

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

**NATURAL ECONOMY** **0670/04**

Paper 4 Alternative to Coursework May/June 2003

**1 hour 45 minutes**

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

**READ THESE INSTRUCTIONS FIRST**

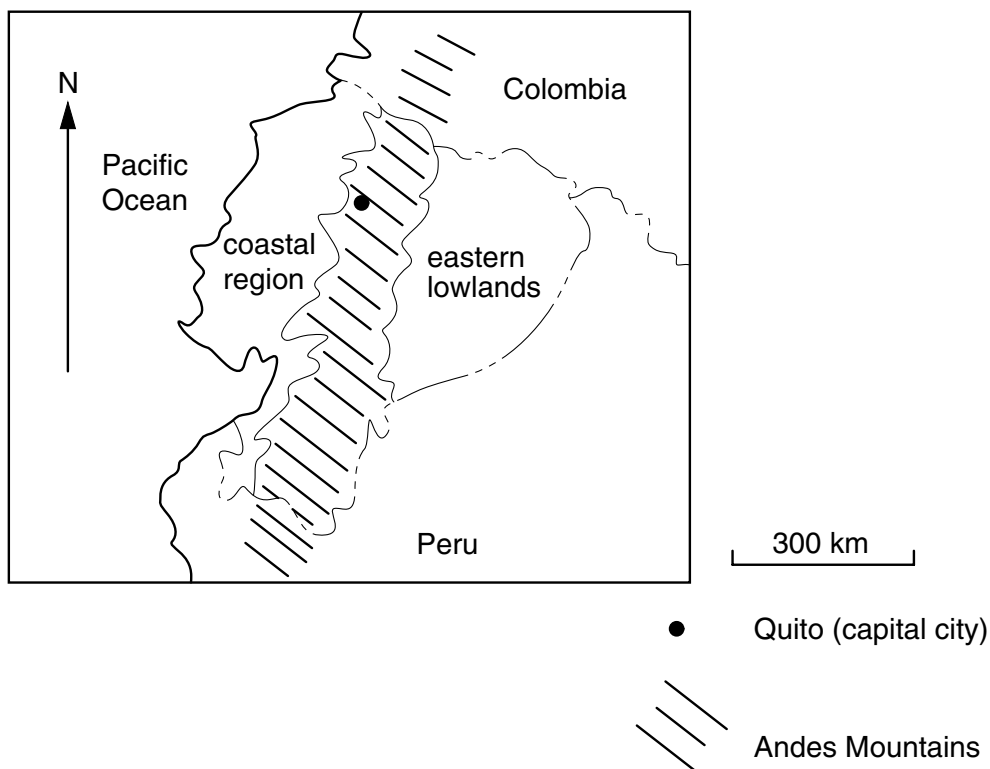
Write your Centre number, candidate number and name on all the work you hand in.  
Write in dark blue or black pen in the spaces provided on the Question Paper.  
You may use a soft pencil for any diagrams, graphs or rough working.  
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.  
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.

<p>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.</p> <p>Stick your personal label here, if provided.</p>	<p><b>For Examiner's Use</b></p>
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**Fig.1 World map**



**Fig.2 Map of Ecuador**

Ecuador has a population of 13 million people. It is the most densely populated South American country with an average of 44 people per sq. km. The majority of people live in the coastal lowlands.

30% of the population make their living from agriculture. Ecuador is the world's biggest banana exporter. It also exports cocoa and coffee.

Large oil deposits are being exploited in the eastern lowlands and manufacturing industries are increasing.

- 1 Many farmers breed native Criollo pigs as an important source of food in Ecuador. They can be kept on small plots of land and fed on crop waste. These pigs grow quickly and produce many piglets. When farmers in mountain valleys have a good harvest of corn they feed the unwanted corn to the pigs. The farmers walk the pigs over the mountains to be sold.

	Village A	Village B
Live piglets at birth	1400	1250
Live piglets at 5 months	980	950
Number of dead piglets		

**Fig. 3 Pig production in two villages in 2001**

- (a) Complete the table above. [2]

- (b) Calculate the percentage (%) of piglets that died in village A.

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

The villagers report that the percentage of piglets that die changes from year to year. Some of the main causes are outbreaks of:

- pig cholera
- foot and mouth disease
- parasitic worms

- (c) Suggest why the villagers do not use drugs to control these diseases.

