UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Advanced Subsidiary Level

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

ENVIRONMENTAL MANAGEMENT **8291/21**

Paper 2 Hydrosphere and Biosphere **May/June 2013**

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 a soft pencil for any diagrams, graphs, tables or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.
Electronic calculators may be used.

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 **12** printed pages.

UNIVERSITY of CAMBRIDGE International Examinations

Section A

Answer **all** questions in this section.

1 **(a)** Fig. 1.1 shows the components of the water cycle within a river valley.

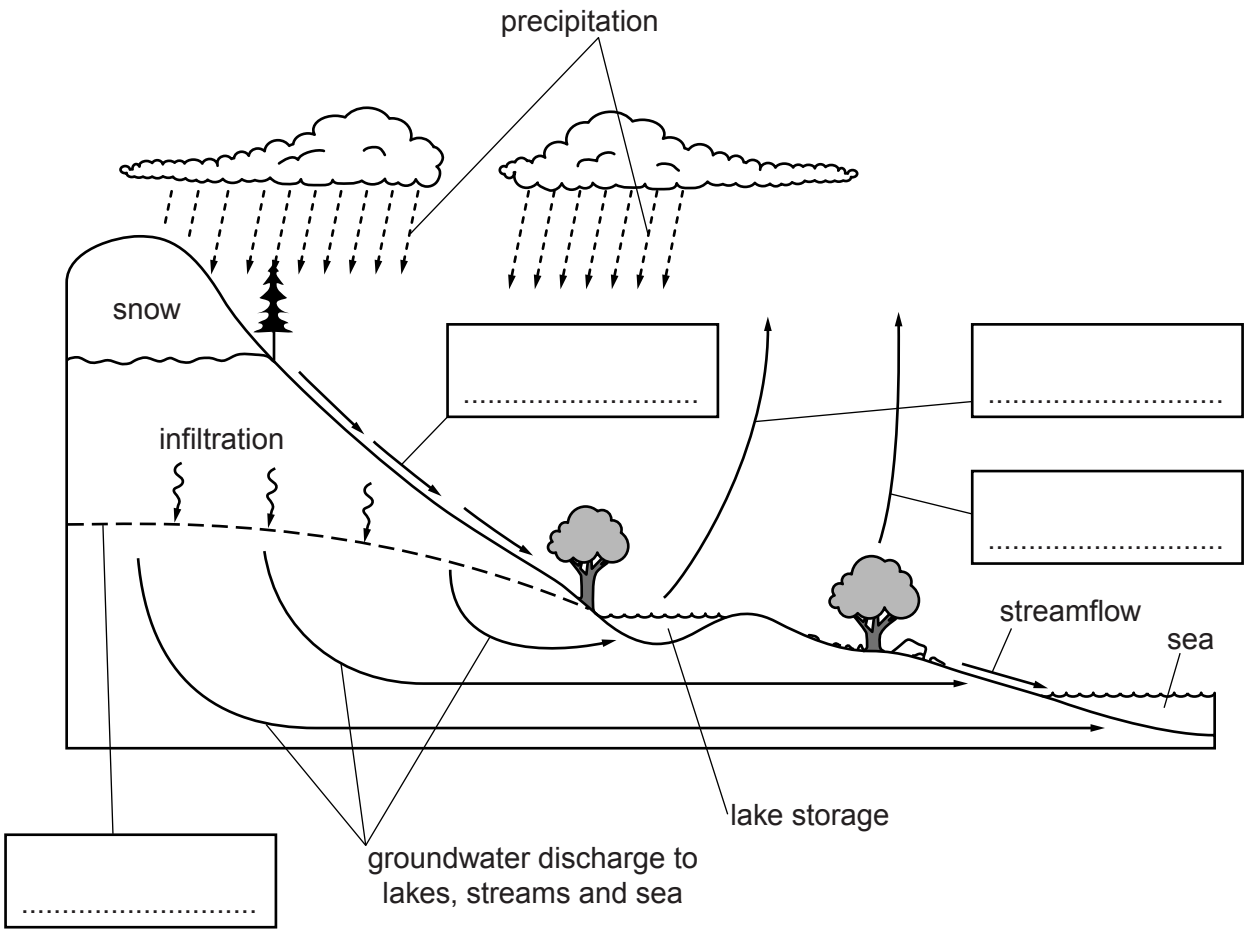

Fig. 1.1

(i) Insert the following labels into their appropriate boxes in Fig. 1.1:

evaporation **transpiration** **surface runoff** **water table** [4]

(ii) Explain why although the contents of Fig. 1.1 can be described as a water cycle it is also an open system.

