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6130183867

ENVIRONMENTAL MANAGEMENT **0680/21**

Paper 2 Management in Context **May/June 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

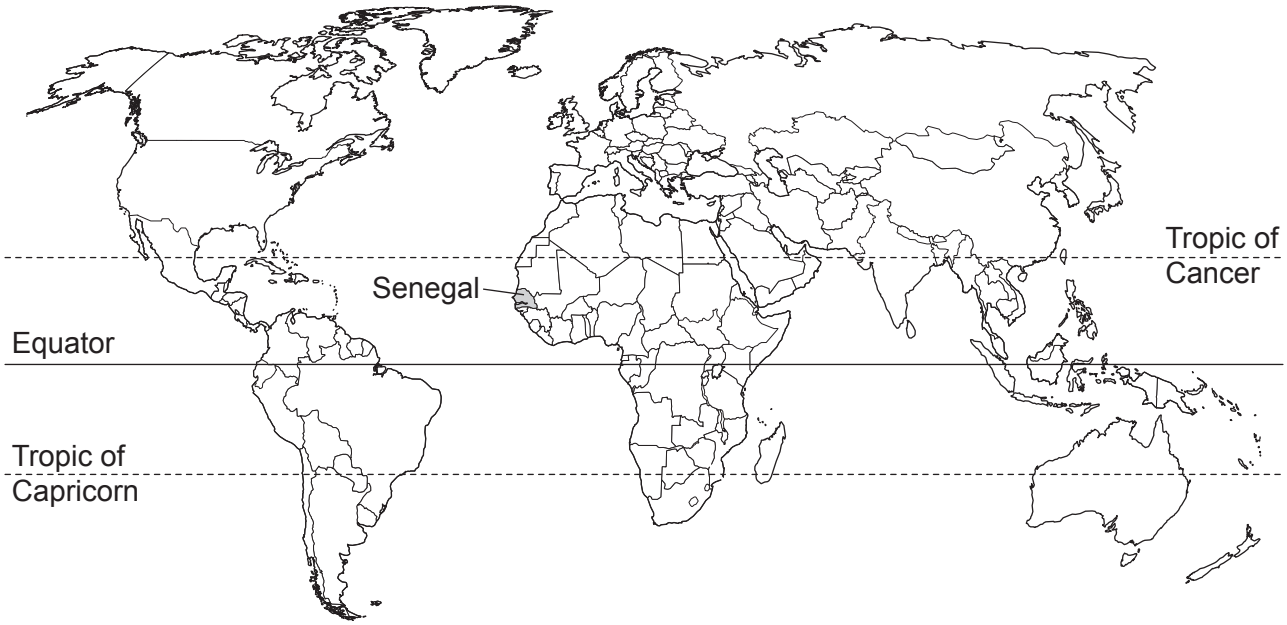
- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

