



# Cambridge International AS Level

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## ENVIRONMENTAL MANAGEMENT

8291/23

Paper 2 Hydrosphere and Biosphere

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	
<b>Section A</b>	/
1	
2	
<b>Section B</b>	/
<b>Total</b>	

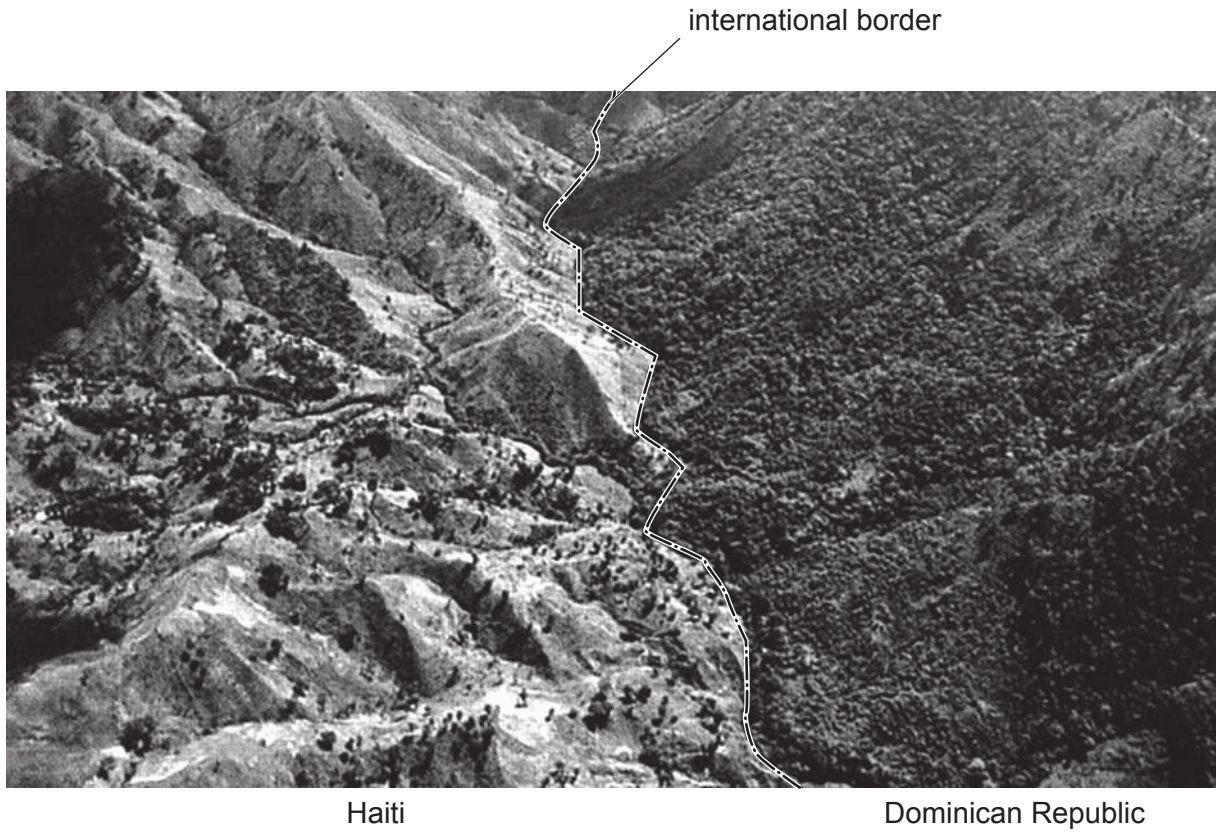
This document has **16** pages. Any blank pages are indicated.

**Section A**

Answer **all** questions in this section.

Write your answers in the spaces provided.

- 1 Fig. 1.1 shows the international border between the Caribbean countries Haiti and Dominican Republic.



**Fig. 1.1**

- (a) (i) Describe **two** differences between Haiti and Dominican Republic shown in Fig. 1.1.

.....

.....

.....

..... [2]

(ii) Suggest **two** reasons for the differences in the amount of vegetation cover shown in Fig. 1.1.

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

(iii) Explain the effect of loss of vegetation cover on soil.

.....  
.....  
.....  
.....  
.....  
..... [3]

(iv) Explain why biodiversity decreases when vegetation cover is lost.

