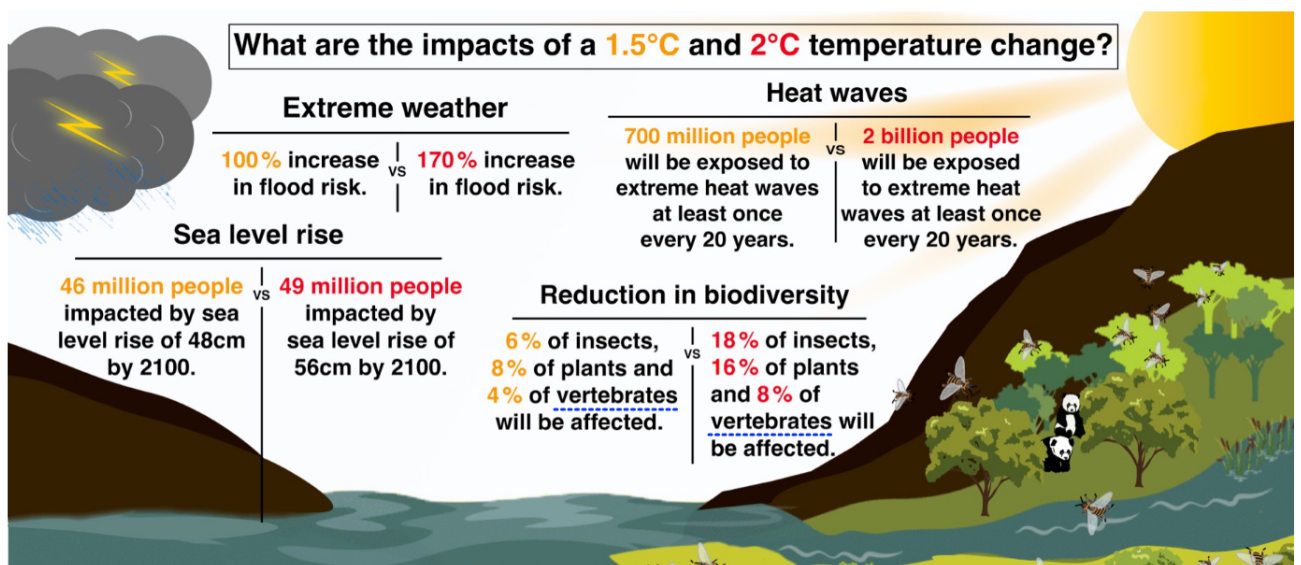


Question 1 (2 marks)

Source A shows the impacts of changing global temperatures since the 1850s. Answer the questions that follow.

Source A



What are the impacts of a 1.5°C and 2°C temperature change?

Extreme weather

100% increase in flood risk. vs 170% increase in flood risk.

Heat waves

700 million people will be exposed to extreme heat waves at least once every 20 years. vs 2 billion people will be exposed to extreme heat waves at least once every 20 years.

Sea level rise

46 million people impacted by sea level rise of 48cm by 2100. vs 49 million people impacted by sea level rise of 56cm by 2100.

Reduction in biodiversity

6% of insects, 8% of plants and 4% of vertebrates will be affected. vs 18% of insects, 16% of plants and 8% of vertebrates will be affected.

Coral bleaching

70% of the World's coral reefs lost by 2100. vs Almost all of the World's coral reefs lost by 2100.



Question 1a (1 mark)

Identify the change in flood risk from a 2°C temperature increase.

B *I* | ← → | x₂ x² | \int \sum | Ω Σ | Styles ▾ |



Question 1b (1 mark)

“Plants, animals, bacteria and fungi are all included in the measurement of biodiversity.”

Select whether the statement is true or false.

- True
- False





Question 2 (4 marks)

Source A is repeated below.

You will explain a cause of one of the impacts shown in **Source A**.

