

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 2005

**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.

**For Examiner's Use**

**Section A**

1

2

**Section B**

**TOTAL**

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

Section A

Answer all questions in this section.

Write your answers in the spaces provided.

- 1 (a) Fig. 1.1 shows water withdrawals for domestic, agricultural and industrial use within the major continental regions. Water withdrawals are given as a volume and as a percentage of the potential water supply for each region. For example: World water withdrawal amounts to 3000 cubic kilometres which is 9% of the potential supply.

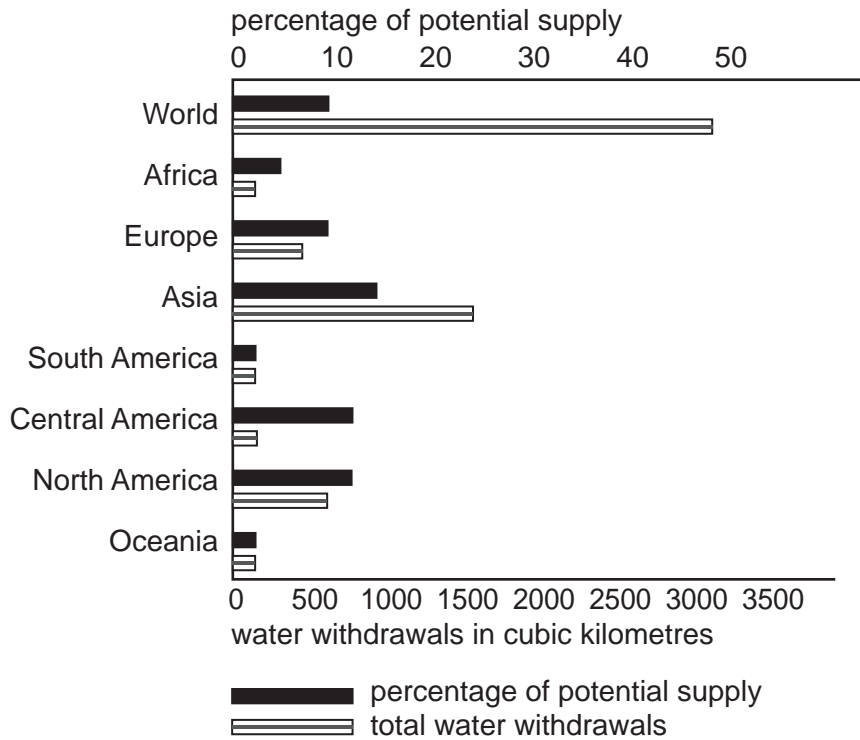


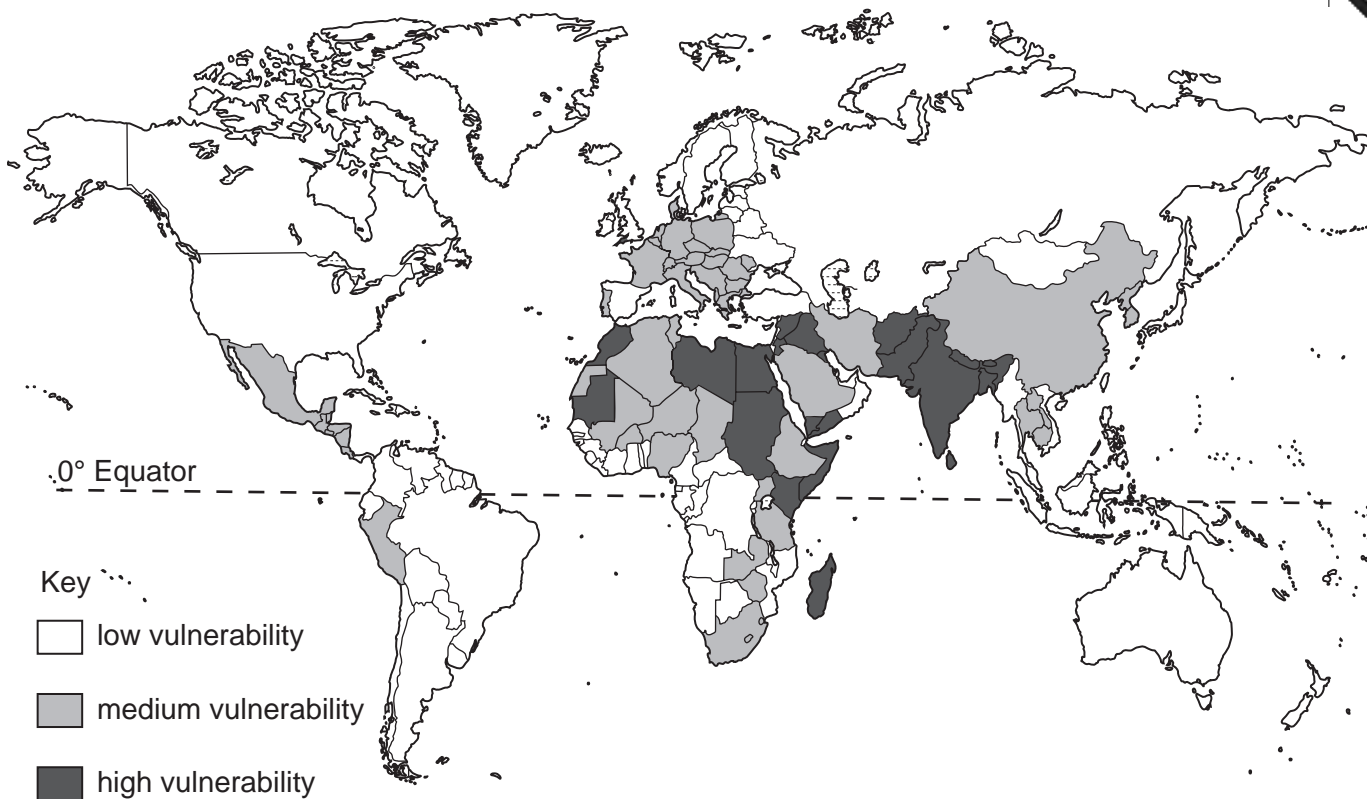
Fig. 1.1

Describe the withdrawals and the potential supply of water for Asia, Europe and Africa.

- Asia .....
  - Europe .....
  - Africa .....
- .....[3]

(b) Fig. 1.2 shows how regions of the world are likely to be vulnerable to a scarcity of water in 2025.

Projected Water Vulnerability in 2025, Taking into Account National Economic Status



**Fig. 1.2**

Using Fig. 1.2 and Fig. 1.1, suggest why certain areas of the world are likely to have

- a high vulnerability to water scarcity in 2025,
- a low vulnerability to water scarcity in 2025.

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- (c) Fig. 1.3 contains information on water management within the Colorado Basin effects upon water discharge and sediment discharge at point **A** on the map.

