

Centre Number	Candidate Number	Name
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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

ENVIRONMENTAL MANAGEMENT

5014/01

Paper 1

May/June 2004

2 hours 15 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 in the spaces provided on the Question 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.
All questions in Section A carry 10 marks.
Both questions in Section B carry 40 marks.
The number of marks is given in brackets [] at the end of each question or part question.

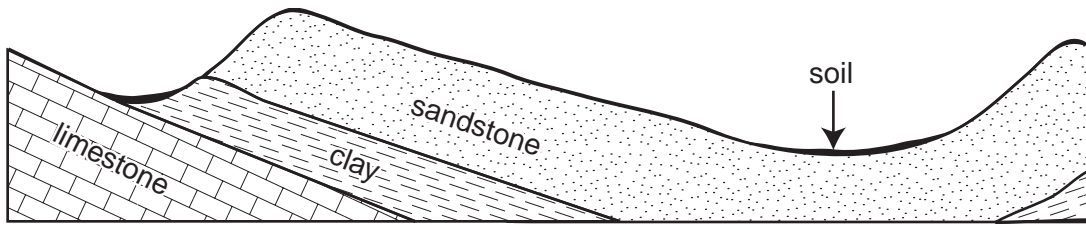
For Examiner's Use	
1	
2	
3	
4	
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6	
TOTAL	

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

1 The diagram shows a section across an area.



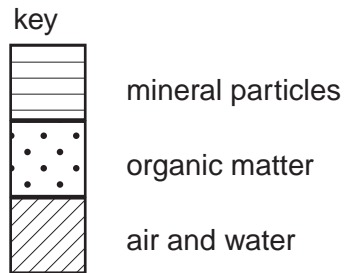
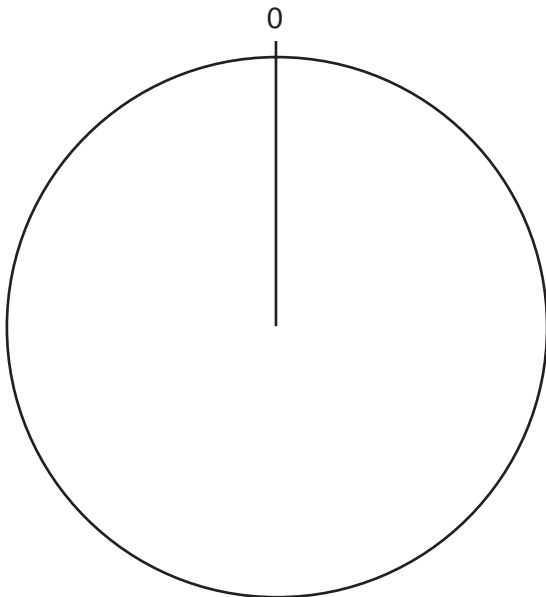
(a) (i) Are the rocks on the section igneous, sedimentary or metamorphic?
[1]

(ii) When first formed, the rocks were horizontal. What type of earth movement has caused this to change?
[1]

(b) (i) A sandstone soil was made up of:

mineral particles	40%
organic matter	10%
air and water	50%

Plot this information on the pie chart, using the shading in the key.



[2]

(ii) Why are air and water included together?

[1]

(iii) How is soil, such as the one shown in the pie chart, formed?

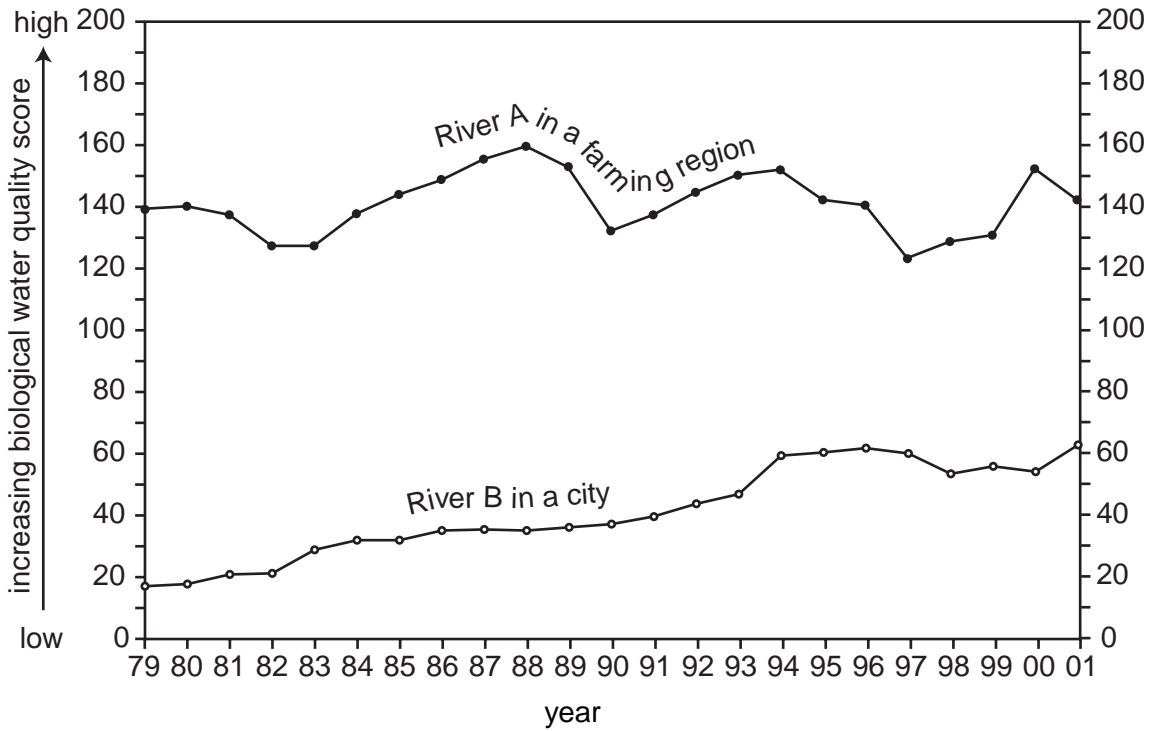
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.....[2]

(c) Why are some soils better than others for crop growth?

