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ENVIRONMENTAL MANAGEMENT **0680/22**

Paper 2 Management in Context **February/March 2024**

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.

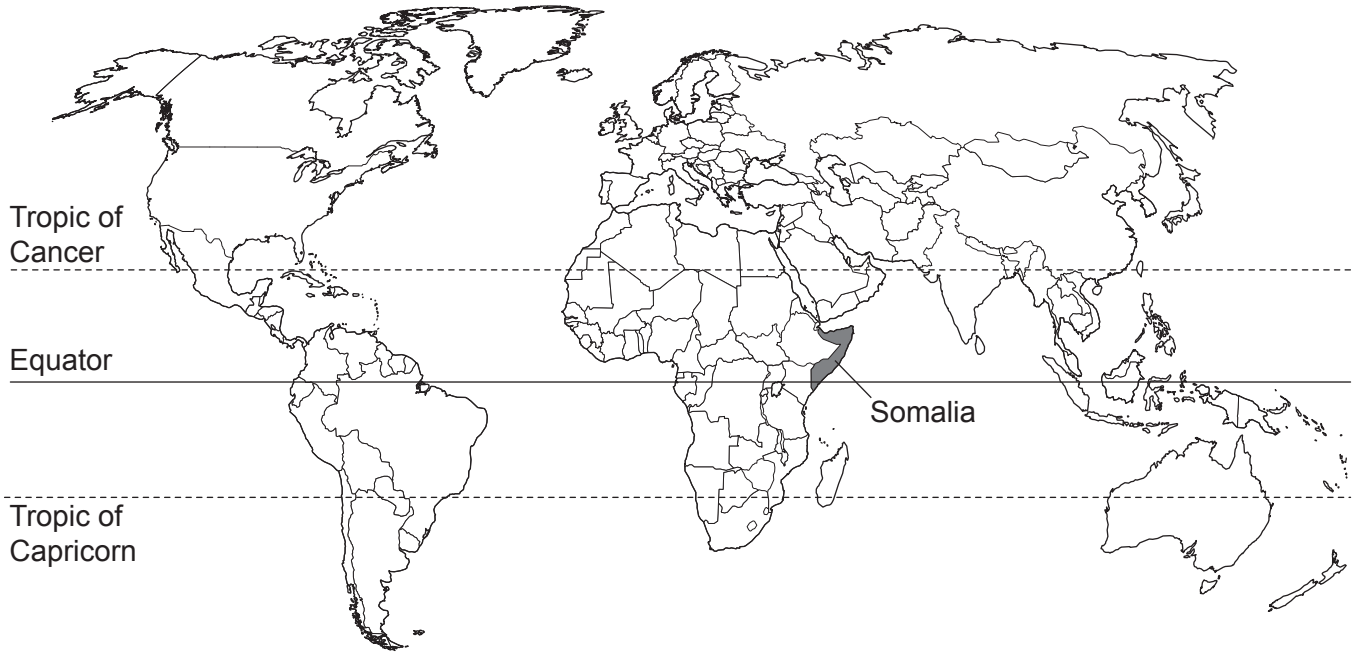
INFORMATION

- 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. Any blank pages are indicated.

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World map showing the location of the Federal Republic of Somalia



Map of the Federal Republic of Somalia

Key

⊛ capital city

–·–·– international boundary



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Area of Somalia: 637 657 km^2

Population: 16 790 432 (in 2022)

Children per woman: 5.98

Life expectancy: 55.3 years

Currency: Somali shilling (584 SOS = 1 USD)