Simplified Map of the Colorado River Basin

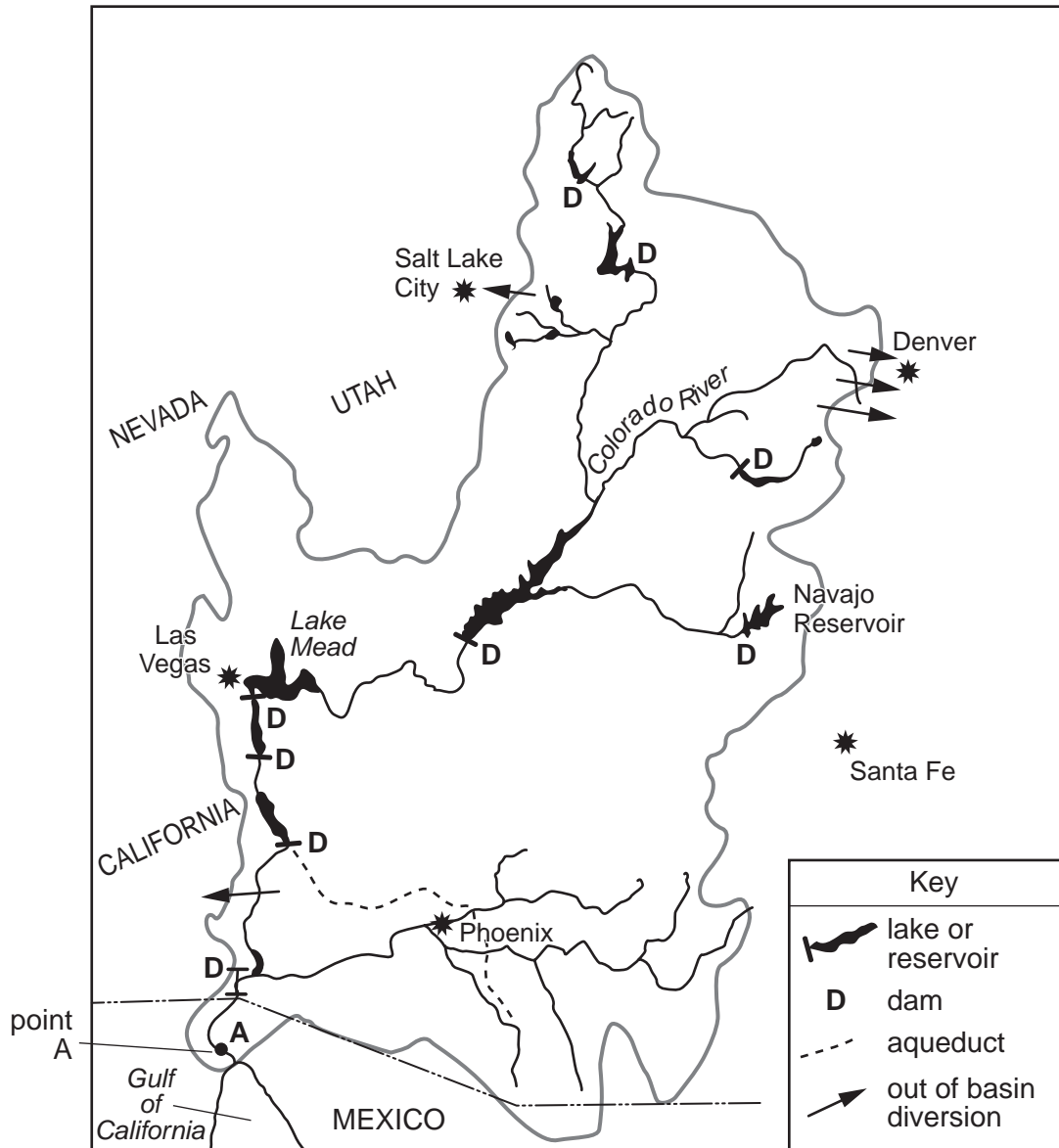
