

CANDIDATE
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ENVIRONMENTAL MANAGEMENT

8291/21

Paper 2 Hydrosphere and Biosphere

May/June 2017

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
Section A	/
1	
2	
Section B	/
Total	

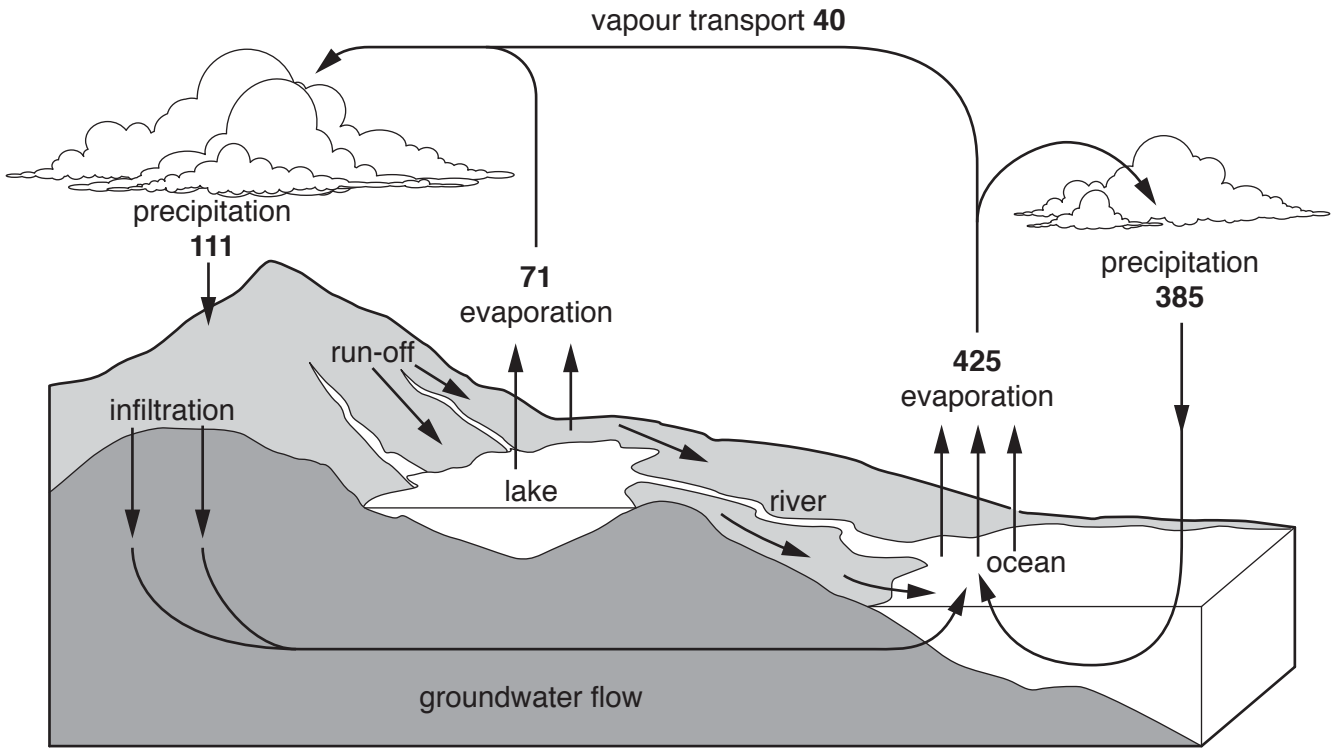
This document consists of **13** printed pages and **3** blank pages.

Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

- 1 (a) Fig. 1.1 is a diagram representing some of the flows and stores of the hydrological cycle.



values are in hundred thousand km³

Fig. 1.1

- (i) State what is meant by the terms *run-off* and *infiltration*.

run-off

.....

infiltration

.....

[2]

(ii) Use Fig. 1.1 to explain why more water evaporates from the ocean than returns to the ocean as precipitation.

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.....[4]

(iii) Describe **one** process, other than evaporation, in which water changes state in the hydrological cycle.

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.....[2]

(b) Fig. 1.2 shows changes in past global sea-levels and predicted global sea-levels. The predicted global sea-levels are based upon climate change models produced in 2000.

