



Centre Number	Candidate Number	Name
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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

May/June 2005

**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 in the spaces provided at the top of this page.  
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.

**For Examiner's Use**

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.



Fig. 1 World map

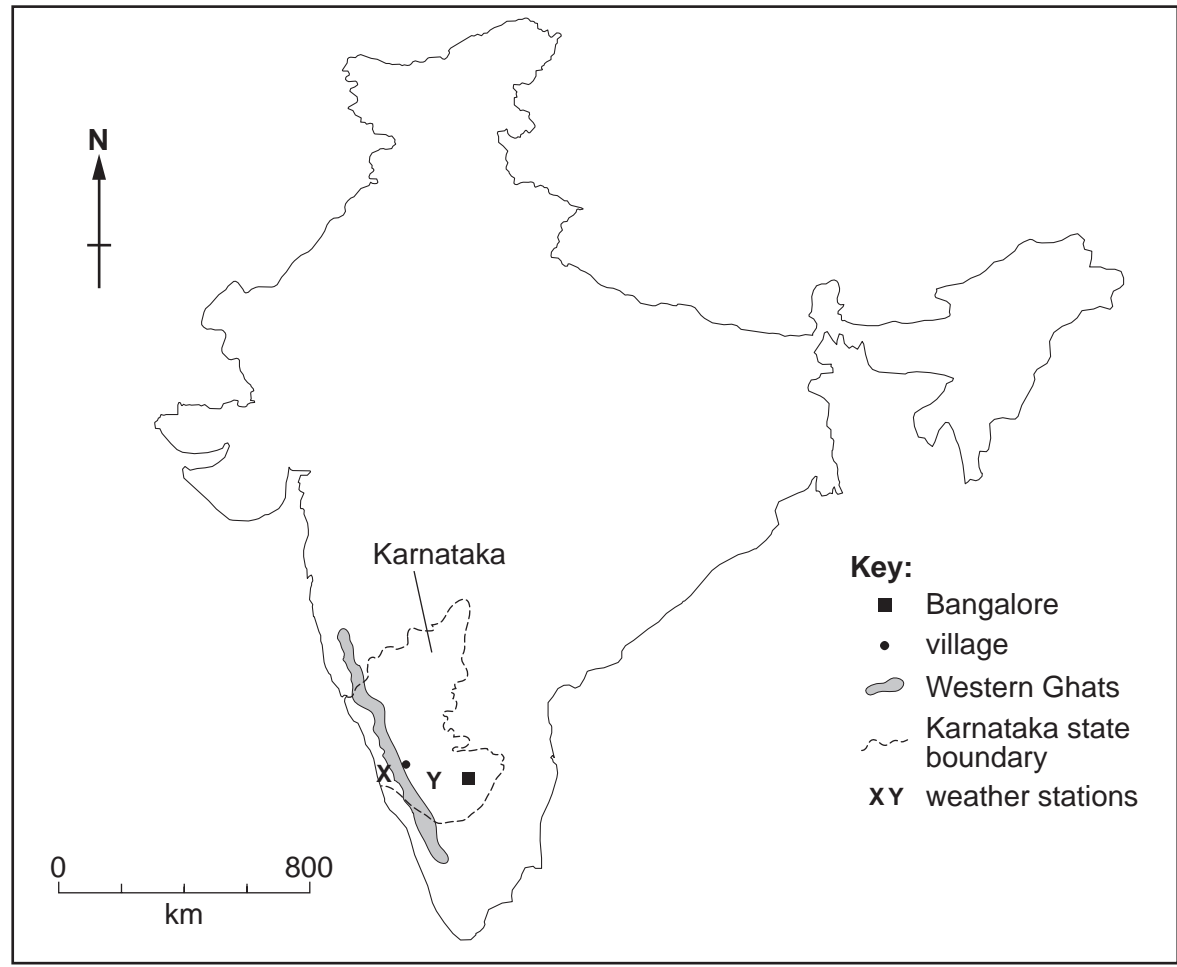


Fig. 2 Map of India

India is the seventh largest country in the world. It is divided into 28 states. The population is employed in traditional village farming, modern industries and support services. The economy has been growing by 6% per year in recent years and poverty has been reduced by 10%

