

Candidate Name \_\_\_\_\_

Centre Number	Candidate Number

**International General Certificate of Secondary Education  
CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**NATURAL ECONOMY**

PAPER 4 Alternative to Coursework

**0670/4**

**OCTOBER/NOVEMBER SESSION 2002**

1 hour 45 minutes

Candidates answer on the question paper.  
No additional materials are required.

**TIME** 1 hour 45 minutes

**INSTRUCTIONS TO CANDIDATES**

Write your name, Centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Study the appropriate Source Materials before you start to write your answers.

Write your answers in the spaces provided on the question paper.

**INFORMATION FOR CANDIDATES**

The number of marks is given in brackets [ ] at the end of each question or part question.

Credit will be given for appropriate selection and use of source 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.

<b>FOR EXAMINER'S USE</b>

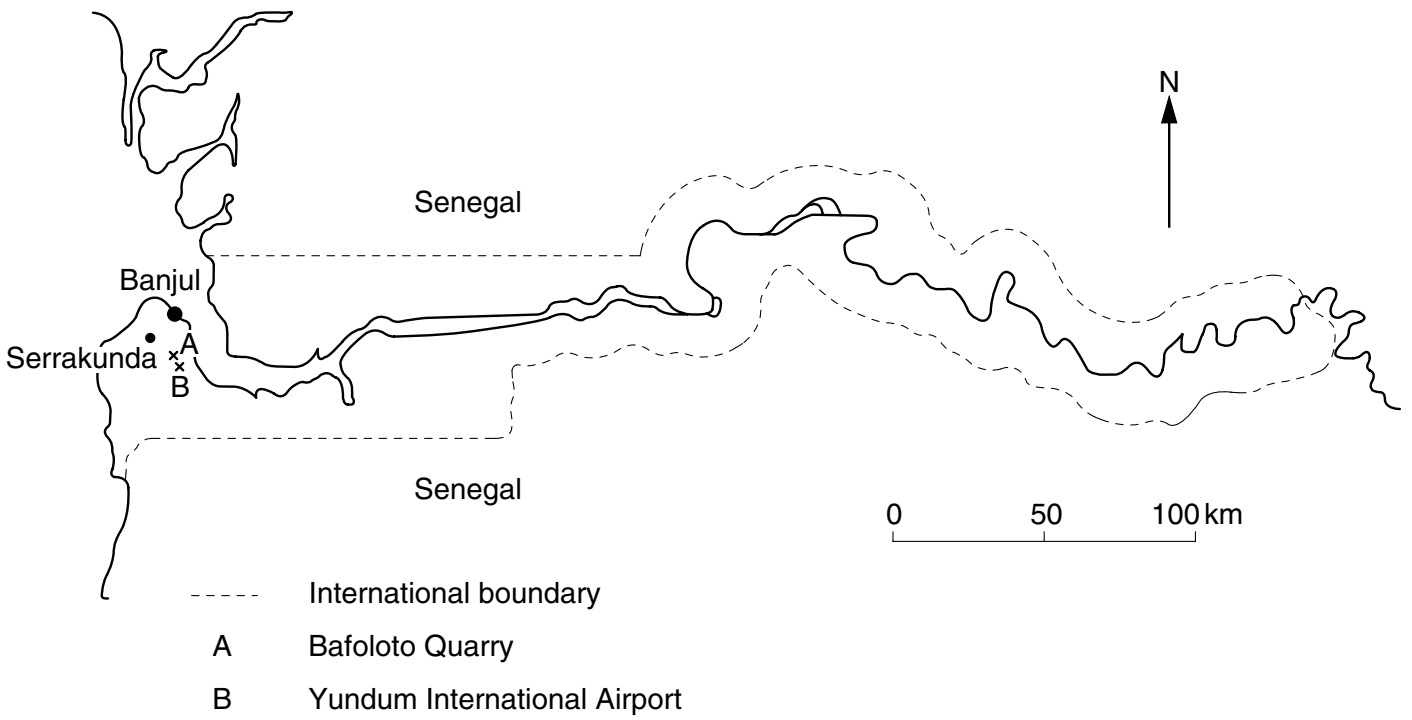
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**This question paper consists of 15 printed pages and 1 blank page.**