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.....[3]

[Total: 10]

- 2 The graphs show changes in the biological water quality of two rivers. Biological water quality is measured by the variety of life in the river. River A flows through an area of farmland, whereas River B is in a city.



- (a) (i) How many points higher was the biological water quality score for River A than for River B in 1979?

..... points [1]

- (ii) Compare the changes in biological water quality of the two rivers between 1979 and 2001.

.....

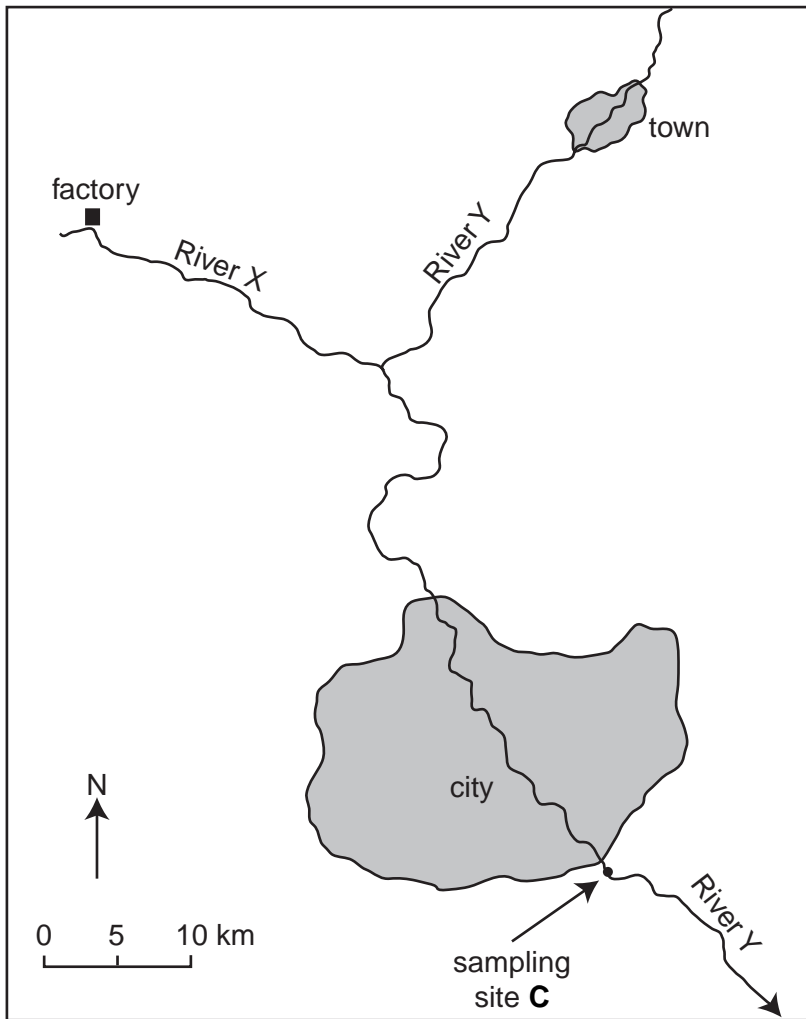
 [3]

- (b) Suggest reasons why the biological water quality of rivers can suddenly decline.

.....

 [3]

(c) The map shows part of a river system.



key

■ urban area

~ river

→ direction of flow

● sampling site

■ factory

(i) Regular checking has shown that there has been a decline in water quality at sampling site **C**. There are only three possible sources responsible for this decline: the factory, the city or the town.

On the map mark **two** more sites, **A** and **B**, where the rivers could be sampled to find out which source is causing the decline in water quality found at **C**. [1]

(ii) Explain how comparing samples from sites **A**, **B** and **C** would find the source of the decline in water quality.