Language: Somali and Arabic

Climate of Somalia: hot all year-round, two dry seasons and two rainy seasons

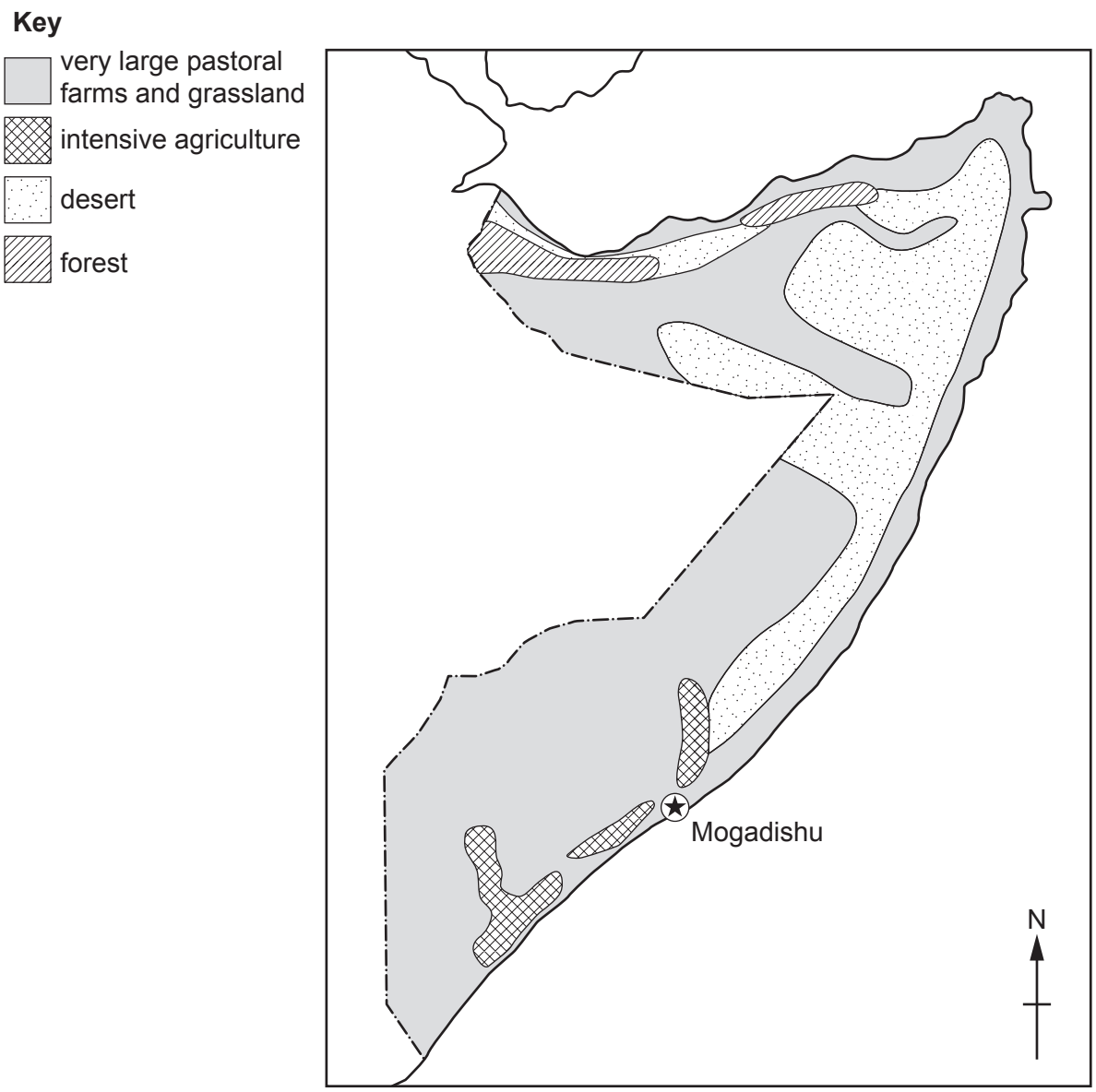
Terrain of Somalia: mainly flat, with hills in the north

Main exports of Somalia: gold, livestock, fish and bananas

The Federal Republic of Somalia, known as Somalia, is a country in Eastern Africa. Somalia has many reserves of minerals and oil that have not been extracted. The country experiences frequent droughts and flooding. 60% of Somalia's population is under 25. Education and jobs are limited for many people.

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1 The map shows the distribution of different types of land and land use in Somalia.



(a) (i) Describe the distribution of land and land use in Somalia.

.....

.....

.....

.....

.....

..... [3]

(ii) Suggest **two** reasons for the distribution of intensive agriculture in Somalia.

1 .....

.....

2 .....

.....
[2]

(iii) Intensive agriculture is often commercial.

State what is meant by commercial agriculture.

.....

..... [1]

(b) The photograph shows a *Spodoptera* moth.



Spodoptera moths eat plants, including crops such as maize. Lizards eat *Spodoptera* moths. Eagles eat lizards. Wolves eat eagles.

