| Centre Number | Candidate Number | Name |
|---|---|---|
| | | |

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

**ENVIRONMENTAL MANAGEMENT** **8291/02**

Hydrosphere and Biosphere

Paper 2

October/November 2006

**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, table or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

**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.

All questions in this paper carry equal marks.

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

This document consists of **13** printed pages and **3** blank pages.

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## Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

**1** **(a)** Fig. 1.1 is a cross section of a river valley showing how water is stored and transferred.

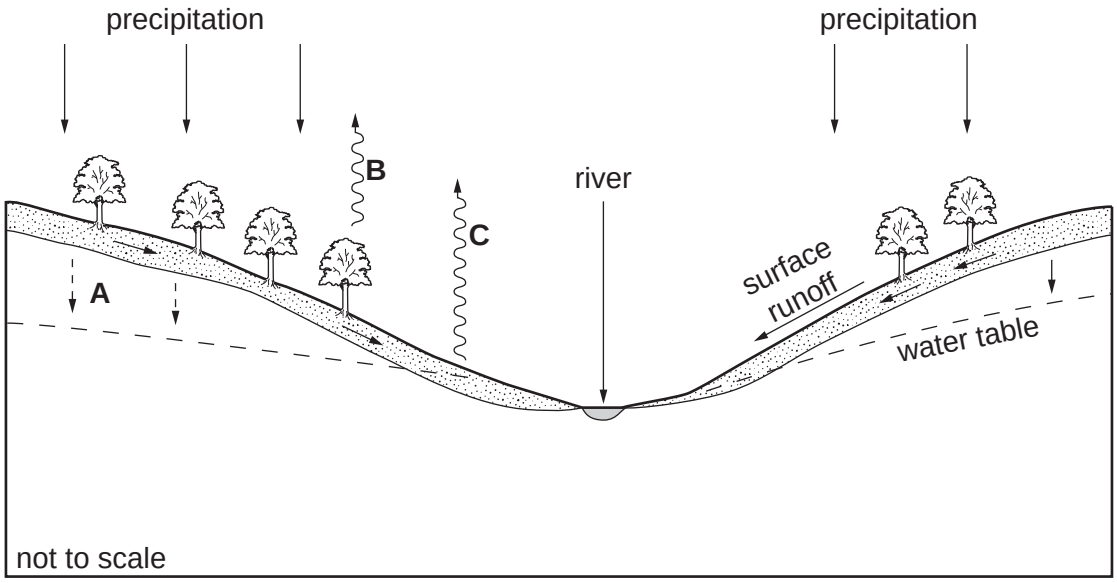


**Fig. 1.1**

**(i)** Name the processes occurring at points **A**, **B** and **C** in Fig. 1.1.

A .....

B .....

C .....[3]



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**(ii)** Describe the effects that each of the following would have upon the stores and transfers within Fig. 1.1:

- during a long dry summer

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- following heavy rainfall when the soil moisture content is high

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- following the removal of the trees from the valley sides.

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.....[6]

