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

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

1526851317

ENVIRONMENTAL MANAGEMENT **8291/21**

Paper 2 Hydrosphere and Biosphere **October/November 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.
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 **12** printed pages.

Section A

For Examiner's Use

Answer **all** questions from this section.

Write your answers in the spaces provided.

1 **(a)** Fig. 1.1 shows the instrumental record and estimates for sea level between 1800 and 2100. These levels are relative to the 1990 level which is set at 0 mm.

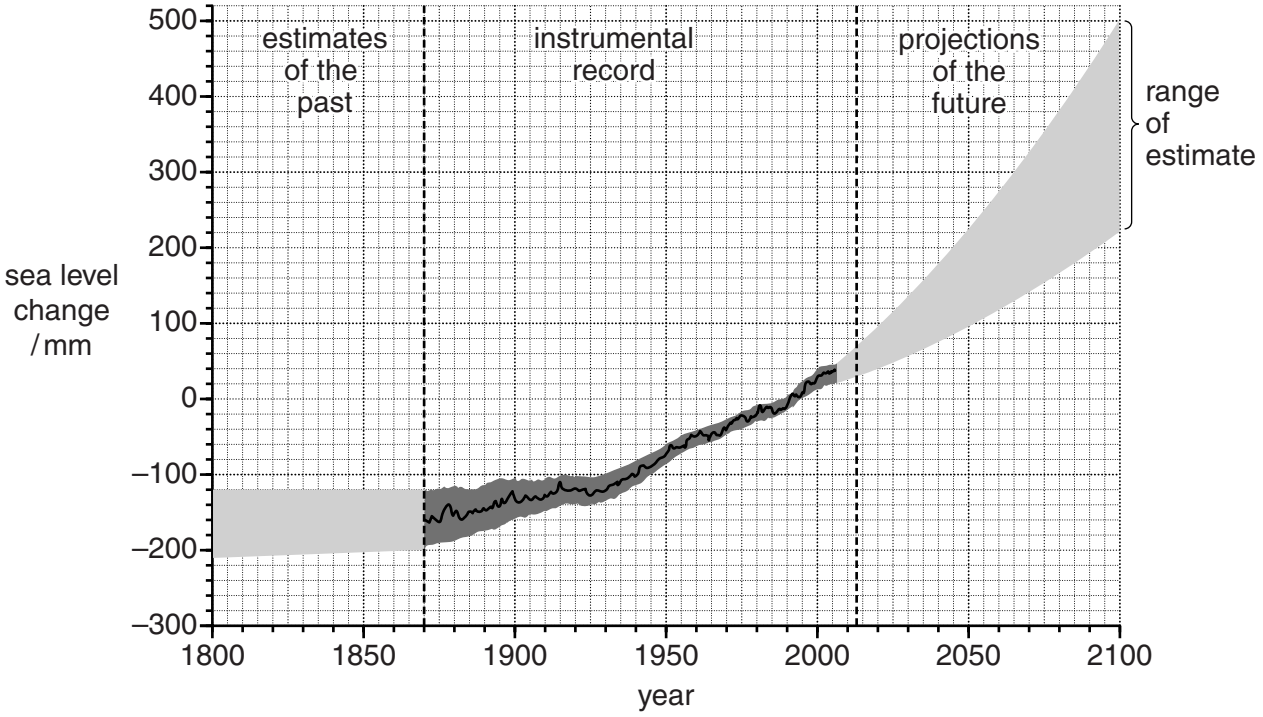

Fig. 1.1

(i) Describe the trend for the instrumental record between 1870 and 2013.

.....

.....

.....

..... [2]

(ii) Suggest **two** reasons for the increase in sea level between 1930 and 2013.

For Examiner's Use

1 .....

.....

.....

.....

2 .....

.....

.....

..... [4]

(iii) Explain why the range between the low and high estimates **increases** between 2014 and 2100.

.....

.....

.....

.....

.....

.....

.....

..... [3]

(b) Fig. 1.2 shows the area of Bangladesh likely to be flooded by a major rise in sea level.

