Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education
General Certificate of Education Ordinary Level

ENVIRONMENTAL MANAGEMENT **0680/04**
5014/02

Alternative to Coursework

October/November 2004

1 hour 30 minutes

Candidates answer on the Question Paper.
Additional Materials: Ruler (cm/mm)

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 on both sides of the paper.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.
Study the appropriate Source materials before you start to write your answers.
Credit will be given for appropriate selection and use of data in your answers and for relevant interpretation of these data. Suggestions for data sources are given in some questions.
You may use the source data to draw diagrams and graphs or to do calculations to illustrate your answers.
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

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.

For Examiner's Use

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

Fig. 1 Map of the World

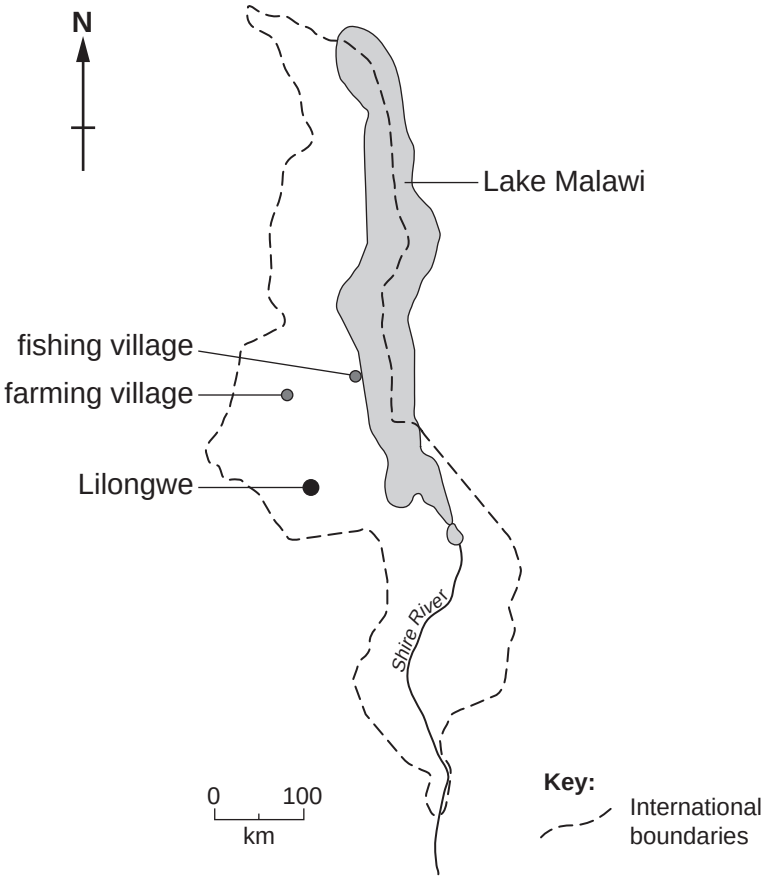


Fig. 2 Map of Malawi

Malawi is one of the world's least developed countries. It has a very high population den
only 15% of the population live in towns.

- Area: 118 480 km^2
- Population: 10 700 000
- Languages: English, Chichewa, other regional languages
- Climate: sub-tropical, rainy season November to April, dry season May to October
- Main exports: tobacco, tea, sugar and cotton
- Annual average income per person: 750 US dollars per year
- Population growth rate: 1.4% per year
- Population below poverty level: 54%
- Infant mortality: 20%

Most of Malawi is covered by miombo woodland. Many species of tree are present in the savanna lands where grasses grow between the trees.

