

Oxford Revise | Geography | Answers

Chapter 29 Strategies to achieve food security

All exemplar answers given are worth full marks.

1

(a)

(i) Sustainable food production avoids damaging natural resources, provides good quality produce, and brings social and economic benefits to local communities.

(ii) D

(iii) 1 Food is produced without the use of agrochemicals such as fertilisers and pesticides.

2 It is more expensive because both production and labour costs are higher.

(iv) Currently, a staggering one-third of all food produced globally is wasted or lost. Practical measures, such as the use of more efficient refrigerated food storage and distribution, could help to reduce food waste and losses. The use of clearer and more sensible 'use by' food labelling and using sealed plastic bags for fresh produce will also help to reduce waste.

(b)

(i) The Green Revolution was a strategy introduced in the 1960s where scientists aimed to increase food yields in LIDCs by introducing cross-bred animals and high yielding varieties (HYVs) of rice and wheat. This was often only possible with the use of agrochemicals, irrigation, and mechanisation.

(ii) 1 Hybrid, high-yielding varieties (HYVs) of miracle rice were ten times more productive than traditional varieties.

2 Cross-breeding of animals improved their tolerance of difficult environmental conditions like aridity.

(iii) 1 Poorer farmers took out loans to buy HYVs and agrochemicals which put them into debt, meaning that they lost their land.

2 Only richer farmers could afford mechanisation. This increased unemployment and led to rural depopulation.

(c) This question is level-marked:

Level	Marks	Description
3	5–6	<ul style="list-style-type: none"> • Thorough knowledge, understanding or analysis of the issue, process or concept. • Uses well-developed ideas and line of reasoning is clear and logically structured. • Information presented is relevant and substantiated.
2	3–4	<ul style="list-style-type: none"> • Reasonable knowledge, understanding or analysis of the issue, process or concept. • Uses developed ideas and line of reasoning with some structure. • Information presented is mostly relevant and supported by some evidence.
1	1–2	<ul style="list-style-type: none"> • Basic knowledge, understanding or analysis of the issue, process or concept. • Uses simple ideas with no developed points made. • Information is basic, unstructured, and supported by limited evidence.
	0	No response or no response worth of credit.

Example answer: *The Green Revolution introduced by scientists in the 1960s aimed to increase the amount of food available in LIDCs. They developed hybrid, high-yielding varieties (HYVs) of rice and wheat, with ‘miracle rice’ proving to be a staggering ten times more productive than traditional varieties. They successfully cross-bred animals to improve their tolerance of difficult environmental conditions, such as aridity. There were advances in water control and irrigation. The Green Revolution also introduced mechanisation and artificial fertilisers, herbicides, and pesticides which doubled farm yields.*

The scheme did cause economic and social problems. Poorer farmers took out loans to buy HYVs and agrochemicals and many of them got into debt as a result. Education was needed to ensure productive cultivation of HYVs, given their special agrochemical and irrigation requirements, and many of the poor, traditional farmers did not have the necessary expertise to be successful. Only richer farmers could afford mechanisation, which in turn increased unemployment and rural depopulation.

- (d) Biotechnology is the controversial modification of products or processes, including the development of genetically modified (GM) crops. These produce higher yields, use fewer chemicals, and reduce CO₂ emissions. GM crops are widely grown, particularly in the USA, Brazil, and Argentina. For example, in terms of hectares, in 2019, 74% of the world’s soya beans were GM. Biotech crops have increased productivity by over 800 million tonnes and have lifted an estimated 65 million people out of poverty.
- (e) The ‘New’ Green Revolution technology can be used to increase food supply in a more sustainable and environmentally friendly way compared to the original Green Revolution of the 1960s. The new technology adopts methods such as water harvesting, collecting, and storing water, soil conservation, and improved seeds and livestock.

2

- (a) Fairtrade is an international movement that sets standards for trade and environmentally friendly production, particularly in LIDCs and EDCs. It helps to invest in local development projects and encourages participation in community cooperatives to ensure that farmers get a fair price for their produce by cutting out the ‘middle men’.
- (b) This question is level-marked:

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3	5–6	<ul style="list-style-type: none"> • Thorough knowledge, understanding or analysis of the issue, process or concept. • Uses well-developed ideas and line of reasoning is clear and logically structured. • Information presented is relevant and substantiated.
2	3–4	<ul style="list-style-type: none"> • Reasonable knowledge, understanding or analysis of the issue, process or concept. • Uses developed ideas and line of reasoning with some structure. • Information presented is mostly relevant and supported by some evidence.
1	1–2	<ul style="list-style-type: none"> • Basic knowledge, understanding or analysis of the issue, process or concept. • Uses simple ideas with no developed points made. • Information is basic, unstructured, and supported by limited evidence.
	0	No response or no response worth of credit.

