ENVIRONMENTAL MANAGEMENT

> **Paper 5014/11**
> **Paper 1**

Key messages

Candidates need to read the questions carefully to ensure that they use the information given to construct their answer, particularly in the six-mark final parts to each question in *Section B*. Underlining key terms in the question stem can help candidates to answer the question set. In **Question 5(f)**, many candidates just agreed with the statement rather than addressing it. The mark allocation for a question and the number of answer lines or space can be used as a guide to the length and detail of answer required.

Photographs are used as resources quite frequently. If a question asks for a description of some aspect of that photograph, then candidates must put into words what they see.

General comments

Candidates had sufficient time to answer all the questions. In *Section A*, candidates achieved the highest levels of credit in **Question 4**. In general, the answers to **Questions 1**, **2** and **3** lacked detail. In *Section B*, candidates gained roughly equal credit, on average, in each of the two questions. Questions using data were usually well answered. Some candidates needed to take greater care to avoid missing out answers where they were required to draw or complete graphs.

Comments on specific questions

Section A

Question 1

(a) (i) Most candidates completed the graph correctly.

(ii) Half the candidates were able to give the correct answer of 60–62 thousand tonnes.

(iii) Few candidates provided more than one suggestion. The most frequent valid answer was difficulty of access.

(b) (i) Approximately half the candidates explained that the rocks contain other substances.

(ii) Few candidates gained credit here. Recycling was the answer most frequently given.

Question 2

(a) (i) The correct answer was given by most candidates.

(ii) The correct answer was given by most candidates.

(iii) Only the stronger candidates understood from the table that Cambodia was ahead of target in most areas of access to safe water and good sanitation.

(b) Weaker candidates struggled to give valid reasons as to why more improvements are made in urban areas.

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(c)   More candidates were able to give creditworthy answers here, although there was a lack of knowledge by a number of candidates about water-related diseases.

Question 3

(a) (i)   This was well answered by nearly all candidates.

(ii)   Few correct responses were seen; candidates seemed unaware that this method wastes water.

(b) (i)   The term *trickle drip irrigation* was given by very few candidates.

(ii)   Some candidates were able to give a reason why the method wastes less water.

(c) (i)   Several candidates wrote about the method shown in the diagram rather than the photograph as instructed. Those who did comment on the correct method had limited ideas about its effect on soil erosion.

(ii)   The stronger candidates usually scored most or all of the credit available. They explained how trampling or overgrazing could lead to soil erosion.

Question 4

(a) (i)   This was correctly answered by all candidates.

(ii)   This question was well answered by candidates.

(b)   Candidates found this question challenging. A number of candidates showed little understanding of the meaning of 'pull factors'. Stronger responses rarely gave more than two correct answers.

(c)   The shortage of money and the fact that more migrants keep arriving were the most frequent answers.

Section B

Question 5

(a)   Most candidates named the thermometer correctly. The other three instruments were less well known with a number of candidates incorrectly stating wind vane in place of anemometer.

(b) (i)   Most candidates correctly stated a figure of 260–270 mm and August. A few confused the temperature and rainfall graphs, incorrectly stating April and 340 mm.

(ii)   Some candidates who had correctly answered **Question 5(b)(i)** then used the wrong part of the graph to answer this question, stating just three months for the dry season instead of seven months. A number of others gave figures from 4–9 months.

(iii)   Again, some candidates used the wrong part of the graph. The strongest answers identified temperatures and times of increase and decrease, along with maximum and minimum temperatures.

(c) (i)   Some candidates wrote general accounts of savanna vegetation or described what was not shown in the photograph. The best answers noted the light-coloured grass, the bush with no leaves and the scattered trees with some leaves.

(ii)   Most candidates gained credit for stating that the grass would be green. A few mentioned leaves on the bush, more leaves on the trees or possibly flowers or fruits on the trees. Some answers stated that there would be more trees, which did not gain credit.

(iii)   To define producer, photosynthesis or energy from the sun was required. Answers that showed an understanding that consumers were animals that did not produce their own food were given credit.

(iv) Candidates found this question challenging. Many candidates mentioned the grass being reduced and possible soil erosion. Few went on to discuss the impact on natural fauna and their habitats. Some weaker candidates suggested that the grazing of some cattle and goats would lead to an increase in global warming and a reduction in rainfall.

(d) (i) Figures read from the graph were mostly correct.

(ii) The line was correctly extrapolated by many to give a predicted population of 60–70 million.

