

Centre Number	Candidate Number	Name
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CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

**NATURAL ECONOMY**

**0670/02**

Paper 2

May/June 2003

**2 hours**

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 **both** questions.  
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.

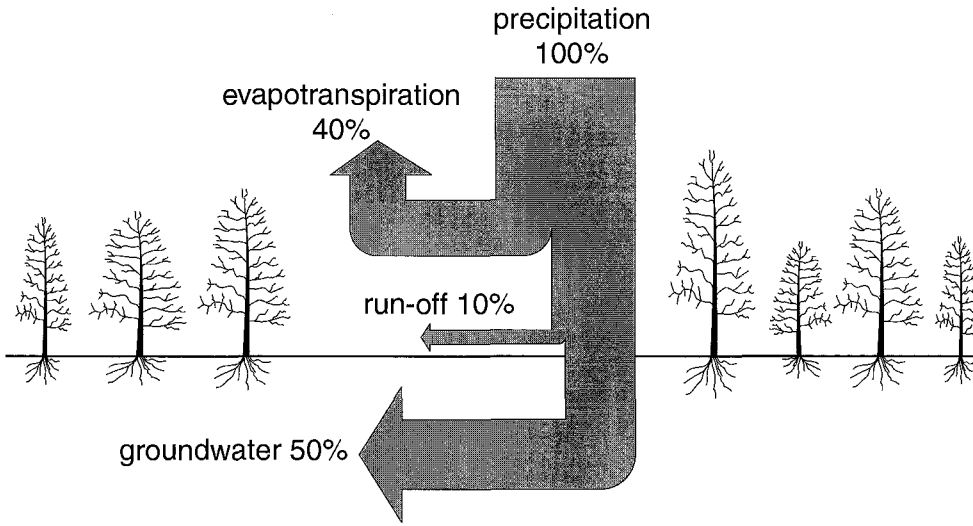
Stick your personal label here, if provided.

For Examiner's Use	
1	
2	
<b>TOTAL</b>	

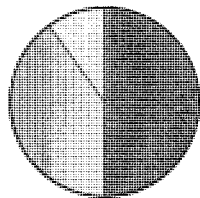
This document consists of **19** printed pages and **1** blank page.

- 1 (a) Look at diagram A, which shows what happened to precipitation that fell in a forested area in Canada.




diagram A



**what happens to the precipitation**



**key**

-  groundwater
-  evapotranspiration
-  run-off

- (i) What is precipitation?

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

- (ii) What causes evapotranspiration?

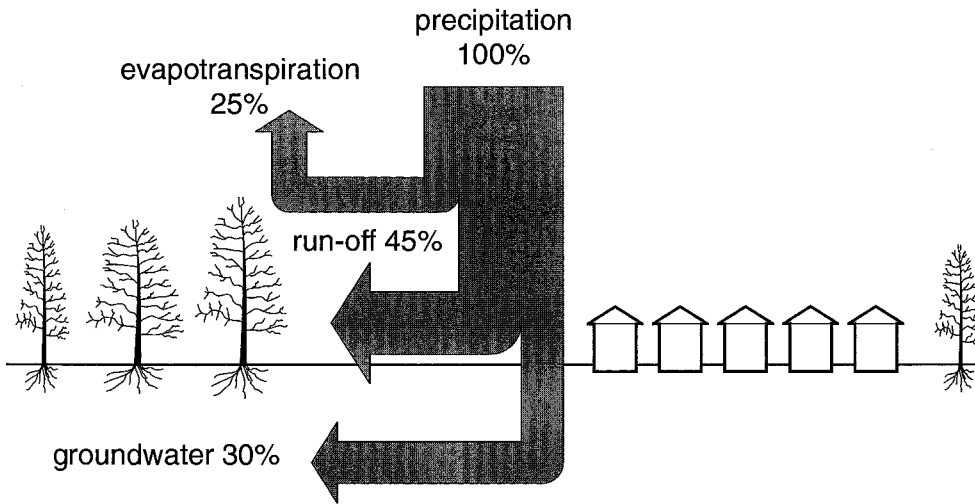
.....  
 ..... [1]

- (iii) State the difference between run-off and groundwater.

