GEO.PH16 Earthquake Case Study in a Wealthier Country: L'Aquila, Italy

Total Marks

AQA 8035 · Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 State the date and magnitude of the L'Aquila earthquake, Italy, which is the focus of this case study.

(Total for Question 1 is 1 mark)

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2 Give the name of the region and country where the L'Aquila earthquake occurred.

(Total for Question 2 is 1 mark)

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3 State the official recorded death toll in the L'Aquila earthquake, Italy, 2009.

(Total for Question 3 is 1 mark)

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4 Explain briefly what is meant by a primary effect and give ONE primary effect of the L'Aquila earthquake, citing the case details.

(Total for Question 4 is 2 marks)

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5 Explain briefly what is meant by a secondary effect and give ONE secondary effect that occurred after the L'Aquila earthquake.

(Total for Question 5 is 2 marks)

6 Identify TWO immediate (short-term) responses used after the L'Aquila earthquake to help survivors.

(Total for Question 6 is 2 marks)

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7 Identify TWO long-term responses implemented after the L'Aquila earthquake to rebuild and reduce future risk.

(Total for Question 7 is 2 marks)

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8 Describe the extent of building and structural damage in the L'Aquila earthquake, using case-study figures where possible.

(Total for Question 8 is 3 marks)

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9 Describe TWO immediate responses that were used in the hours and days after the L'Aquila earthquake and explain how each helped survivors.

(Total for Question 9 is 3 marks)

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10 A regional population affected by the earthquake is estimated at 300,000 people. Approximately 65,000 people were displaced into temporary housing after the L'Aquila earthquake. Calculate the percentage of the regional population displaced. Give your answer to one decimal place.

(Total for Question 10 is 2 marks)

11 Explain ONE challenge faced by people living in temporary housing after the L'Aquila earthquake, and describe a short-term response that attempted to address this challenge.

(Total for Question 11 is 4 marks)

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12 Give TWO economic impacts of the L'Aquila earthquake, using case-study figures where possible.

(Total for Question 12 is 2 marks)

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13 Explain why many historic buildings and churches in L'Aquila were severely damaged or collapsed during the earthquake, referring to the case details.

(Total for Question 13 is 4 marks)

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14 Give TWO reasons why aftershocks after the L'Aquila earthquake caused additional problems for rescue and rebuilding efforts.

(Total for Question 14 is 2 marks)

15 Use the L'Aquila case details in this pack to answer the question.

'Assess the effectiveness of the responses to the L'Aquila earthquake in 2009.'

(Total for Question 15 is 12 marks)

Mark scheme · GEO.PH16 Earthquake Case Study in a Wealthier Country: L'Aquila, Italy

Question 1

- **B1** 6 April 2009 and magnitude 6.3
- **Answer: 6 April 2009; magnitude 6.3.**

Question 2

- **B1** Abruzzo region, Italy
- **Answer: Abruzzo region, Italy.**

Question 3

- **B1** 309 deaths
- **Answer: 309 deaths.**

Question 4

- **B1** definition: an immediate effect caused directly by the earthquake event, oe
- **B1** example: e.g. 309 people killed or many buildings collapsed in L'Aquila, oe
- **Answer: A primary effect is an immediate result caused directly by the earthquake, for example 309 people were killed and many buildings collapsed in L'Aquila.**

Question 5

- **B1** definition: an effect that occurs later as a consequence of the initial earthquake, oe
- **B1** example: e.g. around 65,000 people displaced or long-term economic losses for local businesses, oe
- **Answer: A secondary effect happens later as a consequence of the earthquake, for example about 65,000 people were displaced into temporary housing and local businesses suffered long-term economic losses.**

Question 6

- **B1** search and rescue operations, oe
- **B1** provision of emergency shelter and temporary camps, oe
- **Answer: Search and rescue operations and provision of emergency shelter/temporary camps.**

Question 7

- **B1** a long-term rebuilding and repair programme for homes and infrastructure, oe
- **B1** strengthening of building codes and inspections, oe
- **Answer: A long-term rebuilding programme for homes and infrastructure, and strengthening of building codes with improved inspections.**

Question 8

- **B1** many buildings in L'Aquila city centre and surrounding towns were damaged or destroyed, oe
- **B1** historic buildings and churches were particularly affected, with some collapsing, oe
- **B1** approximate case detail, e.g. thousands of buildings damaged and large parts of the historic centre rendered unsafe, oe
- **Answer: Many buildings in L'Aquila and nearby towns were damaged or destroyed; historic buildings and churches were particularly affected, with some collapsing. Thousands of buildings were damaged and large parts of the historic centre were made unsafe.**

