Cambridge International **AS Level**

Cambridge International Examinations
Cambridge International Advanced Subsidiary Level

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

5399146061

ENVIRONMENTAL MANAGEMENT **8291/21**

Paper 2 Hydrosphere and Biosphere **May/June 2015**

1 hour 30 minutes

Additional Materials: Answer Booklet/Paper

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

Section A
Answer **all** questions.
Write your answers in the spaces provided on the question paper.

Section B
Answer **one** question from this section.
Answer the question on the separate answer paper provided.

At the end of the examination,
1. fasten all separate answer paper securely to the question paper;
2. enter the question number from Section B in the grid opposite.

	For Examiner's Use
Section A	
1	
2	
Section B	
Total	

This document consists of **11** printed pages and **1** blank page.

CAMBRIDGE International Examinations

Section A

Answer **all** questions in this section.

1 **(a)** Fig. 1.1 shows three different types of aquifers.

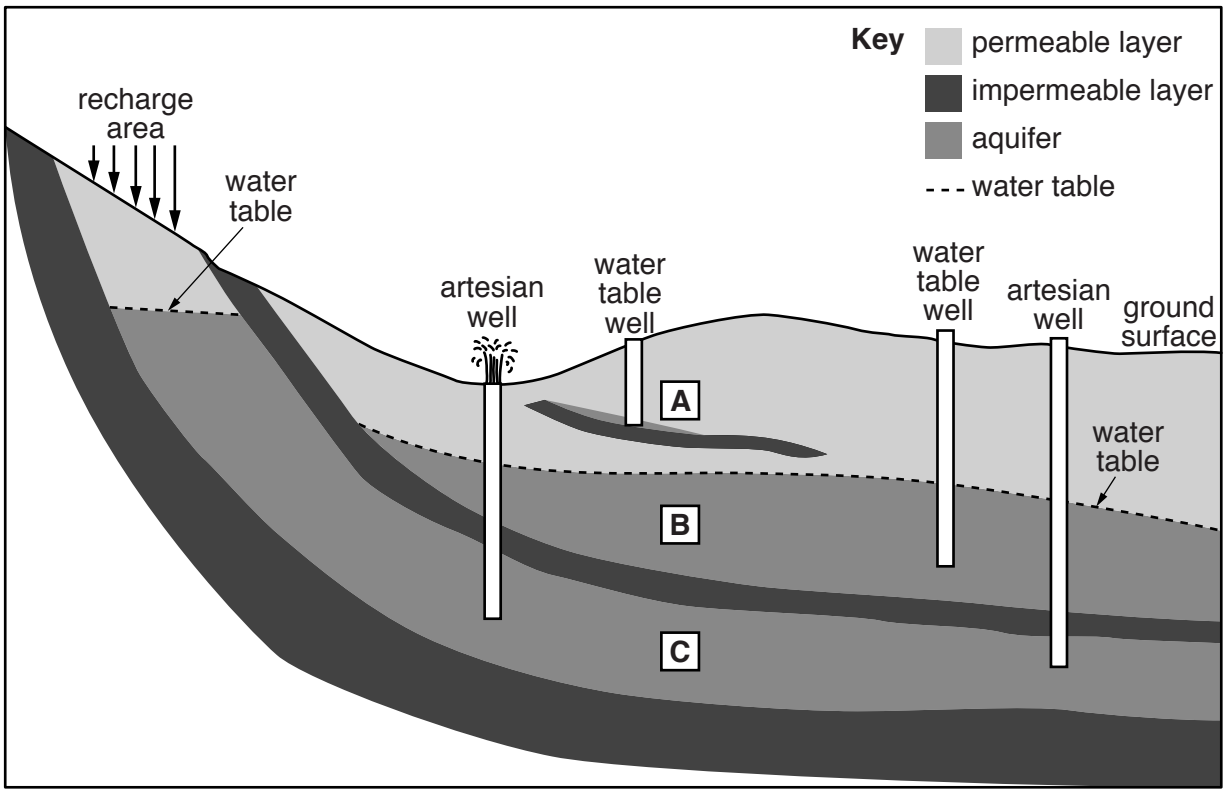

Fig. 1.1

(i) Identify the type of aquifer at positions **A**, **B** and **C** in Fig. 1.1.
Choose from the list below.

unconfined **confined** **perched**

A .....