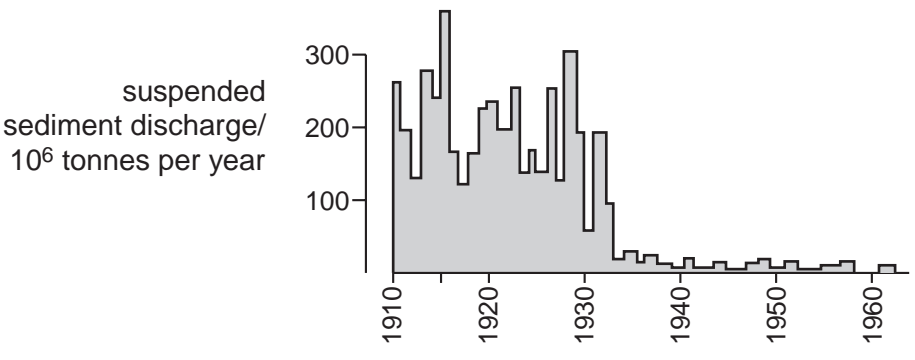
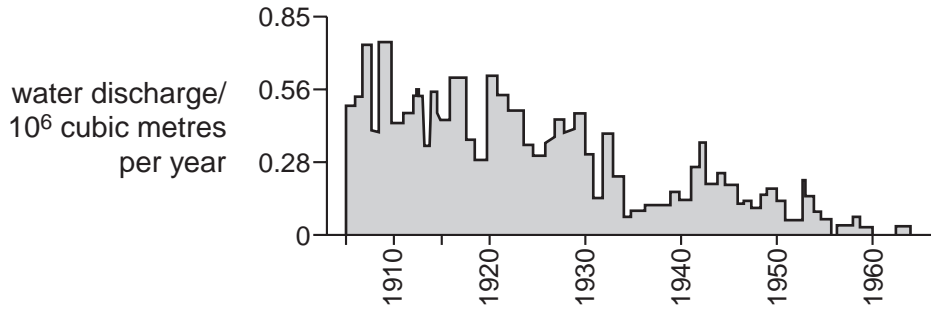
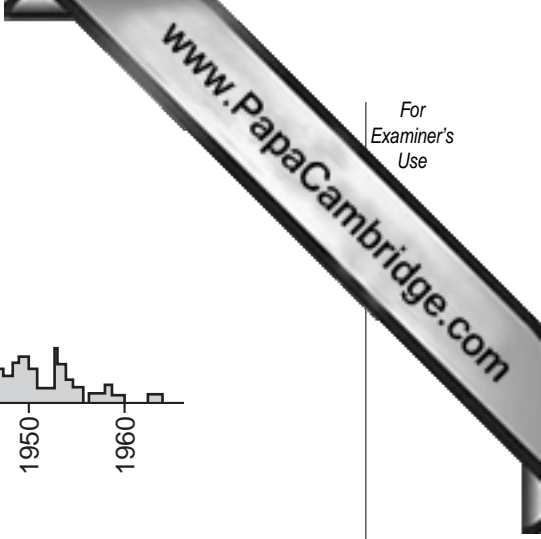