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.....[2]

(iii) Explain the inverse relationship between infiltration and surface runoff shown in the graphs, in Fig. 1.2 of

A precipitation against soil porosity

B precipitation against slope angle

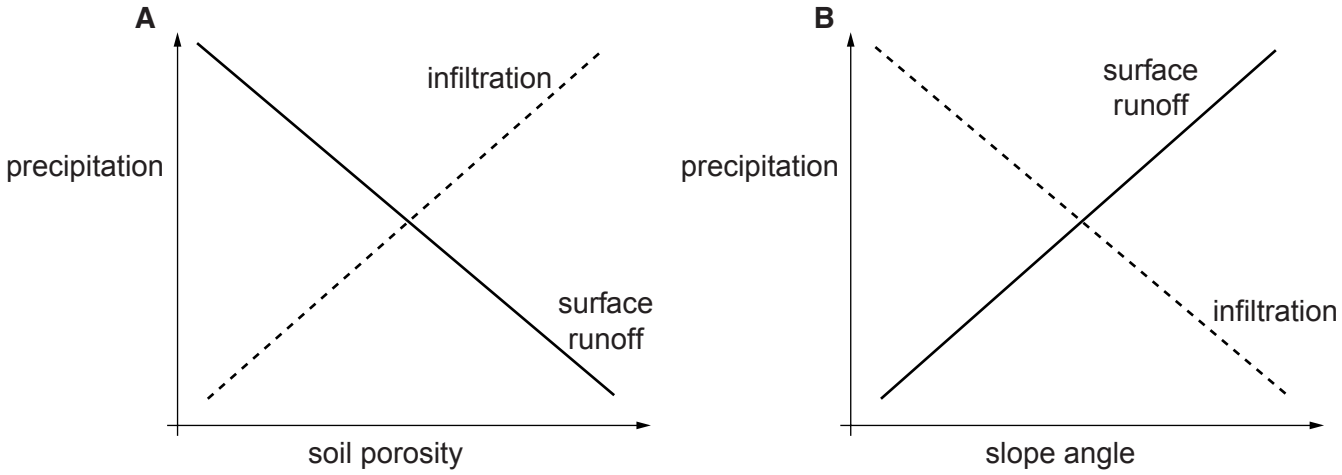

Fig. 1.2

A .....

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.....[3]

B .....

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.....[3]

(b) Describe how the priorities in Fig. 1.3 are important in flood risk management.

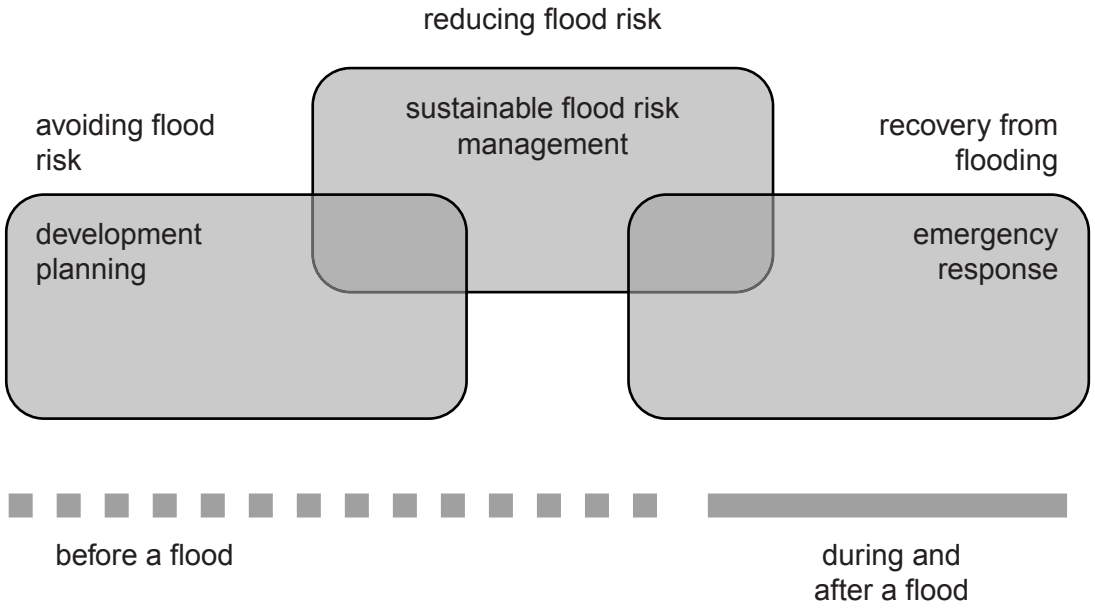

Fig. 1.3

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[Total: 20]

2 **(a)** What is meant by the terms *biodiversity* and *biomass*?

biodiversity .....

