

CANDIDATE  
NAME

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NUMBER

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**ENVIRONMENTAL MANAGEMENT**

**8291/21**

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>	

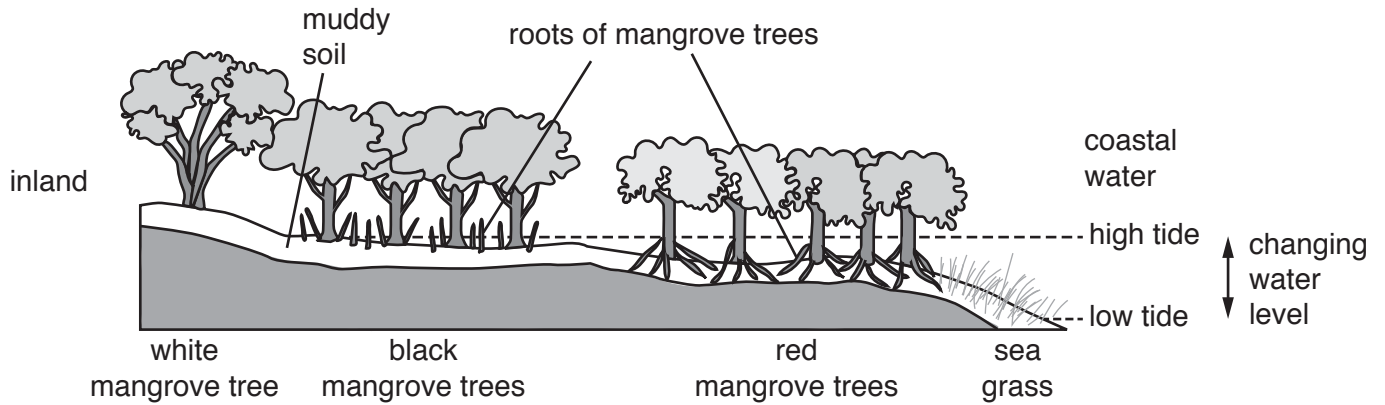
This document consists of **14** printed pages and **2** blank pages.

**Section A**

Answer **all** questions in this section.

Write your answers in the spaces provided.

- 1 (a) Fig. 1.1 is a diagram of a mangrove ecosystem, which is an example of a coastal water ecosystem.



**Fig. 1.1**

- (i) With reference to Fig. 1.1, state **two** components of a mangrove ecosystem.

.....  
.....[2]

- (ii) With reference to Fig. 1.1, suggest **two** effects of the changing water level between high tide and low tide on the mangrove ecosystem.

.....  
.....  
.....  
.....[2]

(b) Table 1.1 shows the estimated global mangrove area between 1980 and 2010.

**Table 1.1**

year	1980	1990	2000	2010
estimated global mangrove area / million ha	18.79	16.93	15.74	15.23

(i) With reference to Table 1.1, describe the changes in estimated global mangrove area between 1980 and 2010.

.....

.....

.....

.....[2]

(ii) Using the data in Table 1.1, calculate the difference in estimated global mangrove area between 1980 and 2010 as a percentage.

Show your working.

.....%

[2]

(iii) Explain reasons why coastal water ecosystems, such as mangrove ecosystems, are at risk.

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

(c) Fig. 1.2 shows restoration of a mangrove ecosystem.



**Fig. 1.2**

(i) With reference to Fig. 1.2, briefly explain what is meant by ecosystem restoration.

.....  
.....  
.....  
.....[2]

(ii) Briefly explain **two** benefits of conserving coastal water ecosystems, such as mangrove ecosystems.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....[4]

(iii) Suggest **one** benefit of community involvement in conservation of ecosystems.

.....  
.....  
.....  
..... [2]

[Total: 20]

2 (a) Fig. 2.1 shows two types of aquifer.

