residential, industry etc) has led to the profound modification of the coast.

Students need to understand the spectrum of coastal management strategies: hard engineering – groynes, sea walls, rip-rap, revetments and off-shore breakwaters. Of course there are significant cost implications, e.g. see examples in the table, based on UK Environment Agency data 2013.

Option	Building costs	Maintenance	Estimated cost £m
Groynes	High	Medium	2,700-7,300
Rock revetments	High	Low	650-2800
Nearshore breakwaters	Medium	Low	1,750-4,300

Table 6

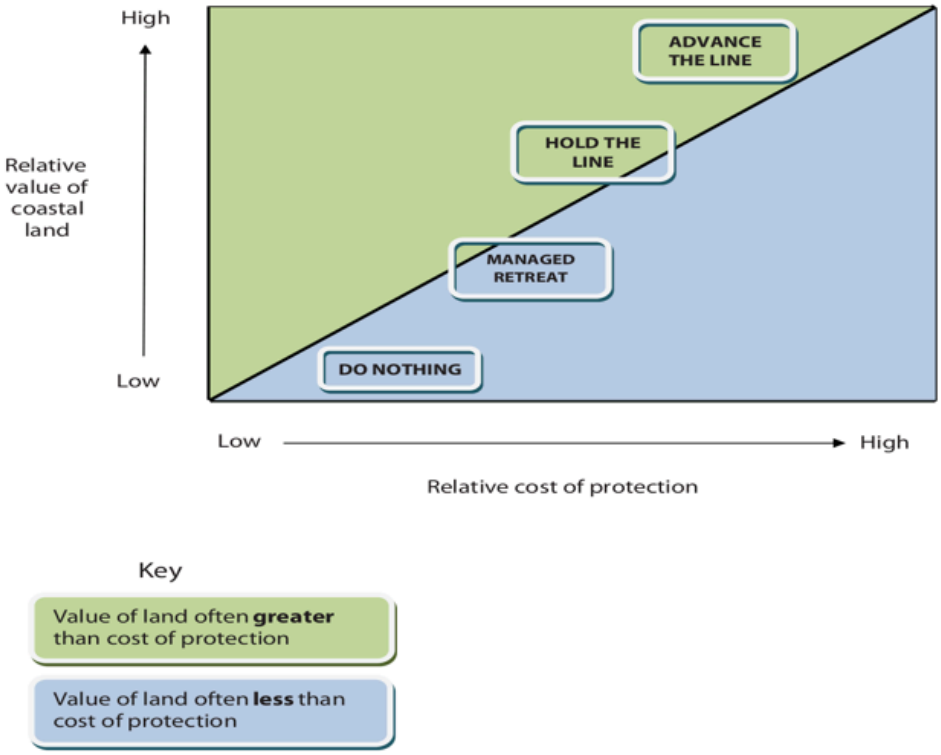
Option chosen should be examined as this could be via a number of different places, or, perhaps one small section of coast that uses a range or combination of defence measures that operate together. The longer and shorter term consequences need consideration, e.g. sediment starvation, loss of amenity beaches and possible impacts on tourism. Hard engineering gives an obvious presence (publically/politically significant?), but costs are high and solutions have a limited life span as they are prone to failure.

Soft engineering attempts to work with natural processes to reduce coastal erosion and flood threat. It usually has a lower visual impact, can encourage habitat recreation, and many would argue is cheaper in the long term. Students need to know different examples, mechanisms of working and whether such systems are successful, especially against the backdrop of limited resource allocation for coastal protection.

2) Coastal management and conflict

Students need to know the range of coastal management policy options, and from those a discussion regarding the conflicts between different players can be developed.

A simplified diagram showing the relationship between the value of coastal land and the cost of coastal defences



Students should understand the reasons why policy decisions are complex – it's a combination (in varying amounts) of economic value of the coastal asset or resource, the technical difficulty of the engineering solutions, cultural and ecological value of the coastal asset and the influence and pressure from local groups and communities.

Coast Benefit Analysis (CBA) and **Environmental Impact Assessment** (EIA) are also important components of both medium and longer term coastal decisions. Often these are only part of the evidence for a particular coastal management scheme. One of the reasons that these approaches are not widely accepted by all governments, agencies and communities is the uncertainty of future economic costs and discounting.

3) Sustainable policies and management

This final item looks at sustainable approaches such as beach nourishment, beach profiling and dune stabilisation, depending on location these may be used as part of a wider management strategy that includes an integrated approach, sometimes called integrated coastal zone management (ICZM) – from Rio 1992.

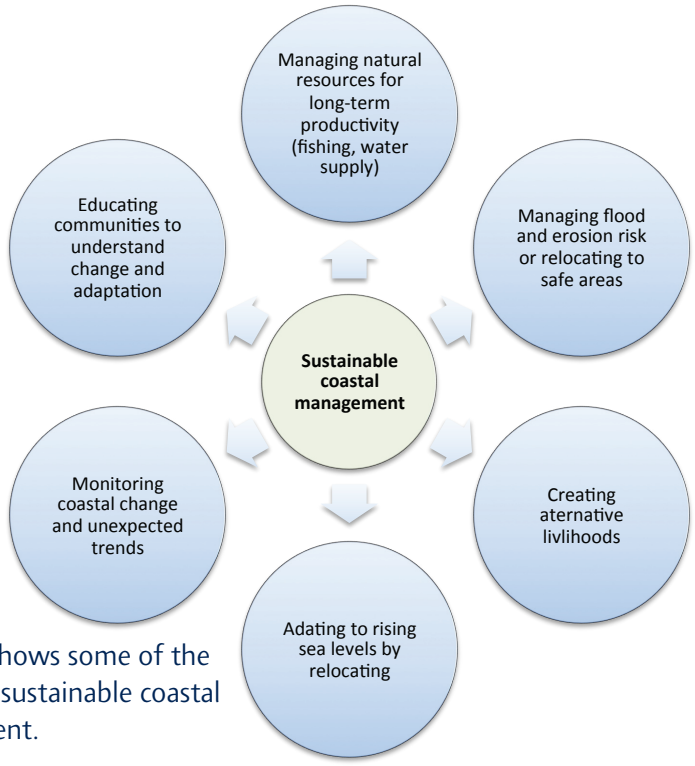


Figure 4 shows some of the aspects of sustainable coastal management.

Sustainable coastal defences are relatively new in many parts of the world. As with soft engineering, they try to accommodate, copy or work alongside natural systems and processes, with ecosystems often playing a key role. As an approach to defence they are regarded as environmentally friendly and may offer a longer-term solution for many places along the coast.

Key elements of this item are:

- appreciating the likely issues involved in the development (environmental impact)
- understanding and carrying out a cost-benefit analysis (CBA)
- examining the views and objectives of stakeholders (conflict matrix and values analysis)

Topic 2: Urban Problems, Planning and Regeneration

2.4.1 Urban and social environmental problems

1) Housing provision challenges in growing urban areas

Students need to recognise the complexities of the housing markets in many cities throughout the world, fuelled by a range of factors such as rural urban migration as well as wealth safe-havens. Lack of affordable housing is most acute where there are jobs and this pushes up rents and drives down choice. This has led some commentators to describe the problems of "unaffordable cities". **Affordability** (and the other linked issues of homelessness, income deprivation etc.) are aspects of social justice or injustice.

Figure 5 – ten most expensive cities in the World. Source: Economist Intelligence Unit 2014.

The solutions to such problems are simple – building. But this requires strong political drive.

In some places there has been the growth of unplanned and informal slum housing, associated with rapid urban growth that governments and agencies are unable to manage. There are many well researched problems here, but what is important are the reasons why and particular problems for some sections of society. In terms of urban sprawl, students need to appreciate its unplanned and short term approach and the problems of car dependent people. The term has become synonymous with the need to manage urban growth. It is sometimes called "peri-urbanisation".

2) Impacts of poor service provision

Squatter and slum settlements have formed mainly because of the inability of city governments to plan and provide affordable housing for the low-income segments of the urban population. The impacts of rapid urban growth are most acute in places where there are the greatest rates of urban growth, coupled with poor / unregulated planning and a city whose infrastructure is unable to cope with the numbers of people who require services.

Students need to be aware that the **social problems** of poverty, health, opportunity and lack of quality and / or affordable services are all closely wedded to each other.