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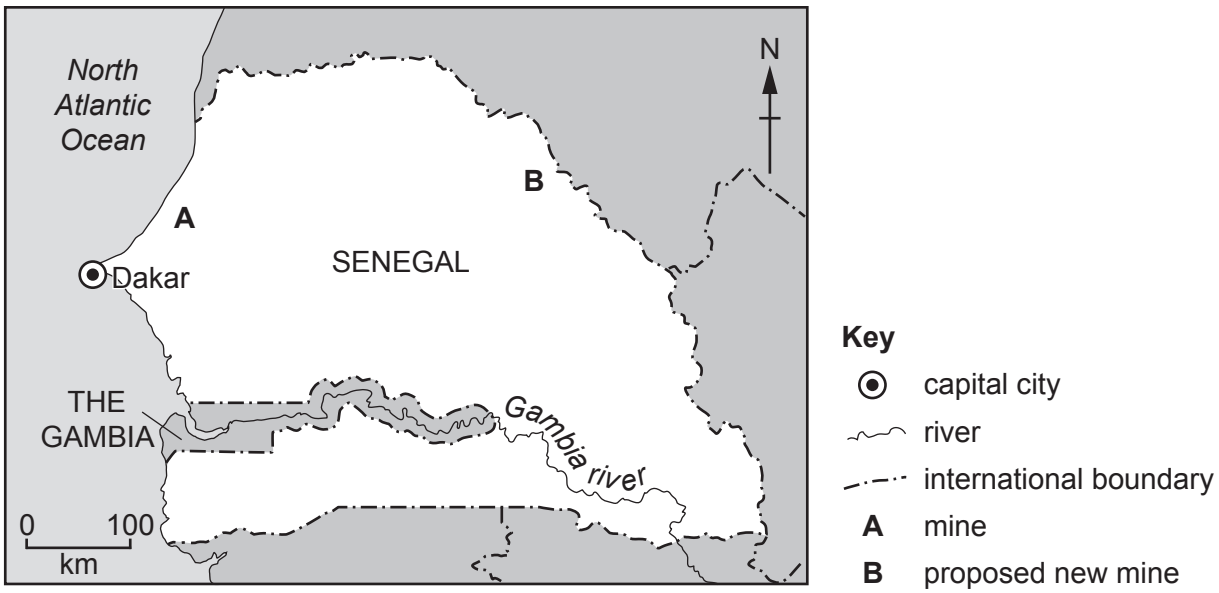
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[Turn over

world map showing the location of Senegal



map of Senegal



Area of Senegal: 196 722 km^2

Population of Senegal: 15.9 million (in 2018)

Children per woman: 4.28

Life expectancy: 62.1 years

Currency: 617 XOF = 1 USD

Languages: French, local languages

Climate of Senegal: tropical in the south, drier in the north, rainy season May to November

Terrain of Senegal: low rolling plains, hills in the south east

Main economic activities: agricultural production, fishing, phosphate mining, oil refining, gold mining

Senegal is a less economically developed country (LEDC) with a rapidly increasing population. 60% of the population is under the age of 25. The government are investing in infrastructure projects and encouraging export businesses. Unemployment remains widespread.

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[Turn over

1 **(a)** **(i)** In Senegal, 75% of the population are involved in agriculture.

Calculate the number of people in Senegal involved in agriculture in 2018.

..... [1]

(ii) Describe the shape of the population pyramid for Senegal.
You can sketch a population pyramid to help your answer.

.....

.....

.....

..... [3]

(b) Cotton and peanuts are two important cash crops that account for more than 70% of the agricultural production of Senegal.

(i) State the meaning of the term *cash crop*.

.....

..... [1]

(ii) Suggest **one** benefit and **one** disadvantage of growing cash crops.

benefit .....

.....

disadvantage .....

.....
[2]

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(c) The photograph shows some young mango trees with mango fruits growing on a small farm.



The farmers do not remove the dead leaves under the mango trees.

Suggest reasons why the farmers do **not** remove the dead leaves.

.....

.....

.....

..... [2]

(d) The fact sheet shows some information about mango fruits.

Mango fruit fact sheet

- Mango fruits are an important part of the diet in Senegal
- 230 000 mango trees are grown on 2500 small farms
- mango trees can be attacked by fungi and insects
- mango fruits are harvested between April and September
- the best quality mango fruits are exported from Senegal in July and August
- it is only possible to export mango fruits if they are grown 50 km or less from the capital city, Dakar.

(i) Calculate the average number of mango trees on a small farm.

..... [1]

(ii) Suggest reasons why mango fruits for export are only supplied from farms 50 km or less from the capital city.

.....

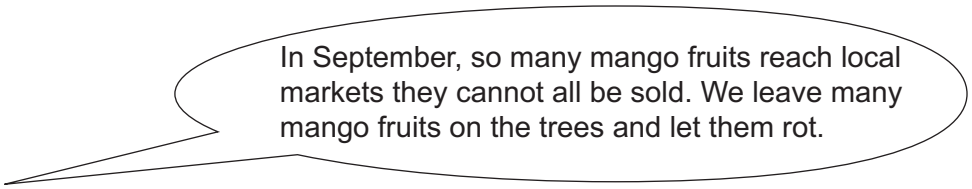
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..... [2]

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(iii) A local farmer said,



The price of mango fruits changes in local markets between August and September.

