

CAIE Geography Pre-U

2B: The Provision of Food Essential Notes

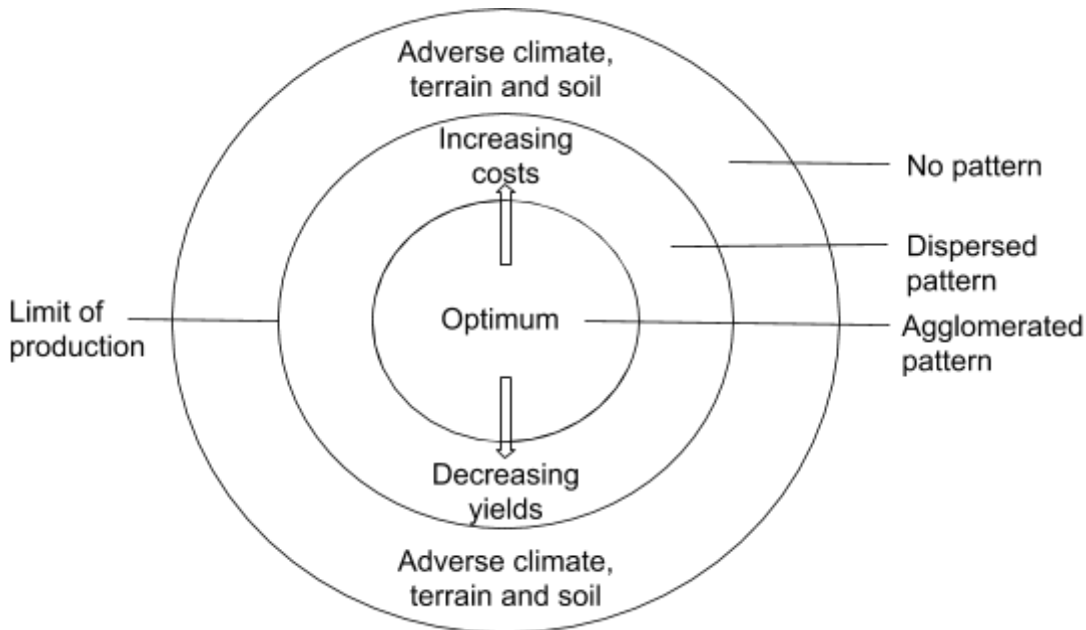


Classification and distribution

Physical constraints on food supply

- Insolation
- Temperature
- Precipitation and water supply
- Wind
- Relief
- Soil nutrient and structure
- Pests and diseases
- Global warming and climate change

The optima limits model



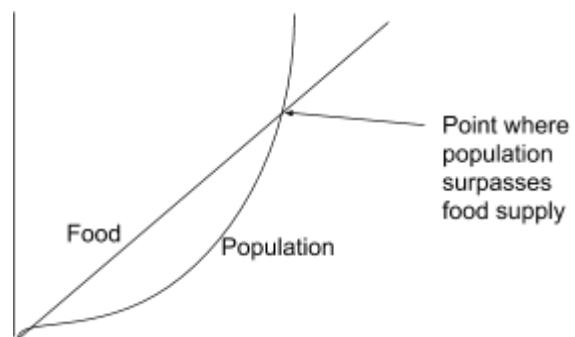
Distribution of agriculture globally

The physical constraints that act upon an environment will determine which method of agriculture is used.

Carrying capacity

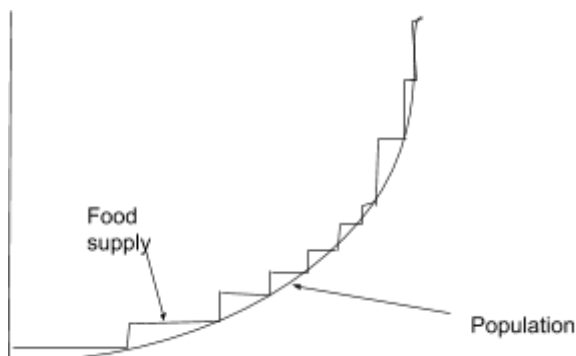
Is the number of people that a region can support with its basic resources.