(i) Construct the food chain containing three trophic levels which includes *Spodoptera* moths.

..... [2]

(ii) *Spodoptera* moths are primary consumers.

State what is meant by primary consumer.

.....

..... [1]

(iii) Farmers in Somalia want to control the population of *Spodoptera* moths. A scientist has found a fungus that kills *Spodoptera* moths. The fungus does **not** exist naturally in Somalia.

Suggest benefits and limitations of releasing a fungus into Somalia to control the population of *Spodoptera* moths.

benefits .....

.....

.....

limitations .....

.....

.....
[3]

(iv) A farmer notices that some individual plants in the maize crop are **not** affected by *Spodoptera* moths.

Describe how these plants can be used to produce a maize crop that is resistant to *Spodoptera* moths.

.....

.....

.....

.....

.....

.....

..... [4]

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(c) (i) A scientist investigates the population of *Spodoptera* moths in a 1000 m^2 field of maize using a random sampling technique.

Describe how the scientist:

- uses random sampling
- uses a quadrat
- records the data collected
- obtains an estimate for the population of *Spodoptera* moths in the field.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(ii) Estimating the population of *Spodoptera* moths using a quadrat has limitations.

Suggest **two** limitations of sampling *Spodoptera* moths using a quadrat.

1 .....

.....

2 .....

.....

[2]

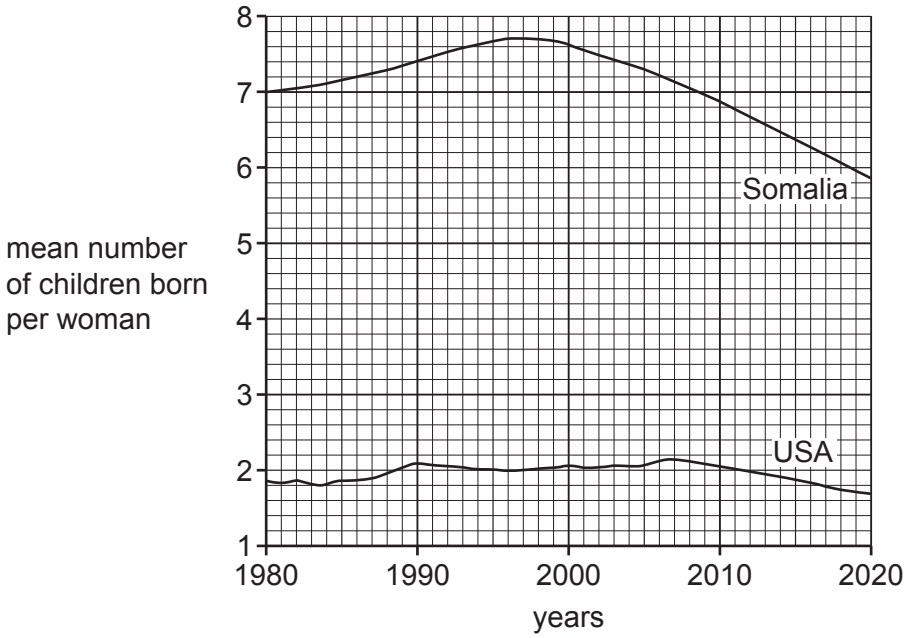
(iii) Suggest **one** other method for estimating the population of *Spodoptera* moths.

.....

..... [1]

[Total: 23]

2 The graph shows the mean number of children born per woman in Somalia and the USA from 1980 to 2020.



(a) (i) Compare the **overall** trends shown in the graph.

.....

.....

.....

..... [2]

(ii) Determine the year with the maximum mean number of children born per woman in Somalia.

year = ... [1]

(iii) Suggest **three** reasons why the mean number of children born per woman is decreasing in many countries.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

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(b) In 2022, it was estimated that 2.8 million people in Somalia could **not** meet their daily food requirements. One strategy to prevent malnutrition is to provide school children with meals. Charities, such as the World Food Programme, provide the food for the meals.

Suggest benefits and limitations of this strategy for preventing malnutrition.

benefits .....

.....

.....

.....

limitations .....

.....

.....

.....

[4]

(c) The government of Somalia wants to find out if there is a difference in access to safe drinking water for people in rural areas compared to urban areas.

A questionnaire was used to survey 200 men.

question	response
1.	
2. Do you have access to safe drinking water?	
3. How far do you have to travel to access safe drinking water?	