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biomass .....

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.....[4]

(b) Fig. 2.1 shows both nutrient flow and energy transfer in an ecosystem.

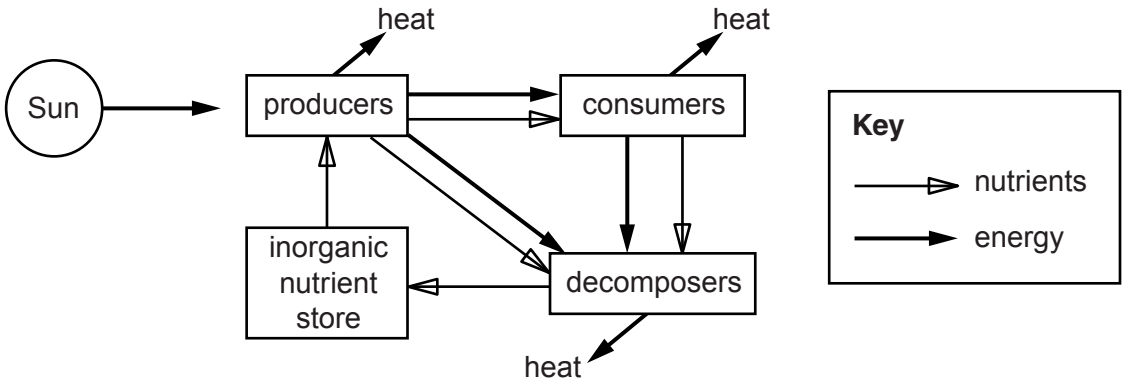

Fig. 2.1

(i) With reference to Fig. 2.1, describe the flow of nutrients in an ecosystem.

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.....[3]

(ii) With reference to Fig. 2.1, describe the transfer of energy in an ecosystem.

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.....[3]

Question 2(c) starts on page 8

(c) Fig. 2.2 is a nutrient model for a rainforest ecosystem. The size of the circles corre to the quantity of nutrients stored. The width of the arrows corresponds to the quan of nutrient flow.

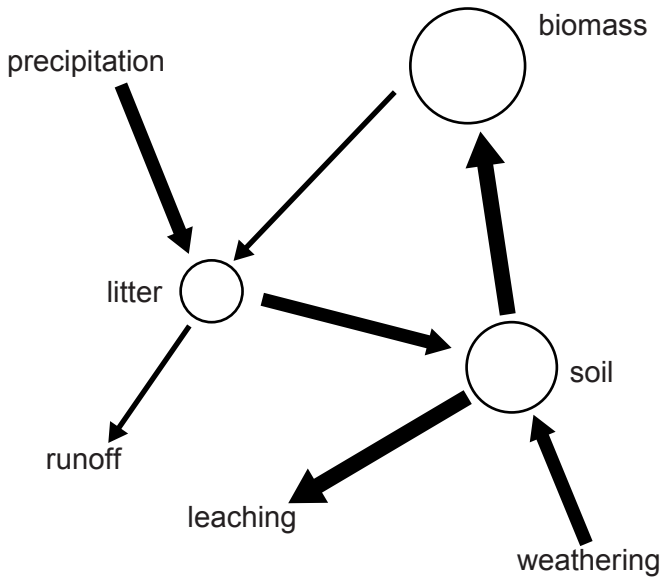

Fig. 2.2

(i) Give two reasons for the quantity of nutrients in the biomass store.

1 .....

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2 .....

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.....[2]

(ii) Explain why the litter nutrient store is the smallest.

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.....[2]

(iii) Describe the effect of deforestation upon the flows and stores in Fig. 2.2.

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.....[6]

[Total: 20]

Section B

Select **one** question from this section.

3 **(a)** Fig. 3.1 shows how the use of hydroelectric power (HEP) developed between 1965 and 2006 in different regions of the world.