Malthus suggested that **famine was the inevitable result of population growth**. This is because the population increases **geometrically** (eg. doubles with each generation) whereas food production can only increase **arithmetically** (eg. 2+2+2 etc.).



The **Club of Rome's limit to growth model** suggested that the human population would reach a point where the level of **food supply would determine the size of the human population** by decreasing birth rate and increasing death rate.

Boserup's hypothesis suggested that the **size of the population determines the agricultural methods used**.



The **Brundtland report** promoted sustainable economic development and highlighted the lack of regard for the environment and overconsumption of the human race. It also promoted the idea of a **sustainable carrying capacity** that would allow a decent standard of living for all humans without destroying the environment for future generations.

Commercial vs sustainable

Commercial agriculture is concerned with producing crops or livestock in order to sell the product to **gain a profit**. Subsistence agriculture is producing crops or livestock to be **used by the family or community** with any excess being sold at a market or traded for other goods.

The benefits of commercial agriculture include:

- It's able to **feed the majority of people**.
- **Industrialisation** and **urbanisation** would not have been possible.
- The money made can be used to **buy fertilisers, pesticides and GM crops**.
- People can be **involved in other areas of society**.
- Workers receive a **constant wage**.

The benefits of subsistence farming are:

- People are **living in harmony with the environment**.
- More **sustainable**.
- **Community-focused**.
- People are **self-employed** so are not at risk of being exploited.
- Polyculture so **soil is not damaged** and lower risk of pests or diseases.

Location of major marine fish stocks

- **NW Pacific:** Salmon, Herring, Cod
- **NE Pacific:** Salmon and Cod
- **SE Pacific:** Anchovy due to the upwelling of cold currents
- **NW Atlantic:** Cod is the major fish where the Gulf stream and the Labrador current meet
- **Indian ocean:** Tuna and shrimp, other fish are limited due to the warmth
- **Southern Ocean:** The most productive in the world due to cold, oxygen-rich waters



- **Arctic Ocean:** Not much fish and hard to fish here due to ice cover, little plant life and a fragile ecosystem

Reasons for the locations of marine fish stocks

- Abundance of plankton.
- Shallow coastal waters.
- Marine topography.
- Cold ocean currents.
- Ocean gyres.
- Sublittoral zone.

Reasons for the locations of fish farming

Fish farming is the cultivation of freshwater and saltwater populations under controlled conditions.

- High levels of demand
- Shelter
- Allowed by the government

Supply of food in developed countries

Modernisation of food production after 1950

Involved the **intensification, concentration and specialisation** of agriculture with a focus on the **economics** of farming. It was a period of time where **agribusiness** became prominent, farmers were **increasing yields to the point of overproduction**, there were changes in **land tenure and farm size** and there were **significant landscape changes**.

Agribusiness' are those involved in any of the various parts of the food production chain from the production of machinery and agrichemical to marketing and retail sales.

Modernisation of food production has **increased agricultural yields to the point of overproduction**.

- This is due to higher levels of inputs, **high yield varieties**, the use of **fertilisers and pesticides** and are often driven by **government incentives**.
- Farms have tended to **increase in size and more land is now owned by companies rather than families and communities**.
- The influence of agribusinesses and the increased size of farms have caused **significant landscape changes**.

The post-productionist phase of food production

Represented by the **extensification, dispersion and diversification** of agriculture and an increased focus on **conservation**. **Farm diversification schemes, stewardship schemes** and **bottom-up approaches** were all characteristics of this phase of food production.

Farm diversification schemes were aimed at adding different business activities to traditional farming such as alternative livestock, non-food crops or tourist accommodation.