Suggest how the price changes and give **one** reason for your answer.

price change .....

reason .....

.....

[2]

(e) A student visited one small farm growing mango fruits for export.

The student selected a box of these mango fruits.

Five mango fruits were selected and weighed.

The table shows the results.

mango fruit	**mass /g**
A	485
B	522
C	546
D	510
E	543
total mass	.....
average mass	.....

Complete the table by calculating the total mass and average mass of the five mango fruits.

[2]

(f) The student talked to some farmers.

One farmer said,

I only pick large mango fruits with perfect skins for export. Each fruit is packed in a plastic net and then into a box. If they do not arrive at Dakar in good condition I do not get paid.

Another farmer said,

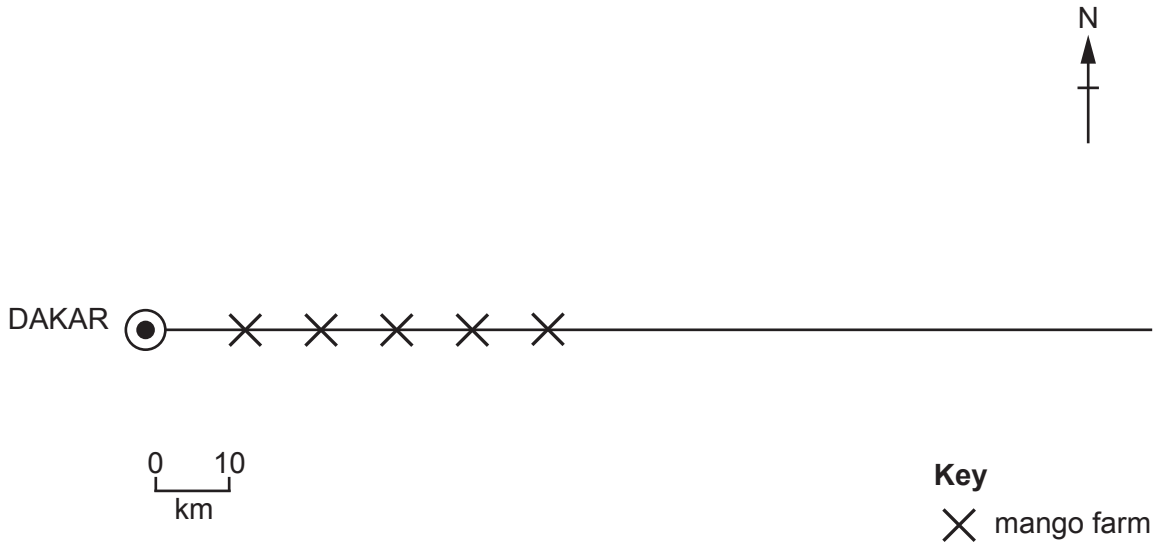
Mango trees grow well in the soil here. Unfortunately, I can only sell some of the mango fruits in local markets. Many fruits are wasted each year.

The student decided to use a questionnaire to find out more about mango farming.

The student sent the questionnaire to ten mango farms.

The farms were selected as shown on the diagram.

The diagram shows five of the farms selected by the student.



(i) Name the type of sampling shown in the diagram.

..... [1]

(ii) **Complete the diagram** to show the location of the other five farms sampled. [2]

(iii) The student prepared the questionnaire shown.

farm	
question	**answer**
How many mango trees do you have?	
How many kg of mango fruits do you export?	
How many kg of mango fruits do you sell in local markets?	
How many kg of mango fruits are wasted?	
....	

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

(g) The results from the questionnaire are shown in the tables.