Explain one cause of

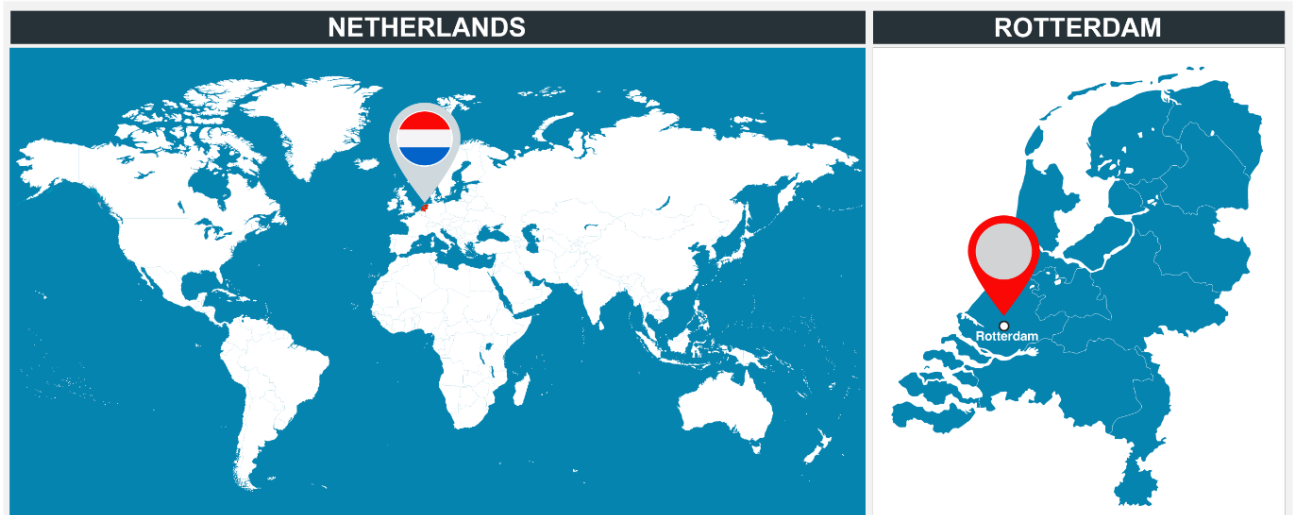
- Select
- extreme weather.
- a reduction in biodiversity.
- coral bleaching.
- sea level rise.
- heat waves.

B *I* | ← → U x_2 x^2



Question 3 (8 marks)

Rotterdam is a city in The Netherlands. The city experiences heavy rainfall and many parts of the city are flooded each year.



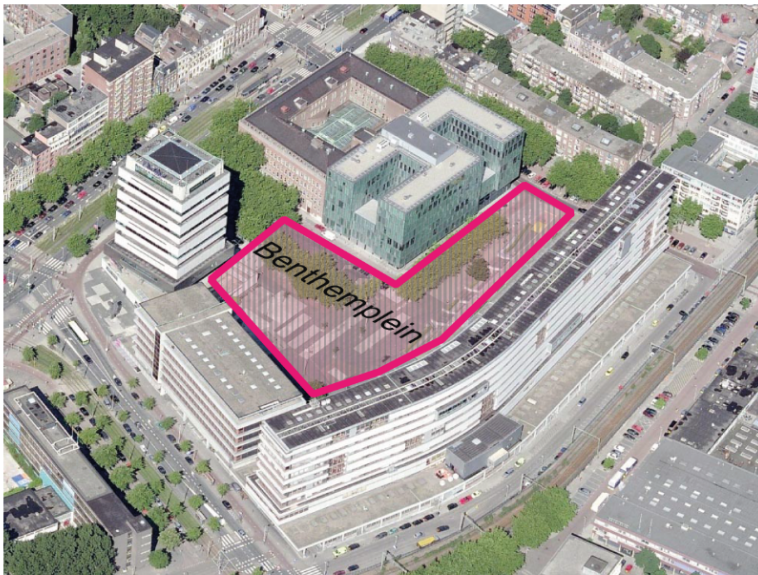
An urban planner is investigating how to manage the flood risk caused by increasing levels of rainfall. The planner is focusing on an area called Benthemplein in Rotterdam.

You will evaluate the urban planner's investigation below.

Goal

Plan

Outcome



Goal: To develop a strategy to manage the flood risk caused by increasing levels of rainfall in Bentheplein in Rotterdam.