Stewardship schemes include **milk quotas**, **set aside policies** where farmers are made to set aside areas of land which is not to be farmed, and the **Countryside Stewardship** which brings together all environmental schemes.

Bottom-up approaches are **organic** and **low-impact techniques** aimed at maintaining the quality of the soil.

The neo-productionist phase of food production

The neo-productionist phase of food production involves the use of **subsidies**, **further intensification** of agriculture, the use of **GM crops** and **food insecurity**.

- Governments are giving **subsidies** to farmers so that they are able to make a livable wage whilst still providing the consumers with cheaper produce.
- Further **intensification** of agriculture has occurred mainly in the form of mega-livestock farming which keeps animals inside with all food and water being supplied to them directly.
- **Genetically modified (GM) crops** are where a plant or animal has had its genes altered or selectively bred to encourage favourable characteristics.
- The neo-productionist phase of food production is also characterised by **increased food insecurity**.

The exploitation of marine resources

In order to manage the exploitation of marine resources, many fisheries policies have been put in place. The EU's **Common Fisheries Policy (CFP)** is a set of rules for **managing European fishing fleets** and for **conserving fish stocks**.

More efficient and larger trawlers have been developed that enable them to stay out at sea for longer and they can access new areas of the sea for fishing. This means that more fish can be caught leading to **increased depletion** of marine resources.

The growth of fish farming

Farmed fish are less likely to run out and it is easy to sustain large levels of demand.

Environmental impacts of fish farming include:

- **Disease and parasites** spreading to wild fish.
- **Pesticides** used can affect the ecosystem.
- Damage to seafloor due to build-up of faeces and waste.
- **Loss of genetic diversity**.
- **Seals and sea lions are shot**.
- **Fish caught in the wild provide food for the fish in the farms**.
- **Loss of natural habitat**.
- **Antibiotic** resistance.
- Pollution can over-fertilise the water and **lead to toxic algae blooms**.



Economic impacts of fish farming:

- **Competes with wild fishing.**
- **Drives down the price** of fish.
- Affects the **tourism** industry due to the unpleasant site.
- **Small fisheries lose out.**

Supply of food in the wider world

The use of fertilisers and pesticides

Fertilisers are used to supplement essential plant nutrients to promote optimal production.

Pesticides protect plants from weeds, insect damage and diseases.

The Green Revolution

The Green Revolution is a **set of agricultural practices aimed at increasing agricultural yields and providing food security.**

- **High yield varieties (HYV)** of wheat were developed by Norman Borlaug in Mexico, this then spread to Asia where HYV of rice were produced in the Philippines. The Green Revolution encompasses biochemical changes, irrigation, drainage and terracing schemes and the use of machinery.
- **Biochemical changes** allowed crops to be grown in a **reduced timeframe** and with an **increased yield**. Biochemical changes also involve the increased use of fertilisers and pesticides which can harm wildlife and lead to resistance.
- **Irrigation, terracing and drainage schemes** increase the area of cultivable land, allow **more water-intensive farming to take place** and makes the land more suitable for agriculture.
- The **increased use of machinery** allows for **faster planting, harvesting and processing of crops**, it also requires a smaller workforce so can increase development.

Land reform

Land reform is a **purposive change in the way that agricultural land is held or owned, the methods of cultivation, or the relation of agriculture to the rest of the economy.** It provides land to those who otherwise wouldn't have been able to own it and **small farms in developing countries tend to be more productive.**

Land grabs

Land grabs are **large scale land acquisitions that involve the buying or leasing of land in developing countries** by domestic companies, TNCs, governments or individuals.

The social, economic and environmental implications of the commercialisation of agriculture

Social implications include:

- **Improving standards of living** due to profits being earned from cash crops.
- Farming becomes more individual and **communities deteriorate.**



Economic implications include:

- **Fluctuations** of cash crop prices.
- **Improvements to the country's GDP.**
- **Smallholders could become indebted.**

Environmental implications include:

- Monocultures can **damage soil quality.**
- Not as careful about managing the environment **sustainably.**
- Profits used to buy **fertilisers and pesticides** which further damages the environment.