Another challenge of rapid and / or unplanned urban growth is the sustainable management of waste. Students should be aware, through a variety of exemplification how solid waste can be managed with varying approaches and degrees of success.

3) City inequality

This item looks at the processes and causes of inequality for people in urban areas, i.e. environmental quality, access to social opportunity (including jobs and employment) as well as aspects of quality of life and health. There is a good opportunity to include some local research on aspects that illustrate and or initiate inequality. There is also an opportunity to use local and up-to-date census data which can be helpful in developing numerical skills as well as spatial analysis and cartographical skills, e.g. GIS.

Inequality can be caused by a number of processes, but they are often linked to the economy. **Table 7** gives examples of fieldwork data and information could be relevant to a piece of local work investigating evidence for spatial inequality.

Table 7

	Qualitative	**Quantitative**
Social	Types of cars; clothing worn, etc. (general photographic evidence)	Higher disposable incomes / purchasing power; change in the shopping basket of local shops
Economic	General feel of the area, e.g. annotated photos which illustrate changes	Reduction in unemployment / increase in range and type of employment
Environmental	Area 'feels' better, less threatening, cleaner, safer, etc	Detailed notes; biodiversity; street cleanliness, EQA

2.4.2 Transport in cities

This is another area that offers rich opportunities for fieldwork and research in a range of locations: contrasting parts of larger cities, comparison of two smaller urban areas, or investigating before and after changes, i.e. the implementation of a sustainable transport initiative.

1) Urban transport as a source of urban pollution

Many places and urban areas can illustrate the challenges of urban transport in terms of an agent of pollution.

Students should firstly be introduced as to the factors that have led to increases in the numbers of vehicles in cities, especially in the last 50 years. Data should be investigated for different locations to investigate rates, patterns and trends.

Air pollution is very high in a number of Asian cities: Karachi, New Delhi, Kathmandu, Beijing, and in Latin American cities: Lima, Arequipa, and in Africa, especially Cairo. There is not always a direct link to transport since other factors such as pollution from industry may play a part. Students should be reminded that not all cities have sophisticated monitoring of air quality (especially **particulate**), or publish their data. Many cities in China, for example, are heavily polluted by power station emissions (coal) rather than transport, although this is a significant contributing factor.

2) Consequences of transport problems for people and the environment

Air pollution increases the risk of respiratory and heart disease in people exposed. Both short and long term exposure to air pollutants have been linked to a range of health impacts. More severe impacts affect people who are already ill. Children, the elderly and poor people are the most vulnerable. Exposure to air pollutants is largely beyond the control of individuals and requires action by public authorities / stakeholders at the national, regional and even international levels.

According to researchers at the Harvard Centre for Risk Analysis, congestion in the 83 largest urban areas in the United States caused more than 2,200 premature deaths in 2010 and added $18bn to public health costs.

The recent (2015) VW scandal may also provide a rich area of complex and contemporary research.

This is a useful website for global levels of air pollution (live and historical). Individual cities can be selected. http://aqicn.org/city/united-kingdom/london-bloomsbury/

Another aspect of air pollution that can be researched is the linkage to weather conditions and the diurnal changes e.g. **NOx and ozone**.

Traffic congestion is also linked to stress and delays are an "opportunity cost", i.e. delays prevent people from having leisure time and exercising for example.

3) Different solutions to urban transport problems

A range of solutions can be utilised in different urban places, but they should be investigated according to their different costs and benefits. In particular, pay-back times should be considered as a better measure of value and linked to a cost-benefit analysis. Some sustainable transport projects are often criticised due to high capital costs, high operational costs and note socially equitable.

Often alternative transport has to be planned to link in with strategies to reduce car usage.

See here for a global bike share map - http://bikes.oobrien.com/global.php#zoom=3&lon=-60.0000&lat=25.0000

Individual cities can be selected and patterns investigated over time.

Figure 6. Source: David Holmes / Geography Southwest
Sustainable transport is a clear fieldwork and research opportunity.

2.4.3 Urban Planning

1) The solution of public housing

Students need to be aware of some brief history of social housing, and the spatial variation in social housing between urban areas in terms of quality, type, availability and relative affordability.

This is an interesting are for research since there are considerable political debates regarding housing stock and provision, and the linkage to public/social housing.

2) NGO and community help to improve housing

Informal slum housing requires a range of complex solutions. Almost 1 billion people currently live in slums, and this number is expected to grow by nearly 500 million by 2020. Government policies aiming at improving conditions for the poorest in cities must focus on expanding the flow of affordable houses as well as improving the living conditions of existing informal settlements.

A major concern in some cities is that the private sector has taken over public sector housing provision with a view to profit maximisation.

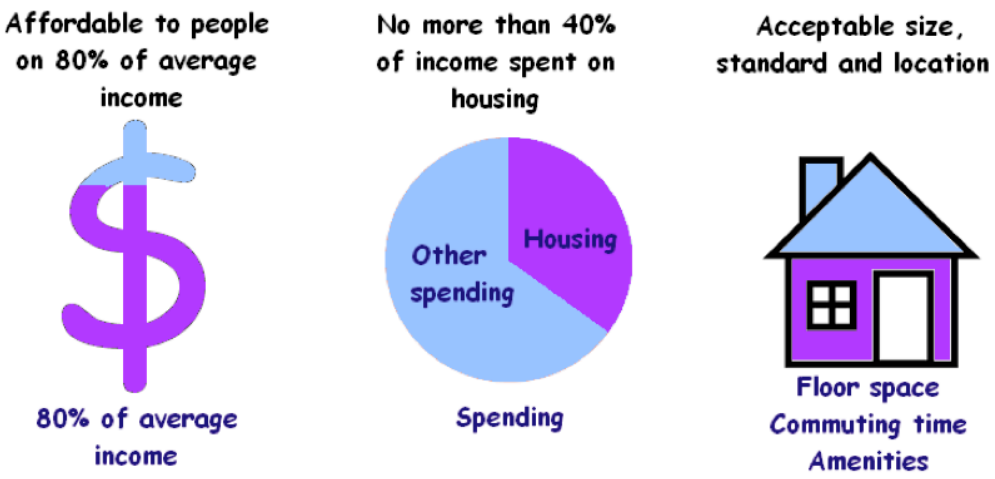


Figure 7

Source: http://www.mckinsey.com/insights/urbanization/tackling_the_worlds_affordable_housing_challenge

There are a number of agencies, individuals and organisations who can improve both housing and access to housing provision in some slum areas. Such organisations often have two main aims:

- Help to win the legal argument over land rights and tenure protection for the most vulnerable groups. When residents have security in their home ownership, they will be more willing to invest in renovating and upgrading existing housing.
- Find new ways to finance housing repairs and upgrades. Low-income families cannot renovate or rebuild their properties quickly, instead, they would rather borrow small amounts and invest in incremental repairs over time. Once the works are done, resident can then borrow more money for additional improvements.

In developed cities, different solutions are needed, governed by political appetite. Students should be aware that affordable and social housing is an overlooked opportunity for developers, investors, and financial institutions. Building houses for 106 million more poor urban households by 2025 could require more than $200 billion a year.