Results from five farms **50 km or less** from Dakar.

question	farm					average
	A	B	C	D	E	
How many mango trees do you have?	80	75	90	100	95	88
How many kg of mango fruits do you export?	100	120	200	140	80	128
How many kg of mango fruits do you sell in local markets?	350	390	400	430	340	382
How many kg of mango fruits are wasted?	110	130	290	150	90	154

Results from five farms **more than 50 km** from Dakar.

question	farm					average
	F	G	H	J	K	
How many mango trees do you have?	84	79	90	110	92	91
How many kg of mango fruits do you export?	0	0	0	0	0	0
How many kg of mango fruits do you sell in local markets?	450	420	400	440	340	410
How many kg of mango fruits are wasted?	220	260	3000	310	220	253

(i) The student was concerned that one of the results from a farm **more than 50 km** from Dakar might be anomalous.

Circle this anomalous result **in the table**. Give a reason for your choice.

.....

..... [2]

(ii) What could the student conclude from the results of the questionnaire?

.....

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..... [3]

(h) The government of Senegal plans to improve roads up to 150 km from Dakar by 2022.

(i) Suggest how this could benefit farmers and the government.

benefit to farmers .....

.....

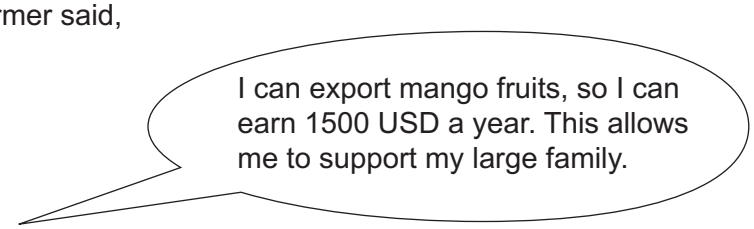
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benefit to the government .....

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.....
[3]

(ii) One farmer said,



Suggest **two** ways the farmer can spend money to support their family.

1 .....

2 .....
[2]

(iii) One mango farm more than 50 km from Dakar has now planted cashew nut trees and is keeping bees to give a harvest of honey.

Suggest why the farm did this.

.....

..... [1]

(iv) The mango farm also decides to grow a cereal crop and keep chickens.

Suggest how this farm is practising a sustainable form of agriculture.

.....

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..... [4]

(v) Many people do **not** have access to a reliable source of food.

Explain why this is a problem.

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..... [2]

[Total: 37]

2 The geology of Senegal is mostly sedimentary rocks. These include large deposits of phosphate rock.

(a) Describe the formation of sedimentary rock.

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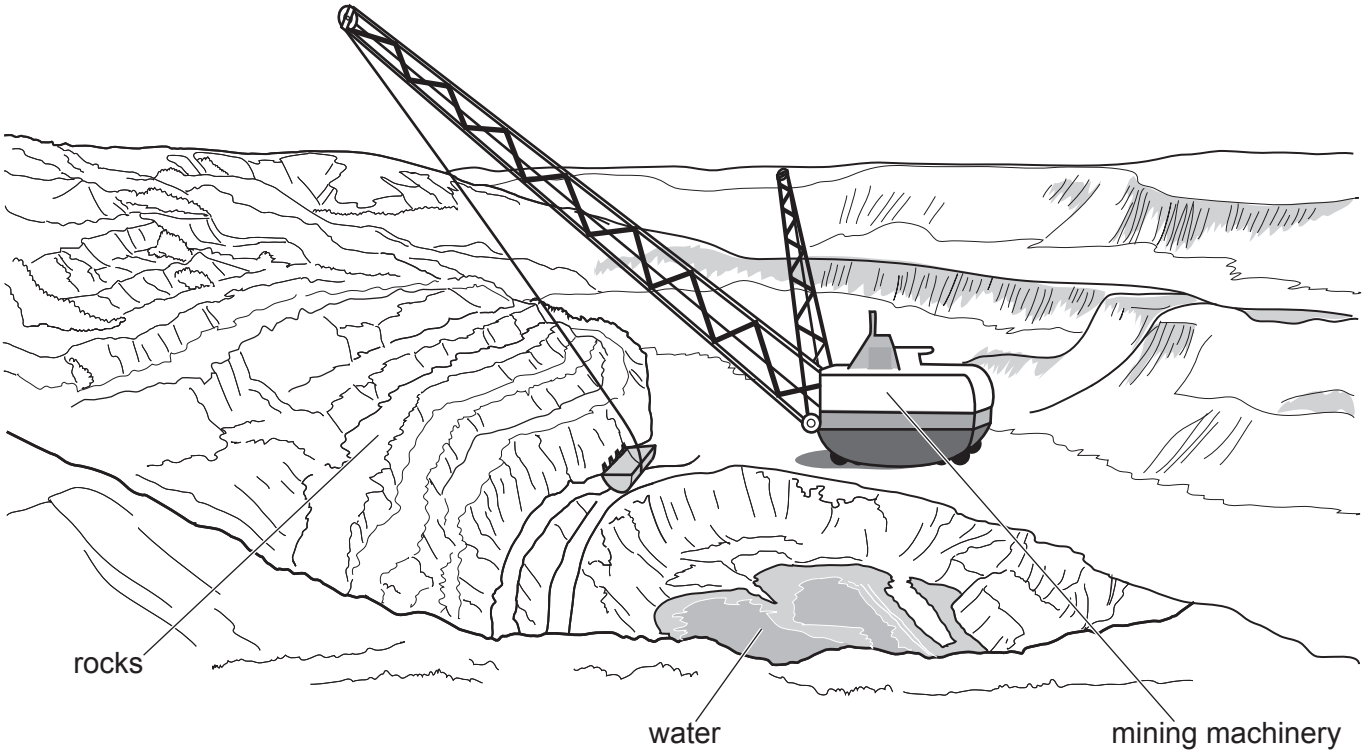
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..... [3]

