

# POPULATION AND THE ENVIRONMENT: POPULATION

## GLOBAL POPULATION CHANGE

On the 15<sup>th</sup> November 2022 the UN declared that the global population had increased to 8 billion. Around 80,000 a day are added to the global population. World population growth has been exponential since the 1800s with the most dramatic increase from the 1950s onwards, however, it is now expected to slow down.



## GROWTH RATE AND NET REPLACEMENT RATE

Demographers can calculate the growth rate of a country by multiplying by 100 to get a percentage. For example, if a country has a natural increase of 36 per 1000 of its population this can be converted to a growth rate of 3.6% ( $0.036 \times 100$ ).

**Fertility rate:** The average number of children that each woman of childbearing age will give birth to. A fertility rate of 2, means both parents would be replaced, and the population would be stable.



## INFANT MORTALITY RATE

The infant mortality rate is the number of babies who die before they reach the age of one per 1000 live births. It is a good indicator of the healthcare services available as babies are very vulnerable.

**Fertility rate:** IMR has an impact on the fertility rate. There is a correlation between countries with high IMR and high fertility rate. LICs tend to have higher fertility rates which means families are larger, but it can also lead to a higher IMR.

**Afghanistan** has the highest IMR with 103 per 1000 babies, it also has a high fertility rate of 4.43.

**Niger** has the highest fertility rate in the world with 7 births per woman, it also has the highest birth rate with 46.6 births per 1000 people.

## DEMOGRAPHIC TRANSITION MODEL

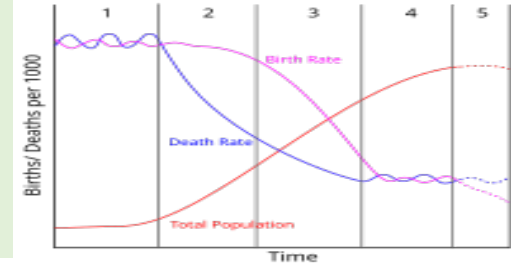
**Stage 1 (High fluctuating):** High birth and death rate and low population.

**Stage 2 (High expanding):** High birth rate but the death rate is falling, and the population is rapidly increasing.

**Stage 3 (Late expanding stage):** Birth rates and death rates decline, and the population is growing quickly, but not as quickly as Stage 2.

**Stage 4 (Low fluctuating stage):** Birth rate and death rate are low, but they fluctuate, and the population growth slows.

**Stage 5 (Decline):** The death rate overtakes the birth rate and the population decreases.



## POPULATION PYRAMIDS

Population pyramids show the age and gender structure of the population.

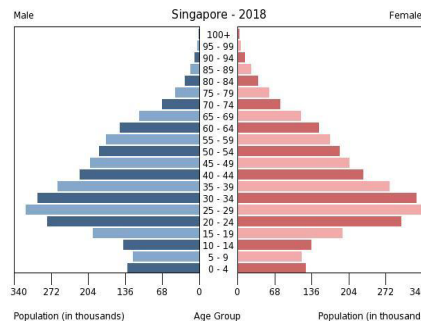
**Narrow base:** Low birth rate.

**Wide base:** High birth rate.

**Tall pyramid:** High life expectancy.

**Bulges:** Years with a higher birth rate.

**Indents:** Years of lower birth rate or higher death rate.



## DEPENDENCY RATIO

Population pyramids divide into 3 age groups: 0-14, 15-65 and 66+. The 15-65 category are the economically active.

The dependency ratio is expressed as:

Dependent population / Economically active x 100.

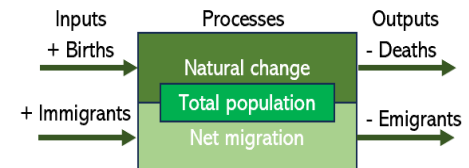
**What is the demographic dividend?** The demographic dividend is a period when the population structure of a country means that there is low dependency. The 0-14 and the 66+ population categories are smaller than the working age population.

## COMPONENTS OF POPULATION CHANGE

**Natural change:** Difference between birth rate and death rate.

**Migration change:** Migration can cause a population to become larger or smaller. Immigrants move into a country and emigrants leave a country.

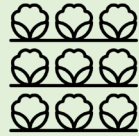
**Net migration rate:** The difference between migrants entering and leaving.



# POPULATION AND THE ENVIRONMENT: FOOD PRODUCTION AND SECURITY

## FOOD PRODUCTION AND CONSUMPTION

Globally, this is uneven. Around 828 million people were undernourished in 2023 – a 2/3s are in Asia. Across the world we have the land available and the means to produce food, however for many reasons, e.g. conflict and political instability, not everyone gets the food they need.

