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3850522957

ENVIRONMENTAL MANAGEMENT **0680/22**

Paper 2 Management in Context **February/March 2020**

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

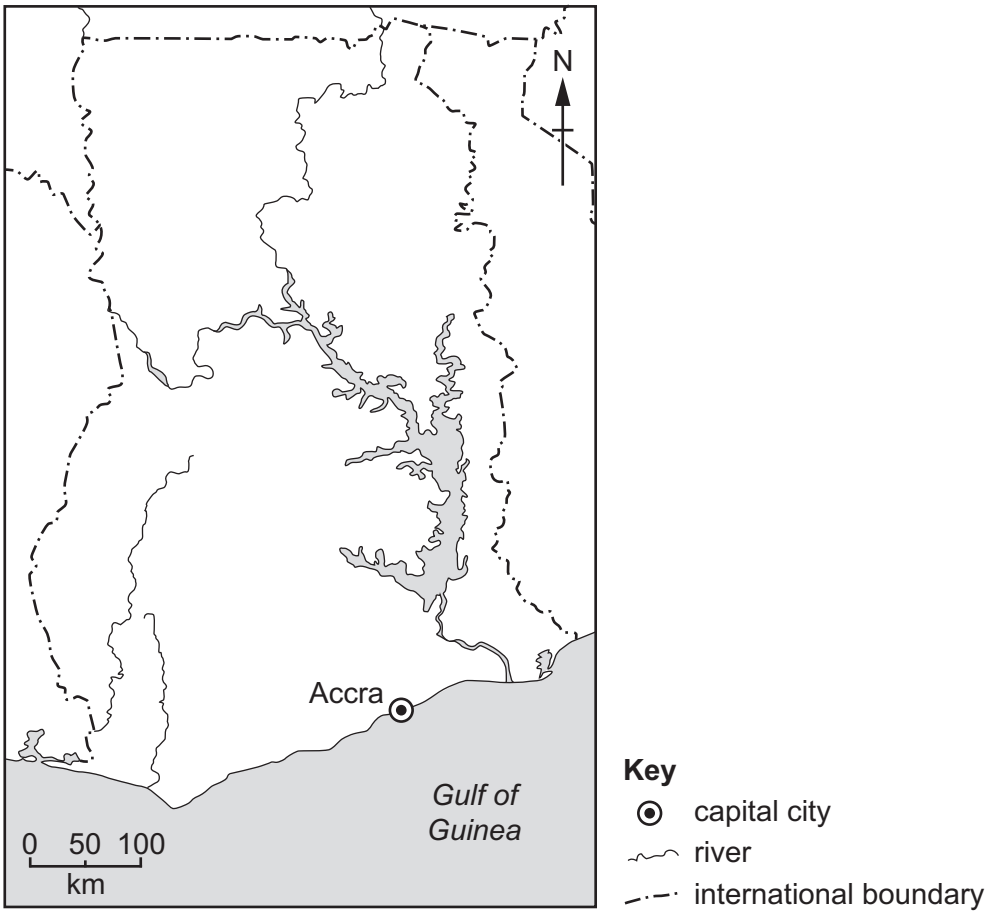
This document has **20** pages. Blank pages are indicated.

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world map showing the location of Ghana



map of Ghana



Area of Ghana: 238 533 km^2

Population of Ghana: 27.5 million (in 2018)

Children per woman: 4.0

Life expectancy: 67 years

Currency: 4.4 GHC = 1 USD

Languages: Asante, local languages, official language English

Climate of Ghana: tropical, dry in the North

Terrain of Ghana: low rolling plains

Main economic activities: agricultural production, oil and natural gas extraction, gold mining

Ghana is a less economically developed country (LEDC) with an increasing population. In Ghana, 20% of the population are involved in agricultural production. The government is investing in infrastructure projects and encouraging export businesses. Unemployment remains widespread.

1 (a) In Ghana, 20% of the population are involved in agricultural production.

Calculate the number of people involved in agricultural production in 2018.

..... [1]

(b) Many people in Ghana work on small farms.