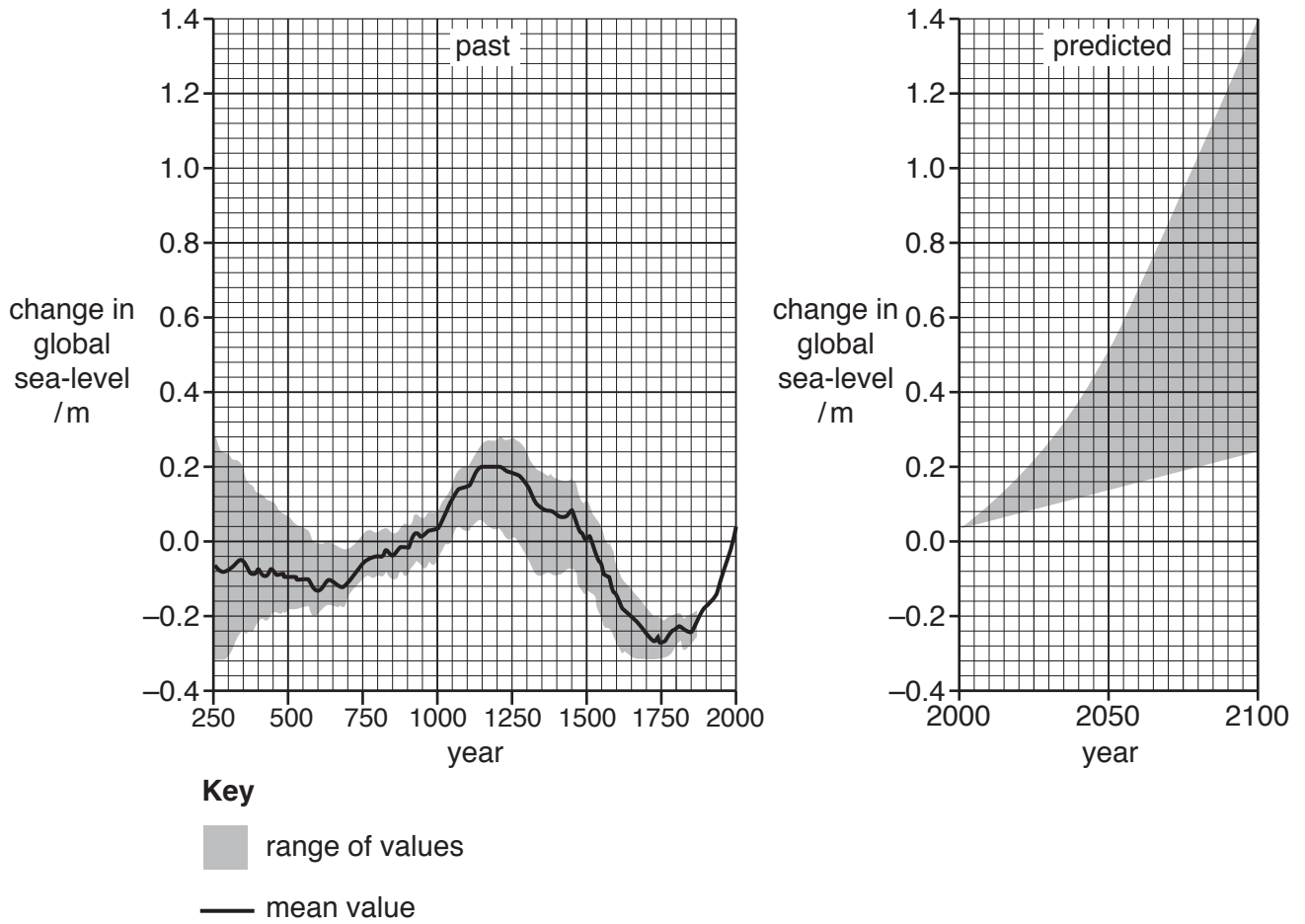


Fig. 1.2

(i) With reference to Fig. 1.2, describe the changes in global sea-levels in the years before 2000.