3) Large-scale planned cities

There are a number of examples of planned ideal and sustainable cities - Wikipedia provides a useful list and links that could be examined: https://en.wikipedia.org/wiki/Sustainable_city

This topic provides an ideal opportunity for elements of research. **Figure 8** for example shows some aspects of sustainable urban design and planning:

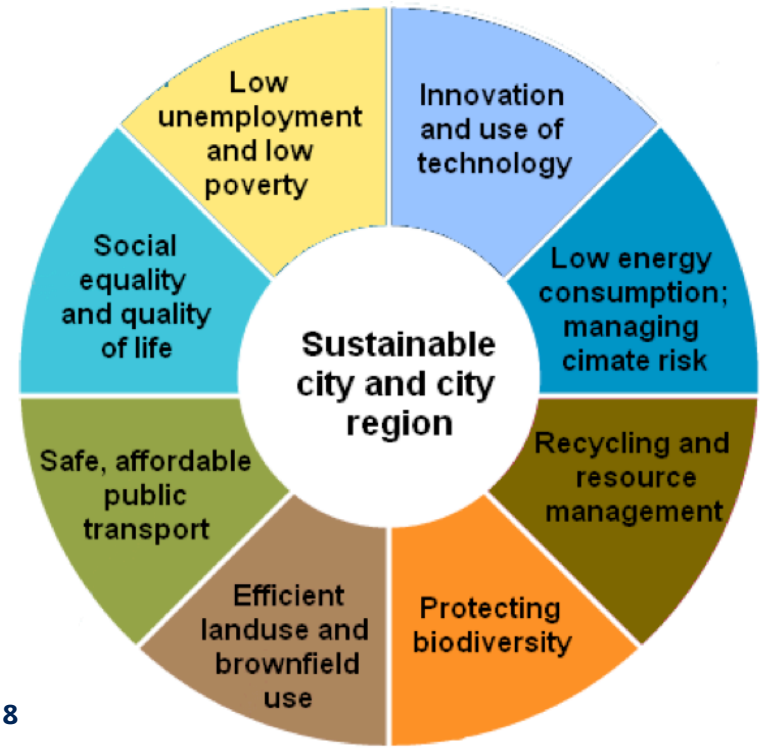


Figure 8

Contrasting locations might be selected in terms of approach to sustainability focus, i.e. transport vs waste vs housing etc. An alternative model might be the Egan Wheel, e.g. https://www.rgs.org/NR/rdonlyres/455C9C21-2E7D-42C8-A9B9-520EDDFA599C/0/FW_LL_Egan_Wheel.pdf

2.4.4 Urban regeneration

Again this topic lends itself to local investigations and local research, especially the latter as there may need to be a temporal dimension, e.g. finding out about what was there before and how a place has changed. Qualitative information including reports and oral histories for example, may form part of the research armoury as well as high quality photographs analysing and explaining change.

1) Different players in the role of regeneration

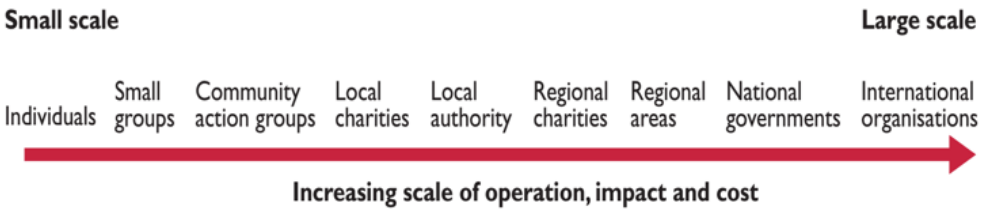


Figure 9

Various groups, organisations and individuals can be involved in reducing urban inequalities. These are often referred to as 'players' or 'stakeholders'. The spectrum of stakeholders is illustrated in **Figure 9**. Governments for example, play a key role in regeneration by managing the country's economic, social and physical environments through various political decisions. Investment in infrastructure and

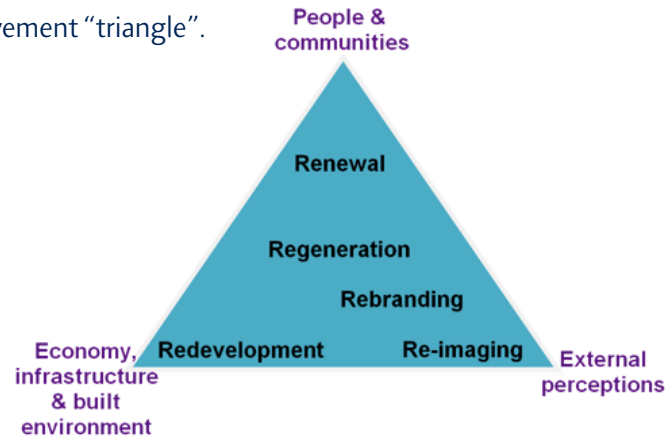
addressing issues of accessibility are seen as major factors in maintaining economic growth. Most infrastructure projects are high cost, sensitive and have a long life span. They may be intrinsic to redevelopment and an urban areas improvement.

2) Contrasting approaches to regeneration

Students need to be aware of the differences between the different approaches to improvement. Regeneration for example, was the buzz-word of the 1980s and 1990s. This meant giving an area a 'new start' by:

- changing the economic base of an area
- attracting new social groups
- renewing the environment and infrastructure of the area.

Figure 10 – the improvement "triangle".



Reimaging is about external perceptions and desirability – it tends to link to large scale infrastructure projects: retail, heritage, sport, culture, arts etc which may have global appeal.

3) Sustainability and urban regeneration schemes

Regeneration is best achieved as a long-running process rather than a quick fix to economic, social and environmental problems, despite political and economic pressures for speed. Events designed as a catalyst, such as the Olympic Games, may be successful in attracting visitors and investment; creating a legacy of success, which tackles more systemic and long-standing issues of inequality and a poor environment, may be more problematic.

Students should be aware of the notion of social progress, i.e. how an individual and community improve their relative status in society over time.

Measuring **environmental success** is probably the easiest component to see through fieldwork, especially if historic baseline data is available to analyse what changes have occurred. Other research-based indicates that can be accessed locally include: deprivation indices, crime statistics, pollution, education attainment, housing amounts, unemployment.

Unit 3 Contested Planet

Overview

This unit has two compulsory topics – **A1**: Atmosphere and Weather Systems **and** **A2**: Biodiversity Under Threat. These topics focus on physical processes and how these processes generate patterns and problems in the natural environment. Issues of managing weather hazards and managing biodiversity loss are also considered.

Two further topics should be chosen, **either** Topic **B1**: Energy Security **or** Topic **B2**: Water Conflicts. These topics consider in detail a key human resource, in terms of its distribution and use, and real and potential problems resulting from its development and utilisation.

Finally, **either** Topic **C1**: Superpower Geographies **or** Topic **C2**: Bridging the Development Gap can be studied. These are economic and political options considering global power, inequality and development from opposite ends of the development spectrum.

Section A Study BOTH	Section B Study ONE	Section C Study ONE
A1 Atmosphere and weather systems	B1 Energy security	C1 Superpower geographies
A2 Biodiversity under Threat	B2 Water conflicts	C2 Bridging the development gap

The options in Section B and C are parallel in terms of both content volume, style and assessment so the decision about which to study is down to personal preference of students and staff.

This unit is issues-based, allowing for investigation of the causes and consequences of global issues. Examples and case studies can be used to support teaching and learning but the choice of these is again down to the teacher.

Topic guide and Suggested activities/resources

Please refer to the accompanying Scheme of Work booklet for this unit for detailed topic guide and suggested activities/resources.

Content can be taught in the context of any suitable location, but teachers should be aware that:

- Place contexts [ ] in the Specification indicate where content should be delivered through a suitable place-based example. The place context in the content can be used, or another suitable parallel example.
- Some place contexts require reference to a range of countries at different levels of development such as developed (e.g. USA, UK, Japan), emerging (e.g. China, Mexico, Brazil) and developing (e.g. Kenya, Peru, Nepal)

- Skills are listed at the end of the specification content and numbered within the content; these must be delivered as part of teaching.
- Note that in the biodiversity topic some content should be delivered through a chosen terrestrial biome (a marine biome, such as coral reefs, is not acceptable).

A1 Atmosphere and weather systems

The most important concept in this topic to understand is the global atmospheric circulation as shown in the link here:
https://www.youtube.com/watch?v=Ye45DGkqUkE

The tri-cellular model has a major influence on the planet as it determines the location of climate zones, and influences the location of biomes.

The location of high and low pressure areas, and therefore areas of precipitation, shift seasonally in response to the migration of the inter-tropical convergence zone.