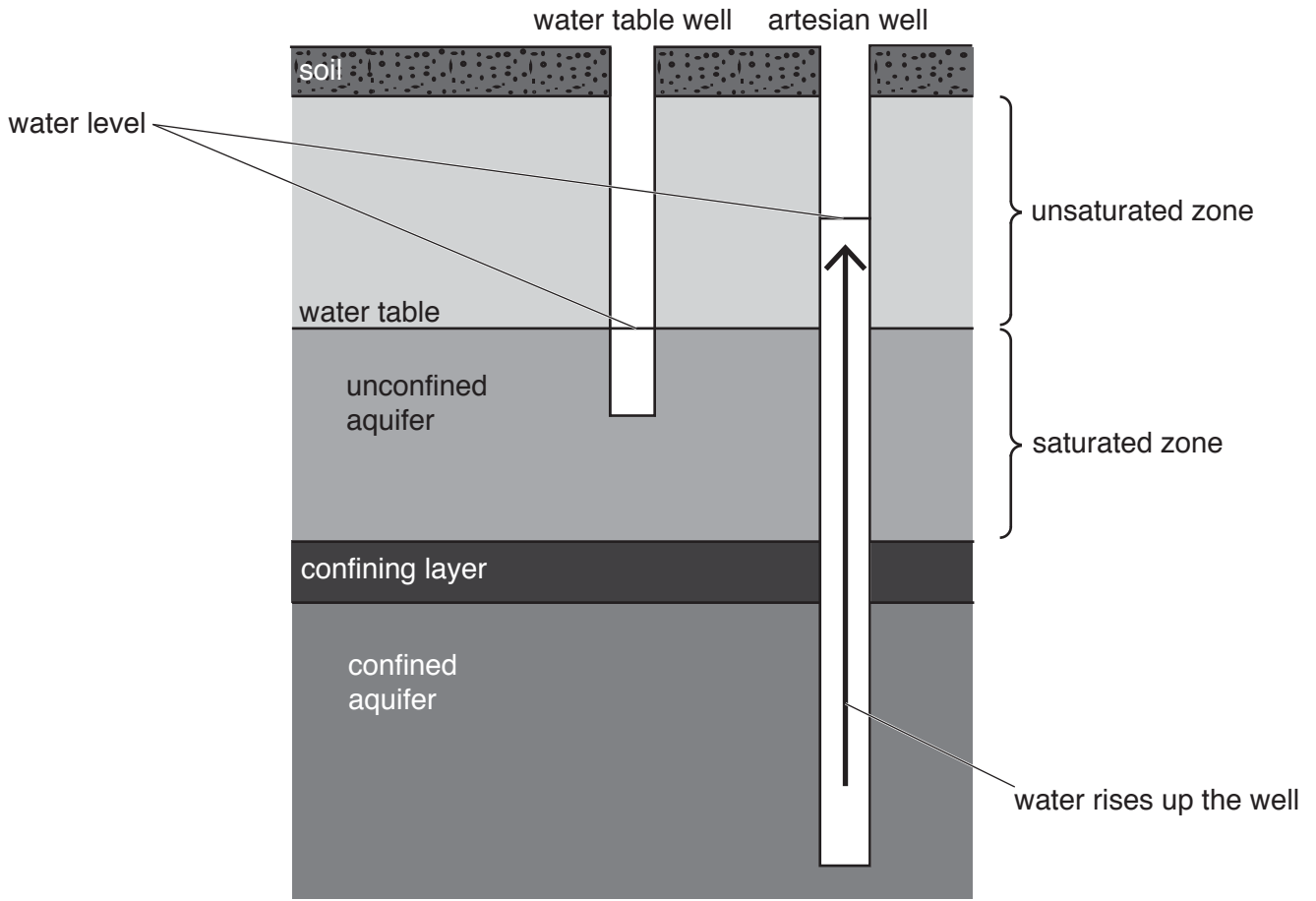


Fig. 2.1

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

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

(ii) With reference to Fig. 2.1, describe the characteristics of the two types of aquifer.

.....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....  
 ..... [4]



- (b) Fig. 2.2 shows the extent and the variation in thickness of the saturated zone of the Ogallala Aquifer in some states of North America.