(i) The questionnaire is incomplete and will **not** allow a conclusion to be made.

Suggest a suitable question that will allow a conclusion to be made.

.....

..... [1]

(ii) Suggest **two** ways to improve the survey.

1 .....

.....

2 .....

.....

[2]

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(d) The photograph shows a person collecting water from a shallow well dug in a dry river.



(i) State the source of water that is accessed by wells.

..... [1]

(ii) The river is dry because of a drought in Somalia.

Suggest **two** other reasons why the river is dry.

1 .....

.....

2 .....

.....

[2]

(iii) Water collected from shallow wells is an important source of fresh water in Somalia.

Describe **two** limitations of collecting fresh water using the method shown in the photograph.

1 .....

.....

2 .....

.....

[2]

(e) Malaria is a disease that kills more than 2000 people a year in Somalia.

Malaria is spread by mosquitoes infected with the malaria parasite. Mosquitoes are the vector for spreading malaria.

State **two** strategies of vector control for malaria.

1 .....

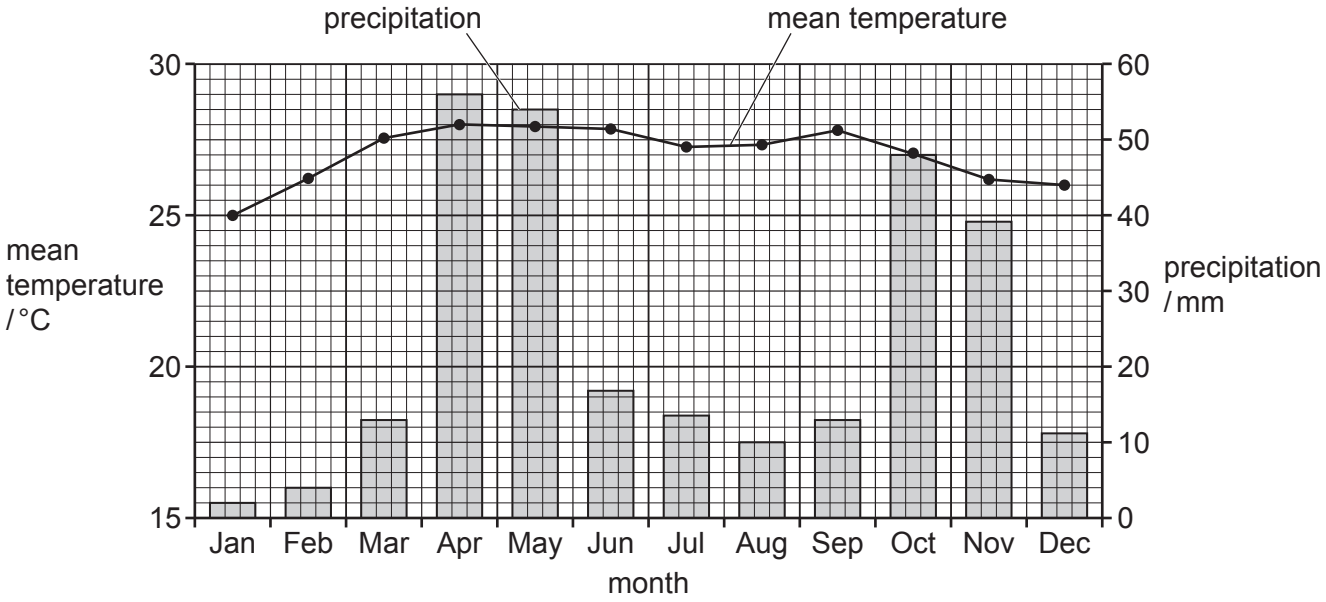
.....

2 .....

.....

[2]

(f) The graph shows climate data for Somalia.



(i) Identify the month with the lowest precipitation.

..... [1]

(ii) Identify the 3-month period with the greatest precipitation.

..... [1]

(iii) Calculate the range of the mean monthly temperature.

..... [1]

(iv) Identify the month when drought conditions are most likely.

Explain your answer.

month .....

explanation .....

.....

[2]

(v) State **two** strategies for managing the impacts of drought.

1 .....

2 .....

[2]

(g) Droughts are a cause of soil erosion.