(iii) There was very little reference to declining death rates or longer life expectancy. Birth rates, when stated, were usually said to be 'rising'. Many candidates achieved only limited credit for reasons for high birth rates, although these were often described in detail. Some confused developing countries and developed ones and stated the increase was due to migration inwards for employment and a higher standard of living.

(e) (i) This question scored highly although some candidates were inaccurate in their completion of the bar for females aged 5–9.

(ii) This was frequently poorly answered as candidates did not write about government problems. Instead they wrote about general issues of a growing aged population, more concerned with pensions and healthcare for the small proportion of old dependents. Stronger answers identified the large number of young people and discussed the need to provide education, the need for job creation as they reached the 15–24 age groups and how the government could cope with services such as water and sanitation.

(f) Almost all candidates wrote about reducing the world's population rather than reducing the rate of population growth. A large number wrote about the impact on global warming and other types of air pollution, eutrophication and other types of water pollution, deforestation and soil degradation. Comparatively few looked at other ways of reducing environmental impacts; those who did usually covered recycling and alternative energy sources. These candidates, who also wrote a balanced answer, were able to access level 3.

Question 6

(a) (i) Good, succinct answers identified that the reefs were mostly between the tropics, were coastal and usually located on east coasts and that the biggest concentration was between Asia and Australia. The latter was credited when expressed in a number of ways. Weaker candidates needed to go beyond just listing the areas.

(ii) Nearly two-thirds of the candidates correctly noted the lower temperature of the oceans mentioned.

(b) Many candidates identified the positive correlation, although only a small number mentioned the anomaly.

(c) (i) The graph was usually completed reasonably well but some candidates did not place their lines for 27% and 57% carefully enough; some were too close to the 30% and 60% lines, and were sloping. Some candidates left this question blank.

(ii) This was well answered, with most candidates gaining full credit.

(iii) The stronger candidates gave ideas of access, demand and enforcement of protection measures. Weaker candidates often gave only one reason and so could only gain limited credit.

(iv) A common response was simply 'better technology', without stating what that technology was, and so missed out on the credit. Many gained credit for increased population or demand.

(v) Most candidates showed good knowledge of this subject although there was some confusion between small nets and large holes. Quotas, restricted fishing zones and seasons to allow breeding were well covered by candidates.

(d) (i) Nearly all candidates correctly identified phytoplankton.

(ii) The majority of candidates added the correct organisms, with the stronger ones adding arrows to show the direction of energy transfer. Occasionally a level was missed in the food chain.

(iii) Most candidates were able to correctly follow the effects of a decrease in numbers of seals on the food chain. There were many acceptable routes to score credit here. Weaker candidates seemed confused, with answers suggesting there would be fewer fish or even fewer sharks and birds.

(iv) The strongest responses identified the lack of predators and therefore the fact that starfish numbers would increase, plus the fact that each starfish destroys a large area of coral each year. Weaker candidates needed to read the information in the question stem more carefully and use this as a basis for their answer.

(e) This question proved difficult for many candidates. There were many vague answers for all three parts along the lines of 'the oil/fertiliser/lead gets into the sea and kills fish', or that each was simply harmful. These were not creditworthy. The most frequently seen correct answer was eutrophication from fertilisers or animal wastes reaching the sea, although the reason why oxygen was depleted was not always explained. Some knew that oil was poisonous or affected the gills of fish and also knew its effects on birds. Lead pollution was least well known, although stronger candidates knew that it was a poison that acted on the nervous system and the implications of bioaccumulation.

(f) Many candidates showed knowledge of why marine pollution is difficult to control. Examples included how it is spread around the oceans, created by many sources, difficult to trace sources and is difficult to extract if in solution or tiny particles. Weaker candidates often mentioned oil, fertilisers and lead from the previous question with little idea on spread or control. Good answers covered aspects such as costs, especially for developing countries. Only the strongest candidates accessed level 3, considering the fact that the majority of the oceans are not owned by nations and therefore the need for global solutions.

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Paper 5014/12
Paper 1

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Key messages

Care should be taken to read the question carefully. For example, at the end of **Question 1** a number of candidates wrote about wind turbines when the question was about nuclear power and then hydro-electric power. Underlining key terms and command words in the question stem can help candidates to answer the question set. For example, if the command word is 'explain', then it is essential that answers do not just describe or state without giving reasons.