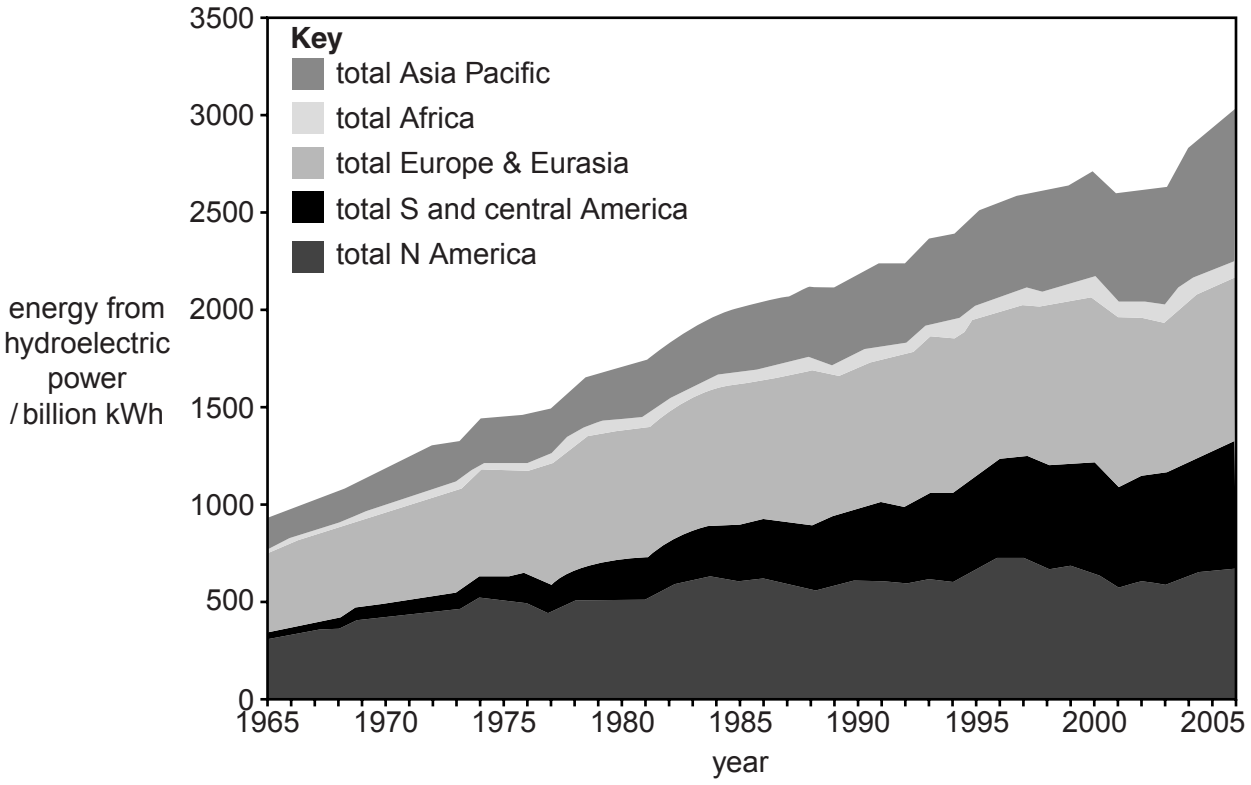

Fig. 3.1

Describe and explain the variations in the development of HEP shown in Fig. 3.1. [10]

(b) Hydroelectric power stations usually require water storage behind dams. With reference to examples you have studied, assess the extent to which the benefits accrued from storing water for HEP are frequently outweighed by disadvantages. [30]

[Total: 40]

4 **(a)** Fig. 4.1 shows the sources of petroleum that lead to marine pollution, and the a
contribution made by each source.