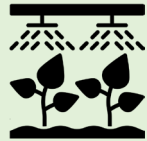


## GAINS IN FOOD PRODUCTION

**The Green Revolution:** Enabled many developing countries to access new, high-yielding crop varieties and farming technologies.

**Technology:** Irrigation techniques, and fertiliser and pesticides have increased crop yields for millions of farmers, but there are environment drawbacks.

**Global trade increase:** The ability to import and export food has strengthened and diversified food supplies.



## GLOBAL PATTERNS OF FOOD PRODUCTION

The continents of Europe, North America and Australia all have enough farmland and farming know-how to provide the food they need for their populations.

**China:** Largest producer of wheat, rice, potatoes and chicken

**India:** Largest producer of bananas

**USA:** Largest produce of beef.



## UNDERNOURISHMENT

**Millennium Development Goals:** Halving the proportion of hungry people worldwide was almost met (in 2015).

**Sustainable Development Goals:** Goal 2 is 'zero hunger' by 2030 – far from being met. One third of all food produced worldwide is still wasted despite global hunger.

2 ZERO HUNGER



## FOOD SECURITY

When the population of a country have enough affordable and nutritious food to eat at all times. 4 main components to this:

**Availability:** A reliable and consistent source of quality food available.

**Stability:** The ability to access and use food resources remains stable.

**Access:** People have enough resources to produce or purchase food.

**Utilisation:** People have the knowledge and the right sanitary conditions to choose, prepare and distribute food in a way that results in food nutrition for all.

## FOOD INSECURITY

Families classed as severely food insecure are mainly in east central and west Africa. Across the world 2.4 billion people experience moderate or severe food insecurity with 900 million facing severe food insecurity according to a recent UN report.

**UK:** It is reported that around 32% of children experience some sort of food insecurity (linked to cost-of-living crisis).



## STRATEGIES FOR FOOD SECURITY

- Biotechnology and genetically modified organisms
- High-yield variety crops
- Hydroponics and aeroponics.
- The New Green Revolution
- Subsidies for farmers
- Food vouchers
- School meal programmes



HYDROPONICS

## GM CROPS AND BIOTECHNOLOGY

Plants and animals are carefully bred to ensure they have specific traits, e.g. maize that is pest/heat tolerant, cows that can produce more milk, or fruit and vegetables that can last longer.

Controversial as many people are concerned about the impacts on health and the Environment.



## HIGH CALORIE INTAKE

Despite millions having an inadequate diet, there are also over 1 billion people who are classed as being obese, which puts significant strain on health services and has increased DALYs.

**DALYs:** Disability-adjusted life years – statistical measurement that quantifies the burden of disease on a population.

## CALORIE DIFFERENCES

A study by Oxford University found the following to have the highest calorie intake:

1. **Bahrain:** 4,012 kcals
2. **USA:** 3,868 kcals
3. **Ireland:** 3,851 kcals
4. **Belgium:** 3,824 kcals



# POPULATION AND THE ENVIRONMENT: AGRICULTURE

## TYPES OF FARMING

**Pastoral:** The rearing of livestock.

**Arable:** The growing of crops.

**Mixed:** A combination of pastoral and arable farming.

**Subsistence:** Small-scale farming to feed own family.

**Commercial:** The growing of crops to make a profit.

**Agribusiness:** Large corporate organisations running farms for huge profits.

**Extensive:** When the size of the farm is very large in comparison to the inputs of money and labour.

**Intensive:** Where the farm size is small in comparison with the large amounts of labour and inputs required.



## PHYSICAL FACTORS AND FARMING

Productive agriculture is dependent on:

- Soils
- Climate
- Relief and aspect

As a result, different types of agriculture are present across the world to try to make the most of the land available for food production.



## SOIL QUALITY AND AGRICULTURE

- Loamy type soils are better for growing crops as they are aerated and retain water and nutrients well
- The pH of the soil is important, e.g. wheat favours soil which has a pH of 5.5-7.5 – farmers need to monitor soil pH or risk crop failure
- Some soils such as clay become waterlogged very easily and this can cause root rot and crop failure



## AGRICULTURAL PRODUCTIVITY

Productivity is a measure of the economic performance of agriculture, and is measured in terms of yield, e.g. how many kg of grain per hectare.

