



# UNIT 8: UK CHALLENGES RESOURCES & SUSTAINABILITY

## DEFINING SUSTAINABILITY

Sustainability is defined as meeting the needs of the present without compromising the needs of the future.

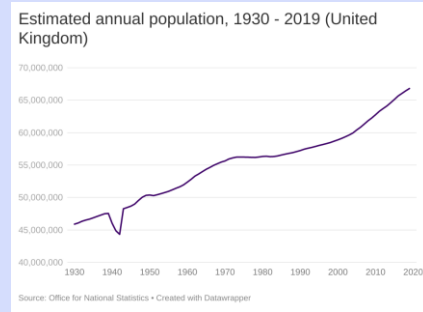
This involves taking care of individual's needs (social); financial needs of countries, businesses, and individuals (economic); and ensuring the environment is looked after for people and nature.

## CHANGES TO THE UK'S POPULATION

### POPULATION GROWTH

The UK's population has grown considerably in the last century and is expected to continue to rise over the next 50 years. By 2070 it is expected to have reached 71 million compared to 67 million in 2023.

This is even though the UK has an aging population, with the average age increasing from 37 to 40 between 2001 and 2021. The elderly dependents ratio is 29% compared to 18% young dependents.



### CAUSES OF POPULATION GROWTH

**Natural increase:** Natural increase refers to a population growing due to its fertility rate. In the UK, the fertility rate would need to be 2.08 children per woman for the population to remain constant. In the UK, the current fertility rate is 1.58 so the population should be shrinking year on year.

**Migration:** Migration refers to the movement of people from one place to another with the intention of living there for more than one year. In the UK, the UK has had a steady increase in population caused by migration at around 250,000 immigrants per year. However, since 2020 there has been a significant increase in migrants with net migration reaching 500,000. People are drawn by pull factors such as job opportunities, education, and healthcare. People are also pushed away by pushed away from their home country by factors such as war.

### IMPACTS OF POPULATION GROWTH

Advantages	Disadvantages
Economic growth Cultural diversity Demographic balance with younger migrants Innovation	Strain on public services Social tensions Wage suppression Housing market pressure

## PRESSURES ON TERRESTRIAL ECOSYSTEMS

Population increase requires the need for more space for houses and transport; and more space for more intense agricultural practices.

### Deforestation and habitat loss:

The UK has lost over 13% of its woodland cover since the early 20th century due to urban development, agriculture, and logging. This has led to UK woodland birds declining by 24% since 1970.

### Agricultural intensification:

70% of UK land is used for agriculture, with a shift towards intensive farming practices. This has caused soil degradation, loss of hedgerows, and a significant decline in wildlife.

### Pollution:

Agricultural runoff contributes to 40% of nitrates and 50% of phosphates in UK rivers. This causes eutrophication, harming aquatic ecosystems.

## PRESSURES ON MARINE ECOSYSTEMS

Marine ecosystems are threatened by the need to use marine ecosystems for both food and energy resources.

### Overfishing:

Around 33% of fish stocks in UK waters are overfished. This leads to population declines in key species like cod and haddock, disrupting marine food webs and economies reliant on fishing.

### Pollution:

Around 1-2 million tonnes of plastic waste enters the oceans globally each year, with the UK contributing significantly. Microplastics are found in 70% of UK marine species, with them also threatened by entanglement.

### Habitat Destruction:

75% of UK seabed's such as cold-water corals and seagrass beds are damaged, which are vital for biodiversity and carbon sequestration.

## SUSTAINABLE TRANSPORT IN THE UK

### MANCHESTER BEE NETWORK

The Bee Network is a comprehensive plan to create the UK's largest cycling and walking network in Greater Manchester. Part of Greater Manchester's aim to be carbon neutral by 2038. The UK central government has pledged at least £1bn to support this project.

### KEY FEATURES

- **Integrated transport:** Connects cycling, walking, and public transport routes for seamless travel.
- **Cycling and walking routes:** Over 1,800 miles of safe, accessible routes designed for cyclists and pedestrians to reduce car use, congestion, and emissions. Hire bikes have been introduced across the city.
- **Bus network:** Over 500 new buses are being constructed to reduce emissions by an expected 1.1million tonnes. Fares are capped at £2 per journey to allow more people to access these.
- **Trams:** There are plans to double the size of the Metrolink by bringing rail networks under local government control and investing in tram-trains.
- **Cars:** Whilst public transport will be encouraged, private cars will be discouraged with a proposed ultra-low emission zone, taxing drivers entering the city.