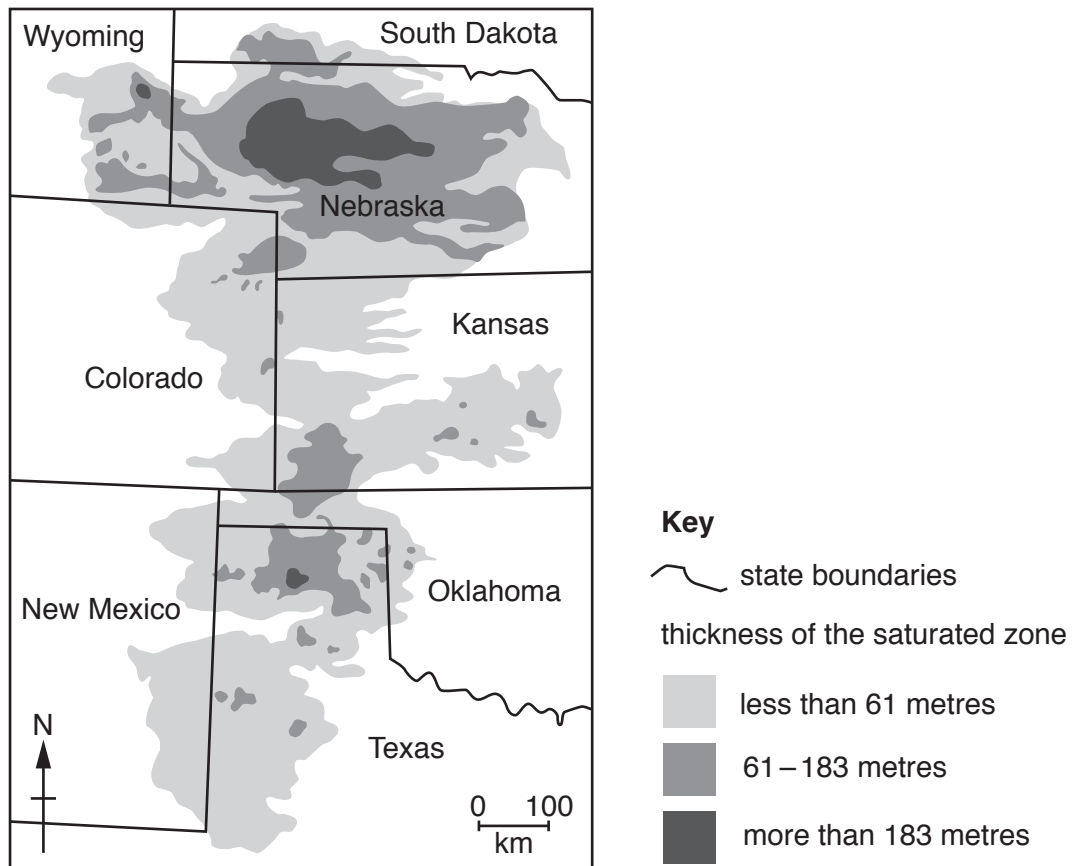


Fig. 2.2





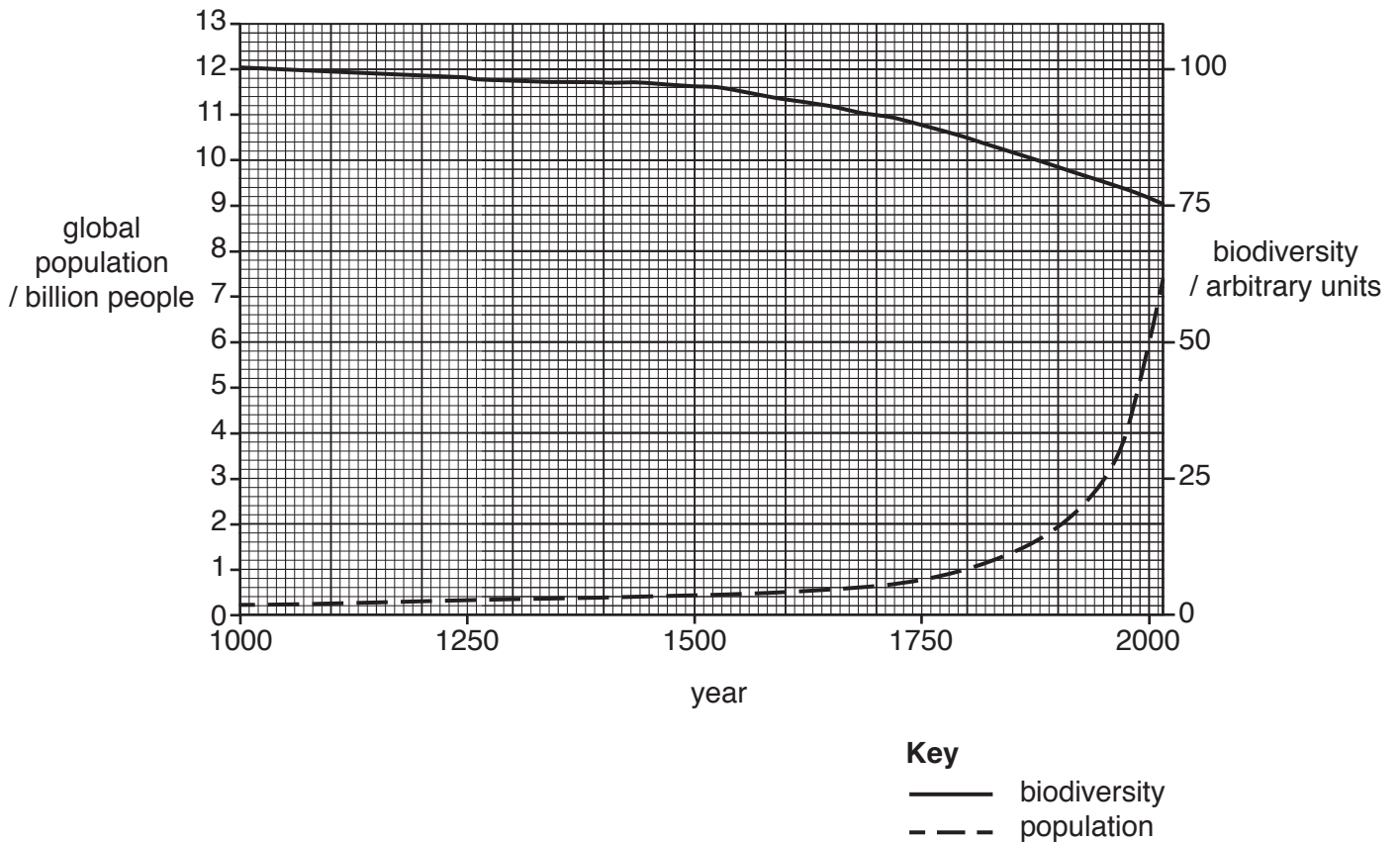


## Section B

Answer **one** question from this section.

Write your answers on the separate answer paper provided.

- 3 Fig. 3.1 shows global human population and estimated biodiversity from the year 1000 until 2015.



**Fig. 3.1**

- (a) Describe the relationship between the global human population and biodiversity shown in Fig. 3.1. Suggest reasons for this relationship. [10]
- (b) Assess to what extent humans can reduce the loss of biodiversity and provide resources for an increasing human population. Refer to examples in your answer. [30]

[Total: 40]

