2.2 Causes, Impacts and Management of Desertification: 30-minute Pack

AQA 8035 · Calculators not allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Give one impact of desertification on people living in a Sahel village.

(Total for Question 1 is 1 mark)

2 Give one impact of desertification on the natural environment in dryland areas such as the Sahel.

(Total for Question 2 is 1 mark)

3 Give TWO ways in which appropriate technology can reduce pressure on trees and vegetation in a Sahelian community.

(Total for Question 3 is 2 marks)

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4 'Evaluate the effectiveness of strategies used to reduce the risk of desertification in semi-arid regions such as the Sahel.'

(Total for Question 4 is 9 marks)

5 Describe how planting shelter belts or windbreaks can help reduce soil erosion and desertification around a farming village in the Sahel.

(Total for Question 5 is 3 marks)

6 Suggest THREE reasons why reforestation projects to tackle desertification in the Sahel might fail, even when trees are planted.

(Total for Question 6 is 3 marks)

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7 Explain one physical cause of desertification, using an example relevant to the Sahel region.

(Total for Question 7 is 4 marks)

8 Explain how an appropriate soil-water management technique, such as zai pits or magic stones, helps to restore degraded land in dryland areas like the Sahel.

(Total for Question 8 is 4 marks)

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Mark scheme · 2.2 Causes, Impacts and Management of Desertification: 30-minute Pack

Question 1

reduced crop yields leading to food shortages or loss of income, oe **B1**

Answer: Reduced crop yields, causing food shortages or loss of income.

Question 2

loss of biodiversity or decline in native plant and animal species, oe **B1**

Answer: Loss of biodiversity, with declines in native plant and animal species.

Question 3

fuel-efficient stoves that use less wood, oe **B1**

alternative fuels or solar cookers to replace cutting fuelwood, oe **B1**

Answer: Fuel-efficient stoves that use less wood; alternative fuels or solar cookers to replace cutting fuelwood.

Question 4

Level 3 A well-developed evaluation that integrates named strategies and place detail, weighs strengths and limitations of different approaches (soil-water management, tree planting, shelter belts, appropriate technology and top-down projects), and reaches a balanced, justified judgement on overall effectiveness, showing understanding of scale and sustainability. **7-9**

Level 2 A clear evaluation that refers to at least two strategies with some named place detail; strengths and limitations are identified but the judgement is less fully supported or balanced. **4-6**

Level 1 Simple, brief points about one or two strategies with little or no place detail and no clear, supported judgement. **1-3**

Level 0 No relevant content. **0**

Indicative content:

- Named strategies: soil-water techniques such as zai pits and stone lines; shelter belts and windbreak planting; reforestation and agroforestry; controlled grazing and rotational grazing; fuel-efficient stoves and alternative energy to reduce tree cutting; large scale irrigation or governmental programmes.
- Strengths: many community-led, small-scale techniques are low cost, suit local conditions, improve water retention and vegetation cover and can be sustained by local farmers, examples include zai pits in Burkina Faso and stone lines in Niger.
- Limitations: small-scale schemes may not reach large areas or cope with severe droughts; seedlings may fail without water or protection; political instability, lack of funding or poor governance can hinder large programmes; top-down irrigation can cause salinisation if poorly managed.
- Scale and sustainability: combination approaches often work best, e.g. integrating soil-water methods with community management and policy support; long-term maintenance, training and secure land rights increase success.
- Evidence from the Sahel: shelter belts and local water-harvesting have helped restore farmland in some villages since the 1980s, but wider-scale desertification continues where pressures from population growth and climate variability persist.
- Judgement: conclude whether strategies are generally effective, under what conditions and with what caveats, for example that appropriate, locally led techniques combined with policy support are most effective, whereas isolated or poorly funded projects are not.

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Question 5

planting lines or belts of trees or shrubs upwind of fields reduces wind speed, oe **B1**

reduced wind speed lowers wind erosion and the amount of soil blown away, oe **B1**

they also can trap moving soil and create microclimates that help crops establish, oe **B1**

Answer: Shelter belts of trees or shrubs planted upwind reduce wind speed, which lowers wind erosion and soil loss; they can trap moving soil and create a more favourable microclimate that helps crops establish, reducing the risk of desertification.

Question 6

a valid reason, e.g. seedlings may die due to lack of water in severe drought conditions, oe **B1**

a second, different valid reason, e.g. grazing animals may eat young trees if not protected, oe **B1**

a third, different valid reason, e.g. there may be insufficient community engagement or maintenance to ensure survival; accept any other valid reason, e.g. trees cut for fuelwood or unsuitable species planted, oe **B1**

Answer: For example, seedlings can fail because of severe drought and lack of water, grazing animals may eat young trees without protection, or projects may lack local engagement and ongoing maintenance so planted trees do not survive.

Question 7

identify a physical cause, e.g. reduced and variable rainfall due to climate variability, oe **B1**

linked detail, e.g. less rainfall means less water for crops and vegetation so plants die back, oe **B1**

further development, e.g. without plant roots the soil is more exposed to wind erosion and surface crusting, oe **B1**

impact link, e.g. this process reduces soil fertility and leads to the spread of degraded, desert-like ground, oe **B1**

Answer: Reduced and variable rainfall, as occurs in the Sahel, reduces soil moisture and plant growth; with fewer plants the soil becomes exposed to wind and rain erosion, losing fertility and leading to desert-like degraded land.

Question 8

identify the technique, e.g. zai pits or stone lines (magic stones), oe **B1**

explain how it traps or retains water, e.g. zai pits collect and concentrate rainfall around the seed, stone lines slow runoff and allow infiltration, oe **B1**

explain the effect on soil and plants, e.g. increased soil moisture improves germination and crop yields, and organic matter builds up, oe **B1**

link to desertification reduction, e.g. healthier vegetation protects soil from erosion and increases land productivity, oe **B1**

Answer: Techniques such as zai pits or stone lines collect and concentrate scarce rainfall and slow runoff so water infiltrates the soil; this raises soil moisture, improves seed germination and crop yields, builds organic matter and vegetation cover, and so protects soil from erosion and reduces desertification.

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