Example answer:

1 Climate; regions experiencing extreme temperatures and rainfall struggle to produce food

2 Technology; in ACs, mechanisation and agribusiness give high levels of productivity

3 Pests; insects, such as locusts, devastate food crops, and diseases in animals are spreading north and

south from the Tropics.

(c) Appropriate technology is suited to the needs, skills, knowledge, and wealth of local communities and their environment. Appropriate technology projects are often set up by NGOs and charities. These are small-scale, low-tech projects using local skills and materials to maximum effect. Examples include water harvesting, local irrigation schemes, or crop processing, such as de-husking coffee beans using bicycle power.

(d) This question is level-marked:

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1	1–2	<ul style="list-style-type: none"> • Basic knowledge, understanding or analysis of the issue, process or concept. • Uses simple ideas with no developed points made. • Information is basic, unstructured, and supported by limited evidence.
	0	No response or no response worth of credit.

Example answer: *Permaculture is a sustainable, productive, non-polluting, and healthy system of food production that follows the patterns and features of natural ecosystems. It involves harvesting rain water, organic gardening, crop rotation, and managing woodland. Organic farming where crops are grown and rearing livestock without the use of agrochemicals are the most obvious and appreciated methods of increasing sustainable food supplies. Both production and labour costs are higher, which makes the produce more expensive. Until the present cost of living crisis, this has not proved to be an issue for wealthier environmentally conscious consumers. Organic farming also reduces 'food miles' and our carbon footprint with the growth of Pick Your Own and farm shops producing seasonal foods. Organic farming often produces food that supermarkets will not accept because of their strange shapes and sizes. If these foods are not sold locally, they are thrown away, contributing to food waste.*

(e) This question is level-marked:

Level	Marks	Description
3	6–8	<ul style="list-style-type: none"> • Thorough knowledge, understanding or analysis of the issue, process or concept. • Uses well-developed ideas and line of reasoning is clear and logically structured. • Information presented is relevant and substantiated.
2	3–5	<ul style="list-style-type: none"> • Reasonable knowledge, understanding or analysis of the issue, process or concept. • Uses developed ideas and line of reasoning with some structure. • Information presented is mostly relevant and supported by some evidence.

Level	Marks	Description
1	1–2	<ul style="list-style-type: none"> • Basic knowledge, understanding or analysis of the issue, process or concept. • Uses simple ideas with no developed points made. • Information is basic, unstructured, and supported by limited evidence.
	0	No response or no response worth of credit.

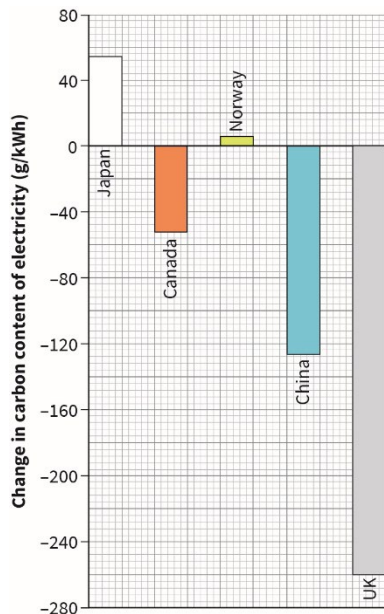
Example answer: *There are issues with producing food sustainably. Farming organically without the use of artificial fertilisers and pesticides is environmentally friendly, but the production and labour costs make the produce more expensive. At a time when there is a major cost of living crisis and very high food inflation, organic food is too expensive for many people. Eating food produced locally reduces ‘food miles’ and reduces the cost of transporting food from abroad when it is not in season. Food from abroad is often transported by plane and so contributes to carbon emissions affecting the world’s climate. Urban gardening has meant food can be obtained relatively cheaply from pieces of waste ground, very often in deprived urban areas. This has the additional advantage that, as well as creating some jobs, it makes the urban areas more attractive, attracts wildlife, and contributes to peoples’ quality of life and community spirit. Permaculture is a sustainable, productive, non-polluting, and healthy system of food production following the patterns and features of natural ecosystems. It involves harvesting rain water, crop rotation and managing woodland. Sustainable fishing sets limits to the amount of a particular species of fish that can be caught and monitors fish breeding and fishing practices. The aim is to reduce the problem of overfishing. The FAO estimates that 87% of the world’s fisheries are over-exploited. Intensive fish farming using chemicals has become very popular in recent years, but it is now known that fish farms can harm ecosystems and spread diseases to wild fish populations.*

3

(a)

(i) 315g/kWh

(ii) The bar chart should be completed as below.



(iii) The UK changed its 'energy' by reducing its dependence on fossil fuels for electricity generation, using more low carbon alternatives instead. There has also been the use of nuclear power, although many nuclear power stations have been decommissioned and a new one is still being built. The use of renewables is most likely to account for the change. For example, the UK is an island nation, and one of the windiest in Europe, so onshore and especially offshore wind farms are increasingly being used. In 2020 wind power accounted for almost 25% of the UK's electricity demand.