

CANDIDATE  
NAME

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CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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**ENVIRONMENTAL MANAGEMENT**

**5014/12**

Paper 1

**October/November 2014**

**2 hours 15 minutes**

Candidates answer on the Question Paper.

Additional Materials: Ruler

**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.**

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.

Write your answers in the spaces provided on the Question Paper.

All questions in Section A carry 10 marks.

Both questions in Section B carry 40 marks.

At the end of the examination, fasten all your work securely together.

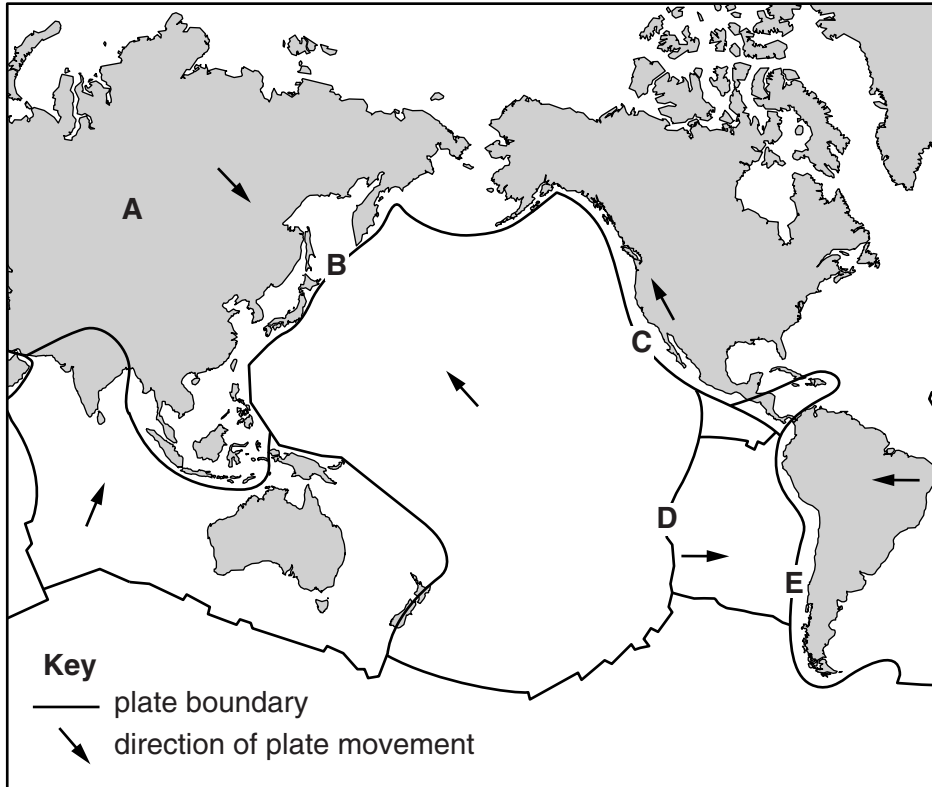
The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **26** printed pages and **2** blank pages.

## Section A

Answer **all** the questions.

- 1 (a) Look at the map of part of the world's tectonic plates. Use the map to answer the questions that follow.



In the table, write **one** letter from the map to show where each of the following is found. You may use each letter more than once.

feature	letter location on map
plates moving towards each other	
plates moving apart	
plates sliding past each other	
a plate margin where fold mountains form	
a place where earthquakes are unlikely to occur	
a place where a plate is sinking beneath another plate	

[6]

(b) Explain:

(i) why igneous rocks are found at plate margins

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

(ii) **one** reason why metamorphic rocks are formed next to igneous rocks

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

(iii) why geothermal energy is available near some plate margins

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

[Total: 10]

- 2 (a) The pie graphs below show information about fishing activity in the world's marine fisheries in 2000 and 2009.



- (i) Use the information in the table to complete the pie graph for 2009.

fishing activity	percentage
fully fished	56
overfished	30
under-fished	14

[2]

- (ii) Compare the percentages of the fisheries that were under-fished in 2009 with 2000.

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

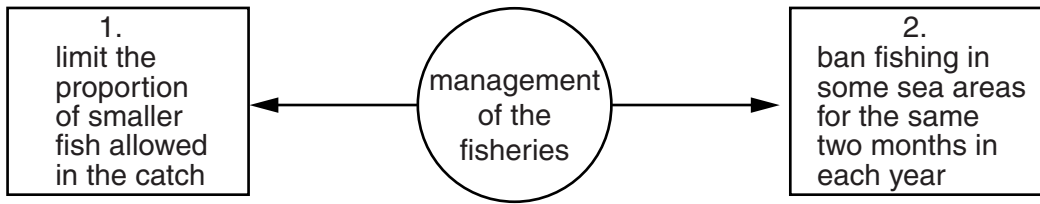
- (iii) What percentage of the world's fisheries in 2009 had no possibility of giving an increased fish catch in the near future?

..... % [1]

(iv) Explain why the changes in fishing activity shown in the pie graphs are thought to be a serious problem.

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

(b) China, the country with the biggest fish catch, has introduced measures to reduce problems caused by overfishing. Two of them are shown below:



(i) Suggest how each of these measures could increase the number of fish in the seas.

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

(ii) Describe **two** problems of using these measures.

1 .....