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

In village B every piglet death over a five year period was recorded. The rainfall was also recorded at the local school. The results are shown in Fig. 4.

Year	1995	1996	1997	1998	1999	2000
Number of piglet deaths	290	380	390	300	320	400
Annual rainfall in village (mm)	940	1240	1280	960	1000	1180

**Fig. 4**

**(d) (i)** Complete the bar charts on page 5. The data for 1995 has been filled in for you. [5]

**(ii)** Describe the relationship between the number of piglet deaths and rainfall. Suggest a reason for the relationship.

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

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

Some government scientists visited the village and gave the farmers a drug to prevent some piglet deaths from disease.

- Some farmers gave the drug to their piglets.
- Other farmers did not use the drug to treat their piglets. This was because in the past some piglets had not died, but had made a complete recovery.

**(e)** Describe the advantages of

**(i)** using the drug, .....  
.....  
.....

**(ii) not** using the drug. ....  
.....  
.....

[3]

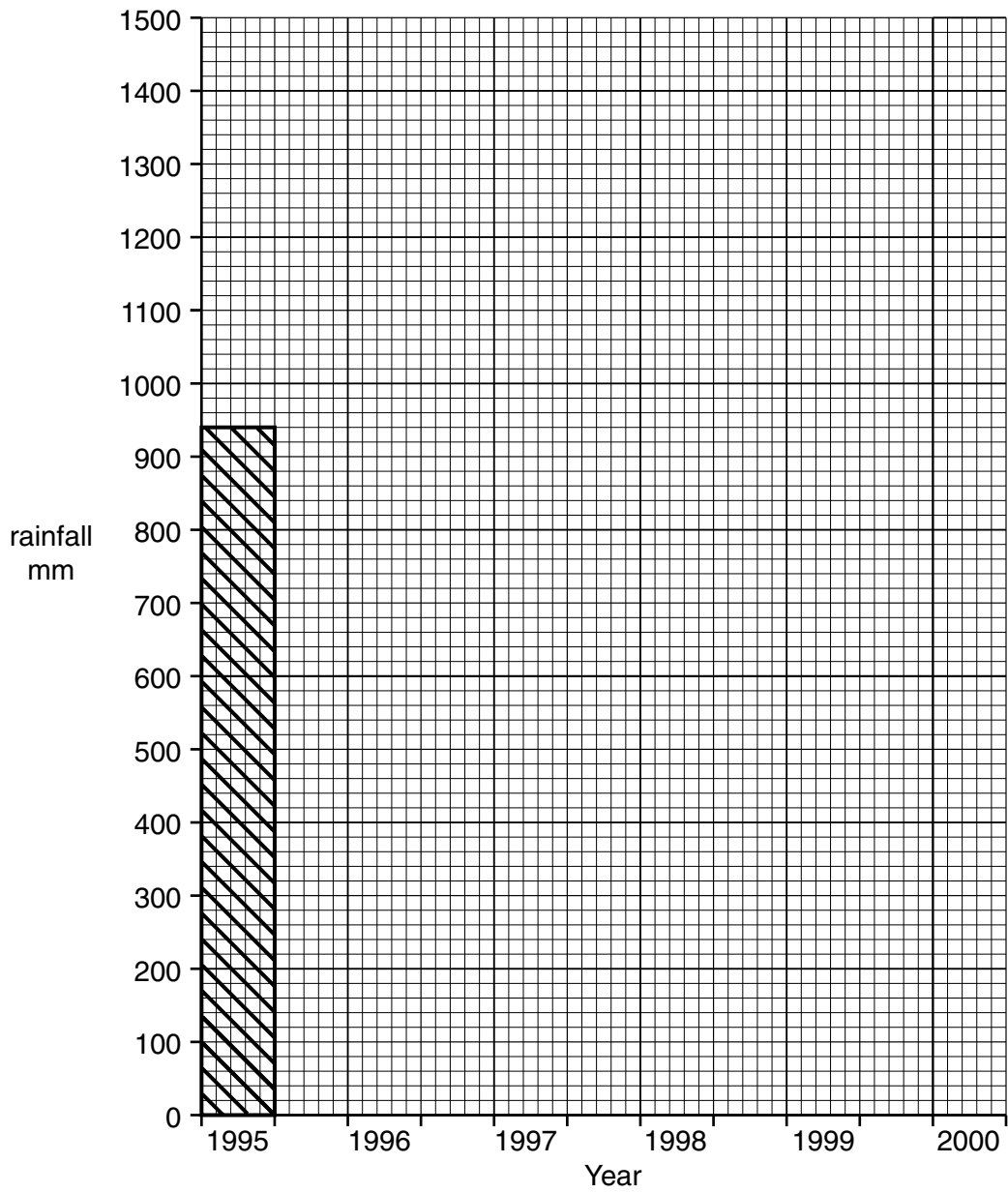
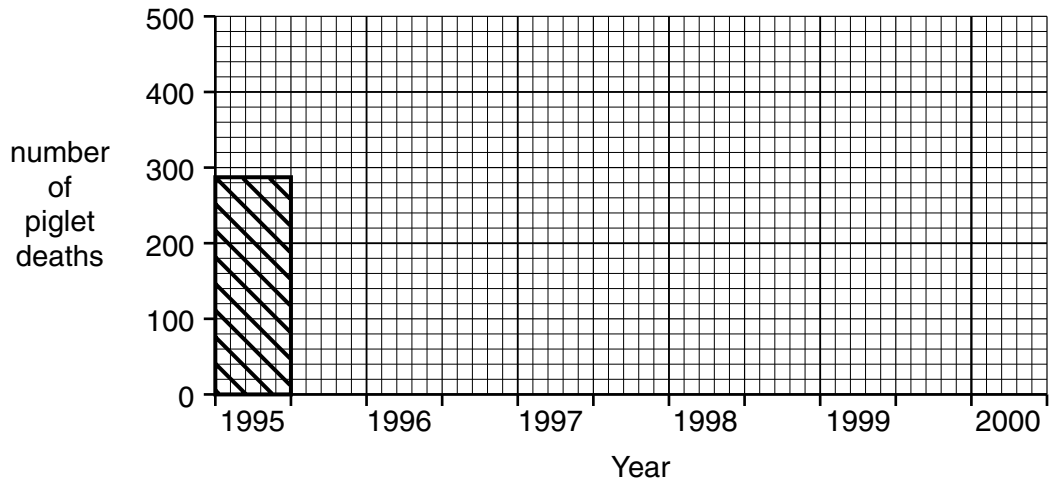
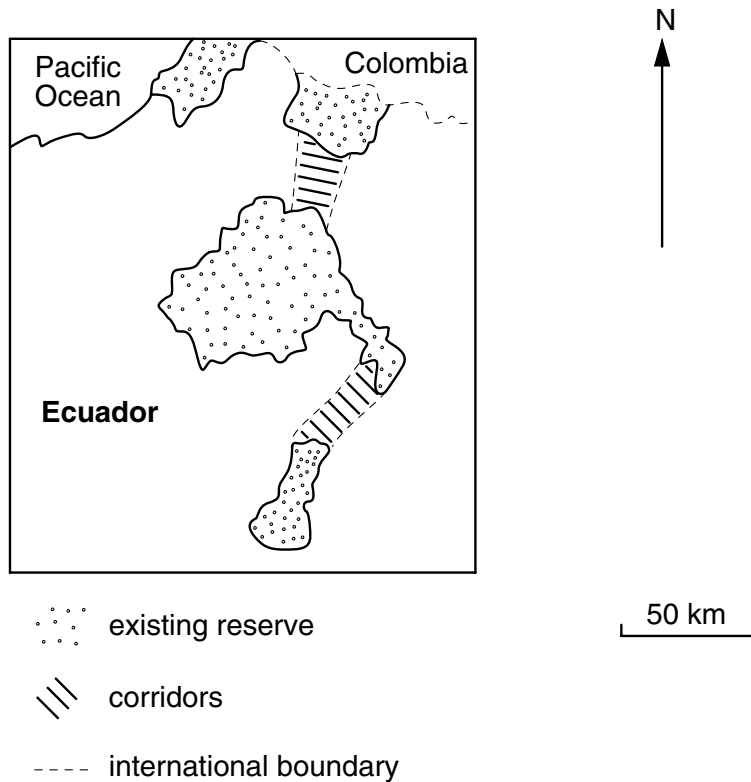


Fig. 5



**Fig.6 Nature reserves and biodiversity corridors**

Ecuador is one of only twenty biodiversity ‘hot spots’ in the world. ‘Hot spots’ have large numbers of different species in each square kilometre.