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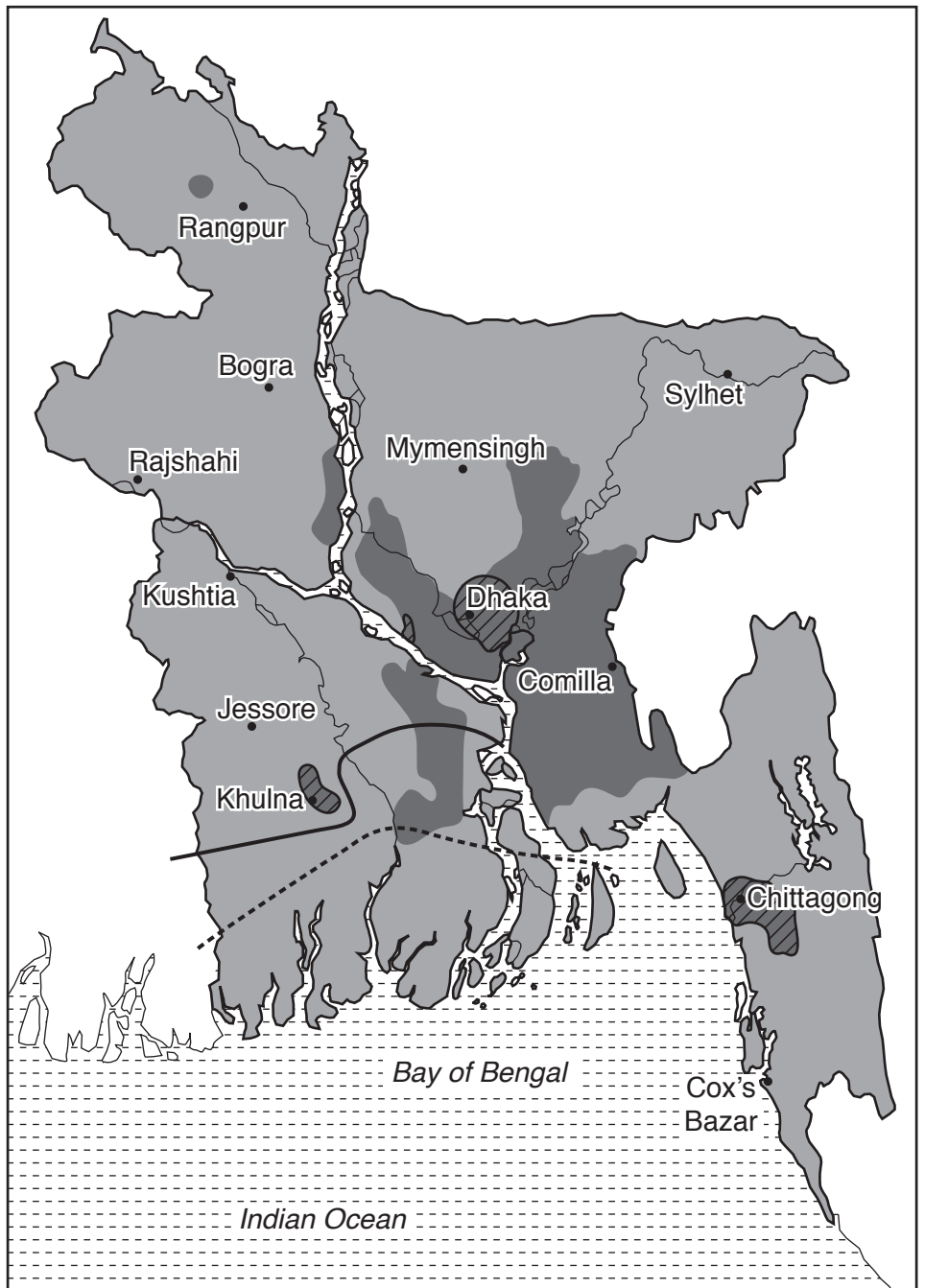
 [2]

(ii) Suggest reasons why data before 1870 has a range of values for the change in global sea-level.










.....

 [2]

Fig. 1.3 shows the area of Bangladesh that would be affected by a long-term rise in global sea-level.