**Fig. 1 The location of The Gambia**



**Fig. 2 Map of The Gambia**

- 1 The Gambia is the smallest country in Africa. It is 48 km wide at the coast, narrowing to only 24 km inland. The River Gambia flows from the eastern tip to the coast. It is surrounded by the much larger country of Senegal. 80% of the population of The Gambia are farmers.

Area: 11 292 km<sup>2</sup>

Population: 1.2 million

Currency: Dalasi. 10 Dalasi = 1 US Dollar

Languages: English, African languages

Climate: tropical, wet and dry season, dry season November – May

Main exports: groundnuts, fish, hides and skins

Annual average income per person: 800 US Dollars per year

Population growth rate: 3.5% per year

An average of six children are born to each woman

- (a) (i) Approximately how long is the country of The Gambia from west to east?

.....[1]

- (ii) When is the rainy season?

.....[1]

- (b) Groundnuts are grown by village farmers throughout the country as a cash crop. When prices are higher in The Gambia than Senegal, groundnuts are smuggled across the border.

- (i) Suggest why farmers need to grow cash crops.

.....

.....

.....[2]

- (ii) Suggest why smuggling between Senegal and The Gambia is very difficult to stop.

.....

.....

.....[2]

2 There is a rapid increase in the population of Serrakunda and basic building materials, such as sand and gravel, are in demand. For 500 Dalasi anyone can buy a licence from the government to dig sand and gravel. The licence allows people to dig anywhere within the Bafoloto quarry.

At least 350 people work in the quarry during the dry season. The average earnings per person in one dry season is 8000 Dalasi. Many women dig in the quarry, but they usually have to work for more hours than a man in order to earn the same amount of money.

In the wet season very little quarrying takes place. Most people return to their villages and farms.

(a) Look at the quarry profile (Fig. 3). What type of material can be extracted between

(i) 0 – 1 m, .....[1]

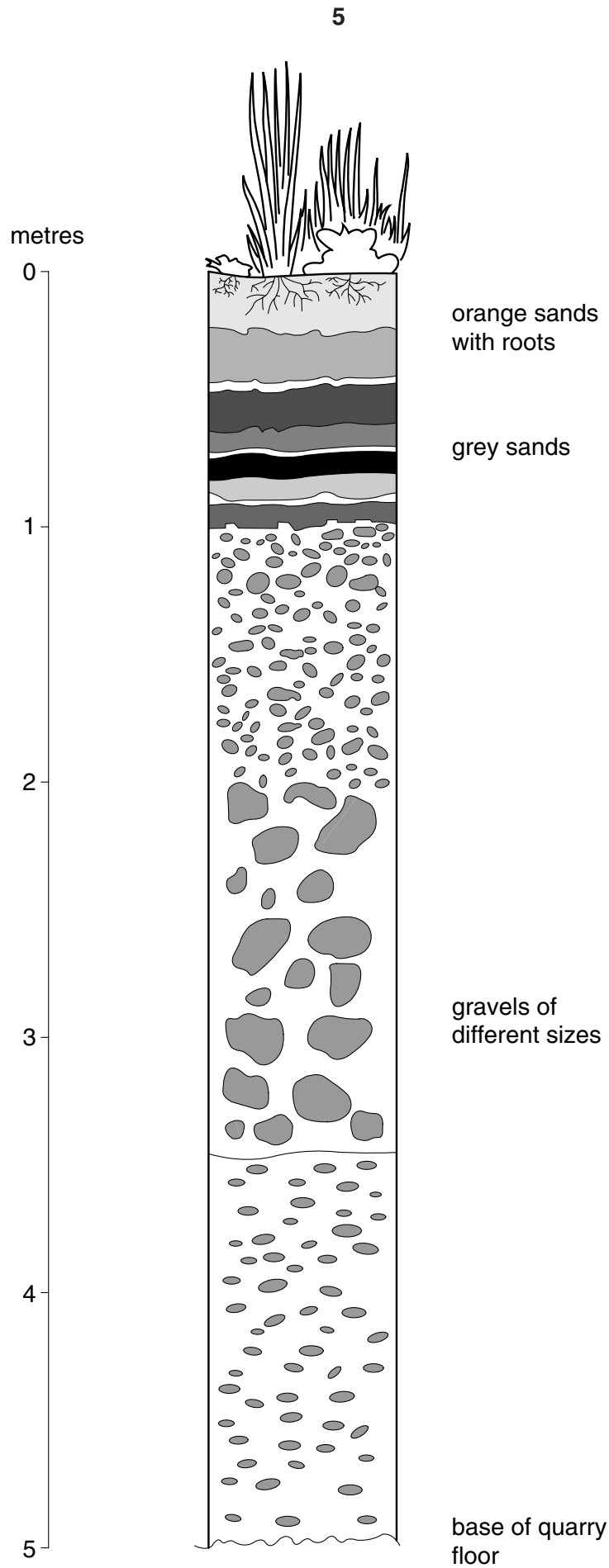
(ii) 2 – 3 m? .....[1]