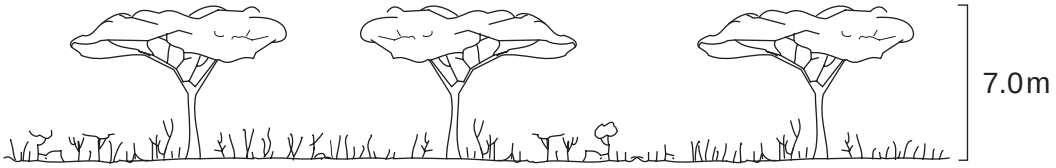


Fig. 3 Miombo woodland

1

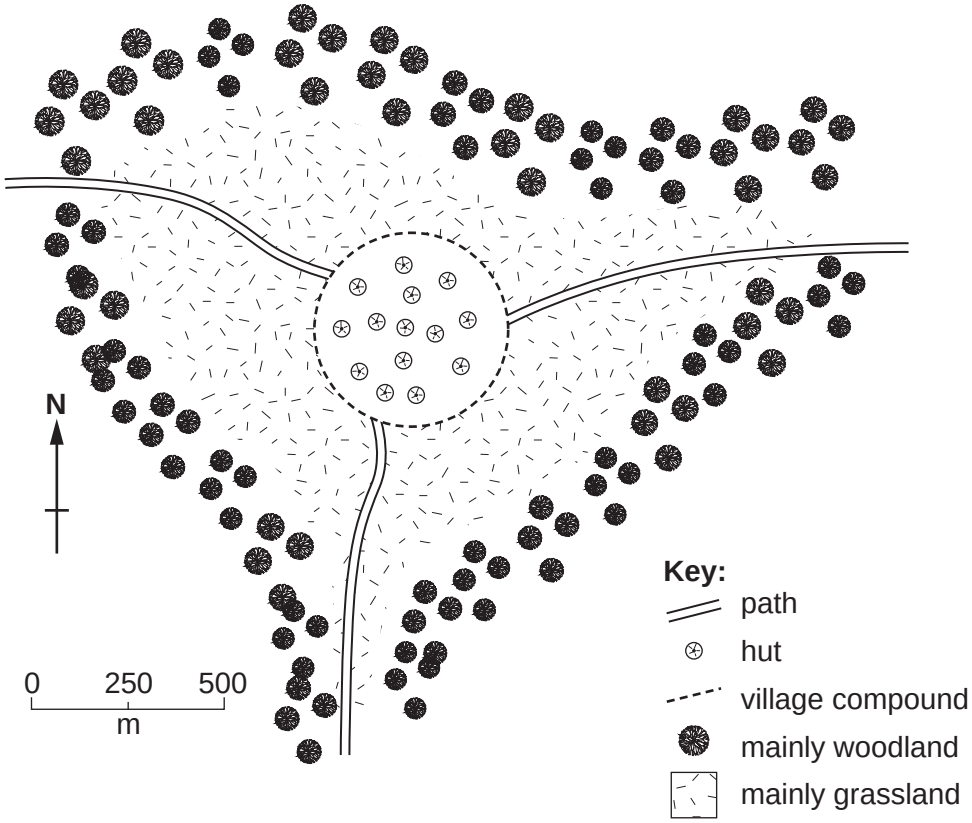


Fig. 4 Farming village

In this farming village people use animal dung and wood to cook food and keep warm at night. Charcoal is made in the woodland and sold to people in the nearby town.

The village leaders think that local supplies of fuelwood are going to run out in a few years. Three students were asked to find out how much fuelwood the village used each week. Each student prepared a plan.

Student **A**
I will stand by one path for one day and count how many people carry a bundle of wood into the village.

Student **B**
I will stand by one path and I will ask other students to stand by the other two paths for one day. We will count how many people carry a bundle of wood into the village. I will write all the information in a table.

Student **C**
I will go along one path and find some people cutting wood. I will ask them how much wood they take back to the village each week.

(a) Which student plan do you consider would be **least likely** to find out how fuelwood is used in the village each week.
Give **two** reasons for your answer.

Student plan …….

First reason.....

.....

Second reason.....

.....[3]

(b) Draw, in the space below, a table for recording the information to be collected using student plan **B**.

[3]

(c) Student plan **B** was carried out and the total number of bundles recorded in one day was 33.
Assuming the same number is recorded everyday, how many bundles does the village use in

(i) one week.....

(ii) one year? .....[2]

(d) Suggest **two** improvements to student plan **B** to make the findings more accurate and reliable.

.....

.....

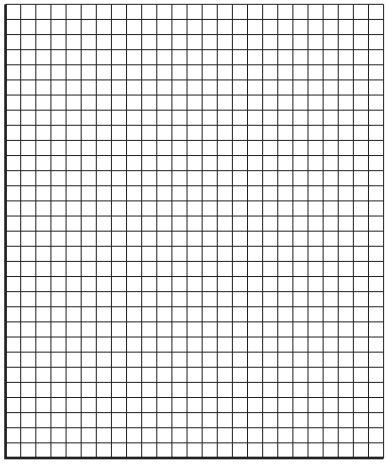
.....[2]

(e)

Year	Tonnes
1960	240
1970	320
1980	480
1990	680
2000	900

Fig. 5 Charcoal consumption in one town in Malawi

(i) Draw a suitable graph of these data.



