

# Year 11 Case Studies Revision Booklet/past paper questions

Name \_\_\_\_\_

Use this booklet to learn the **specific facts** linked to your case studies.

You could reproduce each case study into your own **mind map, revision card or basic question and answer cards.**

This resource is really useful to get people at home to **quiz** you – find out how much case study information you really know.

**Have you locked in yet????**

# Paper 1 - The Challenge of Natural Hazards





read

# Natural Hazards

## LIC Case Study

### Nepal Earthquake 2015



quiz



## The Big Picture



## Primary Effects

- 8632 people died.
- 19,009 people were injured.
- 8 million affected.
- 3 million people made homeless.
- 1.4 million people needed support with access to water, food and shelter.
- Electric and water supplies affected.
- Seven thousand schools were destroyed.
- Total damage estimated at US \$5 billion.



## Key Terms



**Immediate responses** - The reaction of people as the disaster happens and in the immediate aftermath.



**Long-term responses** - Later reactions that occur in the weeks, months and years after the event.



**Primary effects** - The initial impact of a natural event on people and property, caused directly by it.



**Secondary effects** - The after-effects that occur as indirect impacts of a natural event, sometimes on a longer timescale.



## Secondary Effects

- Avalanches and landslides were triggered by the quake, blocked roads restricting relief.
- At least nineteen people lost their lives on Mount Everest due to avalanches.
- 250 people were missing in the Langtang region due to an avalanche.
- The Kali Gandaki River was blocked by a landslide increasing the risk of flooding.



## Immediate Responses

- India and China provided over \$1 billion of international aid.
- Over 100 search and rescue responders, medics and disaster experts were provided by The UK, including 3 Chinook helicopter.
- Support from aid workers from charities such as the Red Cross came to help.
- Temporary housing was provided, including half a million tent, 'Tent city' set up in Kathmandu.



## Overview

- 📅 April 25<sup>th</sup> 2015
- 🕒 11.26 am
- 📍 60km northwest of Kathmandu
- ⚙️ Low income country
- 🌊 Magnitude 7.9
- 🏔️ Collision margin – Indian and Eurasian



## Long-term Responses

- \$3 million grant provided by The Asian Development Bank (ADB) for immediate relief efforts and up to \$200 million for the first phase of rehabilitation.
- Many countries donated aid. £73 million was donated by the UK (£23 million by the government and £50 million by the public).
- Stricter building codes were introduced.



read

# Natural Hazards

## HIC Case Study Chile Earthquake 2010



quiz



### The Big Picture



### Key Terms



**Immediate responses** - The reaction of people as the disaster happens and in the immediate aftermath.



**Long-term responses** - Later reactions that occur in the weeks, months and years after the event.



**Primary effects** - The initial impact of a natural event on people and property, caused directly by it.



**Secondary effects** - The after-effects that occur as indirect impacts of a natural event, sometimes on a longer timescale.



### Overview

- 📅 February 27<sup>th</sup> 2010
- 🕒 3.34 am
- 📍 Just off the coast of central Chile
- ⚙️ High income country
- 🌊 Magnitude 8.8
- 🏗️ Destructive margin – SA and Nazca plate



### Primary Effects

- 500 people died
- 12,000 people were injured
- 800,000 affected
- 220,000 homes damaged/destroyed along with 4500 schools, 56 hospitals and 53 ports.
- Power, water and communications were disrupted across Chile.
- Total damage estimated at US \$30 billion.



### Secondary Effects

- Tsunami waves devastated coastal towns.
- A fire at a Santiago chemical plant led to the local area being evacuated.
- The tsunami struck several Pacific countries; however, warnings prevented a loss of life.
- Landslides destroyed up to 1500 km of roads, cutting off remote communities for days.



### Immediate Responses

- Emergency services responded quickly.
- International support provided field hospitals, satellite phones and floating bridges.
- Within 24 hours, the north-south highway was temporarily repaired, allowing aid to be transported from Santiago.
- Within ten days, 90% of homes had had power and water restored.
- US\$60 million was raised after a national appeal, which funded 30,000 small shelters.



### Long-term Responses

- Chile's government launched a housing reconstruction plan just one month after the earthquake to help nearly affected 200,000 families.
- Chile's strong economy reduced the need for foreign aid to fund rebuilding.
- The recovery took over four years.



read

# Natural Hazards

## Typhoon Haiyan Case Study



quiz



### The Big Picture



### Key Terms



**Immediate responses** - The reaction of people as the disaster happens and in the immediate aftermath.



**Long-term responses** - Later reactions that occur in the weeks, months and years after the event.



**Primary effects** - The initial impact of a natural event on people and property, caused directly by it.



**Secondary effects** - The after-effects that occur as indirect impacts of a natural event, sometimes on a longer timescale.



### Overview

- 📅 November 8<sup>th</sup> 2013
- 🕒 04.40 am
- 📍 Philippines
- ⚙️ NEE
- 🏠 190 MPH
- 🌀 Category 5



Typhoon Haiyan, a category five typhoon, struck the Philippines on 8th November 2013 at 4.40 am. The tropical storm originated in the northwest Pacific Ocean. It is one of the most powerful typhoons to affect the Philippines. Wind speeds of 314 kilometres per hour (195 miles per hour) were recorded.



### Primary Effects

- 6190 people died
- 4.1 million people were made homeless
- 14.1 million people affected
- The overall cost of damage was around \$12 billion
- 1.1 million tonnes of crops destroyed
- 1.1 million houses damaged
- 1 million farmers and 600,000 hectares of farmland affected



### Secondary Effects

- Shortages of food, water and shelter led to outbreaks of disease.
- Survivors fought for food and supplies. Eight people died in a stampede for food supplies.
- Seawater, chemicals and sewerage contaminated surface and groundwater.
- An oil tanker ran aground, causing an 800,000-litre oil leak that contaminated fishing waters.



### Immediate Responses

- Eight hundred thousand people were evacuated following government warning.
- The government provided essential equipment and medical supplies.
- A curfew was introduced two days after the typhoon to reduce looting.
- 1200 centres set up to help the homeless.
- International governments and aid agencies provided food aid, water and shelters.
- Over \$1.5 billion of foreign aid was pledged.



### Long-term Responses

- Build Back Better, the government's response to the typhoon was launched in 2014, to upgrade damaged buildings to protect them from future disasters.
- Aid agencies such as Oxfam provided replacement fishing boats.
- Thousands of homes built away from areas at risk of flooding.



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# Natural Hazards



quiz

## Somerset Levels Flood

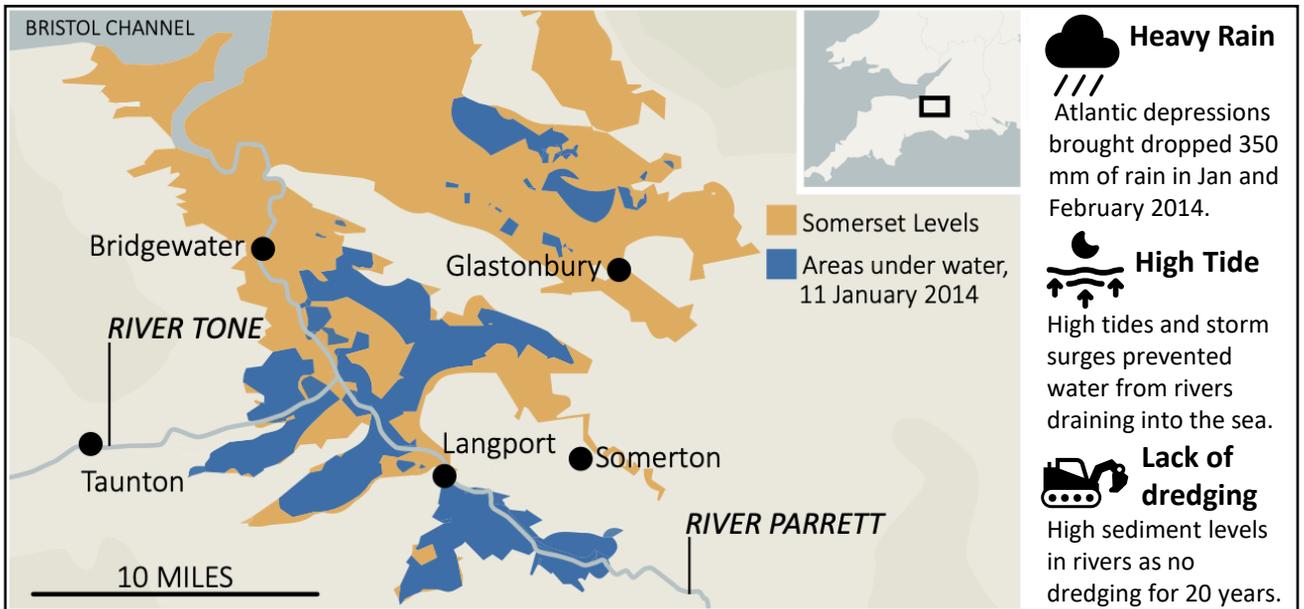


### The Big Picture



### Background

A quick succession of prolonged Atlantic storms, with persistent rainfall and gale-force winds, was the primary cause of flooding. The rivers could not cope with the significant amount of rain that fell. Additionally, high tides in the Bristol Channel and its narrowing created tidal surges.



### Social Impacts

- More than 600 homes flooded.
- Sixteen farms evacuated.
- Residents required temporary accommodation for several months.
- Some villages were cut off.
- Power supplies were disrupted.



### Environmental Impacts

- River water was contaminated with sewage, oils and chemicals.
- A large volume of debris was deposited across the Somerset Levels.
- Stagnant water had to be reoxygenated then pumped back into rivers.



### Economic Impacts

- Over 14,000 hectares of agricultural land flooded for months.
- Over 1,000 livestock had to be evacuated from farms.
- Roads were cut off.
- Railway lines were closed.
- It is estimated the flooding caused £10 million of damage.



### Management

- River banks have been raised and straightened.
- £20 million was pledged on a flood action plan by Somerset County Council.
- Dredging occurred on the River Tone and Parratt in March 2014.
- Road levels have been raised.
- Flood defences have been constructed for communities at risk.
- Pumping stations have been constructed.

## Natural hazards.

1. Define the term Natural hazard (2)
2. Name 3 types of natural hazard (3)
3. Explain 2 factors that can lead to an increase in hazard risk (4)

### **Tectonic hazards**

4. Draw and label a diagram of the earth's structure showing the main layers (4)
5. Define a tectonic plate (2)
6. Describe the distribution of earthquakes (3)
7. Describe the distribution of volcanoes (3)
8. Contrast oceanic and continental crust (4)
9. Explain why plates move (4)
10. Explain why most earthquakes occur at plate margins (4)
11. Explain why most volcanoes occur at plate margins (4)
12. With the help of an annotated diagram(s) explain the processes taking place at a constructive plate margin (6)
13. With the help of an annotated diagram(s) explain the processes taking place at a destructive plate margin (6)
14. With the help of an annotated diagram(s) explain the processes taking place at a conservative plate margin (6)
15. Describe the direction in which plates move at a (conservative/constructive/destructive) plate margins (3)
16. What are the primary and secondary effects of a tectonic hazard? (4)
17. Assess the extent to which primary effects are more significant than secondary effects (9)
18. Explain how different levels of wealth and development have affected the impact of 2 contrasting earthquakes that you have studied (9)
19. Explain the differences between immediate and long term responses (4)
20. Using examples, you have studied (one HIC, one LIC), compare the effectiveness of immediate responses (9)
21. Using examples, you have studied (in contrasting areas), compare the effectiveness of Long term responses (9)
22. Are earthquakes more devastating in HIC's or LIC's, justify your answer (9)
23. Describe how management can reduce the effects of tectonic hazards (6)
24. Why do people continue to live in areas at risk from tectonic hazards? (4)