### BENEFITS

- **Health:** Promotes physical activity and healthier lifestyles.
- **Environment:** Reduces carbon emissions and improves air quality.
- **Safety:** Enhances safety for cyclists and pedestrians.
- **Accessibility:** Improves access to transport for all, including disabled and elderly people.





# UNIT 8: UK CHALLENGES LANDSCAPE CHALLENGES

## UK LANDSCAPES

Very little of the UK's landscape can be classed as natural landscapes, with human activities such as deforestation, farming, mining, and urbanisation all leaving behind scars on the landscape. As a result, the UK is classified as one of the most nature poor countries in the globe. Despite this, there are a variety of protected landscapes that face additional threats from tourism, climate change, and more.

## UK NATIONAL PARKS

### NATIONAL PARKS

National parks are areas of countryside that are protected because of their natural beauty; being managed for both visitor enjoyment and landscape conservation.

There are 15 national parks in the UK. The oldest of these is the Peak District, and the youngest is the South Downs. There are no national parks in Northern Ireland. The largest national park is the Cairngorms, whilst the smallest is The Broads.



### MANAGEMENT OF NATIONAL PARKS

National parks have two aims. To conserve and enhance natural beauty, wildlife, and cultural heritage; and to promote opportunities for public enjoyment.

Funding is made available from the central government to each of the national park authorities. These then carry out conservation projects. Land is privately owned including by farmers, the National Trust, water companies, forestry commission and more, so the national park authorities try to work with landowners.

### TOURISM AND CONSERVATION

	Tourism	Conservation
Advantages	Contribute at least £5.5bn to economy. Educates about environmental issues. Puts pressure on to conserve landscapes.	Protect nature with at least 300 projects. Provides carbon and water storage. Invasive species are stopped.
Disadvantages	Walking can lead to footpath erosion. Litter can threaten biodiversity. Visitor numbers can burden locals.	Can prevent local development. Footpaths leave scars on landscape. Some projects can have high costs.

## RIVER MANAGEMENT

River management is increasingly needed as more and more of river floodplains must be built on to meet housing demand; increased urbanisation reduces land permeability increasing surface runoff; and the impacts of global warming see increased river levels in winter storms.

Around 2.5 million properties are at risk from flooding by either rivers or the sea in the UK. Flooding costs the UK hundreds of millions to billions of pounds each year in recovery; however, this would be significantly higher without the £600 million-£800 million spent on flood defences annually.

### HARD ENGINEERING

Advantages	Disadvantages
<b>Flood Control:</b> Effectively control floodwaters, protecting communities and infrastructure from damage.	<b>Environmental Impact:</b> River engineering can disrupt natural habitats and processes.
<b>Economic Benefits:</b> Improved flood control and reduced erosion can reduce economic losses due to flooding and property loss.	<b>Sediment Accumulation:</b> Dams trap sediment that would otherwise replenish downstream areas, affecting erosion and agriculture.
<b>Water Storage:</b> Reservoirs created by dams can store water for various purposes such as irrigation, drinking water supply, recreation and hydroelectric power.	<b>Cost:</b> Construction, maintenance, and repair of river engineering structures can be expensive.
	<b>Risk of Failure:</b> Structural failures cause catastrophic flooding.

### SOFT ENGINEERING

Advantages	Disadvantages
<b>Environmental Benefits:</b> Planting vegetation and restoring wetlands, enhances natural habitats.	<b>Potential Conflicts:</b> Balancing the needs of different stakeholders, such as farmers, conservationists, and developers.
<b>Cost-Effective:</b> Generally cheaper because it requires fewer materials and less maintenance over time.	<b>Effectiveness in Extreme Events:</b> Less effective in extreme weather events, such as severe flooding.
<b>Sustainability:</b> Working with natural processes, makes them more sustainable in the long term.	<b>Land Use Restrictions:</b> Floodplain zoning restricts land use which limits development opportunities impacting local economies.
<b>Aesthetic Appeal:</b> Enhance natural landscape, making river more attractive for local communities.	

## COASTAL MANAGEMENT

Coastal management is increasingly needed with sea levels rising around the UK by 3-5mm per year. On top of this, increased winter storms mean that rates of erosion have increased, with the Holderness Coast experiencing rates of 2m per year.