[4]

(ii) State the increase in charcoal consumption between

1970 and 1980 ……tonnes

1990 and 2000 ……tonnes [2]

(iii) If the trend shown between 1970-2000 were to continue, what is the likely number of tonnes of charcoal you would expect to be consumed in

2010 ……tonnes [1]

(iv) Suggest **three** reasons why charcoal consumption increased.

.....

.....

.....

.....[3]

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Miombo woodland can be used for traditional shifting cultivation known as chi
cultivation.
The branches of trees in a large circle are cut off and stacked in the centre. The branch
are then burnt in October to form an ash garden. Crops are planted without tilling.
Traditionally, after 3 years the gardens are abandoned for at least another 25 years.

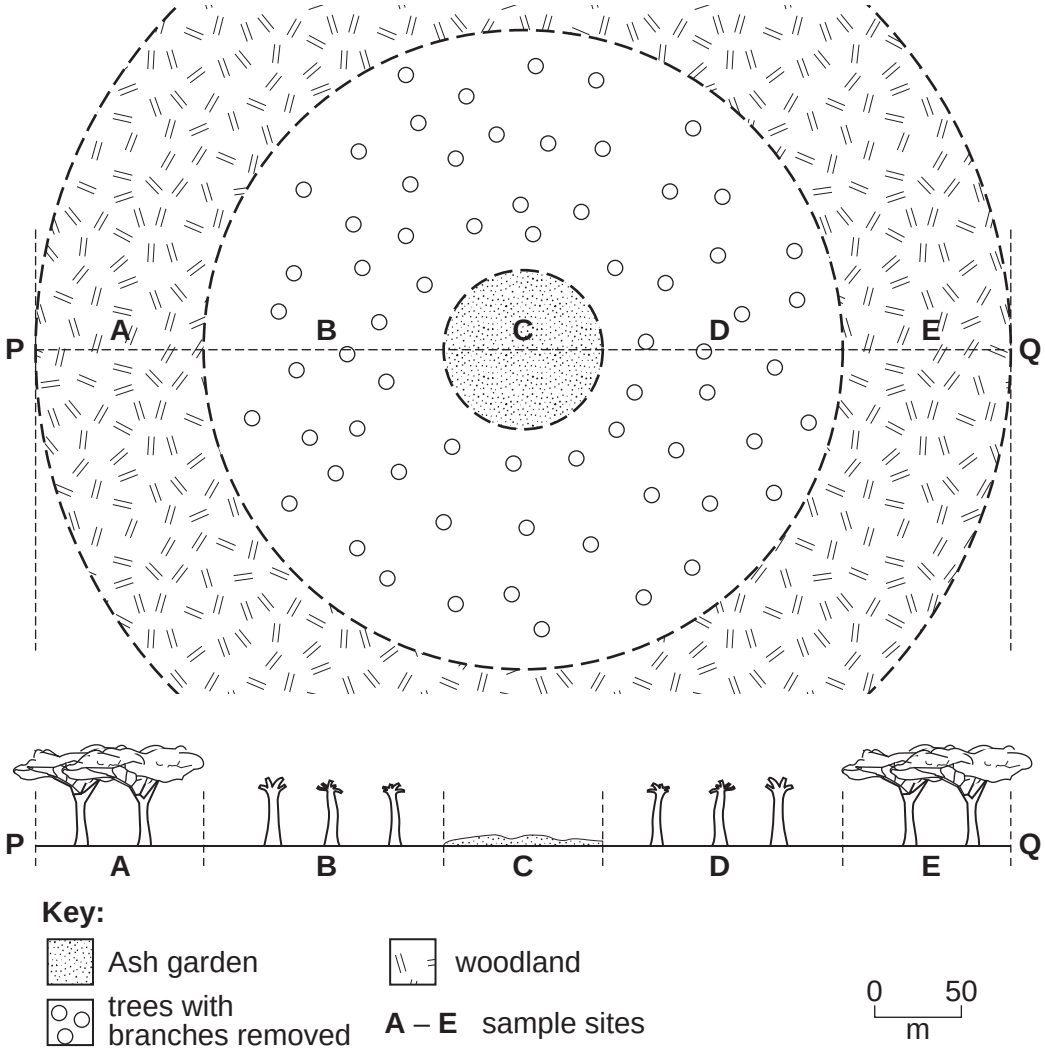

Fig. 6 Section through traditional chitemene cultivation circle

Nitrate available to plants in soil (parts per million).