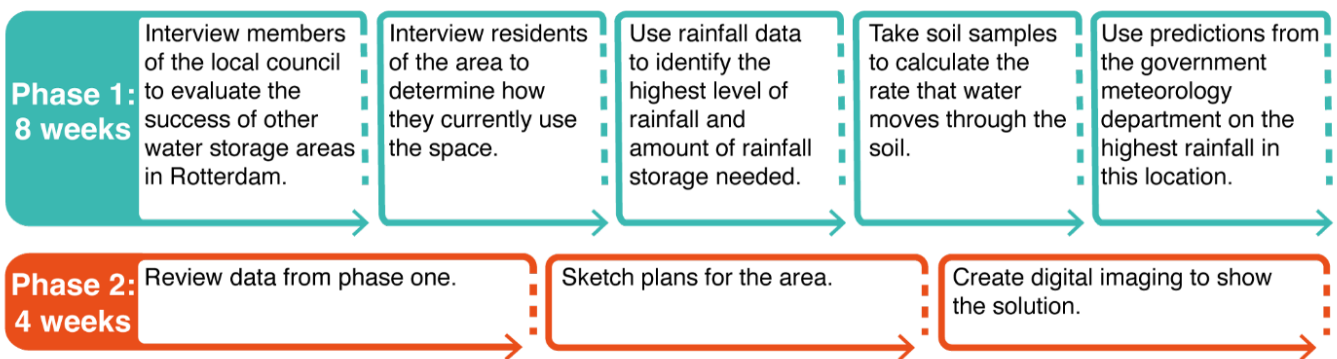
Solution: Create a 'Water Plaza' with surface water storage and recreational areas. The surface water storage will hold excess rainwater on the surface and prevent surrounding areas from flooding.