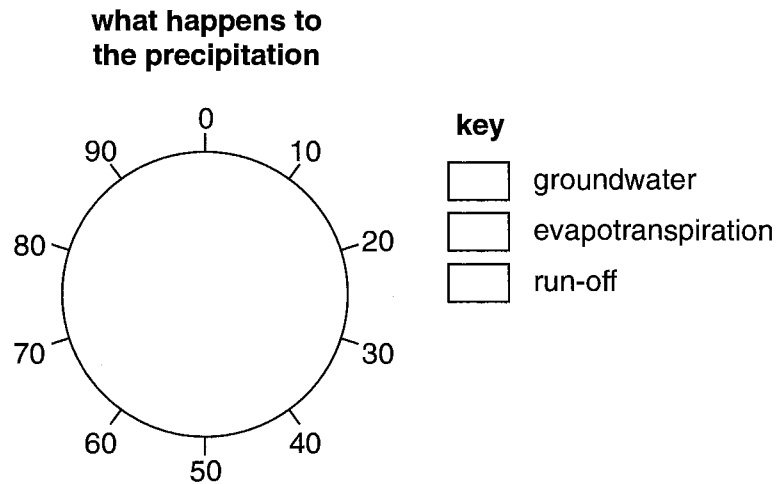
.....  
 ..... [1]

- (b) Diagram B below shows what is happening now in the same area, after many of the trees were cut down and replaced by buildings.

diagram B



- (i) Complete the pie graph to show the percentages for what is happening to the precipitation in diagram B. Complete the key.



[3]

- (ii) Using information from diagrams A and B, complete the table below.

Process	Diagram A	Diagram B	change (%)
Precipitation	100	100	0
Evapotranspiration	40	25	-15
Run-off			
Groundwater			

[2]

**(iii)** Explain why the percentages of some processes have decreased from diagram A to diagram B.

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

**(iv)** In which diagram (A or B) would flooding be more likely to occur?

Explain your answer.

Diagram .....

Explain .....

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

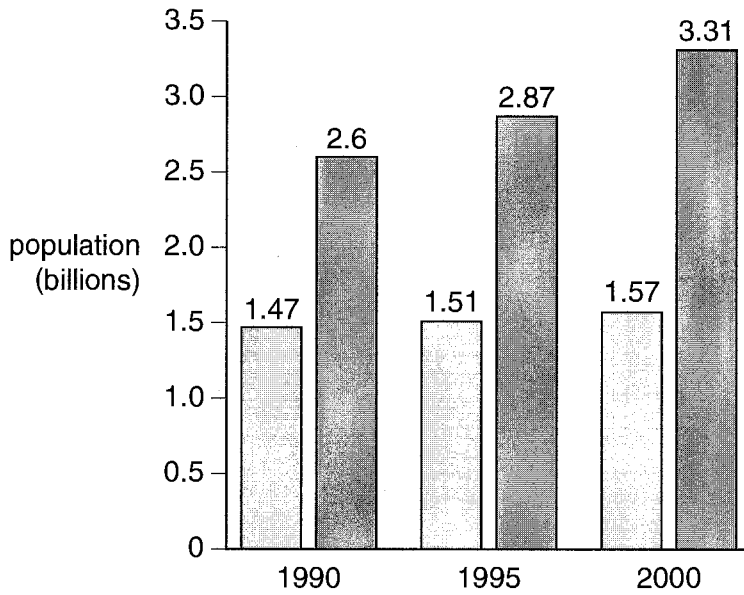
**(c)** Many people are living in homes without any sanitation (clean water and sewage disposal) in developing countries.

**(i)** Explain why it is very important to have proper sanitation in homes.



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

(ii) Look at the bar graphs.

**population with and without sanitation**  
(all developing countries)



**key**

-  with sanitation
-  without sanitation

State the evidence from the graphs that the situation in developing countries is becoming worse rather than better.