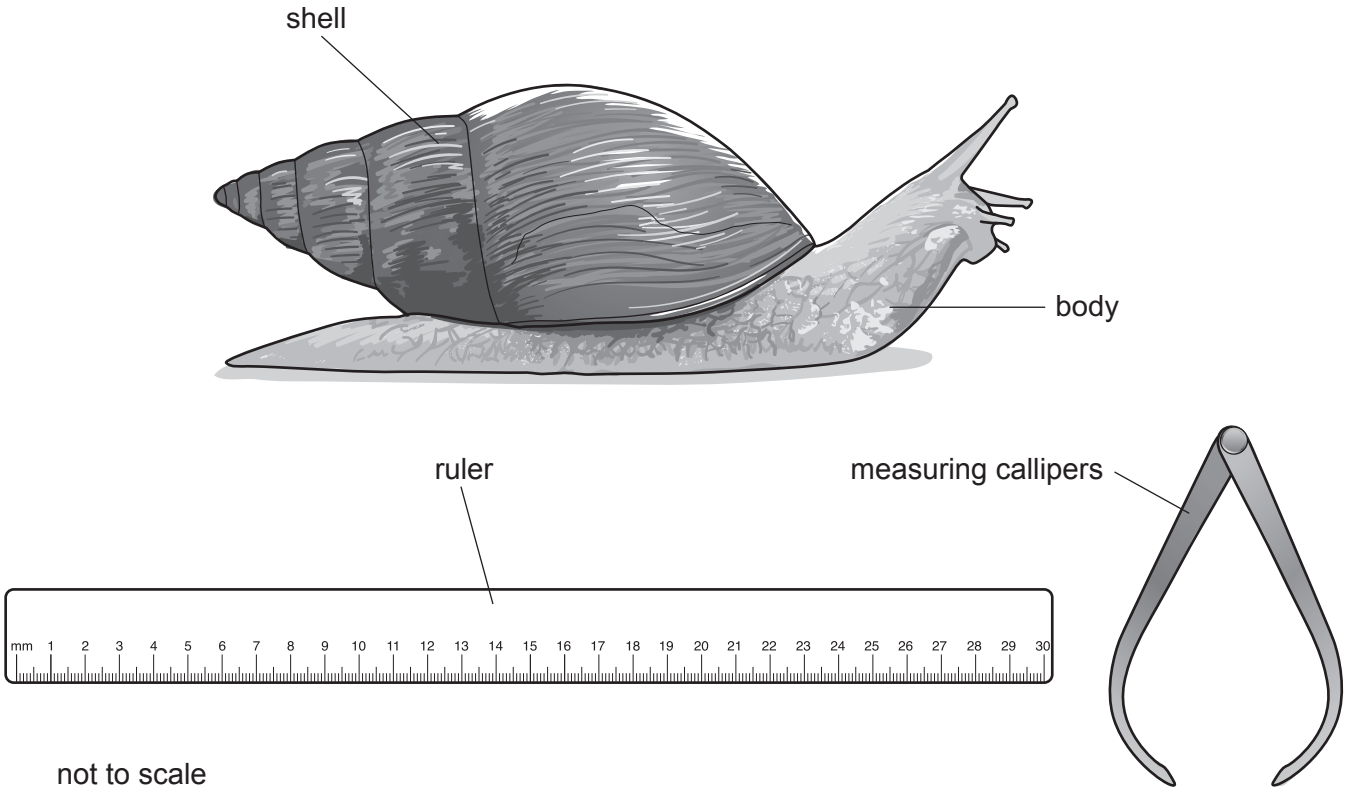
Some people farm giant land snails as a source of food and to sell in local markets.

The photograph shows some giant land snails for sale.



The largest giant land snails are in highest demand and are sold for the highest prices.

The diagram shows a giant land snail and the apparatus a farmer uses to measure the length of the shell of each giant land snail before selling them.



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(i) Suggest how a farmer could use the apparatus in the diagram to measure the length of the giant land snail shell.

.....

.....

.....

..... [2]

(ii) Suggest **one** reason why the farmer does **not** measure the body length of the giant land snail.

.....

..... [1]

(c) Calcium is an important mineral needed for growth.

A student investigated how calcium affects the growth of giant land snails.

One group of giant land snails were fed leaves only (diet **A**).