Goal

Plan

Outcome

Planning Stage



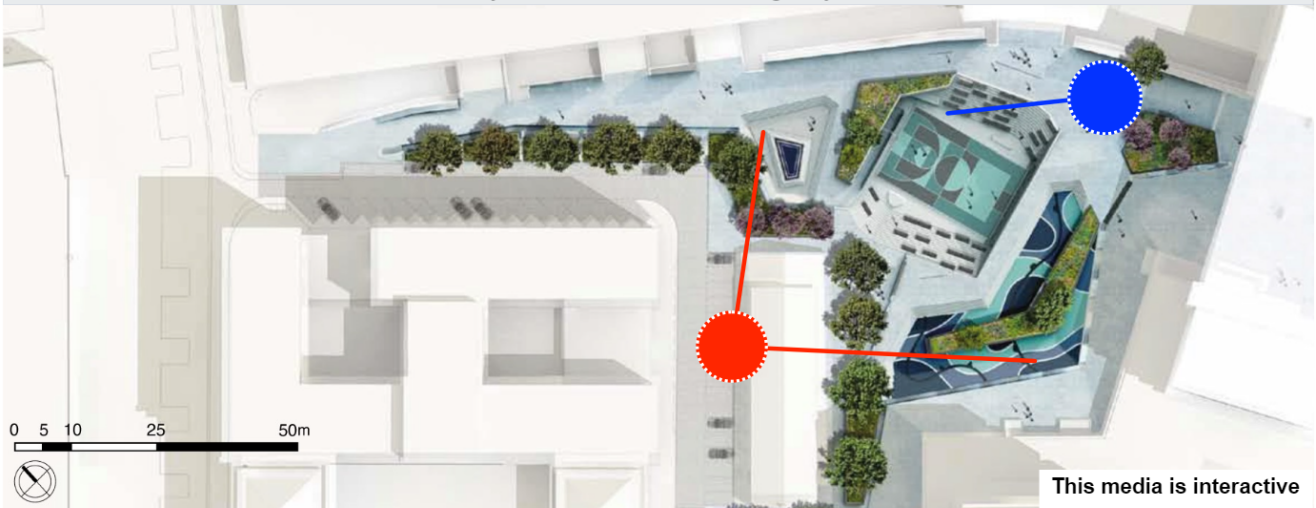
Goal

Plan

Outcome

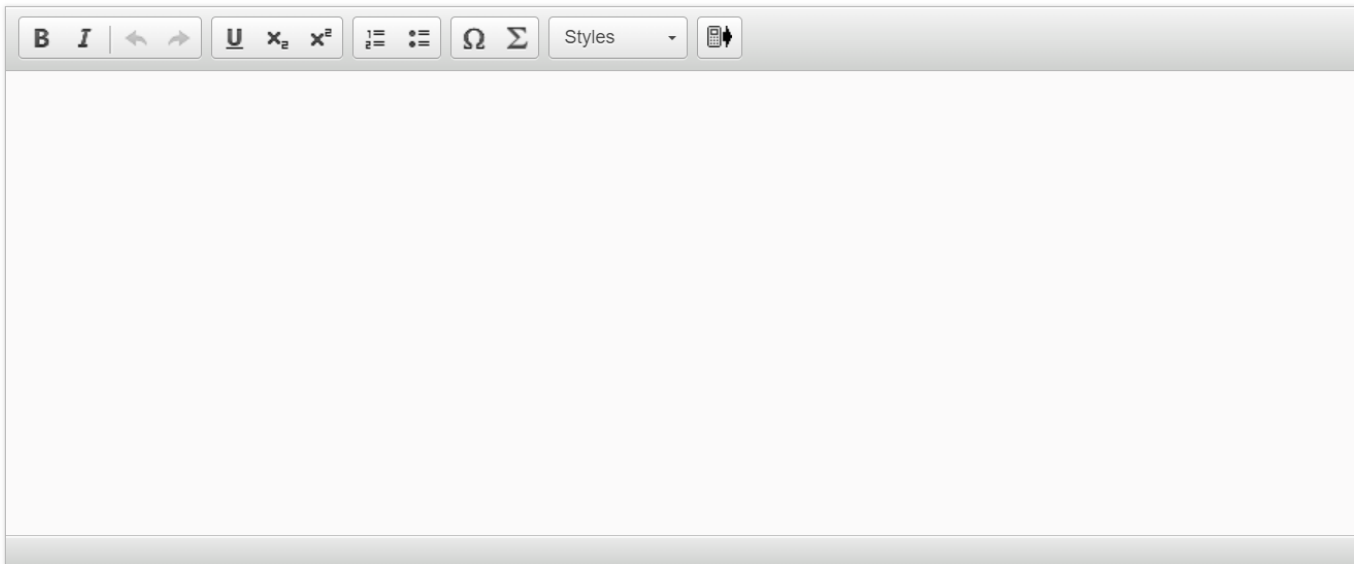
Plan for the area

3 surface reservoirs can hold 8500 bathtubs or 1 730 000 litres of water from surrounding areas. The water is then released into the city's storm water drainage system.



This media is interactive

Evaluate the urban planner's investigation.



A rich text editor toolbar with the following icons from left to right: Bold (B), Italic (I), Undo (left arrow), Redo (right arrow), Underline (U), Subscript (x₂), Superscript (x²), Bulleted List (list with dots), Numbered List (list with numbers), Link (Ω), Unlink (Σ), Styles (dropdown menu), and Print (printer icon).



Question 4 (12 marks)



Question 4a (2 marks)

You have been asked by a local government to investigate mitigation strategies that are used to address climate change. Mitigation is the action of reducing the causes and impacts of climate change.

The investigation will allow the local government to consider the actions they need to take in reducing the impacts of climate change in the future.

The statement of inquiry is:

Effective planning can reduce the impact of changes in global temperatures on the environment.

You must not repeat information from Question 3 in your responses.

Use the statement of inquiry to **formulate** a clear and focused research question for your investigation.

B I | ← → | x₂ x^e | ¶ ☰ ☷ | Ω Σ | Styles - | 📄 ↕



Question 4b (4 marks)

Justify why your research question is worthy of investigation.

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Question 4c (2 marks)

Outline one challenge that you might experience when completing your investigation.

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Question 4d (4 marks)

Choose **one** of the sources below and **explain** how the source would be beneficial to your investigation.

- Recent newspaper articles on the topic
- Statistics on the topic from the local government
- Topographic maps of the location
- Scripts of interviews with local stakeholders

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Question 5 (18 marks)



You work for a geographic information systems (GIS) company called SpatialCode. You receive the email below from the Government of the Kingdom of Tonga.



