



Cambridge International AS Level

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ENVIRONMENTAL MANAGEMENT

8291/13

Paper 1 Lithosphere and Atmosphere

May/June 2021

1 hour 30 minutes

You must answer **Section A** on the question paper and **Section B** on the answer booklet/paper you have been given.

You will need: Answer booklet/paper

INSTRUCTIONS

- Section A: answer **all** questions. Write your answer to each question in the space provided on the question paper.
- Section B: answer **one** question. Write your answer on the separate answer booklet/paper provided.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.
- At the end of the examination, fasten all your work together. Do **not** use staples, paper clips or glue.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [].

| For Examiner's use | |
|--------------------|--|
| Section A | |
| 1 | |
| 2 | |
| Section B | |
| Total | |

This document has **12** pages.

Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

- 1 (a) Fig. 1.1 shows global energy consumption per source of energy for 1990 to 2019, and predicted global energy consumption per source of energy for 2020 to 2040.

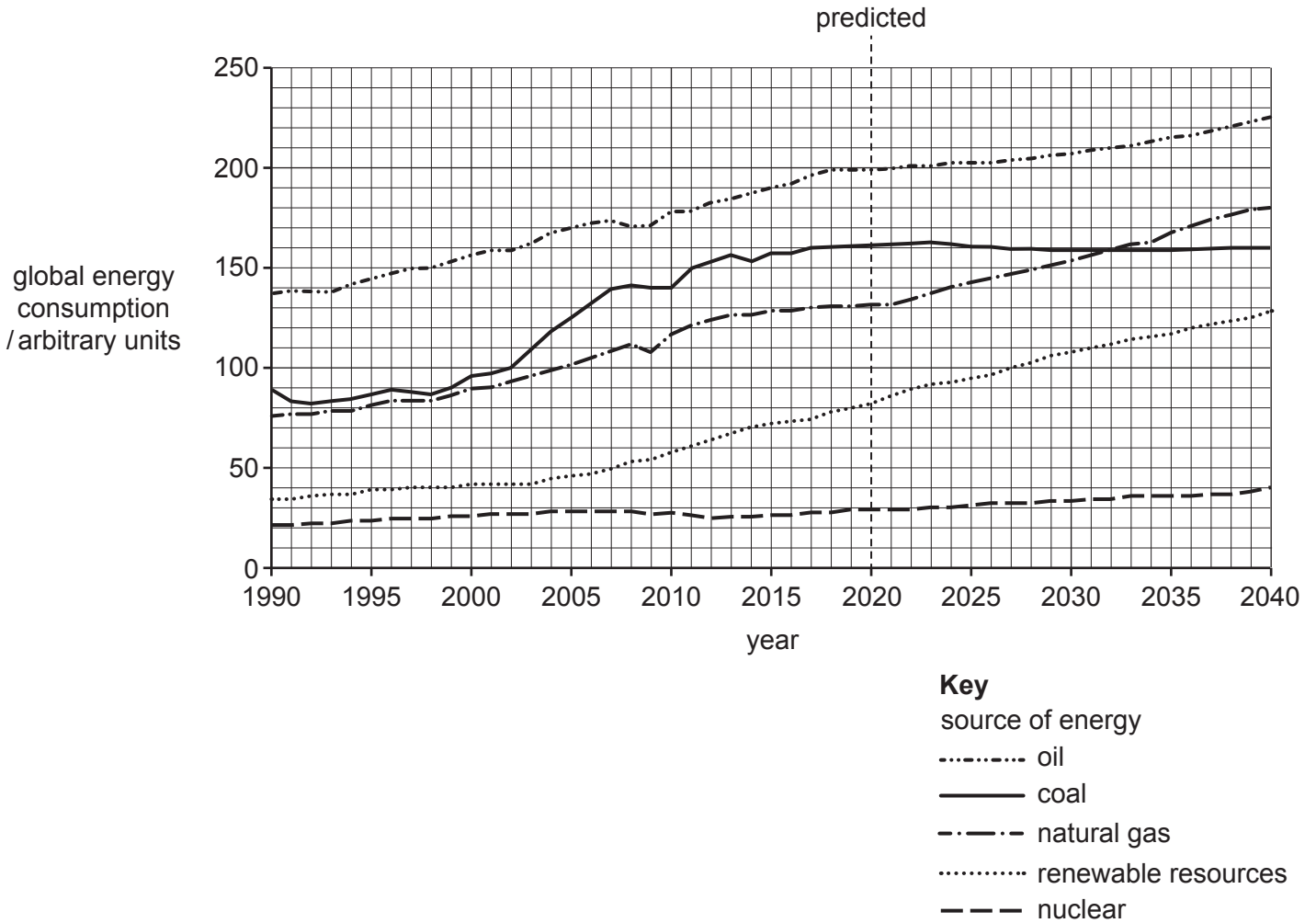


Fig. 1.1

- (i) Explain why coal is a non-renewable resource.

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..... [2]

- (ii) Describe the trend in global consumption of energy produced using coal from 1990 to 2040.

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..... [2]

- (iii) Calculate the percentage of total global energy consumption in 2040 that is predicted to come from renewable resources.

..... % [2]

- (iv) Suggest reasons for the predicted increase in global energy consumption from renewable resources between 2020 and 2040.

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..... [3]

(b) Fig. 1.2 shows some of the effects of burning fossil fuels.

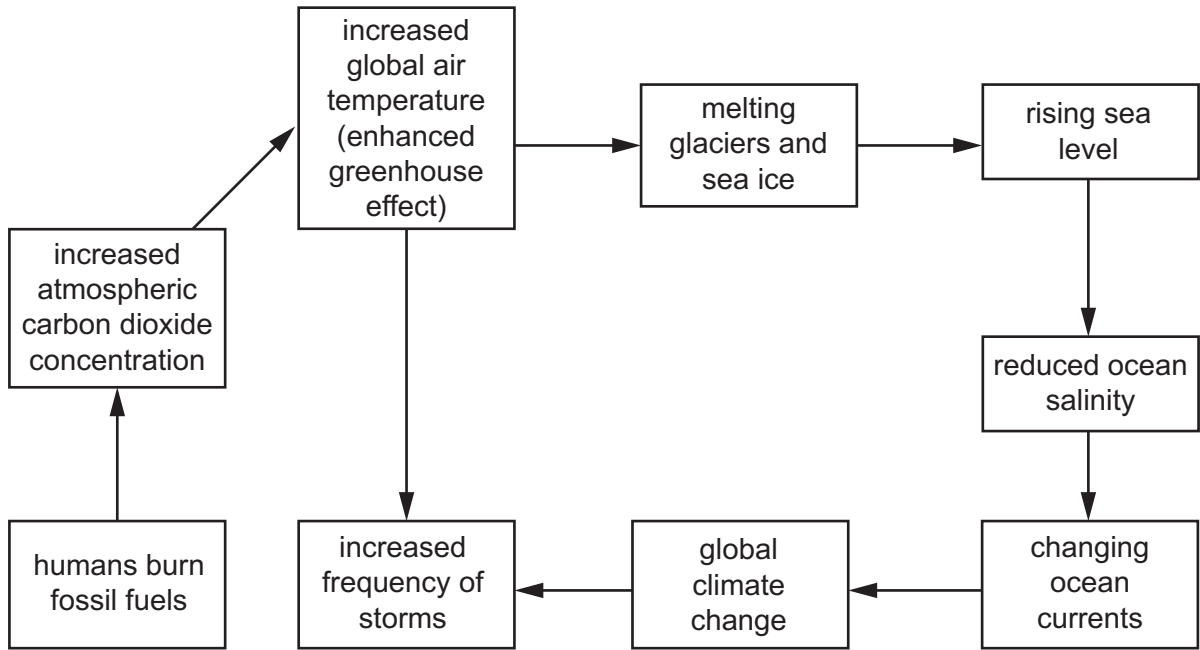


Fig. 1.2

(i) Explain the link between increased atmospheric carbon dioxide concentration and increased global air temperature. Refer to Fig. 1.2 in your answer.

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..... [3]

(ii) Suggest how the melting of glaciers and sea ice may change ‘the Earth’s energy budget’.