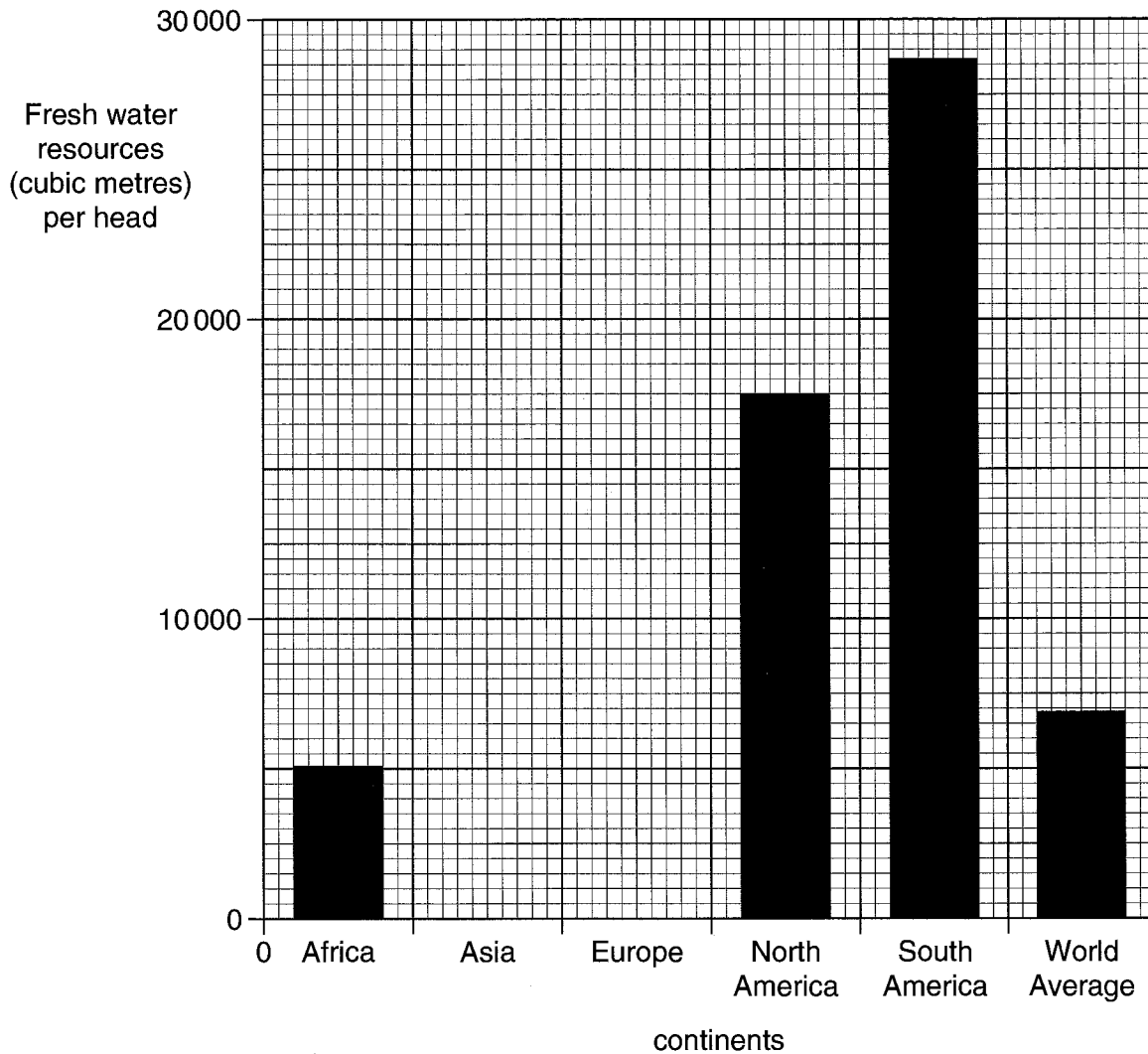
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..... [2]

- (d) Resources of renewable fresh water are greater in some parts of the world than in others.

Look at the graph below which shows this.



- (i) Complete the graph by plotting the values for Asia and Europe.

Asia                    3700

Europe                8500

[2]

- (ii) Name the continents in which fresh water resources per head are lower than the world average.

..... [1]

(e) Name one type of climate in which drought is a frequent problem.

..... [1]

(f) 'Water, not oil, is the most precious thing in our lives'.

(i) Why is water vital to life on Earth?

.....  
.....  
.....  
.....