(b) Suggest **three** problems which could occur because the licence allows people to dig anywhere in the quarry.

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

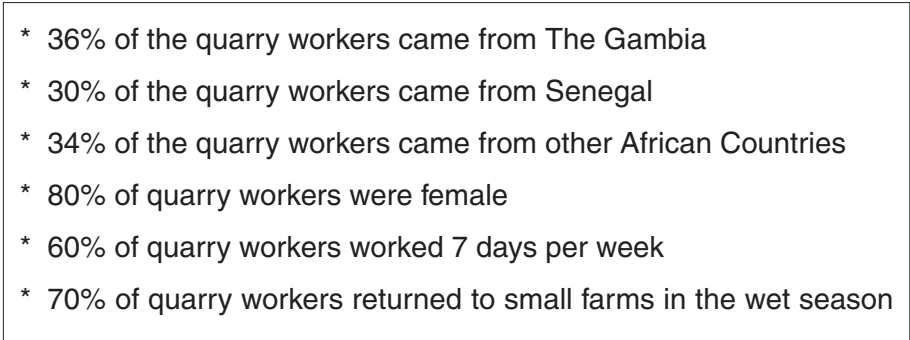
(c) It takes about 20 days to earn 1000 Dalasi by quarrying. How many days of work are needed to earn the cost of a licence?

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



**Fig. 3**

3 Five students surveyed some of the 350 quarry workers to find out about the workers by using a questionnaire. The results of the questionnaire are given in Fig. 4.



**Fig. 4**

(a) Suggest how many quarry workers should be questioned by the students to give a fair, representative sample.

.....[1]

(b) Write out the questions which the five students used to obtain the results in Fig. 4.

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

(c) Present **two** more questions you think would have helped the students find out more about the quarry workers.

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

- (d) The government is encouraging tourism in the coastal zone to earn foreign exchange. Suggest why this has caused a rapid increase in the population of the town of Serrakunda.

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

4

Month	Average Minimum Temp °C	Average Maximum Temp °C	Average Rainfall mm	Level of discomfort from heat and humidity
JANUARY	15	31	3	MEDIUM
FEBRUARY	16	32	3	MEDIUM
MARCH	17	34	0	MEDIUM
APRIL	18	33	0	MEDIUM
MAY	19	32	10	HIGH
JUNE	23	32	58	HIGH
JULY	23	30	270	HIGH
AUGUST	23	29	500	HIGH
SEPTEMBER	23	31	296	HIGH
OCTOBER	22	32	89	HIGH
NOVEMBER	18	32	18	MEDIUM
DECEMBER	16	31	3	MEDIUM

**Fig. 5 Climate in The Gambia**

- (a) In which month is the average minimum temperature

(i) lowest, ..... [1]

(ii) highest? ..... [1]

- (b) (i) Calculate the average rainfall total for one year.