B .....

C ..... [2]

(ii) With reference to Fig. 1.1, describe the characteristic features of each of these three different types of aquifers.

perched .....

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confined .....

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unconfined .....

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[6]

(iii) Outline the benefits of extracting water from the aquifers located at **A** and **C** in Fig. 1.1.

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.....[2]

(b) Fig. 1.2 is adapted from a water cycle report for the Great Artesian Basin in Australia. It shows losses, gains, stores and flows of water in the area.

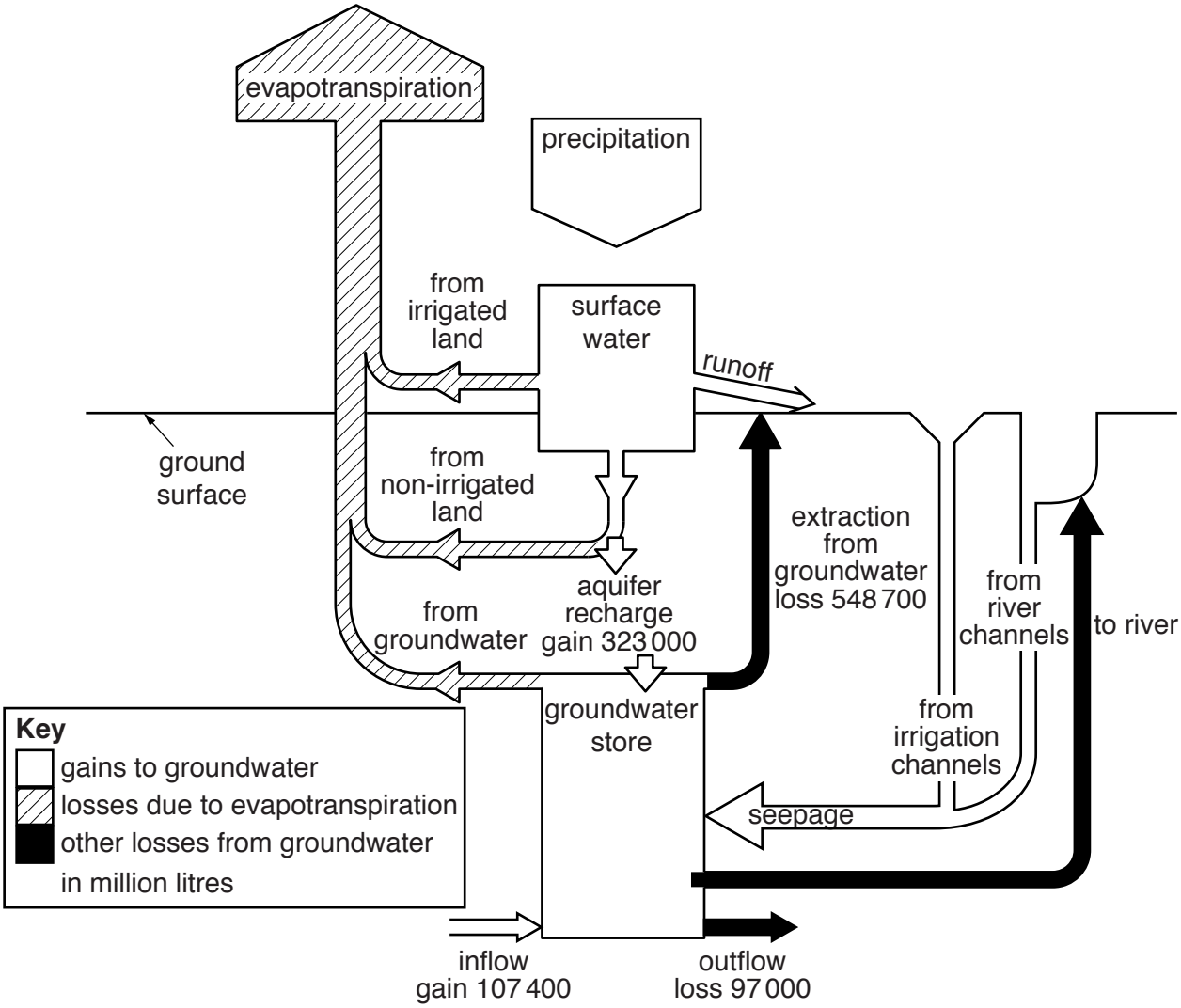

Fig. 1.2

(i) With reference to Fig. 1.2, explain what is meant by the term *aquifer recharge*.