General comments

In *Section A*, candidates scored the most credit on **Questions 2** and **4**, whilst in *Section B*, **Question 5** scored more highly than **Question 6**. In general, *Section B* was better answered than *Section A*. Candidates had sufficient time to answer the questions. Candidates should take note of the credit available for each question and aim to make sufficient points to address this. Checking of answers would help candidates to add further detail where necessary, whilst avoiding making the same points again.

Comments on specific questions

Section A

Question 1

(a) (i)   Descriptions of the land where the turbines were located were often lacking detail. Flat land in a valley with low trees and bushes gained full credit, but frequently candidates wrote about the hills in the background.

(ii)   Wind turbines are usually on high land where the wind is stronger. These are in a valley where the hills would block the wind. Few candidates stated this.

(iii)   A considerable number of candidates answered this question without reading it carefully and wrote about the location in terms of wind turbines. The strongest answers noted the lack of settlement and therefore the reduced risk, and also the lack of workers. Distance from markets and the high cost of transmission lines were also seen in good answers. Weaker candidates often just made one correct statement.

(b)   There were a number of candidates who did not answer the question, and wrote about wind turbines or about relief or river features rather than climatic features. The best answers identified high rainfall throughout the year along with temperatures above freezing all year but low enough for low evaporation rates.

Question 2

(a) (i)   Nearly all answers were correct.

(ii)   Half of the candidates selected the correct information.

(iii)   The majority of the candidates selected the correct information, although two reasons were required for full credit.

(iv) Many good answers were seen covering contamination and the resultant diseases plus the breeding of insects such as mosquitoes and the consequent spread of malaria.

(b) The word 'economy' was frequently not addressed by weaker candidates. Few took into account that a dam collapse could cause vast damage downstream to farms and places of employment with a loss of production and income. Costs of rebuilding the dam and buildings were rarely stated.

Question 3

(a)(i) Most candidates identified September.

(ii) Some answers described changes in the ozone hole for 2014 or for the largest hole, without any comparison of length of time that the ozone hole lasted. Responses should have compared the length of time that each lasted, stating that in 2014 it was shorter than the largest recorded, or stated the months August to November compared with July to December.

(b)(i) Most knew that ozone absorbs UV rays and were able to give at least one reason why this was important.

(ii) This was well answered, with most candidates giving CFCs as their answer.

(c) Few candidates gained full credit. Those who did were aware that CFCs are stable and persist for up to 120 years and that CFCs are still in old refrigerators or air conditioning units and are released when they become obsolete. A few answers noted reluctance to abide by the ban on CFCs.

Question 4

(a)(i) Most candidates correctly stated 4 million.

(ii) Some candidates correctly identified that birth rates started to decrease about 20 years ago. Some candidates left this question blank.

(iii) This question was usually well answered.

(b) Most candidates gained a reasonable level of credit on this question. There were many possible answers and good candidates were able to gain all of the credit available.

(c) A large number of candidates realised that the large 20-30 age group would be over 60 in 40 years' time. Fewer gave further reasons such as improved health care, sanitation and diet leading to increased life expectancy.

Section B

Question 5

(a) Most of the candidates could name all three types of rock.

(b)(i) This was usually well answered with candidates describing the removal of vegetation and soil, the use of explosives to break up the rock and the use of mechanical shovels to load the rock onto trucks. A few wrote about deep shaft mining.

(ii) Many candidates stated that the pit could be filled with soil. There would not be sufficient soil to do this. Stronger candidates described filling the pit with waste rock or possibly landfill, then replacing the soil and planting vegetation. Other responses involved creating lakes for recreation.

(c)(i) Most candidates extracted the correct response from the map.

(ii) Most candidates extracted the correct responses from the map.

(iii) More candidates noted that these countries needed the iron for their manufacturing industries than that their reserves of iron were exhausted or very small. Some weaker candidates stated iron ore was needed for power stations or for infrastructure.

(d) (i) A significant number of candidates wrote about mining and so did not answer the question. Of those that answered the question as set, most gained some credit, usually for stating that coal was formed from the remains of dead plants. Stronger candidates wrote in detail about the process by which coal is formed and identified that it required millions of years.

(ii) There were many good answers. However, quite a few candidates stated that the trains took the coal from the coal face to the surface when the diagram showed that access to the coal seam was via shafts.

(e) (i) Nearly all candidates used the information provided to complete the flow diagram correctly.

(ii) Many knew that sulfur and nitrogen oxides were necessary for acid rain. Weaker candidates needed to explain how these gases reacted with water vapour or droplets to create weak acids and so lowered the pH of the rain. Many thorough answers covering all these aspects and more were seen.