Weather hazards, which affect millions of people every year, are also strongly related to global circulation:

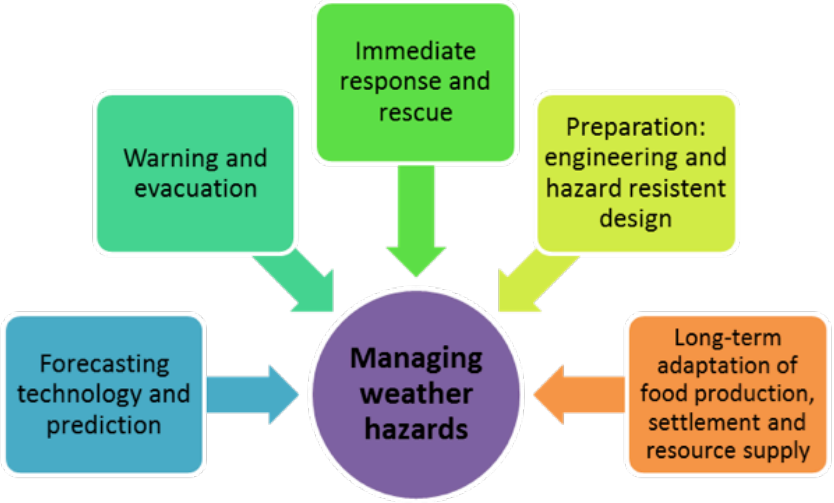
- Mid-latitude depressions form at the polar front where polar and tropical air masses interact.
- Tropical cyclones form seasonally in the warm oceans of the tropics are carried by trade winds to interact with densely populated coastlines in both the developed and developing worlds
- Drought is common in high pressure zones when seasonal rains fail.

All of the above have the potential to be affected by global warming in the future.

The general circulation of the atmosphere, increased risks from higher magnitude and / or more frequent hazards as a result of climate change plus the rising number of people vulnerable to weather hazards set the context for place-based investigations into the causes and impacts of weather hazards:

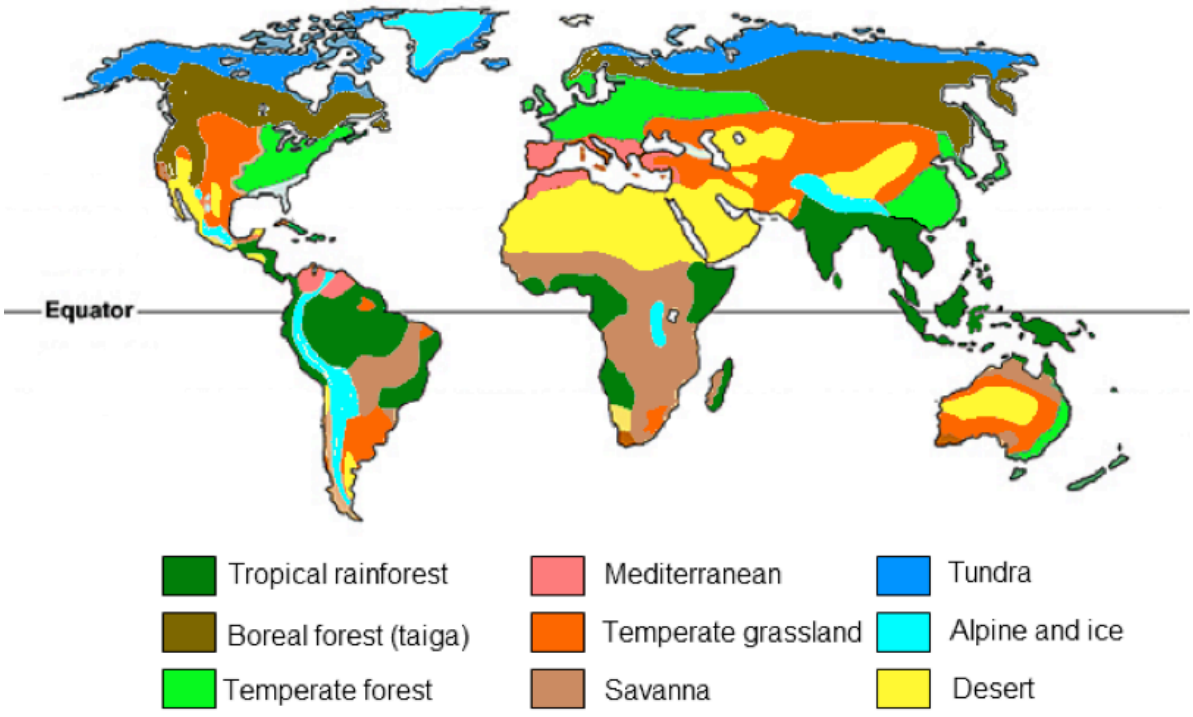
Mid–latitude depressions	Tropical cyclones	Drought
North-easterly tracks towards the UK and Northern Europe	North-westerly tracks towards the Gulf of Mexico and the USA; cyclones on the Bay of Bengal or Philippines	Drought and its impacts on the Sahel and Australia; impacts of anticyclonic heatwave conditions in Europe.

Enquiry Question 3 in this topic focuses on the management of weather hazards. There is much that can be done to prepare, predict and respond to these hazards. Management focuses on five main areas shown below:



A2 Biodiversity under Threat

The starting point for this topic is understanding the global distribution of terrestrial biomes shown in the map below:



This distribution is strongly linked to topic A1, as the global atmospheric circulation largely determines temperature (by latitude) and precipitation (location of high and low pressure zones; ITCZ seasonal shifts).

The distribution is modified by local factors such as the influence of mountain ranges affecting precipitation and altitudinal zonation, local drainage and soil types.

Within the context of these biomes very different levels of biodiversity exist. Biodiversity can be considered in three different ways as shown below:

Species	Genetic	Ecosystem
• The variety of species, plant and animal, within a region.	• The variety of genes within a species. Each species is made up of individuals that have their own particular genetic composition.	• The variety of ecosystems, and ecological niches, within an area.

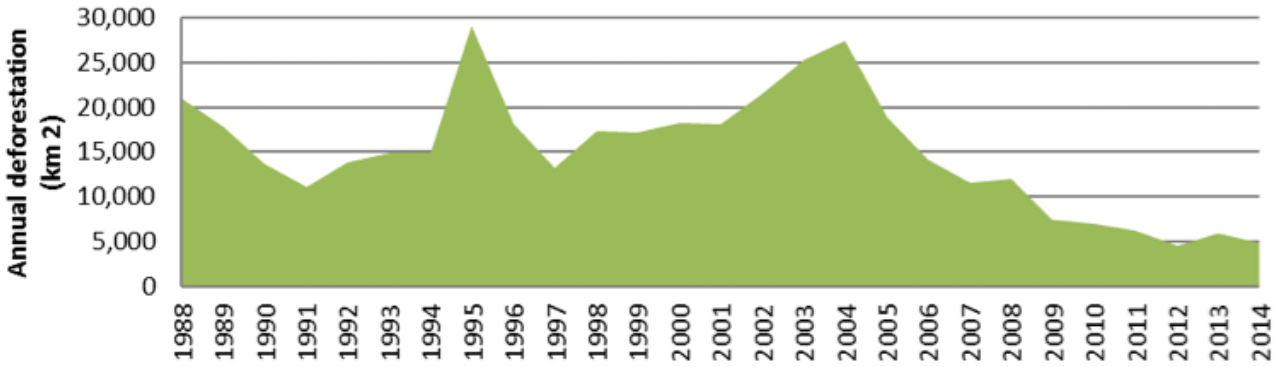
Ecosystems and biodiversity are considered valuable to humans because of the relationship between ecosystem health and human wellbeing (social, cultural and economic). The concept of 'value' was set out in the 2005 Millennium Ecosystem Assessment in terms of ecosystem services:

Enquiry Question 2 and parts of Enquiry Question 3 should be studied with reference to a chosen terrestrial biome such as tropical rainforest, savanna grassland or tundra. Focussing on:

- ecosystem processes: nutrient cycles and food webs / energy flow
- threats local and global: destruction, degradation, alien invasive species, global warming, resource demand
- management / conservation approaches

<table>
<tr><th colspan="2">Ecosystem Services</th></tr>
<tr><td rowspan="3">Supporting
• Nutrient cycling
• Soil health and formation
• Primary Production of plants</td><td>Provisioning
• Foods
• Fresh water supply
• Wood and fibres
• Fuel</td></tr>
<tr><td>Regulating
• Regulation of the climate system
• Flood and water cycle regulating
• Disease control
• Hydrological cycle water purification</td></tr>
<tr><td>Cultural
• Aesthetic value
• Spiritual wellbeing
• Educational value
• Leisure, recreation and tourism</td></tr>
</table>