(b) The drawing shows phosphate rock being mined in Senegal.

Phosphate rock is a valuable export.



(i) Name the type of mining shown in the drawing.

..... [1]

(ii) Describe the environmental damage that can be caused by this type of mining.

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..... [3]

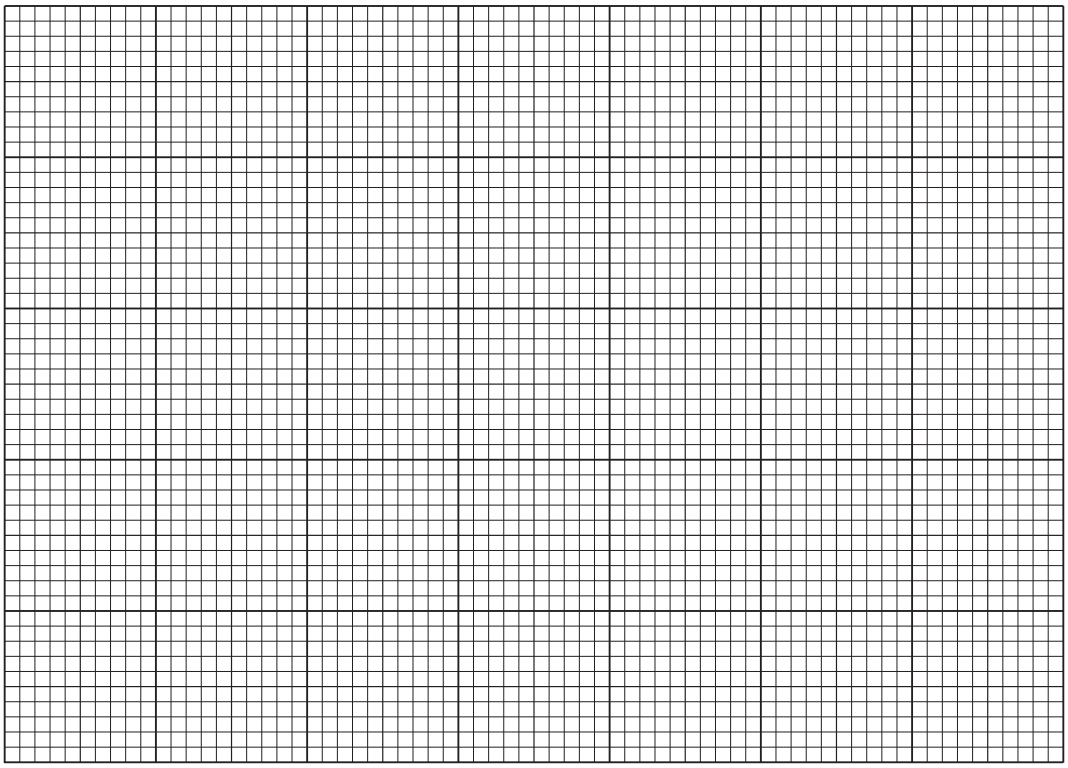
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(c) The phosphate rock can be exported or it can be processed into phosphoric acid and then exported.