## Weather hazards

1. Define; General atmospheric circulation model: pressure belts and surface winds.(2 per definition)
2. How does the Global atmospheric circulation model lead to high and low pressure bands? (6)
3. How does the Global atmospheric circulation model effect the weather in the UK? (4)
4. How does the Global atmospheric circulation model effect the weather in the tropics? (4)
5. Explain why arid (dry) environments can be found in many different places including the tropics and the poles (6)
6. Define the term tropical storm (2)
7. Describe the Global distribution of tropical storms (3)
8. Describe the regions of the world where you'd expect people to be most vulnerable to tropical storms (4)
9. Describe the relationships between tropical storms and general atmospheric circulation. (6)
10. Why does a tropical storm spin? (2)
11. Explain the Causes of tropical storms and the sequence of their formation and development. (6)
12. What can cause tropical storms to lose strength? (2)
13. Draw and label diagram to show the structure and features of a tropical storm (4)
14. Explain how climate change might affect the distribution, frequency and intensity of tropical storms. You should name examples in your answer. (9)
15. Describe the difference between a Primary and secondary effect (2)
16. Describe the difference between Immediate and long-term responses (2)
17. Why are Immediate and long-term responses necessary after a tropical storm? (4)
18. Compare responses between a LIC and HIC (4)
19. To what extent are the primary effects more significant than the secondary effects? Use a named example of a tropical storm in your answer (9)
20. Suggest 3 reasons why tropical storms can cause more damage than others (3)
21. Use a **named example** of a tropical storm to describe the effects (6)
22. Use a **named example** of a tropical storm to describe the responses (6)
23. Describe the scale used to categorise tropical storms (4)
24. Evaluate the effectiveness of monitoring, prediction, protection and planning in reducing the effects of tropical storms (9)
25. Explain how a countries level of development can affect its responses to tropical storms (9)
26. Describe the types of weather hazard experienced in the UK. (4)

## Climate change

1. Describe the Evidence for climate change from the beginning of the Quaternary period to the present day (6)
2. When was the Quaternary period? (2)
3. What are the glacial and interglacial periods? (4)
4. If there were no human effects on climate, how would you expect the change over the next several thousand years? Justify your thinking (6)
5. Describe the natural causes of climate change – (orbital changes, volcanic activity and solar output) (6)
6. Describe the human factors of climate change – (use of fossil fuels, agriculture and deforestation.) (6)
7. To what extent do you think natural causes are in explaining climate change? (9)
8. Discuss the effects of climate change on people and the environment (6)
9. Draw an label a diagram to help explain the greenhouse effect (6)
10. Distinguish between mitigation and adaptation (4)
11. Discuss how mitigation – (alternative energy production, carbon capture, planting trees, international agreements) can be used to manage climate change (9)
12. Discuss how adaptation – (change in agricultural systems, managing water supply, reducing risk from rising sea levels.) can be used to manage climate change (9)

# Paper 1 - The Living World



A named example of a small scale ecosystem

## Lymm Dam – Lymm, Cheshire

### The freshwater pond ecosystem consists of:

*Pond bottom* - very little oxygen or light at the bottom of the pond. **Decomposers** and scavengers feed on dead material, eg water worms and rat-tailed maggots.

*Mid water* - fish are the main **predators** here. Food is found on the pond bottom or the pond surface. Animals breathe through their skin or gills, eg stickleback fish, water fleas and dragonfly nymphs.

*Pond surface* - animals breathe through their gills, skin or lungs. There is plenty of oxygen and light here. Animals found here include ducks, water boatmen, midge larvae and tadpoles.

*Pond margin* - plants provide a sheltered habitat for insects and small animals such as frogs. There is lots of light and oxygen so plants such as marsh marigold thrive.

*Above the pond surface* - birds such as kingfishers and insects like dragonflies are common.

### Changes to ecosystems

Natural factors include:

- Drought / flood / fire / disease

Human management include:

- introducing more fish (fish stocking)
- altering the drainage of the land which may influence the amount of water
- changing the pH level of the water
- altering the nutrient levels of the water if fertilisers are leached into the water resulting in eutrophication ('Hypernutrition' resulting from fertiliser pollution of aquatic ecosystems).

**Lack of maintenance:** accumulation of silt and growth of vegetation. Excellent habitat for birds, but impressive view of the lake from the house was lost.

### Change within the pond ecosystem

If more fish were added to the ecosystem, they would eat more great diving beetle. This would reduce the great diving beetle. This would mean there would be an increase of midge larva. There would also be more food available for the heron.



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# THE LIVING WORLD

## Malaysia Rainforest Case Study



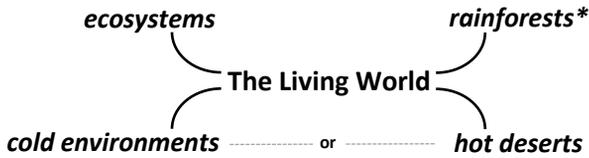
causes



effects

quizzes

### The Big Picture



### Background

- Malaysia is in southeast Asia.

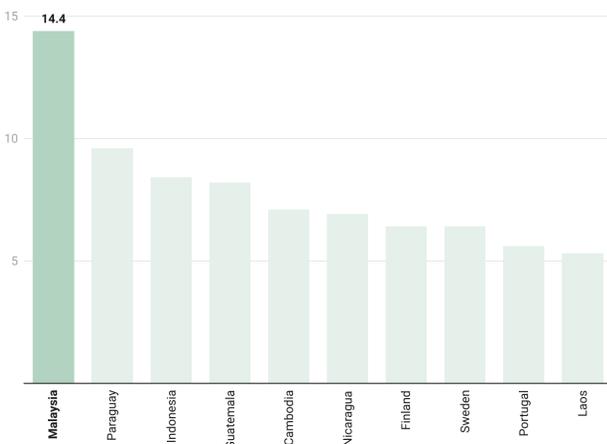


- At 192,838 km<sup>2</sup>, the Malaysian rainforest is the 24th largest in the world.

### Deforestation Rates

- Between 2000 and 2012 Malaysia had the highest deforestation rate in the world (by % area), losing 14.4% of its forest cover.

Percentage Forest Loss 2000 - 2012



- The rate of deforestation fluctuated between 2012 and 2015.
- It steadily declined between 2016 and 2020.
- Between 2001 and 2021 17% of rainforest cover was lost.

### Causes of Deforestation

- Agriculture** – Malaysia is the second-largest producer of palm oil in the world.
- Logging** – Hard wood (mahogany & teak) valued for furniture. Small trees pulped/charcoal.
- Road building** – Increased accessibility encourages development e.g. in Sarawak.
- Mineral extraction** – Bauxite mined in Peninsular Malaysia. Oil and Gas in Borneo.
- Energy development** – High rainfall creates ideal conditions for HEP e.g. Bakun Dam, Sarawak.
- Settlement and population growth** – Transmigration Policy – 15000 ha rainforest cleared.

### Impacts of Deforestation

- Economic Development**
  - Raw materials used by processing industries increasing the value of exported products.
  - Commercial farming and mining generate employment and tax income.
  - Cheap, renewable energy = development.
  - Loss of biodiversity affects tourism.
  - Long-term economic losses due to forests being destroyed and rivers polluted.
- Social Impacts**
  - Education, health care and social conditions are improved from tax revenue.
  - Decline in indigenous tribes e.g. Orang Asli.
- Environmental Impact**
  - Exposed land increases soil erosion
  - Decline in biodiversity
- Climate Change**
  - Local environment becomes hotter and drier.
  - Reduction in carbon sink due to deforestation.

### Sustainable Management





causes



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# THE LIVING WORLD

## Amazon Rainforest Case Study



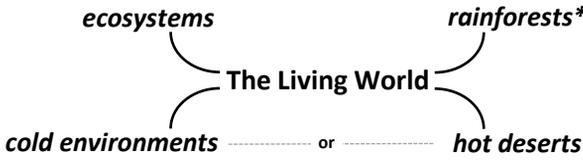
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### The Big Picture



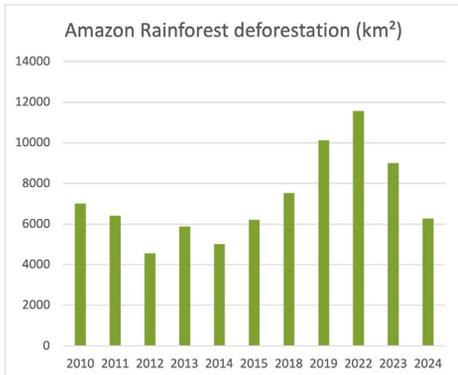
### Background

- The Amazon is located in South America.



- Covering 5.5 million km<sup>2</sup>, it is the largest in the world, accounting for 40% of the world's remaining tropical rainforest.

### Deforestation Rates



- Between 2010 and 2012 deforestation in the Amazon fell from around 7,000 km<sup>2</sup> to 4,571 km<sup>2</sup>.
- Rates rose again between 2012 and 2015.
- Deforestation then increased sharply, peaking at over 11,500 km<sup>2</sup> in 2022.
- It declined after 2022, falling to around 6,288 km<sup>2</sup> in the 12 months to July 2024.

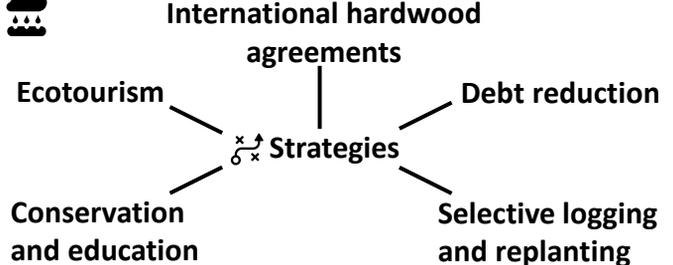
### Causes of Deforestation

- Agriculture** – Around 80% of deforestation caused by cattle ranching.
- Logging** – Hard wood (mahogany & teak) valued for furniture. Small trees pulped/charcoal.
- Road building** – Increased accessibility increases development e.g. Trans Amazon Highway
- Mineral extraction** – Gold, iron ore & bauxite. Mining ↑ 10K ha (1999) to 50K ha (2016) (e.g. Carajás)
- Energy development** – High rainfall creates ideal conditions for HEP e.g. Belo Monte, Brazil.
- Settlement and population growth** – Manaus expands (1.4 to 2M) for housing, roads and services.

### Impacts of Deforestation

- Economic Development**
  - Raw materials support processing industries and increase export value e.g. beef.
  - Commercial farming and mining generate employment and tax income.
  - HEP (e.g. Belo Monte Dam) = cheap energy.
  - Loss of biodiversity reduces potential for ecotourism and new medicines.
  - Long term loss - ↓ soil fertility and rivers polluted.
- Social Impacts**
  - Education, health care and social conditions are improved from tax revenue.
  - Decline in indigenous tribes e.g. Kayapo.
- Environmental Impact**
  - Exposed land increases soil erosion
  - Decline in biodiversity (approx. 137 species/day)
- Climate Change**
  - Local environment becomes hotter and drier.
  - Reduction in carbon sink due to deforestation.

### Sustainable Management





read

# THE LIVING WORLD

## Thar Desert



quiz



### The Big Picture



### Location



### About

The Thar Desert, also known as the Great Indian Desert, is located in north-west India and stretches into Pakistan. It covers 200,000 square kilometres and is the most densely populated desert in the world. The desert forms a natural boundary between India and Pakistan.



### Opportunities

 **Mineral resources** – Many minerals are extracted from the ground in the Thar Desert including limestone, marble, phosphorite, feldspar and gypsum. Oil discovered in Barmer.

 **Renewable energy** – At Jaisalmer, 75 wind turbines are generating 60MW of electricity. Solar energy is being used in Bhaleri to power water treatment works.



**Tourism** – Tourism in the Thar Desert has increased recently, mainly from Pakistan. Desert safaris are popular as is ecotourism including camel treks to visit oases.



**Farming** – Most farming is subsistence including rearing animals, growing crops and foraging fruit and berries. Indira Gandhi canal = irrigation of 3500km for commercial farming.



### Challenges

 **Water** – Precipitation levels are in the Thar Desert are very low, between 120-240mm, and evaporation rates are high. Water stored in tobas (natural ponds) in remote areas.

 **Inaccessibility** – Covering 200,000km<sup>2</sup>, The Thar Desert is vast. Despite having the highest desert population density in the world, it has a limited road network.



**Temperature** – The average temperature is 27°C. Temperatures can exceed 50°C in the Thar Desert which makes it very challenging to for people, such as farmers, to work outside. High temperatures lead to rapid evaporation and a shortage of water.



### Key Terms



**Ecotourism** – Travel that conserves the environment and benefits locals.



**Inaccessibility** – Very difficult to travel or impossible to travel to or reach.



**Irrigation** – Applying controlled amounts of water to crops.



**Non-renewable energy** – Energy from sources that will run out e.g. oil.



**Population density** – a measurement of the number of people in an area.



**Renewable energy** – Energy from sources that will eventually run out e.g. solar.



read

# THE LIVING WORLD

## Sahara Desert

quiz



### The Big Picture



### Location



### About

The Sahara desert is the largest hot desert on Earth. It stretches across many countries in north Africa including Egypt, Tunisia, Algeria and Morocco covering an area almost the size of the United States of America. The Sahara has one of the lowest population densities on Earth.