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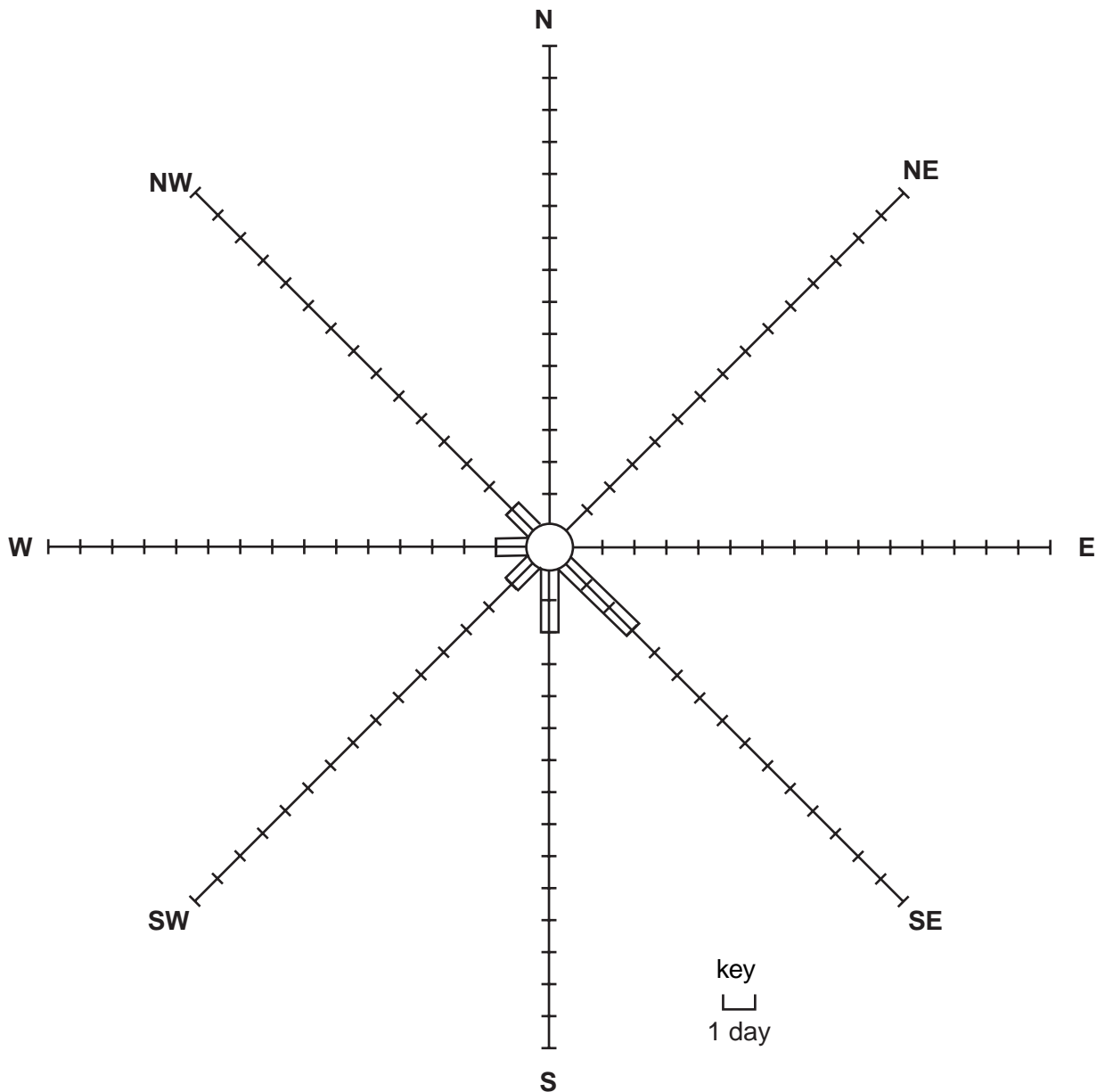
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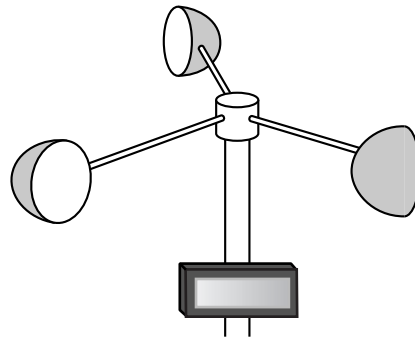
- 3 (a) The table shows wind frequencies for June at a weather station.

wind direction	number of days in which the wind blew from that direction
N	4
NE	13
E	5
SE	3
S	2
SW	1
W	1
NW	1

Use the data in the table to complete the wind rose.



(b) The diagram shows an instrument used to measure wind speed.



(i) The name of this instrument is

.....

[1]

(ii) Explain how it works.

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[3]

(c) Strong winds in cyclones can cause much loss of life. Choose **one** strategy to reduce this loss of life and explain why it is usually more successful in countries of the developed than the developing world.

strategy

.....

reasons

.....

.....

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[3]

[Total: 10]

4 The photograph was taken in a National Park on the African Savanna.



(a) (i) What is the purpose of a National Park?

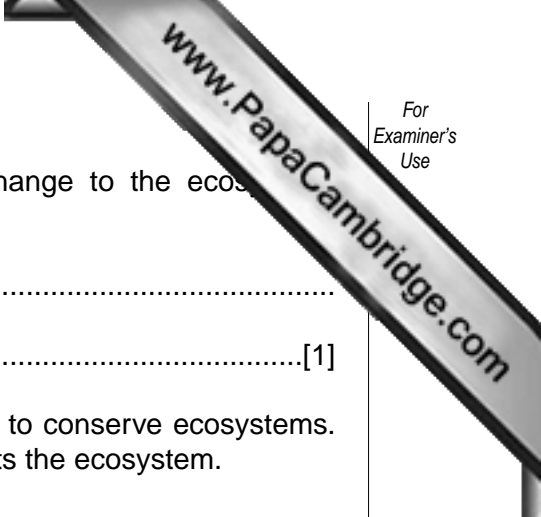
.....
.....[1]

(ii) What other type of area has a similar purpose?

.....[1]

(b) (i) Describe the components of the natural ecosystem shown on the photograph.

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



(ii) People managing this National Park have made a change to the ecosystem.
What is it and why has it been made?

change

why made[1]

(c) Organisations such as UNEP, IUCN, WWF and CITES work to conserve ecosystems.
Choose **one** such organisation. Describe how its work benefits the ecosystem.

organisation

how its work benefits the ecosystem

.....

.....