The table shows the world price of phosphate rock from January 2012 to January 2018.

year	price / USD per tonne
2012	200
2013	190
2014	110
2015	125
2016	135
2017	105
2018	85

(i) Plot the information in the table as a line graph.



[4]

(ii) Describe the trend shown by the graph.

.....

..... [1]

(d) Phosphoric acid is used to make fertiliser.

The table shows the price of phosphoric acid from four suppliers in other countries.

supplier	price / USD per tonne
P	650
Q	850
R	1000
S	900
average	850

(i) State the **least** expensive supplier.

..... [1]

(ii) Suggest reasons why the government wants more phosphoric acid to be made from phosphate rock in Senegal.

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..... [3]

(iii) Suggest **one** way the government could encourage the production of phosphoric acid in Senegal.

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..... [1]

(iv) Intensive agriculture uses large quantities of fertiliser on many different crops. Some of the fertiliser is not absorbed by the crops.

Describe the environmental damage caused when fertilisers are overused.

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..... [5]

(e) Most small farms in Senegal do not use fertilisers to grow crops. Instead, they use manure and crop wastes.

Farmers near the mine mix some phosphate rock with manure to increase crop growth.

(i) Suggest **one** reason why mixing phosphate rock with manure is unlikely to cause any environmental damage.

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..... [1]

(ii) Describe how a mine can be managed after rock extraction comes to an end.

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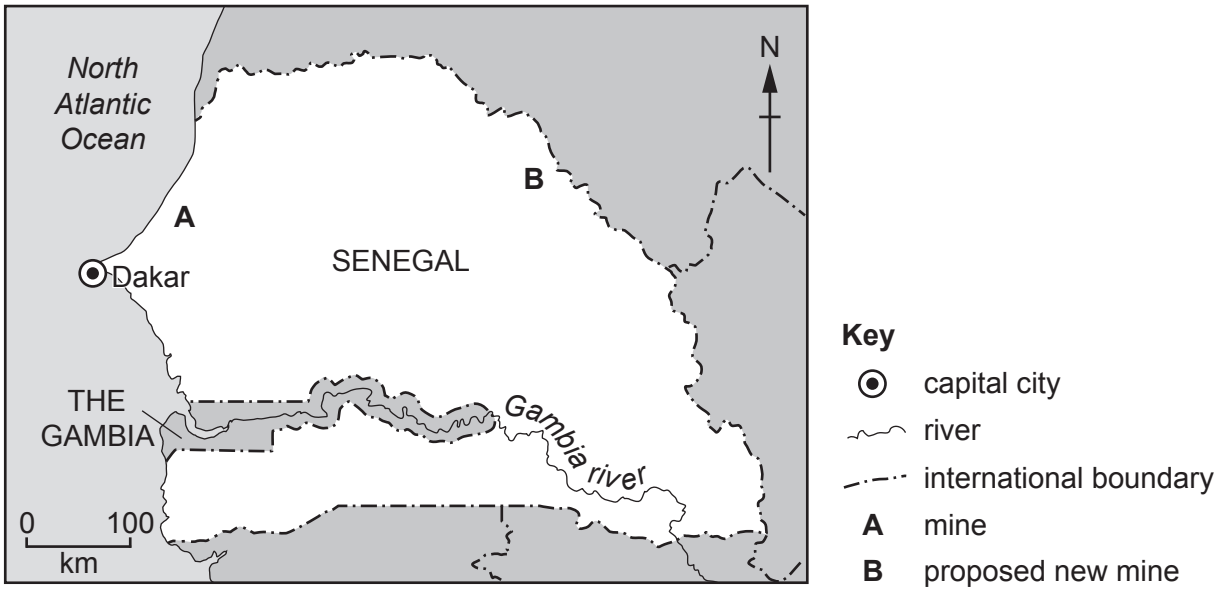
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..... [4]

(f) There are very large phosphate rock reserves in the east of Senegal.