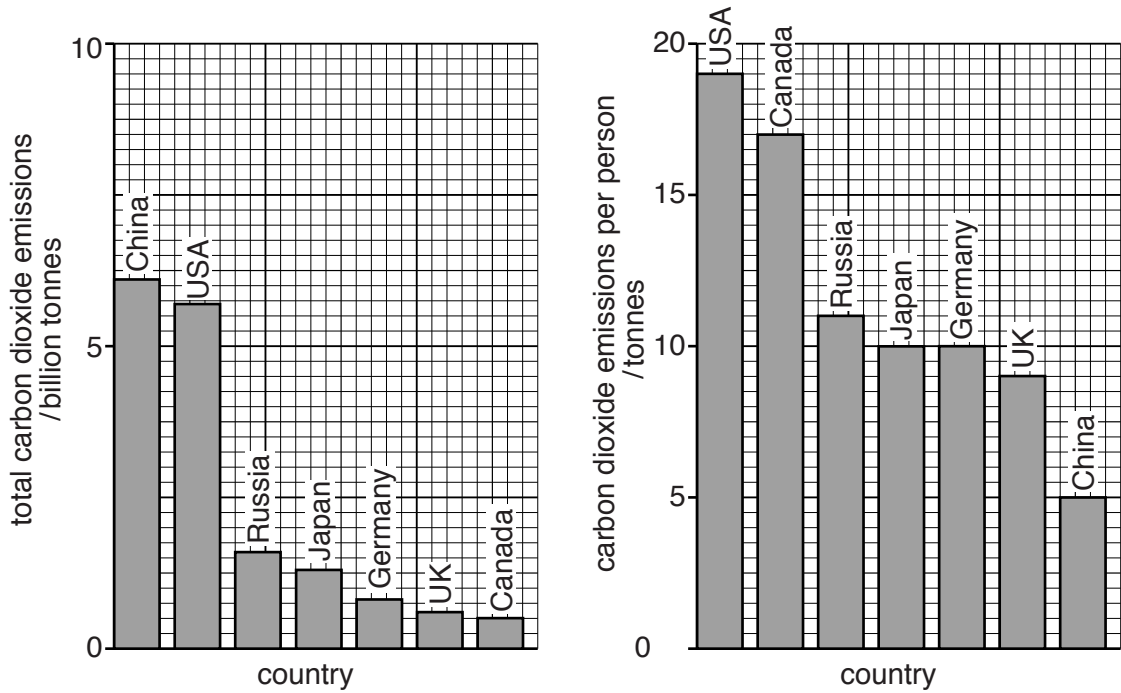
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2 .....

..... [2]

[Total: 10]

- 3 (a) Look at the bar graphs which show the countries that have the highest carbon dioxide emissions both in total and per person in the country.



- (i) Name a country with a high total emission of carbon dioxide and a high amount per person.

..... [1]

- (ii) Name a country with a high total emission of carbon dioxide but a low amount per person.

..... [1]

- (iii) Name a country with a low total emission of carbon dioxide but one of the highest amounts per person.

..... [1]

- (b) Suggest why there are differences between the order of countries for total amounts of carbon dioxide emissions and the amount per person.

.....

.....

.....

.....

.....

.....

..... [3]

(c) Explain why the amount of each of the following is **not** increasing in the atmosphere.

(i) CFCs

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

(ii) lead oxides

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

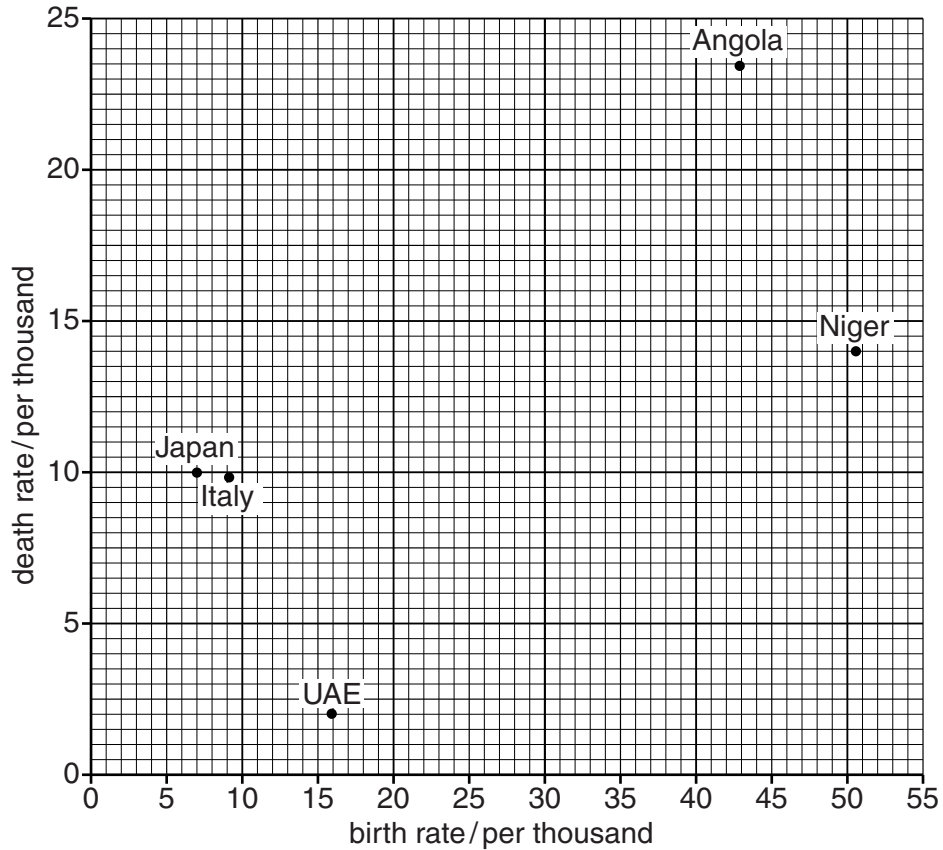
[Total: 10]

- 4 (a) State how the natural population growth of humans is calculated.

..... [1]

- (b) Look at the scatter graph of birth and death rates of selected countries in 2011.

Both values can be read from the point where the plot for the country is. For example, Japan has a death rate of 10 per thousand and a birth rate of 7 per thousand.



- (i) Name the country with the highest birth rate.

..... [1]

- (ii) Name the country with the highest death rate.

..... [1]

- (iii) Name the country with the highest rate of natural population growth.