- Area: 3287500 sq km
- Climate: mainly tropical monsoon
- Population: 1 050700000
- Population growth rate: 1.47% per year
- Children born per woman: 2.9
- Languages: Hindi, 14 other official languages, English
- Currency: Rupee 48 rupees = 1 US dollar
- Exports: textiles, gems/jewellery, chemicals, leather goods
- Imports: chemicals, fertilisers
- Agricultural products: rice, wheat, cotton, tea, sugarcane, potatoes, cattle, water buffalo, sheep, goats, poultry

1 (a) The climate data for the state of Karnataka, collected at weather stations X and Y, are shown in Fig. 3.

Coastal station X	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
temperature (°C)	28	28	30	32	33	32	29	29	29	32	32	31
rainfall (mm)	3	4	3	0	18	486	617	340	264	24	13	3

Inland station Y	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
temperature (°C)	29	32	36	38	40	35	31	31	31	31	29	28
rainfall (mm)	9	10	13	31	28	112	152	135	165	64	29	8

Fig. 3

(i) Which month was hottest at the coast?

.....[1]

(ii) Complete the table

	Coastal station X	Inland station Y
Driest month		
Wettest month		

[2]

(iii) In which month is the wet season expected to start in the state of Karnataka?

.....[1]

(b) Suggest why the Karnataka weather forecasting service is very important to

(i) farmers,

.....

(ii) people living in the city of Bangalore.

.....[2]

(c) Small areas of unused land in Bangalore do not remain empty for long. Homeless families start living in these areas; their temporary shelters create a slum.

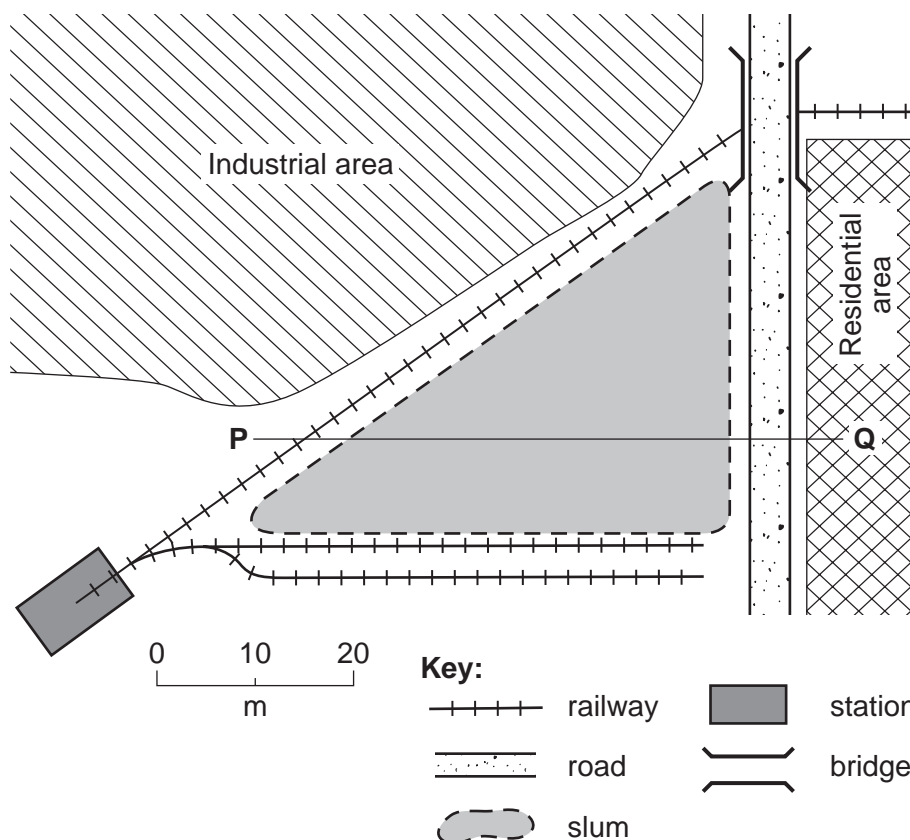


Fig. 4

This slum began when ten homeless families started to live on waste ground. They used poles, plastic and cloth to make shelters. These varied in size but an average shelter was 2m x 3m.