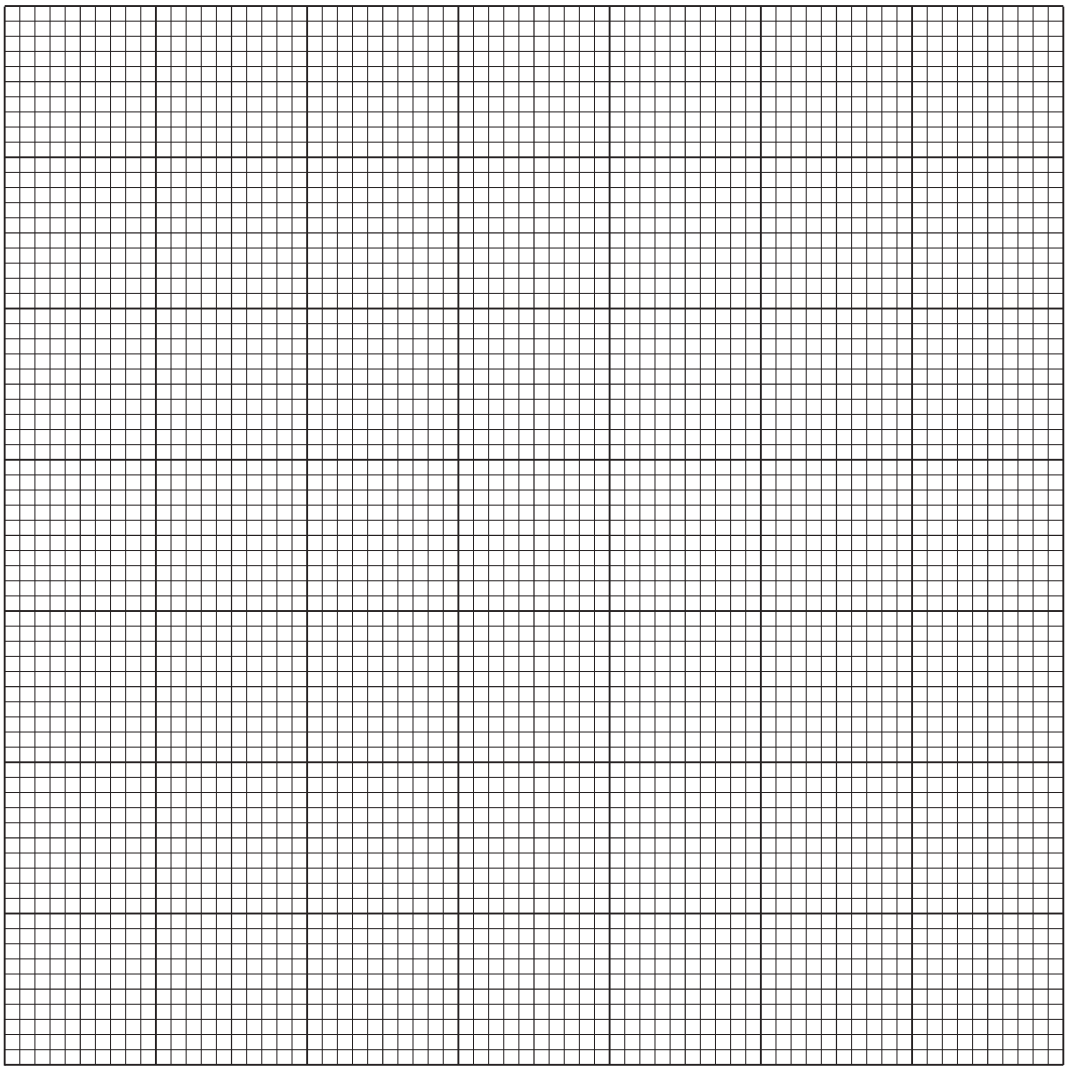
A second group of giant land snails were fed leaves with calcium added (diet **B**).

The student measured the shell length of each giant land snail at four-week intervals.

The table shows the results.

week	0	4	8	12	16	20	24
average length of shell on diet A / cm	4	6	8	10	15	16	17
average length of shell on diet B / cm	4	8	10	14	24	25	26

(i) Plot a line graph of the data for diet **A** and diet **B**.



[4]

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(ii) **On the graph**, draw a straight line between each plotted point for diet **A** and another straight line between each plotted point for diet **B**. Label the lines **A** and **B**. [1]

(iii) Describe the trend shown by the results for giant land snails fed on diet **A** and diet **B**.

diet **A** .....

diet **B** .....
[2]

(iv) The range for a set of data is the difference between the highest and lowest value.

