Cambridge Assessment International Education

Cambridge International AS Level

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0123456789

ENVIRONMENTAL MANAGEMENT **8291/01**

Paper 1 Principles of Environmental Management **For examination from 2022**

SPECIMEN PAPER **1 hour 45 minutes**

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Section A: answer **all** questions.
- Section B: answer **one** question.
- 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.
- Write your answer to each question in the space provided.
- 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.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **22** pages. Blank pages are indicated.

© UCLES 2019

Section A

Answer **all** questions in this section.

1 (a) Italy is a high-income economy country (HIC) in Europe and Bangladesh is a low-income economy country (LIC) in Asia.

Table 1.1 shows population data for Italy and Bangladesh in 1990 and 2010.

Table 1.1

country	area / km^2	population 1990	population density 1990 / people km^{-2}	population 2010	population density 2010 / people km^{-2}	percentage increase in population density
Bangladesh	147 630	105 983 136		151 616 777	1027.0	43.1
Italy	301 340	57 007 577	189.2	59 588 066	197.7	

(i) Calculate the population density of Bangladesh in 1990.

Give the answer to 1 decimal place.

population density 1990 ..... people km^{-2} [2]

(ii) Calculate the percentage increase in population density for Italy.

Give the answer to 3 significant figures.

percentage increase .....% [2]

(iii) Suggest how social factors can cause the changes in population density in Bangladesh and Italy. Refer to the data in your answer.

.....

.....

.....

.....

.....

.....

.....

.....[4]

© UCLES 2019

(b) Fig. 1.1 shows two population pyramids representing the percentage of the population in different age groups in Italy in 1950 and 2010.