(i) Draw on the diagram where you think the first ten families built their shelters. [2]

Then another hundred and fifty families quickly settled on the waste ground so authorities were forced to build a large concrete container for waste. This was emptied after it had been full for several weeks.

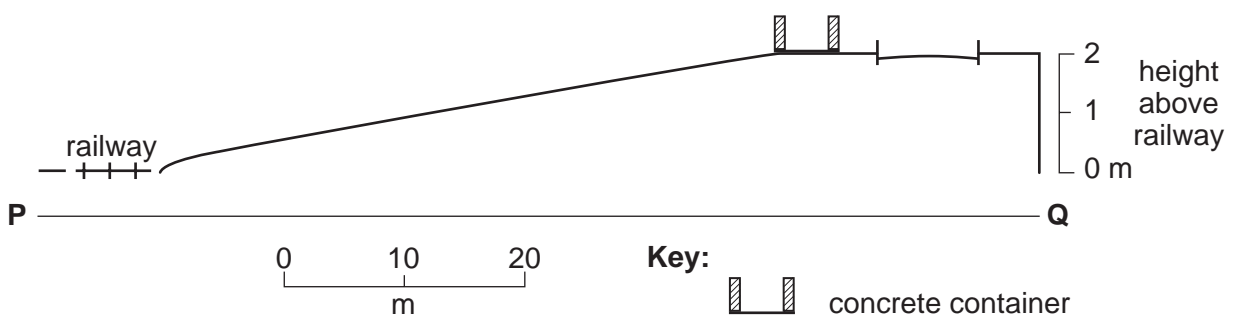


Fig. 5

(ii) Why did the city authorities build the concrete container near the road, instead of in the middle of the settlement?

.....[1]

(iii) Explain why more people in this settlement become ill in the wet season than any other time.

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

(d) A newspaper in Bangalore reported

### 'Filthy air leaves Bangalore children breathless'

In 2000 one in every two children suffered from breathing problems such as coughing and shortage of breath. In 1980 only 9% of children suffered these problems. Slum dwellers use plastic, oily rags and coal dust as fuel for cooking. About 70% of children from slums have breathing problems, especially girls.

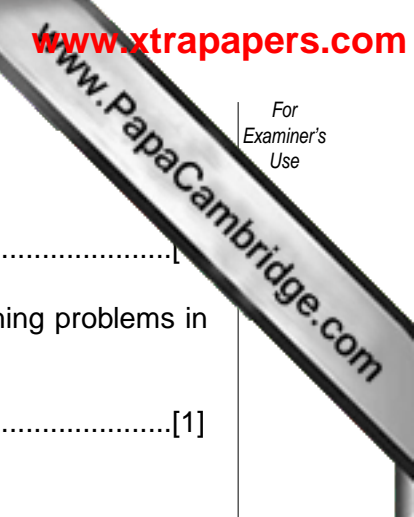
(i) Name **two** gases that could cause breathing problems. State the source of each gas.

Named gas .....

Source .....

Named gas .....

Source .....[4]



(ii) Suggest why girls suffer more breathing problems than boys.

.....[1]

(iii) Suggest **one** way the civic authorities could help to reduce breathing problems in Bangalore.

.....[1]

(e) A newspaper in Bangalore reported

### **‘Hundreds of slum dwellers rehoused’**

The slum settlement situated near a railway station was moved to new buildings in the city. The Karnataka Slum Clearance Board has built 319 houses and provided solar street lighting and borewells for water supply.

The slum settlement was fifteen years old and had suffered two major fires. The slum dwellers had asked the city authorities to give them a new place to live.

(i) Explain why the slum had a high risk of catching fire.

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

(ii) Suggest **two** services, other than street lights and borewells, the slum dwellers would have asked the city authorities to provide.

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

(iii) Explain why slum dwellers have more disease problems than people living in better housing conditions.

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

2 (a) A local newspaper also had a report about farming activities around Bangalore.

## ‘Farmers have problems with trial of new cotton plants’

Forty four farmers grew genetically modified (GM) cotton. More than half found that the GM cotton

- was attacked by bollworm (boll weevil)
- was expensive – pesticides had to be used
- needed spraying with pesticide less often than ordinary cotton
- needed more fertilisers than ordinary cotton
- had a dull colour so it was worth less
- took longer to pick so labour costs were higher
- seeds cost more than ordinary cotton seeds

Some farmers are asking for compensation for their losses.