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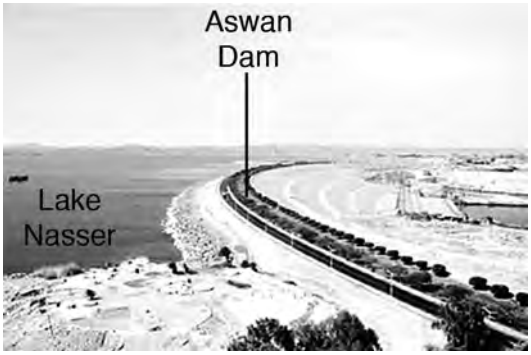
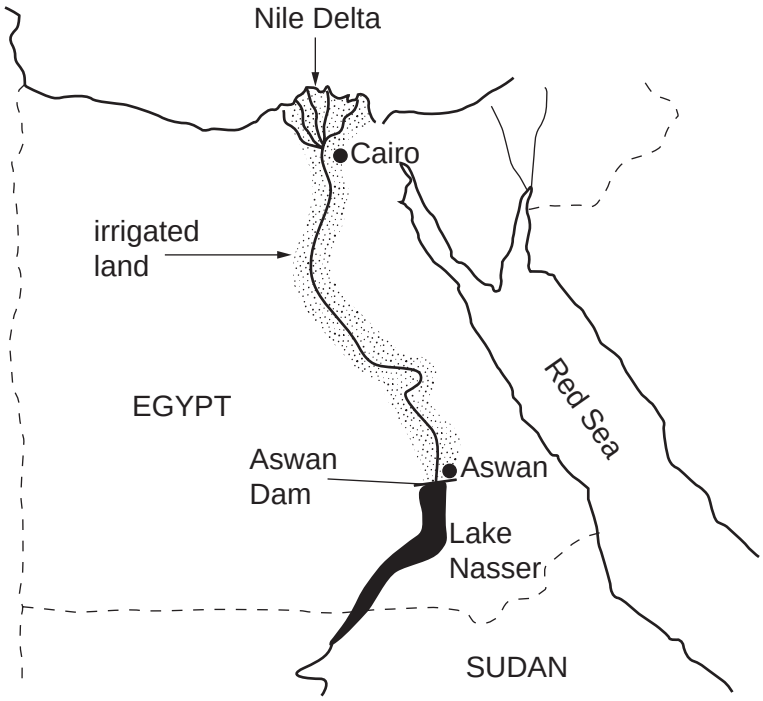
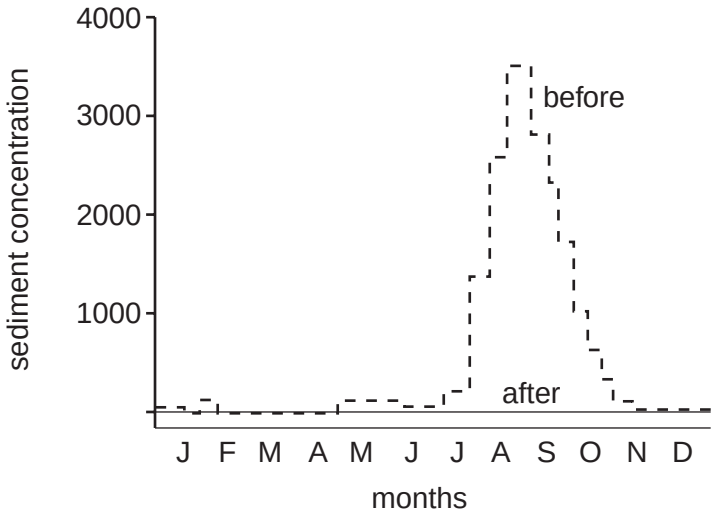
**(b)** Fig. 1.2 contains information on the impact of the Aswan Dam upon the River Nile and its flood plain.




Sediment concentration in the River Nile at Aswan; before and after construction of the dam.




Daily River Nile discharge at Aswan, before and after the construction of the dam.

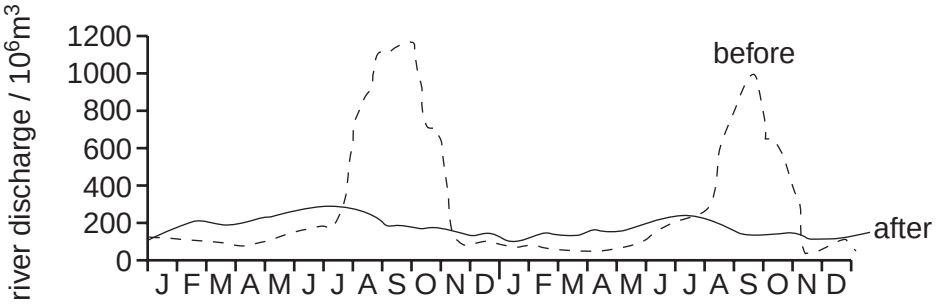



**Fig. 1.2**

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**(i)** Suggest **two** benefits associated with the construction of the Aswan Dam.

.....

.....

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.....[2]

**(ii)** Suggest **one** reason why the daily discharge from the River Nile changed after the dam was constructed.

.....

.....[1]

**(iii)** Explain why the sediment concentration in the river water at Aswan changed after the dam was constructed.

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.....[2]

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**(iv)** Suggest and justify **one** reason in each case for the following disadvantages associated with the construction of the Aswan Dam:

- whilst the area of irrigated and cultivated land has increased, agricultural productivity per unit area has decreased

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- the Nile Delta is no longer stable and is experiencing erosion

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- whilst there are economic benefits to Egypt, there have also been social disruption and cultural losses.