Senegal may have up to 1000 million tonnes of phosphate rock if all these reserves are extracted.

The map shows the location of a phosphate rock mine, **A**, and a proposed new mine, **B**.



(i) Estimate the distance between Dakar and mine **A** and between Dakar and proposed new mine **B**.

distance between Dakar and mine **A** ..... km

distance between Dakar and proposed new mine **B** ..... km [2]

(ii) Mining at the proposed new mine **B** will not start until mine **A** has run out of phosphate rock.

Suggest reasons why.

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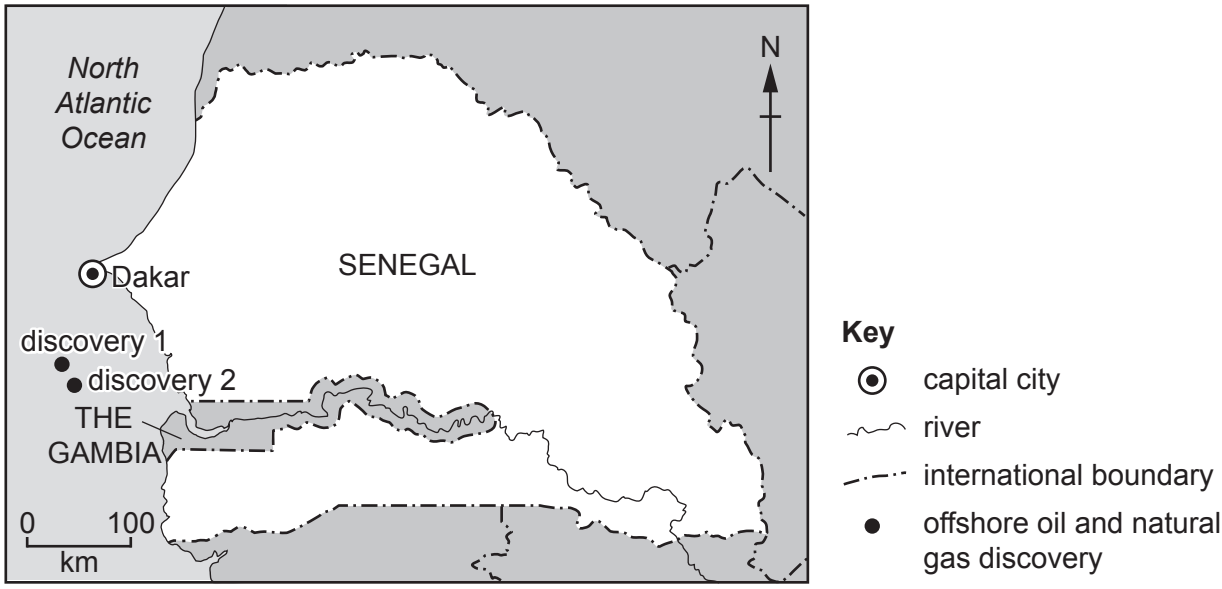
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..... [2]

(g) The government of Senegal has sold oil and gas exploration rights to several foreign companies.

The map shows the location of two new discoveries of offshore oil and natural gas.



Oil and natural gas production is due to start in 2021.

(i) Suggest reasons why some people are worried that these discoveries may **not** benefit the people of Senegal and could damage the economy.

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..... [3]

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

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..... [3]

(iii) Describe strategies for minimising the impacts of oil spills.

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..... [3]

(iv) Describe the formation of oil.

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..... [3]

[Total: 43]

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