4 Fig. 4.1 shows the changes in the extent of the Aral Sea between 1957 and 2015.

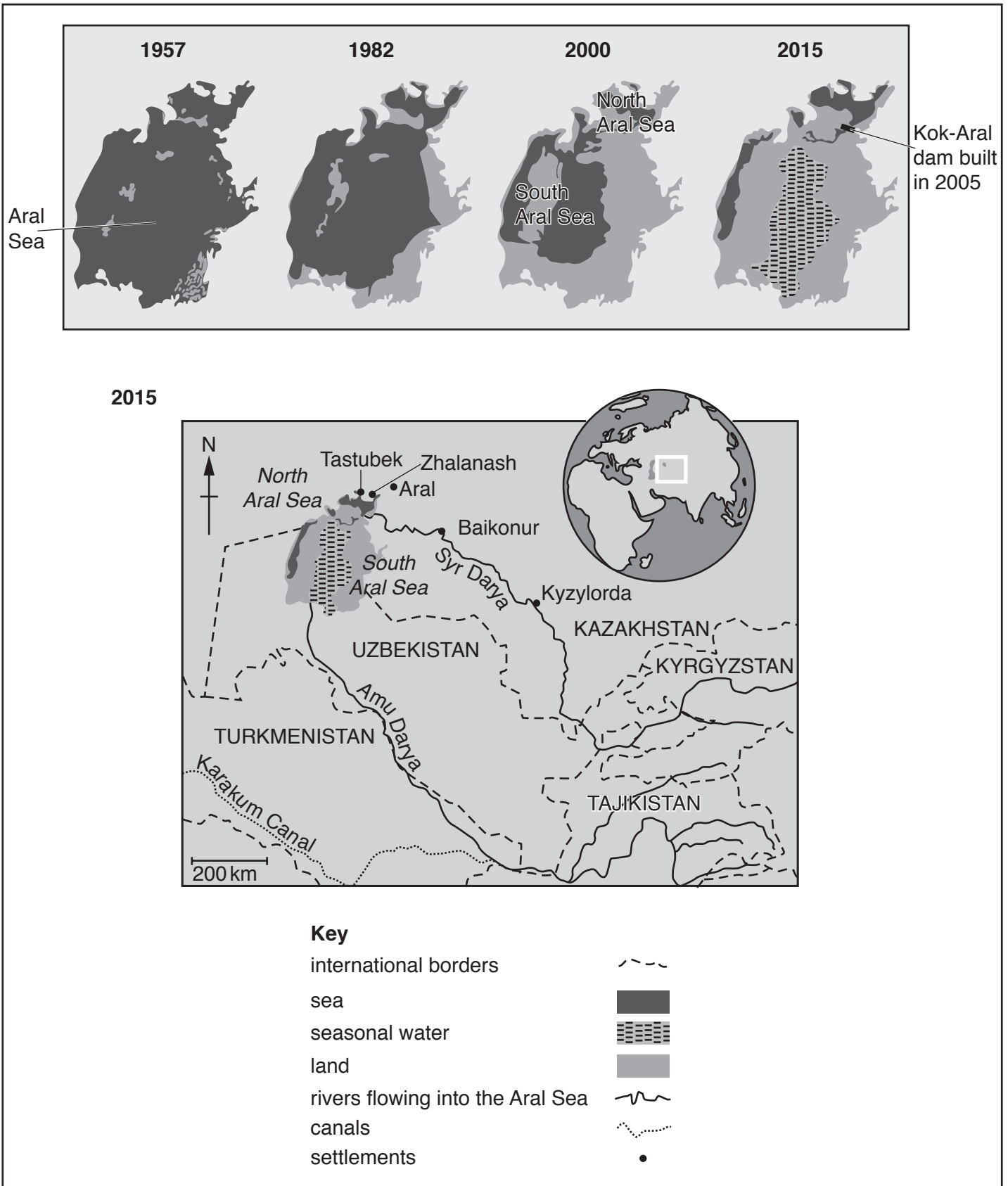


Fig. 4.1

- (a) With reference to Fig. 4.1, describe suggested reasons for the changes in the extent of the Aral Sea between 1957 and 2015. [10]
- (b) Assess strategies which can safeguard a country's water supply. [30]

[Total: 40]

5 Fig. 5.1 shows the numbers of two species of rhinoceros in South Africa between 1960 and 2010.

Rhinoceros species are on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species.