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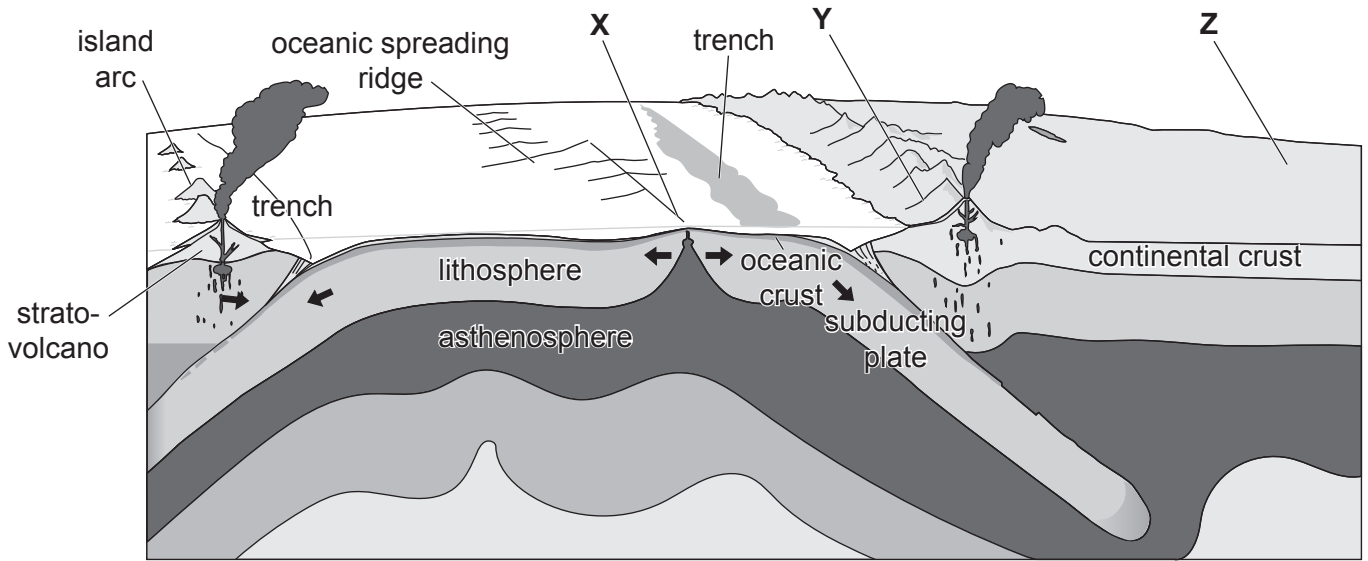
..... [2]

(iii) Describe the impacts that rising sea level has on low-lying coastal settlements.

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..... [6]

[Total: 20]

2 (a) Fig. 2.1 shows tectonic plates.



Key
 → plate movement

Fig. 2.1

(i) Name the type of plate boundary labelled X on Fig. 2.1.

..... [1]

(ii) Describe the processes which cause the plate movement shown in Fig. 2.1.

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 [2]

(iii) Explain why volcanoes are more likely to occur at location Y compared to location Z shown in Fig. 2.1.

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 [4]

(iv) Explain the evidence which supports scientific theory on Post-Pangaea plate movement.

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..... [4]

- (b) Fig. 2.2 is an account of the Laki volcanic eruption that took place in June 1783 in Iceland, an island country in Europe.

The Laki volcano has been erupting basaltic lava for 8 months. The lava flow stopped just outside our town. A haze of ash and sulfur destroyed the plants and killed the livestock. Since the start of the eruption, a quarter of the population of Iceland have died, mainly from famine.

This winter the ash and sulfur particles in the air have reduced the sunlight in the Northern hemisphere. Effects have reached Egypt, 5500 km from Iceland. In Egypt, the water level of the River Nile is much lower following reduced rainfall upstream.

Fig. 2.2

- (i) Suggest why the volcanic eruption did not immediately cause significant damage or loss of life to the local population. Refer to Fig. 2.2 in your answer.

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(ii) Explain why the Laki volcanic eruption affected many countries.

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..... [5]

[Total: 20]

Section B

Answer **one** question from this section.

Write your answers on the separate answer paper provided.

- 3 Fig. 3.1 shows the predicted path and category of Hurricane Florence, a tropical cyclone.