**Total Factor Productivity (TFP):** The ratio of outputs to inputs – the most common measurement.

**Factors affecting productivity:** Weather, animal disease, policy interventions and the economy.

### IMPROVING CROP TFP

- Grow higher yielding crops
- Grow disease resistant crops
- Grow drought/flood tolerant crops
- Use technologies that indicate when to water and add fertiliser

### IMPROVING LIVESTOCK TFP

- Breeding animals for favourable genetic qualities
- Using better animal care
- Using better disease management practices
- Using high quality animal feed

## CLIMATE AND AGRICULTURE

### Temperature:

- In seasonal climates, the temperature will dictate the growing season of crops
- High temperatures can dry out the soil and increase evaporation
- Low temperatures can freeze the soil
- In the UK the growing season needs to be around 3 months long with fairly consistent temperatures otherwise crops may fail



### Precipitation:

- Low levels of rainfall can affect crops with high water content, e.g. pumpkins, causing a failure to grow
- Rainfall patterns are becoming more unpredictable in semi-arid locations such as the Sahel, which can lead to drought and famine
- A monsoon failure in south-east Asia would be disastrous for commercial and subsistence farmers



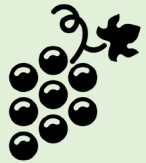
### Wind strength and type:

- Tropical storms can completely destroy crops
- Wind erosion can affect soil fertility leading to desertification



## RELIEF AND ASPECT AND AGRICULTURE

- Some crops grow better than others on a slope, e.g. on the slopes of Etna there are almond and pistachio trees, and vineyards growing grapes
- Slopes can increase the difficulty for ploughing which limits farming to mainly pastoral, e.g. UK upland areas where the main farming is sheep farming
- If a slope is south facing, it will receive a lot of sunlight and warmer temperatures, however it may not have much shade which could cause the soil to dry out and plants to die



# POPULATION AND THE ENVIRONMENT: SOIL AND ZONAL SOILS

## SOIL PROBLEMS

**Soil erosion:** When the top layer of the soil is worn away by the wind or rain.



**Waterlogging:** When the pore spaces between particles of soil are filled with water rather than air.

**Structural deterioration:** Agricultural practices can breakdown the soil through compaction by heavy machinery and through over-cultivation – compacted soil can become impermeable.



**Salinisation:** The build-up of salt in the soil, which can be toxic for plants.

## SOLUTIONS

**Planting:** Lines of trees or hedgerows can reduce wind speeds which reduces wind erosion and evaporation, but trees take a long time to grow, so the effectiveness of this strategy takes years.



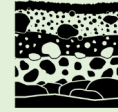
**Contour ploughing:** Reduces overland flow and topsoil being washed away by following the contour of the land rather than ploughing straight up and down. But, heavy machinery is commonly used for this method so compaction can still occur.

**Salinisation:** Soil experiencing salinisation needs to be flushed with lots of water, however this results in the salt entering rivers and groundwater.



## ZONAL SOILS

A zonal soil is a major soil group which covers a wide geographic region – soils are well developed and mature.



## CHERNOZEM SOILS

**Coverage:** An estimated 230 million hectares worldwide – mainly in mid Eurasia and North America.

**Characteristics:** Deep black soils, rich in organic matter and have high nutrient content (e.g. phosphorus and ammonia).

**Structure:** Over one metre deep and is clay-like, which is good at retaining water.

## CHERNOZEM SOILS AND AGRICULTURE

Chernozems are widely farmed due to their high natural fertility and the wide flat expanses of land.

**Russian Steppes:** Crops planted on the chernozem-rich steppe include cereals, oilseed plants and potatoes.

**Russia-Ukraine conflict:** Fears of worldwide cereal crop shortage due to the conflict – this increased the cost of buying goods that contain cereal crop.



## SOIL HORIZONS

**O horizon:** Top, organic layer of soil, made up mostly of leaf litter and humus.

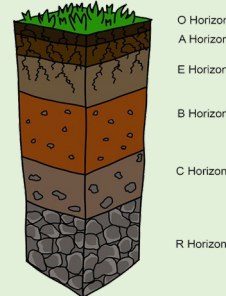
**A horizon:** Topsoil – dark coloured and made of humus mixed with minerals.

**E horizon:** Mostly made of sand and silt – water drips through this layer leaching out minerals.

**B horizon:** Subsoil – contains clay and mineral deposits such as iron.

**C horizon:** Regolith – made of slightly broken up rock.

**R horizon:** Unweathered rock.



## TROPICAL LATOSOL SOILS

**Coverage:** Found in the tropical rainforests – they are the product of a hot, wet climate which has thick forest and vegetation cover.



**Characteristics:** Appear fertile but are not (the nutrients are in the leaf litter, not the soil), Red/brown in colour to the iron content, permeable and wet, lower pH (so slightly acidic)

**Structure:** 20-30 metres deep, with no clearly defined structure due to weathering of the soil.

## LATOSOL SOILS AND SLASH AND BURN AGRICULTURE

As the soil isn't very fertile it can be difficult to grow crops in rainforest areas.