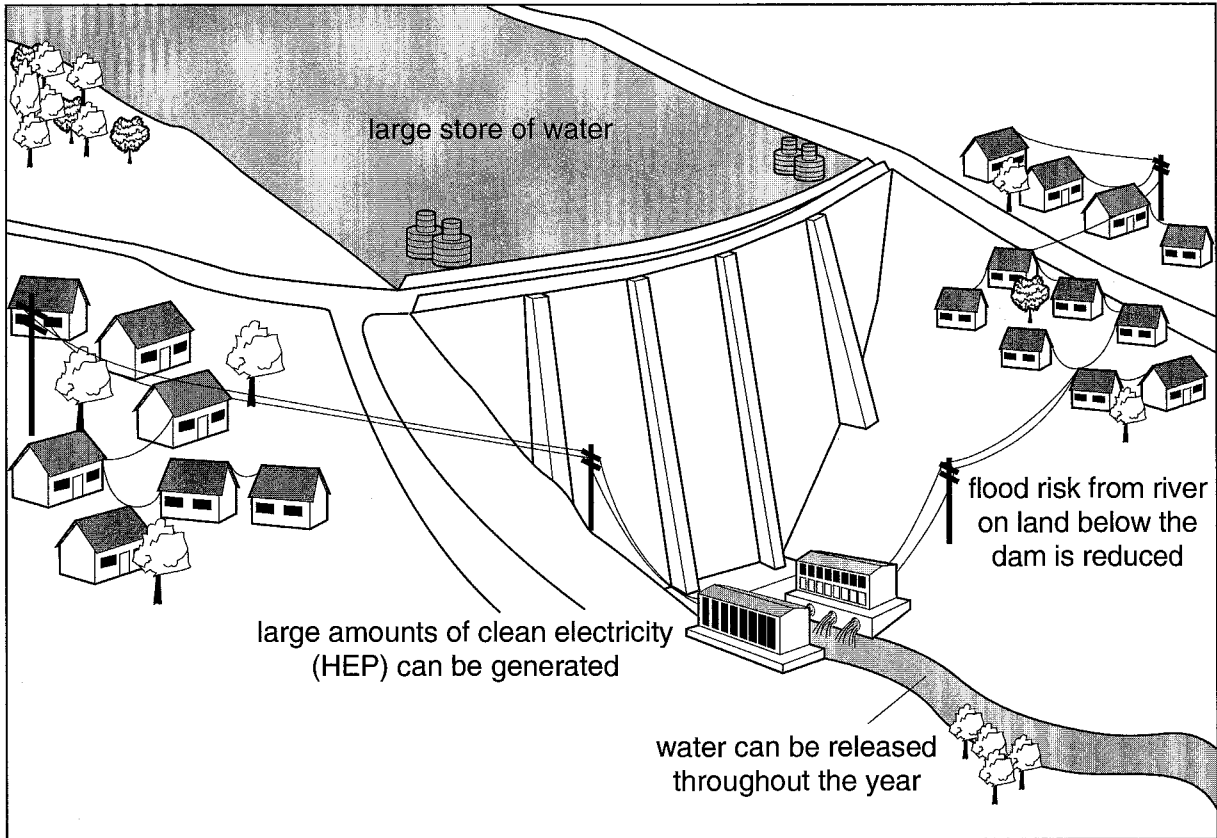
(ii) Do you agree with the statement about water being more important than oil in our lives? Give reasons.

.....  
.....  
.....  
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.....  
.....

[5]

- (g) One method to increase the amount of fresh water available to people is to build a dam and create a reservoir behind it. Water can be taken by pipeline from the reservoir to where it is needed.

Look at the diagram below which shows some of the advantages of building large dams.



- (i) Suggest why the electricity generated at the dam is described as being clean.

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

- (ii) Explain the advantages that a dam gives for farmers who live in areas often affected by drought.

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



(h) Read the newspaper report below.

## The unacceptable cost of big dams

An international report said that many of the 45,000 big dams built across the world

- \* cost too much
- \* were finished late
- \* harmed poor people
- \* failed to provide all the electricity and water for irrigation that had been promised when they were being planned.

The people who benefited most were often the big construction companies from Europe and North America, which gained billions of dollars of business. This increased the debts of some of the world's poorest countries.

The number of people forced to move by building dams was estimated at between 40 and 80 million, most of them in China and India. The local people were rarely consulted before their homes, fields and jobs were destroyed. Many were promised compensation, but few have received the money. The new land on which they were forced to settle was usually less fertile.

The report said that there were environmental disadvantages of building big dams. Some fish and bird species have become extinct and half the world's wetland areas have been lost. In some areas, creating reservoirs leads to forests being covered by water; when the vegetation decays, large quantities of greenhouse gases are produced.