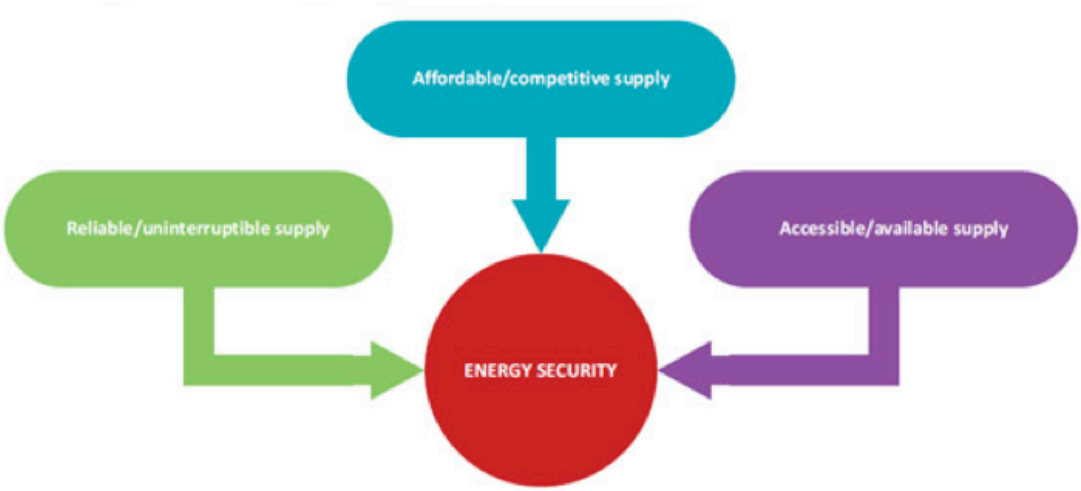
It is important to recognise that this topic is not 'all bad news'. While many ecosystems are under threat, there are signs in some places that they are being protected more fully as attitudes change and the importance of ecosystems to human wellbeing is recognised. This can be seen in terms of deforestation rates in Amazonia as shown below:



B1 Energy Security

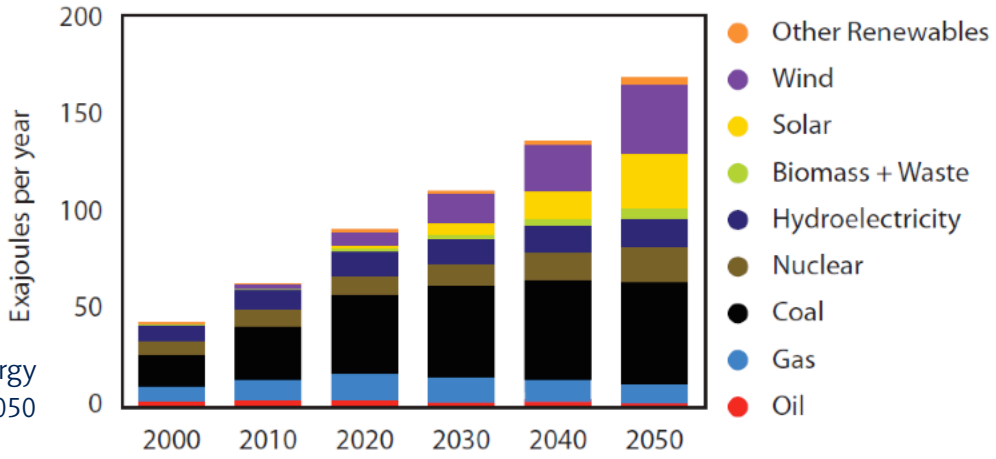
Energy is a vital resource to everyone on the planet, but its use varies enormously. In developing countries, especially in rural areas, 100s millions of people still depend on traditional biomass as their main energy source. In the developed world fossil fuels account for 80% of energy consumption in most countries – although renewable are increasingly popular.

In emerging countries the rapid transition to higher standards of living means rising demand for oil, coal and gas. Combined with dwindling and hard to reach supplies, this raises the risks of energy insecurity. Energy security exists when three conditions shown below are met:



Energy security has become a key goal for countries. Disruption to supply has serious consequences. Failure to provide sufficient power to the Indian national electricity grid in 2012 led to the largest power-outage in history, when 620 million people suffered an electricity blackout.

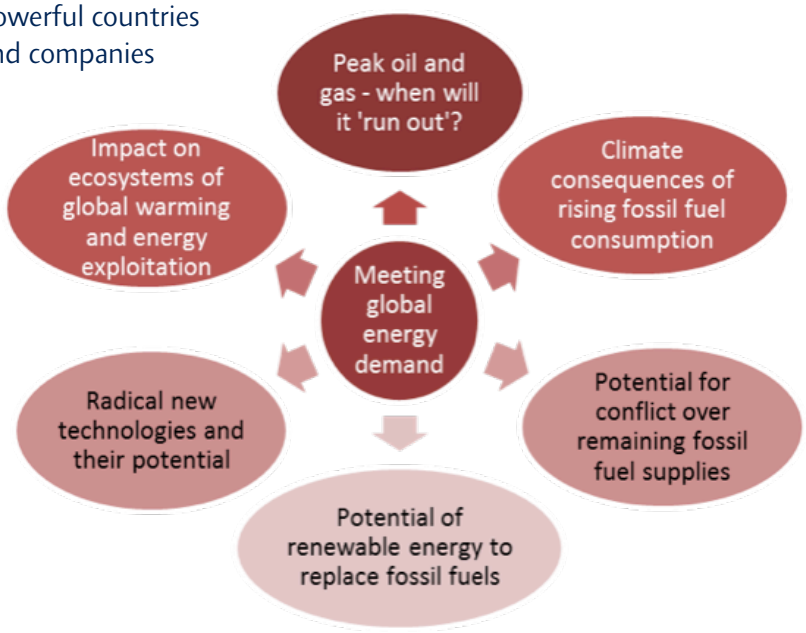
A key issue is how projected global demand can be met. Most projections suggest global energy demand will increase by 30-40% by 2035 and that much of this will come from BRIC countries:



Global energy consumption 2000 to 2050

This topic explores a range of issues that these projections raise. Many of these have strong links to other topics in the Unit including:

- A2 loss of biodiversity and ecosystems, as energy resources are exploited in increasingly fragile environments
- A1 the consequences for the atmosphere of continued fossil fuel burning the risks of global warming
- B2 the consequences to water supply of a warmer world caused mainly by human use of energy resources
- C2 the need for energy supply as part of the development process, in order to raise people out of poverty
- C1 potential for energy supplies to be controlled by a small number of powerful countries and companies