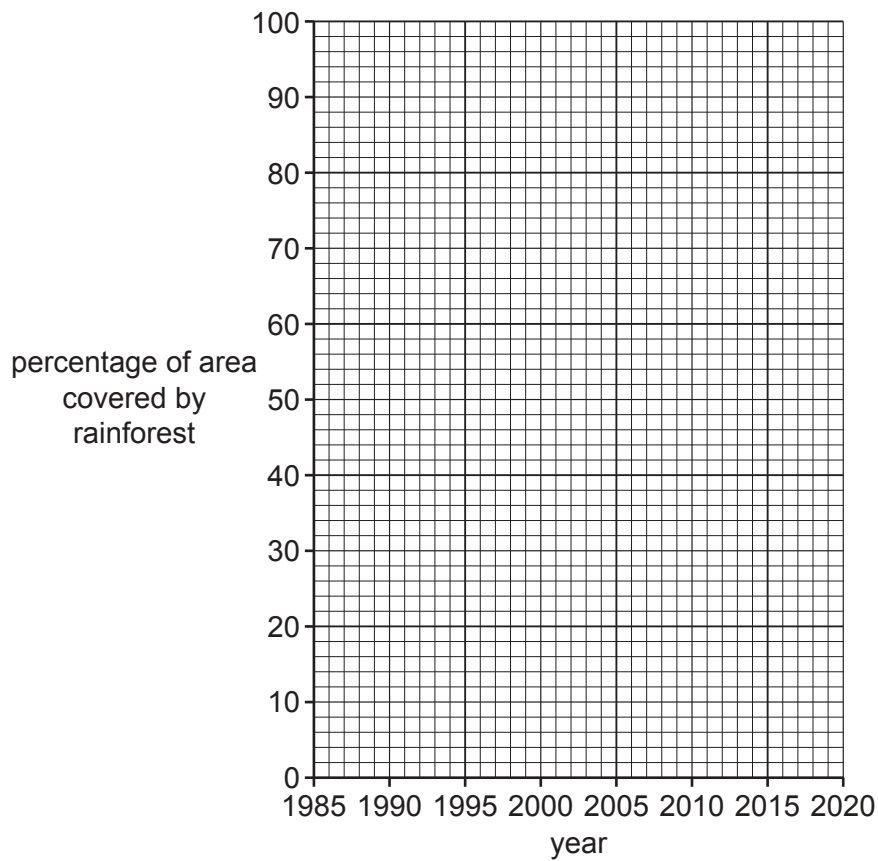
.....  
.....  
.....  
..... [2]

(b) Table 1.1 shows the percentage of an area covered by rainforest between 1985 and 2020.

**Table 1.1**

year	percentage of area covered by rainforest
1985	74
2000	58
2005	50
2010	44
2020	33

(i) Plot a scatter graph using the data from Table 1.1. Include a line of best fit.



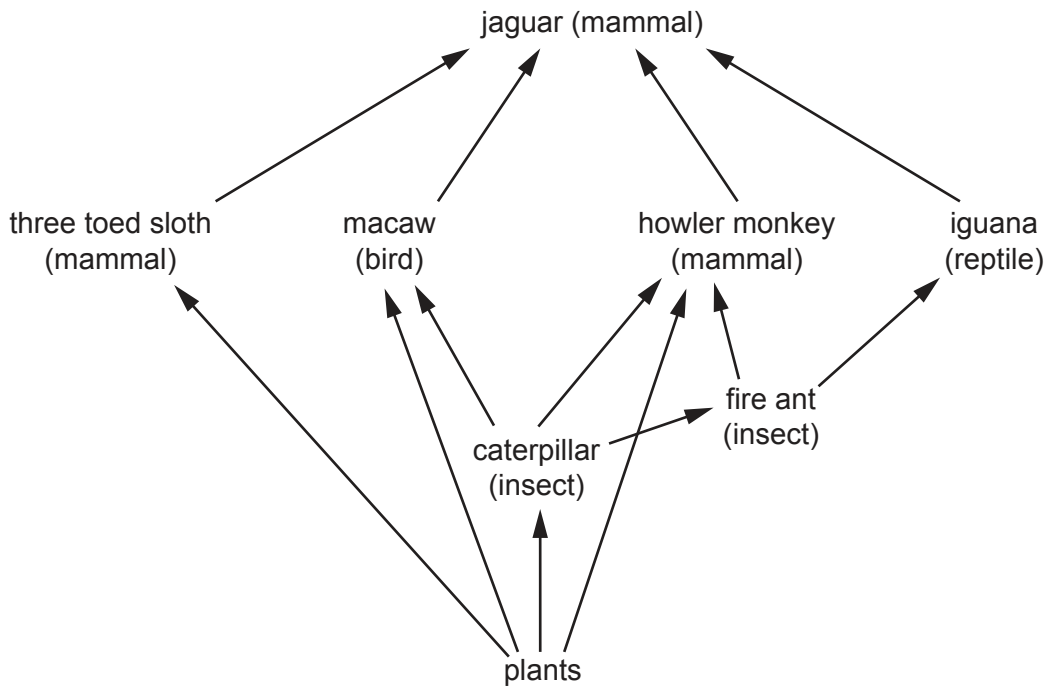
[3]

(ii) Describe the change in the percentage of the area covered by rainforest between 1985 and 2020.

.....