Conservationists are worried about the areas of rainforest being cleared for roads, oil exploration and extraction. The remaining forest is also being affected by these developments. The populations of many species of animals are decreasing rapidly and some species have become extinct locally. Creating corridors that link existing nature reserves will help to maintain biodiversity.

A European visitor to Ecuador said, ‘I am worried about how quickly the rainforest in Ecuador is being destroyed. I donated enough money to buy one hectare of forest to help create a biodiversity corridor. One hectare can have up to 473 tree species. I hope I have helped to save some species from extinction and I am going to ask my friends to donate money to conserve as many hectares as possible.’

**(a)** Suggest **two** reasons why the populations of some animal species may decrease rapidly in an area of the remaining rainforest.

.....

.....

.....[2]

**(b)** Suggest **one** reason why people from other countries might be interested in biodiversity ‘hot spots’ in Ecuador.

.....

.....[1]

A person in Ecuador said, 'I do not like people from other countries being allowed to buy many hectares of rainforest in Ecuador. The rainforest belongs to the people of Ecuador and it is a resource we should use as we like.'

(c) Suggest **two** reasons why European people are interested in conserving rainforest.

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

(d) Complete the table to describe **three** uses of tropical rainforest and give **one** advantage and **one** disadvantage of each.

	Use of forest resources	Advantage	Disadvantage
1	..... ..... ..... .....	..... ..... ..... .....	..... ..... ..... .....
2	..... ..... ..... .....	..... ..... ..... .....	..... ..... ..... .....
3	..... ..... ..... .....	..... ..... ..... .....	..... ..... ..... .....

[6]

Fig. 7

- 3 In recent years new pipelines have been built to carry oil from the oil fields in the eastern lowland rainforest to the coast for export. So much oil is exported that Ecuador is one of only thirteen countries belonging to the Organisation of Petroleum Exporting Countries (OPEC). This organisation tries to control the production and world price of oil.

The government of Ecuador wants to issue more oil exploration rights to international oil companies. Conservationists are worried about the large areas of rainforest that will be damaged by oil exploration and extraction.

- (a) Suggest **two** reasons why the government wants to increase oil production.

.....

.....

.....[2]

After the land is surveyed, drilling rigs have to be moved along roads cut through the rainforest and then boreholes are drilled to find oil. Look at the table below.

	Weight of drilling rig (tonnes)	Size of borehole (cm)	Amount of drilling waste produced (tonnes)	Area of rainforest damaged by drilling (sq m)
Old drilling rig	1000	50 reducing to 21	400	7000
New drilling rig	800	17 reducing to 8	100	5500

[100 trucks are needed to carry 1000 tonnes of drilling rig]

**Fig. 8**

In one part of the rainforest a company has been given permission to drill eight boreholes. The company will use the new drilling rigs.

Look at Fig. 8.

- (b) By using eight new drilling rigs instead of the old ones,

- (i) how many tonnes less drilling waste will be dumped,

.....[1]

- (ii) how many square metres of rainforest will be saved from damage?

.....[1]



(c) Describe and explain **one** other way the new drilling rigs cause less damage to the environment.

.....

.....

.....[2]

- 4 Student A visited the area shown in Fig.9 and reported, 'I walked around a pool of leaking oil and placed a frame of 1 m x 1 m on the ground in positions 1, 2, 3 and 4. I counted the number of plants in each frame. I completed my table.'

Frame position	Number of plants
1	27
2	25
3	28
4	48

'I found out that there are fewer plants near the leaking oil pipeline.'

Student B thought these fieldwork results were not clear evidence of the effect of leaking oil.

- (a) Suggest **two** weaknesses in the planning of student A's fieldwork.

First weakness .....

.....

Second weakness .....

.....[2]

- (b) Suggest which,

- (i) other biological measurements could have been made,

.....

.....

.....