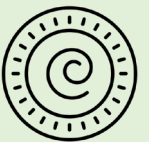
**Slash and burn:** Clearing small areas of vegetation and then burning it to create ash, which then provides nutrients for the soil to increase fertility.



It is also known as 'shifting cultivation' as the land is farmed for 2-3 years and then a new area is selected – this allows both the soil and the forest to recover.



**Indigenous communities:** This style of agriculture supports low numbers of people, e.g. the Kayapo in the Amazon basin. It is a form of subsistence farming, not commercial.



# POPULATION AND THE ENVIRONMENT: INTERNATIONAL MIGRATION

## TYPES OF MIGRATION

In 2020 approximately 281 million people lived outside of their country of birth – this is around 3.6% of the global population.

There are different categories of migrant:

**Immigrant:** Someone who moves into an area.

**Emigrant:** Someone who leaves an area.

**Economic migrant:** A person who has left their country of origin to seek employment in another country. e.g. to work in construction or the health service.

**Asylum seeker:** A person who has fled their country of origin and cannot return for fear of death or persecution – they apply for asylum in a different country.

**Refugee:** A person fleeing dire circumstances in their country of origin, such as civil war or a natural disaster – they may eventually want to return to their home country.

**Undocumented migrant:** Someone who enters or lives in a country without the proper authorisation or documentation – replaces the term 'illegal immigrant' which is seen as dehumanising and contributes to the demonisation of migrants.



## MIGRATION AND DEMOGRAPHICS

In countries such as the UAE there is a large gender imbalance due to migration, with most immigrants being male. Countries reliant on migration, e.g. Singapore tend to have youthful populations as migrants move across with their young families.

## PUSH FACTORS

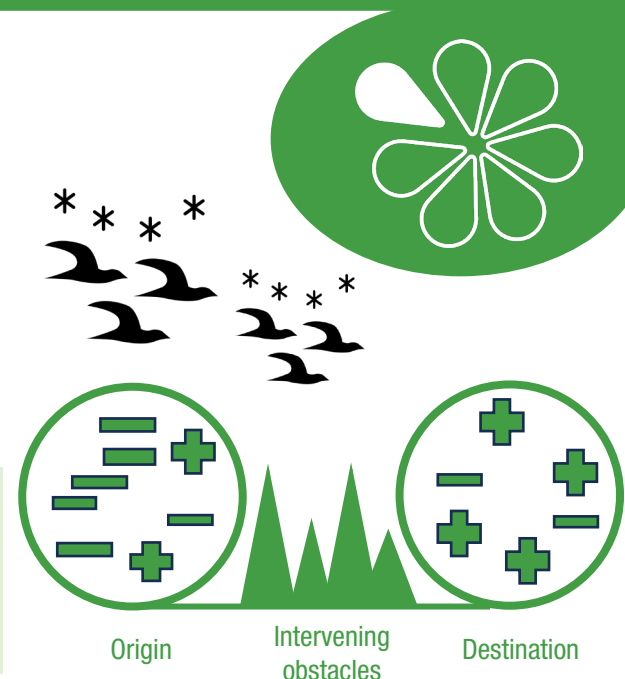
- Wars
- Natural disasters
- Poor medical care
- Lack of jobs
- Desertification
- Political instability
- Hard to access education

## PULL FACTORS

- Better access to schools
- Higher incomes
- Safety
- Perceived quality of life
- Informal and formal employment opportunities
- Better housing

## LEE'S PUSH PULL MODEL OF MIGRATION

Migration is rarely as simple as just looking at the push and pull factors. There are often obstacles which need to be taken into consideration, e.g. family, legal documents and physical features such as deserts and oceans.



	ORIGIN	DESTINATION
<b>BENEFITS OF MIGRATION</b>	<ul style="list-style-type: none"> <li>• The strain on services such as education and healthcare is reduced</li> <li>• Remittances sent home can support families – this can be a very important part of the economy for some less developed economies</li> </ul>	<ul style="list-style-type: none"> <li>• Greater diversity encourages integration and understanding</li> <li>• Job shortages can be filled, e.g. medical staff in the NHS, agricultural labourers and construction workers</li> <li>• Spread of culture, e.g. food and music</li> </ul>
<b>ISSUES LINKED TO MIGRATION</b>	<ul style="list-style-type: none"> <li>• It can lead to a skilled labour shortage, e.g. doctors, teachers and engineers – this is called the 'brain drain'</li> <li>• It can lead to a gender imbalance when more men than women migrate</li> <li>• Can leave behind ageing population – so fewer people to work in agriculture, which can affect food security</li> </ul>	<ul style="list-style-type: none"> <li>• Cultural differences can lead to race tensions – there has been a rise in hate crimes directed at migrant communities in the UK</li> <li>• Strains can be put upon services such as education, healthcare and housing</li> <li>• Diseases such as TB have risen in countries where it has previously been eradicated – this is thought to be due to migration</li> </ul>

# POPULATION AND THE ENVIRONMENT: CLIMATE CHANGE - HEALTH AND AGRICULTURE



## CLIMATE CHANGE AND AGRICULTURE

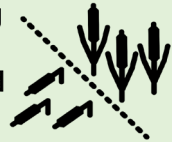
Climate change will have global impacts on agriculture. Almost a billion people will face the direct impacts of climate change with changing weather patterns affecting seasonal farming practices.