..... [1]

(c) Fig. 1.2 shows part of a food web for the Amazon Rainforest.



**Fig. 1.2**

(i) State the number of trophic levels in the food web shown in Fig. 1.2.

.....  
 ..... [1]

(ii) State the trophic level that has the most energy.

..... [1]

(iii) Explain why howler monkeys are both primary and secondary consumers.

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

(d) Explain the influence of light intensity on plant productivity.

.....

.....

.....

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.....

.....

..... [3]

[Total: 20]



2 Fig. 2.1 is a diagram showing an effect of fertiliser pollution in water.

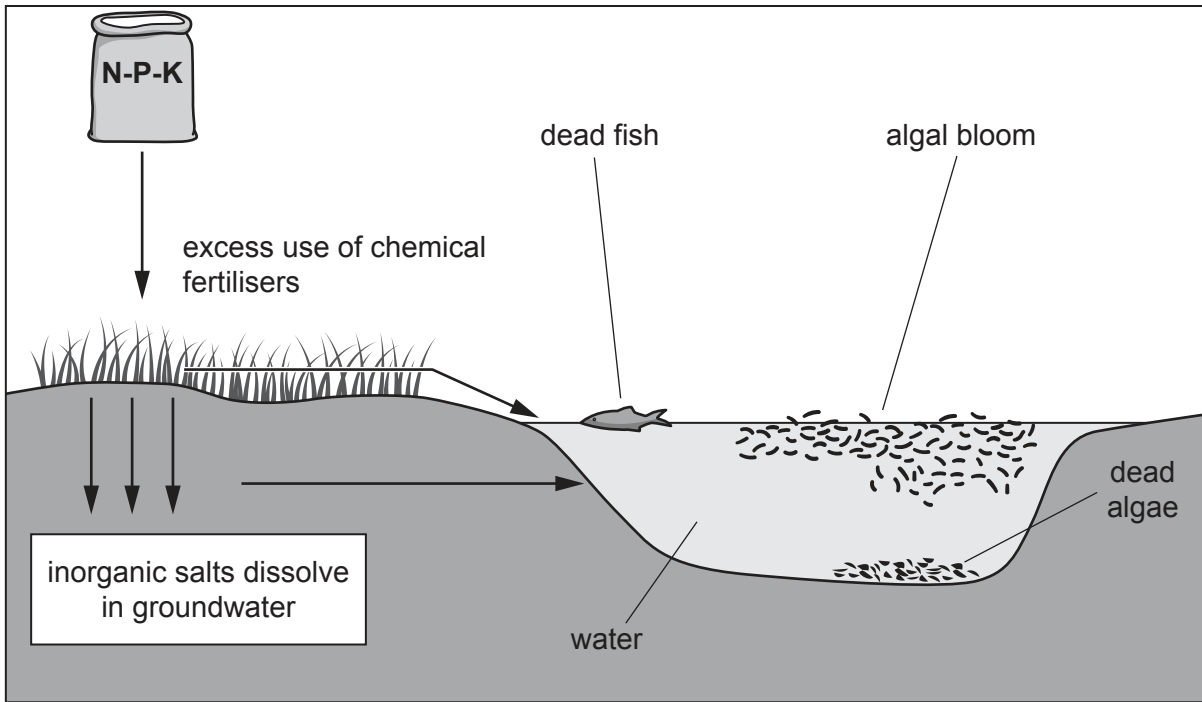


Fig. 2.1

(a) (i) State the process occurring in the water shown in Fig. 2.1.

..... [1]

(ii) Explain how excess use of fertilisers cause fish to die.

.....  
.....  
.....  
.....  
.....  
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.....  
.....  
.....  
..... [4]





(ii) Fertilisers are pollutants which affect groundwater stores.

State **three** other pollutants which may affect groundwater stores.

- 1 .....
- 2 .....
- 3 ..... [3]

(iii) Explain why aquifers do **not** recover quickly from pollution.

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

(iv) Suggest strategies to prevent the pollution of groundwater stores such as aquifers.

.....  
.....  
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.....  
.....  
.....  
.....  
.....  
.....  
..... [4]

[Total: 20]