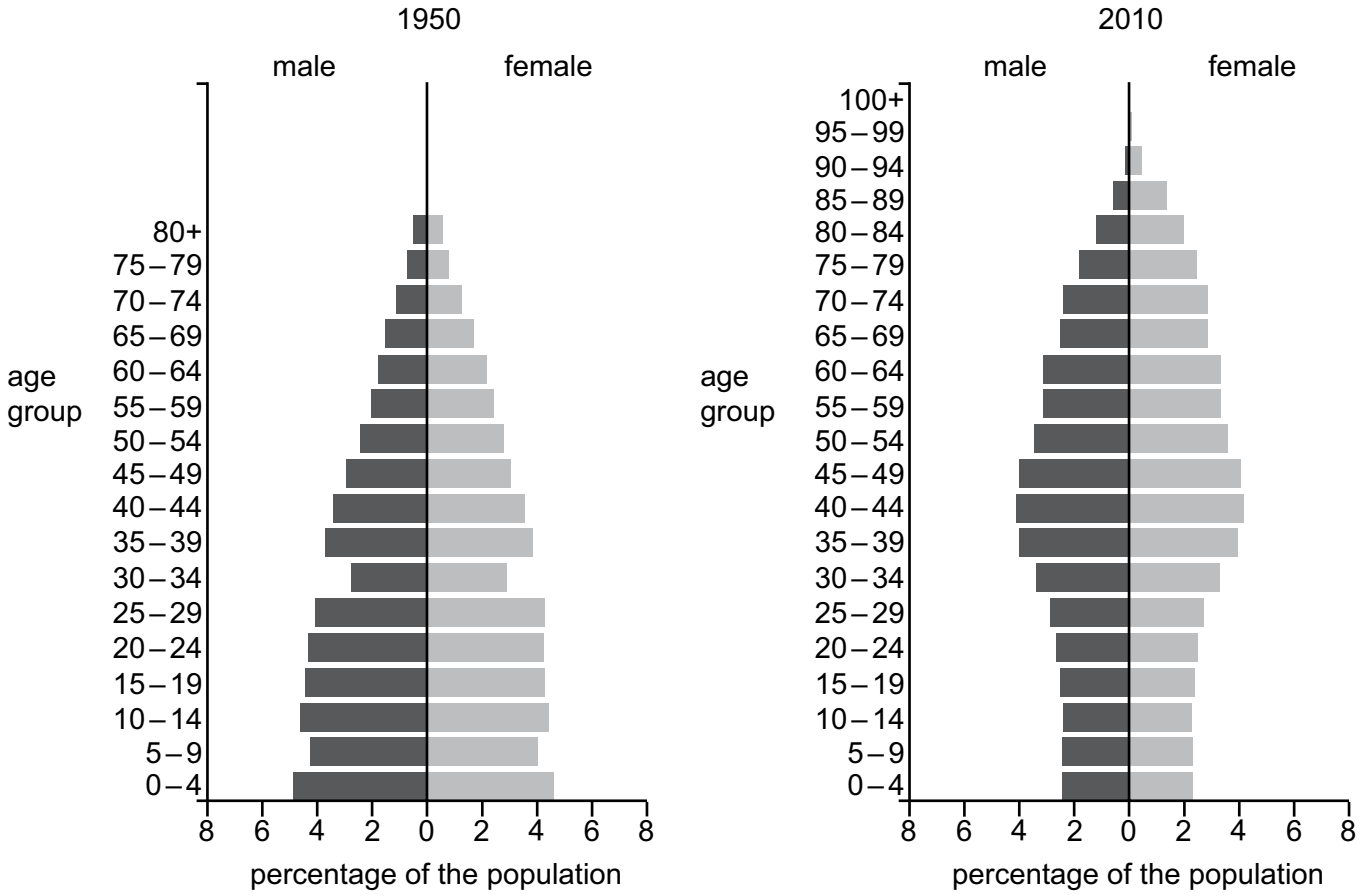


Fig. 1.1

(i) Describe the changes in population distribution using data from Fig. 1.1.

.....

.....

.....

..... [2]

(ii) Describe the impacts that the changes in **(i)** could cause.

.....

.....

.....

.....

.....

..... [3]

[Total: 13]

© UCLES 2019

[Turn over

2 Approximately one third of all food produced for human consumption is wasted.

In many low-income economy countries (LICs) food wastage occurs when food is stored.

Fig. 2.1 is a news report on a method for farmers to reduce food waste in Uganda, an LIC in Africa.

Some farmers in Uganda are using a new device that dries fruit and vegetables quickly. The dried fruit and vegetables can last for months instead of days. The device runs on organic garden waste, meaning farmers who cannot access electricity are able to use it.

Traditional open-sun-drying does not work well during the rainy season and is much slower.

The new device has a catalytic converter that prevents harmful gases from being released into the atmosphere during the drying process.

One farmer said, 'We sell dried produce for four times the price of the fresh produce, and use the profits to improve our farms.'

Fig. 2.1

(a) Explain how the device described in Fig. 2.1 provides a sustainable method of food production in Uganda.

.....

.....

.....

.....

.....

.....

.....

..... [4]

(b) Fig. 2.2 shows how some companies in Europe plan the management of their food waste.

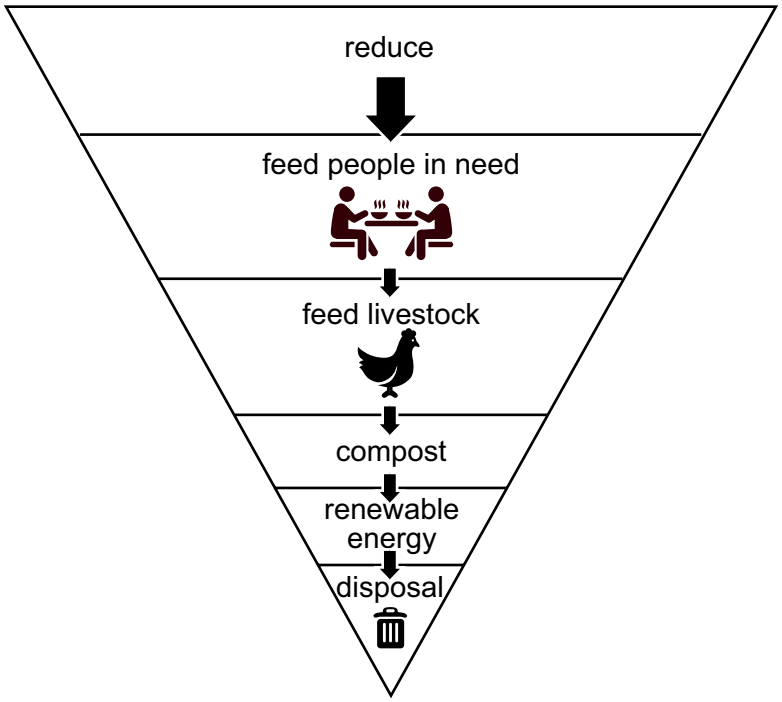


Fig. 2.2

One benefit of this food waste management strategy is that it provides food for people in need.

