



GEO.HU18 Small-Scale Sustainable Food Supply: Urban Farming in Kenya

AQA 8035 • Calculators not allowed • about 40 minutes

Total Marks

--

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Define the term 'appropriate technology' as used in small-scale urban farming projects in Nairobi, Kenya.

(Total for Question 1 is 1 mark)

- 2** Define the term 'permaculture' in the context of community gardens in Nairobi informal settlements.

(Total for Question 2 is 1 mark)

- 3** Give one example of an urban farming technique used in Nairobi informal settlements, such as those around Kibera and Mathare.

(Total for Question 3 is 1 mark)

- 4** Describe how a sack garden scheme works in an informal settlement in Nairobi, Kenya, including soil, watering and crop choices.

(Total for Question 4 is 2 marks)

- 5 Compare, using two clear points, small-scale sack gardens run by community groups in Nairobi and a large-scale engineered suburban irrigation scheme for peri-urban farms outside Nairobi.

(Total for Question 5 is 4 marks)

- 6 Describe two groups who benefit directly from community-run sack garden and vertical growing schemes in Nairobi informal settlements, and explain briefly how each group benefits.

(Total for Question 6 is 2 marks)

- 7 Give two limitations of small-scale sack garden schemes in Nairobi when considering their impact on the city's overall food supply.

(Total for Question 7 is 2 marks)

- 8 Explain how a small drip irrigation setup can be used with sack gardens or vertical planters in Nairobi to improve water efficiency. Include at least two linked points.

(Total for Question 8 is 4 marks)

- 9 A typical sack garden in Nairobi yields about 2.5 kg of vegetables per month. If a household needs 20 kg of fresh vegetables per month, calculate the percentage of the household need met by one sack garden. Give your answer to one decimal place.

(Total for Question 9 is 2 marks)

10 State one environmental benefit of urban sack gardens and vertical growing in Nairobi.

(Total for Question 10 is 1 mark)

11 Give one social benefit of community-run urban farming schemes in Nairobi informal settlements.

(Total for Question 11 is 1 mark)

12 Explain two reasons why small-scale urban farming schemes in Nairobi depend on community organisation and training to succeed.

(Total for Question 12 is 4 marks)

13 Suggest one way a city-wide council programme could help scale up the benefits of sack gardens across Nairobi without replacing community ownership.

(Total for Question 13 is 1 mark)

14 Assess the value of small-scale, sustainable food schemes such as sack gardens and vertical growing in Nairobi compared with large-scale engineered food-supply schemes. Use named references to Nairobi initiatives and consider advantages and limitations in your answer.
'Assess the value of small-scale, sustainable food schemes compared with large-scale schemes.'

(Total for Question 14 is 6 marks)

Mark scheme · GEO.HU18 Small-Scale Sustainable Food Supply: Urban Farming in Kenya

Question 1

- **B1** technology that is low-cost, easy to use and maintain, and suitable for the local community and environment, oe
- **Answer: Technology that is low-cost, easy to use and maintain, and suitable for the local community and environment.**

Question 2

- **B1** a design approach that mimics natural ecosystems to grow food sustainably, using techniques like composting and crop diversity, oe
- **Answer: A design approach that mimics natural ecosystems to grow food sustainably, using techniques like composting and crop diversity.**

Question 3

- **B1** e.g. sack gardens, vertical pallet gardens, small drip irrigation systems, oe
- **Answer: Sack gardens.**

Question 4

- **B1** a sack or bag is filled with compost and soil and placed on a balcony, rooftop or small patch of ground, oe
- **B1** small, fast-growing vegetables and herbs are planted and watered by hand or with a simple drip system, using recycled water and organic fertiliser, oe
- **Answer: A sack or bag is filled with compost and soil and placed on a balcony, rooftop or small patch of ground; small, fast-growing vegetables and herbs are planted and watered by hand or with a simple drip system, using recycled water and organic fertiliser.**

Question 5

- **B1** point of comparison 1: scale and output, e.g. sack gardens produce small amounts for household consumption while large irrigation schemes produce much larger commercial crops, oe
- **B1** linked detail for point 1, e.g. sack gardens increase food security for a family but cannot supply city-wide demand, whereas irrigation can support market supply, oe
- **B1** point of comparison 2: cost and maintenance, e.g. sack gardens use low-cost materials and local labour while large irrigation requires major capital, technical expertise and ongoing energy, oe
- **B1** linked detail for point 2, e.g. large schemes can fail if funds or technical skills are lacking, while sack gardens are resilient but limited in reach, oe
- **Answer: Sack gardens are small and produce enough for household consumption, increasing local food security but not supplying the whole city, whereas large irrigation schemes produce much larger commercial crops for markets. Sack gardens are low-cost and maintained by local people using simple skills, while large irrigation requires major capital, technical expertise and ongoing energy and maintenance.**