Sample site	A	B	C	D	E
First cultivation	5	6	12	6	5
After 3 years	5	5	4	5	5

(f) Describe the changes in nitrate availability between sample points **A** to **E**

(i) at first cultivation,

.....

.....[1]

(ii) after 3 years.

.....

.....[1]

The increasing population has meant that ash gardens are now abandoned after only 2 years and the land is used again after only 12 years. Many villagers think the shorter intervals between cultivation will cause crop failures.

(iii) Explain how the shorter interval between cultivation could result in crop failure.

.....

.....

.....[2]

An alternative method of cultivation is to grow crops in rotation, protected by wind
of miombo woodland.

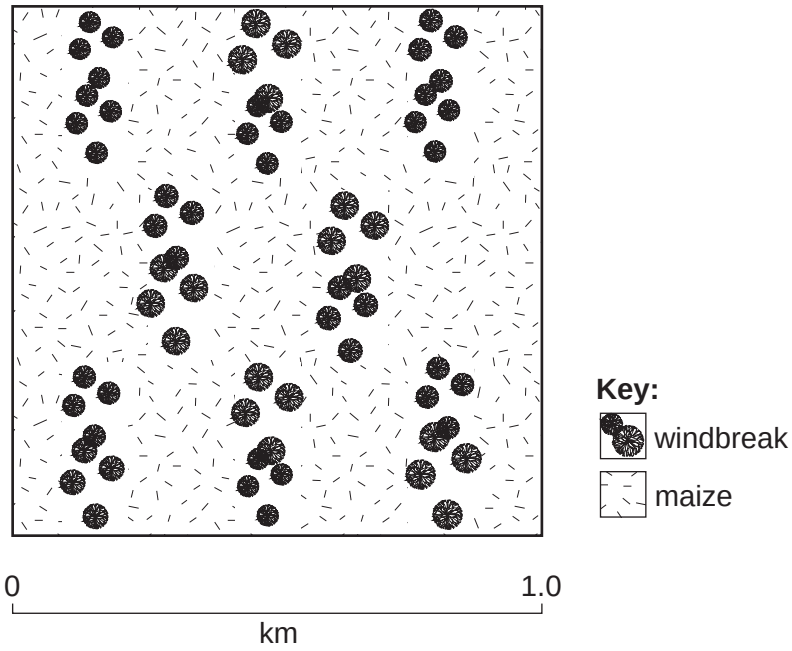

Fig. 7 Diagram of windbreaks and cultivated areas

Local farmers drew up the following guidelines for managing these cultivated areas.

Guideline 1: trees provide seeds and fruits.

Guideline 2: only cut selected tree species.

Guideline 3: cut selected tree species in September/October for fastest growth of new shoots.

Guideline 4: never cultivate within 30 m of a stream.

(iv) Explain how each guideline encourages the sustainable use of miombo woodland.

Guideline 1 .....

.....

Guideline 2 .....

.....

Guideline 3 .....

.....

Guideline 4 .....

.....[4]

2 In the dry season the women of the farming village have to walk for 1 kilometre to a hole and then carry water back to the village. They need to do this several times each d get enough water. This takes up to two hours each day. The village leaders want to build well in the village. They ask the government for help.