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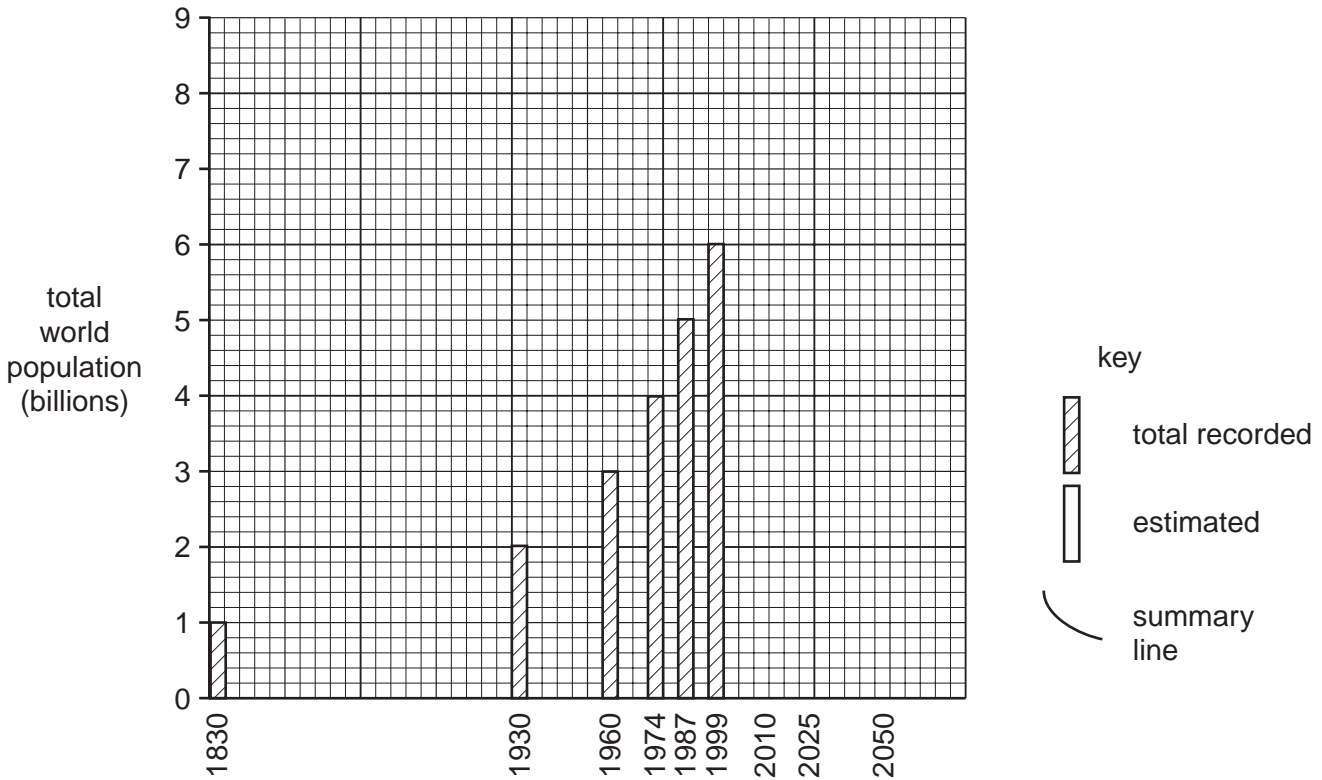
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[Total: 10]

Section B

5 (a) Look at the graph below which shows total world population.



(i) Complete the graph and key to show estimates for future total world population given below.

Year	Total (billions)
2010	7
2025	8
2050	9

[2]

(ii) On the graph, draw the summary line for world population growth. [1]

(iii) Describe what the graph shows about rates of past and future world population growth.

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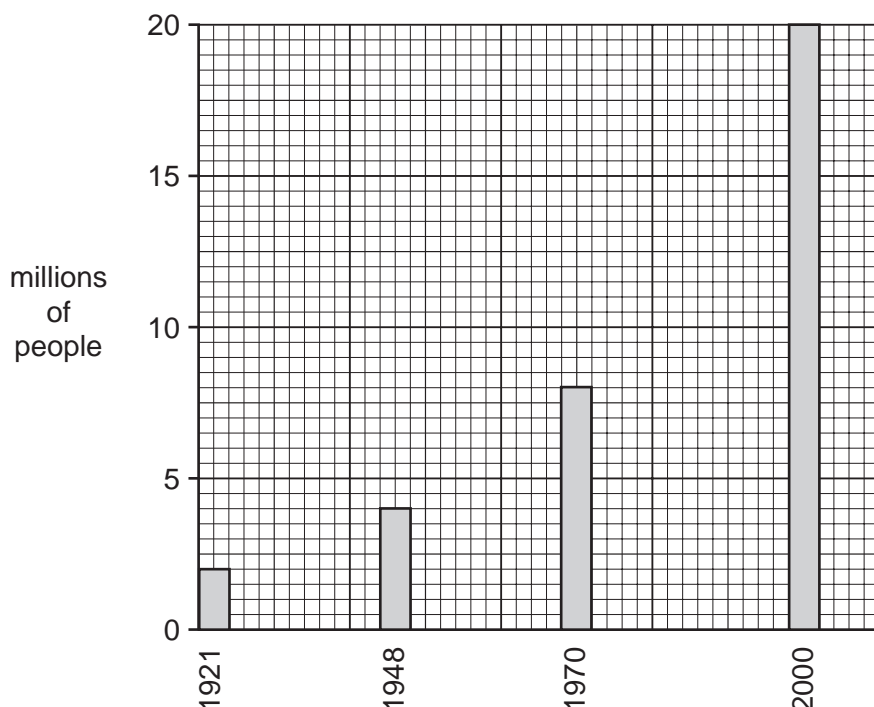
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[3]

(b) Look at and read the information below about population in Ghana, a country in West Africa.



Ghana mid-1990s
 birth rate 40 per 1000
 death rate 12 per 1000

Ghana is a country of young people. Half its population is aged 15 and under. During the next 20 years many children will reach child bearing age. This means that Ghana's population explosion is unlikely to be stopped. Government policy is to reduce the birth rate, but it is going to be a major task to educate people and to provide contraception.

In rural areas, where 70% of Ghana's people still live and where most are farmers, children are seen as assets. They provide income and status for the family. Despite the government working with churches, schools, hospitals and village chiefs, in only 15% of families is birth control practised.