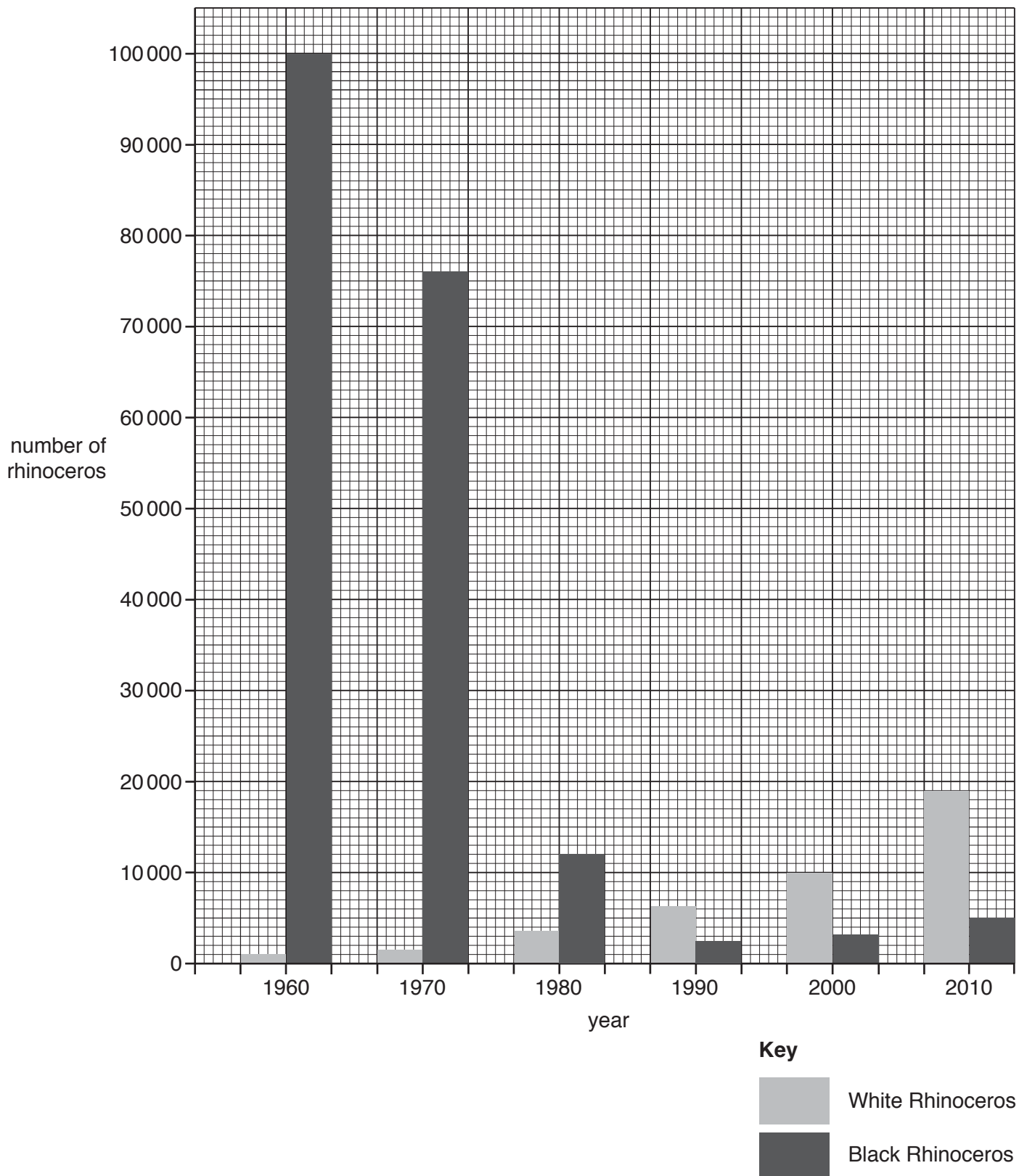


Fig. 5.1

- (a) Describe the changes in the numbers of rhinoceros between 1960 and 2010, shown in Fig. 5.1, and suggest reasons for these changes. [10]
- (b) 'Conservation of ecosystems is more successfully achieved through local action rather than through international protocols.' With reference to examples, assess to what extent this statement is true. [30]

[Total: 40]

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