



GEO.KS312 Food Security Case Study: Almeria's Greenhouse Agriculture

AQA 8035 · Calculators not allowed · about 40 minutes

Total Marks

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Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** State the region and country where Almeria's intensive greenhouse agriculture is located.

(Total for Question 1 is 1 mark)

- 2** State the local nickname used for the large area of plastic-covered greenhouses around Almeria.

(Total for Question 2 is 1 mark)

- 3** Give ONE typical vegetable crop grown year-round in Almeria's greenhouses.

(Total for Question 3 is 1 mark)

- 4** State how the greenhouses around Almeria mainly save water compared with older irrigation methods.

(Total for Question 4 is 1 mark)

- 5** State ONE main source of water used to irrigate Almeria's greenhouses.

(Total for Question 5 is 1 mark)

- 6** Give ONE other water source increasingly used for Almeria's greenhouses besides aquifers.

(Total for Question 6 is 1 mark)

7 State roughly the scale of greenhouse coverage in the Almeria area, using the common order-of-magnitude description often given in reports.

(Total for Question 7 is 1 mark)

8 State ONE economic benefit of Almeria's greenhouse agriculture for Spain or the local area.

(Total for Question 8 is 1 mark)

9 State ONE environmental disadvantage associated with the intensive plastic greenhouse area around Almeria.

(Total for Question 9 is 1 mark)

10 State ONE social issue linked to labour on Almeria's greenhouse farms.

(Total for Question 10 is 1 mark)

11 State ONE visual or landscape impact caused by the sea of plastic around Almeria.

(Total for Question 11 is 1 mark)

12 State ONE way that greenhouse production in Almeria helps UK consumers.

(Total for Question 12 is 1 mark)

- 13** The table below shows fictional export volumes (in thousand tonnes) of vegetables from the Almeria greenhouse area to international markets in three selected years. Use the table to answer parts a to d.

Year	Export volume (thousand tonnes)
2010	820
2015	1,050
2020	1,260

- a) Calculate the increase in export volume from 2010 to 2020. (1 mark)
b) Calculate the percentage increase from 2010 to 2020, to one decimal place. (2 marks)
c) Describe the pattern shown by the export volumes between 2010 and 2020. (1 mark)

(a) Calculate the increase in export volume from 2010 to 2020 using the table given. (1)

.....

(b) Calculate the percentage increase in exports from 2010 to 2020, to one decimal place. (2)

.....

(c) Describe the pattern shown by the export volumes between 2010 and 2020. (1)

(Total for Question 13 is 4 marks)

14 Evaluate the success of Almeria's greenhouse agriculture in increasing food supply. Use named facts and figures from the Almeria case study where relevant, and give a supported overall judgement.

'Almeria's intensive greenhouses are a successful strategy for increasing food supply.' To what extent do you agree?

(Total for Question 14 is 12 marks)

Mark scheme · GEO.KS3 12 Food Security Case Study: Almeria's Greenhouse Agriculture

Question 1

- **B1** Almeria, Andalusia, Spain
- **Answer: Almeria, in Andalusia, southern Spain.**

Question 2

- **B1** the 'sea of plastic' (la mar de plastico) or sea of plastic
- **Answer: The 'sea of plastic'.**

Question 3

- **B1** e.g. tomatoes, peppers, cucumbers, or courgettes
- **Answer: Tomatoes.**

Question 4

- **B1** by using drip irrigation which delivers water directly to plant roots
- **Answer: By using drip irrigation which delivers water directly to plant roots.**

Question 5

- **B1** groundwater from aquifers
- **Answer: Groundwater from aquifers.**

Question 6

- **B1** desalinated seawater
- **Answer: Desalinated seawater.**

Question 7

- **B1** tens of thousands of hectares (e.g. around 30,000 to 40,000 hectares)
- **Answer: Tens of thousands of hectares (commonly quoted around 30,000 to 40,000 hectares).**

Question 8

- **B1** income from exports or creation of local jobs
- **Answer: Export income from year-round vegetables.**

Question 9

- **B1** aquifer depletion, plastic waste, or landscape/visual pollution
- **Answer: Aquifer depletion.**

Question 10

- **B1** low pay or poor working conditions for migrant labour
- **Answer: Low pay and poor working conditions for many migrant workers.**

Question 11

- **B1** large areas covered in white plastic changing the natural coastal and rural landscape
- **Answer: Large tracts of countryside covered in white plastic that alter the natural landscape.**

Question 12

- **B1** provides a supply of fresh vegetables out of season in the UK
- **Answer: It provides fresh vegetables to the UK year-round, including out-of-season produce.**

Question 13

- (a) **M1** 1,260 - 820 seen
- **(a) Answer: 440 thousand tonnes.**
- (b) **M1** 440 / 820 seen or equivalent
- (b) **A1** 53.7% cao
- **(b) Answer: 53.7%.**
- (c) **B1** exports increased steadily from 820 thousand tonnes in 2010 to 1,260 thousand tonnes in 2020
- **(c) Answer: Export volumes increased steadily between 2010 and 2020, rising from 820 to 1,260 thousand tonnes.**

Question 14

- **Level 1** (1-3): A few relevant points are made about Almeria's greenhouses with limited detail, or reasons are listed without development. A simple judgement may be offered with little supporting evidence.
- **Level 2** (4-6): Several relevant points are made about how the greenhouses increase food supply and about negative impacts, with some named facts or figures. There is an attempt to balance strengths and weaknesses and a conclusion is given that is supported but may lack depth.
- **Level 3** (7-9): Detailed, balanced evaluation that refers to named features and figures from the Almeria case study. Strengths and limitations are weighed clearly, implications for food supply are analysed, and a justified, well-supported overall judgement is reached.
- **Indicative content:**
 - Strengths: very high, intensive year-round production of tomatoes, peppers and other vegetables increases total food supply and extends the season beyond local growing periods, supplying European markets.
 - Strengths: the large scale (tens of thousands of hectares, often quoted around 30,000-40,000 ha) and high export volumes have supplied significant quantities of fresh produce to international markets, improving food availability.
 - Strengths: efficient drip irrigation under plastic reduces evaporation compared with surface irrigation, increasing water-use efficiency per unit yield and allowing reliable production in a semi-arid climate.
 - Limitations: heavy reliance on groundwater has led to aquifer depletion and falling water tables in parts of Almeria, which threatens the long-term sustainability of supply.
 - Limitations: desalination is increasingly used but is energy intensive and expensive, which raises production costs and environmental impact and may limit long-term scalability.
 - Limitations: extensive plastic use generates waste management problems and visual pollution, and plastic degradation can harm soils and marine environments if not properly handled.
 - Limitations: social issues, including reliance on low-paid migrant labour and seasonal employment, mean benefits are unevenly distributed and may not improve local food security for all residents.
 - Balance and judgement: while the greenhouses have clearly increased the quantity and seasonality of vegetable supply to European consumers and generated export income, the environmental costs (aquifer loss, plastic waste) and social concerns cast doubt on sustainability unless managed.
 - A well-supported conclusion should judge whether increased short- to medium-term food supply outweighs the environmental and social costs, and may argue that the system is successful for boosting supply now but risky for long-term sustainable food security unless reforms (better water management, plastic recycling, fair labour practices) are implemented.