○ Government of the Kingdom of Tonga
To: ○ SpatialCode



Today at 09:01

Dear SpatialCode,

We have experienced the devastating effects of a volcanic eruption and resulting tsunami in Tonga.

The volcano erupted here from December 2021 to January 2022. The eruption caused a 1.2 metre tsunami wave to hit our capital city, Nuku'alofa.

In the aftermath of the volcanic eruption and tsunami, it was very challenging to deliver aid to those who needed it most, and this is something that we need to address in the future.

[Here](#) is a link to relevant information about the eruption and its impacts.

to this email to **explain at least one** strength and **at least one**



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[Here](#) is a link to relevant information about the eruption and its impacts.


Please reply to this email to **explain at least one** strength and **at least one** limitation of using geographic information systems (GIS) to manage the impacts of tectonic events in Tonga.

Yours sincerely,

Ministry of Disaster Response
Government of the Kingdom of Tonga

Question 5 (18 marks)

You work for a geographic information systems (GIS) company called SpatialCode. You receive the email below from the Government of the Kingdom of Tonga.



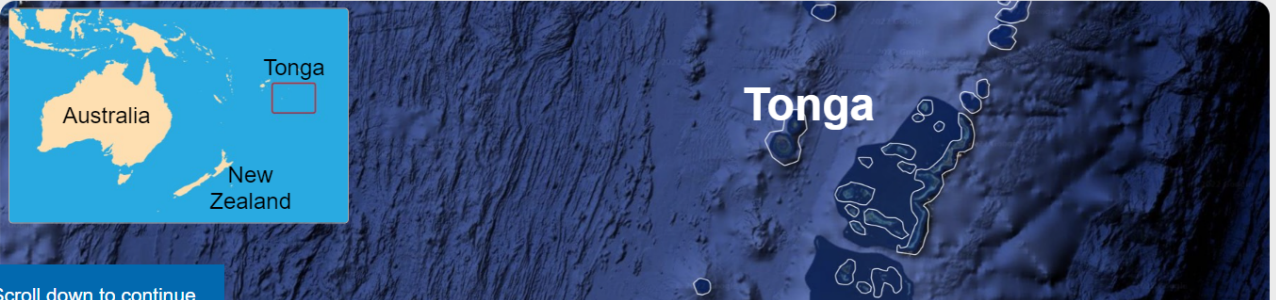
Ministry of Disaster Response
Government of the Kingdom of Tonga

Close

Data on volcanic eruption December 2021 to January 2022

Introduction **Impacts** **The future**

Tonga is made up of 170 islands in the Pacific Ocean. Some of these are highlighted on the map below. People live on 36 of these islands. The map below shows the location of the volcano.



Scroll down to continue



Ministry of Disaster Response Government of the Kingdom of Tonga

Close

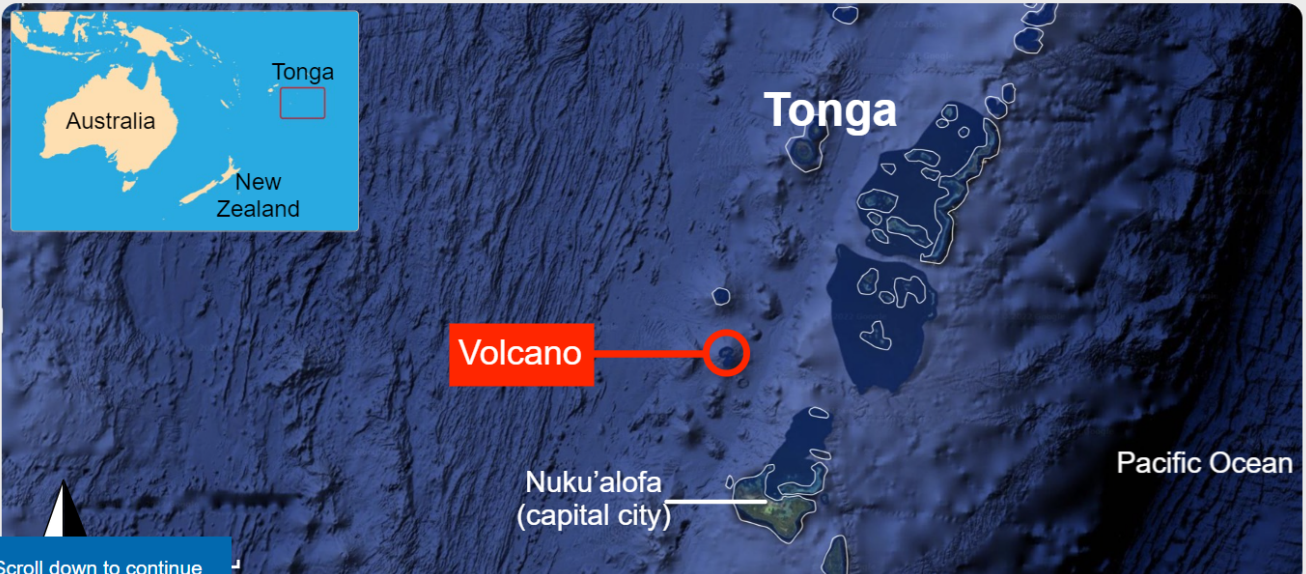
Data on volcanic eruption December 2021 to January 2022