Key

-  very densely populated area
-  densely populated area
-  less densely populated area
-  water
-  other land
-  rivers
-  area inundated by a 1 metre sea-level rise
-  area inundated by a 0.5 metre sea-level rise
-  settlement

0 40 80 120 160
km

Fig. 1.3

2 (a) A lake is an example of an ecosystem.

(i) State what is meant by the term *ecosystem*.

.....
.....[1]

(ii) An ecosystem is influenced by abiotic and biotic factors.

Choose **one** abiotic factor and **one** biotic factor from the list and explain the influence of each factor in the ecosystem.

- | | | | |
|--------------------------|--------------------|---------------------------|-----------------|
| competition | oxygen | predators | minerals |
| food availability | water | carbon dioxide | disease |
| pH | temperature | population density | light |

abiotic factor

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biotic factor

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[6]

(c) Fig. 2.2 shows a photograph of a lake ecosystem and a sketch map of the surrounding area.

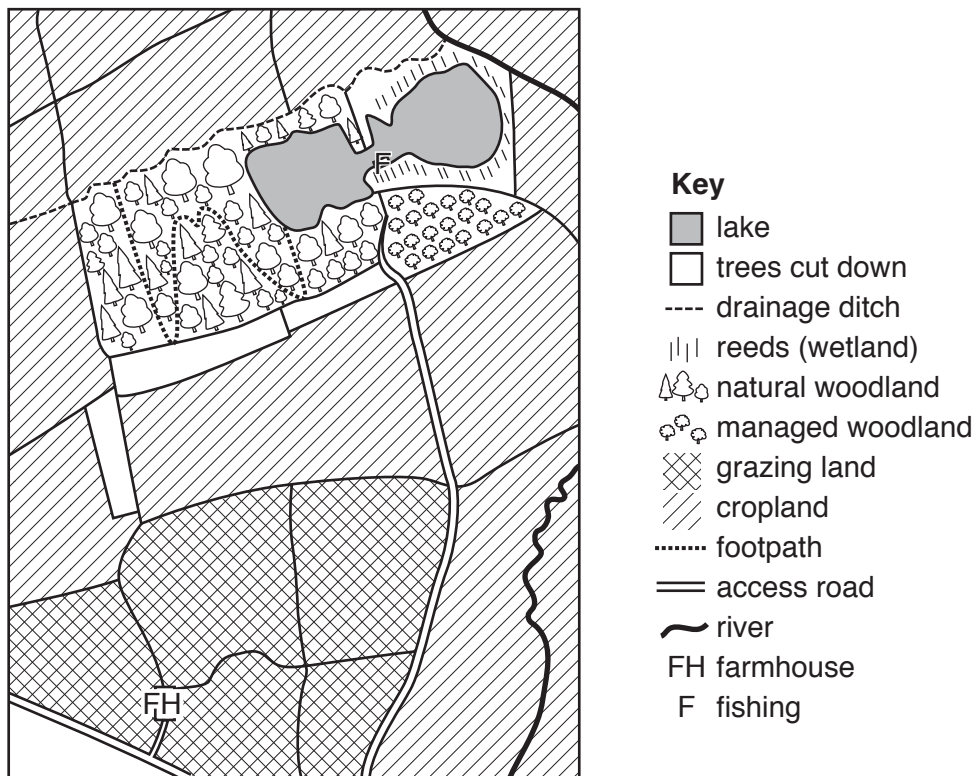


Fig. 2.2

(i) Outline the benefits of conserving a lake ecosystem.

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.....[3]

(ii) Suggest ways in which a lake and surrounding area can be managed for conservation. Refer to Fig. 2.2 in your answer.

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.....[5]

[Total: 20]

Section B

Answer **one** question from this section.

Write your answers on the separate answer paper provided.

- 3 Fig. 3.1 shows trends in global water use by sector.