..... [1]



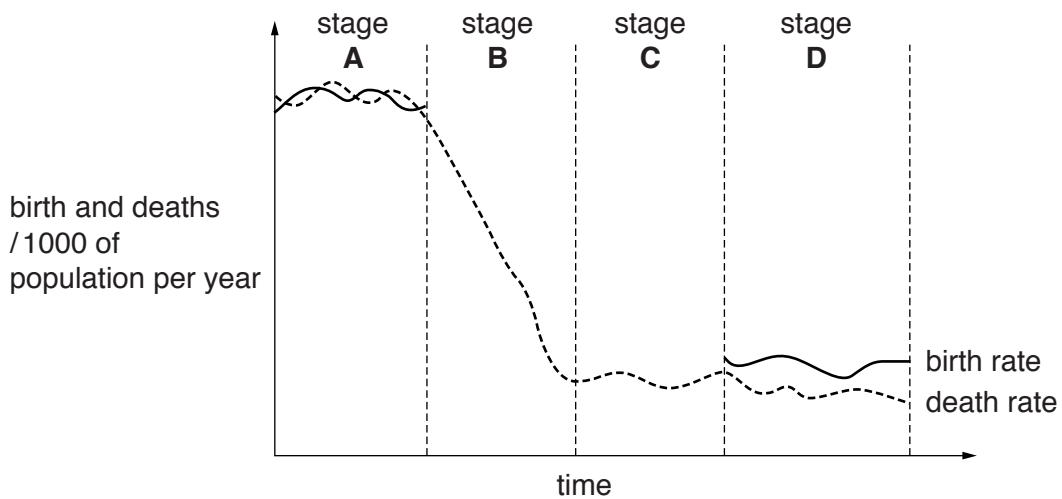
(c) (i) How have death rates changed over time in most countries?

..... [1]

(ii) Suggest reasons why there can be sudden small increases in death rates in some countries.

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..... [3]

(d) The diagram shows part of the birth rate curve on a demographic transition model.



On the diagram, complete the missing parts of the birth rate curve in stages B and C. [2]

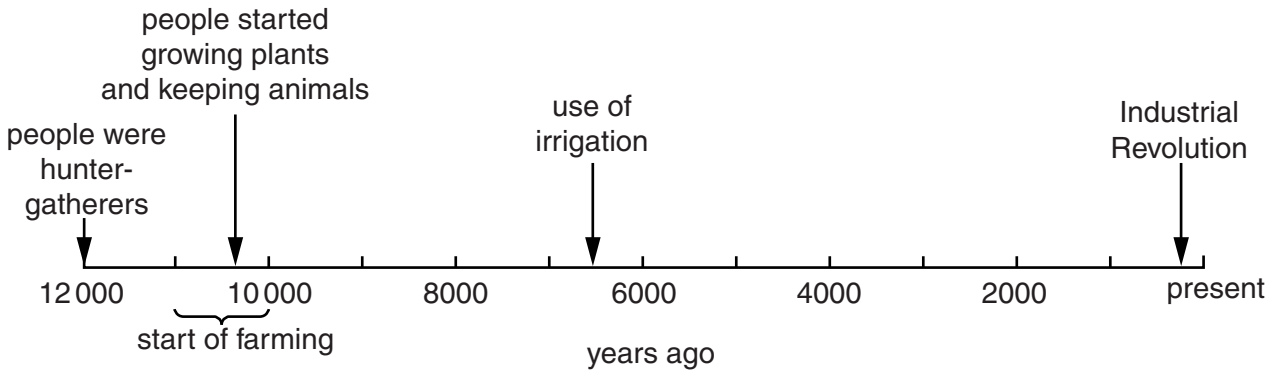
[Total: 10]

Section B

Answer **both** questions.

- 5 (a) Look at the timeline below, showing when major changes in the human way of life occurred.

timeline for major changes in human way of life



- (i) Farming (agriculture) began between 10 000 and 11 000 years ago. State and explain the evidence from the timeline for this.

.....  
.....  
.....  
.....  
..... [3]

- (ii) Before farming began, humans were hunter-gatherers. What does the term 'hunter-gatherer' mean?

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

(iii) Today, there are only a few remaining people who still make their living as hunter-gatherers. Most of them are found in one of these two environments:

- tropical rainforests, such as in the middle of the Amazon Basin
- tundra lands of the Arctic, in the north of North America and Europe

Explain why:

this way of life has survived in these two environments

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only a small total number of people in the world still follow this way of life

.....

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[4]

(iv) Methods of irrigation were first used in the area known as the Fertile Crescent between the Tigris and Euphrates rivers (in present day Iraq in the Middle East).

Knowledge of irrigation spread from here to the Nile Valley (in ancient Egypt), where the methods were improved.

Suggest why the invention of irrigation led to a great increase in food output.