### Opportunities

**Mineral resources** – There are significant mineral resources in the Sahara including phosphate in Morocco, oil in Algeria, and gas in Egypt and Algeria.

**Solar energy** – The Sahara provides ideal conditions for generating solar energy with 12 hrs of sunshine every day. The Noor solar farm in Morocco will be the world's largest.



**Tourism** – Many people are fascinated by holidaying in extreme environments. Sand-boarding, cross-desert treks and carting a popular attractions on the edge of the Sahara.



**Farming** – Commercial farming is limited to areas where there is enough irrigation water. The Aswan Dam provides water for Egyptian farmers.



### Challenges

**Water**– It is difficult to meet the growing demand for water for irrigation and industry. Extraction from boreholes is not sustainable as aquifers take 1000s of years to fill.

**Inaccessibility** – The Sahara covers a vast area. Often, air has to be used to transport people and materials which is very expensive.



**Temperature** – High temperatures in the Sahara present a threat to human life. With daily temperatures often higher than 40°C exposure to this kind of heat leads to death or illness. In addition to this healthcare may be a long distance away. The hot season is too warm for tourists so tourism is seasonal.



### Key Terms



**Ecotourism** – Travel that conserves the environment and benefits locals.



**Inaccessibility** – Very difficult to travel or impossible to travel to or reach.



**Irrigation** – Applying controlled amounts of water to crops.



**Non-renewable energy** – Energy from sources that will run out e.g. oil.



**Population density** – a measurement of the number of people in an area.



**Renewable energy** – Energy from sources that will eventually run out e.g. solar.

## The living world.

1. Use an **example** of a small-scale UK ecosystem to illustrate the concept of interrelationships within a natural system. (6)
2. Define the term ecosystem (2)
3. Define the following terms; producer, consumers, decomposers, food chain, food web. (2 per definition)
4. Use an example to outline the main features of a nutrient cycle (6)
5. Suggest how one part of a nutrient cycle can affect another (6)
6. What is the difference between a food chain and food web? (2)
7. Using a named example, explain how change can have short term and long-term effects (6)
8. Describe the distribution of rainforests (3)
9. Describe the distribution of deserts (3)

### **Tropical rainforests**

1. Describe the climate of a tropical rainforest (3)
2. Describe and explain the main adaptations of plants/animals in a rainforest (6)
3. Describe the characteristics of the rainforest nutrient cycle (6)
4. What is biodiversity? (2)
5. Suggest reasons why biodiversity is so high in a tropical rainforest (4)
6. Describe the characteristics of the rainforest soil (latosol) (3)
7. What is interdependence? (2)
8. Give an example of an interdependent relationship in the tropical rainforest ecosystem (2)
9. Explain the interdependence between climate, soil and plants (6)
10. Explain how humans can impact upon interdependence within the rainforest ecosystem (6)
11. Describe how deforestation rates have changed over time (2)
12. Using a case study, explain the causes of deforestation (subsistence and commercial farming, logging, road building, mineral extraction, energy development, settlement, population growth) (9)
13. Give examples of wasteful use of the rainforest and its land (6)
14. Using a case study, which of the following impacts of deforestation (economic development, soil erosion, contribution to climate change) are the most damaging. You should refer to a case study in your answer (9)
15. "The rainforest is more valuable when left intact than when destroyed". Use a case study to support or challenge this view (9)
16. Discuss the main strategies used to manage the rainforest sustainably – (selective logging and replanting, conservation and education, ecotourism and international agreements about the use of tropical hardwoods, debt reduction) (9)
17. Describe and explain 2 benefits of international cooperation in sustainably managing tropical rainforests (9)

## Hot deserts

1. Describe the climate of a hot desert (3)
2. Describe and explain the main adaptations of plants/animals in a hot desert (6)
3. Describe the characteristics of the desert nutrient cycle (6)
4. What is biodiversity? (2)
5. Suggest reasons why biodiversity is so low in a hot desert (4)
6. Describe the characteristics of the hot desert soil (4)
7. What is interdependence? (2)
8. Give an example of an interdependent relationship in the hot desert ecosystem (6)
9. Using a case study discuss the development opportunities in hot desert environments: (mineral extraction, energy, farming, tourism) (9)
10. Using a case study discuss the challenges in hot desert environments: (extreme temperatures, water supply, inaccessibility.) (9)
11. "The environmental impacts of all human activity in hot deserts outweigh the economic benefits they bring". To what extent do you agree with this statement (9)
12. Explain the causes of desertification – (climate change, population growth, removal of fuel wood, overgrazing, over-cultivation and soil erosion.) (9)
13. Desertification is largely caused by poor land management. Use evidence to discuss this statement (9)
14. Discuss the strategies used to reduce the risk of desertification – (water and soil management, tree planting and use of appropriate technology.) (9)

# Paper 1 - Physical Landscapes in the UK





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# Coastal Landscapes



quiz

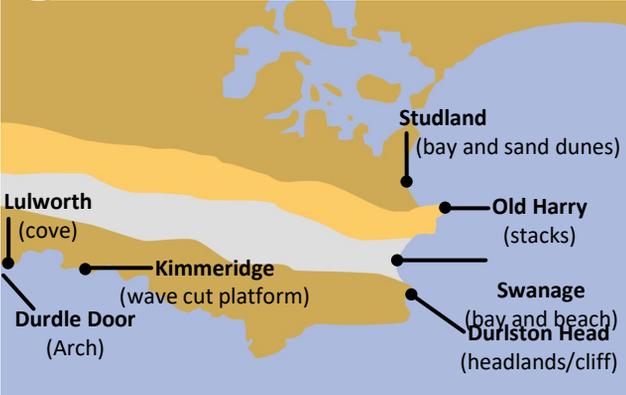
## Dorset Coast



### The Big Picture



### The Dorset Coast



The Dorset Coast, located in the south of England on the English Channel, runs from Lyme Regis in the west, past Old Harry Rocks in Purbeck to Highcliffe in the east. Excluding the shoreline of Poole Harbour, the Dorset coastline is 142 kilometres (88 mi) long. Through its geology and landforms the coast represents 185 million years of the Earth's history.



### Durdle Door



Durdle Door is a coastal arch. It is formed from a layer of hard limestone standing almost vertically out of the sea. As the sea broke through the hard limestone it eroded the softer rocks behind creating the arch.



### Studland



Studland Bay is sheltered from erosive waves, leading to the formation of sandy beaches and sand dunes.



### Old Harry



Old Harry Rocks are three chalk formations, including a stack and a stump, located at Handfast Point.



### Lulworth Cove



Lulworth Cove is situated on a concordant coastline. The entrance to the cove is narrow where the waves have cut through weaknesses in the resistant limestone. The cove widens where the softer clays have been eroded.

## A named example of coastal management

### Holderness, East Yorkshire, UK

<b>Background Information</b>	<p>The Holderness Coastline is in the North of England (where we did our fieldwork) and runs between the Humber Estuary in the south and a headland at Flamborough Head. It has a large array of coastal features including:</p> <ul style="list-style-type: none"><li>• A headland with caves, stacks and stumps at Flamborough Head</li><li>• Beaches along the whole coastline</li><li>• The deposition of sediment along the spit at Spurn Head</li></ul> <p>It is the number one place in Europe for coastal erosion. It is one of the fastest eroding coastlines in Europe as a result of its geology</p>
<b>Issues</b>	<ul style="list-style-type: none"><li>• The geology runs in bands, with a chalk layer at Flamborough in the North, Boulder clay or till (from the last ice age) south of that</li><li>• Because the clay is an unconsolidated WEAK it erodes more rapidly than the more resistant rock of chalk in the north.</li><li>• The processes of erosion and weathering occurring are numerous but include hydraulic action, freeze thaw, abrasion, solution and carbonation (on the clay) ☒ This has left a bay where the clay is and a headland jutting out to sea at Flamborough head.</li><li>• Indeed, today, farmland, tourist sites such as caravan parks and villages remain under threat. The weak clay, stormy nature of the North Sea, and rising sea levels of 4mm per year mean that the future is bleak for parts of this coastline. ☒ In addition to the clay being vulnerable to erosion, it is also prone to slumping. This is because water enters cracks and pore spaces in the rock, adding weight and making it slump.</li></ul>
<b>Management</b>	<p><u>Holderness Management Strategy</u></p> <p>Over 11km of the Holderness coast has been managed.</p> <p>Mablethorpe had 2 groynes and rock armour built in 1991. They are made of 61,000 tonnes of rocks at a cost of £2 million. This was done to protect the village and the B1242 coastal road from erosion &amp; flooding.</p> <p>Easington- 25% of UK gas gets processed here so the area is heavily defended with sea wall, rock armour.</p> <p>Hornsea is protected from erosion and flooding by a 4.7km long sea wall plus groynes.</p> <p>Withernsea has groynes to create wider beaches and a sea wall. Rock armour was placed in front of the wall after it was damaged in storms in 1992. ☒</p>
<b>Outcomes</b>	<ul style="list-style-type: none"><li>✓ New beaches have increased visitor numbers and seafront businesses are thriving</li><li>✓ New defences have stood up to recent stormy winters.</li><li>✓ Harbour is now better protected, benefitting boat owners and fishermen.</li><li>✗ Increased visitor numbers have led to conflict – traffic congestion and littering.</li><li>✗ Some people think new defences have spoilt the natural coastal landscape.</li><li>✗ New sea wall may interfere with coastal processes and affect neighbouring stretches of coastline, causing conflict elsewhere – ‘starves’ other beaches of material.</li><li>✗ Landslips reveal important fossils – stabilising cliffs may prevent this from occurring.</li></ul>



# Coastal Landscapes

## Withernsea – Coastal Management



read

quiz



### The Big Picture



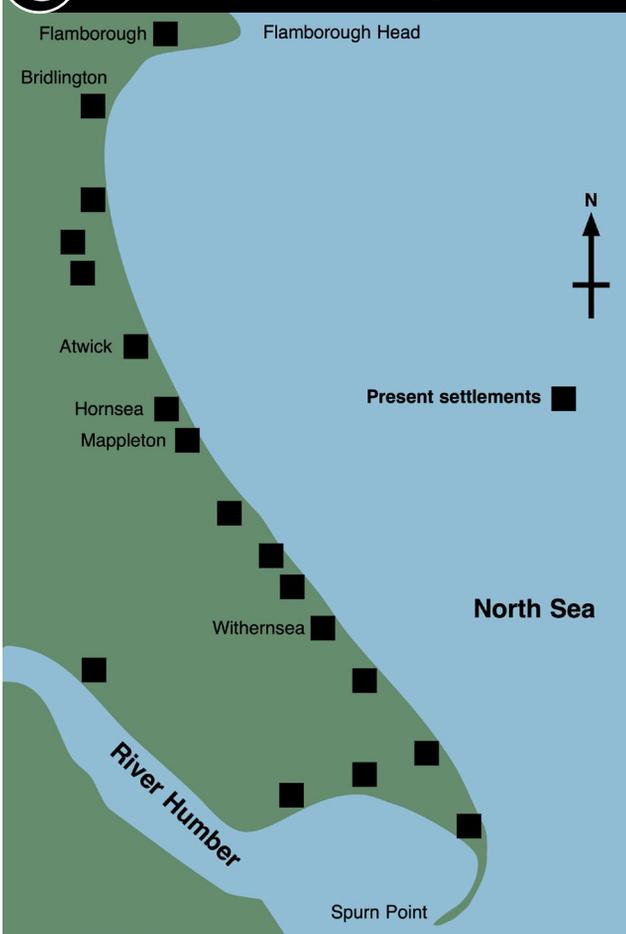
### Management Strategy



Coastal defences were built at Withernsea during the 1870s. Nine extensions have followed. Timber groynes were replaced and the sea wall strengthened in 2017/18. Rock armour was extended 500m south of Withernsea in 2020. The current coastal management plan is to hold the line at Withernsea.