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.....[2]

(ii) With reference to the information in Fig. 1.2, describe how natural processes and human activity are causing an overall loss of 215 300 million litres from the groundwater store. In your answer refer to losses, extraction and natural recharge.

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[Total: 20]

2 **(a)** Fig. 2.1 shows a food web for some of the organisms living on part of the Galapagos Islands. Fig. 2.2 shows the locations of some native species on the islands.

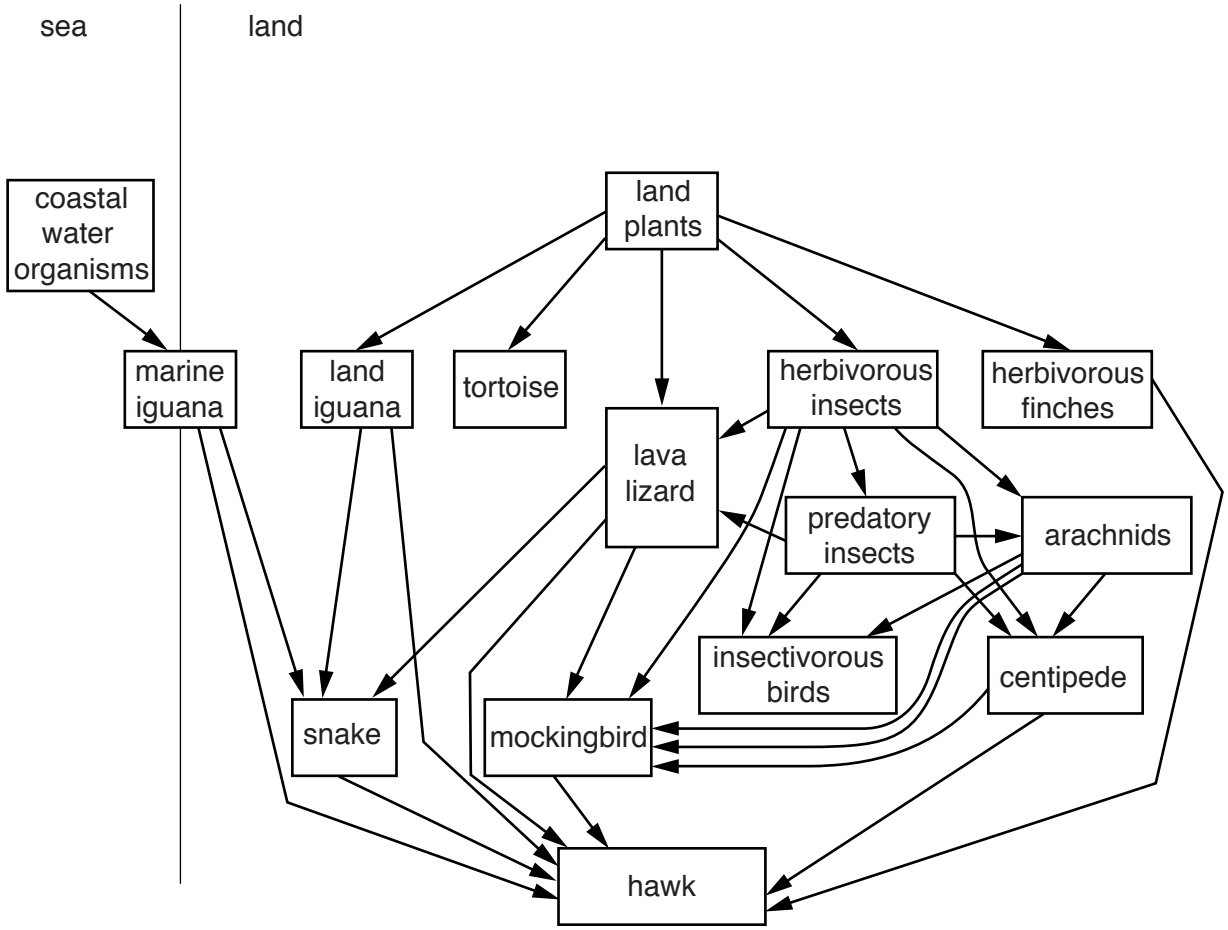


Fig. 2.1

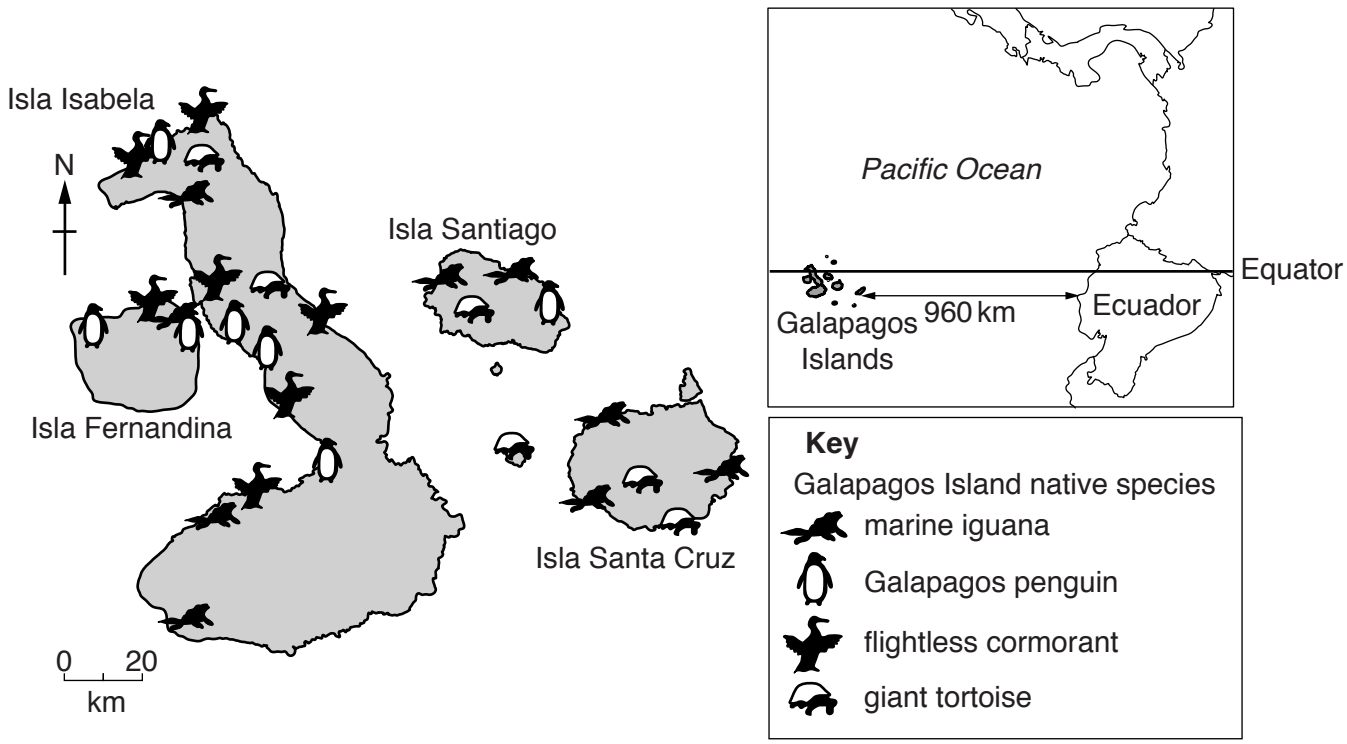
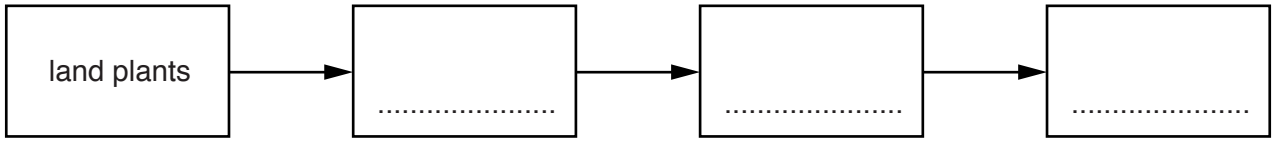


Fig. 2.2

(i) With reference to Fig. 2.1, complete the four-stage food chain.