Hand dug well

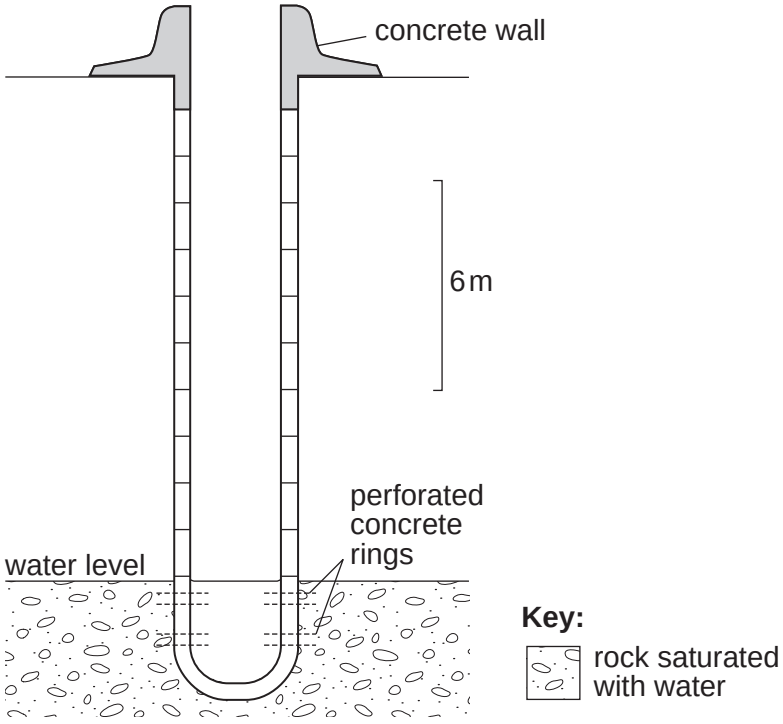

Fig. 8 A water well

(a) (i) Give **two** advantages of having a well in the village.

Advantage one .....

Advantage two.....[2]

(ii) Explain why the villagers will need help to build the well.

.....

.....

.....[2]

(iii) Why do the villagers want to build the well themselves?

.....

.....

.....[2]

(b) Later a well was built in the village. Villagers noticed that their health improv more babies survived the first year of life.
Explain why the peoples' health improved.

.....

.....

.....[2]

3 Lake Malawi is one of the largest freshwater lakes in Africa. There are many fishing villages on its shores. One of these villages is shown in Fig. 2. The lake contains about 600 species of fish, many of which are found nowhere else in the world. The leaders of the fishing village are worried that the fish catches are decreasing. The village population is increasing. There are now 100 small fishing boats.

The leaders of the village know that,

- the size of fish now being caught is smaller than it was
- certain fish species can no longer be caught
- the number of fish in each catch is getting smaller.

(a) **(i)** Why are fish important to the diet of the villagers?

.....[1]

(ii) The villagers hold a meeting to discuss their fishing problems. They agree to control their fishing so that it becomes a sustainable activity.

Suggest **three** methods of control that could be used and explain why each control will improve fishing in the future.

control.....

explanation .....

.....

control.....

explanation .....

.....

control.....

explanation .....

.....[6]

(b) The villagers will need to know if their controls are having any effect on the supply for the village. You have been asked to write a questionnaire to find out about the st of fish.
The first **two** questions have been done for you.

Q1 How often do you fish?

1 – 3 days a week ☐ 4 – 5 days a week ☐ 6 – 7 days a week ☐

Q2 Do you spend the same time fishing per week as you did one year ago?

yes ☐ no ☐

Q3 .....

.....

Q4 .....

.....

Q5 .....

.....

Q6 .....

.....[5]

(c) The people living in villages beside the lake suffer from more diseases than people in the farming village.

Suggest,

(i) the name of a disease the fishing villagers are likely to suffer from because they live by the lake,

.....[1]

(ii) the effects on humans of this disease,

.....[1]

(iii) how this disease is spread.

.....

.....

.....[2]

4 Elephants live around the farming village and the fishing village. The elephants c villages in search of food.

In the past some elephants were killed for food and their ivory tusks were sold for export.

Poachers killed many elephants for their ivory tusks. The government protected the elephants and international trade in ivory was banned.

Elephant populations are increasing again and some international trade in ivory is now allowed.

Ecotourism has increased so some villagers earn money guiding tourists to see the elephants.

Elephant populations have to be controlled to prevent serious environmental damage.

(a) (i) Explain how the villagers will benefit from international trade in ivory.

.....

.....

.....[2]

(ii) Explain why the international trade in ivory must be limited and controlled.

.....

.....

.....[2]

(b) (i) Suggest reasons why ecotourists visiting Malawi might not approve of the elephants being used as a resource by the villagers.

.....

.....

.....[2]

(ii) Suggest reasons why the villagers want to reduce the elephant population.

.....

.....

.....[2]

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