(f) (i) Candidates needed to be more accurate when reading the graph. The figure for iron production in China was frequently taken as 50 million tonnes rather than the correct figure of between 55 and 60 million tonnes. Consequently, credit was lost.

(ii) This was well answered. A few were a little inaccurate giving 2008 as the year.

(iii) A few candidates confused the lines for China and the rest of the world and so gained no credit. Others wrote in detail about one of the trends with little on the other. As a result, they could gain little credit for the comparison. The best answers split the time period into sections and compared the trends in each.

(iv) About two-thirds of the candidates realised that the air quality would have deteriorated.

(v) In the six-mark questions in *Section B*, it is necessary to consider both sides to achieve level 3. Most candidates decided economic development either could or could not take place and then gave one-sided arguments. Stronger candidates outlined why development requires industry and transport, both of which require fossil fuels to a large extent. They also realised that fossil fuel use can be reduced and that there are ways of reducing the dangerous pollutants that result from burning fossil fuels. Few noted that as the standard of living improves, people will have more money to spend on manufactured goods and that vehicle use increases.

Some candidates suggested that a country could develop solely on agriculture, fishing and tourism, which would stop air pollution. Tourism requires transport, usually planes, and the building of the necessary infrastructure, both of which cause air pollution. Others indicated that renewable energy sources for electricity would solve all issues of air pollution.

Question 6

(a) (i) Most candidates correctly stated 30°C.

(ii) Most candidates correctly identified climates **D** and **C**.

(iii) Many candidates worked out the five climates correctly. The most frequent error was confusing tundra and cool temperate interior.

(b) (i) Most gained the credit, although some were inaccurate in showing the bar for 2050 mm.

(ii) Nearly all candidates correctly counted five years.

(iii) Water shortage was required with an implication such as food shortages or loss of income from farming.

(iv) This question could be answered in terms of water shortage in some years or excess water in other years. The former was the most common. Good answers covered creation of dams, exploiting of groundwater and irrigation. Weaker candidates suggested planting trees and desalination plants would be effective or stated wells. Only a few wrote about flood protection to cope with heavy rainfall.

(c) (i) The roots spreading across the surface were described by many candidates, although some suggested they were fallen branches. Frequently the descriptions then went on to include things that could not be seen in the photograph such as tall trees with wide leaves. Candidates should take care to only write about what they can see when they are asked to describe a photograph.

(ii) Most candidates were clear that the forest floor would be covered in water or at least swampy.

(iii) This was a difficult question for many. Some strong candidates obtained maximum credit, usually by discussing differences in biodiversity, biomass, vegetation at ground level and the variation in leaf loss. Weaker answers diverged from vegetation to climate or gave only one valid difference.

(d) (i) Some candidates thought the river flowed north from the sea, i.e. uphill. Others gave the answer as downwards or towards the delta, rather than a direction.

(ii) Most candidates were able to identify five dams in China for full credit.

(iii) Accuracy and detail were expected here. Answers needed to go beyond a list of countries. Some candidates stated there were dams in Vietnam, suggesting a lack of care in studying the map. Stronger answers identified clusters such as in northern Laos and another cluster in southern Laos and northern Cambodia, along with a couple in southern China.

(iv) Some excellent answers were seen. The dams could be seen as both beneficial and detrimental. Good answers noted the command word 'explain' and went through points such as the dams providing availability of irrigation water all year round so double cropping would be possible. The impact of the blocking of fish migration and its effects on fish stocks and income was also covered well by stronger candidates. Weaker candidates often described without explaining and so gained little credit. In general, candidates described the impacts on farmers more thoroughly than the impacts on fishermen.

(v) Many candidates did not focus on the economic reasons stated in the question and so scored little or no credit. Others did not comment on the hydro-electric dams and wrote about flooding and farming, often repeating answers from **Question 6(d)(iv)**. Some good answers were seen in terms of industrial development and the impact on the standard of living of the population. Saving the cost of imported fossil fuels and being able to export electricity to other countries were occasionally stated by able candidates.

(e) Many candidates did not include the basic points about amount of precipitation and the size of the population, and went into discussions of pollution of water, the fact that some countries do not have glaciers, or the lack of affordability of desalination. Others suggested desalination was the answer to any water shortage, not considering that many people and countries have no access to seawater. Some detailed responses were seen, but a number of these could only achieve level 2 as they only considered one side of the argument. The strongest answers realised the importance of precipitation, covered disputes between countries over rivers, the overuse of aquifers and possibilities for recycling water to achieve a balanced and well-argued conclusion.

