

CANDIDATE  
NAME

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NUMBER

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**ENVIRONMENTAL MANAGEMENT**

**8291/22**

Paper 2 Hydrosphere and Biosphere

**October/November 2018**

**1 hour 30 minutes**

Additional Materials: Answer Booklet/Paper

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.  
Write in dark blue or black pen.  
You may use an HB pencil for any diagrams or graphs.  
Do not use staples, paper clips, glue or correction fluid.  
**DO NOT WRITE IN ANY BARCODES.**

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

**Section A**

Answer **all** questions in this section.  
Write your answers in the spaces provided on the question paper.

**Section B**

Answer **one** question from this section.  
Write your answers on the separate answer paper provided.

At the end of the examination,

1. fasten all separate answer paper securely to the question paper;
2. enter the question number from Section B in the grid.

	For Examiner's Use
<b>Section A</b>	/
1	
2	
<b>Section B</b>	/
<b>Total</b>	

This document consists of **13** printed pages and **3** blank pages.

## Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

- 1 (a) Fig. 1.1 gives information about the sources of nitrogen compounds and phosphorus compounds (nutrients) entering a lake.

source		percentage of total nitrogen compounds	percentage of total phosphorus compounds
sewage		31.5	58.7
urban run-off		5.5	10.0
rural run-off	manured land	9.9	21.5
	other crop land	0.7	3.1
	forest land	0.5	0.3
	pasture	0.7	2.9
rural ground water		42.7	2.3
precipitation onto water		8.5	1.2