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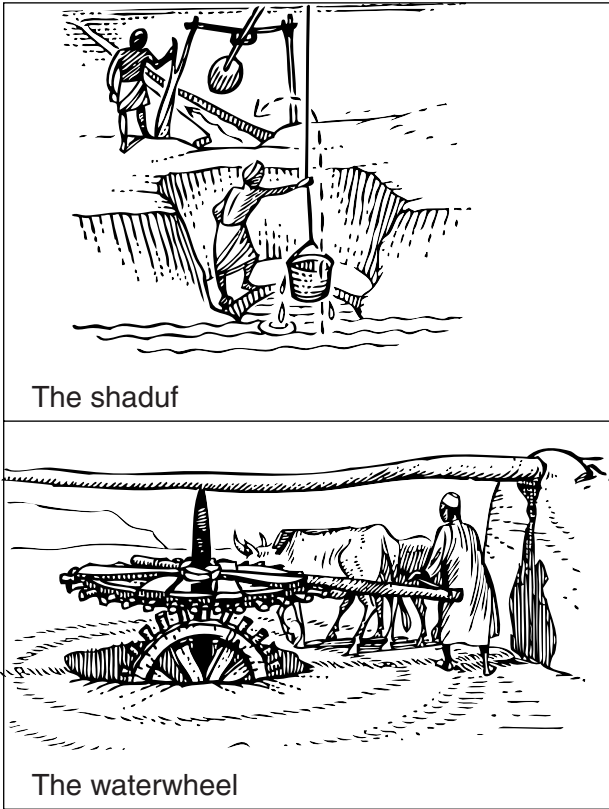
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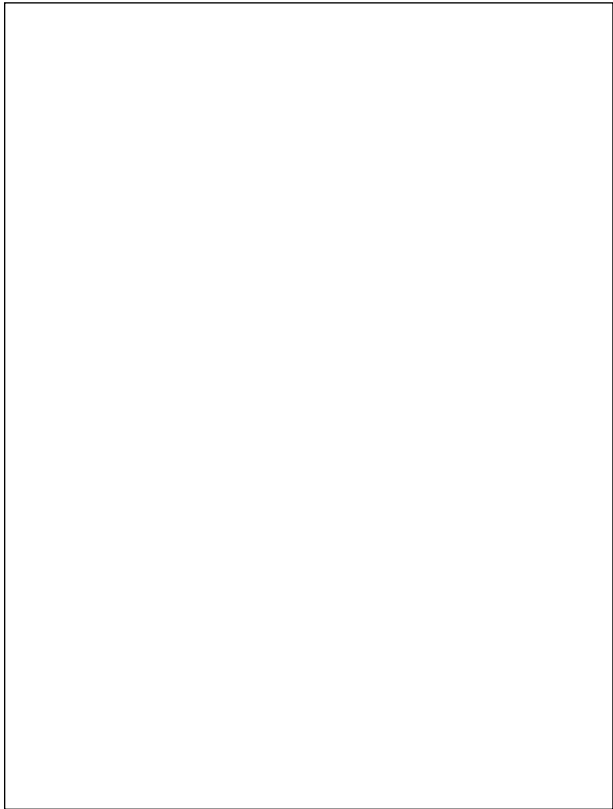
[2]

- (v) The sketches in box A show irrigation methods invented thousands of years ago, which are still in use in some places today.

box A  
old methods of irrigation



box B  
modern methods of irrigation



In box B, state the name of one modern method of irrigation and draw a labelled sketch to show how it works. [3]

- (vi) State two main advantages for farmers of modern methods of irrigation, such as the one you have drawn in box B, compared with old methods, such as those shown in box A.

1 .....

.....

2 .....

.....

[2]

- (vii) Which is more environmentally sustainable – old methods of irrigation or modern methods?  
Explain your answer.

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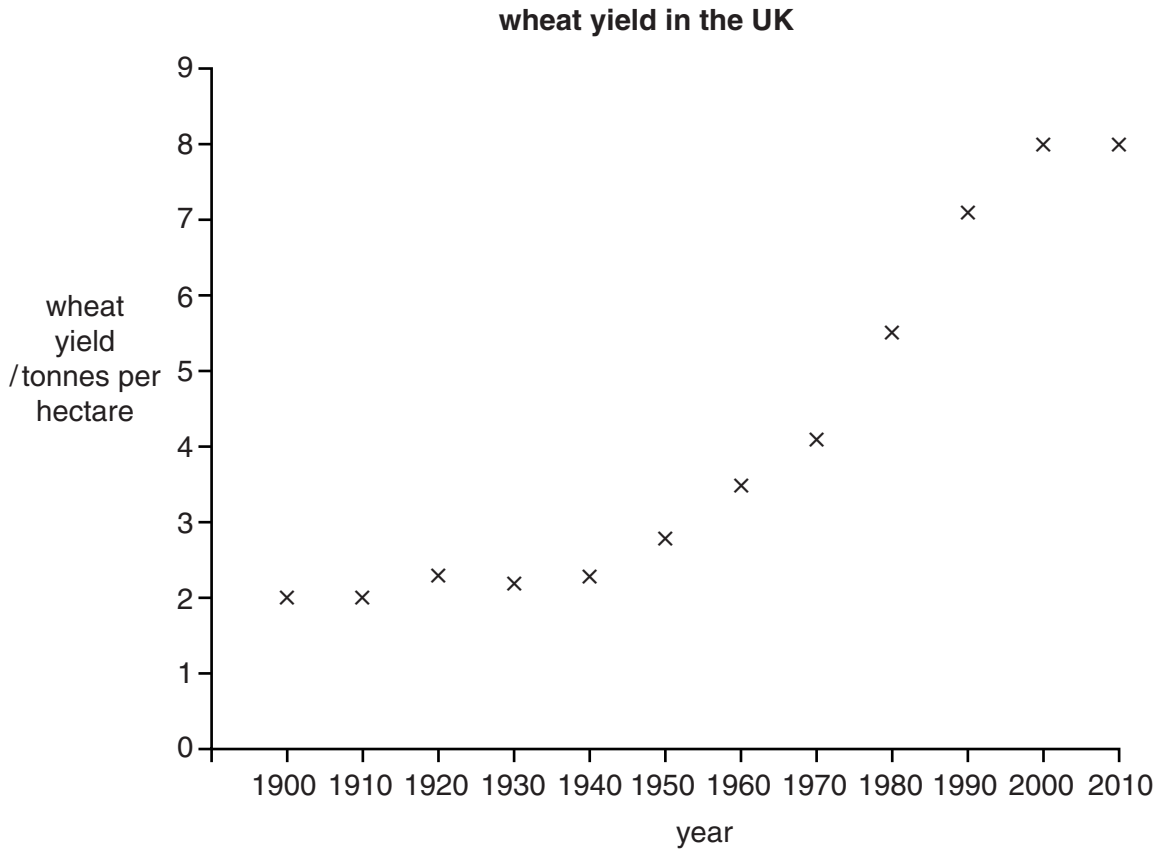
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..... [3]

- (b) Wheat is one of the world’s major (staple) food crops. Look at the graph showing how average wheat yields per hectare in the UK changed between 1900 and 2010.



- (i) On the graph, draw a smooth line of best fit to show the changes in wheat yields in the UK from 1900 to 2010. [1]

- (ii) Identify the 20 year period during which changes in yield were fastest and greatest.