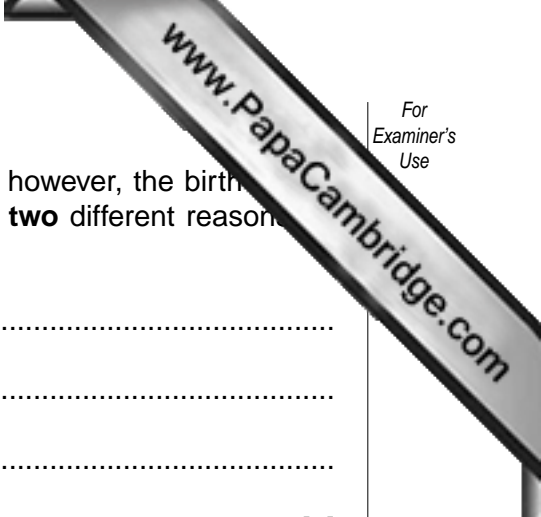
In urban areas, peoples' attitudes are different. One government worker said 'I am the youngest of 8 children. My seven brothers and sisters, who still live in rural areas, have a total of 26 children already, but my wife and I have just 2 children. We are planning not to have any more children. Prices are high in the city and life is hard'.

(i) Why was population growth high in the mid-1990s in Ghana? Use the values stated for birth and death rates.

.....

.....

.....[2]



(ii) Government policy in Ghana is to reduce the birth rate; however, the birth rate is unlikely to fall by a great amount for many years. State **two** different reasons for this.

1

.....

2

.....[2]

(iii) Why are government strategies for reducing population growth usually more successful in cities than in rural areas in developing countries?

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.....[2]

(iv) Name **one** country in which there are government strategies for reducing population growth.

Describe the strategies used in this country and explain how successful they have been.

Name of country

Strategies used

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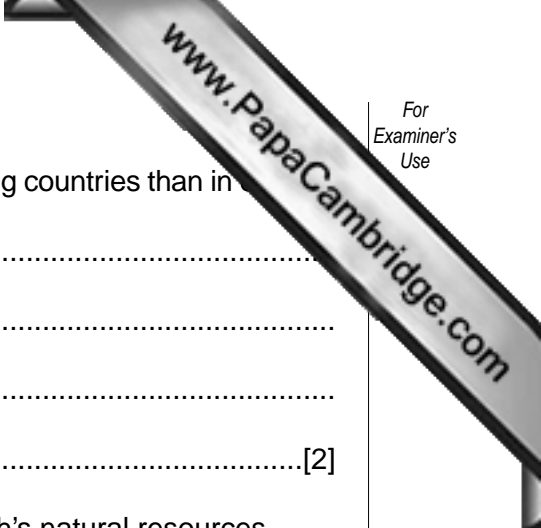
How successful?

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.....[4]



(v) Why have birth rates fallen more quickly in some developing countries than in others?

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.....[2]

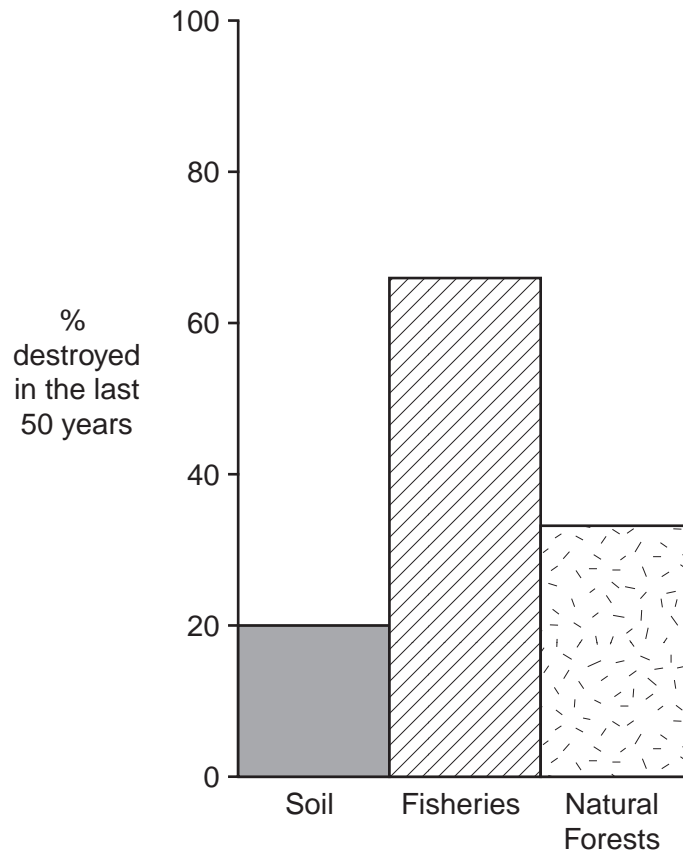
(c) World population growth is putting great pressure on the Earth's natural resources.

The time taken to replace the amount of crops, animals and biomass used by people in **12 months** is **14.4 months**.

How does this show an **unsustainable** use of the Earth's natural resources?

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.....[2]

(d) The graph below shows population pressure on three natural resources.



Explain why destruction of soil is a serious problem for farmers.