## CLIMATE CHANGE AND ASIA-PACIFIC REGION

Asia-Pacific region will be hard hit – warmer temperatures, changing rainfall patterns and sea level rise are predicted, e.g. temperatures hit a record 50.5°C in Churu, India in 2024.

- 60% of people in this region live in rural areas and rely on subsistence farming
- Rising temperatures can affect crop growing seasons and could reduce crop yields



## CROPS AND CLIMATE CHANGE

**Coffee:** Very vulnerable to climate change – coffee growing regions in Brazil, Indonesia, Vietnam and Cambodia will decrease by around 50% by 2050.



**Cashew nuts:** Crop growing areas could increase by 17% as temperatures become warmer, but some areas which already grow them (such as India and Benin) will lose their growing areas as their temperatures become too hot.



**Avocados:** Crops see a fate similar to cashew nuts with an increase in Mexico but a decrease in Peru.



## NEGATIVE IMPACTS

- Increase of pests and insects – and therefore increase in disease risk
- Damage to crops from extreme heat
- Forecasts become less reliable which reduces the ability to plan
- Soil erosion will increase
- Drought and increased moisture stress in some locations
- Increased weed growth
- Increased food and water insecurity

## ANYTHING POSITIVE?

- Increased productivity of some crops from warmer temperatures
- Possibility of growing new crops
- Longer growing seasons
- Decreased moisture stress in some locations

## OZONE DEPLETION

The ozone layer (15-30 km above the Earth) helps to protect us from harmful UV radiation from the sun – however, depletion (from CFCs) means that more UV rays reach the Earth which can have harmful impacts on human health, including a weakened immune system and risk of skin cancer and cataracts.



## SKIN CANCER

Most skin cancers are caused by exposure to the sun. The UV light in sunlight damages the DNA in our skin cells.



Malignant melanoma is a type of skin cancer – cases have increased dramatically since the mid 1970s.

**Australia:** Has the highest rate of skin cancer in the world...

- Skin cancers account for 80% of all new cancers diagnosed each in Australia
- Two out of three Australians will be diagnosed with a form of skin cancer by the age of 70
- Around 2000 Australians die from skin cancer each year

## CATARACTS

Cataracts are a form of eye disease where the eyes look cloudy due to the proteins in the eye lens unravelling – light can no longer reach the retina, affecting sight. UV light exposure can increase the risk of developing cataracts. Increased ozone depletion will increase the risk of cataracts in people of all ages if they spend a lot of time outside.



## RISK FACTORS FOR DISEASES CAUSED BY UV EXPOSURE

**Latitude:** Nearer the equator UV levels are higher.

**Altitude:** The higher the altitude the greater the UV level – very exposed.

**Time of day:** Between 10am and 2pm UV levels are greater.

**Landscape:** Wide open, highly reflective surfaces such as sand and snow have higher UV levels.



# POPULATION AND THE ENVIRONMENT: HEALTH AND DISEASE

## KEY TERMS

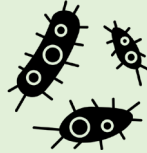
**Health:** Your physical, mental and social well-being and not just the presence or absence of disease.

**Non-communicable disease (NCD):** Chronic disease, not passed on from person to person

**Infectious disease:** Illness caused by a pathogenic microorganism, such as a virus, bacteria or parasite that can be spread to others

**Morbidity:** The rate of disease in a population.

**Mortality:** The state of being subject to death.



## WORLD HEALTH ORGANISATION

The WHO measures global levels of health through two measures:

**HALE (Healthy Life Expectancy):** The average number of years that an individual lives in full health

**DALYS (Disability Adjusted Life Years):** The number of healthy years lost to poor health – it is a measure of morbidity in society.