Explain **two** other benefits of this management strategy.

1 .....

.....

.....

.....

2 .....

.....

.....

..... [4]

(c) Food wastage is one reason why there is a global shortage of food.

State **two** other reasons.

1 .....

.....

2 .....

..... [2]

[Total: 10]

3 (a) (i) Countries need long-term and short-term energy security.

Define:

long-term energy security .....

.....

short-term energy security .....

..... [2]

(ii) Energy insecurity impacts low-income economy countries (LICs).

Outline **four** of these impacts.

.....

.....

.....

.....

.....

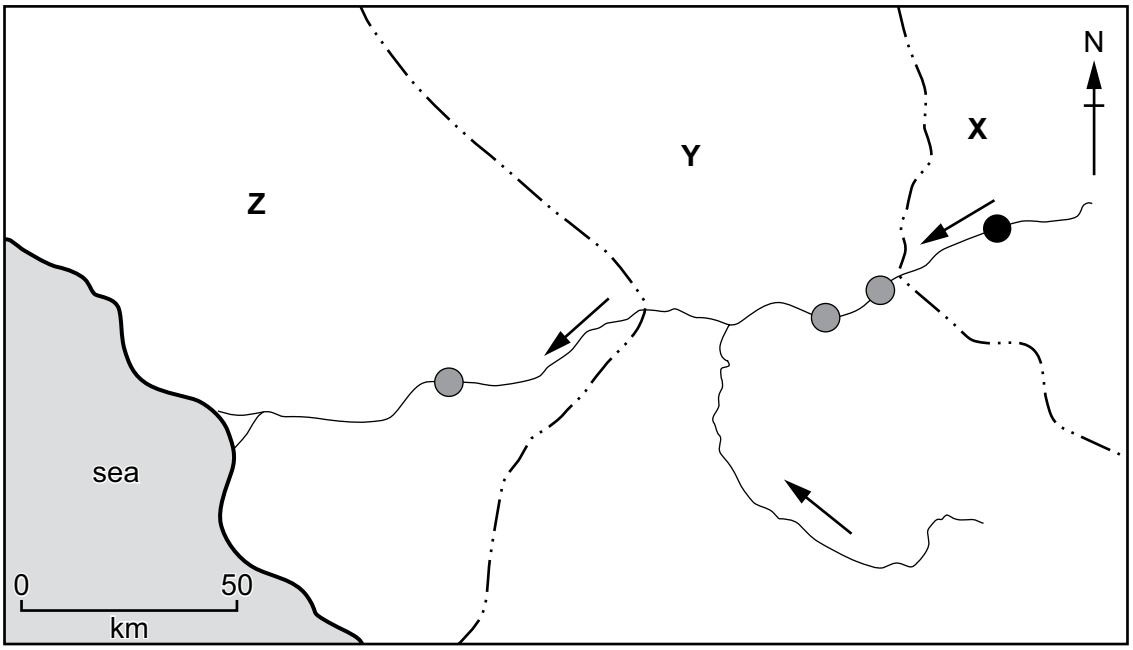
.....

.....

..... [4]

(b) Fig. 3.1 shows the location of hydroelectric projects in country **Y** and country **Z**.

A new dam is planned in country **X** to meet the increasing energy demands of the country. Country **X** is a low-income economy country (LIC). Currently, only 22% of the population of country **X** has access to electricity.



Key

- planned dam
- existing dam
- river
- coast
- international boundary
- flow direction of river
- **X / Y / Z** country

Fig. 3.1

Explain the impacts the new dam could have on the economies of countries **X**, **Y** and **Z**.

Include positive and negative impacts in your answer.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

[Total: 12]

4 **(a)** Fig. 4.1 is a food web that shows some feeding relationships in a rainforest.