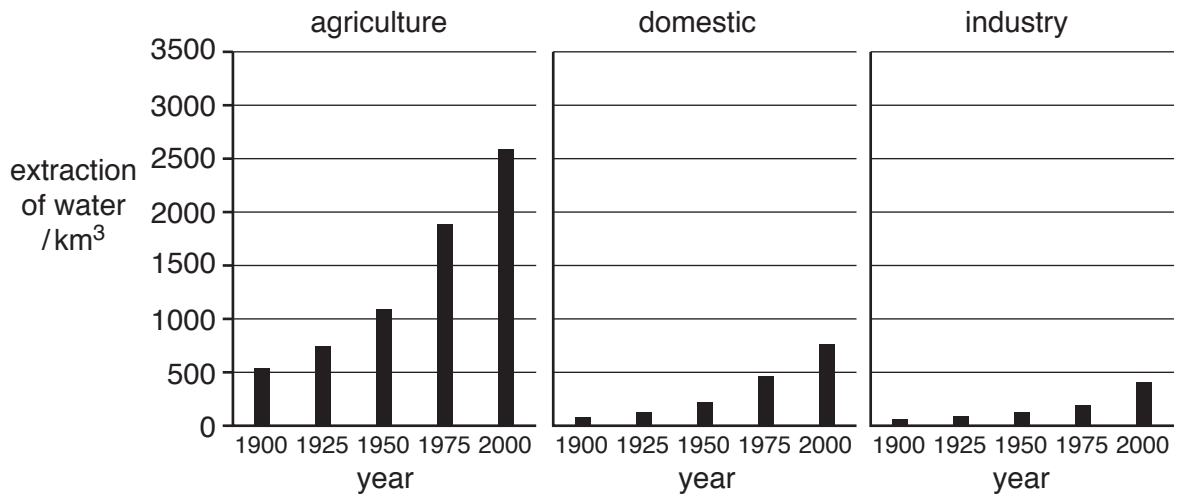


Fig. 3.1

- (a) With reference to Fig. 3.1, describe the trends in the extraction of water by each sector. Suggest reasons for the similarities and differences. [10]
- (b) Assess the impact of an increasing population on water resources in countries at contrasting levels of economic development. [30]

[Total: 40]

- 4 Fig. 4.1 shows changes in the world's biodiversity according to the Living Planet Index from 1970 to 2003. The index compares biodiversity to the 1970 levels.

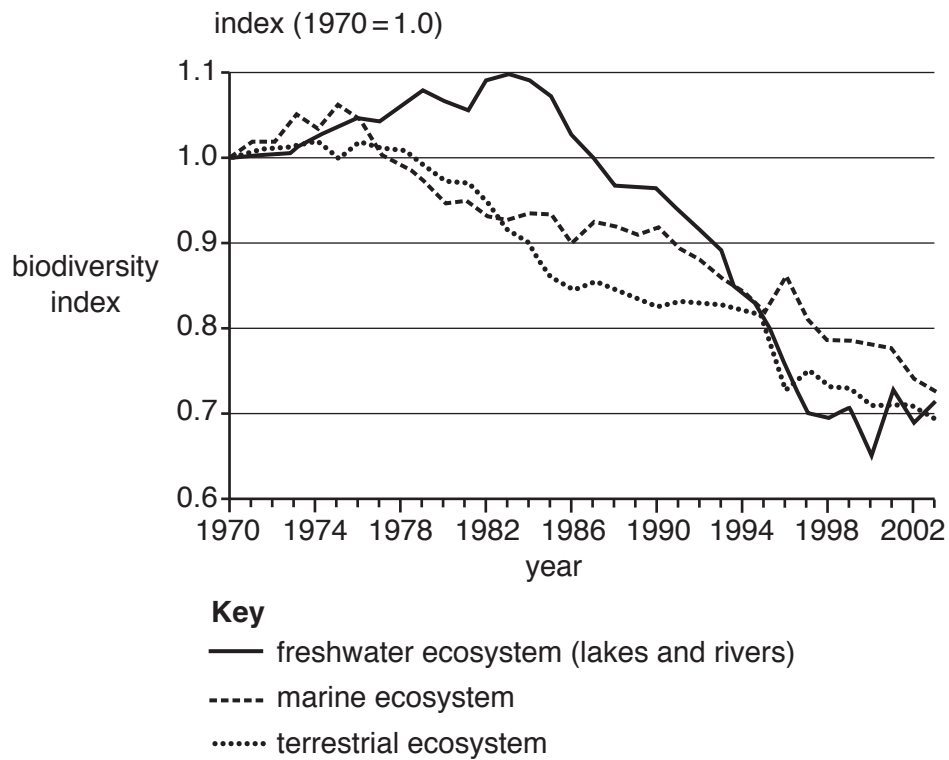


Fig. 4.1

- (a) With reference to Fig. 4.1, describe and explain the trends shown in the biodiversity index of freshwater, marine and terrestrial ecosystems. [10]
- (b) Conservation can involve a 'species approach', which protects species from extinction, or an 'ecosystem approach', which protects populations of species in their natural habitats.