.....[1]

- (ii) August is the month with the highest average rainfall, 500 mm. Calculate, showing your working, August rainfall as a percentage (%) of average annual rainfall.

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

- (c) During which months are tourists most likely to visit?

.....[1]

5 Tourists want to see the wild life, particularly some of the 270 species of exotic birds as well as 3 species of colobus monkeys. The Abuko Nature Reserve is small, only 105 hectares, but has a wide range of habitats from tropical rainforest to savanna. The reserve is open every day. A part of the reserve has an education centre which has hyena, bushbuck and a lion.

A Gambian newspaper reported, 'A new young male lion has arrived from Holland to replace the old lion that died a few months ago in Abuko Nature Reserve.'

In the past, The Gambia used to be rich in biodiversity; however, factors such as the increase in human population had led to some of the larger wild animals, such as the lion, becoming extinct. Large numbers of tourists visit the reserve as it is the only place to see a lion in The Gambia.

(a) Apart from the increase in human population, suggest **two** reasons why wild animals have become extinct.

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

(b) What are the advantages of keeping a lion in the reserve? Explain your answer.

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

(c) The Department of Parks and Wildlife wants to allow visitors to the reserve whilst sustaining biodiversity.

Suggest and outline **two** ways of controlling visitors in the reserve.

First control .....

Second control .....



- 6 The scientists working in the area observed that millet plants grow to different heights around some trees.

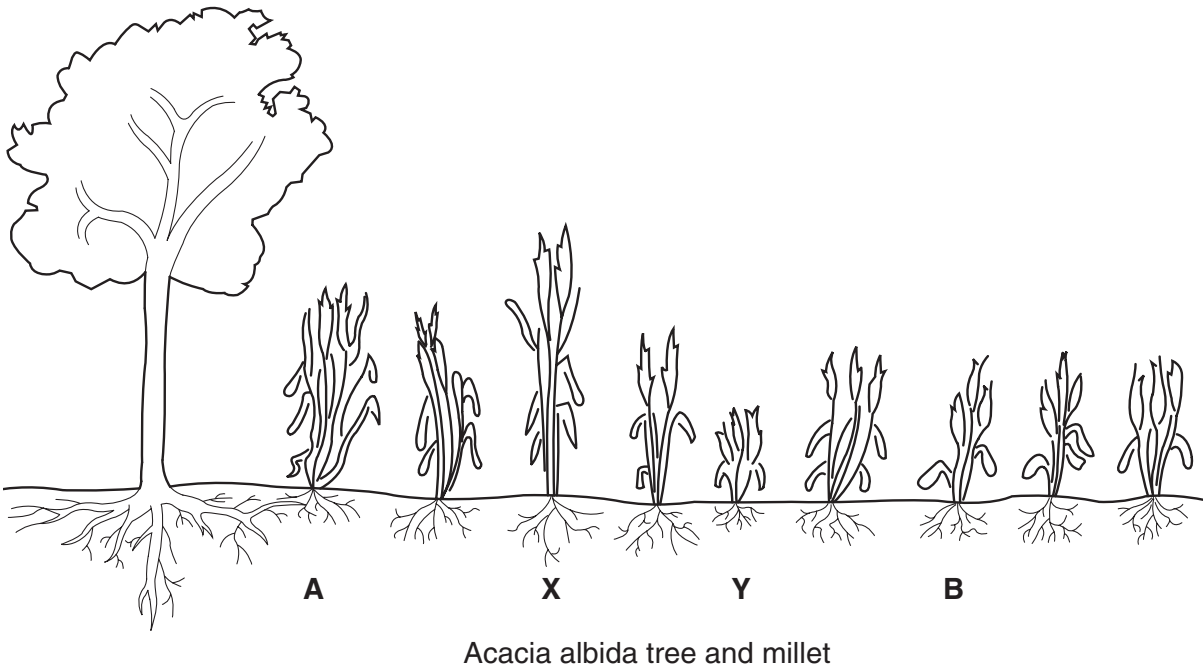


Fig. 6

- (a) (i) Draw a straight line between the top of plant A and plant B in Fig. 6. [1]

- (ii) Describe the trend shown by the line you have drawn between A and B.