(i) Why do farmers want to grow cotton?

.....[1]

(ii) Which of the farmers’ findings suggests GM cotton might be good for environmental management?

.....[1]

(iii) If you were a cotton farmer in Karnataka what would you want to know about a new cotton plant?

Suggest **three** features. Explain your answers.

Feature one .....

Explanation.....

.....

Feature two .....

Explanation.....

.....

Feature three .....

Explanation.....

.....[4]

(b) Some students wanted to find out how well a bollworm pesticide worked. They marked out two sections of the same field as shown in the diagram.

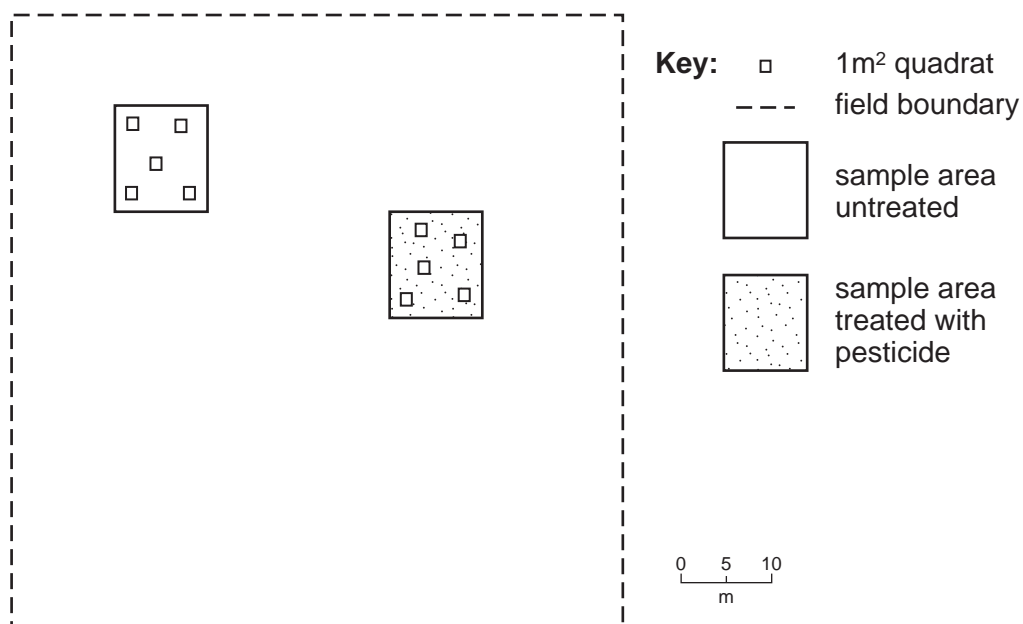


Fig. 6

(i) Suggest **two** reasons why the students used two sections of the same field.

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

(ii) Describe a method the students could have used to locate the positions of the quadrats.

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

(c) All the cotton bolls in each quadrat were removed and the number of bolls with worm infestation were recorded.

(i) Describe how the students could carry out this work safely.

.....[1]



The results of the student's work are shown below.

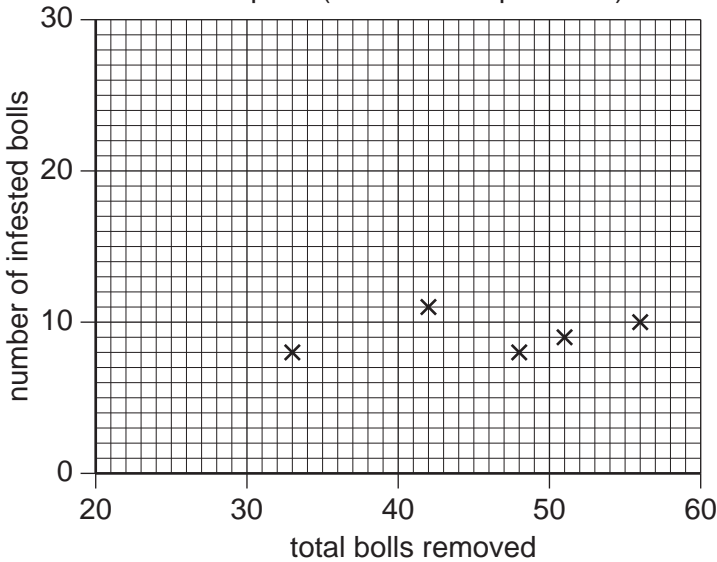
Quadrat	Treated with pesticide		Untreated	
	Bolls removed	Bolls infested	Bolls removed	Bolls infested
1	56	10	60	25
2	48	8	55	22
3	51	9	58	18
4	42	11	61	28
5	33	8	46	19
Total			280	112