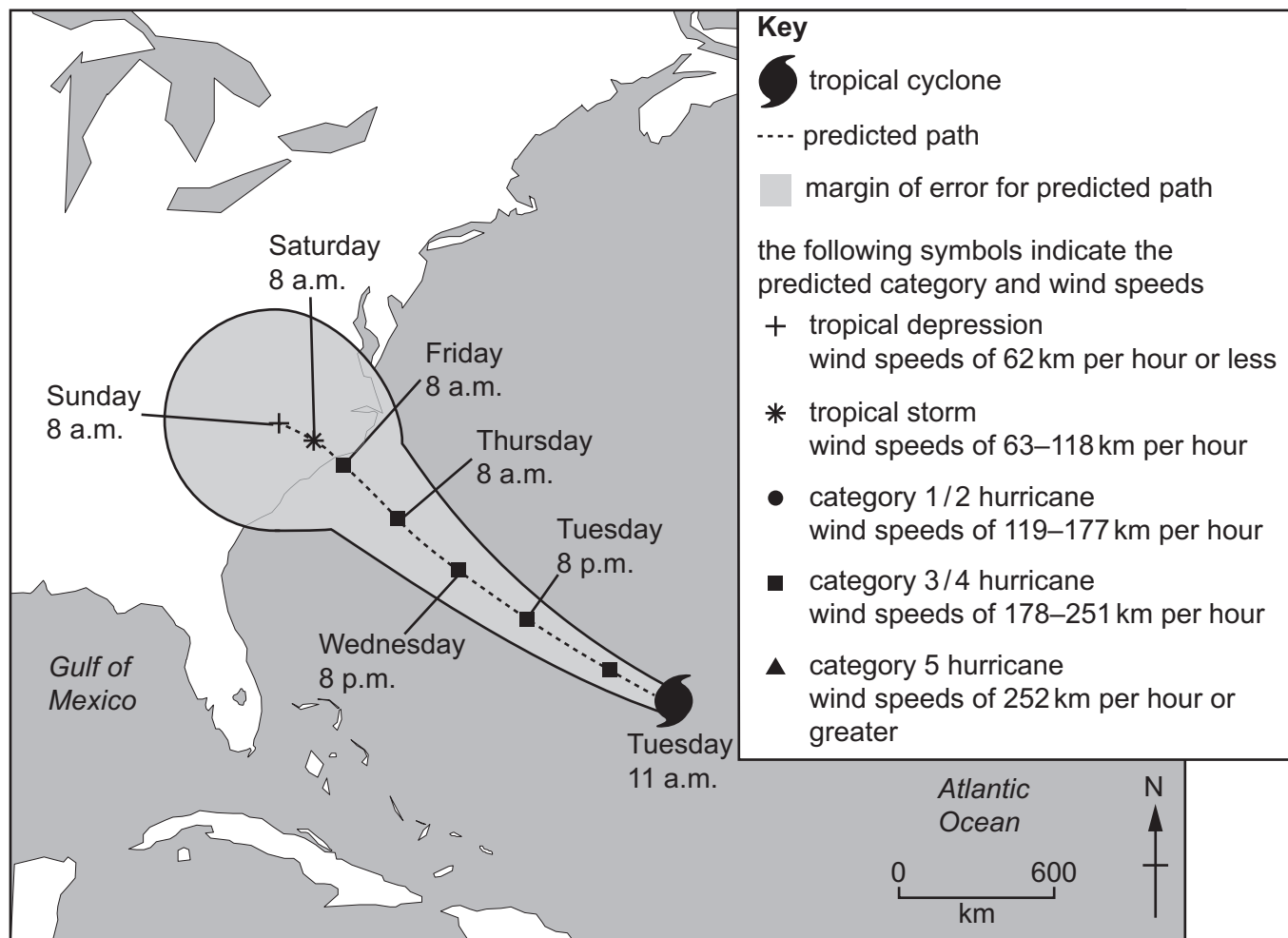


Fig. 3.1

- (a) Describe the predicted path and category of Hurricane Florence shown in Fig. 3.1. Outline the benefits of predicting the path and category of a hurricane. [10]
- (b) 'The long-term effects of climate change need to be addressed by long-term monitoring.'