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

- (b) Suggest why plants X and Y do not fit the trend.

Plant X .....

.....

Plant Y .....

.....[2]

The scientists found that the *Acacia albida* tree is a leguminous plant which is able to add nitrogen to the soil.

Scientists have measured the yield of millet grown in a field with *Acacia albida* trees and a similar field without trees.

They found the following:

Field	Yield of millet kg per ha	Protein content kg per ha
Millet only	600	52
Millet with 60 <i>Acacia albida</i> trees	1700	179

**Fig. 7**

(c) Suggest **three** factors which the scientists kept the same to make a fair comparison of millet yields.

.....

.....

.....

.....[3]

Three students visited one field with *Acacia albida* trees and millet. Each student produced a different plan to investigate the growth of millet plants (Fig. 8, opposite).

(d) (i) Which plan is not likely to give reliable data? Give **one** reason for your choice.

Plan .....

Reason .....

.....[2]

(ii) Which plan is likely to give the most reliable data? Give **three** reasons for your choice.

Plan .....

Reasons .....

.....

.....

.....

.....[4]

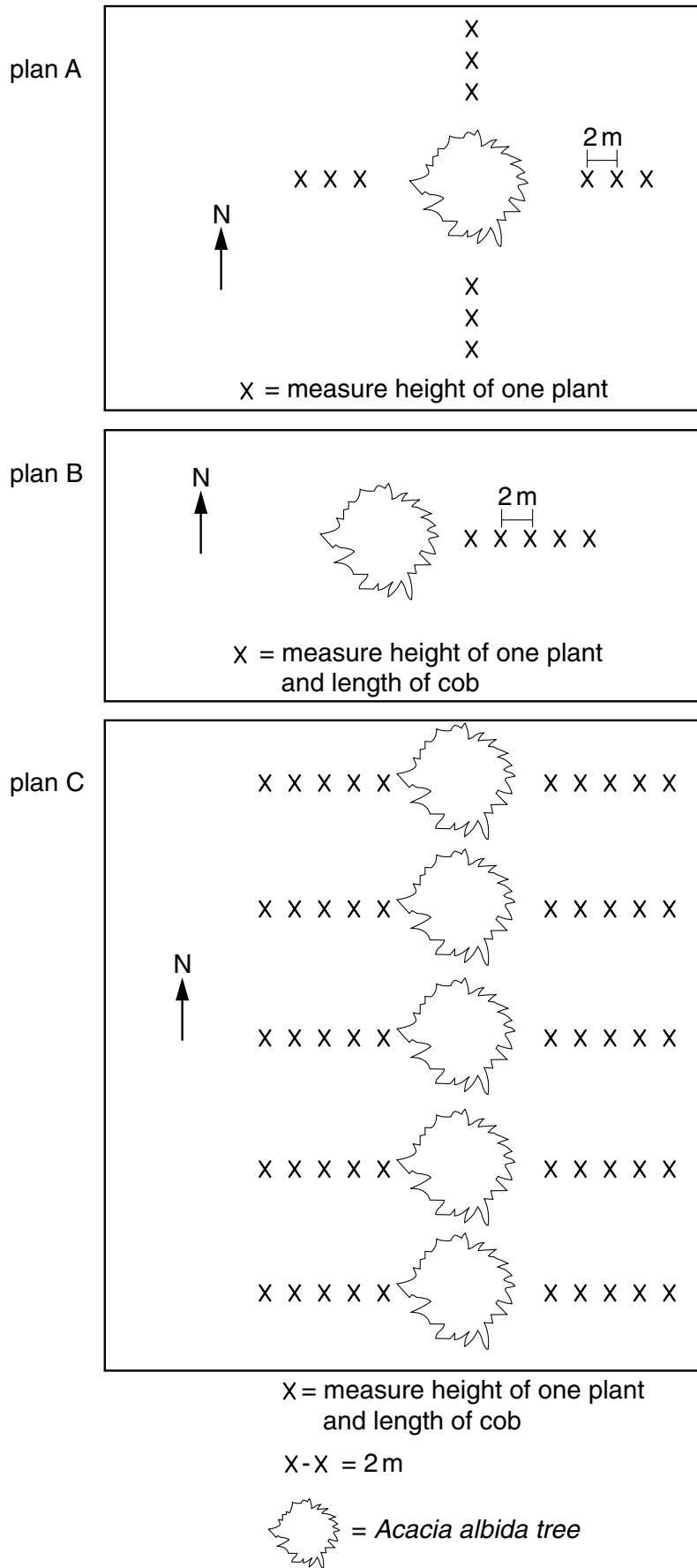


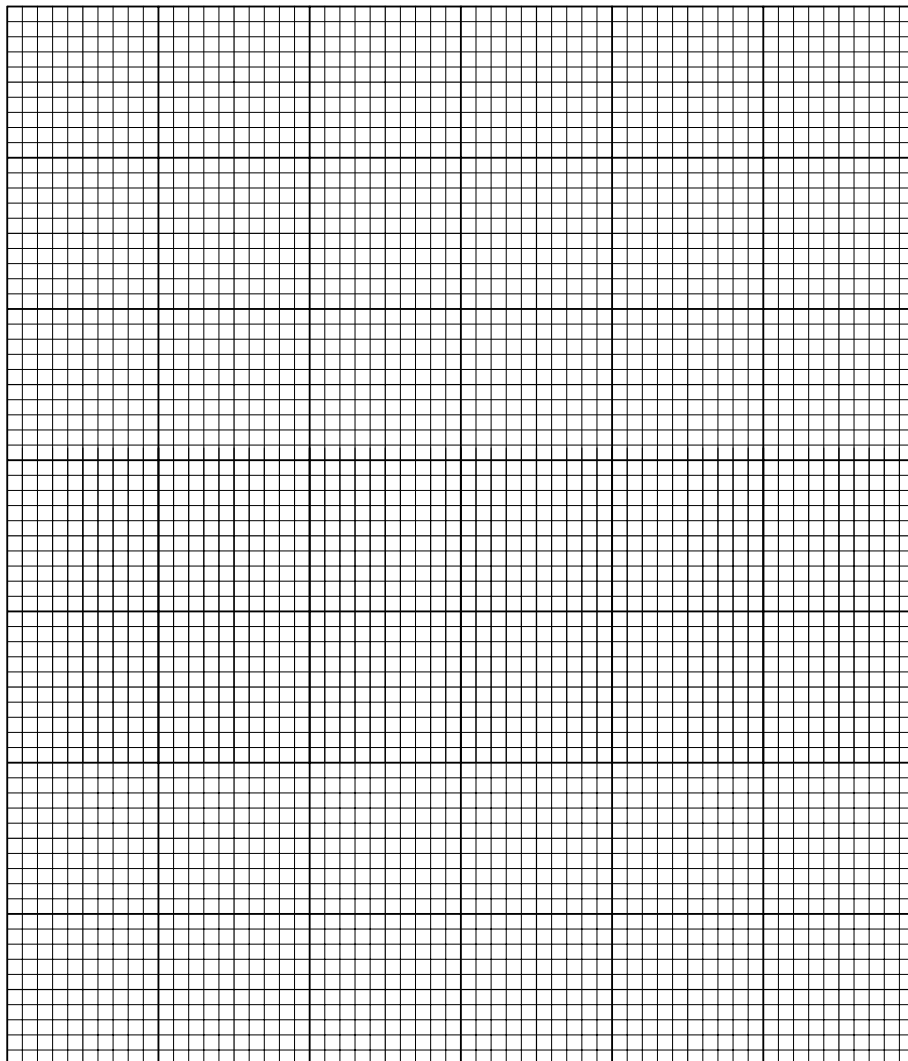
Fig. 8

The data shown below was recorded by another scientist.