### Reason for Management

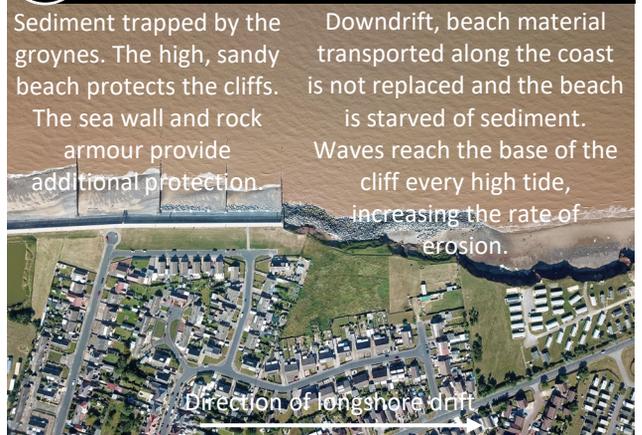


Withernsea is a seaside resort town on the Holderness Coast, situated 10 miles (16 km) north of Spurn Point and 17 miles south of Hornsea where the B1242 meets the A1033. The town requires coastal management because:

- It is a high-density urban development containing residential and various tourist related properties with a population of 6000.
- It lies on soft boulder clay which is susceptible to rapid erosion.
- Withernsea's local economy is dependent on tourism and recreation.



### Effects and Conflicts



Coastal management has been effective in stopping erosion along the sea front at Withernsea. However, it has increased the rate of erosion downdrift of the defences.



#### Conflict

- The increased rate of erosion downdrift of the defences has led to the loss of caravan pitches.
- Increased erosion has led to the loss of farm land downdrift of the defences.



read

# River Landscapes

## The River Tees



quiz



### The Big Picture

*river valleys and processes*

*river landforms\**

River Landscapes

*river management*

*case study\**



### River Tees - Location

The River Tees is located in the north east of England. It's source is high in the Pennine Hills near Cross Fell. It flows east 128km to the North Sea near Middlesborough.



### Key Terms



**Flood plain** – The flat area forming the valley floor either side of a river.



**Gorge** – a narrow, steep sided valley, often formed as a waterfall retreats.



**Levée** – An embankment of sediment along a river caused by flooding.



**Meander** – One of a series of bends in a river.



**Waterfall** – A sudden descent of a river or stream over a vertical or very steep slope in its bed.



### River Landforms on the River Tees



#### High Force

Waterfall and gorge

The River Tees drops around 20m into a plunge pool at High Force. The river then flows through the gorge it has formed as it retreats. Resistant dolerite, an igneous rock lies on top of less resistant limestone.

As the river plunges over the waterfall it undercuts the weaker limestone to form an overhang. This eventually collapses forming the gorge as the waterfall retreats.



#### Yarm

Meanders, levees and floodplains

In its lower course, the River Tees has extensive meanders, particularly between Darlington and Yarm. The meandering river has widened the river valley to create a significant floodplain.

There are also levees along this stretch of the River Tees that have formed when this low-lying area has experienced flooding in the past.

www.internetgeography.net

North Sea

Cross Fell

High Force

Barnard Castle

Cow Green Reservoir

Darlington

Yarm

Middlesborough

- upper course
- middle course
- lower course



## A named example of river features

### River Clyde, UK

<b>Background Information</b>	<p>The River Clyde is about 160km long and flows through Scotland. Its source is in the Southern Uplands region of Scotland and the mouth is an estuary on the west coast of Scotland.</p>
<b>Upper course</b>	<p><u>Features of erosion</u></p> <p>Waterfalls and gorges</p> <p>The Falls of Clyde are 4 waterfalls near Lanark. The highest fall is Corra Linn (27m). A gorge has formed by the waterfalls retreating.</p> <p>Interlocking spurs</p> <p>Examples are found at Crawford. The spurs are between 300 and 500m high. □</p>
<b>Middle course</b>	<p>Meanders and ox-bow lakes</p> <p>The river meanders between Motherwell and Glasgow. An ox-bow lake is starting to form from a meander in the New Lanark area.</p>
<b>Lower course</b>	<p><u>Features of deposition</u></p> <p>Flood plain</p> <p>Glasgow is built on the floodplain of the River Clyde. The land is about 5m above sea level on either side of the river.</p> <p>Estuary</p> <p>This is located about 34km west of Glasgow and is 3km wide. Mudflats are exposed next to the river channel at low tide.</p>



read

# Natural Hazards



quiz

## Somerset Levels Flood

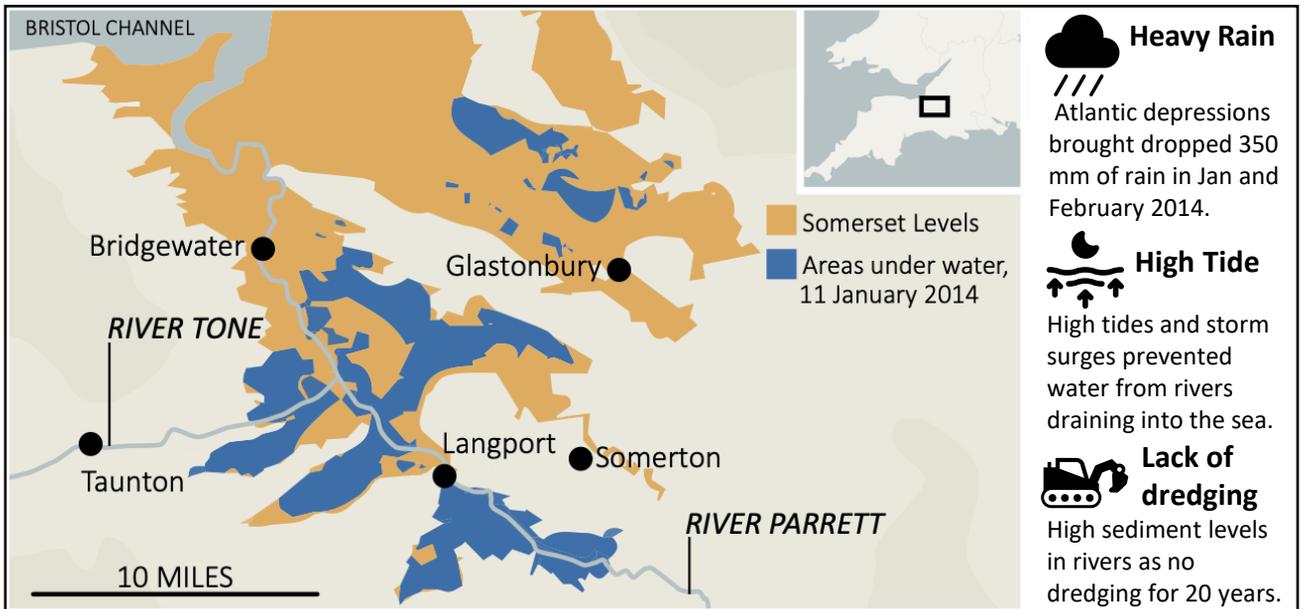


### The Big Picture



### Background

A quick succession of prolonged Atlantic storms, with persistent rainfall and gale-force winds, was the primary cause of flooding. The rivers could not cope with the significant amount of rain that fell. Additionally, high tides in the Bristol Channel and its narrowing created tidal surges.



### Social Impacts

- More than 600 homes flooded.
- Sixteen farms evacuated.
- Residents required temporary accommodation for several months.
- Some villages were cut off.
- Power supplies were disrupted.



### Environmental Impacts

- River water was contaminated with sewage, oils and chemicals.
- A large volume of debris was deposited across the Somerset Levels.
- Stagnant water had to be reoxygenated then pumped back into rivers.



### Economic Impacts

- Over 14,000 hectares of agricultural land flooded for months.
- Over 1,000 livestock had to be evacuated from farms.
- Roads were cut off.
- Railway lines were closed.
- It is estimated the flooding caused £10 million of damage.



### Management

- River banks have been raised and straightened.
- £20 million was pledged on a flood action plan by Somerset County Council.
- Dredging occurred on the River Tone and Parratt in March 2014.
- Road levels have been raised.
- Flood defences have been constructed for communities at risk.
- Pumping stations have been constructed.

## Physical landscapes in the UK.

1. Name four major upland areas in the UK (4)

### Coastal landscapes

1. Distinguish between constructive and destructive waves (4)
2. Explain the main weathering processes at the coast – (mechanical, chemical) (4)
3. Explain the difference between the 3 forms of mass movement – sliding, slumping and rock falls (6)
4. Explain how the sea erodes the land – hydraulic power, abrasion and attrition (6)
5. Explain how the sea transports material – longshore drift (4)
6. Explain why deposition happens at the coast (4)
7. Explain the factors that affect the rate of erosion at the coast (6)
8. Explain the factors that affect mass movement? (6)
9. How can geological structure and rock type influence coastal forms? (6)
10. Describe the characteristics of landforms resulting from erosion – headlands and bays, cliffs and wave cut platforms, caves, arches and stacks. (2 per landform)
11. Explain the formation of landforms resulting from erosion – headlands and bays, cliffs and wave cut platforms, caves, arches and stacks (4 per landform)
12. Describe the Characteristics of landforms resulting from deposition – beaches, sand dunes, spits and bars.(2 per landform)
13. Explain the formation of landforms resulting from deposition – beaches, sand dunes, spits and bars. (4 per landform)
14. Use a section of a named coastline to illustrate the erosive power of the sea (6)
15. Discuss the costs and benefits of hard engineering – sea walls, rock armour, gabions and groynes (9)
16. Discuss the costs and benefits of soft engineering – beach nourishment and reprofiling, dune regeneration (6)
17. Explain the strategy; managed retreat – coastal realignment (6)
18. Using a named **example** of a coastal management scheme in the UK, discuss
  - the reasons for management
  - the management strategy
  - the resulting effects and conflicts. (6)
19. “No human actions at the coast can stop the natural processes of erosion from taking place now and even more so in the future” To what extent do you agree with this statement (6)

## River landscapes in the UK

1. Describe how the shape of the river valley changes downstream (3)
  2. Describe the long profile of a river (3)
  3. Explain how a river erodes the land- hydraulic action, abrasion, attrition, solution, vertical and lateral erosion (2 per erosion type)
  4. Explain how a river transports material – traction, saltation, suspension and solution (2 per transportation type)
  5. Explain how and why a river deposits material (4)
  6. Describe and explain landforms resulting from erosion – interlocking spurs, waterfalls and gorges (6)
  7. Describe and explain landforms resulting from erosion and deposition – meanders and ox-bow lakes (6)
  8. Describe and explain landforms resulting from deposition – levées, flood plains and estuaries (6)
  9. Name an **example** of a river valley in the UK and identify its major landforms of erosion and deposition (6)
  10. Discuss how physical and human factors affect the flood risk – precipitation, geology, relief and land use (9)
  11. Explain how; precipitation, geology, relief and land use can affect the shape of a flood hydrograph (6)
  12. The costs and benefits of the following management strategies:
    - hard engineering – dams and reservoirs, straightening, embankments, flood relief channels
    - soft engineering – flood warnings and preparation, flood plain zoning, planting trees and river restoration. (9)
  13. Use a named **example** of a flood management scheme in the UK to show:
    - why the scheme was required
    - the management strategy
    - the social, economic and environmental issues. (9)
- 
1. Describe how the shape of a river valley changes downstream. (4 marks)
  2. Explain why a waterfall is only a temporary feature on a river's course. (4 marks)
  3. To what extent does the River Tees illustrate the features normally associated with a river's course from its source to its mouth. (6 marks)
  4. 'River flooding is a natural phenomenon.' To what extent do you consider this statement to be correct? (6 marks)
  5. To what extent are hard engineering schemes sustainable? (6 marks)
  6. Using an example of one soft engineering river flood management strategy to show how it has a limited effect on the environment. (4 marks)

# Paper 2 – Urban Issues and Challenges



## A case study of a major city in an LIC or NEE

### Mumbai

#### Background Information

**Location:** India is in south Asia. Mumbai is a coastal city situated in the west of India in the state of Maharashtra. It is the most populated city in the country (22 million 2017). The average earnings are £1250 per year. It is growing at a rate of 1.8% per year. Mumbai is a megacity with a population of more than 10 million people.

#### Importance:

- Regional – It is the capital city of Maharashtra state
- National – Nheva Sheva, India's largest container port handles 60% of all Indian sea trade
- International – Home to world famous Bollywood film industry

Why has urbanisation taken place here? Rural to urban migration.

