Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

8128944766

ENVIRONMENTAL MANAGEMENT **0680/22**

Paper 2 Management in context **February/March 2019**

1 hour 45 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your centre number, candidate number and name in the spaces at the top of this page.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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.

This document consists of **19** printed pages and **1** blank page.

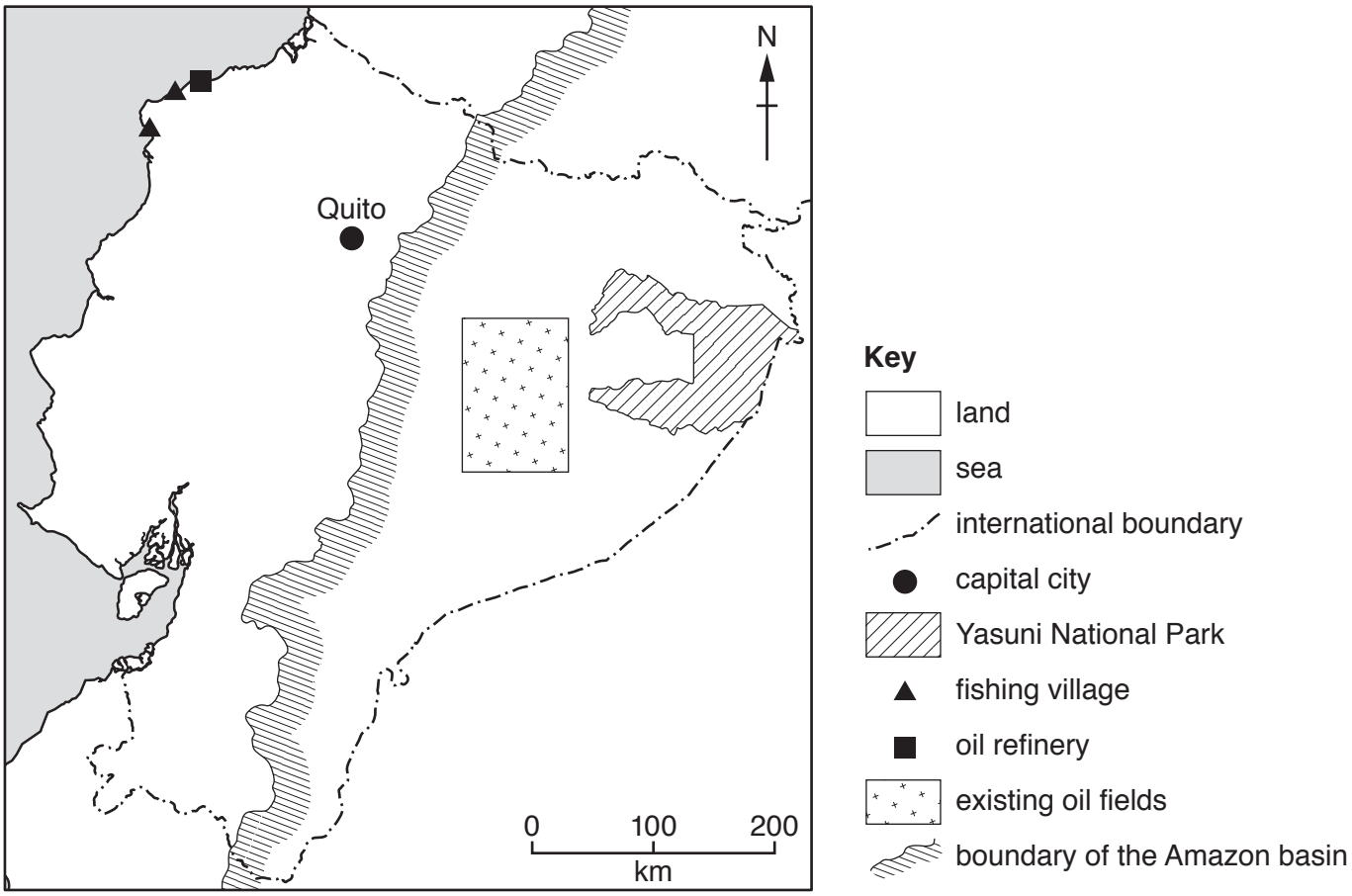
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world map showing the location of Ecuador



map of Ecuador



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Area of Ecuador: 283 561 km^2