Calculate the range in shell length for diet **A**.

range ..... cm [1]

(v) Use the graph to find the average length of shell at 14 weeks for each diet.

average length of shell on diet **A** ..... cm

average length of shell on diet **B** ..... cm
[1]

(vi) Explain why the giant land snails fed on diet **B** are called the experimental group and the giant land snails on diet **A** are called the control group.

.....

..... [1]

(vii) Explain why the term *primary consumer* is used to describe giant land snails.

.....

..... [1]

(viii) Suggest why giant land snails benefit from having calcium added to their diet.

.....

..... [1]

(ix) Many farmers add crushed limestone to the diet of giant land snails as a source of calcium.

Describe how limestone is formed.

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.....

.....

..... [2]

(d) Farmers keep giant land snails in enclosures. The giant land snails are given fresh leaves and vegetable waste each day.

The giant land snails grow best in warm and humid conditions.

The table shows climate data from a weather station near some small farms in Ghana.

month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
average temperature / °C	26	28	27	26	26	26	25	25	25	26	26	26
average rainfall / mm	25	65	135	140	190	225	115	75	170	200	95	30

Using information from the table, explain why these farms are in a good location for keeping giant land snails.

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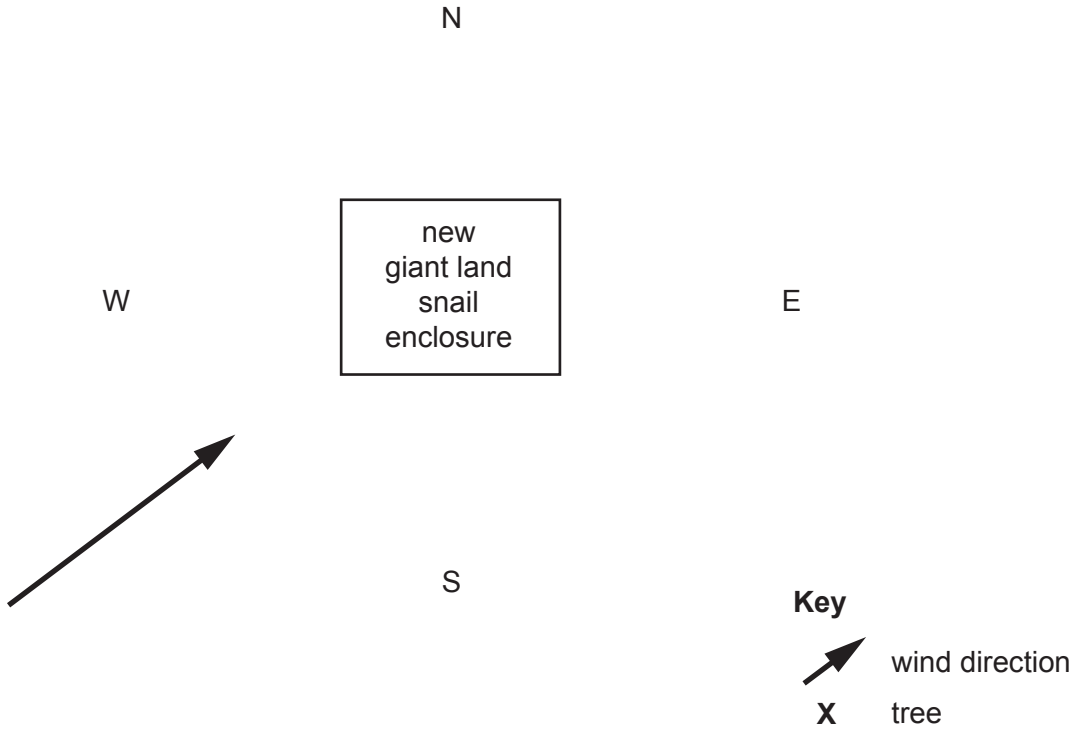
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..... [3]

(e) Farmers shelter their giant land snail enclosures by planting trees to prevent the wind from making conditions too dry for the giant land snails.

The diagram shows the wind direction at a new giant land snail enclosure.



(i) **On the diagram**, draw the best location for a farmer to plant a group of five trees to shelter the new giant land snail enclosure. [2]

(ii) Suggest reasons why giant land snail farming is a sustainable activity.