With reference to examples, compare the advantages of both approaches to conservation. [30]

[Total: 40]

5 Fig. 5.1 shows some ways groundwater is polluted.

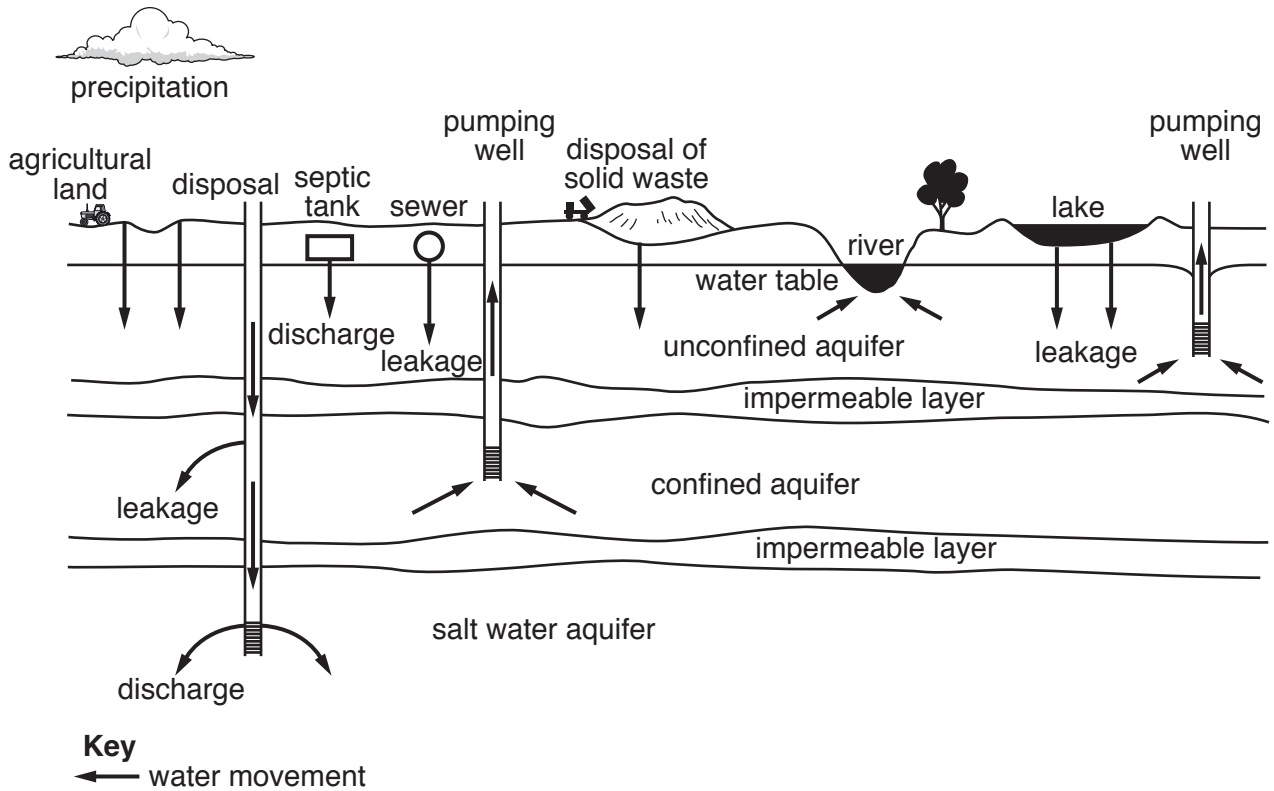


Fig. 5.1

(a) With reference to Fig. 5.1, outline ways in which human activity can lead to the pollution of groundwater stores. [10]

(b) Using examples, evaluate strategies used to manage groundwater stores. [30]

[Total: 40]

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