Rural to Urban Migration. Millions of people have migrated from within Maharashtra state (70%) e.g. rural area of Mahad Taluka that have suffered from drought (7 months without rain), lack of services (few doctors) and unemployment. People do this to search for a better quality of life. Migration averages 1 per min.

Better access to healthcare. This means death rates are falling but more people are still arriving in the city.

This expanding population has resulted in the rapid urbanisation of Mumbai

#### City challenges and opportunities

#### Challenges

#### Opportunities

**Social:** There is a severe shortage of housing, schools and healthcare centres available. Large scale social inequality, is creating tensions between the rich and poor. Increase in diseases such as cholera. Rise in crime.

**Economic:** The rise of informal jobs e.g. making clay pots, with low pay and no tax contributions. There is high unemployment in squatter settlements e.g. Dharavi

**Environmental:** Traffic congestion is high and air pollution bad. Water availability is limited with vendors selling water from carts. Litter is a serious issue especially in Dharavi. Rise in informal squatter settlements.

**Social:** Standards of living are gradually improving. Healthcare, and education are some of the best in India. Excellent universities Good leisure facilities. Emerging middle income society. 1000 free schools, 89% literacy rates.

**Economic:** Employment opportunities good e.g. TNC's – Tata steel, Glaxo, Disney, VW. Mumbai has one of the highest incomes per person in the country. IT graduates can earn £5000 pa. The city has various types of employment including finance, film industry

Informal employment throughout city.

**Health:** Access to health centres, most slum properties have access to clean water.

An example of urban planning (LIC or NEE)

## Urban Renewal in Mumbai

**Background Information**

The Indian and Mumbai authorities want to improve standards of living in Mumbai. They want to project Mumbai as an affluent, desirable global city in order to encourage further investment from TNCs. They also want to get their hands on the land that Dharavi is built on as its worth billions of dollars.

**Improvements**

**Slum sanitation:** Dharavi – reduction from 500 people per toilet because 300 community toilet blocks with separate M/F.

**Electrification project:** 10.000 slum dwellers with new/upgraded electricity.

**Education and crime:** Community programmes to increase the number of girls remaining in school. Providing them with valid ID cards and used plays/campaigns to encourage girls to control their own destiny. In addition, a drive to report physical/verbal abuse so reduced crime.

**Vision Mumbai:** Aims to improve the quality of life for people in Mumbai Slums like Dharavi. Vision Mumbai plans to demolish Dharavi's buildings and sell the land to developers. Developers will get the land cheaply but must build 1.1 million better quality homes. These will be high-rise blocks in order to squeeze them into a smaller space. The plan will reduce slum housing by 90% and improve sanitation. The extra land will be used to build shopping malls and high-class, expensive apartments in order to cater for the wealthier residents of Mumbai.

**Has it been a success or failure? (evaluate)**

**Advantages**

- Improved sanitation
- Improved clean water access
- Reduced disease
- Education improved
- Healthcare benefits
- Employment during construction
- Land sold to government for \$10 billion

**Disadvantages**

- Not all residents will get a new home – only those on ground floor
- Land sold relatively cheap
- Communities broken up
- People forced to leave their homes
- Jobs in small workshops and businesses will disappear
- Takes a long time to complete due to global economic crisis



# Urban Issues and Challenges

## Social and Economic Opportunities of Urban Growth in Rio



read

quiz



### The Big Picture



### Key Terms



**Social opportunities** – Chances for people to improve their quality of life e.g. access to healthcare and education.



**Economic opportunities** – providing an equal chance for people to earn a living wage.



### Social Opportunities



**Health Care** – Rio de Janeiro offers better healthcare access than rural areas, with 3.44 doctors per 1,000 people compared to Brazil's average of 2.81. Initiatives like "family health teams" provide vital services, reaching up to 3,000 individuals per team. Healthcare coverage in favelas increased from 4% to 70% since 2008, supported by investments for the World Cup and Olympics. During the COVID-19 pandemic, Rio achieved higher vaccination rates than other regions, reflecting its advanced healthcare infrastructure.



**Water supply** - Around 96% of Rio residents have access to piped water, compared to only 88% in favelas. The city's water system includes the world's largest treatment facility, seven new plants, and 300 km of pipelines built since 1998. Most of Rio's water comes from the Guandu River, supported by over 1,000 mm of annual rainfall, ensuring a reliable supply with proper infrastructure and management.



**Education** – Rio's education system surpasses that of rural areas, with over 1,000 primary schools, 400 secondary schools, and six universities. The city has a 97% literacy rate for those aged 15 and older, exceeding the national average of 93.2%. Programmes like "Schools for Tomorrow" and government grants improve education in favelas, where attendance has historically been low. The opening of Estácio de Sá University in Rocinha further enhances higher education opportunities.



**Energy** - Nearly 99% of Rio's population has electricity access, with the 2013 Simplicio hydroelectric plant increasing supply by 30%. Two nuclear reactors are operational, with a third underway. Initiatives like solar panels in the Santa Marta favela provide clean energy to poorer areas. However, illegal power tapping in favelas remains an issue, leading to risks such as fires.



### Economic Development



**Manufacturing** – Rio is a hub for diverse industries, including engineering, pharmaceuticals, printing, publishing, and food processing. Offshore oil discoveries have driven the growth of oil-related industries such as refining and shipbuilding, which provide stable employment and attract investment. These industries create a multiplier effect, fostering new businesses in the supply chain and boosting economic growth.

**Commercial and Industrial Zones** – The North and Centro zones are key industrial hubs, benefiting from their proximity to Brazil's third-busiest port. These areas support exporting goods like coffee, sugar, and oil, while thriving industries here provide employment for the local population. The city's high income per capita drives demand for services and retail, boosting the economy further.



**Infrastructure** – Significant investment in infrastructure has improved roads, transport, and

services. The city's port facilities and transport links enhance its role as a centre for commerce and industry. Planned infrastructure improvements will continue to attract business and create further economic opportunities.



**Tourism** – With its iconic beaches, cultural heritage, and global events like Carnival, Rio is a top tourist destination. The South Zone, in particular, thrives on tourism, providing jobs in hospitality, retail, and luxury services. Tourism significantly contributes to the city's economy.



**Informal Sector** – Unemployment in Rio's favelas can exceed 20%, with many residents relying on the informal economy. Jobs include street vending, housekeeping, and handicraft production. While these roles offer essential income, they are low-paid, sporadic, and lack formal contracts, leaving workers without benefits or job security. This sector represents one-third of Rio's workforce but does not generate tax revenue for the government.



# Urban Issues and Challenges

## Challenges of Urban

### Growth in Rio

read

quizzes



Informal settlements

Social and economic

Environmental



## The Big Picture



## Key Terms



**Sanitation** – Measures designed to protect public health, including the disposal of sewage and waste.



**Informal sector** – Employment done without official knowledge of the government without paying taxes.

less on average than in wealthier areas. Diseases like tuberculosis are 10x more common due to poor sanitation. Overcrowding led to the rapid spread of COVID-19 during the



**Education** – While 90% of 10-year-olds can read and write, 25% of the poorest children do not regularly attend. Favelas lack schools; for example, Rio das Pedras, with 50,000 people, has only two primary schools and one high school. Many children drop out by age 14 due to economic pressures to support their families.



## Managing Urban Growth

**Housing Shortages:** Rapid population growth has outpaced housing development, forcing millions into informal settlements or *cortiços*.

**Favelas:** Informal settlements built on steep hillsides and wastelands. These homes often lack basic amenities such as sanitation and clean water. Many are at risk of landslides, such as in 2010 when a slide killed 200 people and destroyed thousands of homes.

**Cortiços:** Overcrowded tenement buildings in central areas, often illegally subdivided. These lack proper ventilation, lighting, and sanitation - landlords charge high rents for poor conditions.



## Water, sanitation and energy

**Water Supply:** The Guandu Treatment Plant provides 92% of Rio's fresh water. 12% of residents lack access to clean running water. Over 1/3 of water is lost due to leaky pipes, fraud, and illegal connections. Favelas supply issues include water being delivered to central collection points.

**Sanitation:** 35% of sewage is discharged untreated into Guanabara Bay. 50% of favela residents lack sanitation, and open sewers are common, increasing the risk of diseases like cholera.

**Energy:** Power cuts are frequent due to overloaded systems. Many favela residents tap into electricity illegally, causing shortages and fires.



## Health and Education

**Health** – Rio has only six hospitals, and health clinics are insufficient for the city's population. In favelas, residents live 13 years



## Unemployment & Crime



**Unemployment** – Between 2017 - 2020, unemployment in Rio averaged 15%, with high youth and female unemployment. 3.5 million workers are in the informal economy, lacking job security, benefits, or tax contributions.



**Crime** – Drug trafficking and violent crime are prevalent in favelas. Murder rates have risen by 20% since 2017, linked to unemployment and reduced police funding. Drug related crime is common.



## Environmental Issues



**Waste Disposal** – Rio produces 3.5 million tonnes of waste annually, with less than 2% recycled. Waste collection is irregular in favelas, leading to uncollected rubbish entering rivers and causing water pollution.



**Water Pollution** – Over 50 tonnes of industrial waste dumped daily into Guanabara Bay



**Air Pollution and Traffic Congestion** – Most congested city in South America. Air pollution causes around 5,000 deaths annually.



# Urban Issues and Challenges

## Urban Planning Improving Life in Rio

### Favela Barrio Project



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quiz



## The Big Picture



## Rio's Challenges

- **Favelas:** Informal settlements housing over 1.5 million people, often lacking basic services like clean water, electricity, and sanitation.
- **Overcrowding:** Densely populated slums with poor infrastructure and high crime rates.
- **Employment:** Limited job opportunities and informal work with low pay.
- **Health Risks:** High rates of disease due to poor sanitation and unsafe housing.



## Favela Bairro Project

- **What is it?** A site and service scheme where authorities provide land, materials, and infrastructure, allowing residents to improve their own homes.
- Example: Complexo do Alemão:
- Home to 26,000 residents.
- Improvements include:
  - Fresh water and sanitation systems.
  - Paved roads and street lighting.
  - Schools, health centres, and community facilities.
- A cable car system improving access to the city centre.
- Credit schemes for residents to purchase materials for home upgrades.



## Features

### Social:

- Childcare and after-school programmes.
- Adult education and skills training (e.g., computing and hygiene).
- Access to healthcare services.



## Key Terms



**Favela:** A densely populated informal settlement in Brazil, often self-built homes and a lack of access to services such as sanitation, water, and electricity.



**Site and Service Scheme:** A project where infrastructure is provided, and residents build their own homes.



**Quality of Life (QoL):** Measures well-being based on health, education, and living conditions.

### Economic

- Legal land ownership for residents.
- Credit access to enable home improvements.
- Increased job opportunities through better transport links.

### Environmental

- Replacement of unsafe housing with brick structures.
- Infrastructure upgrades for water, electricity, and sanitation.
- Road widening to improve waste collection and emergency access.



## Improvements to QOL

- **Social:** Better healthcare, education, and safer housing.
- **Economic:** Legal ownership and credit schemes improve financial stability.
- **Environmental:** Safer housing and improved sanitation reduce health risks.



## Successes and Challenges

### Successes:

- Recognised by the UN as a model for sustainable urban planning.
- QoL and job prospects significantly improved.
- Mobility enhanced through the cable car system.

### Challenges:

- Limited literacy affected training programmes.
- Credit schemes were not widely accessible.
- Rent increase made homes inaccessible to some.
- Maintenance of costly infrastructure (e.g., elevated pavements causing flooding).



# Urban Issues and Challenges



How has urban change created opportunities in Manchester?

read

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## The Big Picture



## Examples of Urban Change

Manchester has transformed through urban regeneration, revitalising areas like the Northern Quarter, Spinningfields, and Salford Quays. The Etihad Campus has become a world-class sports complex, while green spaces like Mayfield Park promote sustainability. Blending heritage with innovation, Manchester balances economic growth, cultural development, and environmental sustainability, cementing its global city status.



## Social Opportunities

### Cultural Mix:

- One of the UK's most multicultural cities, with nearly 200 languages spoken.
- Home to the second-largest Chinatown in the UK and the famous 'Curry Mile' in Rusholme.
- Hosts numerous festivals like the Manchester International Festival, Caribbean Carnival, and Irish Festival.