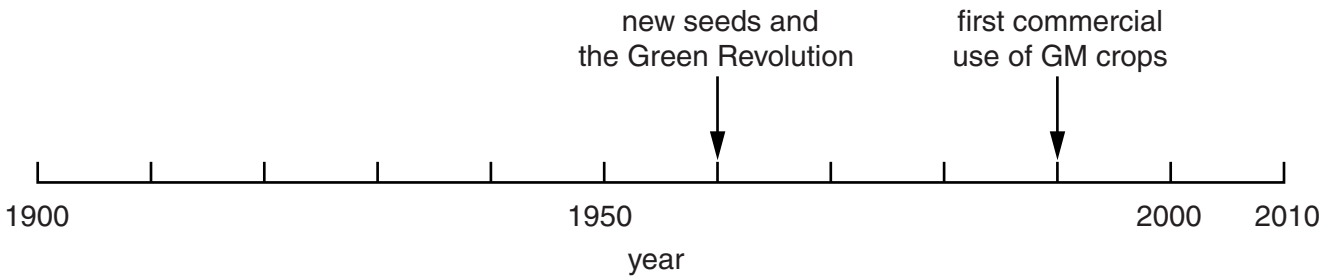
..... [1]

- (iii) Using values from the graph on page 13, describe how the rate of change in wheat yields was different in the years earlier than the 20 year period identified in (b)(ii).

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

- (iv) Look at the timeline below, which gives more detail about inventions affecting crop farming during the 20<sup>th</sup> century.

**timeline for developments affecting crop farming during the 20<sup>th</sup> century**



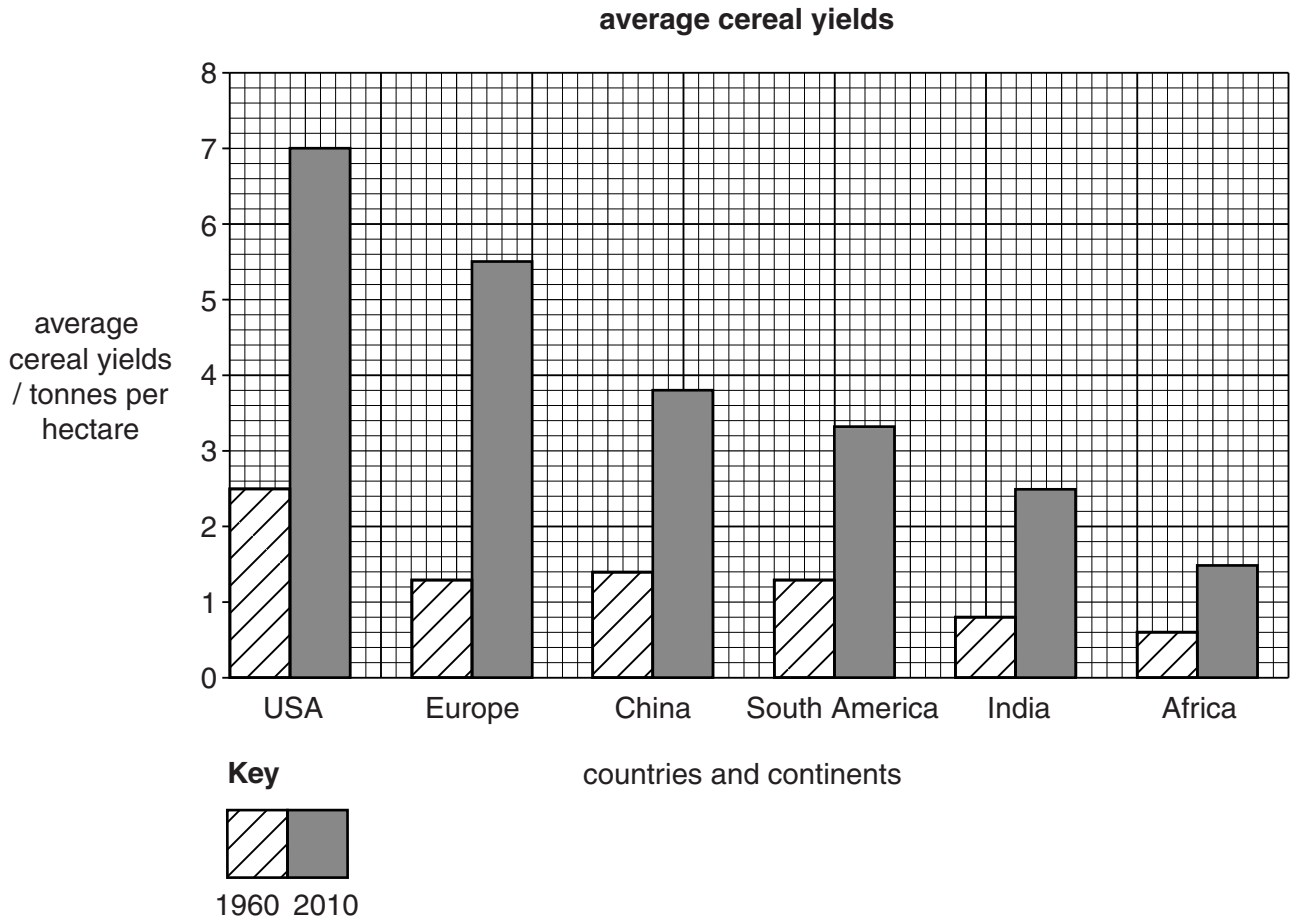
Describe the different ways in which these inventions can increase crop yields per hectare.

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..... [4]

- (v) How does the information in the timeline above, help to explain variations in the rate of change in wheat yields in the UK between 1900 and 2010 that are shown in the graph on page 13?

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

- (c) The graph shows the wide variations in average yield of cereals (wheat, barley, rice) between different countries and continents.



- (i) Describe what the graph above shows about agricultural productivity in Africa compared with other continents and countries of the world. Use values from the graph to support your answer.