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### HARD ENGINEERING

Advantages	Disadvantages
<b>Effective Protection:</b> Sea walls, groynes, and rock armour provide immediate and reliable protection against erosion and flooding.	<b>High Costs:</b> Construction and maintenance is expensive.
<b>Economic Security:</b> Protecting key areas prevents economic losses especially in areas with high-value land or important infrastructure.	<b>Environmental Impact:</b> Disrupts natural coastal processes, leading to increased erosion elsewhere and negatively impacting marine and coastal ecosystems.
<b>Long-Term Solutions:</b> If maintained, can offer long-term protection and stability to coastlines, safeguarding infrastructure and property.	<b>Visual Intrusion:</b> These structures can be visually unappealing and may detract from the natural beauty of the coastline, affecting tourism and the local landscape.

### SOFT ENGINEERING

Advantages	Disadvantages
<b>Cost-Effective:</b> Beach nourishment and dune stabilisation, are less expensive; requiring less heavy machinery and materials.	<b>Ongoing Maintenance:</b> Requires regular maintenance to ensure effectiveness, such as replenishing beach material.
<b>Aesthetic Appeal:</b> Preserves or enhances natural appearance of the coastline, benefiting tourism and locals.	<b>Vulnerability to Extreme Events:</b> Less effective during severe storms or high-energy wave conditions, which can quickly erode beaches.
<b>Sustainability:</b> Working with natural processes, allowing sediment to be transported and improving biodiversity.	<b>Land Use Conflicts:</b> Managed retreat can lead to conflicts with local communities, particularly where land or property is at risk but not protected.



# UNIT 8: UK CHALLENGES SETTLEMENT, POPULATION, & ECONOMIC CHANGE

## UK SETTLEMENTS

In the UK, approximately 80% of the population (56.5 million) live in urban areas, while 20% live in rural areas.

Urban areas represent around 7% of the landcover of the UK, with the largest of these being Greater London (8.7 million), Greater Manchester (2.8 million), and West Midlands (2.6 million).

## THE UK'S TWO-SPEED ECONOMY

### WHAT IS THE TWO-SPEED ECONOMY?

The South East has a faster rate of growth than the rest of the UK.

Many businesses set up in the south, creating a wealth divide with those in the North experiencing different socio-economic conditions.



### EVIDENCE OF A TWO-SPEED ECONOMY

	The North	The South
Economic activity	Mainly public sector	Mainly private sector
Income (disposable)	£16,995	£24,318
Unemployment rates	5%	3.2%
House prices	Average £143,000	Average £350,000
Education	Less high grades	More high grades
Life expectancy	77.6	80.6

### WAYS OF BRIDGING THE GAP

Companies have moved some offices away from the capital due to the high cost. This includes The BBC who built Media CityUK in Salford, relocating some elements of production from London, helping create a "creative and digital cluster" boosting employment by 142% in the area through the multiplier effect.

The government is also aiming to bridge the gap through infrastructure projects. This includes the construction of HS2. This is aimed to shorten journey times between the Midlands and London, encouraging companies to relocate. This is estimated to cost £85bn, with the original plans to reach Manchester and Leeds cancelled due to rising costs.

## COSTS AND BENEFITS OF GREENFIELD SITES

Undeveloped areas of land, usually located on the outskirts of towns or cities, that have never been built on before. Often rural, agricultural, or forested land.

### Costs:

Loss of natural habitats, agricultural land, and open space.  
Causes urban sprawl, leading to increased traffic and pollution in rural areas.  
Costly to extend public services (water, electricity, transport) to new areas.

### Benefits:

Low initial cost as no decontamination needed.  
Appeals to buyers as offer space, cleaner environment, and quieter lifestyle.  
Freedom to design site from scratch allowing for modern, efficient designs.

## COSTS AND BENEFITS OF BROWNFIELD SITES

Previously developed areas of land within towns or cities that are no longer in use. Often have old industrial or commercial buildings that may be derelict requiring redevelopment before they can be used again.

### Costs:

Expensive due to the need for demolition and decontamination.  
Existing structures and infrastructure can limit design options.  
Located near noise, pollution, and traffic, making them less desirable.