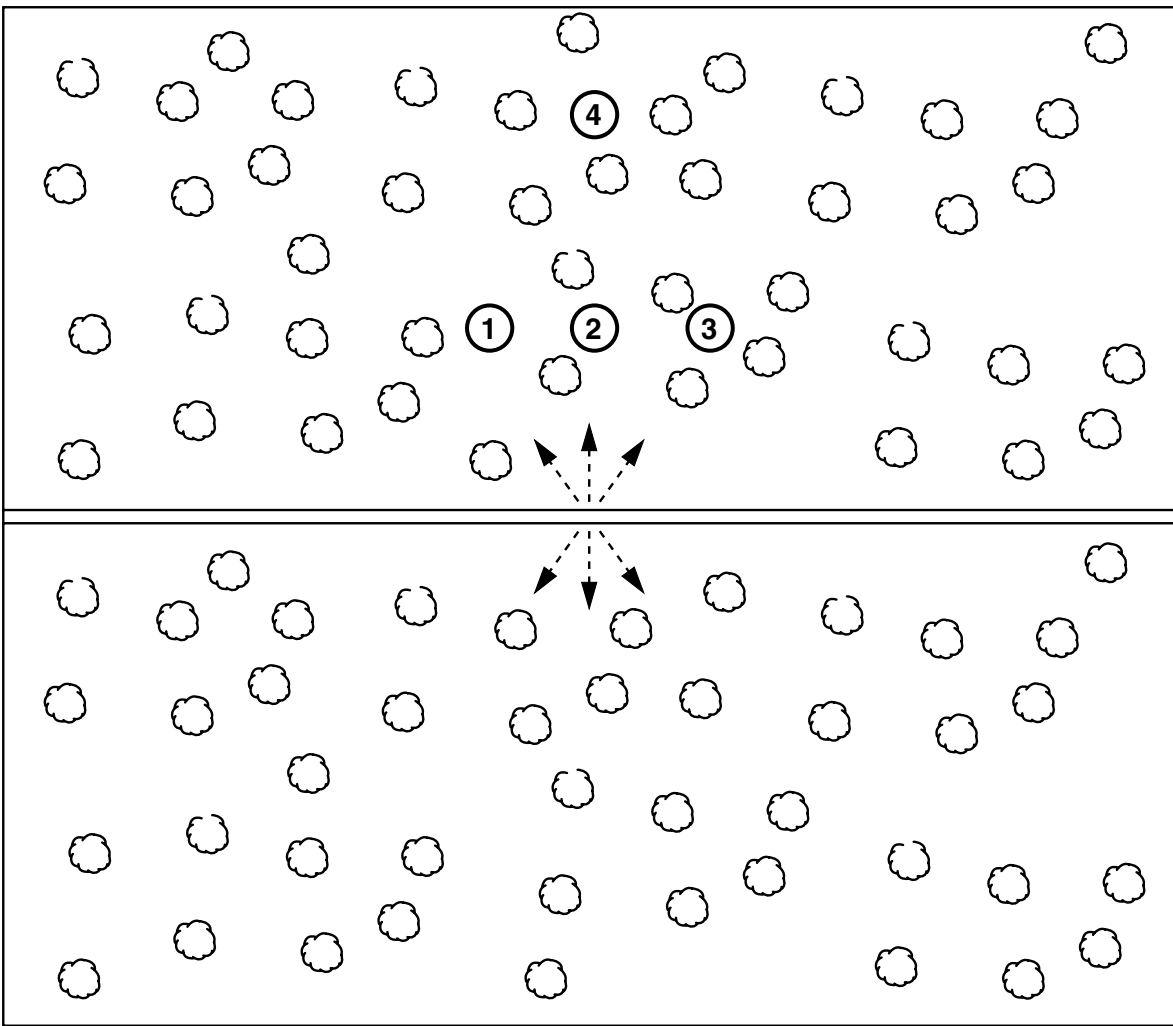
- (ii) environmental measurements could have been made.

.....

.....

.....