## Section B

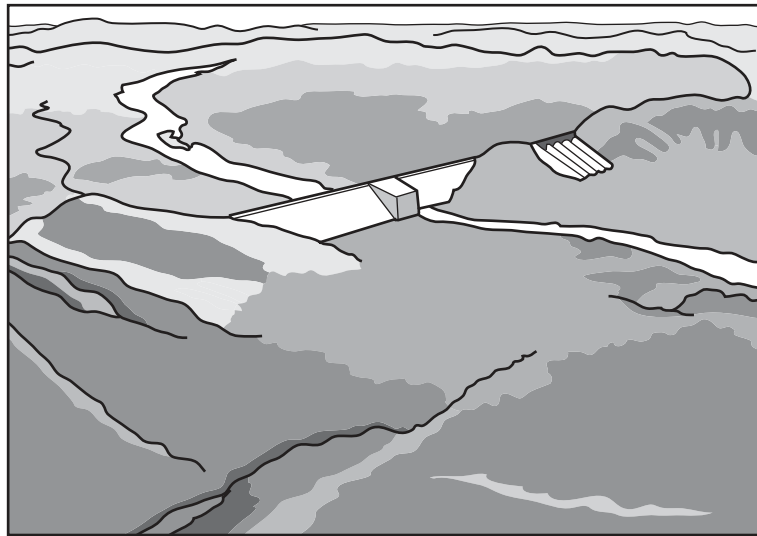
Answer **one** question from this section.

Write your answers on the separate answer paper provided.




- 3 Fig. 3.1 shows a newspaper report about the construction of the Grand Ethiopian Renaissance Dam.

**One of the biggest dams in the world**

The Grand Ethiopian Renaissance Dam, on the River Nile near the Sudan border, will flood 1680 km<sup>2</sup> of forest in northwest Ethiopia, displace approximately 20 000 people, and create a reservoir that will hold around 70 billion m<sup>3</sup> of water.



**Key**

-  international borders
-  rivers
-  city

**Fig. 3.1**

- (a) With reference to Fig. 3.1 describe the advantages and disadvantages of constructing large scale dams such as the Great Ethiopian Renaissance Dam. [10]
- (b) 'Projects such as The Great Ethiopian Renaissance Dam could create conflicts over shared resources.'

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

[Total: 40]

4 Fig. 4.1 describes an ecological island.

### What is an ecological island?

An ecological island is not necessarily an island surrounded by water. It is an area of land isolated by natural or artificial means from the surrounding land where a natural micro-habitat exists within a larger, different ecosystem.

### How to create an ecological island:

- non-native species, especially predator species, have to be eradicated (completely removed)
- native species are reintroduced and encouraged
- the natural or artificial border is maintained to prevent reintroduction of non-native species.

The aim is to recreate the area as it was before human arrival. There will be controlled public access, and scientific study and research.

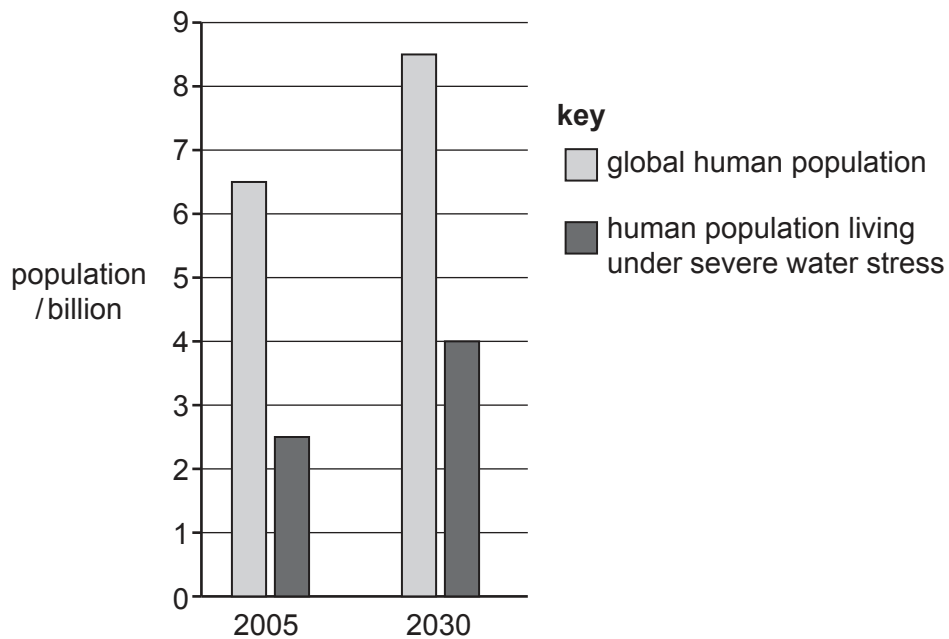
### Fig. 4.1

- (a) With reference to Fig. 4.1 describe the advantages and disadvantages of creating ecological islands to conserve a particular habitat. [10]
- (b) Using examples other than ecological islands, evaluate the success of different strategies to manage the conservation of ecosystems. [30]

[Total: 40]

5 Water stress is when the demand for water exceeds supply.

Fig. 5.1 is a bar chart showing total global human population and human population living under severe water stress for 2005 and predicted for 2030.



**Fig. 5.1**

- (a) With reference to Fig. 5.1 discuss the factors which lead to people living under severe water stress. [10]
- (b) Using examples, evaluate the difficulty of providing potable (drinking) water in countries at different levels of economic development. [30]

[Total: 40]

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