## TOP 5 CAUSES OF DEATH IN LDES 2023

1. Lower respiratory infection

2. Stroke

3. Ischaemic heart disease

4. Malaria

5. Preterm birth complication

## TOP 5 CAUSES OF DEATH IN HDES 2023

1. Ischaemic heart disease

2. COVID-19

3. Stroke

4. Alzheimer disease

5. Respiratory tract cancers

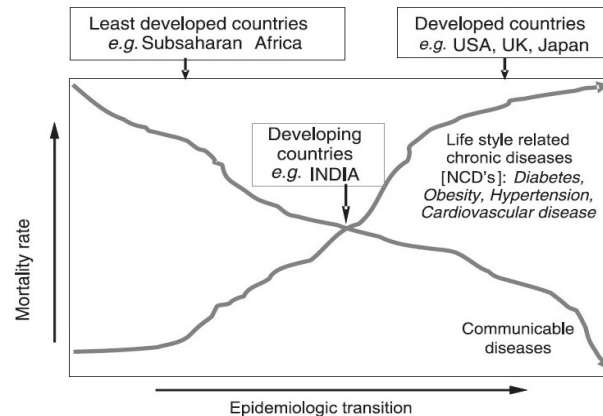
## THE EPIDEMIOLOGICAL TRANSITION

Abel Omran suggested the idea of the Epidemiological Transition in 1971. He noticed that countries transition from infectious diseases being the leading cause of death to more degenerative diseases.

**Four stages of the Epidemiological Transition:**

1. The age of pestilence and famine
2. The age of receding pandemics
3. The age of degenerative and man-made disease
4. The age of delayed degenerative diseases

*Stage 4 was added in the 1980s by public health researchers Olshansky and Ault.*



## NON-COMMUNICABLE DISEASE EXAMPLE: ASTHMA

Asthma is a chronic disease of the air passages of the lungs which inflames and narrows them.

The WHO estimates that 339 million people worldwide have asthma – and that around 25 million DALYS can be attributed to asthma. Approximately 1000 people per day die from asthma around the globe.

**Tiggers:** Air pollution, cleaning chemicals, pollen, animal fur, dust and exercise.

**Treatment:** Asthma cannot be cured, but medication can control asthma, and this is widely available to those who can afford it.



## INFECTIOUS DISEASE EXAMPLE: MALARIA

Malaria is a vector-borne life-threatening disease caused by parasites transmitted to people through the bites of infected mosquitoes.

In 2022, there were an estimated 249 million cases of malaria globally, resulting in 608,000 deaths.

Global cases are decreasing but it is still prevalent in 85 countries.

**Prevention/treatment of malaria:**

The WHO suggests three main interventions:

1. Prompt treatment with anti-malarial medication
2. Use of insecticidal nets by people at risk
3. Indoor spraying with insecticide

**Anti-malarial nets:** Sleeping under nets treated with insecticide is seen as a good low-cost strategy. They have reduced transmissions by as much as 90%.

**Burning mosquito coils:** Also seen as effective but not good for air quality in the home and can lead to respiratory issues.



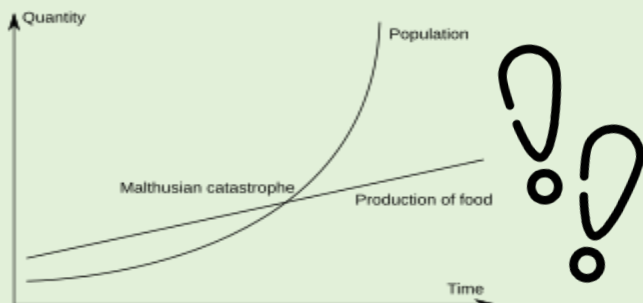
# POPULATION AND THE ENVIRONMENT: PERSPECTIVES ON POPULATION GROWTH



## THOMAS MALTHUS – PESSIMISTIC VIEW

'An Essay on the Principle of Population' (1798): Looked at the relationship between humans and resources and tried to predict what may happen in the future. He stated that food production would increase arithmetically (e.g. 2, 4, 6, 8, 10), whereas population growth will increase geometrically (e.g. 1, 2, 4, 6, 16, 32).

**Carrying capacity:** He believed that there was an 'ultimate limit' to how much the Earth could sustain the human population – the changes in growth rate would mean that the population would exceed the carrying capacity and there would be a catastrophe.



Two sets of checks:

- **Positive checks:** Increased deaths through famine and disease and increased incidence of abortion and infanticide
- **Negative or preventative checks:** Moral restraint (celibacy) and later marriages

**Evidence to support Malthusian Theory**

- Regular famines that occur in countries such as Sudan
- Wars fought over food, water and energy resources
- Water scarcity
- Global pandemics, e.g. COVID-19 and the Spanish flu pandemic following World War I

## ESTER BOSERUP

'The conditions of Agricultural Growth: The Economics of Agrarian Change Under Population Pressure' (1965): She believed that necessity was the mother of invention and that a growing population would stimulate innovation – that a growing population would be resourceful, and that human ingenuity would alter the carrying capacity.