Question 6

- **B1** low-income households, e.g. they gain fresh vegetables improving food security and nutrition, oe
- **B1** women and youth in the community, e.g. they can earn small amounts of income selling surplus produce and gain skills, oe
- **Answer: Low-income households gain fresh vegetables which improve food security and nutrition. Women and young people in the community can earn small incomes by selling surplus produce and develop practical skills.**

Question 7

- **B1** limited output, e.g. each sack yields a small quantity so schemes cannot meet a large city's total food demand, oe
- **B1** dependence on training and organisation, e.g. without ongoing community coordination and knowledge the schemes can fail, oe
- **Answer: Limited output from each sack means the schemes cannot meet Nairobi's total food demand. They also depend on training and community organisation, so without continued support they may fail.**

Question 8

- **B1** a drip system delivers small amounts of water directly to the plant roots, reducing evaporation and runoff, oe
- **B1** linked detail, e.g. this means less water is needed compared with watering by hand or overhead sprinklers, oe
- **B1** it can be fed from collected greywater or a small reservoir and run by gravity or a low-energy pump, reducing the need for mains water and energy, oe
- **B1** linked outcome, e.g. more reliable watering increases yields and reduces crop failure during dry spells, benefiting household food security, oe
- **Answer: A drip system delivers small amounts of water directly to plant roots, reducing evaporation and runoff so less water is needed than with hand-watering. It can use collected greywater or a small gravity-fed reservoir, lowering mains water and energy use, and reliable watering increases yields and reduces crop failure during dry spells.**

Question 9

- **M1** 2.5 / 20 seen or 2.5 / 20 x 100 seen, oe
- **A1** 12.5% cao
- **Answer: 12.5%.**

Question 10

- **B1** e.g. reduced food transport miles if food is grown locally, or increased green space and biodiversity in dense settlements, oe
- **Answer: Reduced food transport miles because food is grown locally.**

Question 11

- **B1** e.g. improved community cohesion as people work together, or new skills and empowerment for participants, oe
- **Answer: Improved community cohesion as neighbours work together on gardening projects.**

Question 12

- **B1** community organisation ensures tasks like watering, composting and pest control are shared and sustained, oe
- **B1** linked detail, e.g. without agreed schedules or leaders, plots can be neglected and yields fall, oe
- **B1** training provides the technical know-how for composting, seed selection and simple irrigation, oe
- **B1** linked detail, e.g. with poor technique plants fail and the scheme loses credibility, reducing participation, oe
- **Answer: Community organisation shares and sustains tasks such as watering, composting and pest control so plots are maintained; without agreed arrangements plots can be neglected and yields fall. Training provides technical know-how for composting, seed choice and simple irrigation; without training plants may fail and participation drops.**

Question 13

- **B1** e.g. provide free training and starter kits, offer microgrants for materials, or create a seed-exchange and compost-collection service that supports many community groups, oe
- **Answer: Provide free training and starter kits to community groups and run a compost-collection and seed-exchange service to support many local sack garden projects.**

Question 14

- **Level 1** (1-2): Simple statements about small-scale schemes or large-scale schemes with little or no development, limited use of the Nairobi context and no clear judgement.
- **Level 2** (3-4): A developed answer that discusses advantages and limitations of small-scale schemes and of large-scale schemes with some reference to Nairobi examples; offers a partial judgement supported by evidence.
- **Level 3** (5-6): A detailed, balanced assessment that uses named Nairobi initiatives (e.g. sack gardens, vertical growing in Kibera/Mathare) to weigh benefits such as food security, low cost and environmental value against limitations like limited output and need for training. Considers when large-scale engineering is more appropriate and reaches a clear, justified conclusion.
- **Indicative content:**
 - Small-scale schemes in Nairobi, such as sack gardens and vertical growing, increase household food security, improve nutrition and can generate small incomes for women and youth, reaching vulnerable households directly.
 - They use appropriate technology and permaculture principles, are low-cost, reduce food miles and can be implemented on rooftops and in tiny spaces where large farms cannot operate.
 - Limitations include low per-sack yields, dependence on ongoing community organisation and training, and limited influence on national or city-wide food deficits; they are vulnerable to loss of funding or waning participation.
 - Large-scale engineered schemes can deliver high outputs and feed cities at scale, but require major capital, technical expertise, reliable water supplies and can have greater environmental impacts and displace smallholders.
 - Effective policy may combine approaches: support small-scale schemes for resilience and local benefits while investing in larger supply infrastructure where appropriate, for example peri-urban irrigation to supply markets alongside community gardens that boost household resilience.
 - A strong conclusion should judge the contexts in which small-scale schemes are most valuable and where large-scale engineering is necessary, supported by Nairobi-specific examples and clear reasoning.