Population: 16.7 million (2017)

Children per woman: 2.22

Life expectancy: 76.8 years

Currency: USD

Languages: Spanish, Quechua, other local languages

Climate of Ecuador: tropical along the coast, cooler inland, tropical in the east

Terrain of Ecuador: coastal lowlands, central highlands, lowlands in the east

Main exports of Ecuador: petroleum products, bananas, cut flowers, shrimp, cacao, coffee, wood and fish

The economy of Ecuador is based on oil extraction and processing, agriculture and fishing. Ecuador has one of the lowest unemployment rates in South America. However, about 12.5 million people still have a low standard of living. About 4% of the people live on less than 1.9 USD per day.

1 (a) (i) Calculate the percentage of people with a low standard of living in Ecuador.

.....% [1]

(ii) Calculate the number of people living on less than 1.9 USD a day.

..... [2]

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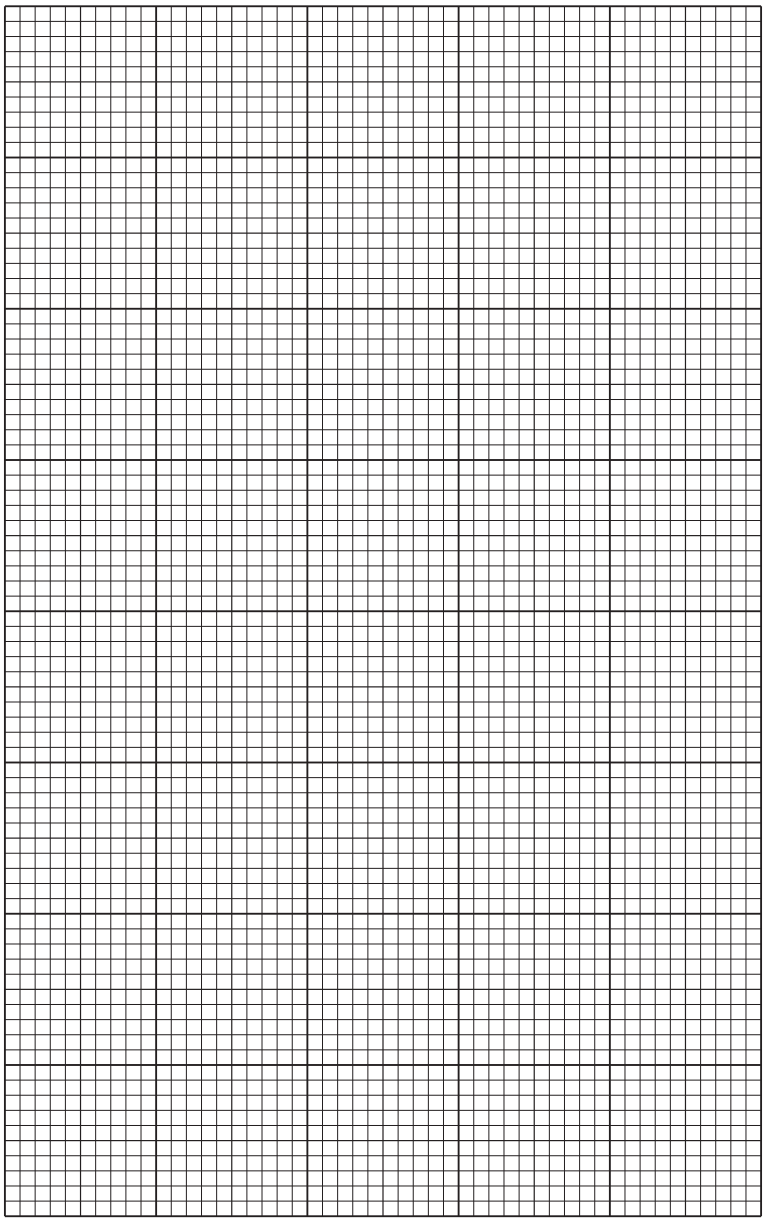
[Turn over

(b) The production of farmed shrimp from Ecuador for export to Europe has increased in recent years.

year	mass of shrimp exported / thousand tonnes
2009	131
2010	148
2011	187
2012	209
2013	224
2014	299
2015	326
2016	362

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(i) Plot a bar graph of the data.