Using examples, discuss the extent to which you agree with this statement. [30]

[Total: 40]

4 Fig. 4.1 shows the depth of weathering and the climate conditions for different biomes.

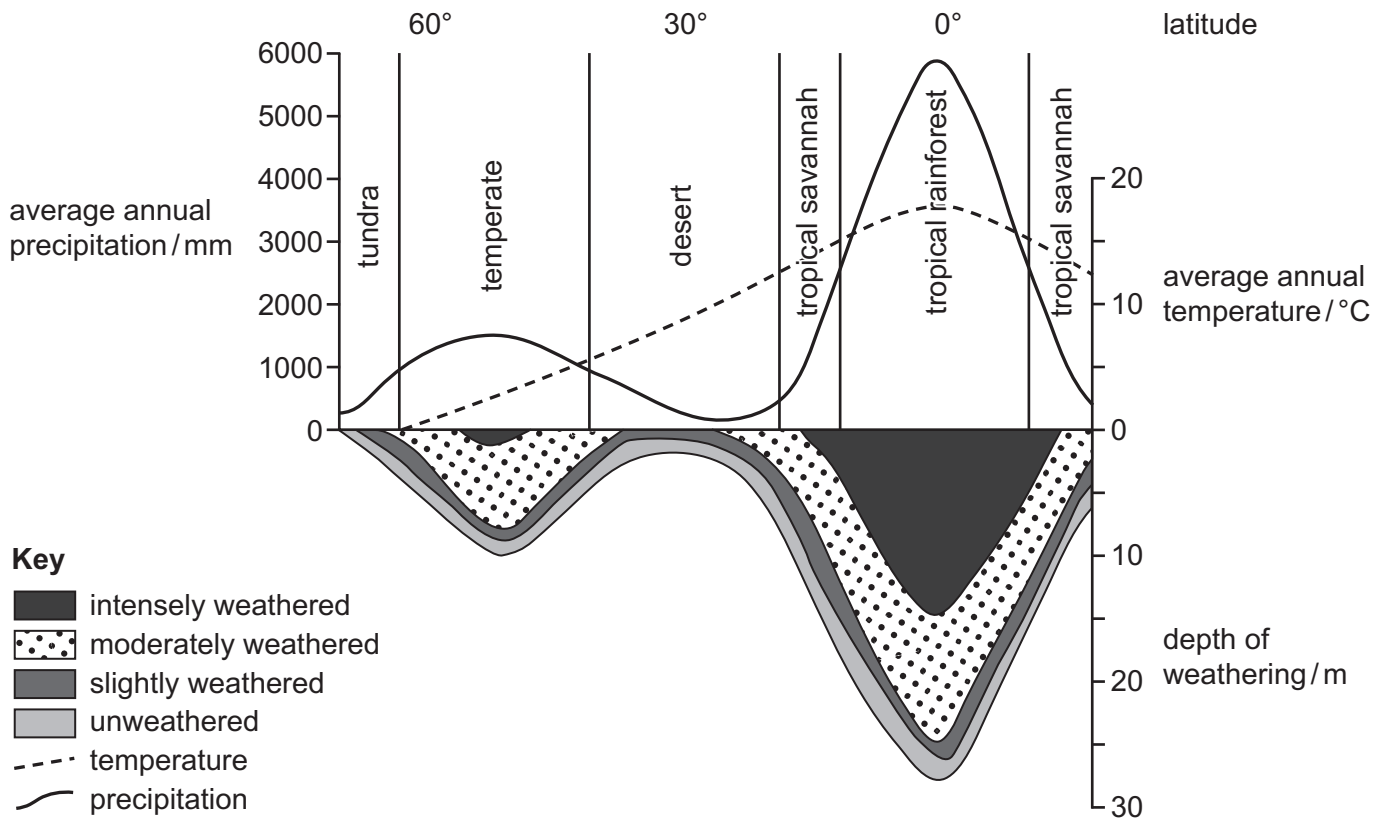


Fig. 4.1

- (a) Describe how climate affects the depth of weathering shown in Fig. 4.1. Suggest other factors which affect the depth of weathering. [10]
- (b) Evaluate strategies to manage mass movement on slopes. Refer to examples in your answer. [30]

[Total: 40]

- 5 Fig. 5.1 shows domestic waste production and area of cultivated land for Shanghai, a city in China, between 1950 and 2010.