### Recreation and Entertainment:

- Renowned music venues like the Bridgewater Hall, AO Arena, Co-op Live Arena, and the Hacienda nightclub.
- Top sporting facilities, including the Etihad Stadium, Velodrome, and Aquatics Centre.
- Home to world-famous football clubs, Manchester United and Manchester City, attracting millions of fans annually.
- Museums and galleries like the Manchester Museum, MOSI, and Whitworth Art Gallery provide rich cultural experiences.

### Shopping:

- Popular shopping areas include the Arndale Centre and the Trafford Centre, which features over 150 shops, 50 restaurants, and a variety of entertainment options



## Key Terms



**Urban Greening** – Increasing green spaces in urban areas for recreation and sustainability.



**Integrated Transport System** – A connected network of trams, buses, and trains for efficient city travel.



## Economic Opportunities

### Employment:

- A leading European business destination and second only to London for foreign investment.

### Key industries:

- Retail and motor trade (15%)
- Health and social work (17.4%)
- Education (10%)
- 54.3% of the population is economically active, with students and retirees forming the rest.

### Business Growth:

- The city centre thrives with retail, creative, and tech sectors, driven by regeneration projects



## Environmental Opportunities

### Urban Greening:

- Creation of the Mayfield Park, a 6.5-acre green space with floodable meadows and multi-surface paths.
- Development of the Castlefield Viaduct, an elevated urban park by the National Trust.
- The city's green strategy promotes biodiversity, addresses climate change, and integrates green and blue spaces.

### Integrated Transport:

- The Manchester Metrolink is one of the UK's most successful tram systems with 99 stops across 64 miles and 36 million passengers annually.
- Bee Network Buses (2023): Locally controlled bus services offering a unified ticketing system.



# Urban Issues and Challenges



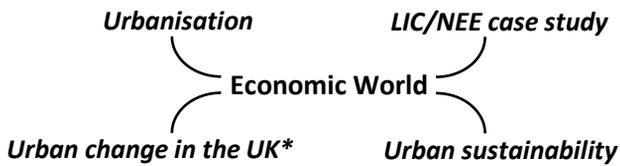
How has urban change created challenges in Manchester?

read

quiz



## The Big Picture



## Social & Economic Challenges

### Urban Deprivation:

- Manchester is the **6th most deprived place in the North-West**, with areas like **Oldham** and **Blackley** among the worst affected.
- **29.7% of children** live in income-deprived families, with current estimates suggesting a rise due to the cost-of-living crisis.
- Deprived communities often face **overcrowding, poor housing, and limited amenities**.

### Housing Inequalities:

- House prices have soared, with the **average now £295,700**, pricing many out of the city.
- A **north-south divide** exists, with homes in **Altrincham** averaging **£564,000**, compared to **£143,000** in Harpurhey.
- Housing is predominantly **privately rented (32.5%)**, with significant demand for affordable homes.

### Education Inequalities:

- **1 in 3 children** in the city centre receive free school meals, compared to lower rates in Trafford.
- Educational attainment varies: only **47.7% of students** in central Manchester achieve a 'good level of progress', compared to **60% in Trafford**.

### Health Inequalities:

- Life expectancy is lower than the national average, with men at **78.1 years** and women at **81.7 years**.
- Leading causes of preventable deaths include **heart disease, cancer, and lung disease**, exacerbated by smoking and poor diets.



## Key Terms



**Urban sprawl** – The expansion of urban areas into surrounding rural land.



**Brownfield site** – Previously developed land now available for redevelopment.



**Green belt** – Protected land around cities to limit urban sprawl and preserve natural areas.



## Environmental Challenges

### Dereliction:

- Economic decline post-Industrial Revolution left **derelict mills** and abandoned areas, especially in the north, where crime rates are high.

### Brownfield and Greenfield Development:

- **Brownfield sites** like the **Trafford Centre** have been successfully redeveloped.
- However, **27 brownfield plots** have been cleared for affordable housing projects.
- **Greenfield developments** face local opposition, with concerns over tree loss and flooding, such as those along the River Mersey.

### Waste Disposal:

- Manchester's recycling rate dropped to **36.6% in 2020/21**, but initiatives like **Renew shops** aim to reduce waste and promote reuse.



## Rural-Urban Fringe

### Urban Sprawl:

- Driven by **population growth** and rising land prices, urban sprawl extends Manchester into areas like **Altrincham, Hale, and Bury**.
- This expansion threatens rural habitats, increases congestion, and worsens pollution.

### Commuter Settlements:

- Towns like **Altrincham** have benefited from the **Metrolink**, allowing easy commutes into the city.
- However, rising house prices and congestion in these areas create further challenges.



# Urban Issues and Challenges



## Urban Regeneration in Manchester

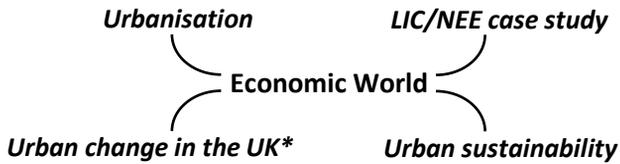
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### Salford Quays

quiz



### The Big Picture



### Salford Quays

Salford Quays is a waterfront area on the Manchester Ship Canal in Salford, Greater Manchester. It was previously the site of Manchester Docks and faces Trafford across the canal. The area faced severe decline when the docks ceased operations. Since then, the area has transformed into a vibrant commercial, residential, and cultural district through regeneration.



### Reasons for Regeneration

#### Decline of Manchester Docks:

- **Closure in 1982** left Salford Quays deserted, with abandoned infrastructure and unused land.
- Reflects broader UK economic shifts away from **industrial activities**.

#### Focus of Regeneration:

- Boost the **local economy** and improve **quality of life** for residents.



### Key Features of Regeneration

#### Transport and Connectivity:

- Extension of the **Metrolink tram system** improved links to Manchester city centre.

#### Cultural Venues:

- **The Lowry**: A theatre and gallery complex serving as a key attraction.
- **Imperial War Museum North**: Highlights the area's cultural importance.

#### MediaCityUK:

- Relocation of **BBC** and **ITV** operations created a hub for **media and digital businesses**.



### Key Terms



**Urban Regeneration** – Redeveloping rundown urban areas by either renewal or redevelopment to improve conditions.



**Sustainability** – Meeting present needs without compromising future resources.



**Connectivity** – The ease of access and transport links within and between places.

#### Commercial and Residential Spaces:

- Development of **offices, housing, and leisure spaces** revitalised the area.

#### Environmental Improvements:

- **Waterfront development**, walkways, and green spaces enhance aesthetics and biodiversity.
- Buildings feature **energy-efficient technologies**, green roofs, and sustainable materials.



### Successful Redevelopment?

#### Economic Impact:

- Attracted **investment**, created jobs, and increased property values.
- Established Salford Quays as a key economic hub in Greater Manchester.

#### Cultural and Community Benefits:

- A vibrant destination for **cultural events and entertainment**.
- Balanced urban living with residential, commercial, and recreational spaces.

#### Challenges:

- Rising **property prices** and **living costs** raise affordability concerns.
- Unequal distribution of regeneration benefits highlights the need for **inclusive growth**.

The regeneration of **Salford Quays** transformed the area into a vibrant economic, cultural, and residential hub while addressing environmental sustainability. However, affordability and equitable growth remain areas for improvement.



# Urban Issues and Challenges



## Sustainable Urban Living - Freiburg

read

quiz



### The Big Picture



### Key Terms



**Sustainable energy supply** – Energy that can be used well into the future without affecting future generations.



**Renewable energy sources** – An energy resource that cannot be exhausted.



**Solar energy** – Electricity generated by solar panels.



### Background

Freiburg is a city in the south of German. In 1970 the local government set the goal of urban sustainability.

#### Why?

- Freiburg has one of the youngest populations in Germany.
- The old town is cobbled, which reduces traffic in the city.
- The city is situated in the Black Forest.



**Social Planning** – decisions take into account people's needs and includes local people in the planning process.



**Economic Planning** – providing people with employment opportunities e.g. green industries employ 10,000 residents.



**Environmental Planning** - ensures that resources are not wasted, and the environment is protected for future generations.



### Water and Energy

- The city plans to be 100% renewable energy powered by 2050 by reducing consumption by 50% and increasing energy efficiency.
- 10m kw of electricity produced from solar energy every year as the area is very sunny.
- The wastewater system allows rainwater to be retained, reused or seep into the ground.
- Grey water used within homes.
- Flood retention basins store excess water



### Waste recycling

- Energy for 28000 homes is provided by burning waste.
- Annual waste disposal has reduced from 140000 tons to 50000 tonnes in 12 years.
- More than 88% of packing waste recycled.
- 350 community collection points for recycling.
- Collection of garden waste and organic food, which is used to generate gas in a biogas digester.



### Creating Green Space

- 40% of the city is forested.
- 44% of the wood from the city's forest is used for timber, with 75% growing back within a year.
- 56% of forests are nature conservation areas.
- The River Dreisam is unmanaged and allowed to flow freely, providing natural flora and fauna habitats.
- Only native shrubs and trees are planted in 600 hectares of parks.
- 44000 trees have been planted in parks and streets.



## Urban Issues and Challenges.

1. Describe and explain the disadvantages of building new housing on brownfield sites. (4)
2. Suggest two pull factors that encourage people to move cities. (2)
3. 'A city of opportunities and challenges.' Explain why this fact makes it difficult for Lagos to overcome its economic challenges (6)
4. Using a named example, discuss the challenges created by urban growth. (9)
5. What is the definition of an 'emigrant'? (1)
6. Use a named example to explain how squatter/slum settlements can be improved (6)
7. Explain why the authorities in Rio/Mumbai have to cope with such a range of social challenges. (4)
8. Describe the location and discuss the importance of a named NEE city (6marks).
9. Suggest why there is such a low rate of urbanisation in rich countries and why some show evidence of counter urbanisation. (6)
10. Explain how migration has been responsible for the growth of Mumbai's' population (6)
11. Discuss the challenges and opportunities of a UK city you have studied (9 marks)
12. How successful has Manchester been in overcoming its challenges (4)
13. What is the definition of urbanisation? (1)
14. Explain how Manchester's' growth has been affected by migration. (4)
15. Explain how the changes in Manchester can prove positive for the people of the city. (4)
16. Discuss the challenges caused by urban growth in a named NEE city. (9)
17. Explain how housing and other social problems can be improved in a NEE you have studied. (9)
18. Explain how the distribution of population in the UK reflects both physical and human geographical factors (6)
19. Outline how the quality of life for Mumbai's/Rio's population can be improved. (6)
20. Define and give an example of a Megacity (2)
21. Suggest reasons for a difference in the rate of urbanisation in HICs vs LIC. (6)
22. Explain why city planners must consider more than just the environment to achieve urban sustainability. (6)
23. For any named example, evaluate the strategies used to manage traffic congestion (6)
24. For a UK urban regeneration project, you have studied, explain how the area has been improved? (4)
25. 'The regeneration of Manchester has been a success'. Discuss this statement (9)
26. Discuss how the growth of Mumbai/Rio has created both opportunities and challenges. (9)
27. Discuss how the growth of Manchester has created both opportunities and challenges. (9)
28. Suggest two reasons for the slow rate of urban growth in many higher income countries (HICs). (2)
29. To what extent do urban areas in lower income countries (LICs) or newly emerging economies (NEEs) provide social and economic opportunities for people? (6)
30. Discuss the effects of urban sprawl on people and the environment (6)

1. Explain one economic problem caused by traffic congestion. (2)
2. Evaluate the effectiveness of an urban transport scheme(s) you have studied. (9)
3. Use an example to outline how cities can be designed to be more sustainable (9)

# Paper 2 – Changing Economic World





# Changing Economic World



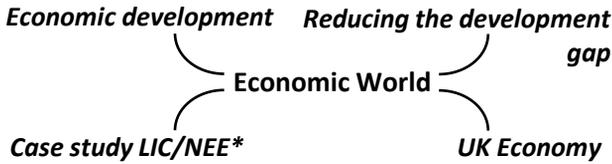
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## The Location and Importance of Nigeria

quiz



### The Big Picture



### Nigeria

Nigeria is an NEE located in Africa. It is one of a number of countries experiencing rapid economic growth.