[4]

(ii) Between which two years was the greatest increase in shrimp production?

between ..... and ..... [1]

(iii) In 2017, the mass of shrimp exported increased by 14% from the mass exported in 2016.

Calculate the mass of shrimp exported in 2017.

..... thousand tonnes [2]

(c) There are many small villages along the coast of Ecuador.

The photograph shows an area of mangrove swamp near a coastal village.



One villager said,

> 'It is our tradition to collect shrimp to eat from the mangrove swamp. We make charcoal from mangrove wood. We use the charcoal as fuel for cooking.'

(i) Suggest why villagers making charcoal is a sustainable activity.

.....

.....

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..... [2]

(ii) Increasing shrimp production has meant that large areas of mangrove swamp have been cleared to make ponds for shrimp farms.

Another villager said,

> 'The shrimp farm is next to our village. The farm has caused our village water supply to become cloudy and smell bad.'

Suggest how shrimp farming could have caused changes in the quality of the village water supply.

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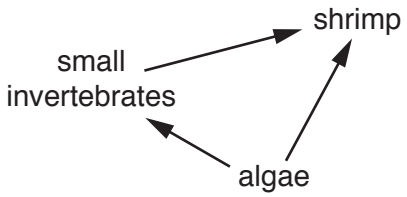
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..... [3]

(d) Shrimp feed on algae and small invertebrate animals. The diagram shows this feeding relationship.



(i) State the primary consumer shown in the diagram.

..... [1]

(ii) Define the term *population*.

.....

.....

.....

..... [2]

(iii) Name **two** abiotic components that could affect the shrimp population.

1 .....

2 .....

[2]

(iv) Many shrimp farmers buy fishmeal to feed their shrimp. Fishmeal is made from fish caught at sea, which are then dried.

Suggest reasons why shrimp grow quickly when given fishmeal.

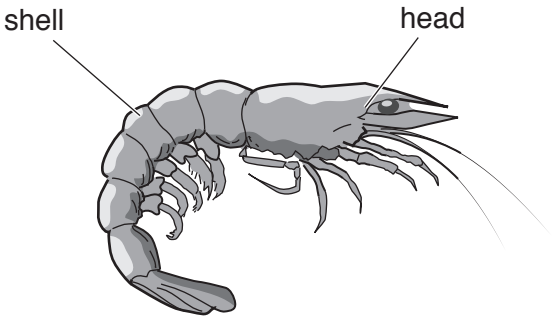
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..... [2]

(e) A student visited a shrimp farm near the village where shrimp are harvested.



Most of the harvested shrimp are exported.

They are either exported:

- whole
- have their head removed or
- have their head and all the shell removed.

The student did the following investigation:

- collected a sample of harvested shrimp
- weighed and measured each shrimp whole
- removed the head of each shrimp and weighed the head
- removed all of the shell
- weighed the edible flesh of each shrimp.

The results are shown in the table.

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shrimp	length / cm	mass of whole shrimp / g	mass of head / g	mass of edible flesh / g
1	14.0	21.0	9.0	6.0
2	15.0	23.0	7.0	6.0
3	15.0	23.0	8.0	6.0
4	14.0	22.0	6.0	6.0
5	15.0	23.0	6.0	7.0
6	15.0	24.0	7.0	8.0
7	13.0	18.0	5.0	7.0
8	14.0	19.0	5.0	7.0
9	14.0	19.0	5.0	7.0
10	14.0	21.0	6.0	6.0
average	14.3	21.3	.....	6.6

(i) Complete the table by calculating the average mass of a shrimp head. [1]

(ii) Calculate the average percentage of a whole shrimp that is edible flesh.

.....% [1]

(iii) Suggest **one** way of using the shrimp heads.

.....