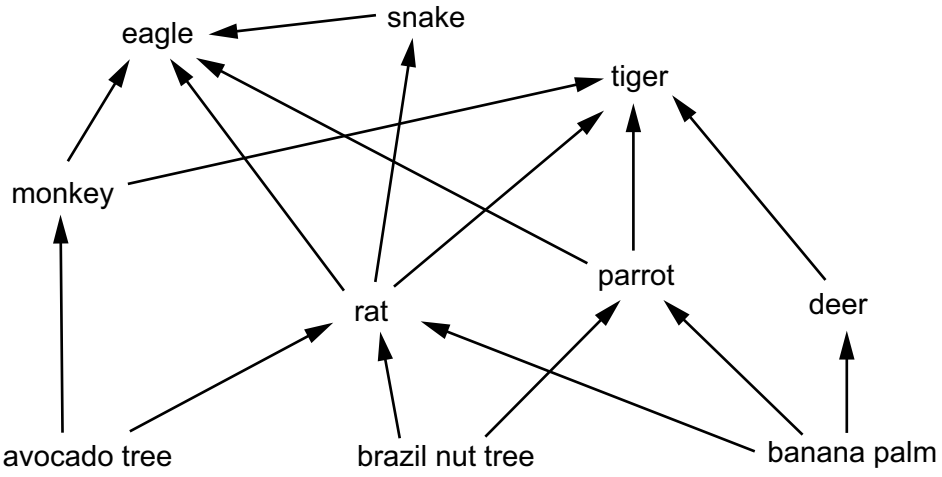
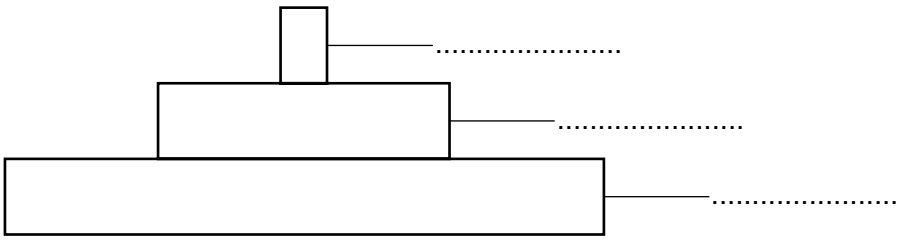


Fig. 4.1

(i) Label the pyramid of biomass using an organism from each trophic level in a food chain within this food web.



Pyramid of biomass

[2]

(ii) Explain the shape of the pyramid of biomass shown in **(a)(i)**.

.....

.....

.....

.....

.....

..... [3]

(b) Table 4.1 shows data on productivity.

Table 4.1

type of land	average annual net primary productivity / g m^{-2}
tropical rainforest	2200
agricultural	650

(i) Tropical rainforest is an example of an ecosystem.

Define ecosystem productivity.

.....

..... [1]

(ii) Suggest **one** reason why the productivity of the agricultural land is much smaller than the tropical rainforest.

.....

..... [1]

(c) A student visits a farm within an area of tropical rainforest. The farm grows a variety of plants.

Fig. 4.2 shows the student's annotated sketch of the farm.