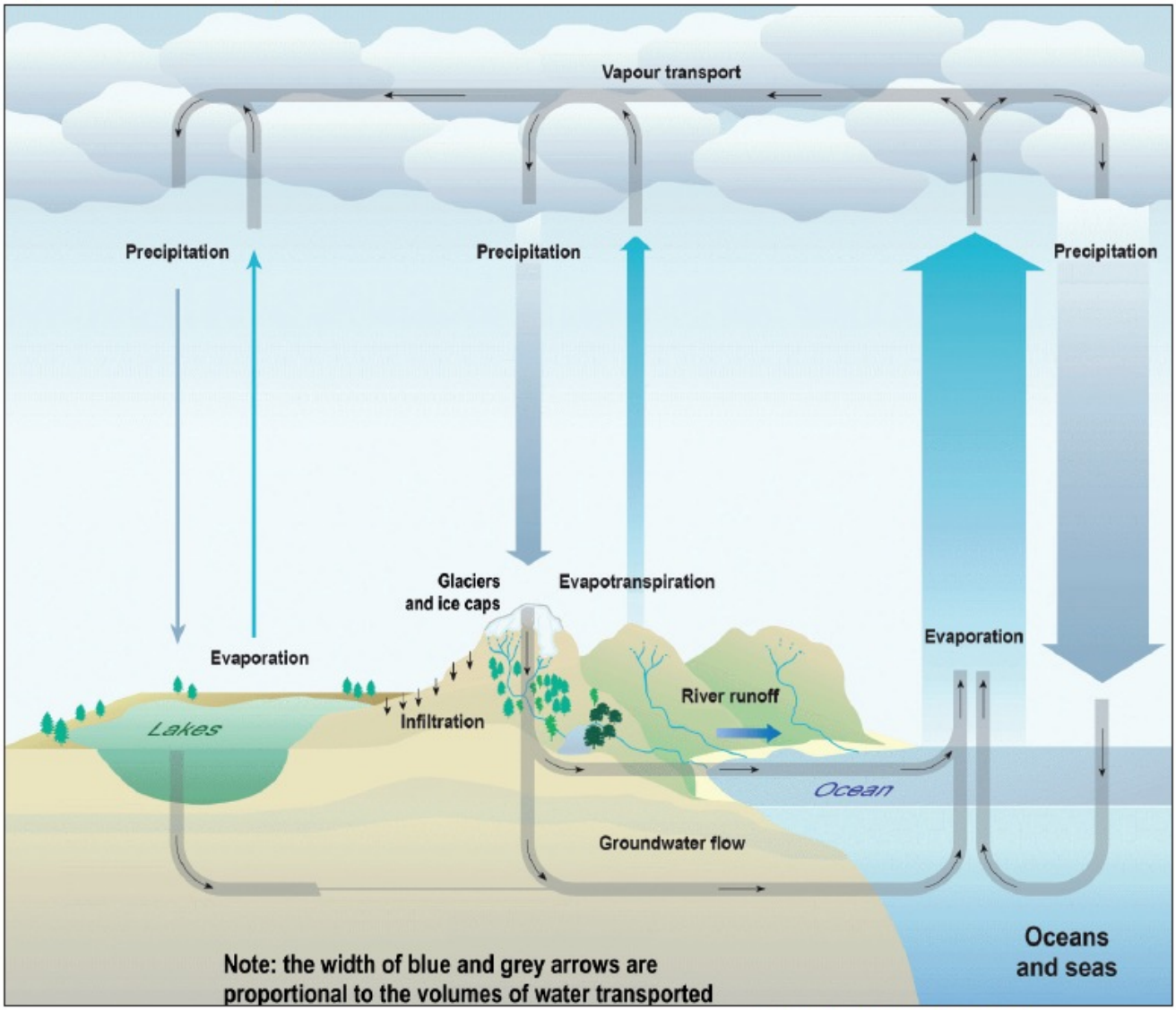


B1 Water Conflicts

Water supply is a crucial factor in human development and unlike energy supply, it has no replacement or alternative if the supply is lost.

The key concept to begin with is the hydrological cycle (see diagram below)

- This is a closed system that naturally moves water around the planet and in the process maintains the health of ecosystems.
- There is a close relationship between the global atmospheric circulation in topic A1 and the hydrological cycle.
- Humans have become expert at 'inserting' themselves into the water cycle in order to extract water for their own needs.
- Understanding the physical processes within the water cycle is important, as is the physical geography terminology that accompanies it.



(Source: www.maps.grida.no)

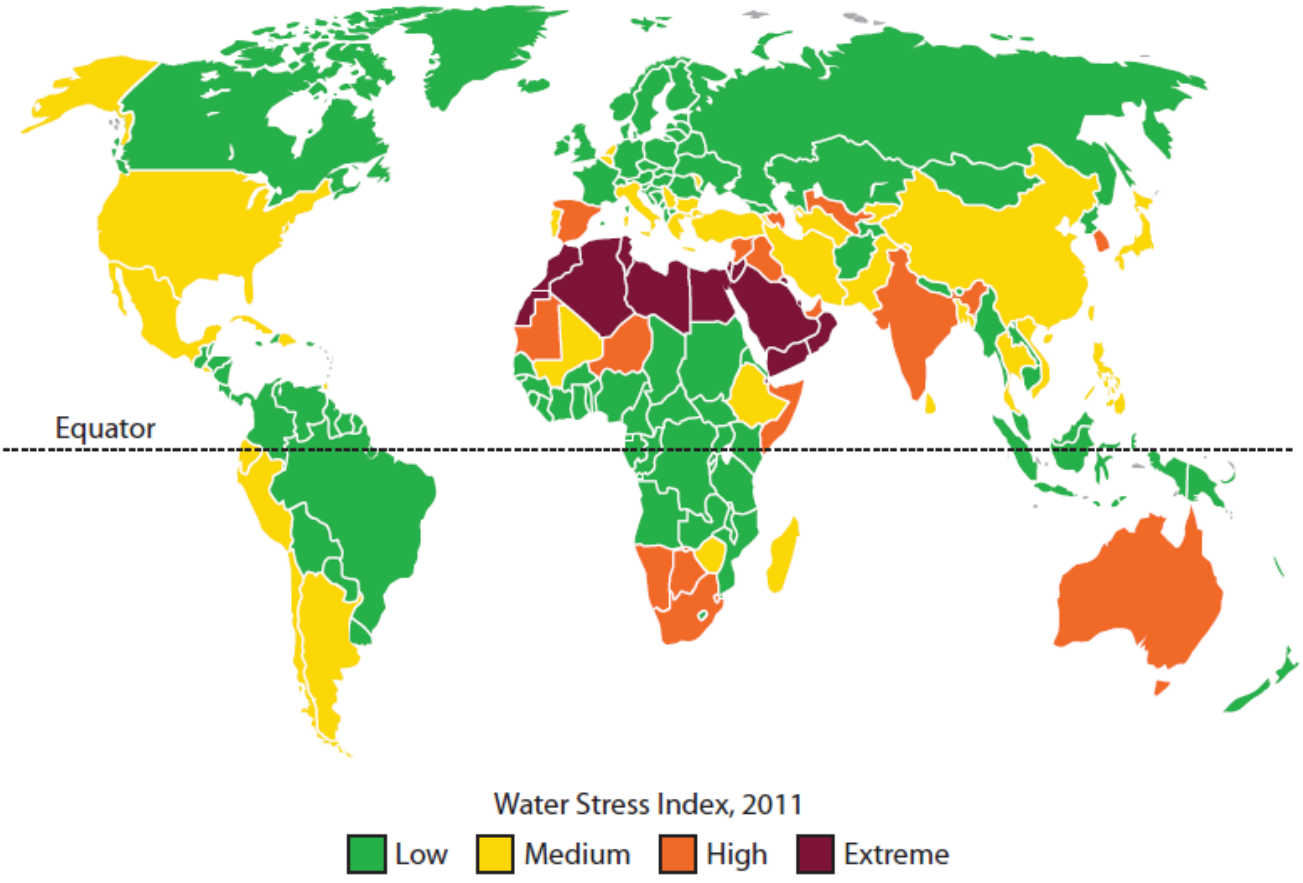
7.5 billion people have had a significant impact on the hydrological cycle in terms of:

- quantify of water available
- quality of water available

Increasing water demand has often been accompanied by increased pollution of supply, so that the overall water resource has shrunk. Large areas of the world are now suffering from water stress or water scarcity, and even in places where water is physically available there may be economic water scarcity as low income people cannot afford water (a particular problem in developing world cities).

Water supply has a greater chance of turning into a 'crisis' in the near future than energy supply. As the map below shows, large areas of the world suffer from severe water stress now and this could become very problematic in the poorer parts of South and Central Asia, North Africa and the Middle East very quickly without careful action to manage remaining supplies.

This is not only a problem for poorer countries as some European countries, the southwest of the USA and Australia all have very tight water supply.



The water stress index is calculated as the ratio of total water demand (domestic, industrial and agricultural) to supplies from renewable sources (streams, rivers and shallow groundwater)

C1 Superpower Geographies

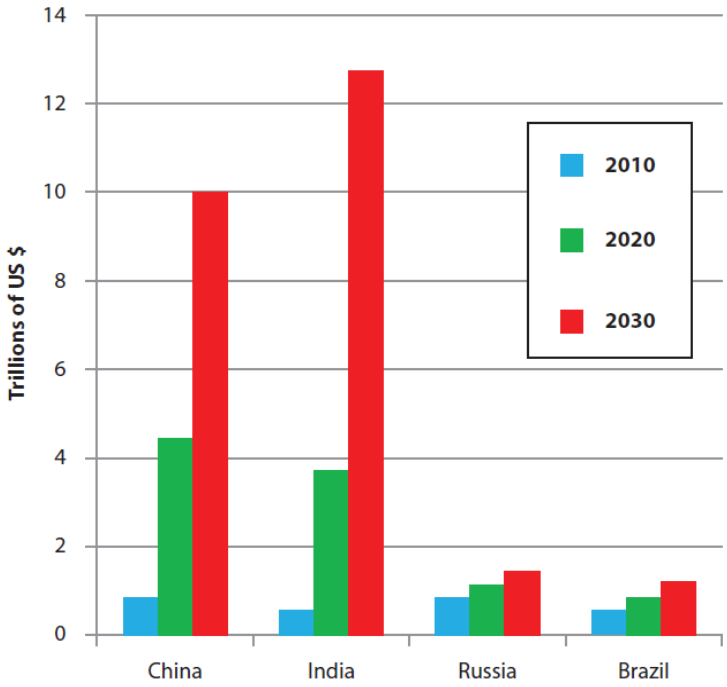
This topic is essentially a geopolitical one about the geographies of power. The world's most powerful countries have changed over time and continue to do so. There is a general expectation that by mid-Century China (and perhaps India) will be as or more powerful than the existing superpowers of the USA and EU. Although countries change, what might be called the 'pillars of superpower status' do not:

These pillars may vary in their relative importance over time but the fundamental characteristics of power are similar today as they were in 1816 and 1916. Some sense of historical geography is important to this topic as understanding the power of the USA today, or China in the future, is made easier when it is done comparatively with the UK in the 19th century or the USSR in the 20th century. This topic allows a wide range of sources of power to be explored. Since 2008 there have been a number of changes which are relevant to this topic, which contextualise it:

- The relative economic power of the USA and EU in the world has been reduced by the protracted Global Financial Crisis.
- The BRICs have become less homogenous, with China pulling away from the others and Brazil and Russia both suffering economic problems.
- Other NICs – Mexico and Indonesia in particular – are eyed as possible emerging powers.

Another key area to investigate is the consequences of continued demand for resources in terms of food, fuel, land and mineral resources. Most projections of the global economy and geopolitical situation in 23030 or 2050 imply a huge ramping up of resource demand from superpowers and emerging powers as well as a decisive shift in were consumption takes place:

The middle class is defined as people with incomes between US $6,000 and $30,000 per year



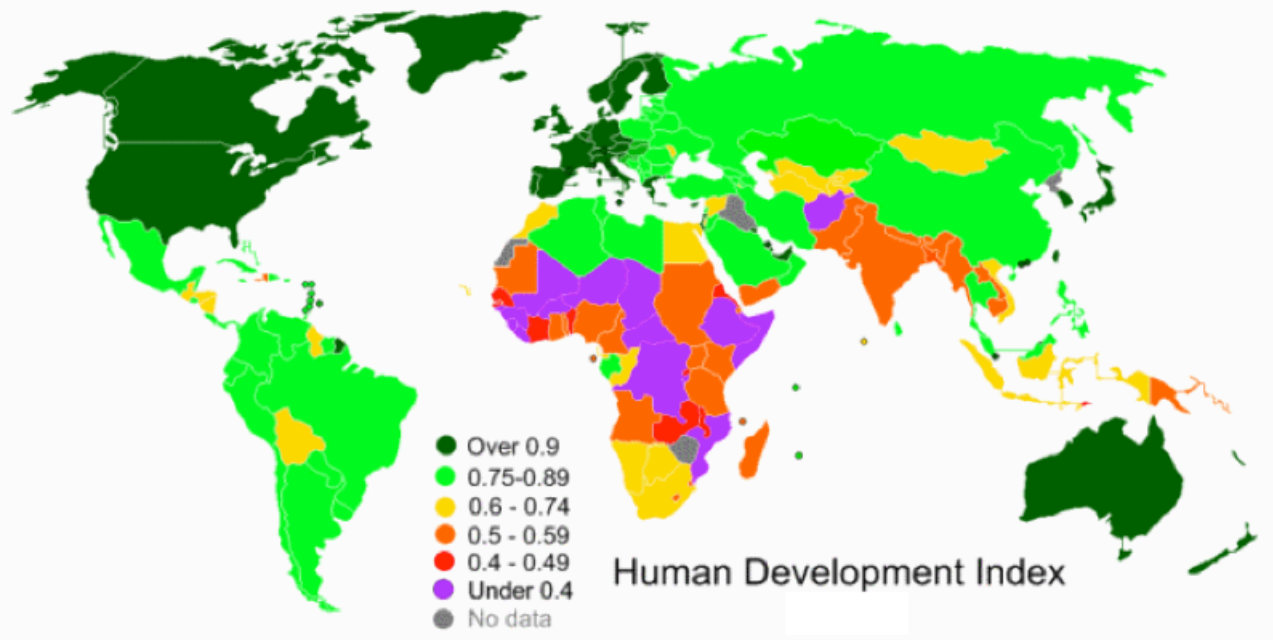
It is possible to see evidence of tensions over resources and geographical spheres of influence already:

- Chinese actions on the South China Sea to secure EEZ rights over large parts of the sea.
- competing claims to the Arctic Ocean sea-bed where oil and gas reserves are suspected.
- continued conflict in the Middle East partly a result of oil resources
- Russia's actions in Georgia and Ukraine, protecting what it believes to be its 'back yard'
- China's increasing involvement in Africa's economy

All of these issues can be studied in the context of this topic.

C2 Bridging the Development Gap

The map below shows the global pattern of the Human Development Index (HDI):



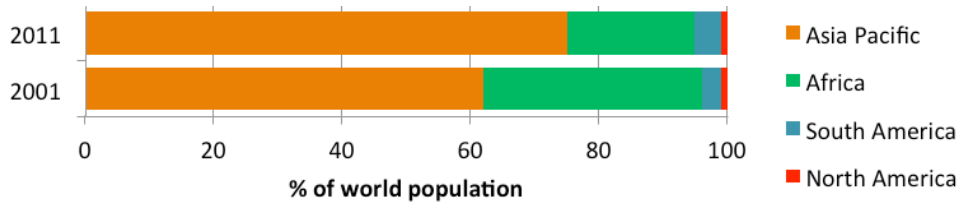
It is important to spot that the clear 'North-South' divide that existed before 1990 is no longer present. Many countries are now in the 'mid-range' band of HD from 0.6 to 0.79 – a success story resulting from economic development and to some degree achievement of the MDGs.

Low HDI is concentrated in two regions:

- South Asia
- Central Africa

Very low HDI, which is often synonymous with the LDC countries, is heavily concentrated in Africa. The development gap is not a simple 'haves' and 'have nots' gap but more of a spectrum.

Proportion of the world's people living on less than $2 per day in 2001 and 2011



The graph above shows that between 2001 and 2011 Africa's share of the world's poorest people increased from 20% to 34%, whereas there was a large drop in Asia. A key theme of this topic is explaining why Africa continues to make little development progress compared to the rest the world.

The topic also allows for detailed consideration of development disparity among different groups including:

Urban versus rural populations	**Ethnic and religious groups**
Gender differences	**Core and periphery regions**

Students will also be able to consider a wide range of different ways to try and narrow the development gap and improve quality of life for people at the wrong end of the poverty–wealth spectrum:

Suggested resources

There are a wide range of resources you can use to support teaching and learning, some key ones are given in the table below:

Books	The following books for the 2008 GCE specification cover much of the material in topics A2, B1, B2, C1, C2: • Edexcel A2 Geography, by Warn et al, Hodder / Philip Allan Updates 2008 • A2 Geography for Edexcel, by Digby et al, OUP 2008 • Edexcel A2 Geography, by Byrne at al, Edexcel, 2008 For topic A1, which is new: • AS/A2 Geography Contemporary Case Studies: Natural Hazards & Disasters: Natural Hazards and Disasters, Warn & Holmes, Philip Allan Updates 2008
Magazines / journals	Geography Review http://www.hoddereducation.co.uk/Geography#&pid=2 Geofactsheets http://www.curriculum-press.co.uk/section/ Geofile https://global.oup.com/education/secondary/kerboodle/geography/geofile/?region=uk
Websites	There are a vast number of websites, please see the accompanying Scheme of Work for details.
Other	Other DVDs http://www.pumpkin-interactive.co.uk/

Unit 4: Researching Geography

Overview

This Unit is designed to allow students and centres to specialise in a topic that reflects their expertise and their interest. It cultivates the skills of independent learning and research in a manner that is both excellent preparation for higher education but also an important skillset in its own right.

Each student will choose one topic to study and answer one question on that topic in the 90 minute examination.

Uniquely on this specification there is a pre-released set of research steers; two for each option. These are designed to help students focus their research and help teachers both lead on that process as well as give guidance to their students about the most productive lines of enquiry.