### Key Terms



**Economy** – the production, consumption, and trade of goods and services.



**GDP** – the total value of all goods and services produced in a country.



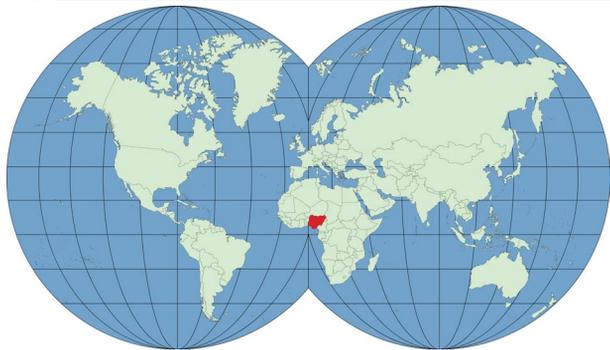
**LIC** – A low income country with a GNI per capita of less than \$1045.



**NEE** – A newly emerging economy with a GNI of between \$1046 and \$12 696.



### What is Nigeria's location?



Nigeria is located in West Africa, sharing a border with Benin, Niger, Chad and Cameroon. To the south, it borders the Gulf of Guinea, part of the Atlantic Ocean. Nigeria is almost 4 times the physical size of the UK. Its population, at just over 200,000,000, is three times the size of the UK. Nigeria is the most populous and economically developed country in Africa. Its recent growth, based on the sale of oil, has led to the country's transformation from a LIC to a NEE.



### Global Importance

- Nigeria had the 31st largest GDP in 2018.
- It is the world's 21st largest economy and has experienced recent rapid growth.
- Seventh largest population in the world.
- Nigeria is the 13th largest producer of oil.
- Lagos, Nigeria's largest city, is a thriving 'world city', with a strong financial and economic base.
- Nigeria has the second-largest film industry in the world.
- Nigeria plays an important role in United Nations peacekeeping.



### Regional Importance

- The fastest growing economy in Africa.
- Nigeria has the highest GNP in Africa.
- Nigeria has the largest population on the continent.
- Nigeria has the third-largest manufacturing sector. The country also has the largest agricultural output and the highest number of cattle.
- Nigerian music is enjoyed throughout Africa. It is also a hub for literature boasting a range of popular writers.



# Changing Economic World

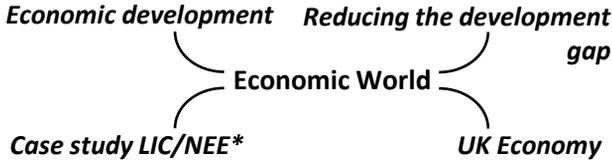


## Nigeria's Changing Industrial Structure

read

quiz

### The Big Picture

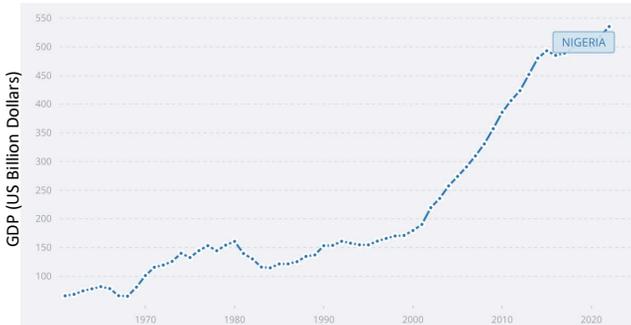


### Key Terms

**Industrial structure** – The relative proportion of the workforce employed in different sectors of the economy (primary, secondary, tertiary and quaternary).

### Economic Growth

Nigeria has the largest economy in Africa and one of the fastest-growing economies in the world. The graph below shows considerable growth in Nigeria's GDP from 2000 to 2022.



Despite this growth, Nigeria has a significant inequality gap. Wealth is typically found in the south, in and around Lagos. The north is exceptionally poor. Most people are poor, living on less than \$1.25 per day. Wealth is held by a small proportion of people in Nigeria.

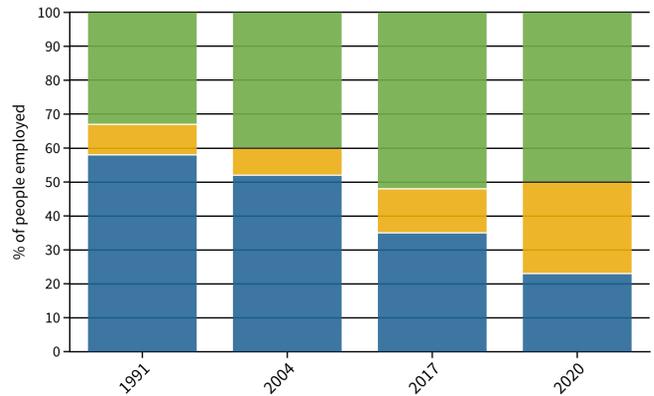
### Changing Industrial Sectors

The structure of Nigeria's economy has changed significantly. Its economy has transformed from one mainly based on agriculture to manufacturing and services. Around 52% of Nigeria's GDP now comes from manufacturing and services. Mechanisation and rural-urban migration have led to a decline in employment in agriculture.

Foreign investment and a considerable growth in the service sector (mainly IT) along with its vast oil reserves has significantly changed Nigeria's economy. Manufacturing the the fastest growing sector, due to its cheap and plentiful labour and vast market.

### Changing Structure

■ Agriculture ■ Industry ■ Services



Since 1991 there have been significant changes to Nigeria's industrial structure. Employment in agriculture has declined due to mechanisation, it's industrial and service sectors have grown.

### Manufacturing

Nigeria's manufacturing industry was hindered by its dependence on exporting raw materials, mainly agricultural produce. Processing was mainly done abroad. However, now, manufacturing accounted for 27% of Nigeria's GDP, growing faster than oils, gas, and telecommunications. This is due to its rapidly growing home market, cheap labour forces, and improving infrastructure.

### Economic Development

Economic development has been stimulated by manufacturing growth:

- A more secure income means increased demand for goods and services.
- Multiplier effect (other support industries grow)
- Increase in tax to spend on development
- Foreign investment

## Nigeria – impact of TNCs – Shell Oil

### Background Information

A TNC (Transnational corporation) is a large company that operates in several countries. Shell is one of the world's largest oil companies, it has extracted oil from the Niger Delta since 1958, with some controversy. The main area of Oil extraction is the Niger Delta an area the size of Portugal with a population of around 31 million people. This is a fragile wetland area.

### Advantages

- Major contribution in taxes
- 65 000 direct jobs and new skills
- Around 250 000 indirect jobs in related industries
- 91% of all Shell contracts have been placed with Nigerian companies
- Improved infrastructure and education
- Export revenues earned
- Shell has invested in social schemes such as providing 3000 scholarships to secondary schools and universities, providing healthcare for ¼ million people and financing micro finance schemes.

### Disadvantages

- Local workers can be poorly paid
- Working conditions are sometimes very poor
- Management jobs go to foreign employees
- Much of profit goes abroad
- Tankers transport oil to Europe and the USA where it is refined into petroleum products. This means that profits go abroad rather than benefiting the host country.
- There have many oil spills which have damaged the fragile Niger Delta environment, causing water pollution and damaging fisheries.
- Gas flaring has been illegal since 1984 however Shell is still doing this leading to toxic fumes which have increased air pollution
- Oil theft and sabotage costs TNCs and the government billions of dollars every year

## Nigeria – impact of international aid

<b>Types of aid</b>	There are two main types of aid: Emergency aid – following a natural disaster or conflict Developmental aid – long-term support aimed at improving quality of life
<b>Impact of aid in Nigeria</b>	<ul style="list-style-type: none"><li>• 2014 World Bank approved a US\$500 million loan to fund development projects and provide loans to businesses</li><li>• Aid from the USA helps to protect people against the spread of AIDS/HIV</li><li>• The Community Care in Nigeria project provides support for orphans</li><li>• Nets for Life (an NGO) provides education on malaria prevention and distributes anti-mosquito nets</li><li>• The most successful aid projects are community-based, supported by small charities and NGO's.</li></ul>
<b>What prevents aid from being used effectively?</b>	<ul style="list-style-type: none"><li>• Corruption is a major factor in the loss of aid</li><li>• Donors may have political influence over what happens to aid</li><li>• By receiving aid, a country may become more dependent</li></ul>





# Changing Economic World

## Environmental Impacts of Economic

### Development in Nigeria

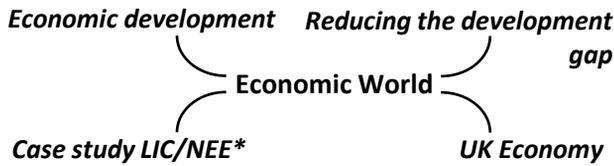
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## The Big Picture



## Key Terms



**Deforestation** – The removal of a wide area of trees.



**Greenhouse gases** – Gases that trap heat in the atmosphere.



**Niger Delta** – The delta of the Niger River sitting directly on the Gulf of Guinea on the Atlantic Ocean in Nigeria.



**Sanitation** – The provision of clean drinking water and sewage disposal.



## Mining and Oil Extraction

Oil extraction in the Niger Delta has had a significant impact on the environment. Oil spills have destroyed aquatic ecosystems and burning gases associated with oil extraction has caused considerable air pollution, released greenhouse gases and led to respiratory problems for local people. Tin mining has caused soil erosion and has polluted water supplies.

Royal Dutch Shell has caused devastating environmental pollution due to two massive oil spills at Bodo in Ogoniland, a small region of the Niger Delta. In 2008, there was a rupture of the Bodo-Bonny trans-Niger pipeline that pumps 120,000 barrels of oil daily through the community. 20 sq km of creeks and inlets, on which Bodo and as many as 30 other settlements depend, has been destroyed. At the time, no attempt was made to clean up the spill, which collected in creeks, washing in and out with the tide, infiltrated farmland, and entered the water table.

Compensation has been paid to the community. However, none of this was spent on cleaning up the area. It is estimated that it will cost more than \$100m to clear the effects of the oil and restore the mangrove swamps that once lined the rivers and creeks.

It was not until an investigation by the United Nations that steps were taken to clean up the area, some ten years after the spill.



## Industrial Development

The rapid growth of industry in Nigeria has led to the development of unregulated, large-scale industrial developments without planning permission. This has led to:

- toxic chemical discharge into drains and open sewers in cities such as Lagos and Kano. This poses a considerable danger to public health and ecosystems.
- due to the widespread emission of poisonous gases that affect the health of local people and contribute to climate change.
- up to 80% of Nigeria's forests have been lost. Deforestation has led to increased soil erosion and climate change gases being released into the atmosphere. An important carbon store has been lost due to deforestation.



## Urban Growth

The rapid growth and urban sprawl of cities such as Lagos have considerably impacted the environment. The countryside has been lost to the construction of squatter settlements and industry. Inadequate sanitation and increased domestic and industrial waste have caused watercourses to become polluted. Urban growth has also led to a rapid increase in traffic, increasing air pollution and greenhouse gas emissions.



# Changing Economic World



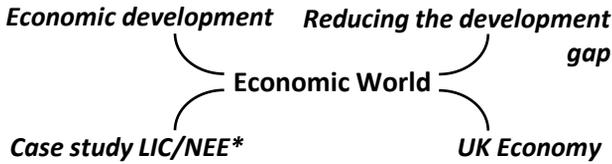
The Impact of Economic Development  
on Quality of Life in Nigeria

read

quiz



## The Big Picture



## Key Terms



**Quality of life** – The wellbeing of individuals or groups of people.



**Human Development Index (HDI)** – A development measure combining life expectancy, years of schooling, and gross national income (GNI) per capita.



## Impact on HDI

Although many people remain poor, particularly in Nigeria's rural north, its Human Development Index (HDI) has increased steadily since 2005 from below 0.47 to 0.532. The country has one of the fastest-growing rates of HDI in the world. However, Nigeria is ranked 152 out of 187 countries which puts it in the low category of human development, despite its recent improvements.



## Development Indicators

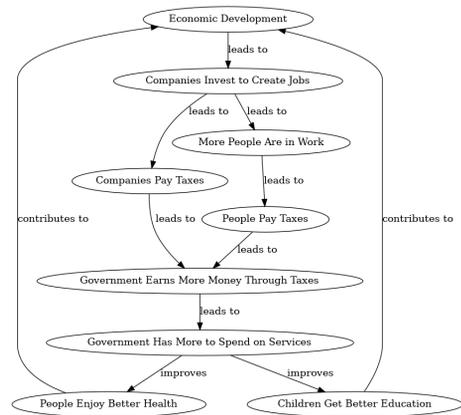
Several quality-of-life indicators have improved significantly in Nigeria, as shown below.