The report said that the picture is not all bad, because dams have brought great benefits as well. Although millions of people have suffered, millions more have gained from new and plentiful supplies of water and electricity. Therefore the problem was not the dams themselves, but their big size. Small dams, built by local people, created work and reduced the need to import foreign workers, money and high technology.

(i) Using information from the newspaper report, complete the boxes in the table below.

Heading	Advantage of big dams	Disadvantage of big dams
Economic		
Environmental		
Social (affecting people)		

[4]

**(ii)** Some people think it is better to build many small dams instead of a few big dams.  
Do you agree with this view? Explain your answer.

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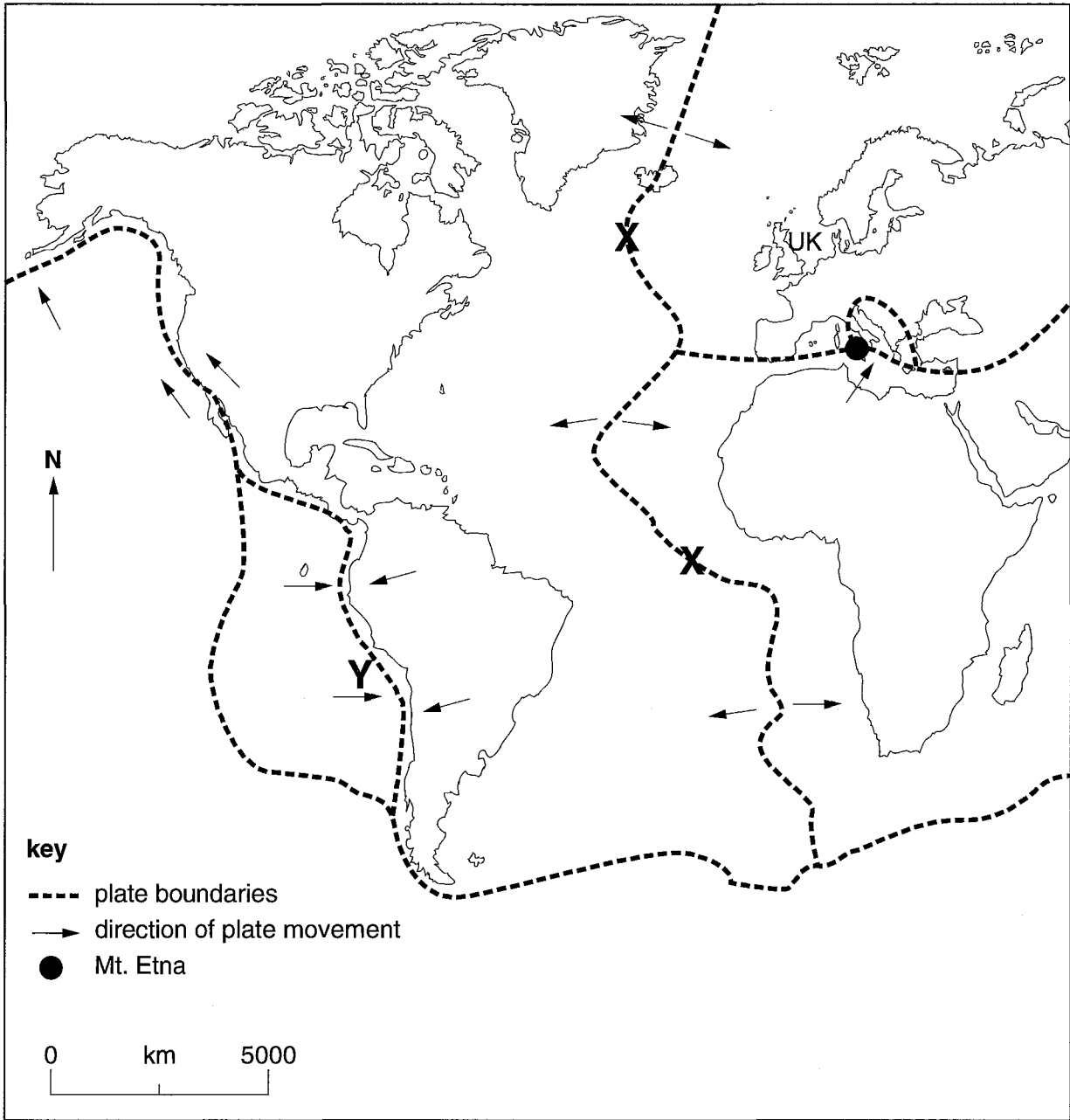
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.....