Introduction

Impacts

The future

Tonga is made up of 170 islands in the Pacific Ocean. Some of these are highlighted on the map below. People live on 36 of these islands. The map below shows the location of the volcano.



Write a subject title for your email:

Reply to the email here:

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Data on volcanic eruption December 2021 to January 2022

Introduction

Impacts

The future

Some of the impacts of the volcanic eruption include:

- The tsunami damaged 600 structures. Infrastructure was affected including transport, power, water and communications.
- The volcanic ash harmed agriculture and fishing.
- An estimated 85 000 people were affected.
- US\$43.7 million worth of damage was caused.

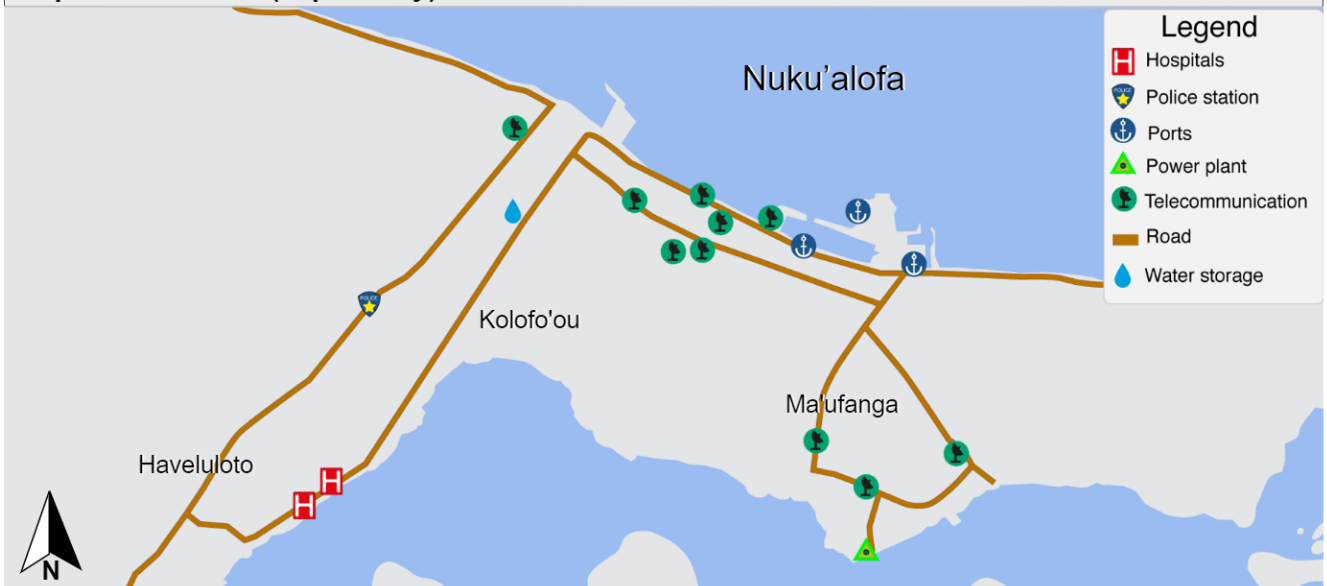
Introduction

Impacts

The future

We are working with experts to find the best ways to monitor the volcano and identify areas most at risk.