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.....[6]

[20 marks]

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**2** **(a)** What is the meaning of the terms: *biomass*, *biodiversity* and *trophic* level?

- biomass

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- biodiversity

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- trophic level.

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.....[3]

**(b)** Fig. 2.1 illustrates a simplified food chain to be found in tropical grasslands.

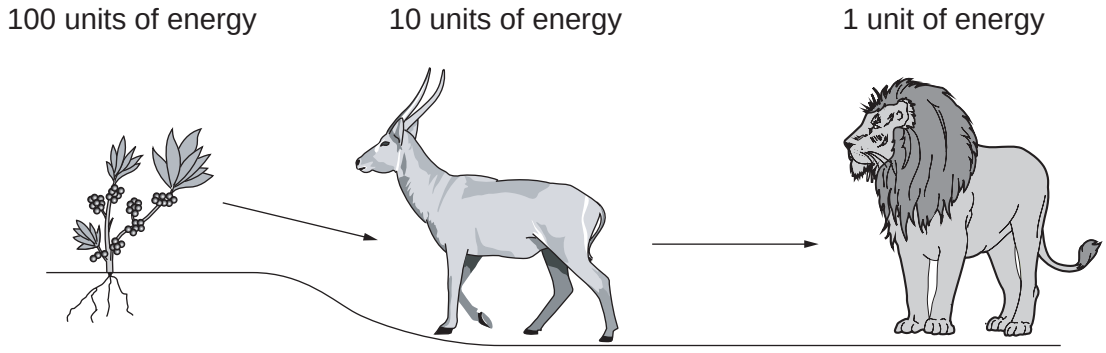


**Fig. 2.1**

**(i)** What is the initial source of energy for this food chain?

.....[1]

**(ii)** Only about 10% of the energy available in one trophic level is transferred to the next trophic level in the food chain. Explain why energy is lost from the food chain at each stage.

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.....[2]



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**(c)** Fig. 2.2 shows changes to agriculture which have occurred between 1930 and the present day.

1930 Present Day

**Fig. 2.2**

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With reference to Fig. 2.2, outline **three** ways in which these changes could lead to a reduction in biodiversity.

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**(d)** The Spanish Steppes suffer from aridity; temperatures can be high and rainfall low. It is hard for vegetation to survive under these conditions.
Fig. 2.3 shows part of the Spanish Steppes and Fig. 2.4 the climate of the Spanish Steppes.

**Fig. 2.3**

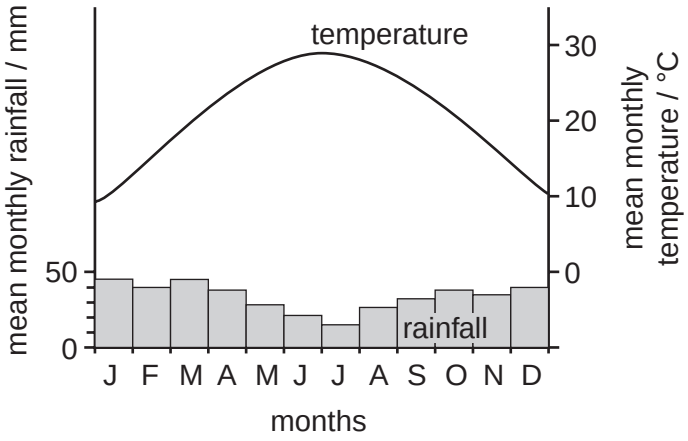


**Fig. 2.4**

Explain how the spread of agriculture to create more pasture and cereals could lead to soil erosion and the formation of desert.

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.....[8]

[20 marks]

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## Section B

Answer **one** question from this section.

Answers must be in continuous prose.

Write your answers on the separate answer paper provided.