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..... [4]

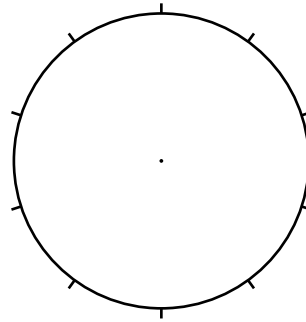
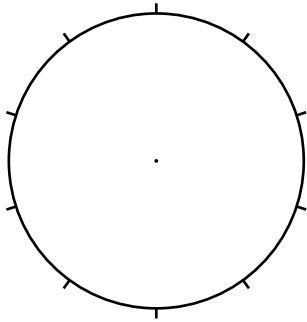
- (ii) In 2010, Africa was home to 15 percent of the world's total population. By 2050, this is expected to increase to 22 percent.

Show these percentages of total world population living in Africa in the pie graphs below and complete the key.

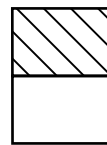
**Africa: percentage of total world population**

2010

2050



**Key**



[2]

- (iii) How urgent is the need for increases in agricultural productivity in Africa? Explain your answer.

.....

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.....

..... [2]



- (iv) Suggest reasons why the agricultural inventions since 1950, shown in the timeline in (b)(iv), have not led to a big increase in crop yields in all continents and countries.

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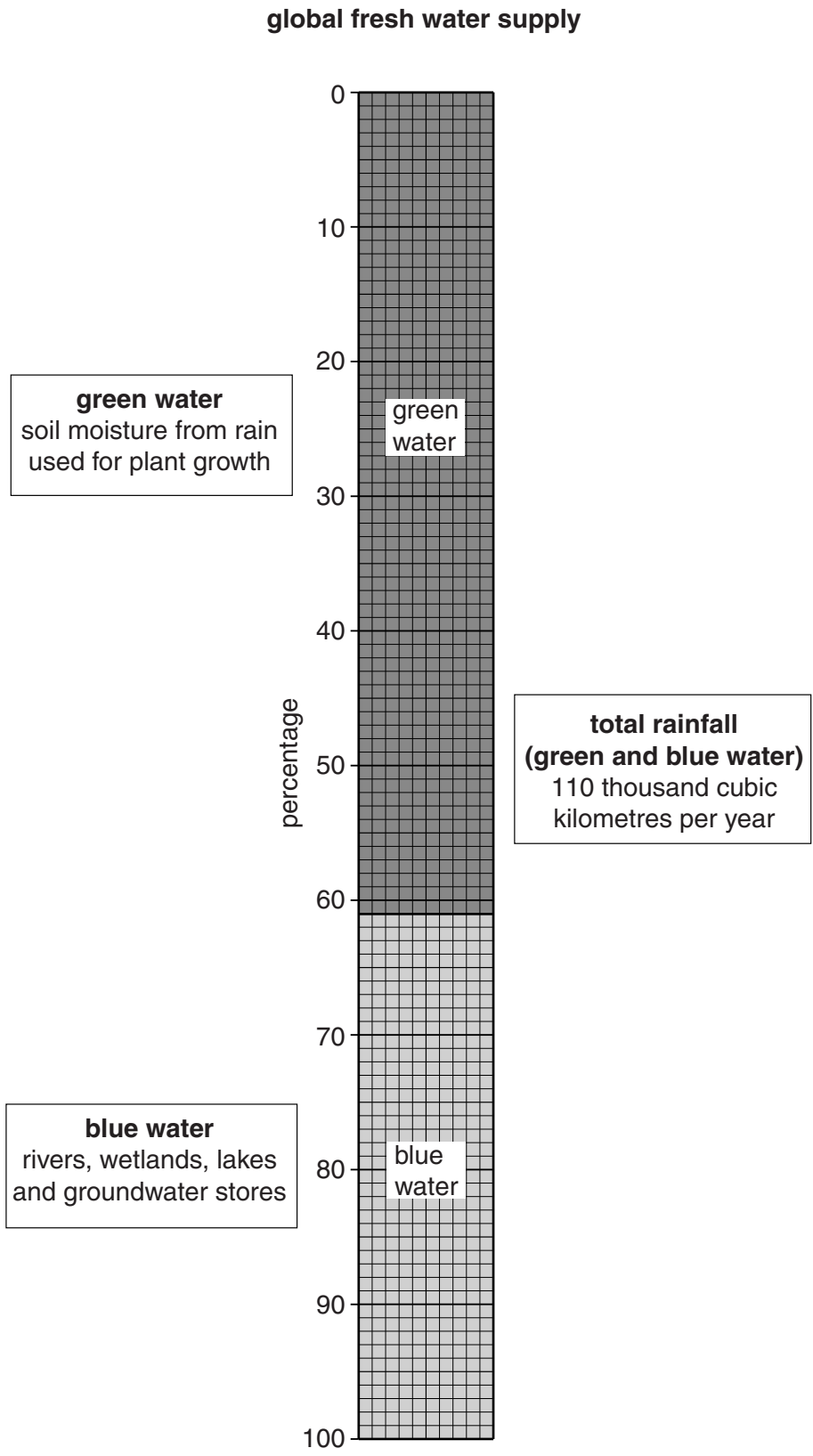
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..... [4]

[Total: 40]

- 6 (a) Look at the diagram below, giving information about what happens to rainfall after it reaches the Earth's surface.