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..... [3]

(f) The student talked to some giant land snail farmers.

One farmer said,

> I only keep enough giant land snails to feed my family. I feed the cooked snails to all my children to help them grow and stay healthy.

Another farmer said,

> I keep enough giant land snails to sell each week, as well as to feed my family. I spend the money I earn from selling snails on improving my farm.

The student decided to use a questionnaire to find out more about farming giant land snails.

(i) Suggest **one** way the student could select a representative sample of giant land snail farmers to answer the questionnaire.

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..... [2]

(ii) The student prepared the following questionnaire.

farm ……..……..		
question	**yes**	**no**
Does your family eat giant land snails regularly?		
Do you sell giant land snails in local markets?		
Do you keep more than 1000 giant land snails?		
....		

Complete the questionnaire with **one** other question the student could have asked about farming giant land snails. [1]

(iii) The table shows the results of the student's questionnaire.

	percentage response	
question	**yes**	**no**
Does your family eat giant land snails regularly?	90	10
Do you sell giant land snails in local markets?	70	30
Do you keep more than 1000 giant land snails?	45	55

Write a conclusion about farming giant land snails using the results from this survey.

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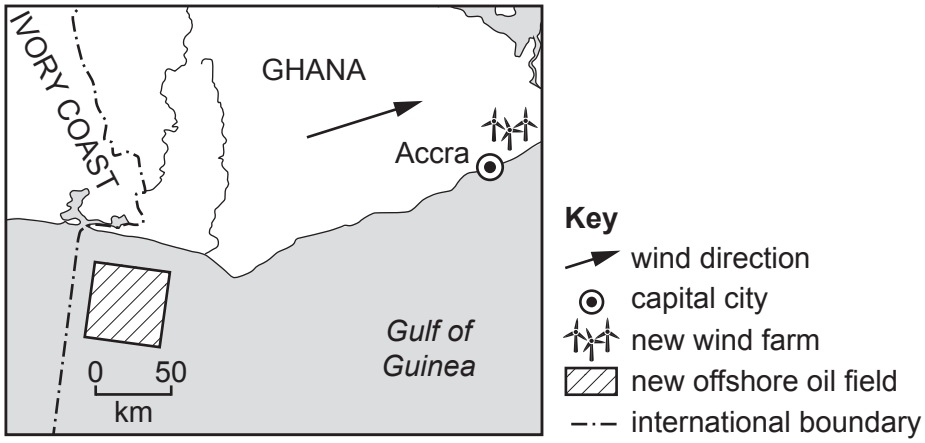
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..... [3]

[Total: 32]

2 The demand for energy in Ghana is increasing.

The map shows the location of two new sources of energy in Ghana.



(a) In 2020, 75 new wind turbines near the capital city will start producing electricity.

Suggest reasons, other than the increasing demand for energy, why Ghana is building new wind turbines.

.....

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..... [2]

(b) Ghana is also developing an offshore oil field.

More offshore oil fields are expected to be found near the capital city.

(i) Calculate the area of the new offshore oil field shown on the map.
Include the unit in your answer.

area ..... unit ..... [3]

(ii) Suggest reasons why some people think these oil fields will **not** benefit the people of Ghana.

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..... [3]

(iii) Describe the impacts of oil pollution on marine and coastal ecosystems.

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..... [4]

[Total: 12]

3 **(a)** The capital city, Accra, has grown rapidly. In 2018, it had a population of 4 million people.

The demand for all types of electrical equipment in Ghana has increased as the standard of living has increased.

Waste electrical equipment is called e-waste.

Most of the e-waste is taken to dumps beside a river near the centre of the capital city. Many people earn money by collecting copper wire from the e-waste dump.

Copper is a valuable metal. The copper wire is insulated with plastic. The plastic contains small quantities of lead.

The photograph shows plastic insulation being burned from the copper wire at the e-waste dump.



(i) Suggest **two** risks to the health of the people shown in the photograph.

1 .....