Fig. 7

- (ii) Complete the table. [1]
- (iii) The untreated section had 40% infestation. Calculate the % infestation for the section treated with pesticide.

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

Graph A (Treated with pesticide)



Graph B (Untreated)

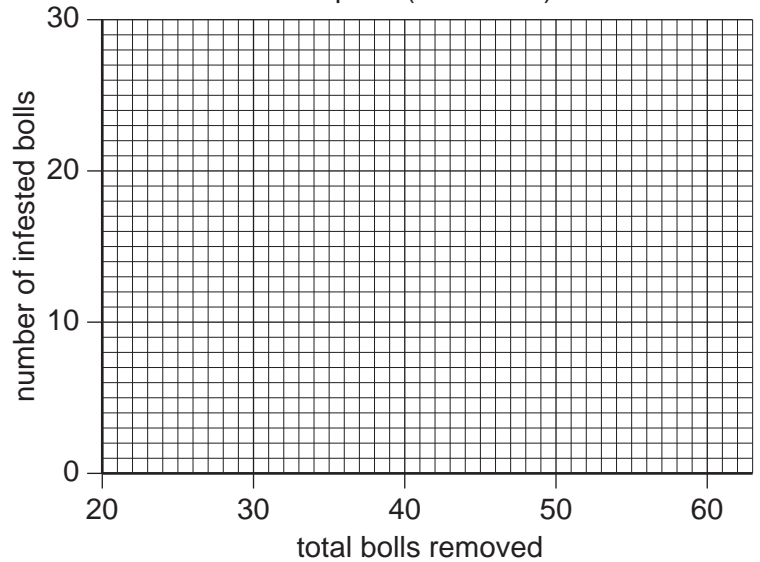


Fig. 8

- (iv) Plot the data for the untreated section on graph B. [2]
- (v) Describe **one** pattern shown by graph B.

.....[1]

(d) The students only had information from one growing season. They decided to interview farmers using a questionnaire to find out more about growing cotton.

Complete the questionnaire by writing three more questions.

**Questionnaire of Farmers Growing Cotton**

1 How many years have you been growing cotton?

1 year     2 – 4 years     5 – 10 years     more than 10 years

2 What area of land do you plant with cotton?

Less than 0.25 hectare     0.26 – 0.5 hectare   
0.51 – 1.0 hectare     more than 1 hectare

3 .....  
.....  
.....

4 .....  
.....  
.....

5 .....  
.....  
.....

[4]

3 A village 200km to the west of Bangalore in the Western Ghats uplands has three types of land use around it. The fields are used for crops and animal grazing. One area is now part of a Joint Forestry Management (JFM) programme and a small area of rainforest remains with several endemic endangered species present, including plants of medicinal value and the lion-tailed macaque.