Map of Nuku'alofa (capital city) critical infrastructure



Write a subject title for your email:

Reply to the email here:

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Scroll down to continue



Question 6 (6 marks)

An MYP student is creating a presentation on the impacts of tourism.

Whilst researching they have found the video shown in **Source B** below on a news website. Watch the video and answer the questions that follow.

Source B

Video

Transcript

The Galapagos Islands are located 1000km from the mainland of Ecuador. The volcanic islands are popular for tourism. In 2019 271 238 tourists visited the Galapagos Islands.

The Galapagos Islands are known for their diverse wildlife.

With a growth in tourism, government officials need to weigh up the advantages and disadvantages of allowing tourists to visit the islands.

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The Galapagos Islands are known for their diverse wildlife.

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The total number of tourists increased from around 180 000 in 2007 to 300 000 in 2018.

There are numerous advantages to allowing tourists, some of which are shown here.

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International tourism:

generates approximately US\$143 million a year

creates jobs for locals

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However, while there are advantages there are also disadvantages.

Tourists bring invasive plant and animal species that harm local ecosystems.

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More tourists has led to more hotels being built and increased urbanization.

Tourists create approximately 230 550kg of waste each year.

The government and key stakeholders must make a decision on the next steps for tourism in the Galapagos Islands.



Question 6a (1 mark)

Identify the origin of the video.

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Styles ▾



Question 6b (1 mark)

State the purpose of the video.

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Styles ▾



Question 6c (2 marks)

Outline one value of the video for the MYP student's presentation.

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Question 6d (2 marks)

Outline one limitation of the video for the MYP student's presentation.

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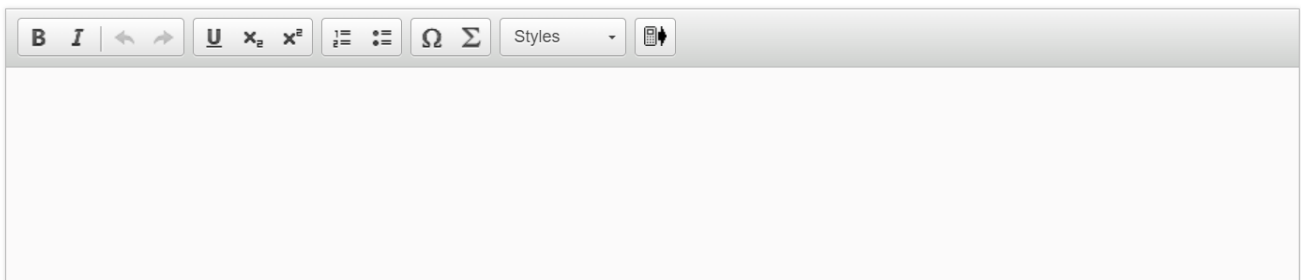
Question 7 (6 marks)

Source B is repeated below for your information. Answer the question that follows.

The local government are considering implementing **one** of the following actions to mitigate the impacts of tourism in the Galapagos Islands:

1. Increase the US\$100 entry fee that all visitors pay upon arrival.
2. Each tourist group must be accompanied by an approved local tourist guide.

Justify which **one** of the actions you think the local government should choose.



A rich text editor toolbar with the following icons from left to right: Bold (B), Italic (I), Undo (left arrow), Redo (right arrow), Underline (U), Text Color (x with a color swatch), Background Color (x with a color swatch), Bulleted List (three horizontal lines with a dot), Numbered List (three horizontal lines with numbers), Link (Omega symbol), Unlink (Sigma symbol), Styles (a dropdown menu labeled 'Styles'), and a mobile device icon.



Question 8 (24 marks)

An increase in tourist numbers is the greatest threat to sustainable tourism. **To what extent** do you agree with this statement?

In a well-structured essay, you should:

- use examples from your MYP studies
- consider different perspectives.

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