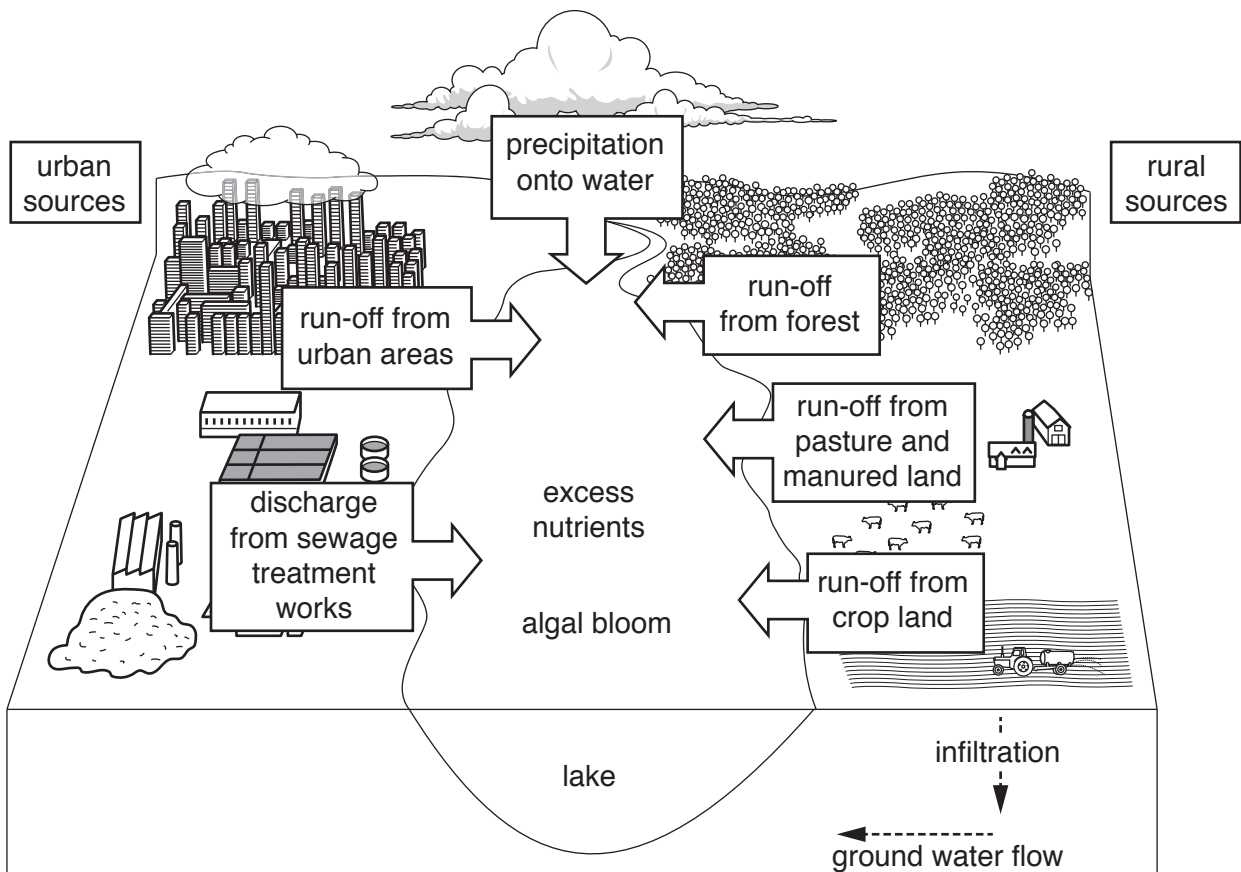


Fig. 1.1

- (i) State the source that contributes the highest percentage of nitrogen compounds to the lake, as shown in the table in Fig. 1.1.

.....[1]

- (ii) Suggest where the nitrogen and phosphorus compounds (nutrients) in the urban run-off shown in Fig. 1.1 originated.

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.....[3]

- (iii) Use Fig. 1.1 to calculate the difference between the total percentage of nitrogen compounds and the total percentage of phosphorus compounds entering the lake from rural run-off.

Show your working.

.....% [2]

- (iv) Explain why there is a high percentage of nitrogen compounds entering the lake through rural ground water, as shown in Fig. 1.1.

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.....[4]





- 2 (a) Fig. 2.1 shows the distribution of the tundra biome and Fig. 2.2 shows the number of polar bears living in this biome.