Distance from <i>Acacia albida</i> trees /m	Average height of three millet plants /cm
1	95
3	89
5	82
7	60
9	58
11	60
13	58
15	58
17	60

(e) (i) Plot a suitable graph of the data.

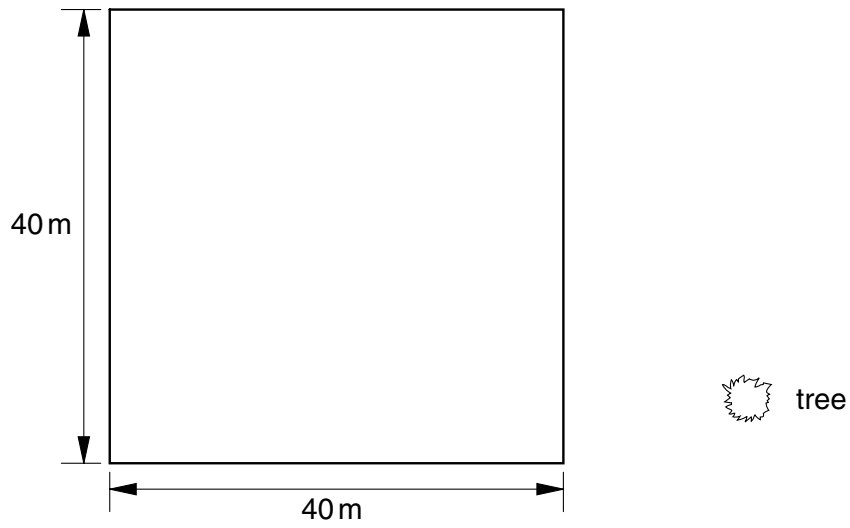
[4]



(ii) State, from the graph, at what distance does the *Acacia albida* tree stop having any effect on millet height.

.....[1]

- (f) In the box below draw a plan of a small field which is going to have nine *Acacia albida* trees planted so as to give the maximum yield of millet. [1]