For Examiner's Use

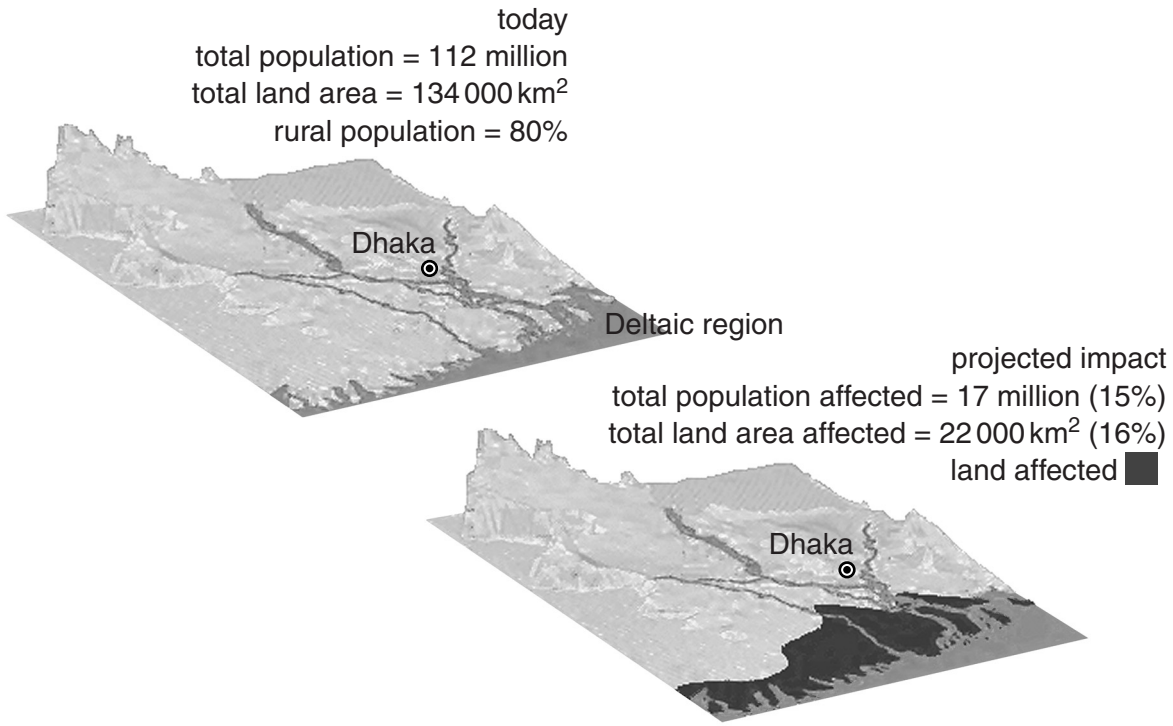

Fig. 1.2

(i) State **one** reason why the deltaic region shown in Fig. 1.2 is vulnerable to flooding.

.....

..... [1]

(ii) Describe and explain the ecological and socio-economic effects that sea level rise and flooding might have on Bangladesh.

For Examiner's Use

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [10]

[Total: 20]

2 **(a)** Table 2.1 contains information on the early and late stages of an ecological succession.

For Examiner's Use

Table 2.1

characteristic	early stages of succession	late stages of succession
plant biomass	small	large
plant longevity	short	long
plant species diversity	low	high
plant morphology and physiology	simple	complex
nutrient level of soil	low	high
rate of soil nutrient resource depletion by plants	fast	slow
extent of nutrient cycling by decomposers	low	high
ecosystem stability	low	high

(i) Describe the changes to plants shown in Table 2.1.

.....

.....

.....

..... [2]

(ii) Why is the amount of nutrient cycling by decomposers low in the early stages and high in the late stages of a succession?

.....

.....

.....

..... [2]

(iii) Explain why the rate of soil nutrient depletion slows down during succession.

.....

.....

.....