ENVIRONMENTAL MANAGEMENT

Paper 5014/21
Paper 2

Key Messages

Candidates should read the source material and the questions carefully.

Candidates are encouraged to use data from graphs or tables when describing trends or patterns.

Candidates should avoid vague statements, for example, that a factor 'will be affected' without any further detail suggesting how that factor might be affected. Candidates should include details to support their suggestions.

General comments

This paper invited candidates to consider environmental issues and methods of gathering and interpreting data in the context of one country, Egypt. Many candidates understood and made good use of the source material and their written responses were sufficiently clearly expressed. The mathematical and graphical questions did pose difficulties for some candidates. Candidates were able to complete the paper in the time available.

Comments on specific questions

Question 1

(a) (i) Many candidates only made rather general statements to try to explain why development should not take place to the north of Cairo. Candidates are encouraged to study the information given very carefully and to include detail in their answers.

(ii) Very few candidates could estimate the area of the new housing development.

(iii) Some candidates could identify one reason for developing to the east of Cairo. However, there were many answers that did not relate to the area to the east.

(iv) Most candidates suggested at least two services that must be provided in the new housing development.

(v) All of the different points on the mark scheme were suggested by candidates. However, only some candidates were able to list two of these points as suggestions and gain full credit.

(b) Many candidates gave good suggestions as to why farming takes place near the river Nile. Most candidates gained most or all of the available credit.

(c) (i) Very few candidates were able to explain the role of root nodules that contain bacteria. The role of nitrogen fixation is very important in natural and agricultural systems.

(ii) Most candidates showed correct working and many gave a correct answer and unit. Candidates need to be careful with rounding up figures.

(iii) Most candidates stated the range correctly.

(iv) This calculation proved difficult for many candidates. Candidates needed to multiply the number of plants in 1m^2 by the average mass of peas per plant; the correct calculation was 60 x 40.

(d) (i) This question set out a sampling grid that can be used for sampling an environment. Most candidates selected the next two pairs of numbers from the table but some made an error in selecting the position of the areas on the grid.

(ii) Many candidates tried to explain why the method used by the second student was better. Some candidates stated the method would be quicker, which did not gain credit. All the points in the mark scheme were seen regularly, although few candidates gained maximum credit.

(e) (i) Candidates were asked to study the graph of water quality and complete the table. Most candidates were able to complete at least some of the table correctly.

(ii) Most candidates selected the correct canal; unfortunately some of the reasons given were not comparative. It was necessary to state the *highest* level rather than just a high level.

(iii) Most candidates identified the correct canal and gave a valid reason.

(iv) Most candidates identified the correct canal; again, some candidates only referred to a high level rather than the highest level. A clear comparative answer was required.

(v) Most candidates were able to suggest valid reasons for the level of biological oxygen demand in canal **R**.

(f) (i) Many candidates found the calculation of a percentage increase too demanding. Only a small number of candidates gave the correct answer.

(ii) Some candidates suggested that the temperature needed to be measured to find the oxygen concentration, which did not gain credit. Only some candidates clearly stated that the scientist wanted to check there was no significant change in water temperature.

(iii) Nearly all candidates gave one reason why the scientist decided that drain **X** was a source of pollution. There were some good suggestions about a possible cause of the pollution in drain **X**.

(g) Candidates often suggested monitoring water sources and having laws that were enforced. Most candidates gained some or most of the available credit.

Question 2

(a) (i) Most candidates found it difficult to explain how the answers to the questionnaires were processed to give the results shown. Candidates may have found it useful to have had experience of processing a questionnaire carried out within their school.

(ii) Many candidates gave good answers that showed the need to take more than one point of view into consideration when making decisions.

(iii) Most candidates made at least one good suggestion as to why the government asked for investment from the people.

(iv) Most candidates made sensible suggestions about the possible benefits of the new industrial areas.

(v) Nearly all candidates had a good idea about how the government could encourage economic activity.

(vi) Most candidates gave an extended answer; however, many relied heavily on repeating the information given in the question rather than giving specific reasons for a point of view.

(b) (i) Candidates found it difficult to give a clear answer that described two ways an invasive species might move from one sea to another through the canal.

(ii)   Many candidates just stated that food chains would be altered and some species might not survive the presence of the invasive species. Some candidates referred to population crashes of existing species.

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ENVIRONMENTAL MANAGEMENT

Paper 5014/22
Paper 2

Key messages

Candidates should read the source material and the questions carefully.