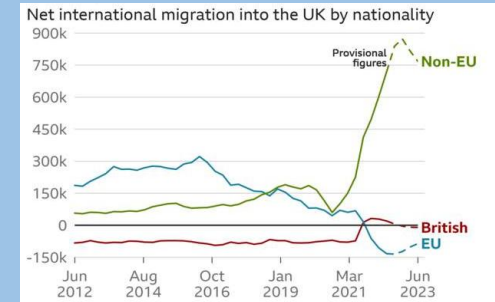
### Benefits:

Improve urban areas through economic regeneration benefitting communities.  
Have pre-existing infrastructure, services, and amenities.  
Cleans up contaminated land, which has positive environmental benefits.

## UK NET MIGRATION

### UK NET MIGRATION STATISTICS

- Net migration shows the difference between those entering the UK and those leaving the UK.
- Since 2000, net migration figures have risen from 158,000 to 764,000 in 2022.
- Before 2019, most of these were from EU countries, but this dropped following Brexit.
- Post 2021, more EU nationals have left the UK than entered the UK.
- Since 2020, large increase in the number of Non-EU migrants, most being asylum seekers escaping war in Syria, Afghanistan, and Ukraine.



### RELIABILITY OF STATISTICS

- Net migration statistics are not reliable as they historically did not include illegal migrants. This means the data is not comparable over a long period.
- Some illegal migrants are still not counted today, which means they can be taken advantage of by employers and gangs.

### ATTITUDES OF STAKEHOLDERS

- The Migration Observatory at the University of Oxford highlights the following: most people (52%) believe migration should be reduced, but the majority (37%) believe migration is a good thing for Britain.
- When asked if migrants should be professionals or unskilled labourers, British citizens wanted professionals to migrate.
- 37% of people thought that the arrival of asylum seekers should be made more difficult, but only 14% wanted to do so for Ukrainians fleeing conflict showing preferences based off country of origin.
- Younger people and people with university degrees tend to express more positive attitudes towards immigration than older people and people with lower levels of education.
- Labour, and their voters, tend to express more positive attitudes towards immigration than the Conservative party and their voters.

Pro-immigration	Anti-immigration
Economic benefits- fill labour shortages and pay taxes supporting growth.	Strain on services- need for more healthcare, education and housing.
Cultural diversity- enriches the UK with foods, languages and traditions.	Job pressure- competition for jobs, wages decrease, locals unemployed.
Demographics- population boost in face of aging pop.	Crime- fears crime rates will rise (no proven correlation).



# UNIT 8: UK CHALLENGES CLIMATE CHANGE CHALLENGES

## CLIMATE CHANGE

Evidence has shown that Earth's temperature is rising due to an increase in greenhouse gasses. These include Carbon Dioxide (CO<sub>2</sub>) and Methane (CH<sub>4</sub>). These greenhouse gases have been released due to humans burning fossil fuels, and through humans deforesting areas of woodland. This has led to an increase of at least 1.1°C since 1880, with this expected to be reach up to 3°C by 2050 (global warming). Climate change includes the resulting change to climate phenomenon.

## UNCERTAINTIES AROUND CLIMATE CHANGE IN UK

### CURRENT CLIMATE CHANGE IN THE UK

- UK has already warmed by 1°C compared with 1950s averages.
- Increased sea temperature around the UK.
- Less frost and snow.
- Longer and more frequent warm and hot spells.
- Shorter and less frequent cold spells.
- The number of days and regions averaging 28°C has increased.

### FUTURE CLIMATE CHANGE IN THE UK

Compared to 1990, by 2070 the UK's climate is expected to be...