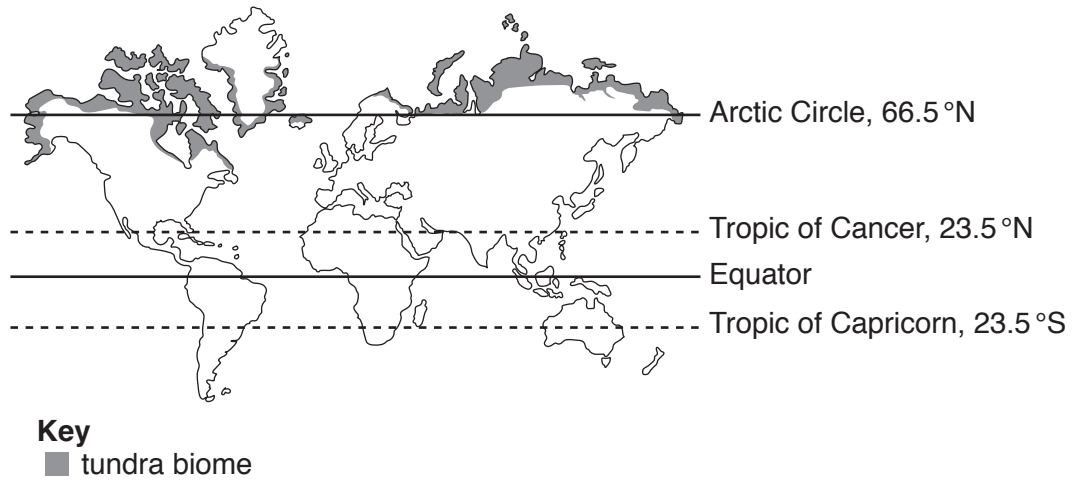


Fig. 2.1

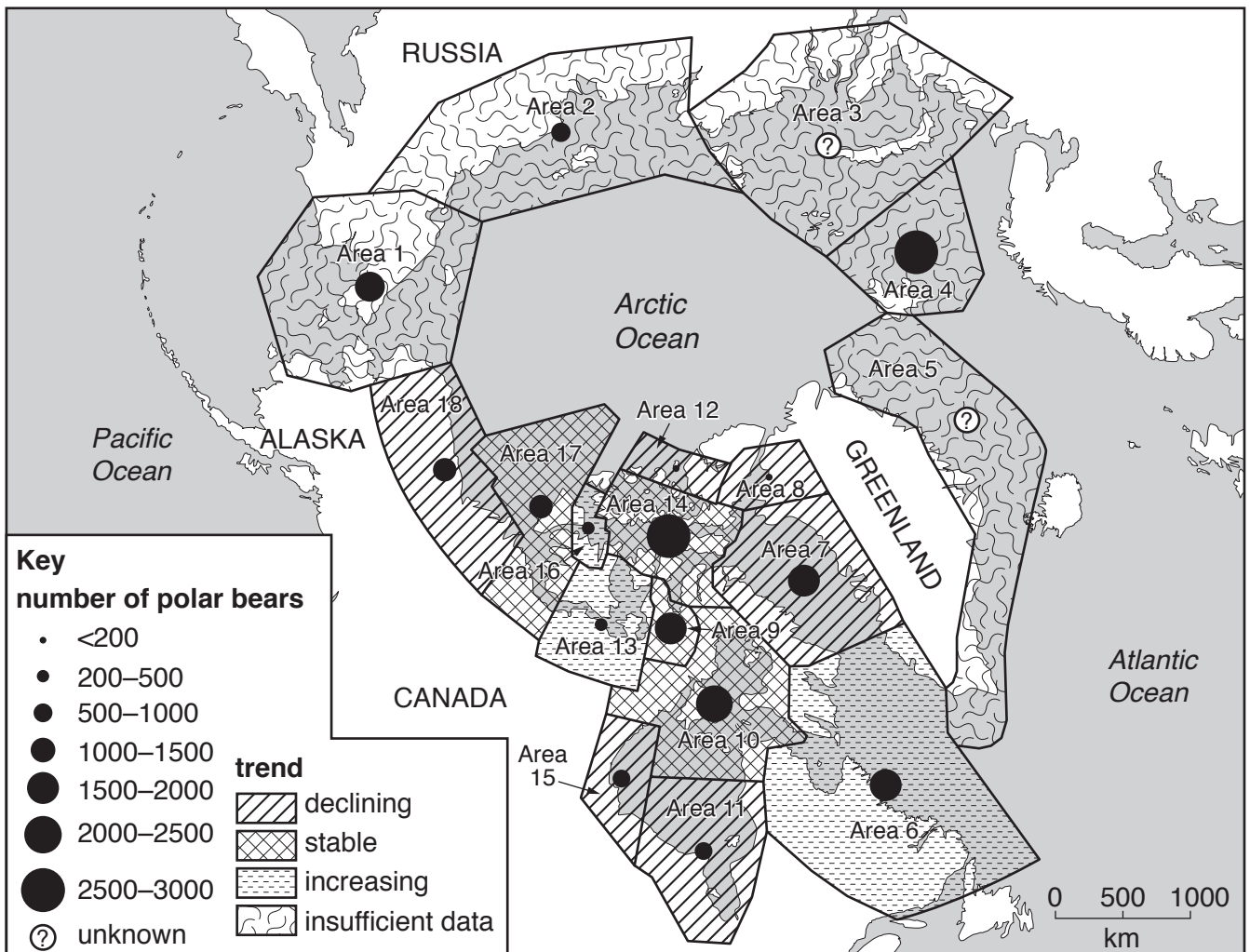


Fig. 2.2

(i) With reference to Fig. 2.1, describe the distribution of the tundra biome.

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..... [2]

(ii) Outline factors that influence the distribution of the tundra biome.

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..... [4]

(iii) With reference to Fig. 2.2, describe the evidence which suggests that the polar bear is at risk of extinction.

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..... [4]

(b) Fig. 2.3 shows part of a food web in the Arctic.