## HAS NECESSITY BEEN THE MOTHER OF INVENTION?

There are many examples that human ingenuity has increased carrying capacity for example:

**The Green Revolution in southeast Asia:**

High-yielding crops were planted and there was an increase in the use of chemical fertilisers. This helped to feed the rapidly growing population.

**Developments in technology:** E.g. the genetic modification of crops to make them resistant to pests and drought or waterlogged conditions.



## AVOIDING A MALTHUSIAN CATASTROPHE

The graph shows how Boserup's theory works in relation to Malthusian theory....

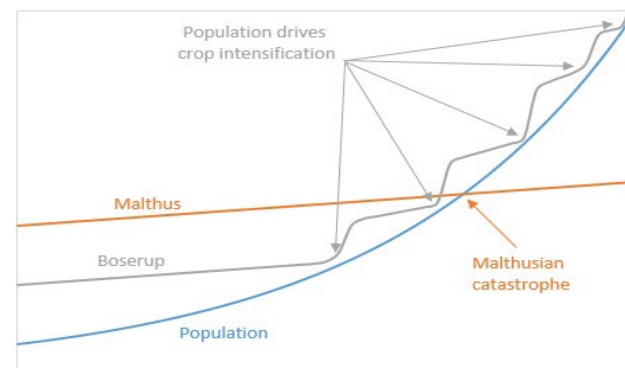
- Boserup felt that when the population was increasing there would be more intensive farming because people would find a way to farm more productively in order to feed the population
- Boserup wrote her theory 167 years after Malthus and much had changed in terms of technology in food production but also the availability and types of contraception



## WAS BOSERUP CORRECT?

Many people globally still believe in Boserup's ideas; however, some criticisms of her theory include:

- More intensive farming has had detrimental impacts on the land, and this isn't taken into consideration.
- It is difficult to prove that population pressures are the cause of agricultural changes and that more intensive farming may have happened without the population pressure



## NEO-MALTHUSIANS

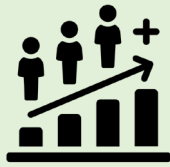
Those that still support Malthusian theory, e.g. Paul Ehrlich and the Club of Rome who wrote 'Limits to growth'.

# POPULATION AND THE ENVIRONMENT: GLOBAL POPULATION PROSPECTS

## PROSPECTS

**Population growth:** Since the Industrial Revolution this has been exponential, however demographers now believe that this is slowing down and that over the 21<sup>st</sup> century the world population is likely to rise by only 50% (rather than the 400% of the previous 100 years).

Population growth has begun to slow down.



## LIFE EXPECTANCY

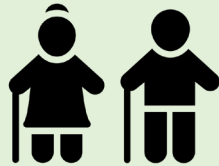
Populations are growing because more people are surviving well into old age.

**LDEs/EEs:** Increased living standards and improved healthcare has meant that life expectancy is increasing rapidly in these countries.

**HDEs:** Life expectancy is already high so is not increasing as much – and in some in HDEs is decreasing slightly.

**Highest life expectancy:** Monaco (Women = 89; Men = 84).

**Lowest life expectancy:** Lesotho (Women = 53; Men = 50).



## CONSENSUS VIEWS

Common themes among demographers include:

- Increasing life expectancy and more challenges due to ageing populations
- Most rapid growth will be in Africa
- Slowing population growth overall – stabilising by 2100
- European and Japanese populations will decline (already seen in Japan, Germany and Italy – Stage 5 of the DTM)
- The TFR will continue to fall across the globe
- India was predicted overtake China as having the largest population size – this happened in 2022



## POPULATION-ENVIRONMENT RELATIONSHIP

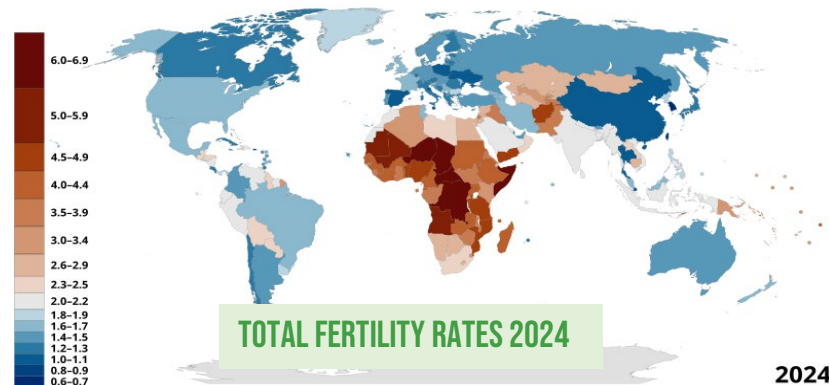
A growing population will have a significant impact on the environment, ecological footprints and carbon budgets. People will need to live more sustainably and consume less to ensure that global supplies remain stable.