In this unit there is increased importance in relation to the assessment objective 2 (AO2 - Apply Knowledge and Understanding in different contexts to interpret, analyse and evaluate). This reflects the greater weighting given to the Analysis and Conclusion and Evaluation sections of the generic mark scheme (20/60 + 15/60 = 35/60 = 58% of total mark). The principle behind this is to help students focus on answering the question set rather than relying on learned case study material that is presented without sufficient attention to analyse how the case study material helps 'make a case'.

Topic guide and Suggested activities/resources

Please refer to the accompanying Scheme of Work booklet for this unit for detailed topic guide and suggested activities/resources.

Question paper and mark scheme

The pre-release material statements will be 'Research' although the second statement will always retain its geographic element by using the phrase 'Research a range of locations'.

Questions will **always** offer a contentious statement or pose a hypothesis that students should feel able to challenge. The aim is to promote the critical thinking skills necessary to elaborate an argument and come to a view.

The question-specific mark schemes will be based on the possible indicative content that students will offer in the form of concepts, theories and case-study-based evidence.

Planning suggestions

Unlike the other units, this unit will have pre-release research steers.

Strategies for the classroom after pre-release becomes available- the purpose of the pre-released advance information:

The purpose of the advance information (research focus) is to encourage students to focus their final research and revision on a particular area or areas of the option they

have researched. It is very important to recognise that:

- the research focus is provided in the form of two bullet points, one intended to be conceptual one that gives the geographic steer.
- the research focus is **not** provided so that students and teachers can 'guess' the question, in the past this approach often leads to students answering a pre-prepared question rather than the actual question they are faced with when they open the examination paper.
- what students should be encouraged to do (see Scheme of Work) is to develop the critical thinking skills to engage with a proposition and provide evidence both for and against a 'view' before coming to a conclusion.
- the research focus usually straddles several specification enquiry questions, not just one.
- the research focus may relate to several specification bullet points across several enquiry questions, rather than all the bullet points for one enquiry question.

Deconstructing the 'Research' bullets

The first task when the research focus is given to students is to identify which areas of the specification the research steers relate to. This might best be done as a group activity.

- Give students a copy of the specification for the whole option (Enquiry Questions 1–3 for your chosen option) and a copy of their research focus.
- In groups of two to four, get students to match the research focus with the specification, by matching key words and phrases and thinking about the sorts of ideas and concepts that could be relevant. Students can use highlighters to do this.
- Compare the different results/views of the groups and come to a consensus about which areas of the specification the research focus relates to. Note that some links might be very obvious and strong, whereas others might be weaker (but still relevant).

The first research bullet focuses on concepts, themes and ideas whereas the second focuses on examples, places and case studies that should be included in the final research and preparation. It is important to give the same degree of importance to both bullets.

Content guidance - topics

Content guidance is included on the published Scheme of Work for this unit.

B Getting started for students

Student guide

Why study the Pearson Edexcel IAL in Geography

Our new International Advanced level Geography specification consists of interesting and engaging contemporary geographical content balancing physical, human and/or environmental global interests relevant to modern day lives.

This specification will provide you the opportunity to develop the knowledge, understanding and skills for further study at higher education or for employment

What do I need to know, or be able to do, before taking this course?

There are no formal requirements for the IAL in Geography. However, you will benefit from having an interest in the world around you. You also need to be prepared to leave the classroom and see for yourself what is going on! It is compulsory for ALL students to complete two days of fieldwork.

What will I learn?

The world we live in is changing. Geography allows you to see why and how it is changing. It can enhance communication skills, literacy and numeracy, IT literacy, spatial awareness, team working, problem solving and environmental awareness.

There is opportunity for fieldwork In Unit 2. Geographical Investigations offers the opportunity to undertake fieldwork and research when investigating the topics chosen. Fieldwork can be a great experience and allows you to apply your knowledge and understanding in a practical way.

The content of the specification is structured as follows:

Unit 1 - Global Challenges	Unit 2 - Geographical Investigations
• World at risk • Going global	• Crowded coasts • Urban problems, Planning and Regeneration

Unit 3 - Contested Planet	Unit 4 - Researching Geography
• Atmosphere and Weather Systems • Biodiversity Under Threat • Energy Security or • Water Conflicts • Superpower Geographies **or** • Bridging the Development Gap	**Choose one topic from:** • Tectonic Activity and Hazards • Feeding the World's People • Cultural Diversity: People and Landscapes • Human Health and Disease

How will I be assessed?

We've created examinations that give every student the chance to succeed. Alongside a straightforward assessment structure, we have created and explained a list of command words used in examinations to make it clear what students are being asked to do.

There is also synoptic assessment designed to help students make links between different geographical ideas and concepts and show their accumulated knowledge and understanding of a topic or subject area.

International Advanced Subsidiary (IAS) (Units 1 & 2)

Unit 1: Global Challenges

1h 45minutes examination paper in two sections and a resource booklet
Examination is set and marked by Pearson.

A total of 90 marks are available in this examination

Unit 2: Geographical Investigations

1 hour 30 mins examination paper in three sections and a resource booklet

Examination is set and marked by Pearson.

A total of 60 marks are available in this examination

International Advanced Level (IAL) (Units 1, 2, 3, & 4)

Unit 3: Contested Planet

2 hours examination paper divided into 3 sections and a resource booklet
Examination set and marked by Pearson.

A total of 90 marks are available in this examination

Unit 4: Researching Geography

1h 30 minutes examination paper with pre-release material of research focus questions relating to each of the four options.

Examination is set and marked by Pearson

A total of 60 marks are available in this examination

Is this the right subject for me?

The International Advanced Level in Geography will appeal to you if:

- you are curious about the world's places, peoples and environments
- you like asking questions and finding answers
- you are interested in local, regional and global issues
- you have the ability to think independently
- you wish to explore human, physical and environmental geographical relationships.

What can I do after I've completed the course?

An Advanced Level in Geography opens doors!

You will find that studying geography is a brilliant step towards a wider range of Higher Education courses and/or employment opportunities.

- Further education — geographers can go on to study higher level courses, including undergraduate degrees and/or BTEC Higher Nationals.
- Employment — geographers can go into a wide range of jobs, including: Advertising, Education, Marketing, Environmental management, Retailing, Finance, Sales, Law, Social/health services.

Next steps!

Interested? Talk to your teacher / tutor in the first instance. They should be able to advise you on what steps to take.

Glossary

This glossary includes information on the commonly used command words from the specification and assessment materials.

Guide to command words in assessment

The new question papers have questions that are of varying difficulty. The command words set out in the following table guide students as to the required answers.

Command word	Definition
Analyse	Use geographical skills to investigate an issue by systematically breaking it down into individual components and making logical, evidence-based connections about the causes and effects or interrelationships between the components
Assess	Use evidence to determine the relative significance of something. Give balanced consideration to all factors and identify which are the most important.
Calculate	Produce a numerical answer, showing relevant working.
Compare	Find the similarities and differences of two elements given in a question. Each response must relate to both elements, and must include a statement of their similarity/difference
Complete	Create a graphical representation of geographical information by adding detail to a resource that has been provided.
Define	State the meaning of a term.
Describe	Give an account of the main characteristics of something or the steps in a process. Statements in the response should be developed but do not need to include a justification or reason
Discuss	Use evidence to build an argument about an issue. Present more than one side of that argument to create a written debate, identifying both positive and negative points to reach an evaluative conclusion.
Examine	Assimilate, consider and review information (either supplied as a resource, or from existing knowledge and understanding of a topic). It may then require some form of decision or judgement to be made, drawing on any evidence provided and consideration of the topic.
Evaluate	Measure the value or success of something and ultimately provide a balanced and substantiated judgement/conclusion. Review information and then bring it together to form a conclusion, drawing on evidence such as strengths, weaknesses, alternatives and relevant data.
Explain	Provide a developed, reasoned explanation of how or why something occurs. An extended response explanation requires a depth of understanding to be demonstrated through the justification/exemplification of points identified.
Identify/give/ name/state	Recall or select one or more pieces of information.
Sketch/calculate	Perform a procedure as instructed relevant to the context of the question.
Summarise	Give the main points relating to data, information or a resource, providing the opportunity to consider the most and/or least significant.
Suggest	For an unfamiliar scenario, provide a reasoned explanation of how or why something may occur. A suggested explanation requires a justification/exemplification of a point that has been identified.
To what extent	Give the main arguments for and against a point of view to create a written debate with a conclusion that is justified and supported by evidence

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