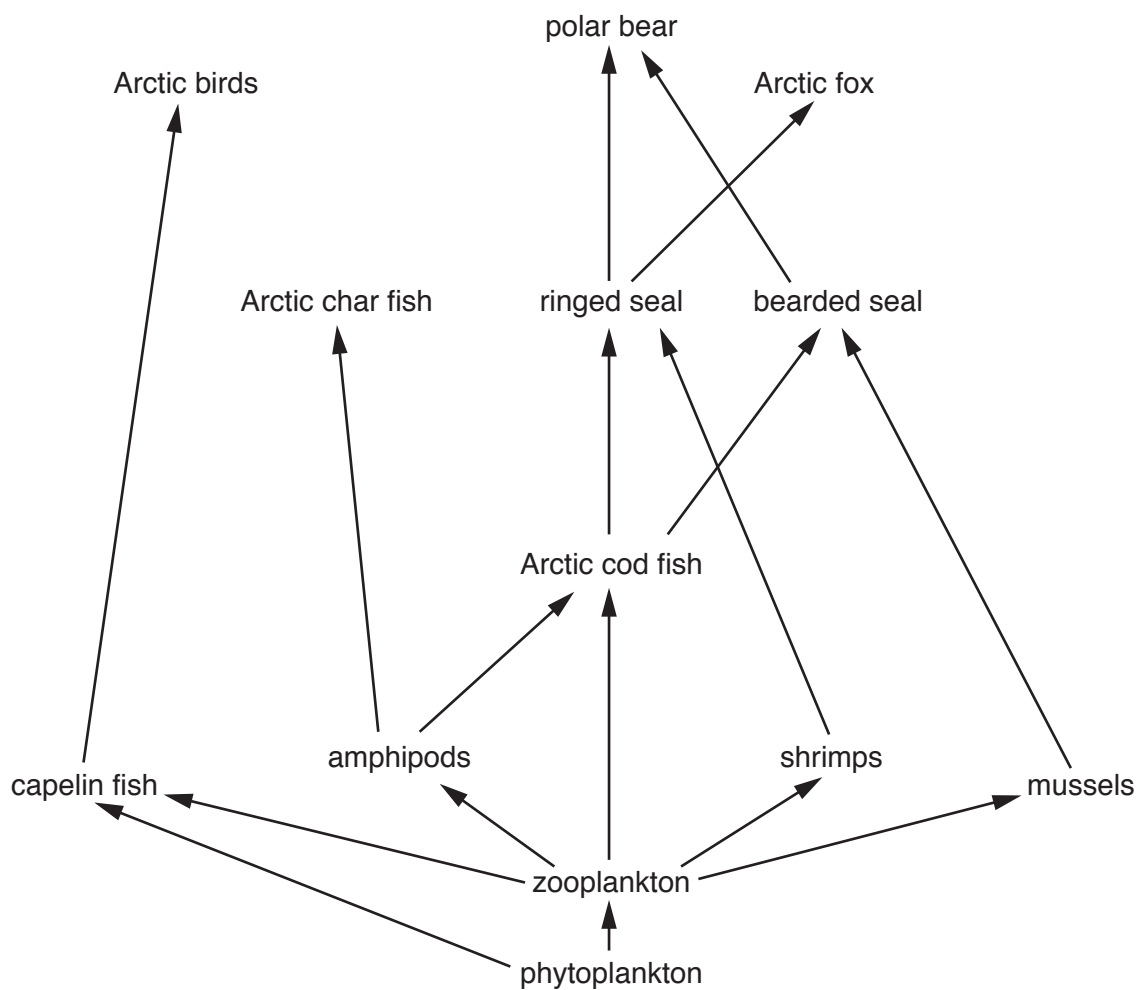


Fig. 2.3

Describe the effects of a decrease in the number of polar bears on the food web shown in Fig. 2.3.

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.....[4]





## Section B

Answer **one** question from this section.

Write your answers on the separate answer paper provided.

- 3 Fig. 3.1 shows information about fresh water availability for selected regions and the contributions made by these regions to the total supply of desalinated water globally.

fresh water availability for selected regions

region	average fresh water availability /m <sup>3</sup> per person per year
Middle East	500
Sub-Saharan Africa	1000
Asia	2970
Europe	4741
South America	7200
North America	13401

percentage contribution made by the selected regions to the total supply of desalinated water globally

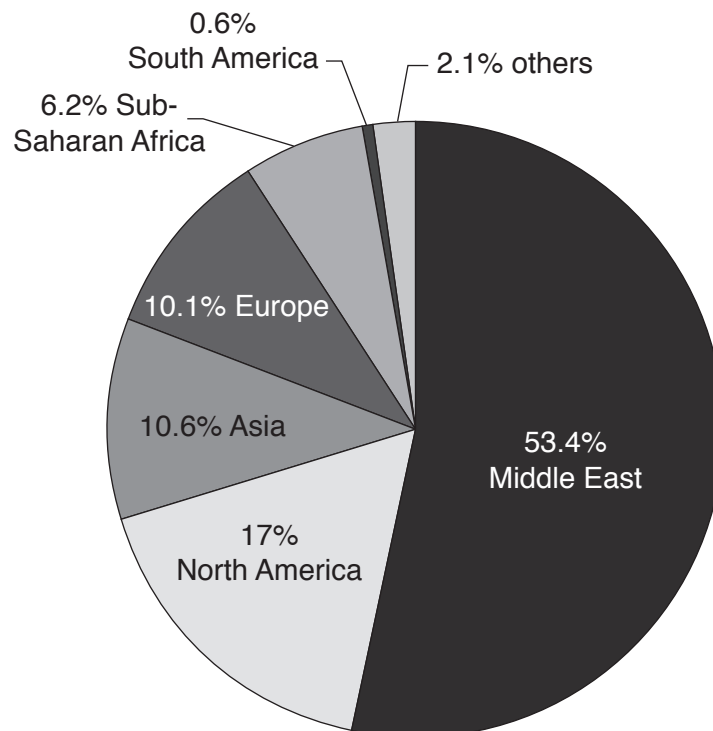


Fig. 3.1

- (a) With reference to Fig. 3.1, suggest reasons for the regional variation in the supply of water by desalination. [10]
- (b) Briefly outline **one** process of desalination. Discuss the advantages and the disadvantages of desalination as a method of supplying fresh water. [30]