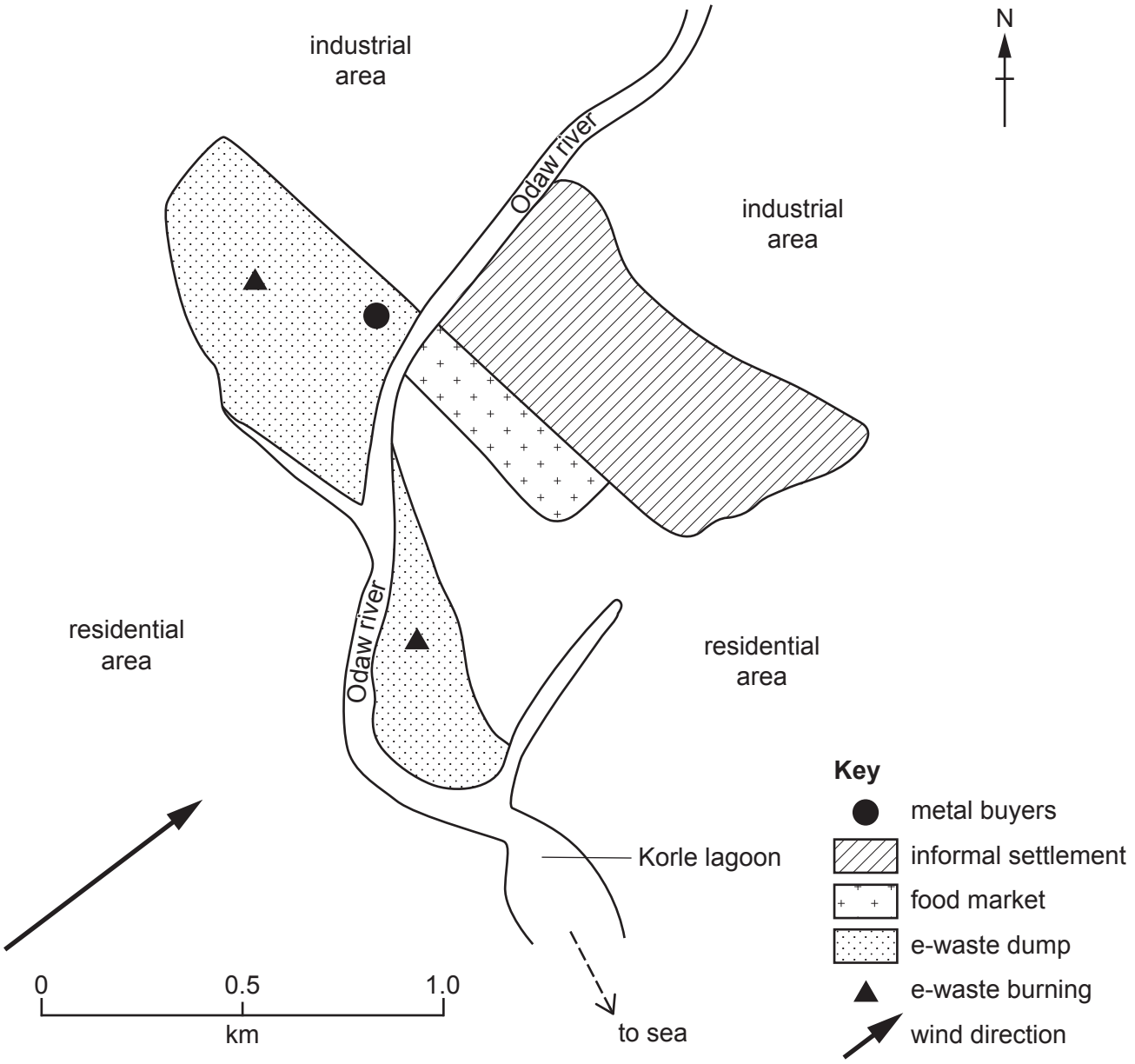
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2 .....

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[2]

(ii) The location of the e-waste dump is shown on the map.



Explain why burning plastic-covered copper wire causes problems for people in the informal settlement.