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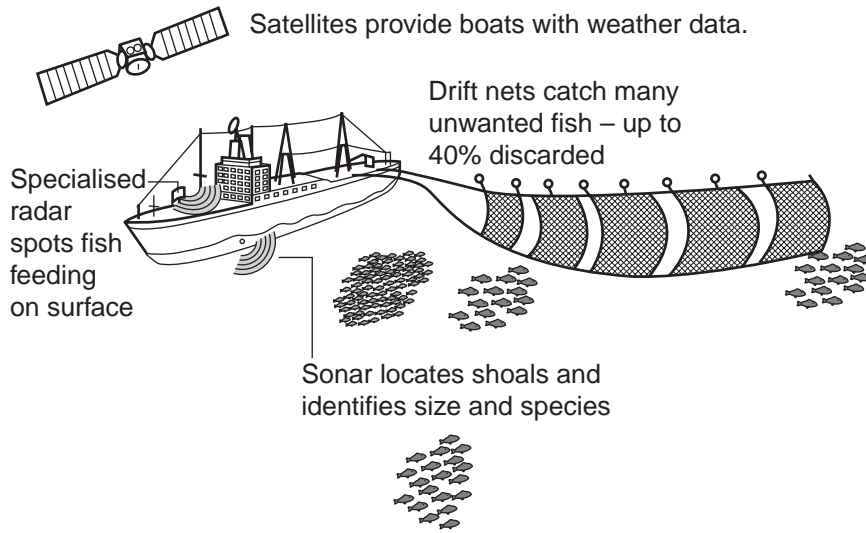
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.....[2]

(e) Look at the diagram below. It shows how modern technology helps to decrease fish

How hi-tech fishing leads to greater decline in stocks



(i) Explain how the use of modern technology can lead to over-fishing.

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.....[2]

(ii) Name and describe **one** strategy for a sustainable way of harvesting fish from oceans.

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.....[2]

(iii) What might prevent this strategy from being successful?

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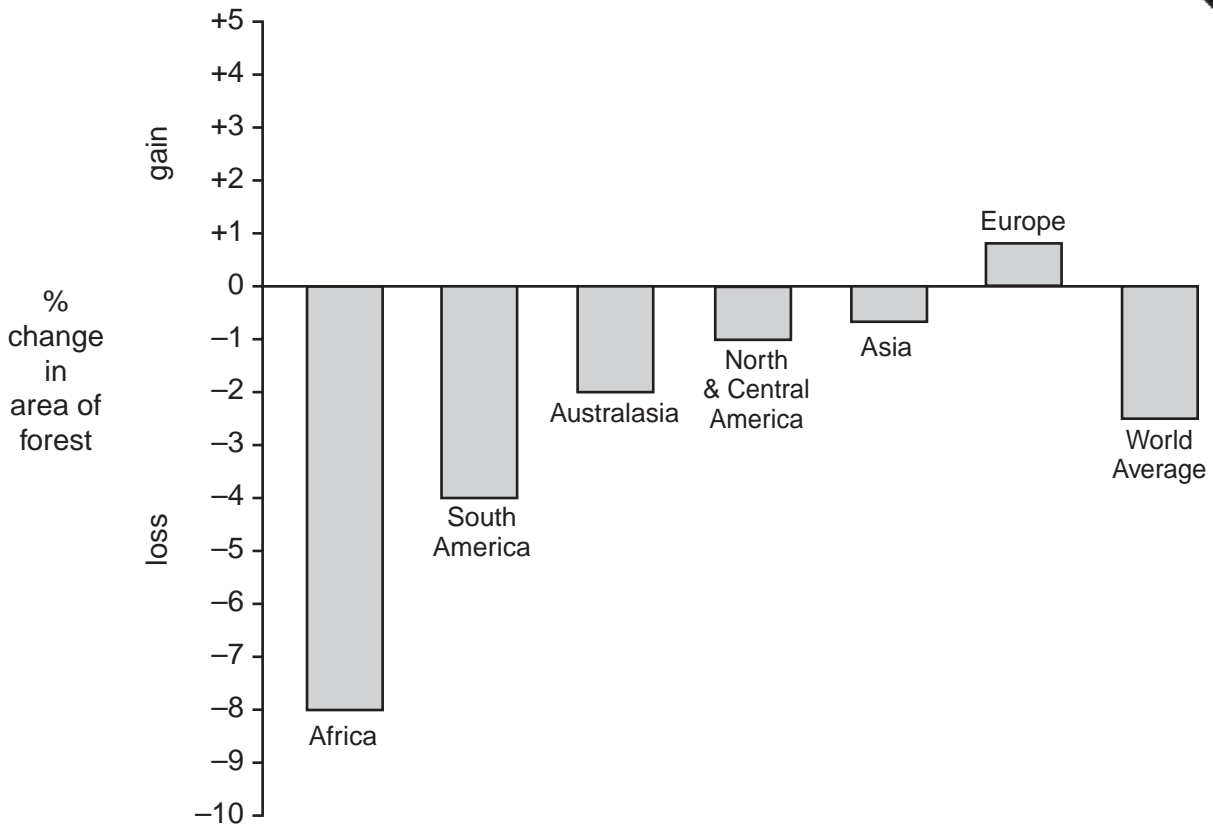
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.....[3]

(f) The graph shows forest losses from 1990 – 2000.

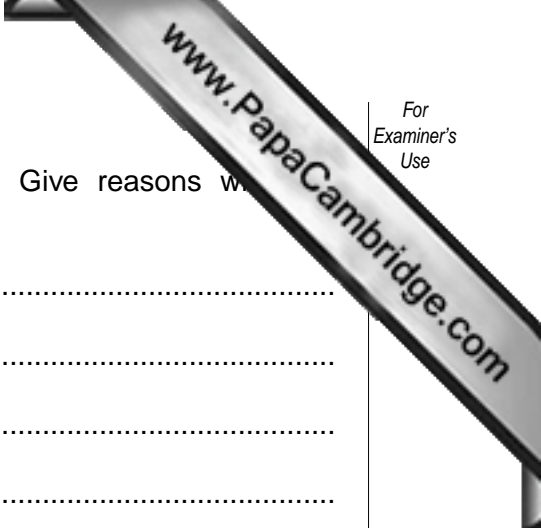


(i) In what ways are forest losses in Africa different from those in other parts of the world? Use information from the graph.

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.....[2]

(ii) Why is more forest being lost in some parts of the world than in others?

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



(g) (i) Name **one** area in which deforestation is occurring. Give reasons why deforestation is taking place.