..... [2]

(iv) With reference to Table 2.1, explain why ecosystem stability is low in the early stages of a succession and high in the late stages of a succession.

For Examiner's Use

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(b) Fig. 2.1 shows part of a coastal area that is under threat from tourism.

For Examiner's Use

Fig. 2.1

(i) Explain why the ecology of such ecosystems is fragile.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(ii) Briefly identify and justify **three** management strategies that would combine promoting tourism and conserving the ecology of this area.

For Examiner's Use

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

[Total: 20]

Section B

Answer **one** question from this section.

3 **(a)** Fig. 3.1 shows the water cycle around a lake.

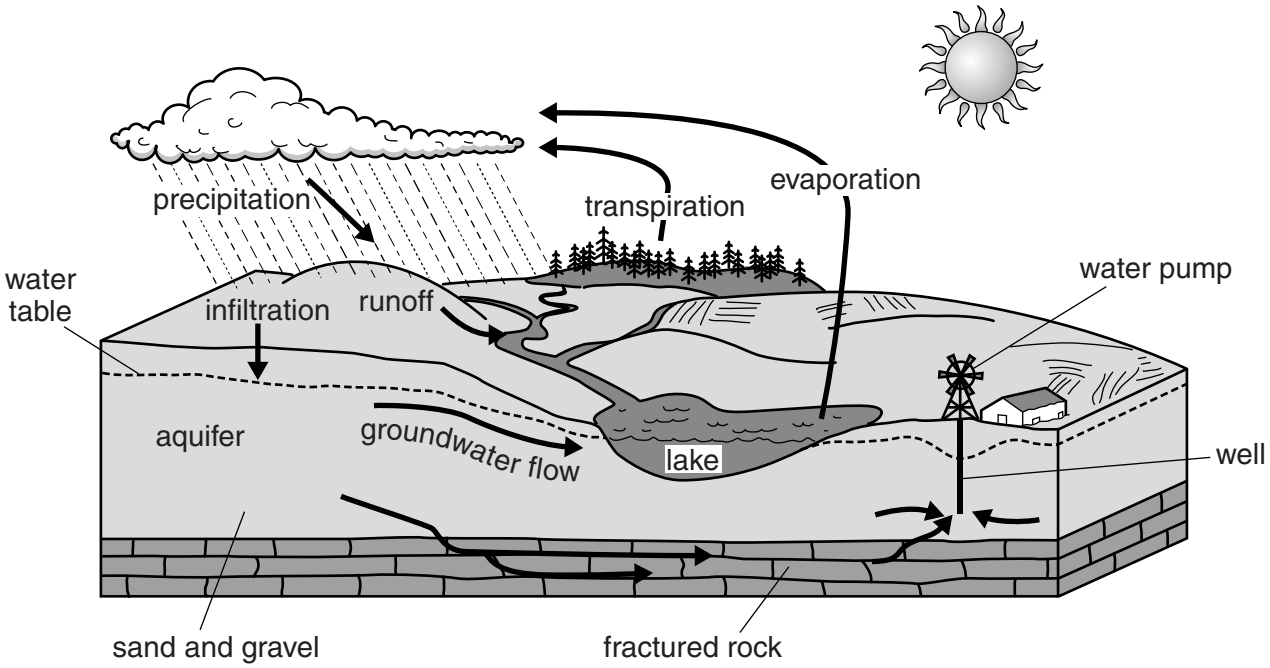

Fig. 3.1

Briefly describe the factors that would cause the water level of the lake shown in Fig. 3.1 to vary. [10]

(b) With reference to areas with which you are familiar, assess the difficulties associated with sustaining a clean and plentiful water supply. [30]

[Total: 40]

4 **(a)** Fig. 4.1 shows two models relating population size to resource availability.