- (i) State the percentage ratio between green and blue water from rainfall.

green water : blue water

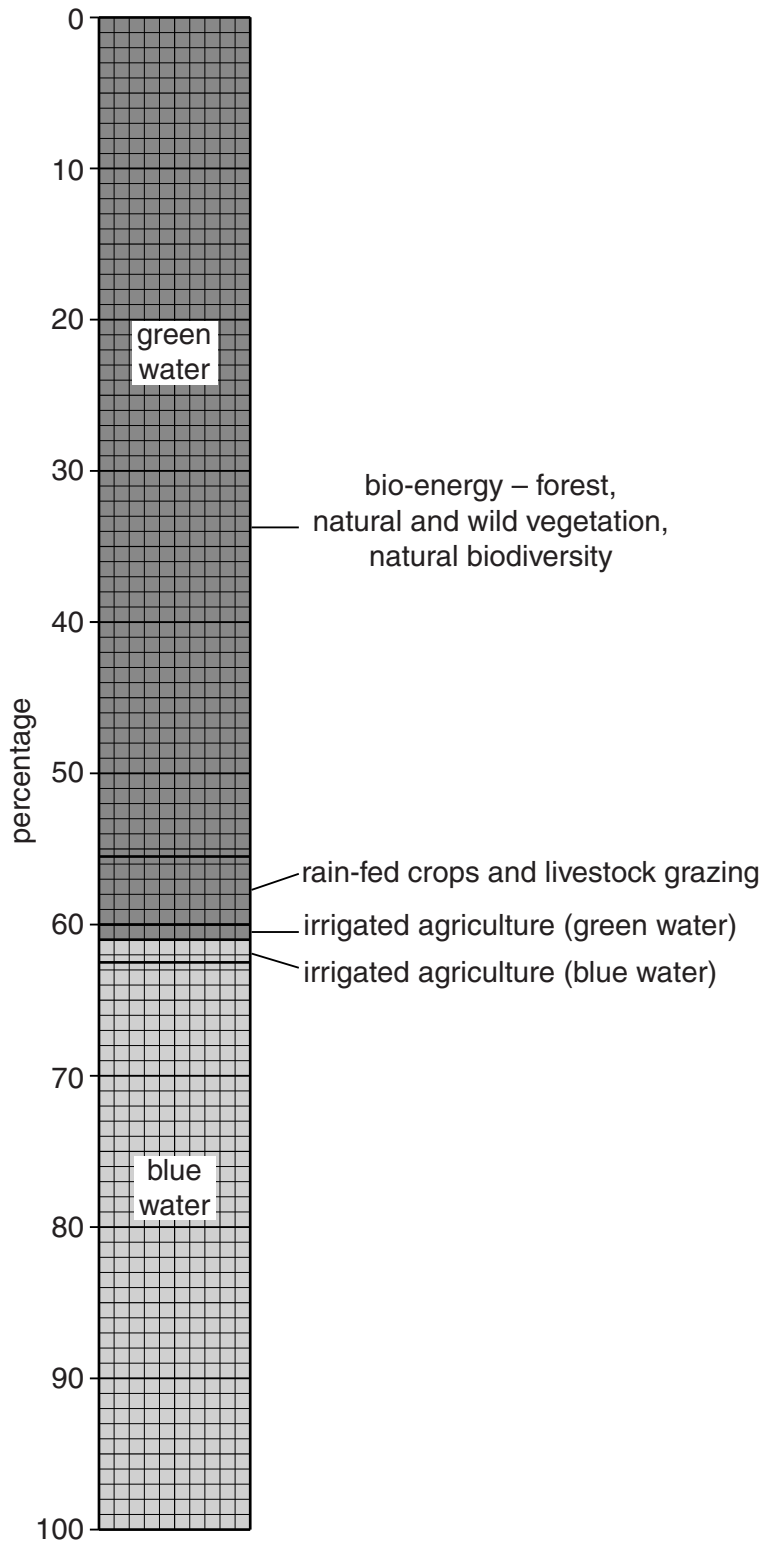
.....% : .....% [1]

- (ii) Explain the difference between green water and blue water.

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

(iii) The divided bar graph below shows how fresh water from rainfall is used.

**global fresh water use**



Complete the divided bar graph by plotting these percentages for blue water use:

- 1.3%: evaporation
- 0.2%: city and industry use
- 36.0%: reaches the oceans

(iv) What is the percentage of total rainfall that is used in farming?  
Show your working.

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

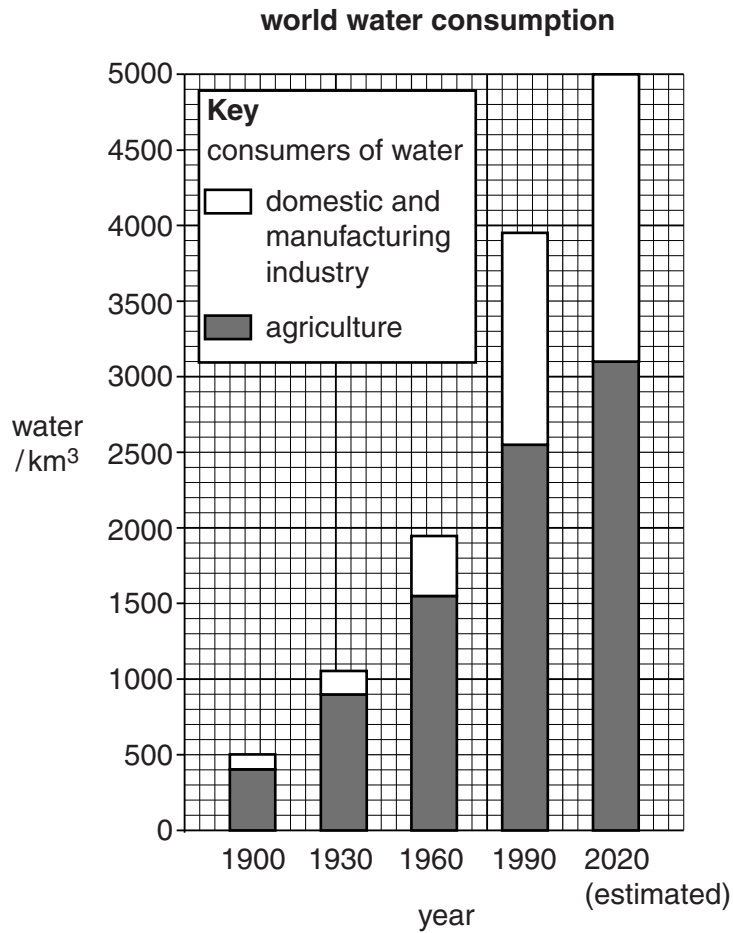
(v) Explain why irrigated agriculture includes water described as both green and blue.