[2]

(ii) With reference to Fig. 2.1 and Fig. 2.2, explain how the terms *habitat* and *niche* can be applied to the location of species in the Galapagos Islands.

habitat .....

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niche .....

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[4]

(iii) A marine reserve has been established with a 64 km radius around the islands. With reference to Fig. 2.1 and Fig. 2.2, explain the need to conserve the Galapagos Islands' habitats **and** protect their coastal waters.

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.....[4]

(b) (i) Suggest **one** way in which tourism can pose a threat to the species in the Galapagos Islands.

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(ii) Fig. 2.3 shows the Galapagos Island of Santa Cruz. Describe how the strategy shown in Fig. 2.3 can protect the island's most vulnerable species.

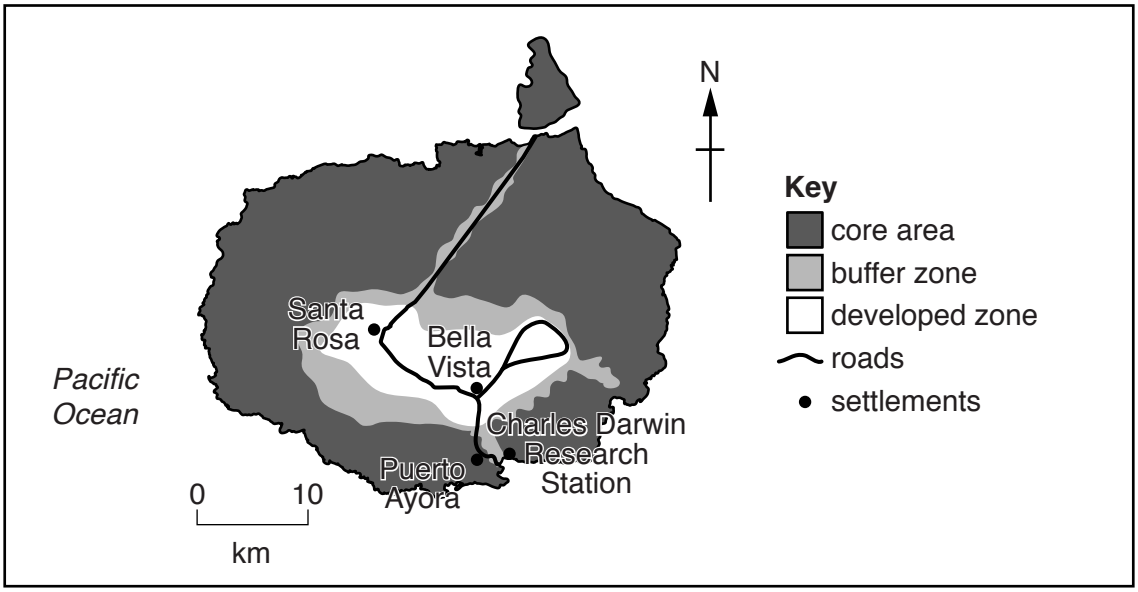

Fig. 2.3

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[Total: 20]

Section B

Answer **one** question from this section.

3 **(a)** Fig. 3.1 shows the number of threatened tree species in three categories for different regions.