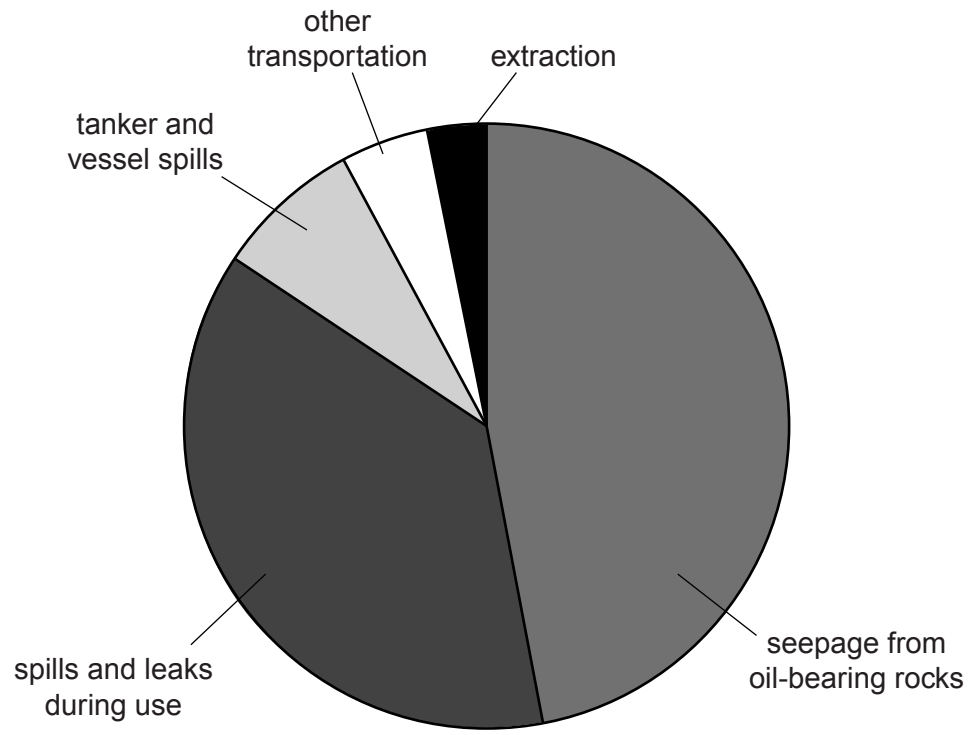

Fig. 4.1

With reference to Fig. 4.1 briefly discuss the contributions made by these sources. [10]

(b) Explain why there are difficulties associated with trying to reduce the causes and effects of marine pollution. Assess **two** strategies that can be used to manage the issue of marine pollution. [30]

[Total: 40]

5 **(a)** Fig. 5.1 shows changes in species extinction and human population between 18[illegible]

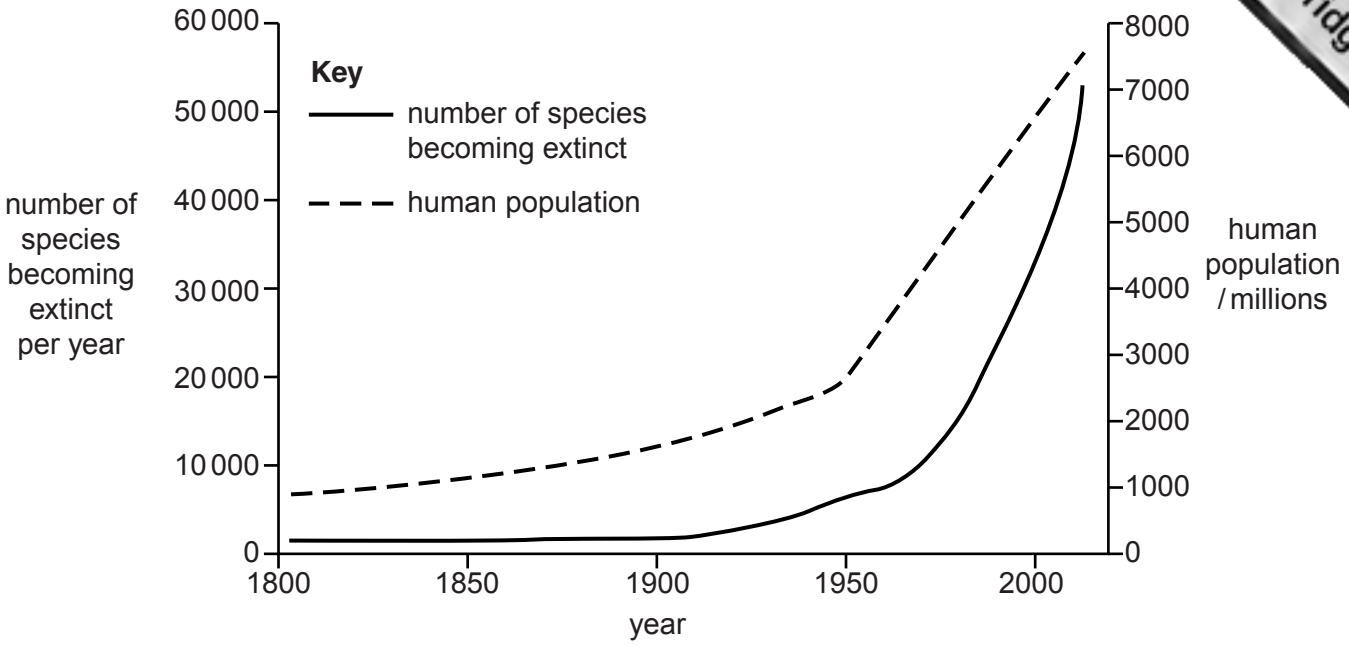

Fig. 5.1

Describe and explain the relationship between species extinction and human population shown in Fig. 5.1. [10]

(b) With reference to **one** area of ecological importance you have studied, assess the conservation strategies used to preserve its species. [30]

[Total: 40]