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

(vi) How useful and important to humans is the 56% of rainwater used for bio-energy (natural plant growth)? Explain your answer as fully as you can.

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..... [4]

(b) Look at the graph, which gives more information about how people use fresh water.



(i) Describe what the graph shows about known and expected changes in **total** world water consumption since 1900.

.....

.....

.....

..... [2]

(ii) State two different reasons to explain these changes in total water amount consumed.

1 .....

.....

2 .....

..... [2]

(iii) Describe what the graph shows about water consumption by the agricultural sector compared with other sectors.

.....

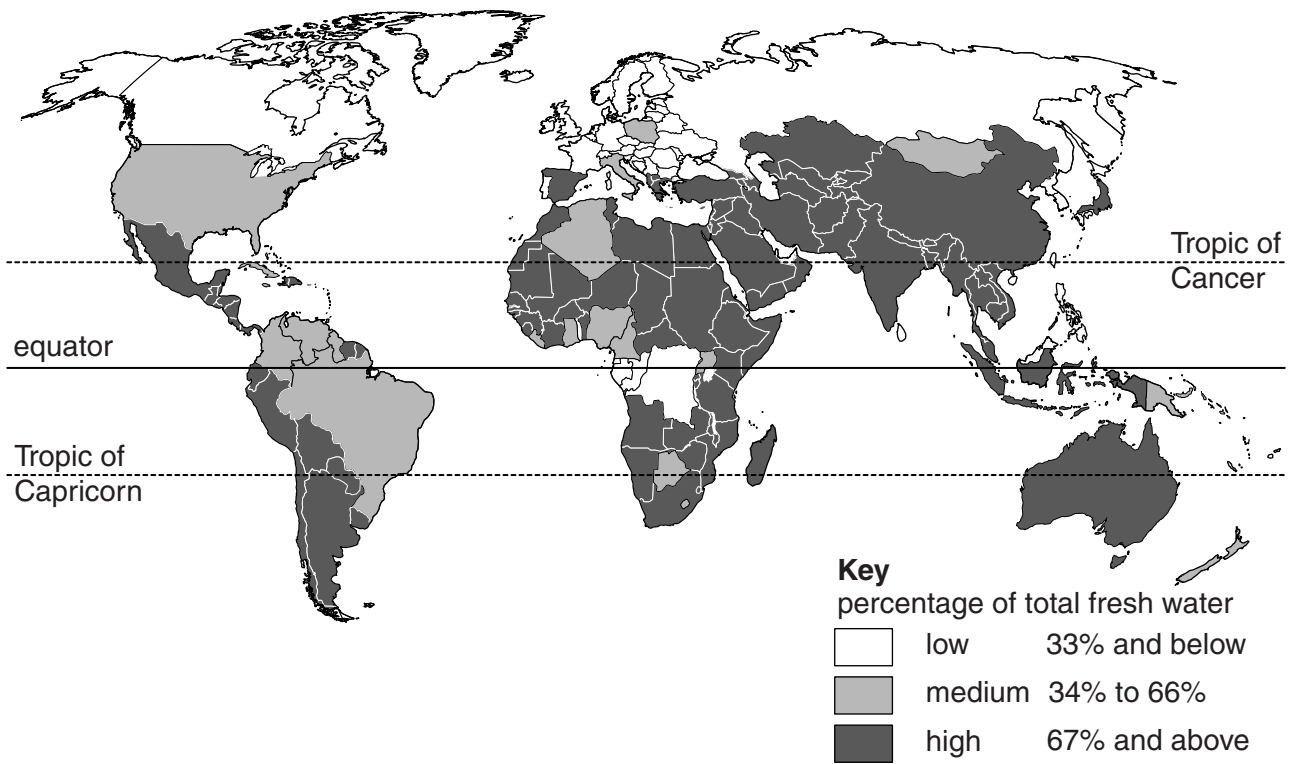
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..... [2]

(c) Look at the world map which shows how percentage of fresh water consumption for agriculture varies between countries.

**percentage of total national fresh water consumption for agriculture**



(i) Using the map, describe areas where water consumption for agriculture is high (67% and above).

.....

.....

.....

..... [2]

- (ii) Using the map on page 23, describe areas where water consumption for agriculture is low (33% and below).

.....

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..... [3]

- (iii) Suggest reasons for these large variations for water consumption in agriculture. Refer to two countries or areas, one with high use and one with low use, to illustrate your answer.

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..... [4]

- (d) (i) It is estimated that about 20 percent of the world's irrigated land is affected by salinisation. Explain how salinisation occurs.

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..... [3]

- (ii) Explain how the use of irrigation water can be better managed to reduce the risk of salinisation occurring.

.....

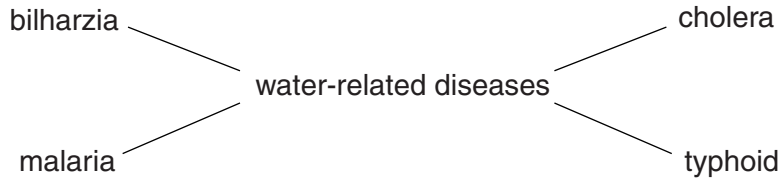
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..... [2]



(e) Storage of water for irrigation increases the amount of surface water, much of it stagnant (still water) or only slow flowing. This increases the risk of water-related diseases affecting farmers and their families, especially in hot tropical latitudes.



(i) The presence of stagnant surface water greatly increases the risk of farmers and their families catching two of the diseases named in the diagram.

Which two water-related diseases are they?

..... [1]

(ii) Explain your choice of diseases in (i).

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

(iii) The widespread occurrence of water-related diseases in farming areas where irrigation water is used helps to keep poor farmers in the poverty trap. Explain why.

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

(iv) Would you say that the occurrence of water-related diseases is the most important factor keeping many farmers in developing countries in the poverty trap, or do you consider other factors to be more important? Give and explain your view on this.

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..... [4]

[Total: 40]



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