Fig. 1.3



(i) Describe the pattern of water management within the Colorado River Basin.

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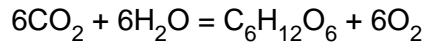
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[4]



2 (a) All organisms need a source of energy to live.

(i) Photosynthesis is described by the equation



Use the equation to describe the process of photosynthesis.

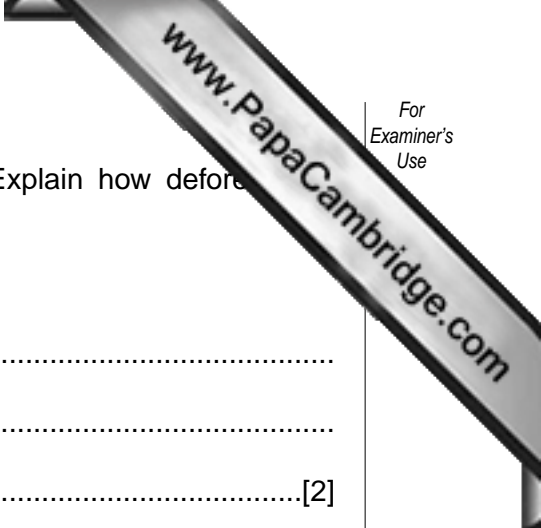
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.....[4]

(ii) Why is photosynthesis important in a food web?

.....  
.....  
.....[2]

(iii) Why is photosynthesis connected to the gaseous composition of the atmosphere?

.....  
.....  
.....[2]



(b) Many areas of the world are experiencing deforestation. Explain how deforestation might lead to

- a reduction in animal diversity,

.....  
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.....[2]

- local climatic change,

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.....  
.....[2]

- soil erosion,

.....  
.....  
.....[2]

- changes to aquatic ecosystems,

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.....[2]

- a reduction in soil fertility,

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.....[2]

- changes to river discharge and flooding.

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.....[2]

[20 marks]



## Section B

Answer **one** question from this section.