..... [4]

[Total : 40]

2 (a) Look at the map below which shows some of the plate boundaries in the Atlantic and Pacific Oceans.



(i) In which directions are the plates moving along boundary X?

..... [1]

(ii) Name the type of plate boundary at X.

..... [1]

(iii) State two ways in which plate boundary Y is different from X.

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

(iv) The location of Mount Etna in Italy, a volcano which erupted during 2001, is also shown on the map.

Explain why there are active volcanoes in Italy, but none in the UK.

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

(b) In July 2001 the eruption of Mount Etna threatened nearby towns.

Read the newspaper report below.

### People against nature

When a volcano begins to erupt lava, ash and gas, the people living close by are forced to take note. In Catania, a city of 380 000 people located on the coast about 50 km away from the top of Mount Etna, there were two effects of the volcano. A fine ash settled on everything and the explosions and flows of glowing lava provided spectacular evening entertainment.

The threat was much greater for the 6300 people who lived in the town of Nicolosi, located higher up the sides of the volcano, only 20 km away from the start of the lava flows. One lava flow was heading straight for the town. The Italian government declared a state of emergency and provided US\$7 m of help. Thirty bulldozers worked night and day building walls of earth on the higher slopes above Nicolosi to try to divert the lava flow away from the town. Two aeroplanes and a helicopter also dropped water to cool the lava and decrease its speed of flow, although they couldn't stop the lava destroying ski-lifts.

Meanwhile, the people of Nicolosi prayed. In the end their prayers seemed to have been answered, because the lava flow stopped 4 km away from the town. A new crack opened up on the side of the volcano, which took some of the lava away from the flow that was moving towards Nicolosi. The volcanic activity decreased, the lava flow became wider and the lava itself became more dense. Each of these three things helped to reduce the speed of flow of the lava. 'We have a love affair with this volcano', said the mayor of Nicolosi. 'Even in the past when eruptions have ruined some property, we just start again'.

(i) State two reasons why the people living in Nicolosi were in more danger from the eruption of Mount Etna than those living in Catania.

1. ....

.....

2. ....

..... [2]

(ii) For how many kilometres did the lava flow towards Nicolosi?

..... [1]

(iii) No one was killed and there was little destruction of property during this eruption of Mount Etna.

How do you explain this? Was it nature, or were the actions of people more important? Using information from the newspaper report, state and explain your views about this.

.....

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..... [5]

- (c) One reason why many people live close to volcanoes, despite the danger, is because of good soils for farming.

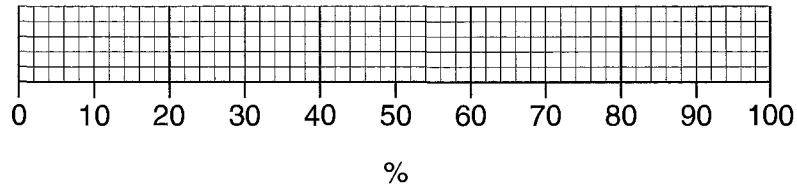
One example of a good soil for farming is a loam soil. It is made up of

40% silt

40% sand

20% clay.

- (i) Show these percentages in the divided bar graph below and complete the key.



**key**


[3]

- (ii) What makes a loam soil more useful for farmers than many other types of soil?

.....

.....

..... [2]

(d) Sometimes land pollution caused by people reduces or destroys the usefulness of soil.

Some causes of land pollution are listed below.

- salination
- toxic waste
- nuclear waste
- domestic waste (sewage)
- pesticides (chemicals)

(i) Which **two** in the list are most likely to be caused by farmers?

1. ....

2. .... [2]

(ii) Choose **one** of the causes of land pollution listed.

State its effects on the soil and explain how pollution from it can be reduced.

Cause chosen .....

Effects .....

.....