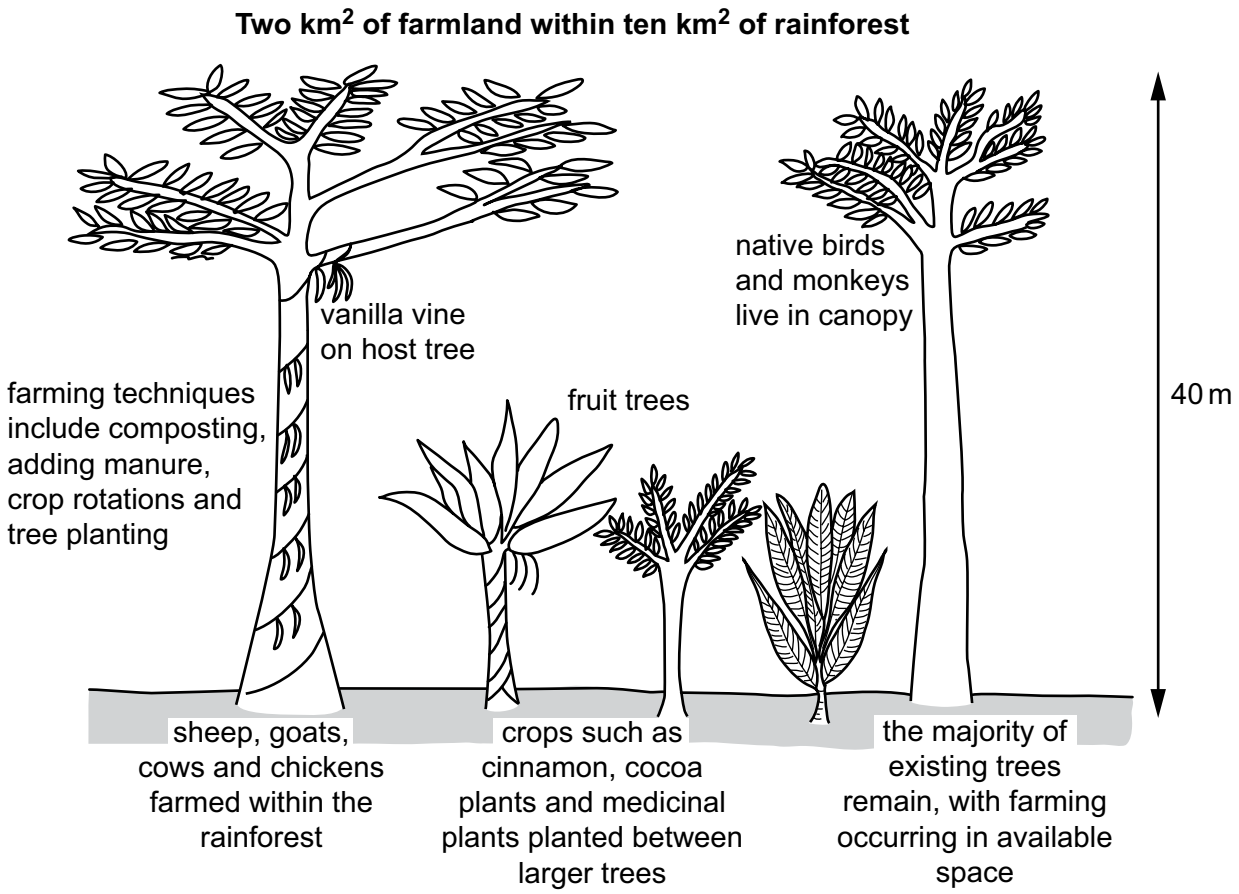


Fig. 4.2

© UCLES 2019

(i) Explain how the farming strategies in Fig. 4.2 manage the impacts of farming in this tropical rainforest.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

(ii) The student noticed that some of the large trees on the farm have dense, broad leaves that shade the forest floor.

Very few plants grow under these trees.

Explain why.

.....

.....

.....

.....

.....

..... [3]

[Total: 16]

5 Ozone (O_3) is a gas found in the stratosphere. Ozone depletion is caused by chlorofluorocarbons (CFCs).

(a) Outline how ozone depletion occurs.

.....

.....

.....

.....

.....

.....

.....

..... [4]

(b) In the 1970s, scientists Rowland and Molina proposed this main hypothesis:

'CFCs will cause significant ozone depletion.'

Explain why this hypothesis was **not** initially accepted by the scientific community.

.....

.....

.....

..... [1]

(c) State **two** impacts of ozone depletion.

1 .....

.....

2 .....

..... [2]

(d) The use of CFCs has been banned in many countries. Some alternative substances to CFCs are greenhouse gases.

Outline **two** possible problems when new laws on managing atmospheric pollution are introduced.

1 .....

.....

2 .....

..... [2]

[Total: 9]

Section B

Answer **one** question

EITHER

6 'National parks are an effective method of conserving biodiversity.'

To what extent do you agree with this statement?

Give reasons and include information from relevant examples to support your answer. [20]

OR

7 Evaluate the success of strategies to manage water security in a location of your choice.

Give reasons and include information from relevant examples to support your answer. [20]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

© UCLES 2019

© UCLES 2019

© UCLES 2019

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

Cambridge Assessment International Education is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which itself is a department of the University of Cambridge.

© UCLES 2019