Question 9

- **B1** response 1: search and rescue teams deployed to find and free people trapped under rubble, oe
- **B1** linked explanation: this saved lives and allowed urgent medical care to reach the injured, oe
- **B1** response 2: emergency shelters and temporary camps provided food, water and a safe place to stay, oe
- **Answer: Search and rescue teams were deployed to find and free people trapped under rubble, saving lives and enabling urgent medical care; emergency shelters and temporary camps provided food, water and safe accommodation for displaced people while more permanent arrangements were organised.**

Question 10

- **M1** 65000 / 300000 x 100 seen, oe
- **A1** 21.7% cao
- **Answer: 21.7%.**

Question 11

- **B1** challenge named, e.g. lack of privacy, poor sanitation, or disruption to schooling and work, oe
- **B1** linked detail explaining why this is a problem, e.g. poor sanitation can increase health risks and lack of privacy affects wellbeing, oe
- **B1** short-term response named, e.g. provision of portable toilets, medical tents, temporary schools or cash aid, oe
- **B1** linked explanation of how the response helps, e.g. medical tents reduce health risks and temporary schools allow children to continue education, oe
- **Answer: One challenge was poor sanitation and limited medical facilities in temporary camps, which increases the risk of illness; emergency medical tents and portable toilets were provided as a short-term response to reduce health risks and provide basic hygiene facilities.**

Question 12

- **B1** major economic loss, e.g. estimated around 11 billion euros of damage and economic disruption, oe
- **B1** loss of businesses and jobs in the city centre and surrounding towns, e.g. many shops and services closed for months, oe
- **Answer: An estimated economic loss of about 11 billion euros and widespread loss of business and jobs as shops and services in the city centre were closed for months.**

Question 13

- **B1** reason 1, e.g. many historic buildings were old and built before modern seismic building standards, oe
- **B1** linked detail, e.g. older masonry and stone construction is brittle and collapses under shaking, oe
- **B1** reason 2, e.g. some historic areas had not been retrofitted or strengthened adequately, oe
- **B1** linked detail linking to case, e.g. concentrated damage to the historic centre where such buildings are clustered increased collapse risk, oe
- **Answer: Many historic buildings were old and built of unreinforced masonry before modern seismic standards, so they are brittle and prone to collapse during shaking; moreover, the historic centre had clusters of such structures that had not been extensively retrofitted, concentrating the damage.**

Question 14

- **B1** aftershocks caused further structural damage, making buildings more dangerous for rescuers and residents, oe
- **B1** aftershocks delayed rebuilding and inspections by creating ongoing safety risks and slowing access for repair crews, oe
- **Answer: Aftershocks caused further structural damage, making buildings more dangerous for rescuers and residents, and they delayed rebuilding and inspections by creating ongoing safety risks that slowed access for repair crews.**

Question 15

- **Level 3** (7-9): A well developed and balanced assessment that evaluates a range of immediate and long-term responses to L'Aquila, uses specific case study detail and figures, explains strengths and weaknesses, and reaches a supported judgement about overall effectiveness.
- **Level 2** (4-6): A clear assessment that describes several responses with some case detail and gives strengths or weaknesses, with a simple conclusion that is supported but not fully developed.
- **Level 1** (1-3): A few relevant points about responses are made, with limited or generalised case detail, and little or no sustained judgement.
- **Level 0** (0): No relevant content.
- **Indicative content:**
  - Immediate responses: search and rescue operations saved lives, emergency shelters and temporary camps provided essentials to tens of thousands, and international aid and national emergency services were mobilised quickly.
  - Strengths of immediate response: rapid deployment of rescuers and provision of shelter reduced short-term mortality and provided basic needs; temporary schools and medical tents helped address health and education disruption.
  - Limitations of immediate response: high numbers displaced indicated that emergency housing capacity was strained and some temporary accommodation conditions were poor; aftershocks complicated rescue and safety operations.
  - Long-term responses: a rebuilding and repair programme, financial aid packages, and the review and strengthening of building codes and inspections aimed to reduce future risk and restore infrastructure.
  - Strengths of long-term response: investment in reconstruction and stricter building controls can improve resilience and support economic recovery; targeted funding helped repair key infrastructure and services.
  - Weaknesses of long-term response: rebuilding took many years, economic recovery was slow for some businesses and residents faced prolonged displacement; controversies over planning, compensation and the pace of rebuilding undermined public confidence in some cases.
  - A balanced assessment should weigh lives saved and short-term support against the scale of damage, the long duration and cost of rebuilding, and social impacts such as prolonged displacement and economic disruption.
  - A supported judgement might conclude that responses were effective at reducing immediate mortality and providing emergency relief, but less effective at delivering rapid full recovery and preventing long-term social and economic harm, recognising that some long-term improvements to building safety were positive steps.