Candidates are encouraged to use data from graphs or tables when describing trends or patterns.

Candidates should avoid vague statements, for example, that a factor 'will be affected' without any further detail suggesting how that factor might be affected. Candidates should include details to support their suggestions.

When drawing graphs, candidates should include labels on both axes. Labels should include a unit if appropriate.

General comments

This paper invited candidates to consider environmental issues and methods of gathering and interpreting data in the context of one country, Zimbabwe. Many candidates understood and made good use of the source material and their written responses were sufficiently clearly expressed. The mathematical and graphical questions did pose difficulties for some candidates. Candidates were able to complete the paper in the time available.

Comments on specific questions

Question 1

(a) (i) Many candidates completed the calculation successfully.

  (ii) Many candidates completed the calculation successfully.

  (iii) Nearly all the candidates expressed a sensible reason for reusing the bags.

  (iv) Many candidates were able to suggest possible risks of selling the sand beside the road.

(b) Many candidates did not make suggestions that were given credit. There were many valid points about fresh vegetables that could have been made, for example, as a supply of vitamins and minerals.

Question 2

(a) (i) Most candidates named both the weather station instruments correctly.

  (ii) Most candidates could name one other instrument.

  (iii) Most candidates gained some credit, usually for suggesting a site with an open or flat surface.

  (iv) This question required a calculation of the range. A small number of candidates selected the highest and lowest value but did not carry out the subtraction needed to find the answer.

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(v)   Many candidates produced a clear graph that displayed the data accurately. Some candidates lost credit by not giving a complete label with unit for the *y*-axis. The table of data provided candidates with the labels for both axes.

(vi)   Most candidates either stated the months correctly or gave a correct range of months. A small number of candidates just stated July (the only month with no rainfall).

(vii)   Many candidates gained full credit for making sensible suggestions as to the advantages of many small dams. All of the points on the mark scheme were seen regularly in responses.

(viii)   Candidates found it difficult to explain why crops could be grown all year round in Zimbabwe. It was expected that they make use of the climate data provided to make a sensible comment about the temperature and water availability.

(b)(i)   Many candidates just stated that the ground warmed up quickly. However, a few candidates did then describe radiation or heat energy being absorbed at the surface.

(ii)   The largest change in temperature was correctly identified by more than half the candidates.

(iii)   Only a small number of candidates could describe any detail of surface cooling at night.

(iv)   Many candidates gave only general descriptions that frequently were not creditworthy. Comments relating to photosynthesis were required and those candidates who mentioned photosynthesis usually went on to gain maximum credit.

(c)(i)   The trends were identified by most candidates. Some candidates only compared **P** and **T** but were still able to gain credit.

(ii)   A small number of candidates gave clear reasons related to the demands of an increasing population to explain why the ash gardens were being used after only ten years.

(iii)   Most candidates only suggested that there would not be enough nitrate to support the growth of crops. The other points on the mark scheme were not often seen.

(d)(i)   Tables were drawn by nearly all candidates. However, the headings were often not detailed enough for credit and some tables did not provide a minimum of four cells that could be filled with data from the survey.

(ii)   Most candidates found it easy to find faults in the student's survey. All the points on the mark scheme were seen in many answers.

(iii)   Candidates who had found faults in part **Question 2 (d)(ii)** suggested good improvements for the survey method.

(e)   Most candidates made good suggestions about the risks of cooking on an open fire. All the points on the mark scheme were seen regularly. Many candidates gained full credit. A small number of candidates claimed that carbon dioxide would be harmful to humans. As this was an open fire this was not creditworthy.

(f)(i)   This question required candidates to inspect the graph carefully and complete the table. Most candidates gained credit by reading values from the graph correctly. The last row seemed to cause the most difficulty.

(ii)   Most candidates completed the table correctly.

(iii)   All the factors listed in the mark scheme were frequently provided by candidates. Some candidates gave time and temperature as factors to keep the same. This suggested they had not read the question carefully.

(iv)   Most candidates calculated the percentage difference correctly.

(g)(i) Some candidates only considered using less wood as a reason why the use of insulated boxes was a sustainable strategy. However, most candidates gained full credit and all the points on the mark scheme were seen regularly.

(ii) Candidates who described the idea of supply and demand and transport costs to explain the higher price of wood for cooking in Harare gained full credit.

(iii) Most candidates made suggestions relating to the ideas of faster cooking and safe to use. All the other points on the mark scheme were seen but less frequently.