[4]



key

----- oil leak on surface

① sample site

☁ trees

==== oil pipeline

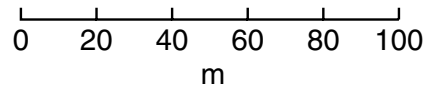
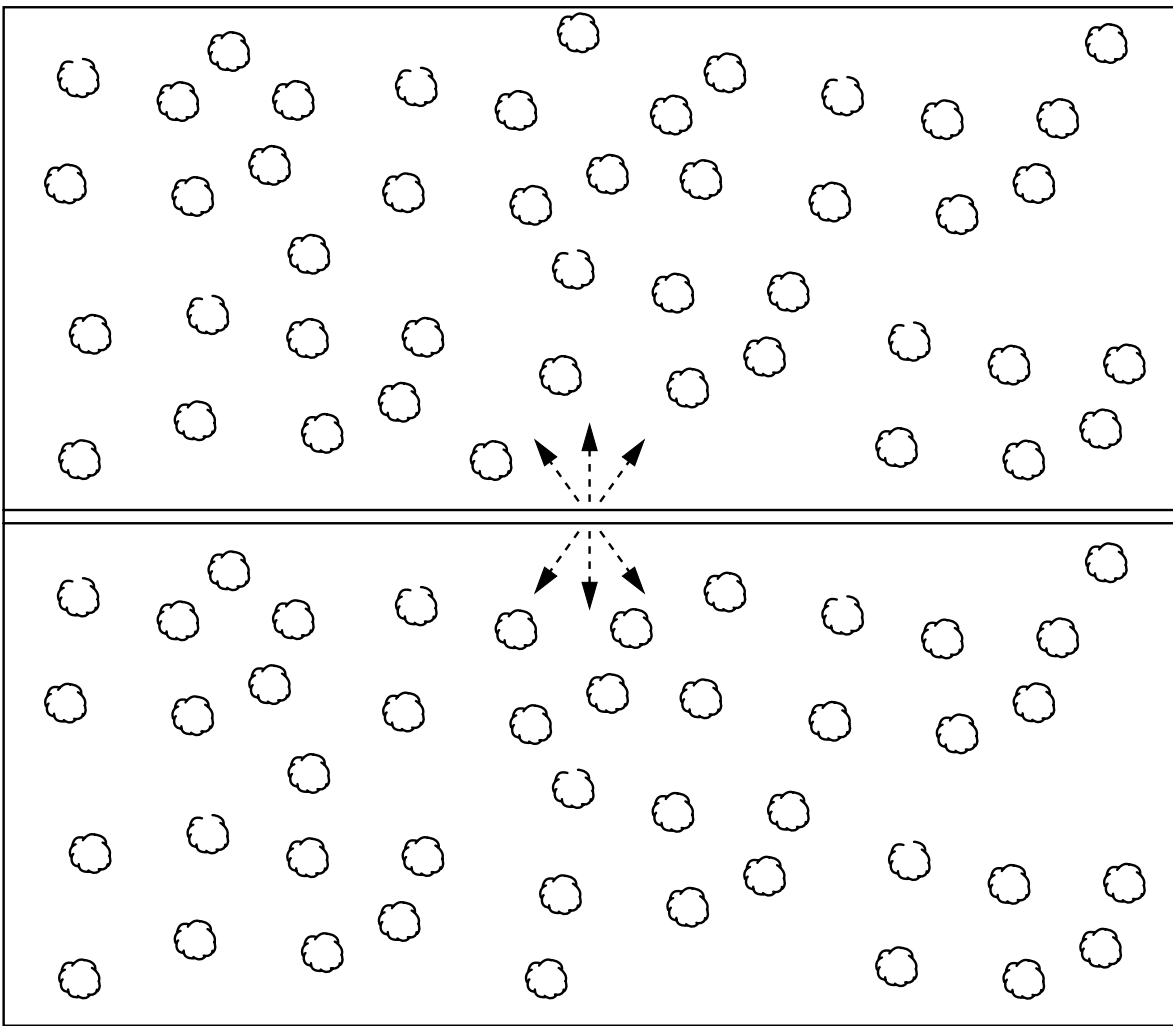



Fig. 9





key

----- oil leak on surface

 trees

==== oil pipeline

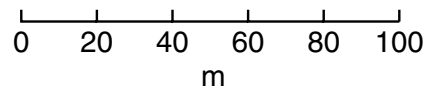


Fig. 11



A biotechnology company has started making a genetic map of banana varieties on farms. This will be ready in 2006. The company claims this will help banana exporting countries by making it possible for new varieties of bananas to be genetically engineered.

**(b) (i)** Explain why some farmers think growing new varieties will help them earn a living farming bananas.

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

**(ii)** Why do other farmers think their way of life will be destroyed and lead to unsustainable banana farming?

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