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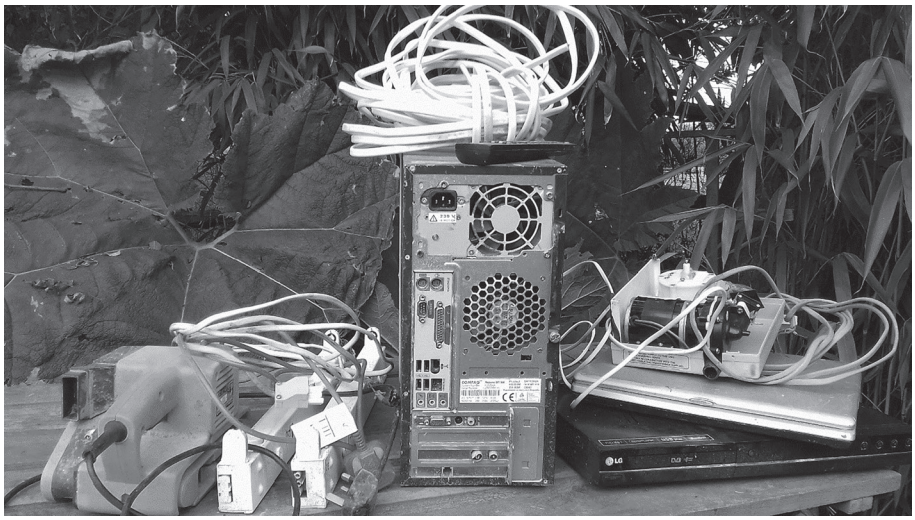
.....

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..... [2]

(b) Metal buyers only pay for copper wire if the plastic insulation is removed.

The photograph shows different sources of insulated copper wire.



A student collected 1.0 m samples of different insulated copper wire from an industrial site near the e-waste dump but did **not** collect samples from the e-waste dump.

The table shows the information the student recorded about the insulated copper wires.

1 m insulated copper wire sample	diameter of wire / mm	mass of wire / g	mass of copper in wire / g	percentage copper content of wire
P	10	120	48	40%
Q	7	75	.....	32%
R	5	32	8	25%

(i) Suggest why the student did **not** collect samples from the e-waste dump.

.....

..... [1]

(ii) **Complete the table** to show the mass of copper in wire sample **Q**. [1]

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(iii) Calculate the length of wire **R**, in metres, needed to give the same mass of copper as 1.0 m of wire **P**.

..... m [1]

(iv) Calculate the length of wire **P** needed to give 1.0 kg of copper to sell.

..... m [1]

(c) An environmental organisation is trying to stop the burning of copper wire at the e-waste dump.

The organisation has given some metal buyers a machine that removes the plastic insulation from copper wire.

(i) Suggest reasons why this has **not** stopped the problem of copper wire burning.

.....

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..... [2]

(ii) Some countries, including Ghana, have made it illegal to import e-waste from other countries.

Suggest **two** reasons why countries would **not** want to import e-waste.

1 .....

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2 .....

.....
[2]

(d) The e-waste dump has destroyed marshland next to the Odaw river.

The Korle lagoon is now full of silt and heavily polluted.

A recent biological survey found no evidence of living plants or animals in the river or lagoon.

The heaviest rainfall at this location is in May and June each year.

One person said,

> We have always had some flooding every June. In recent years, the flooding around the Odaw river and Korle lagoon was more widespread after heavy rainfall. It takes many days for the water to drain away.

(i) Suggest reasons why the flooding in this location is more widespread now than in the past.

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..... [3]

(ii) Suggest **two** reasons why there are no living plants or animals in the river or lagoon.

1 .....

.....

2 .....

.....

[2]

(iii) Describe ways the economy of the capital city could be disrupted by flooding.

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..... [3]

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(iv) Give **two** strategies for improving water quality in the Odaw river and Korle lagoon.

1 .....

.....

2 .....

.....

[2]

(v) The government has a plan to build two drains from the Odaw river to directly connect the river to the sea. This will reduce the risk of flooding.

Suggest **one** reason why the drains have **not** been built.

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..... [1]

(e) In Ghana, malaria is estimated to infect 3.5 million people.

(i) Describe the life cycle of the malaria parasite.

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..... [5]

(ii) Describe strategies to control the malaria parasite.

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..... [3]

(f) There are many fishing villages along the coast of Ghana.

The quantity of fish being caught has gone down in recent years.

Some local fishermen now use illegal methods of catching fish.

Large boats from other countries also fish too close to the coast of Ghana.

The government of Ghana banned all fishing for the month of August for the first time in 2018.

(i) Explain how this ban can help prevent overfishing.

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..... [2]

(ii) Describe other ways overfishing can be managed along the coast of Ghana.

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..... [3]

[Total: 36]

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