Name of area

Reasons

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[5]

(ii) Explain why humans depend on forests to recycle carbon dioxide.

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[2]

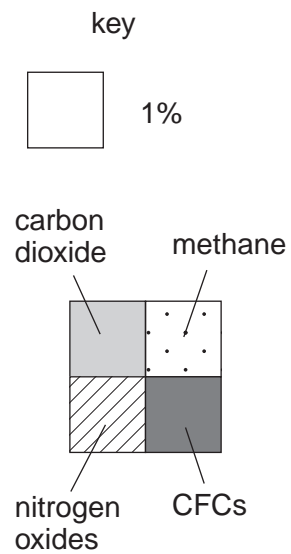
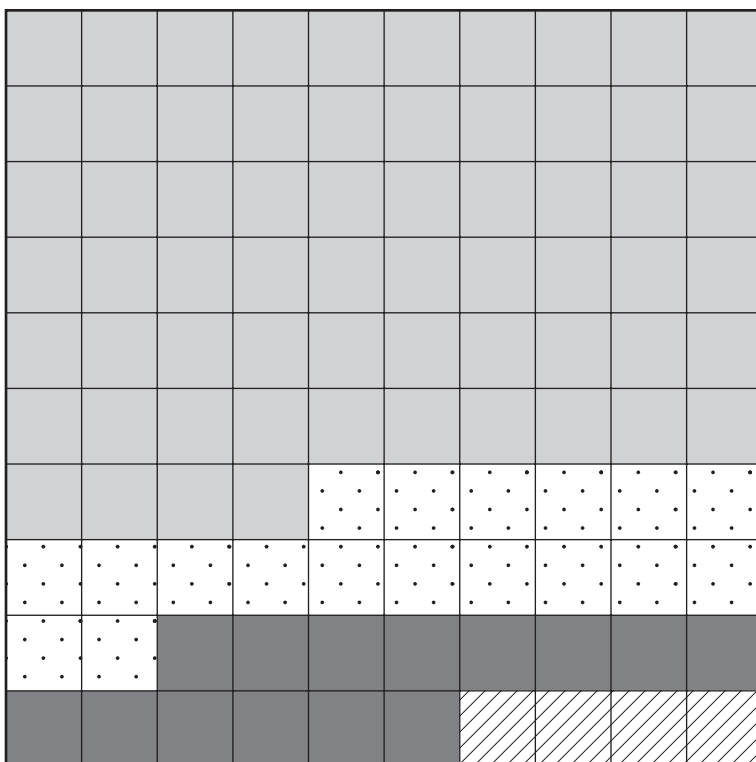
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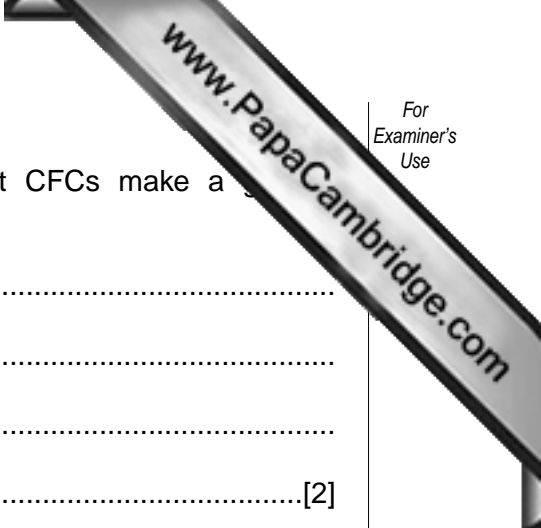
6 (a) Information about greenhouse gases is given in the table below.

1	2	3	4
Greenhouse gas	Sources	% contribution to the greenhouse effect	Number of years it stays in the atmosphere
Carbon dioxide			up to 200
Methane			12
CFCs			1000 or more
Nitrogen oxides	chemical fertilisers car exhausts		120

(i) Complete column 2 in the table by naming **two sources** for each of carbon dioxide, methane and CFCs in the atmosphere. [3]

(ii) Fill in column 3 in the table using percentages shown in the graph below. [1]





(iii) Explain how the information in the table shows that CFCs make a greater contribution to the greenhouse effect than methane.

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.....[2]

(iv) Describe **two** strategies for reducing emissions of greenhouse gases into the atmosphere.

1

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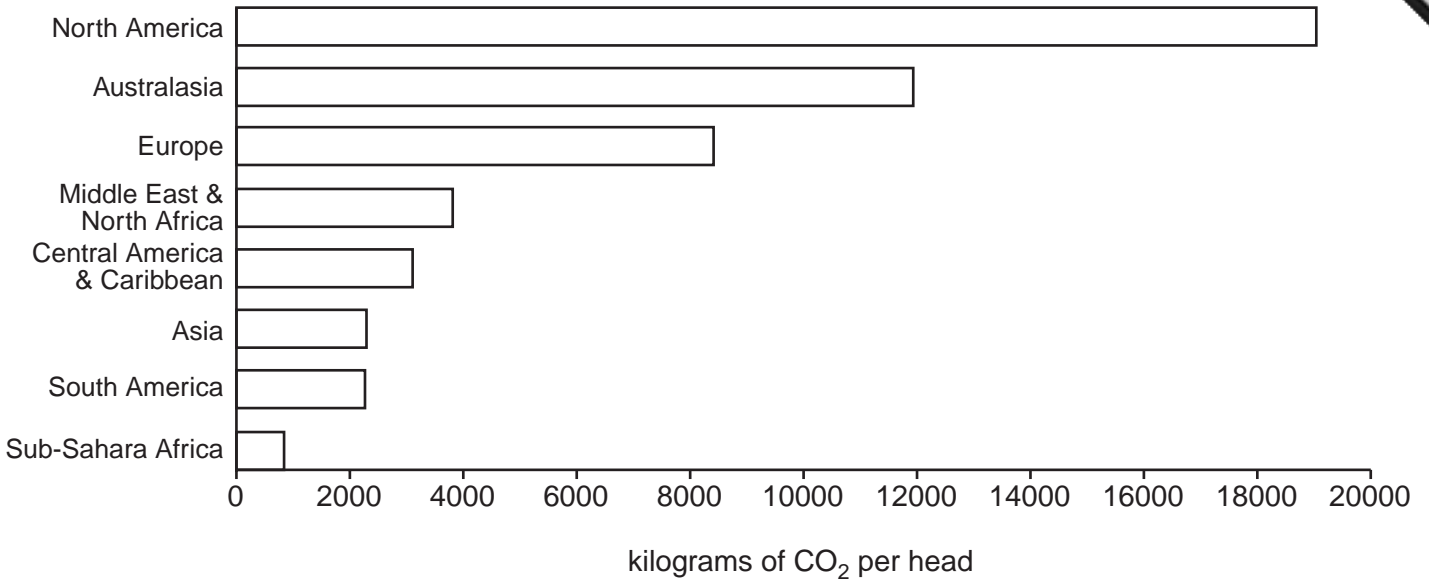
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.....[4]