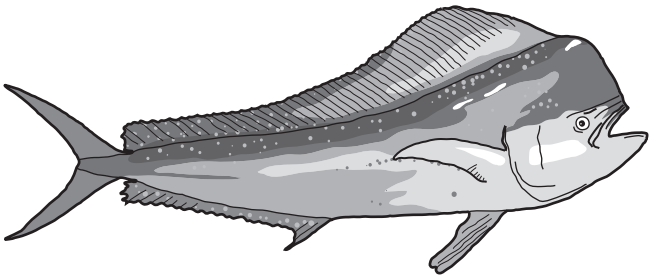
..... [1]

(f) A fisherman from the village said,

> 'We fish at sea in small boats. We use a long line with hooks to catch the dorado fish. It is now illegal to catch and sell dorado fish less than 80 cm long.'

(i) A fisherman catches the dorado fish shown in the drawing.

The drawing is **not** the actual length of the dorado fish.



magnification $\times 0.1$

The actual length of the dorado fish can be determined using the formula:

$$\text{actual length} = \frac{\text{length measured from drawing}}{\text{magnification}}$$

Calculate the actual length of the dorado fish.

..... cm [2]

(ii) Can the fisherman legally sell this dorado fish?

Give a reason for your answer.

.....

..... [1]

(iii) Suggest how controlling the length of dorado fish that can be caught and sold will help to conserve this fish stock.

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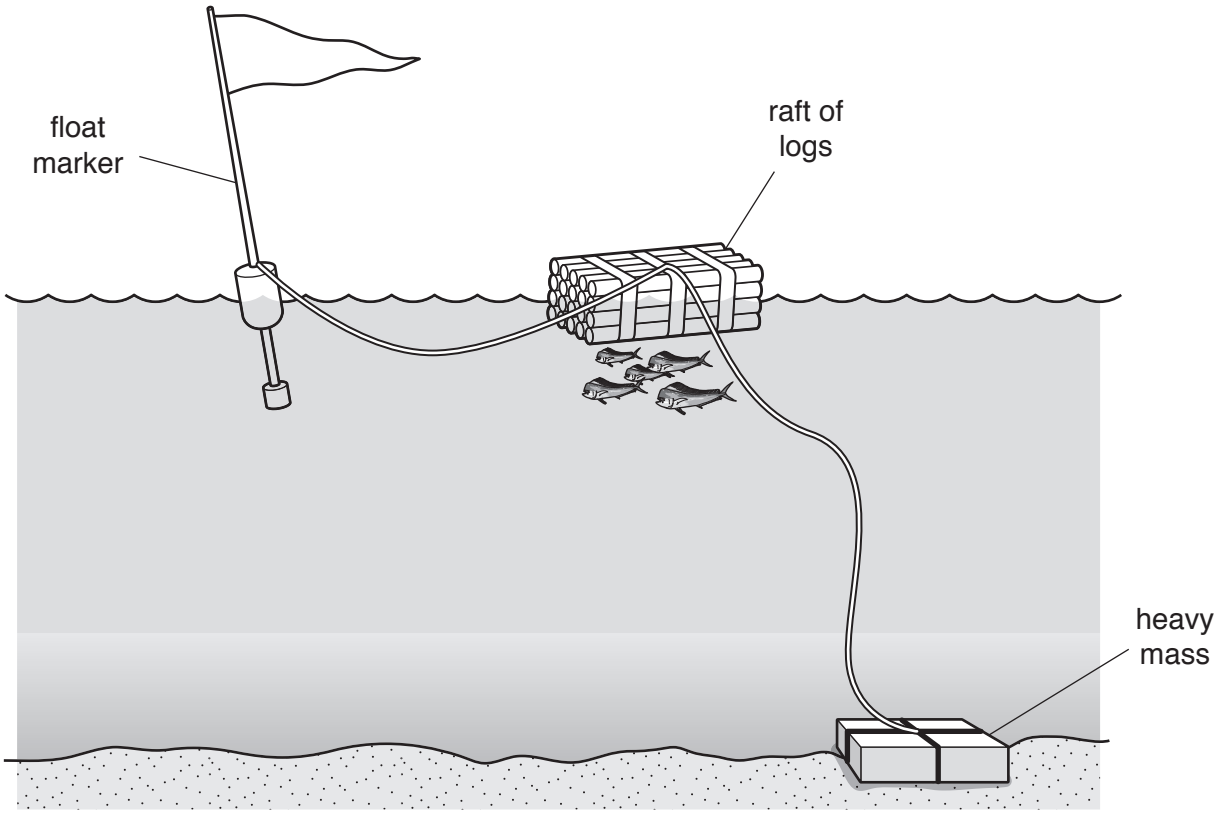
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(iv) The fisherman decides to build a fish aggregating device (FAD).