## FERTILITY RATES (TFR)

**Declining fertility rates:** In the 1960s the global average was 5 children per woman, this has now halved to 2.1 children per woman is needed to maintain a stable population. The UN has predicted that this will continue to fall and will drop below 1 for some countries

**South Korea:** World's lowest fertility rate – 0.72 children per woman due to long working hours and the high cost of living and housing.

**England and Wales:** Dropped to 1.44 children in 2023 (the lowest rate on record) – due to financial pressures, not feeling ready or having not found the right partner.



## UN ESTIMATES

The UN has modelled a number of population projections depending on TFR. They predict that there is an 80% chance that the population will be between 9.6 and 12.3 billion in 2100.

## INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS (IIASA)

Contrary to the UN, the IIASA argues that the population will peak at 9.4 billion in 2075 and then fall to below 9 billion by 2100.

Their justification is:

- They believe that China's TFR has stabilised
- Nigeria's population will only triple by 2100, whereas the UN believes it will quintuple
- Levels of education will increase, particularly in girls



# POPULATION AND THE ENVIRONMENT: CASE STUDIES

## JAPAN

**Population:** Around 124 million – the 11<sup>th</sup> most populated country in the world.

**Gender balance:** Unbalanced - more women than men.

**Diversity:** The population is not very ethnically diverse, and around 97% of people living there are Japanese, with the remaining 3% including Taiwanese, Chinese, Vietnamese and Nepalese.

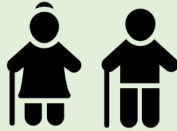
**Physical environment:** This makes the population is unevenly distributed – 75% of Japan is mountainous and 68% has forest cover.

**Urbanisation:** 90.7% of people live in cities (mainly to the south of Japan).

## AGEING POPULATION

**Life expectancy:** 84.9 years (with a healthy life expectancy of 73.4 years). Japan spends 10.9% of its GDP on healthcare and there are excellent sanitary and living standards. Many eat a low-fat diet with lots of fish and vegetables – the obesity rate is very low.

**Fertility rates:** 1.22 children per woman. These have fallen due as women choose to move away from the traditional domestic role to pursue careers.



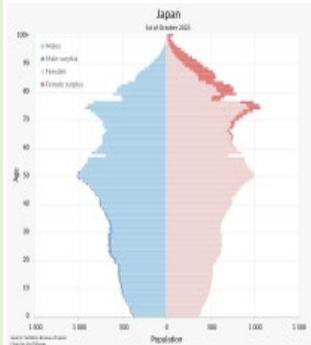
## IMPACTS OF AN AGEING POPULATION

Over 25% of the government budget is spent on pensions and social security for the elderly population. There are now approximately 3.8 million elderly people living with no family support.



## GOVERNMENT RESPONSE

- Encouraging migration particularly of skilled foreign workers
- Encouraging companies to allow employees to work until they are 70 to generate more tax to help pay for social care for ageing population.
- Offering free childcare for a second child to increase TFR.
- Encouraging young people to get married and start families, including launching its own dating app



## ISLINGTON, LONDON

Islington is a mainly residential borough are in inner London...

- 2<sup>nd</sup> most densely populated area in London with a population density of 14,575 people per sq km
- 53<sup>rd</sup> most deprived local authority in England out of 317
- 6<sup>th</sup> most deprived borough in London
- High rates of heart disease deaths compared to other areas of London

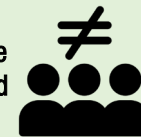


## DEPRIVATION WITHIN ISLINGTON

The neighbourhood of Finsbury Park is the most deprived and Highbury East is the least deprived. 2021 census: 66.2% of households in Finsbury Park experience some form of deprivation, however this had decreased from 76.4% in 2011 – so overall levels of deprivation may be decreasing.

## LIFE EXPECTANCY

Islington men have one of the lowest life expectancies in London at 79, compared to 83 in Kensington and Chelsea.



## AIR QUALITY

**Traffic:** The A1 road runs the borough – lots of congestion leading to a build up of emissions. To the south of the borough is the Ultra Low Emission Zone (ULEZ).

**Healthy Streets Survey:** in 2016 air quality around Islington Schools was judged to be very poor, but by 2018 the air quality had improved significantly due to the creation of 'School Streets' and 'Low Traffic Neighbourhoods'.

School streets are closed becoming pedestrian zones around school opening and closing hours reducing congestion and pollution.



London Borough of Islington Ward Map, 2002-present



## PHYSICAL ENVIRONMENT

25% of Islington is green space, compared to 47% of London as a whole.