[Total: 40]

4 Fig. 4.1 shows global forest reserves by region for three different years.

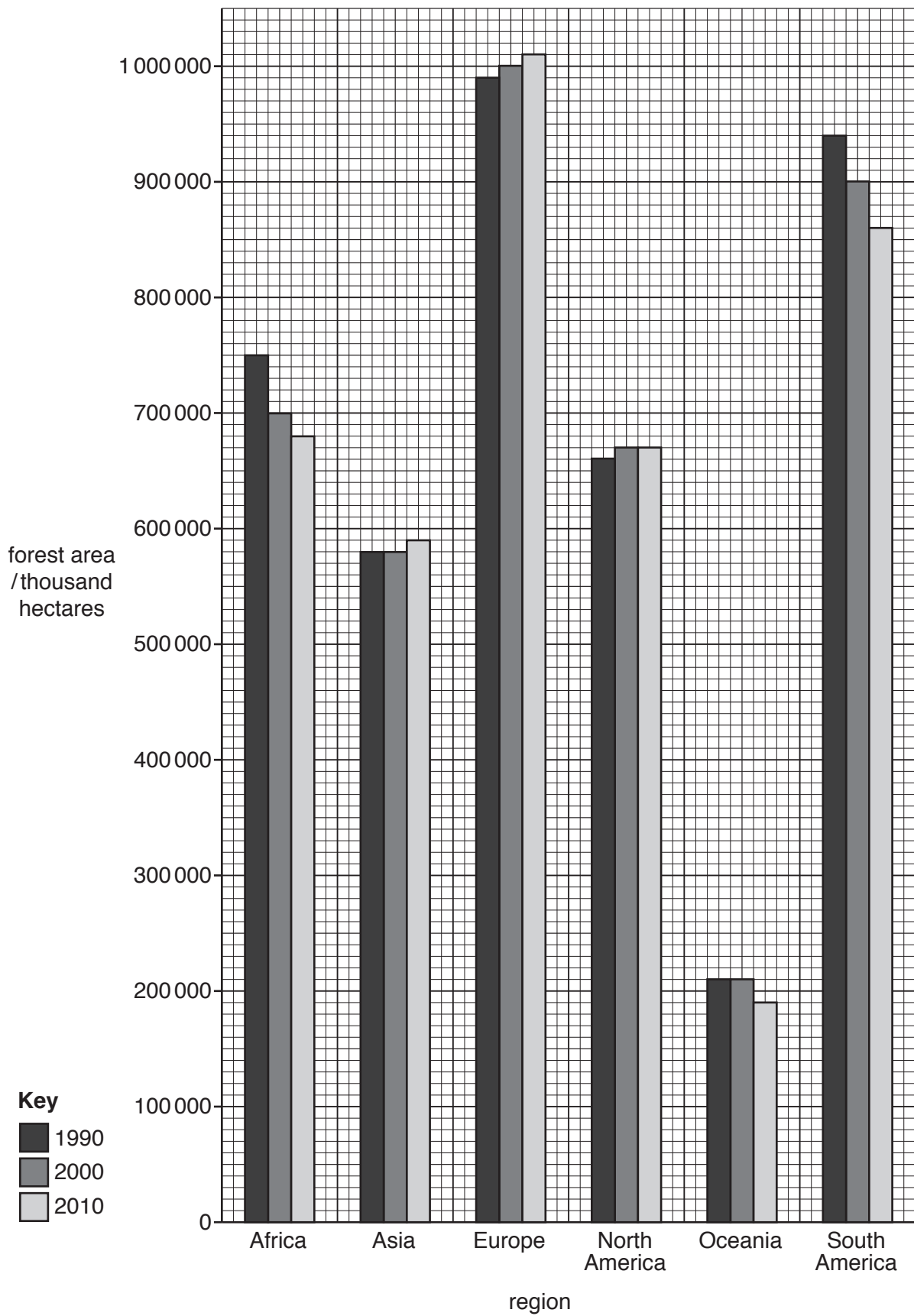
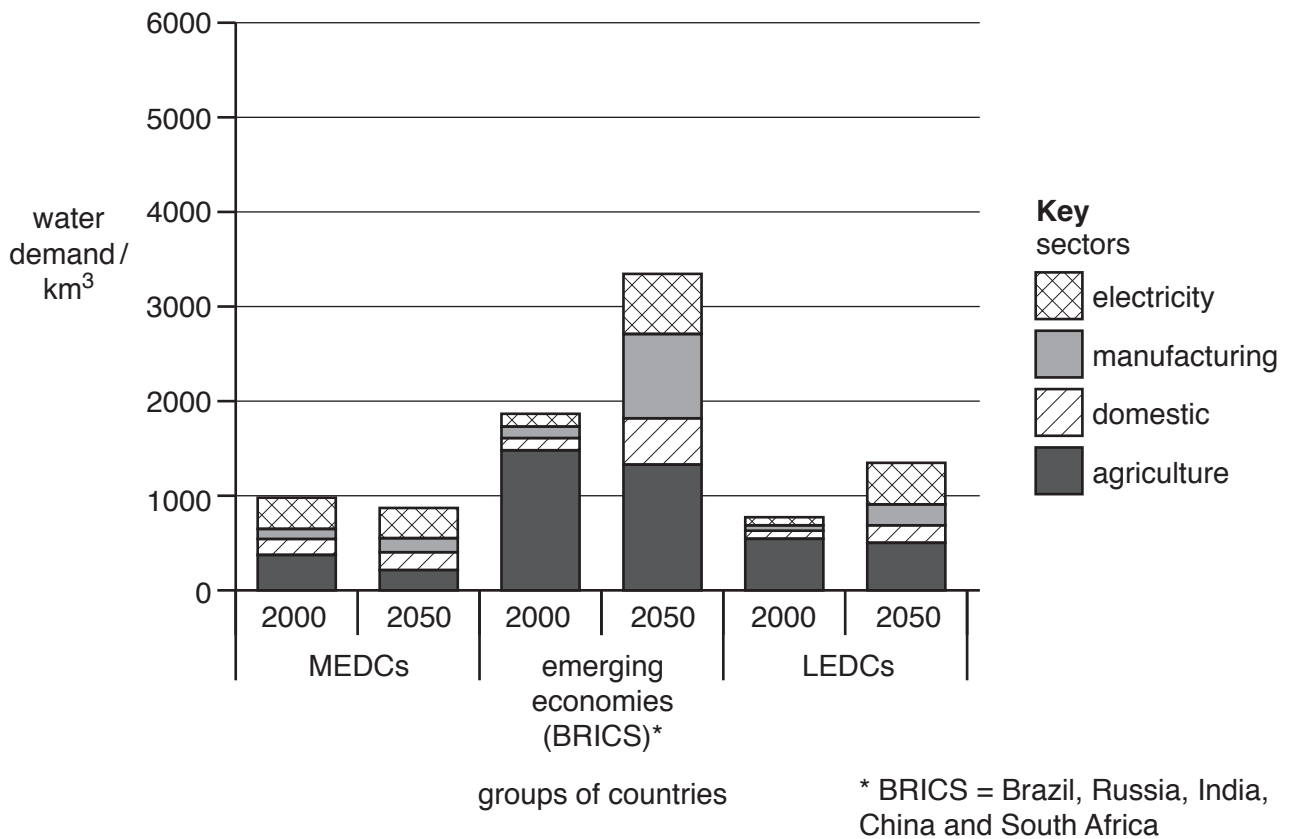


Fig. 4.1

- (a) With reference to Fig. 4.1, compare and contrast the trends in changes to forest reserves globally. Suggest reasons for the trends. [10]
- (b) Assess the effectiveness of methods used in the conservation of a named ecosystem. [30]

[Total: 40]

- 5 Fig. 5.1 shows the water demands of different groups of countries for the year 2000 and the predicted water demands for 2050 by sector.



**Fig. 5.1**

- (a) Compare the water demands of the groups of countries for the year 2000 with those predicted for each group for 2050. Suggest reasons for any increases or decreases in demand. [10]
- (b) With reference to examples, assess the impact of population growth and the growing demand for water on the quality and quantity of natural water supplies. [30]

[Total: 40]



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