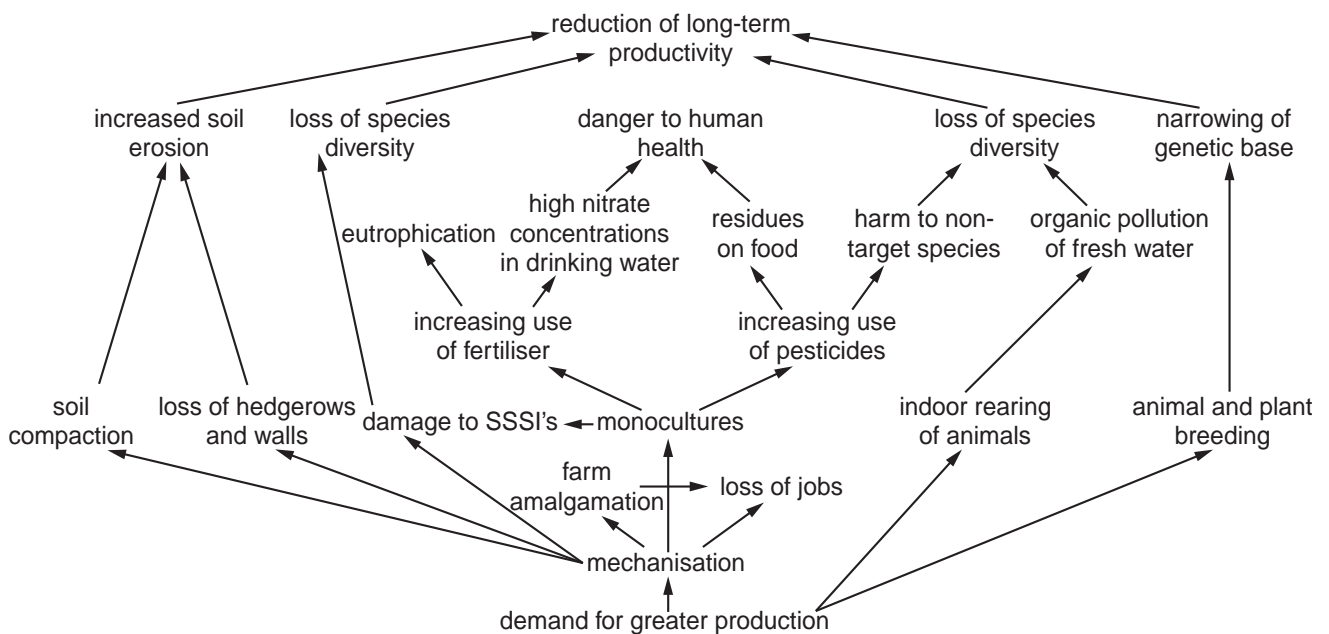
Answers must be in continuous prose.

Write your answers on the separate answer paper provided.

- 3 (a) Outline **three** different ways in which the oceans are important for life on Earth. [10]
- (b) Outline the major sources and effects of marine pollution. Assess the effectiveness of measures aimed at reducing marine pollution. [30]

[40 marks]

- 4 (a) Fig. 4.1 depicts environmental problems caused by agricultural intensification.



SSSI = site of special scientific interest

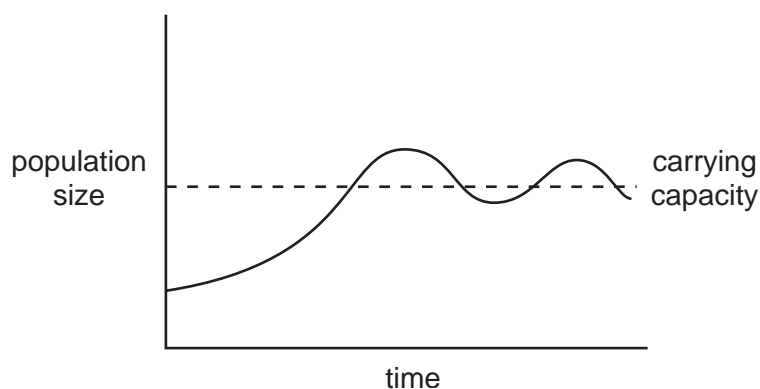
Fig. 4.1

Describe **three** routes by which long-term productivity may be reduced. [10]

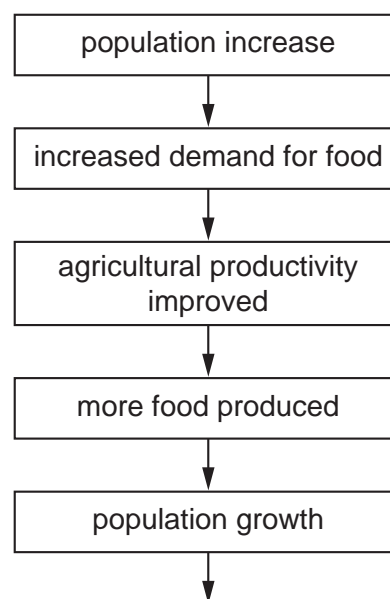
- (b) Using examples you have studied, describe and evaluate the conservation strategies that have been introduced to protect an area of ecological importance. [30]

[40 marks]

- 5 (a) Figs. 5.1 and 5.2 illustrate two different models relating population growth to food production. Describe how the models offer different views of the way in which the population may change over time.



**Fig. 5.1**



**Fig. 5.2**

- (b) In 1987 the Brundtland Commission defined sustainable development as,

“development which meets the needs of the present without compromising the ability of future generations to meet their own needs”.

Describe the policies and priorities, which target sustainable development in a country or area of your choice. Give reasons to justify the extent to which have they been achieved. [30]

[40 marks]



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