Alternative and appropriate technology

Intercropping and polyculture involves the **planting of different species** of plants on the same land at the same time.

Post-harvest losses also need to be addressed in order to secure food security. This can be done either during **harvesting, drying, or storage** such as metal silos.

Hydroponics involves the growing of crops in water and nutrient solutions rather than in soil.

The globalisation of production and supply

Increasing demand for food

In 1915 the population was 1.8 billion, now it is around 7.5 billion and by 2050 the population is expected to be 9.7 billion. It is estimated that the **demand for food would increase by 70-100% by 2050.** There is also a huge issue in the distribution of food worldwide. In 2010, the world was **producing 20% more food than was actually needed** worldwide.

Food security

The availability of food in a given area and the ability of all individuals to access food supplies.

Ethical issues of food supply in the 21st century

- **The exploitation of migrant labour:** Migrants often pay agents to find them work in agriculture in other countries like the UK. The food industry relies heavily on licensed gangmasters to supply manual labour. Some migrants are only just able to meet their debt repayments as their wages are so low. They may also face poor working conditions, 'forced labour' and other forms of exploitation.
- **Religious and cultural differences:** Increased globalisation and increased development within countries have changed the dietary patterns in many countries from predominantly cereals to increased levels of meat and dairy as well as restaurants. This has caused increased levels of obesity as well as other health issues.
- **The exploitation of animals:** To increase food supply animals in intensive farms are being kept in cramped conditions. They have also undergone genetic modification.
- **Introduction of GM crops:** These can interbreed with crops in neighbouring farms, these farms can potentially be sued by the companies who developed the crops (Monsanto is an



example of this). Some farmers can't compete against farms who grow GM crops and therefore go out of business. The long term effects of GM crops on humans and the environment isn't known yet.

- **Obesity in the UK:** The percentage of adults in the UK who are overweight has roughly doubled since the 1980s. This is due to the increased production of cheap, fast food.

Environmental issues of food supply in the 21st century

- **Deforestation:** the clearing of forests for agriculture has increased as populations and demand have increased.
- **Tropical prawn fisheries:** It has become increasingly industrialised and commercialised. Vast monocultures increase susceptibility to disease.
- **Global warming and food miles:** The transport of food is contributing to global warming.
- **Water pollution:** The use of fertilisers and pesticides can contaminate water supplies, killing aquatic life and compromising humans water supply.

Economic issues of food supply in the 21st century

- **Fairtrade:** Promotes development in poorer countries by giving farmers a better wage.
- **Commercialisation:** Cash crops can generate more income for farmers and the country. Although this can increase the standard of living it can also damage the environment and can decrease the amount of food produced and so can increase the levels of food insecurity.
- **TNCs:** Can be involved in all stages of food production. Investing in countries can bring positive effects, however, they can also exploit the workforce and end up removing the products and the profits gained.

Political issues of food supply in the 21st century

- **Role of TNCs in relation to agricultural aid:** TNCs often speculate of food markets which cause the price of food to rise. When food aid is given by NGOs, it is often bought from TNCs who themselves bought it from farmers at much lower prices.
- **Role of NGOs in relation to agricultural aid:** NGOs provide longer-term agricultural assistance aiming to improve the productivity of agricultural land in developing countries as well as providing emergency food aid. For example, after the 2010 Haiti earthquake, the FAO provided assistance by distributing seeds, fertilisers and tools, as well as reinforcing irrigation channels and river banks to prevent flooding.
- **Food aid:** Food aid undercuts local prices of farmers and so can cause farmers to go out of business. This creates a dependency on food aid. Food aid also often comes with political agendas and is normally driven by exporters not what is needed on the ground.