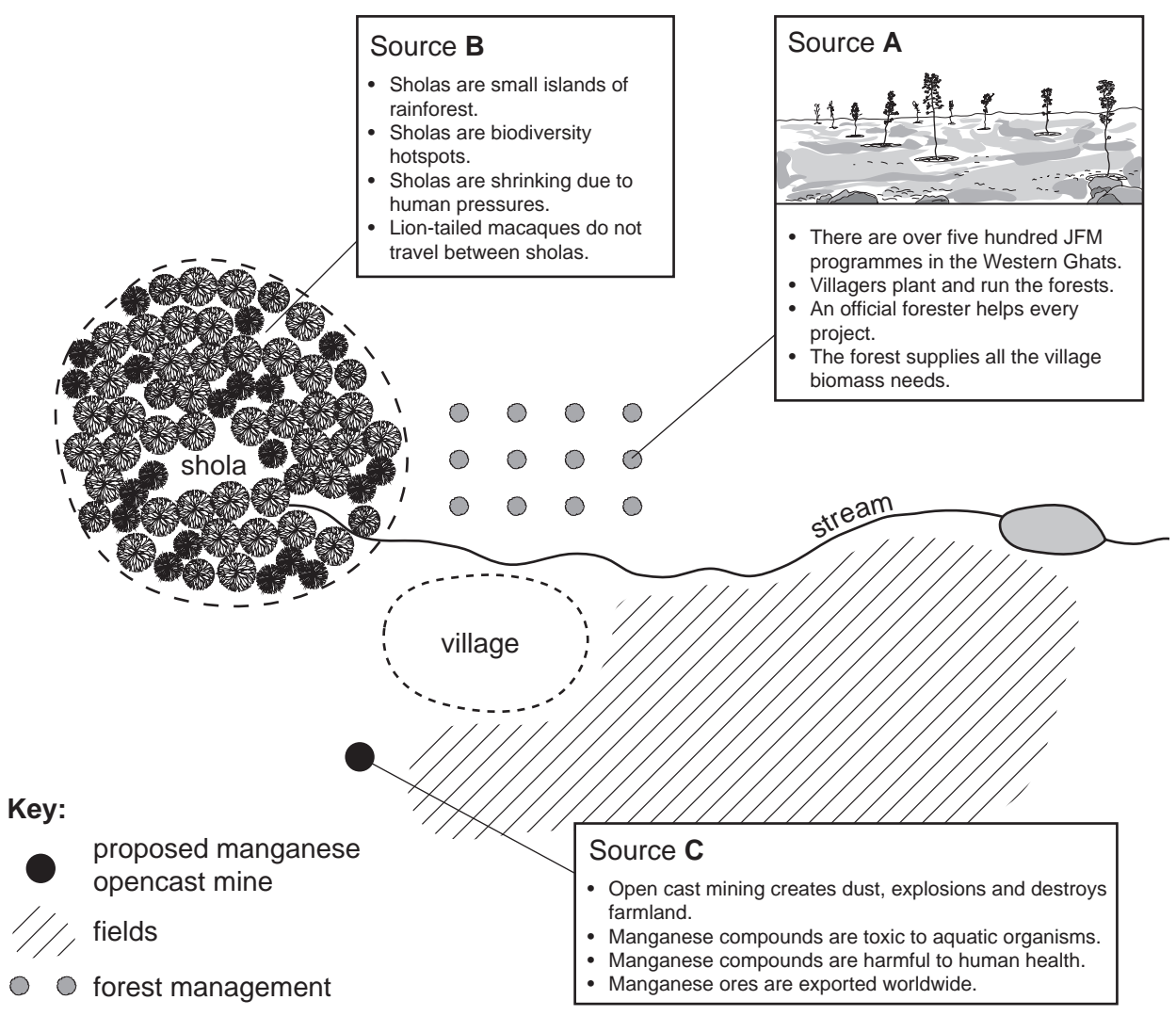


Fig. 9

(a) (i) Using your knowledge and information in Source A (Fig. 9) suggest **three** reasons why the villagers take part in the forest management.

.....

.....

.....

.....

.....

.....

.....[3]

(ii) In the past the shola has not been used by the village but recently some have started exploring the shola to see if it would be possible to earn some income. Suggest **one** forest product, other than wood, which might earn them money. Explain why collecting this product might not be a sustainable activity.

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

(b) The lion-tailed macaque is unique to India and is so rare that it is on the red list of endangered species published by the World Conservation Union (IUCN).

Some villagers think they should not worry about macaques because they are of no value. Other villagers think it will help the village in the future if they try to conserve macaques. Suggest reasons why people in the village have different points of view.

(i) Macaques are of no value to the village because

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

(ii) Macaques are of value to the village because

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

(c) Using information from source C (Fig. 9) suggest and explain **two** reasons why the site of the proposed manganese mine will damage

(i) living conditions in the village,

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

(ii) the natural environment.

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





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