	2005	2017
<b>Life expectancy at birth</b>	48.2	53.9
<b>Expected years of schooling</b>	9.0	10.0
<b>GNI per capita</b>	\$3669	\$5231
<b>Birth rate</b>	43.0	37.3
<b>Death rate</b>	17.0	12.7



## Link to Economic Development

Nigeria's improved quality of life is closely linked to the country's economic development. Economic growth creates new job opportunities, allowing people to earn higher incomes to afford their needs. Additionally, the government collects more revenue through taxes.



However, the advantages of economic development are not distributed equally. Significant disparities exist between:

- The northern and southern regions of the country
- Urban and rural areas
- Educated and uneducated populations.



## Development Challenges

Nigeria's most significant development challenge is overcoming the socio-economic inequality within the country. With over 50% of the population living in poverty, specific challenges need to be met. These include:

- tackling government corruption to ensure wealth reaches everyone
- addressing environmental issues that have resulted from rapid economic development, such as soil erosion, water pollution, desertification, and oil spills
- oil revenues should be maximised with profits invested in developing other areas of the economy
- conflicts between ethnic and religious groups need to be tackled sensitively
- Prioritise basic sanitation provision
- further investment in healthcare and education

An example of an environmentally sustainable industry in UK

## **Jaguar Landrover, Wolverhampton**

Manufacturing plants can look dull and affect the visual effect of the landscape. They often consume lots of energy and produce tonnes of waste for landfill.

### **Location and background**

A new engine manufacturing centre opened in Wolverhampton in 2014. The factory is designed to operate in a more sustainable manner. This includes the design and engines it produces.

### **Sustainable activities**

- Solar panels generate 35% of the factories energy needs.
- Almost all of the waste produces is recycled; this reduces the amount going to landfill.
- Power down robots are used to reduce energy consumption and reduce carbon footprint.
- Cars are made from 85% recyclable materials.

## **DARESBURY SCIENCE PARK – ONE PAGE GCSE GEOGRAPHY CASE STUDY**

### **1. Location**

- Cheshire, North West England, near Warrington, Liverpool, Manchester.
- Close to M56, airports, and rail links. Semi rural with space to grow.

### **2. What It Is**

- Major UK science and innovation campus (Sci Tech Daresbury).
- 150+ high tech companies and national STFC research facilities.

### **3. Key Features**

- High tech labs, supercomputing, materials science, particle acceleration.
- Business support: funding access, mentoring, collaboration spaces.
- Strong partnerships with universities and government research bodies.

### **4. Economic Benefits**

- Creates skilled jobs in science, engineering, digital tech.
- Attracts investment and grows the knowledge economy.
- Helps small technology firms scale up.

### **5. Environmental Features**

- Green, landscaped campus reduces pollution.
- Sustainable buildings with energy efficient designs.
- Biodiversity features: wildflower areas, ponds, habitats.
- Promotes low carbon travel: EV charging, cycle routes, car share.

### **6. Challenges**

- High energy use from supercomputing facilities.
- Need for continued investment to stay competitive.
- Balancing growth with habitat protection.
- Limited public transport access directly onto site.

### **7. Why It Works as a Case Study**

- Shows role of science parks in modern economic growth.
- Demonstrates importance of location, partnerships, sustainability.

## Changing Economic World

1. Explain how improving transport links can help reduce the north-south divide. (4)
2. How does the UK benefit by having close links with the rest of the world? (6)
3. Explain the link between trade and the development gap. (4)
4. Compare the population structure of an LIC or NEE with one for a HIC. (6)
5. Explain how the quality of life can be improved in an LIC you have studied. (4)
6. How does uneven development lead to disparities of global wealth? (4)
7. Explain how being a former colony may affect a country's economic development (3)
8. Evaluate how the economic development can be linked to the DTM. (6)
9. Discuss whether trade or aid is the best way for poorer countries to develop. (9)
10. Draw a labelled sketch of a population pyramid for a country in stage 2 of the DTM. (3)
11. Explain how reducing the debt of a country might help reduce deforestation there. (2)
12. Explain why tourism reduces the development gap. (4)
13. How does uneven development cause international migration? (4)
14. Outline one positive economic impact of deforestation. (1)
15. Outline one advantage and one disadvantage of receiving long term aid. (2)
16. How has the development of IT affected the growth and characteristics of the UK's economy? (6)
17. To what extent do TNC's improve economic development and HDI in LICs and NEEs? (9)
18. What is a TNC? (1) Give an example (1)
19. How can TNC's help to improve the status of women? (4)
20. To what extent is the HDI the most effective measure of development? (6)
21. How can aid reduce the development gap? (4)
22. Describe what HDI is and explain how it can be used to measure a country's development. (6)
23. Suggest how conflict can affect the level of development in a country (3)
24. Explain how poor trade links might affect a country's development. (2)
25. How can the manufacturing industry stimulate economic development? (4)
26. Assess the costs and benefits of TNCs in India. (6)
27. How can roads and rail development improve the UK's economy? (6)
28. Explain the causes and impacts of de-industrialisation in the UK. (6)
29. How do science and business parks provide opportunities for regional economic growth. (6)
30. Explain how economic growth can have harmful impacts on the environment (6)
31. Outline one disadvantage of using a single measure of development such as income (2)
32. Give two reasons why there has been a growth in the number of science parks in the UK. (2)
33. Outline one way that Fairtrade helps to deal with the problems of unequal development. (2)
34. Suggest one reason why Fairtrade schemes are not always successful (2)
35. 'Transnational corporations (TNCs) only bring advantages to the host country.' Do you agree with this statement? Justify your decision. (9)

# Paper 2 – Energy Management



## Fracking in the UK

### Location and background

Fracking is a way of extracting shale gas that is trapped underground shale rock. It is extracted by digging a well and pumping liquid into the shale rock at high pressure. This causes the rock to fracture and release the gas, which is then collected as it comes back out of the well. In October a company called Cuadrilla began drilling for shale gas in Lancashire. This created widespread opposition and debate.

### Advantages

- ✓ Shale gas is widely available in the UK. Geologists believe there could be the up to 50years worth of gas supplies.
- ✓ It increases the energy security of the UK as other fossil fuels run out. It means the UK would be less reliant upon gas imports from Russia.
- ✓ Gas is less polluting than other fossil fuels; it releases 50% less CO<sub>2</sub> than coal
- ✓ Fracked gas is cheaper than some renewable sources
- ✓ The technology needed to extract the gas is reliable. The method has been tried and tested in the USA for a number of years, unlike some renewable sources.
- ✓ Creates employment for local people
- ✓ Kick starts local economies
- ✓ Revenue created increases UK tax

### Disadvantages

- x Gas is unsustainable.
- x It is a non-renewable source that releases CO<sub>2</sub> when burned; this contributes to global warming.
- x There is a risk of groundwater becoming polluted.
- x It creates air pollution.
- x The heavy machinery needed creates noise pollution when the drills are running.
- x It can trigger small earthquakes and lead to subsidence of land.
- x There has been widespread public opposition to the development of fracking.  
Groups such as 'Frack Off' have organised long protests at proposed sites in the UK.
- x Future investments in fracking could slow down as renewable investment increases



# Resource Management

## Chambamontera Micro-hydro Scheme



read

quiz



### The Big Picture



### Where is Chambamontera?

Chambamontera is a remote community in Peru in the Andes Mountains. Its closest town is Jaén.



### Why was the scheme needed?

The community of Chambamontera required a sustainable energy scheme because most of its inhabitants relied on subsistence farming, small-scale coffee production, and livestock rearing. The lack of electricity has significantly hindered development, as it is essential for heating, lighting, and powering homes and businesses. Despite efficient farming practices, poverty was widespread, with nearly half of the population living on just US\$2 a day. The area's challenging terrain, with steep slopes at altitudes up to 1700 meters and roads often closed in winter, contributes to its isolation and the economic impracticality of constructing a traditional electricity grid.



### Main features

To address the energy shortage, Chambamontera implemented a micro-hydro scheme with the help of the charity Practical Action. The region's high rainfall, steep terrain, and fast-flowing rivers make it well-suited to harnessing water power as a sustainable energy source. The project's total cost was US\$51,000, with funding from the government, investments from Japan, and contributions from the local community. Each family faced an average cost of US\$750, with credit options available to assist with payments.



### Key Terms



**Hydro-electric power** – Electricity generated by turbines that are driven by moving water.



**Micro-hydro scheme** – A small-scale hydroelectric scheme that generates between 5 kW and 100 kW of electricity.



**Renewable energy source** – A resource which is not diminished when it is used; it recurs and cannot be exhausted, such as wind and tidal energy.



**Sustainable energy supply** – Energy that can potentially be used well into the future without harming future generations.



### Benefits of the scheme

The advantages of the scheme include:

- Business growth, as access to piped water has enabled the use of machinery for coffee processing.
- Reduced risk of fires since there is no longer a need for kerosene lighting.
- Improved educational opportunities by enabling students to study after dark due to improved school facilities.
- Strengthened healthcare services through the refrigeration of medicines.
- Promoting safer night-time mobility with the installation of streetlights.
- A reduction in rural-to-urban migration.
- Reduced flood risks by regulating river flow.
- Decreased reliance on wood as a heating source helping to prevent deforestation and soil erosion.
- A project lifespan of at least 25 years.
- Consistent electricity during winter months when the demand for heating is greater.
- A dependable power supply for refrigeration, lighting, computer use, and entertainment.

# Local Sustainable Energy Scheme

## Rice Husk Power in Bihar, India

### Location

- Bihar, eastern India
- One of India's poorest states
- Large rural population with limited access to the national electricity grid
- Major rice-producing region

### What is the energy scheme?

- Uses rice husks (waste from rice farming) to generate electricity
- Developed by Husk Power Systems (HPS)
- Small-scale biomass power plants (around 25–35 kW)
- Supplies electricity to 300–500 households per village

### How does it work?

1. Rice husks are collected from local rice mills
2. Husks are gasified (heated with limited oxygen)
3. Gas produced is used to power a generator
4. Electricity is distributed through a local mini-grid

### Why is it sustainable?

- Uses a renewable, local resource
- Turns waste into energy
- Reduces reliance on kerosene and diesel
- Low transport costs → lower carbon footprint

### Positive Impacts on the Local Community

#### Environmental

- Reduces open burning of rice husks
- Lower CO<sub>2</sub> emissions compared to diesel generators
- Makes use of agricultural waste

#### Social

- Reliable lighting in homes
- Children can study after dark
- Mobile phones can be charged
- Improved safety at night

#### Economic

- Cheaper than kerosene for households
- Creates local jobs (plant operators, maintenance)
- Helps small businesses (shops, phone charging, mills)
- Farmers and rice mills earn extra income selling husks

### Negative Impacts / Challenges

#### Environmental

- Still produces some air pollution
- Not as clean as solar or wind energy

#### Technical

- Plants need regular maintenance
- Breakdowns can disrupt supply
- Requires trained workers

#### Economic & Social

- High set-up costs
- Limited power supply (only a few hours per day)
- Depends on a steady supply of rice husks
- Cannot meet all energy needs alone

## **Resource Management**

1. Explain how exploiting energy resources can cause environmental issues (6)
2. Explain the UK's attempts to respond to changing demands for energy. (4)
3. Describe the global distribution of energy production (3)
4. Explain why global energy consumption is unevenly distributed. (4)
5. Give reasons why the global demand for energy consumption is changing (3)
6. Give a physical factor that can affect energy security (1)
7. Give an economic factor that can affect energy security (1)
8. Give a political factor that can affect energy security (1)
9. Give a technological factor that affect energy security (1)
10. Evaluate the issue of fracking in the UK (9)
11. Outline one possible effect of energy insecurity. (2)
12. Explain how both physical and human factors can influence the availability of energy (6)
13. Explain why the UK's energy mix will include both renewable and non-renewable sources in the future. (6)
14. Explain how water insecurity could lead to conflict. (2)
15. Explain how human actions can contribute to water insecurity. (6)
16. Evaluate the success of a local scheme for increasing sustainable energy supplies. (9)
17. Explain the costs and benefits involved in strategies to increase energy supply. (6)
18. Define Sustainable Energy (2)
19. Define Carbon Footprint (2)
20. Evaluate the use of renewable energy supplies (9)
21. Explain the difference between direct and indirect emissions (2)
22. Suggest ways that energy can be conserved in homes (6)
23. Suggest ways that demand for energy could be reduced? (6)
24. Suggest one reason for the development of fracking in the UK. (1) 25. Explain how water security can be improved. (6)