State **three** strategies for reducing soil erosion.

1 .....

2 .....

3 .....

[3]

[Total: 30]

3 The photograph shows a uranium mine. Uranium is a metal.



(a) (i) State the name of the type of mining shown in the photograph.

..... [1]

(ii) Somalia has deposits of uranium. Mining companies want to extract the uranium.

State **three** factors that the company must consider before deciding to extract the uranium.

1 .....

.....

2 .....

.....

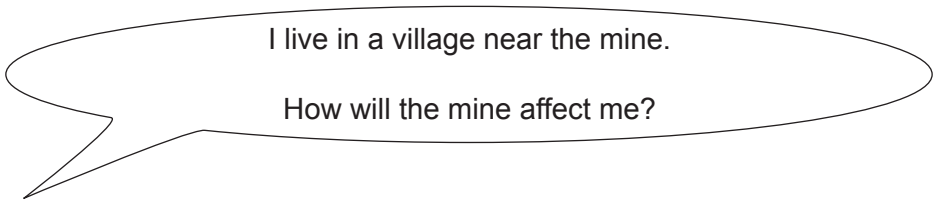
3 .....

.....

[3]

(iii) Some people are concerned about uranium mining in Somalia.

One local person says:



Suggest how the mine will affect people living in a nearby village.

.....

.....

.....

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.....

.....

..... [4]

(iv) The mining company agrees to restore the landscape once the extraction of uranium is finished.

Describe **two** strategies to restore the landscape.

1 .....

.....

.....

2 .....

.....

.....

[4]

(b) Uranium is a nuclear fuel and can be used to generate electricity. In Somalia all of the extracted uranium is exported.

(i) Suggest **three** reasons why Somalia exports all of its uranium and does **not** use it to generate electricity.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(ii) A report stated that in 2022, 36% of people in Somalia had access to electricity.

Calculate the number of people in Somalia in 2022 that did **not** have access to electricity.

number of people = ... [2]

(c) The table shows the percentage of total electricity generated **globally** in 2019 from several different energy resources.

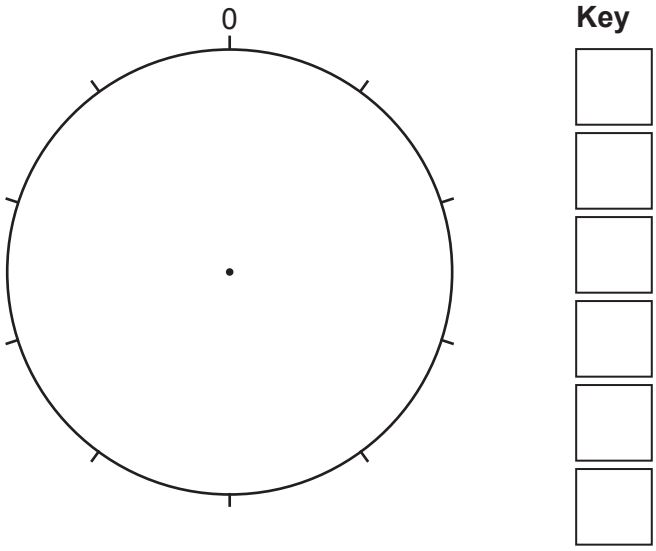
energy resource	percentage of total electricity generated
fossil fuels	70
wind	8
solar	4
hydro-electric	8
nuclear	9
other	

(i) Calculate the percentage of total electricity generated by other energy resources.

percentage = ... [1]

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(ii) Complete the pie chart to show the percentage of total electricity generated globally in 2019 from the different energy resources listed in the table.



[4]

(iii) This table shows the percentage of total electricity generated **in Somalia** in 2019 from the different energy resources.

energy resource	percentage of total electricity generated
fossil fuels	92
wind	2
solar	3
hydro-electric	3

Calculate the difference in the percentage of total electricity generated by non-renewable resources in Somalia compared to the global percentage generated by non-renewable resources.

difference in percentage = ... [1]

(d) The photograph shows a solar power station near Mogadishu. The power station opened in 2020.



(i) State why this solar power station **cannot** generate electricity 24-hours per day.

.....

..... [1]

(ii) Suggest benefits of this solar power station for the people in Mogadishu.

.....

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.....

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.....

.....

..... [3]

[Total: 27]

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