The population of Shanghai in 1950 was 4.3 million and in 2010 the population was 20.3 million.

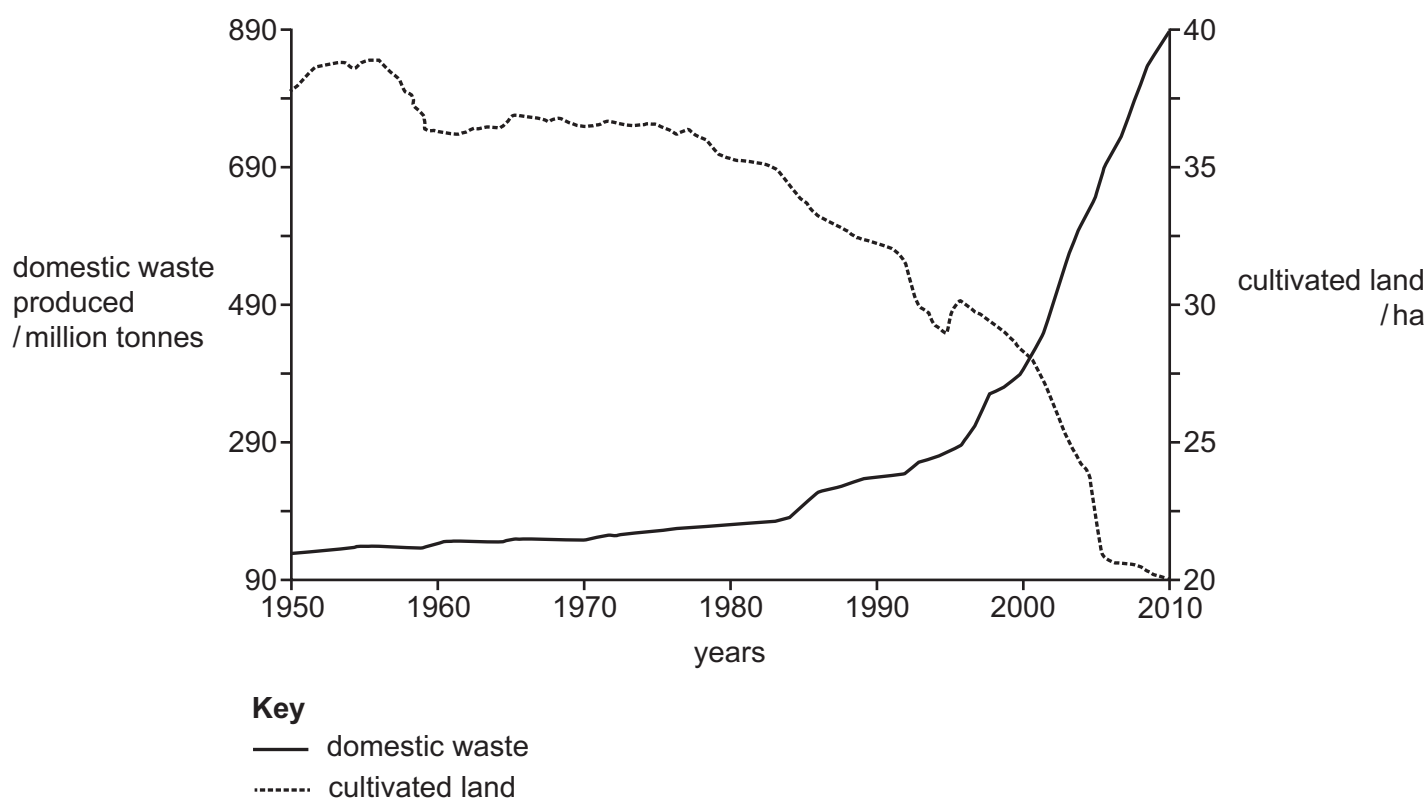


Fig. 5.1

- (a) Suggest the environmental pressures caused by the changes shown in Fig. 5.1 in Shanghai between 1950 and 2010. [10]
- (b) Evaluate strategies to manage threats from natural processes and human activities in areas of outstanding natural beauty. [30]

[Total: 40]

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