fish aggregating device (FAD)



The dorado fish are attracted to feed under the raft of logs. The fisherman uses a net to catch the fish.

Discuss the possible problems in maintaining a sustainable source of fish if many fishermen use FADs.

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..... [4]

(v) Larger boats with different types of fishing gear have started to catch dorado fish.

The dorado fishing season has been changed from December to May to between November and February to control fishing activity.

Describe **three** other ways of controlling fishing activity.

1 .....

.....

2 .....

.....

3 .....

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[3]

(g) When an El Niño Southern Oscillation (ENSO) phenomenon occurs dorado fish populations are affected.

Describe the ENSO phenomenon.

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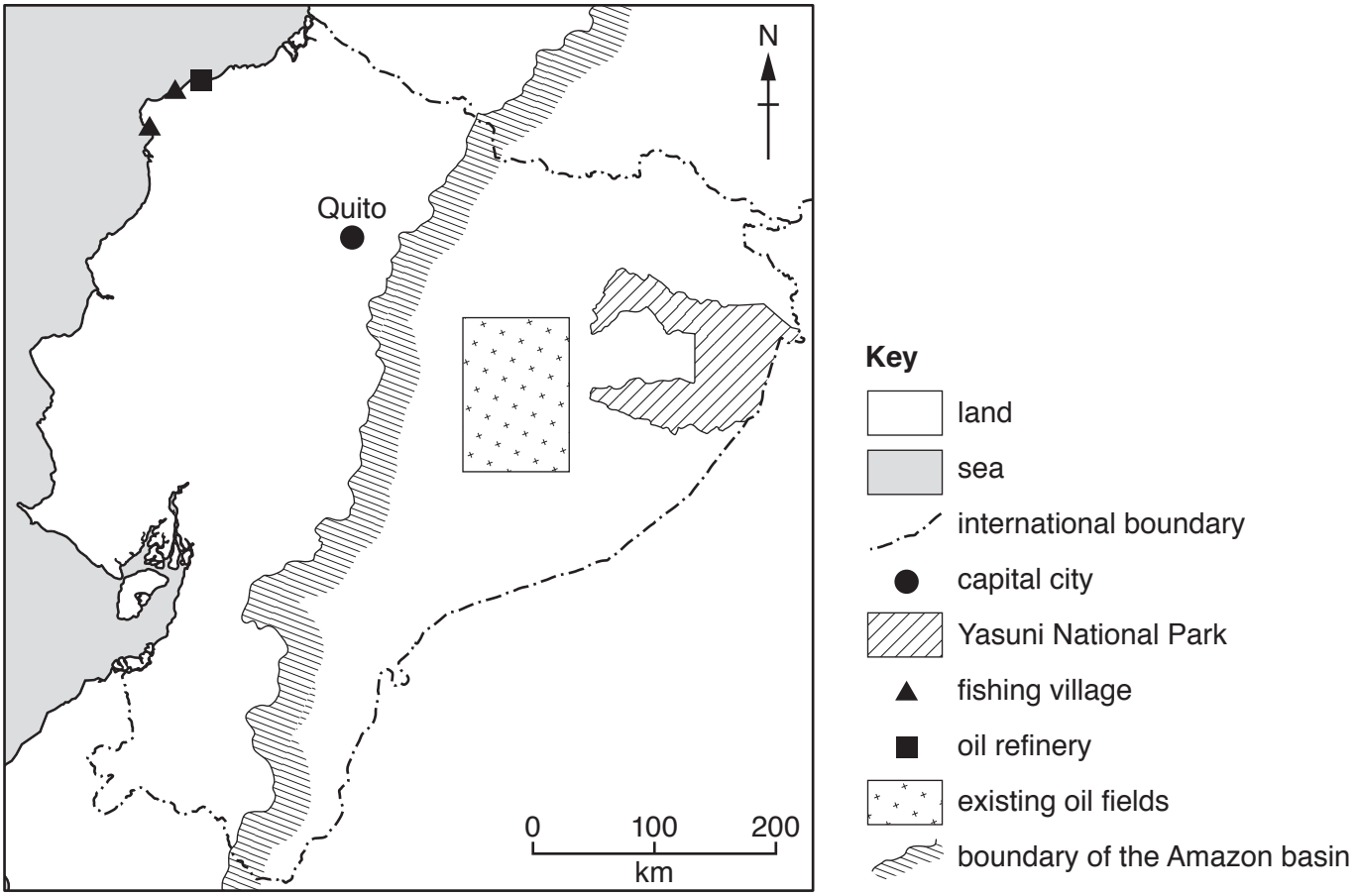
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..... [3]