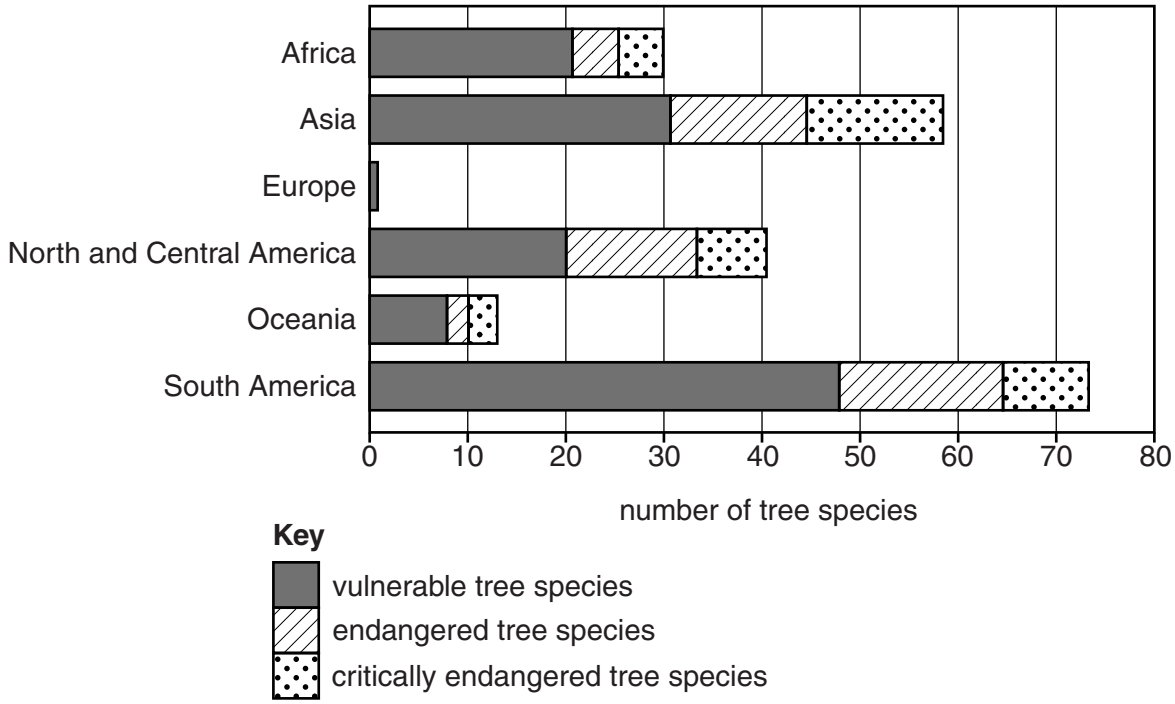

Fig. 3.1

Briefly describe the regional differences in the data shown in Fig. 3.1. [10]

(b) Using an example of a biome you have studied, describe the threat to both the extent and ecological quality of its forest ecosystems. Evaluate the measures that can be used to sustain the biodiversity of these forest ecosystems. [30]

[Total: 40]

[Turn over

4 **(a)** Fig. 4.1 shows a lake which is enriched with nutrients in **A** and has subsequently suffered from the effects of eutrophication in **B**.