7 The diagram below shows a small farming village in The Gambia, where crop rotation is used.

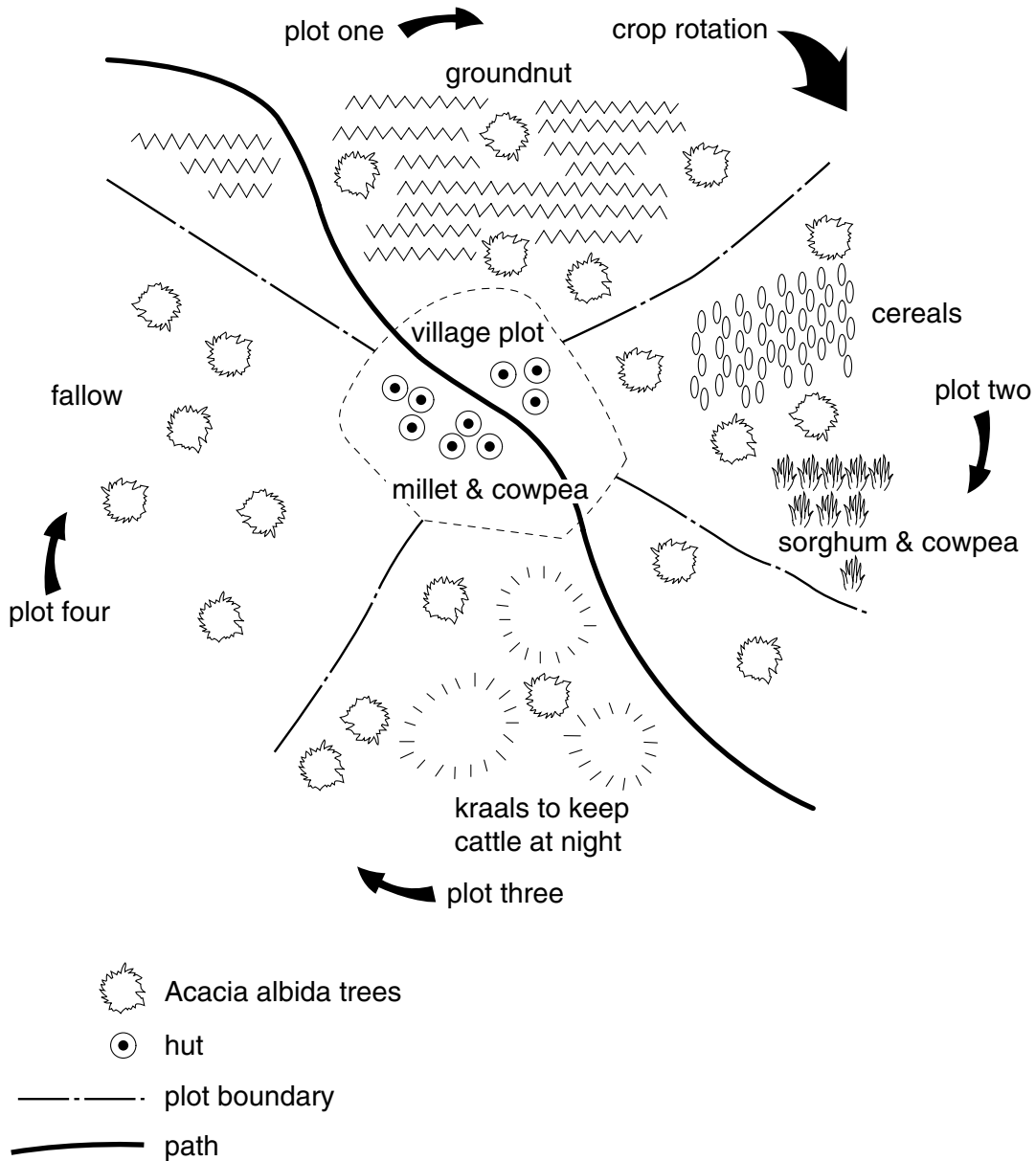


Fig. 9

**Features of the *Acacia albida* tree**

- \* Leaves appear in the dry season and they fall in the wet season.
- \* Gives shade in the dry season.
- \* Leaves and pods give animal food in the dry season.
- \* Leaves fall on the soil and release nutrients.
- \* Deep roots allow water uptake in the dry season.

The groundnut plants are fast growing. They take many nutrients from the soil. Recently the world demand for cashew nuts has increased and a farmer is paid the same amount of Dalasi for 1 kg of cashew nuts as for 4 kg of groundnuts.

Cashew nut trees are slow growing and need some care to produce fruits containing nuts.

The villagers discussed ways of increasing their income. Four proposals were suggested.

Proposal One: Stop rotating crops and grow more groundnuts for export.

Proposal Two: Remove all the Acacia trees in plots two and four and replant with cashew nut trees. Keep rotating crops.

Proposal Three: Keep rotating crops and plant some cashew trees, only in the village plot.

Proposal Four: Keep rotating crops and plant an equal number of cashew nut trees in every plot.

**(a)** Select **two** proposals that you think the village could benefit from. Explain your reasons.

Proposal: .....  
.....  
.....

Proposal: .....  
.....  
.....[4]

**(b)** Select **two** proposals which you think the village should **not** carry out. Explain your reasons.

Proposal: .....  
.....  
.....

Proposal: .....  
.....  
.....[4]