[Total: 40]

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2 Ecuador is an oil exporting country. Oil provides about half the total export income of the country.



(a) The oil fields are in the Amazon basin in the east of the country. Some crude oil is exported and some is processed in an oil refinery.

Estimate the shortest distance between the oil fields and the oil refinery.

..... km [1]

(b) The oil is moved through tropical rainforest to the coast using pipelines.

The photograph shows two pipelines in the tropical rainforest.



(i) Describe the environmental impacts of building pipelines in tropical rainforest, as shown in the photograph.

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..... [4]

(ii) Suggest reasons why the vegetation around the pipeline is **not** allowed to grow tall.

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..... [2]

(iii) The section of pipeline shown in the photograph is running from west to east.

Describe a method you could use to record changes in plant biodiversity between the pipeline and the tropical rainforest.

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..... [6]

(c) The table shows an estimate of the biodiversity in the Yasuni National Park.

animal type	estimated number of species
insects	100 000
amphibians	150
birds	600
mammals	200

(i) Suggest why the estimated number of species of insects is much greater than the other animal types.

.....

..... [1]

(ii) Suggest why the numbers of species are only estimates.

.....

..... [1]

(d) There are large reserves of oil in the Yasuni National Park.

In 2010, the government proposed to the global community that it would **not** develop these reserves if other countries would pay towards keeping the oil in the ground.

(i) Discuss the benefits of this proposal to Ecuador and other countries.

benefits to Ecuador .....

.....

.....

.....

benefits to other countries .....

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[4]

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(ii) The government did not get enough support from other countries so oil extraction has now started on the edge of the Yasuni National Park.

Suggest reasons why the government of Ecuador continues to invest in oil extraction.

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..... [4]

(e) A questionnaire was used to collect people's opinions about the oil extraction on the edge of the Yasuni National Park. People living in the capital city of Ecuador were asked four questions.

The table shows the results.

	percentage response to questionnaire		
question	**yes**	**no**	**do not know**
Do you think oil extraction should take place on the edge of the Yasuni National Park?	58	32	10
Do you think this oil extraction will help the government earn money?	70	25	5
Do you think it is important to maintain the biodiversity of the Yasuni National Park?	40	38	22
Do you think the government should take away the status of Yasuni National Park?	28	57	15

(i) Discuss the results of the questionnaire.

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..... [4]

(ii) Suggest **one** other question that could be asked to find out people's opinions about the oil extraction.

.....

..... [1]

(iii) Describe a method to select the people to be interviewed for the questionnaire.

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..... [2]

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(f) Large offshore oil fields are being developed close to the south of Ecuador.

(i) Explain why there is a risk of oil pollution reaching the coast of Ecuador.

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..... [2]

(ii) Describe the possible impacts of an oil pollution event on the coastal ecosystems of Ecuador.

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..... [4]

(g) Wind power and solar energy are renewable resources. Some people in Ecuador want to invest in these renewable resources to generate electricity rather than using oil.

Explain why these renewable resources may **not** be able to provide all of the energy needed to generate electricity for Ecuador.

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..... [4]

[Total: 40]

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