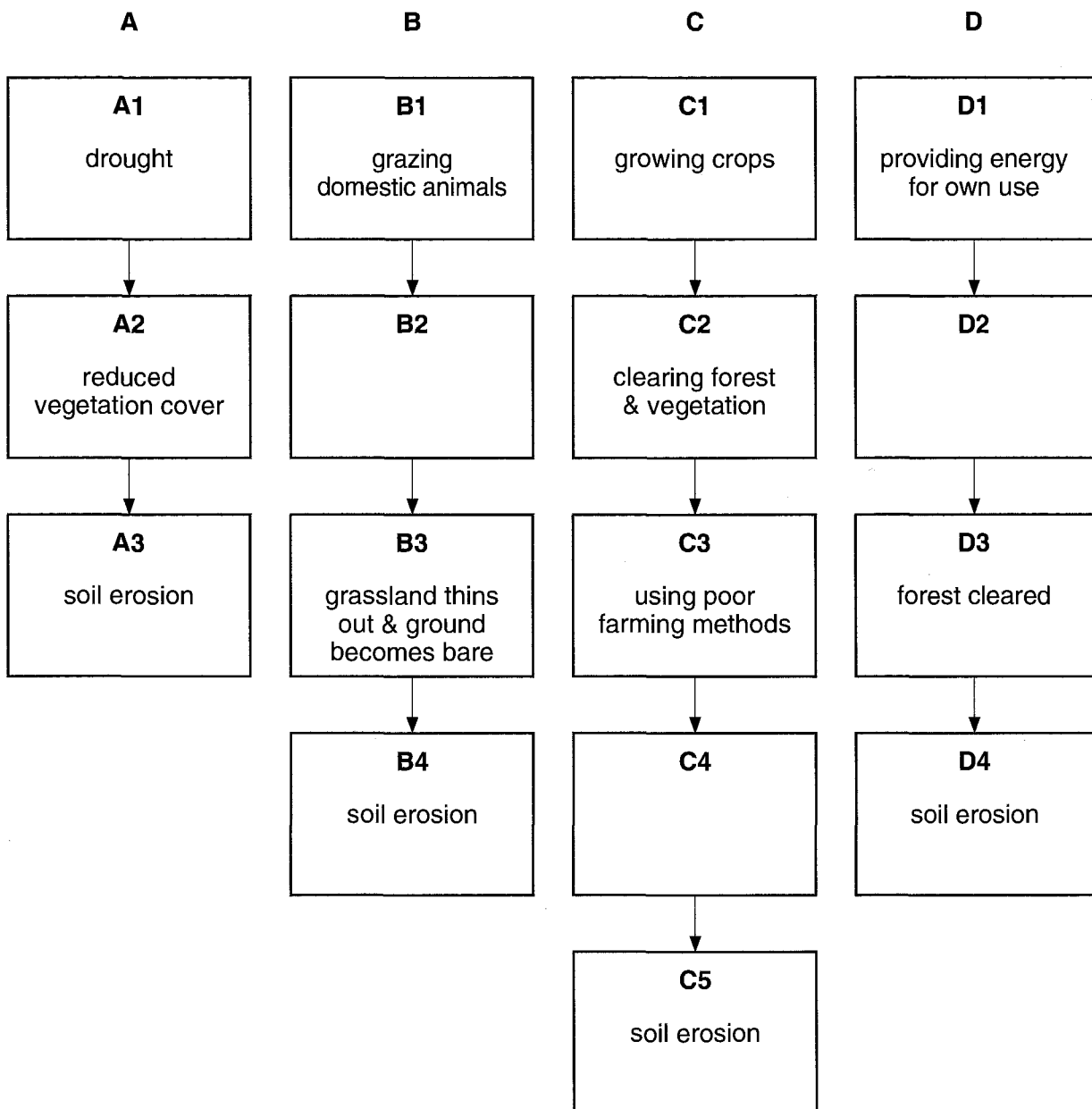
.....

Reducing its effects .....

.....

..... [4]

(e) The flow chart below shows some of the causes of soil erosion and desertification.





(i) In which one of the four columns lettered A – D is soil erosion caused by natural processes rather than by people?