**3** **(a)** Fig. 3.1 shows some of the demands on an area of land in a rural location.

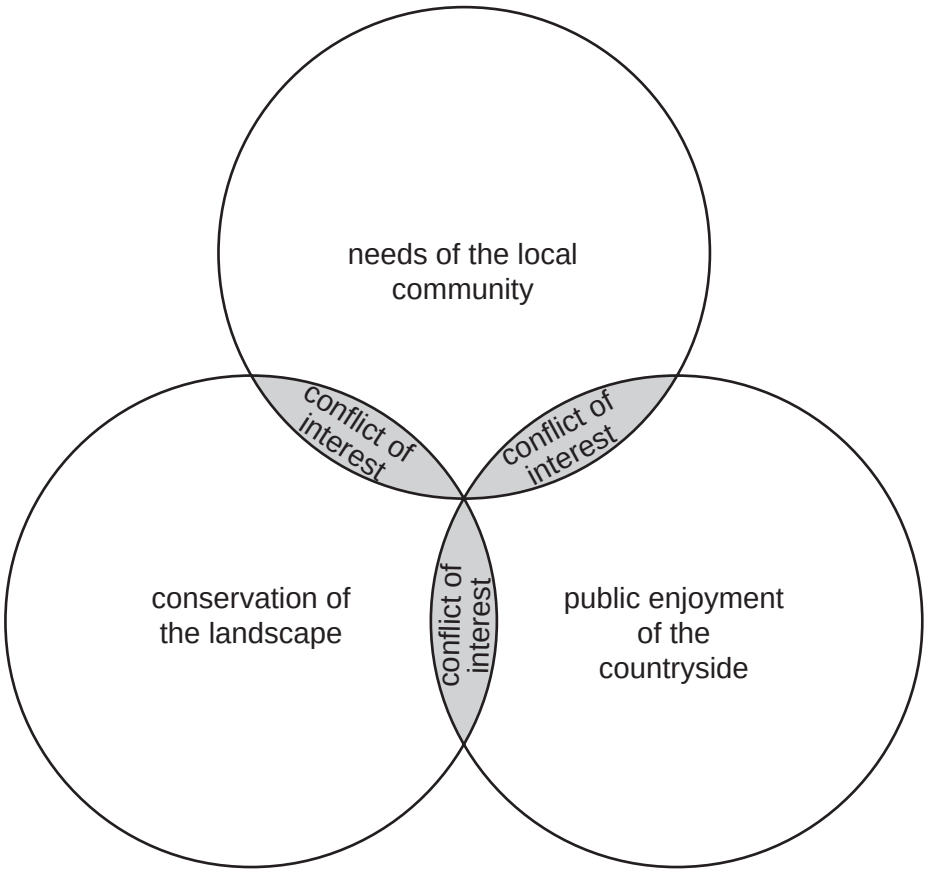


**Fig. 3.1**

Briefly explain how conflicts of interest may arise as a result of these different demands. [10]

**(b)** Using examples you have studied, describe and evaluate the role of National Parks in protecting areas of ecological importance that are under threat from human activity. [30]

[40 marks]


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**4** **(a)** Fig. 4.1 shows the countries and rivers surrounding the Baltic Sea, and some of the environmental problems in the area.

**Fig. 4.1**

Outline **three** reasons why managing pollution in the Baltic Sea is difficult. [10]

**(b)** Giving examples, describe and explain how oceanic ecosystems are threatened by human activity. Using **one** example evaluate the extent to which such situations can be managed. [30]

[40 marks]



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**5** **(a)** Table 5.1 contains the results of a survey. It shows the percentage of people who think that environmental problems are the 'most important' or 'a very serious' issue in their country.

**Table 5.1**

| | **percentage of people in category** | |
|---|---|---|
| **Industrialised countries** | **Most important** | **Very Serious** |
| Ireland | 39 | 32 |
| Finland | 28 | 27 |
| Switzerland | 20 | 63 |
| Japan | 12 | 42 |
| USA | 11 | 51 |
| Great Britain | 3 | 36 |
| | | |
| **Developing countries** | | |
| Mexico | 29 | 66 |
| India | 21 | 51 |
| Russia | 9 | 62 |
| Brazil | 2 | 50 |
| Philippines | 2 | 37 |
| Hungary | 1 | 52 |

Briefly outline the similarities and differences for the results:

- when Industrialised countries as a whole are compared with Developing countries as a whole
- when individual countries within each type of country (Industrialised and Developing) are compared. [10]

**(b)** To what extent have agreements between nations and the action of pressure groups been effective in managing the Earth's biosphere in a more sustainable way? [30]

[40 marks]

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*Copyright Acknowledgements:*

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Question 4 Fig. 4.1 © Richard Buckley; *The Baltic Region: North-East Europe's Frontier of Change*; European Schoolbooks; 1995.
Question 5 Table 5.1 © Timothy O'Riordan; *Environmental Science for Environmental Management*; Longman; 1996.

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