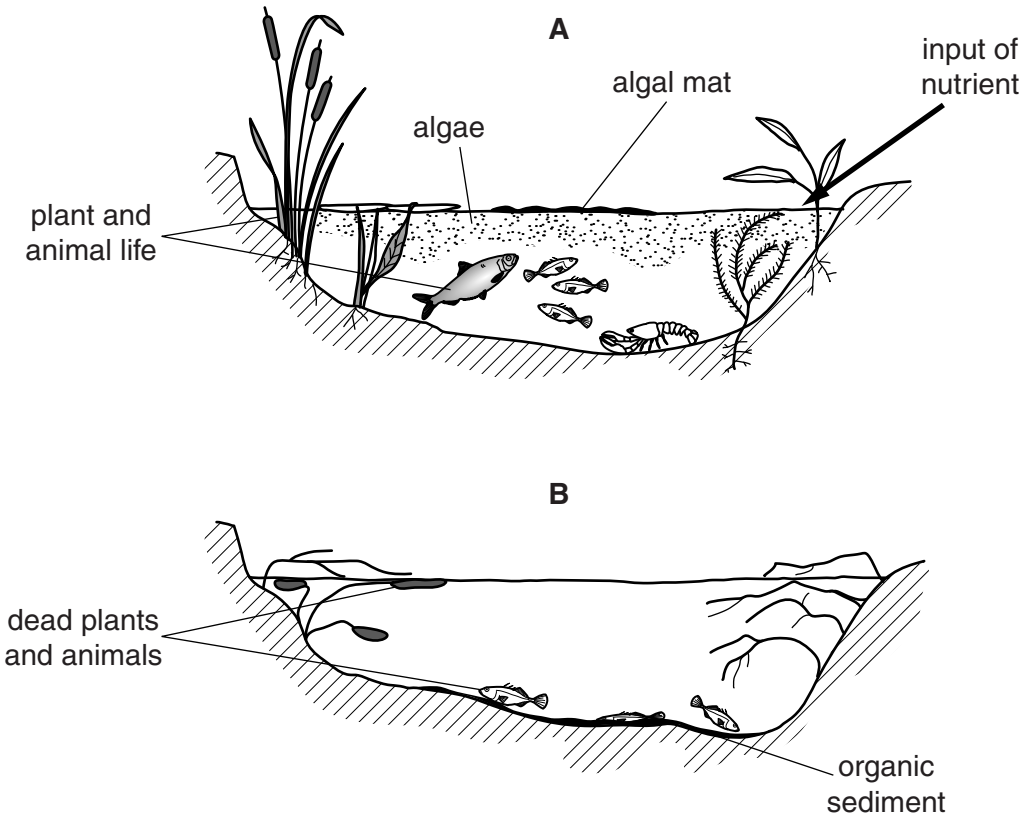

Fig. 4.1

With reference to Fig. 4.1, describe the process of eutrophication and its effects. [10]

(b) Describe the sources of nutrient enrichment of rivers and lakes. For a river with which you are familiar, evaluate the measures that have been used to prevent or reduce pollution. [30]

[Total: 40]

5 **(a)** Fig. 5.1 shows the net primary productivity (NPP) of ecosystems and agricultural land.

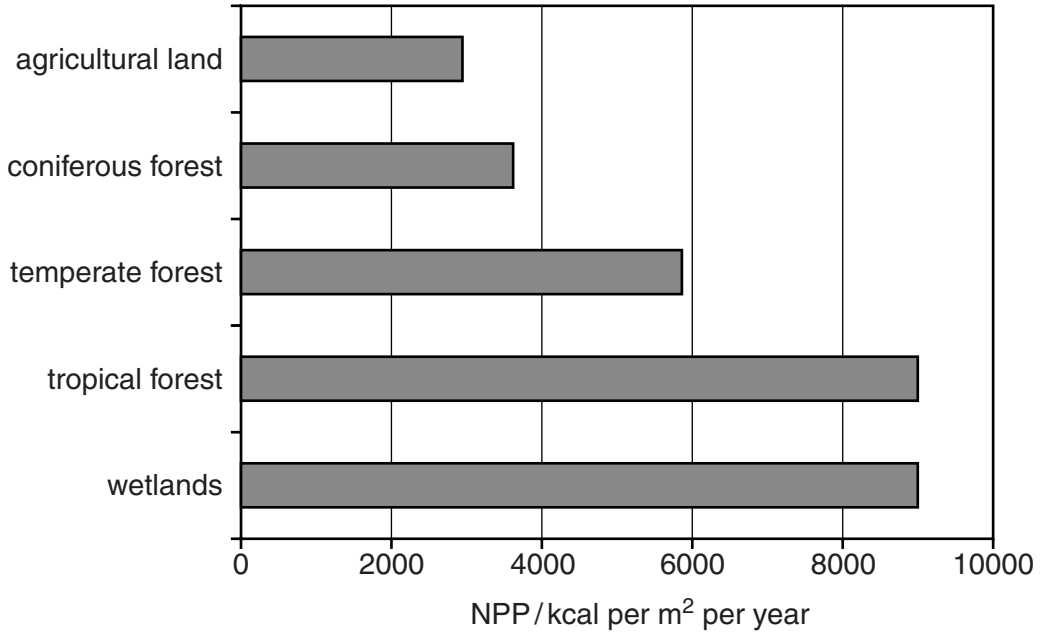

Fig. 5.1

With reference to the data in Fig. 5.1, outline **three** factors that affect the variations in primary productivity of ecosystems and agricultural land. [10]

(b) Fig. 5.2 shows the hectares of productive land and sea needed to resource the lifestyle of one person.

country	productive land and sea / ha
United States of America	9.6
Brazil	2.1
China	1.6
India	0.8

Fig. 5.2

Using examples of countries at different levels of economic development, assess the extent to which the sustainable use of resources can help to resolve issues arising from the increasing demands of populations. [30]

[Total: 40]

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