Letter ..... [1]

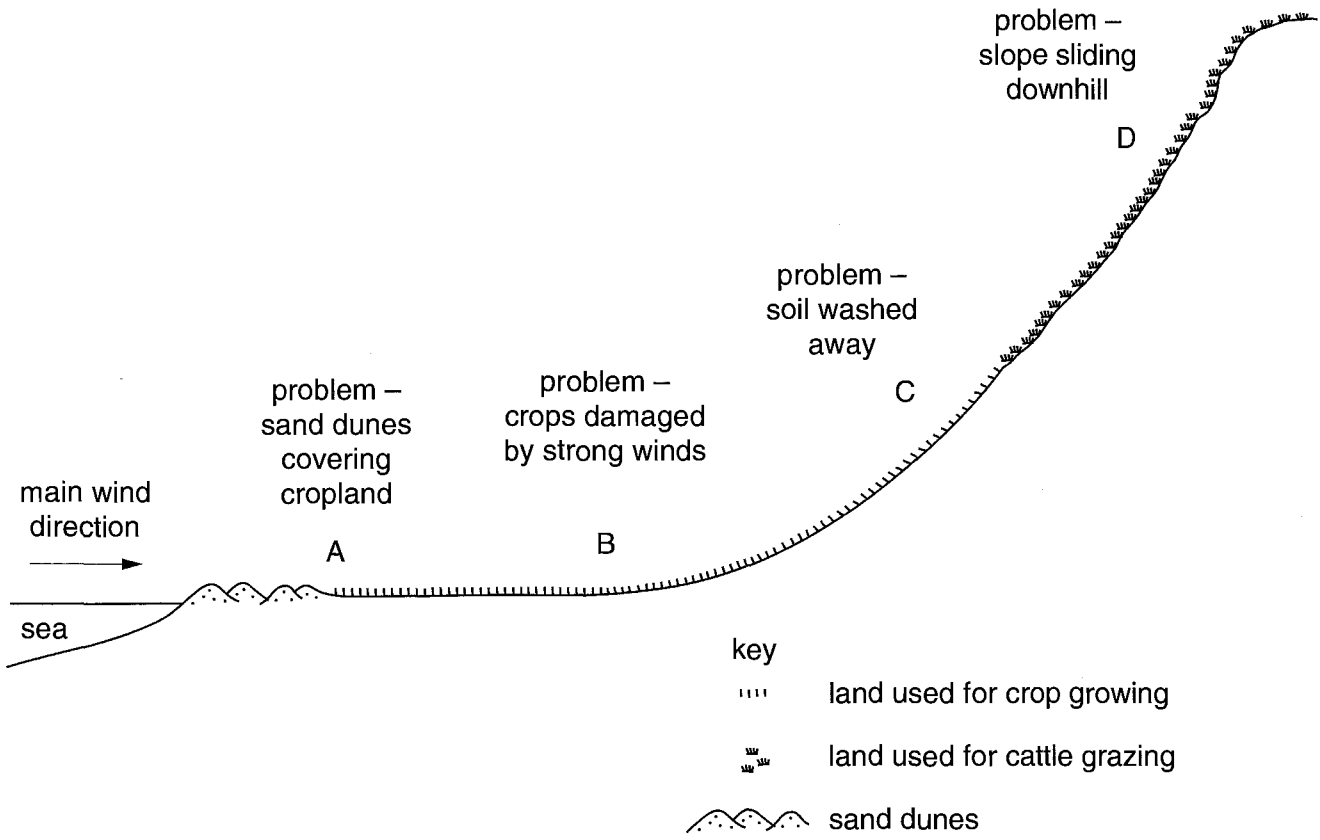
(ii) Fill in the empty boxes (B2, C4, D2) on the flow chart. [3]

(iii) 'Using poor farming methods' is stated as one of the factors leading to soil erosion in crop growing areas (box C3). One example of a poor farming method is monoculture.

Explain why monoculture is a less sustainable farming method than mixed cropping.

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

(f) Look at the diagram below which shows a cross section through a farming area. It shows four problems for farmers in the areas labelled A, B, C and D.



(i) Why is there a danger that the sand dunes may also cover some of the land used for growing crops in area B?

.....

..... [1]

(ii) Three strategies for reducing the problems for farmers in these areas are listed below.

- planting trees
- windbreaks
- contour ploughing

For each strategy,

1. decide in which one of the areas labelled A-D it would be most effective;
2. explain how it could reduce the problem.

Strategy – Planting trees

1. Letter for the area on the diagram .....
  2. Explain .....
- .....
- .....

Strategy – Windbreaks

1. Letter for the area on the diagram .....
  2. Explain .....
- .....
- .....

Strategy – Contour ploughing

1. Letter for the area on the diagram .....
  2. Explain .....
- .....
- .....

[6]

[Total : 40]

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