(b) Look at the graph below. This shows carbon dioxide emissions per head in 2000 in 2 major world regions.

Emissions of carbon dioxide per head in 2000 (in kilograms)



(i) How many times greater were carbon dioxide emissions per head from Europe than from sub-Saharan Africa?

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.....[1]

(ii) Describe what the graph shows about differences in emissions per head between developed and developing regions of the world.

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.....[3]

(e) Read this newspaper report from August 2002 about the Asian brown cloud.

Yesterday a group of international scientists said that they had discovered the 'Asian brown cloud'. This is a three kilometre thick haze of pollutants, caused by human activities, across much of the continent of Asia. The area it covered in August 2002 is shown on the map below.



key



Asian brown cloud

'We used to think that human impact on climate was just global warming', said a scientist, 'Now we know that it is not as simple as this. Greenhouse gases like carbon dioxide are distributed equally across the Earth, but the pollutants that make up the brown cloud are concentrated only in certain parts of the world'. The cloud is described as being like a 'heavy soup' - a mixture of pollutants from motor vehicles and industries, and small soot particles from forest burning and from burning wood for cooking in many rural houses.

Up to 15% of sunlight is blocked by this cloud. This reduces plant photosynthesis. It causes less evaporation from the sea, so that monsoon rains are reduced. Up to 3 billion people in Asia rely upon monsoon rains for farming, which means that the cloud can have big effects on the livelihoods and health of people.

Air pollutants can be carried many thousands of kilometres by winds. Most of the emissions are coming from India and China. The pollution is likely to worsen as population increases and countries such as these industrialise rapidly. Scientists have also discovered smaller pollution clouds over parts of Africa and South America, which may be helping to make the weather less predictable around the globe.

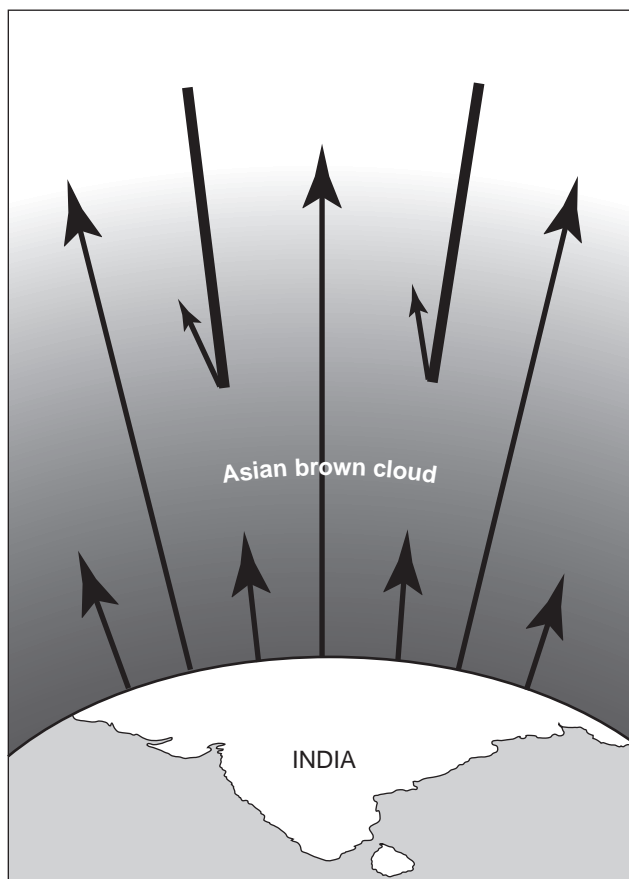
(i) Describe where the Asian brown cloud was located in August 2002.

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.....

.....[2]

(ii) Look at the diagram below of the Asian brown cloud.



Label the diagram to show the causes and effects of the Asian brown cloud. [2]

(iii) In what ways are the effects of the Asian brown cloud on sunlight different from those of the greenhouse effect?

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.....[2]

(iv) Should people living outside Asia be worried about the existence and growth of the Asian brown cloud? Explain your answer.

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.....[3]



(f) One member of the UN environment programme said 'The Asian brown cloud is caused by the actions of people, therefore people can destroy the cloud as well'.

In order to do this, he said that the following **changes** are needed

- more controlled burning
- cleaner traffic and less of it
- more use of sustainable (renewable) energy.

(i) Choose **one** of these changes. Describe how it might help to reduce and destroy the Asian brown cloud.

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(ii) Is the Asian brown cloud likely to be reduced in size and destroyed by the actions of people? Explain your views on this.

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.....[6]

[Total: 40]

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