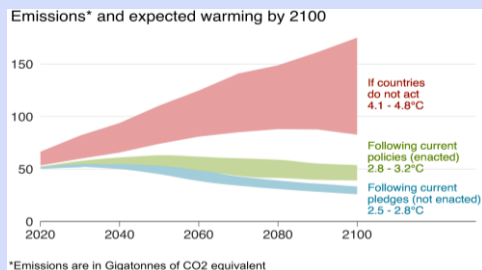
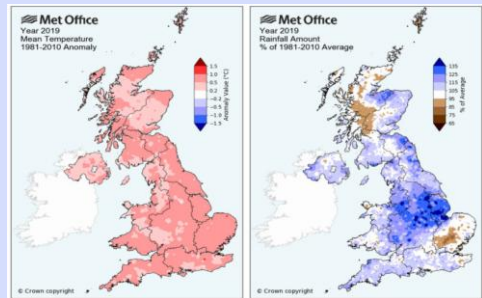
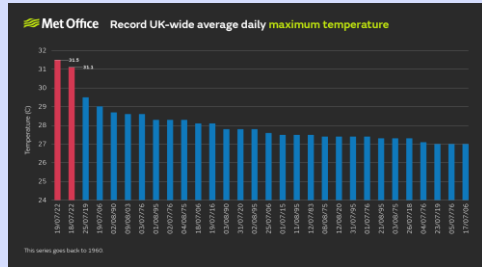
- 1-4.5°C warmer in winter.
- 30% wetter in winter.
- 1-6°C warmer in summer.
- 60% drier in summer, with the SE worst affected.
- The threshold for flash flooding will be met twice as often.

### UNCERTAINTIES

Not known what the full extent of emissions will be. Some countries trying to reduce emissions, whilst other countries increasing with industrialisation.

Natural carbon stores (forests, peat bogs) are now releasing carbon, speeding up climate change.

Melting of ice may switch off the Gulfstream. If this happens, temperatures will drop by 3.4°C and rainfall will drop by 123mm.



## IMPACTS OF CLIMATE CHANGE IN THE UK

### SEA LEVEL RISE

UK sea level has risen by 6.5cm since 1900, but the Met Office says the rate of rise is increasing. They are now rising by 3-5.2mm a year, which is more than double the rate of increase in the early part of last century.

This is exposing more parts of the coast to powerful storm surges and winds, damaging the environment and homes. Around 500,000 homes are at risk from flooding, scientists say.

The UK already spends over £1bn per year on flood defences, however this will have to be increased to ensure defences remain effective. For example, the Thames Barrier will be less effective from 2060 onwards due to sea level rise.



### STORMS AND FLOODS

Current evidence does not show an increase in windspeed during storms. However, the decade, 2009-18 being on average 5% wetter than the 1961-90 average and 1% wetter than 1981-2010. Much larger increases are seen when summers and winters are assessed separately. UK summers during 2009-18 were on average 13% wetter than the 1961-90 average and 11% wetter than 1981-2010, while the figures for winters are 12% wetter and 5% wetter, respectively. This will lead to more flooding within the UK, with associated costs for management and recovery.



### WARMER TEMPERATURES

Rising temperatures will allow for the growing of different crops such as grapes. These have a higher value than some traditional crops. UK plantings of vineyards has increased by 74% over 5 years.

There is however a greater risk of heat related deaths in recent year, with this at 4,000 in 2022 but expected to reach 7,000 by 2050. It is also one of the biggest threats to biodiversity in the country.

## RESPONSES TO CLIMATE CHANGE IN THE UK

### BY THE GOVERNMENT

Pledged to reduce its greenhouse gas emissions to net zero by 2050.

Potential 'Warm Homes Plan' to upgrade millions of homes, installing energy saving measures such as loft and cavity wall insulation, and expanding access to green technologies like solar panels and green technologies.

2030 phase-out date for new petrol and diesel cars.

Increase use of renewable energies to 100% by 2030 with planning restrictions reduced for on-shore wind farms.

### BY THE COUNCIL

Council produced Climate Change Action Plan, goal being zero carbon in 2038.

£1bn of central government funding to set up Bee Network to improve cycling, bus, and tram connections; reducing CO<sub>2</sub> from personal cars and taxis.

Grants are available from Greater Manchester Council to support homeowners in improving boiler efficiency and household insulation.

A low emissions zone was to be introduced in Manchester in 2022, however this was cancelled despite having £60million spent on it due to the pandemic.

### BY SCHOOLS

Some schools have an eco-council, with members going around switching off lights and computers.

Some schools are being fitted with solar panels or getting their energy through green tariff suppliers.

Climate change is an important item on the curriculum, with education allowing individuals to make change.

All schools must have a sustainability coordinator and plan by 2025.

### BY LOCAL INTEREST GROUPS

'Friends of the Earth Manchester' are involved in consultations with local and national government, but also organise events for locals.

This includes bike Friday events to encourage people to become more confident with cycling to and from work, whilst also offering a social opportunity.

Other activities have included pressurising groups to divest from fossil fuel industries, and encourage the government to spend more on improving home insulation grants to improve home energy efficiency.