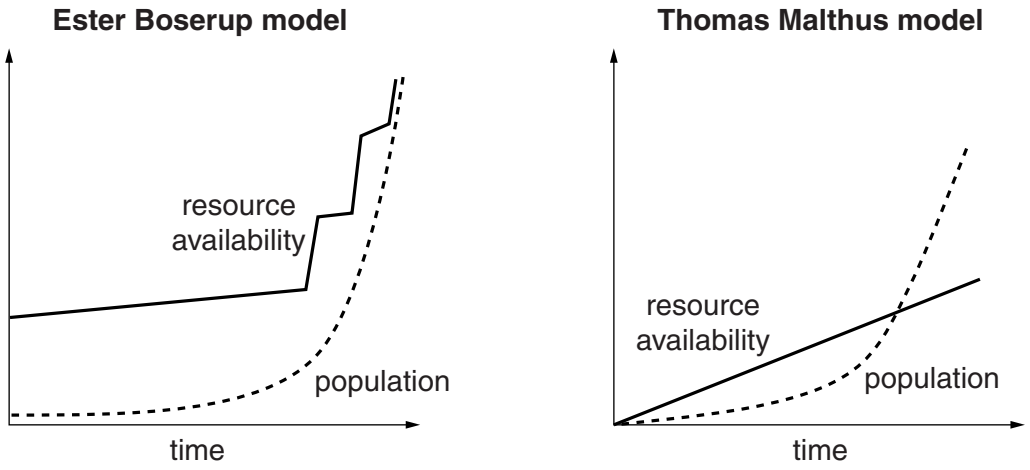

Fig. 4.1

Briefly describe and explain the contrasting relationships between population size and resource availability shown in the two models in Fig. 4.1. [10]

(b) In 2011 The Netherlands had 495.18 people/km^2 and Mali had 11.31 people/km^2, yet both were regarded as being overpopulated.

With reference to examples from LEDCs and MEDCs, describe and explain the conditions under which countries become overpopulated. Assess the measures that can be used to reduce the problem of overpopulation. [30]

[Total: 40]

5 **(a)** Fig. 5.1 shows a transition in biomes from forest to desert in tropical and temperate latitudes.

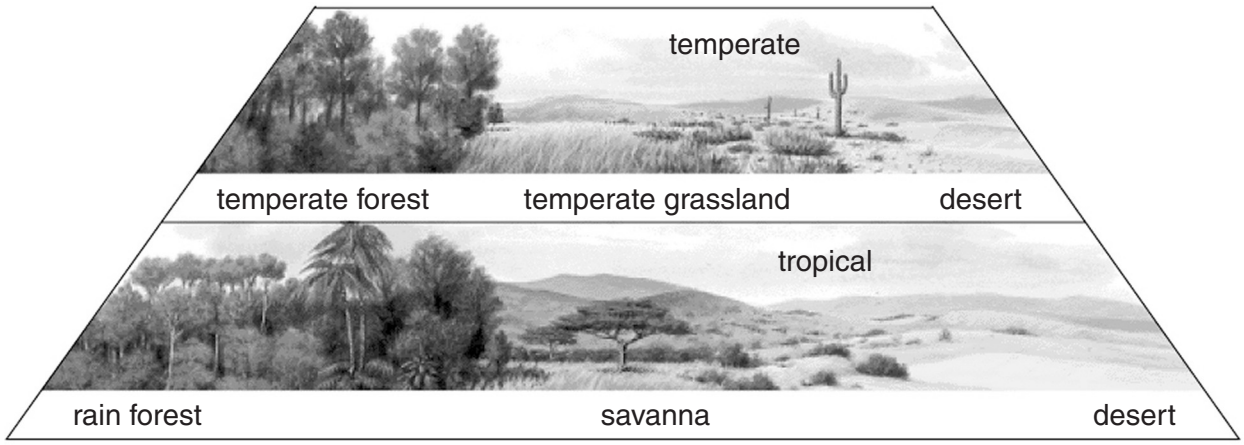

Fig. 5.1

Briefly explain the transition from forest biome to grassland biome to desert biome for **either** the temperate **or** tropical latitudes shown in Fig. 5.1. [10]

(b) With reference to examples with which you are familiar, assess the role of National Parks in conservation. [30]

[Total: 40]