ENVIRONMENTAL MANAGEMENT

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| **Paper 5014/11** |
| **Paper 1** |
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Key messages

Most candidates attempted all the questions in the paper, although some needed to pay greater attention to the command words within questions, such as 'describe' and 'explain'. Factually correct information that did not apply to the question asked could not be awarded credit.

A greater proportion of candidates were able to use appropriate technical terms, although they were not always able to define them accurately.

The quality of responses within the extended writing questions showed good improvement; candidates demonstrated skills in developing a reasoned response. These skills should continue to be encouraged in centres. Candidates could have benefited from including specific examples to support their statements.

General comments

Candidates showed evidence of good preparation for some subject areas and many were able to respond confidently on many topics.

There was a general weakness in the understanding and labelling of plate boundaries and equally a weak understanding of the development of geothermal energy. Similarly, candidates were challenged when requested to provide an accurate definition of an ecosystem.

Candidates showed good evaluative skills when evaluating the response of the authorities to a natural disaster, providing justifications for their views.

There has been a general improvement in the quality of writing for the extended responses – candidates relied less on a series of bullet points. This is good practice and provided scope to meet the higher demands of some of these questions, particularly where candidates backed up their statements with examples.

Comments on specific questions

SECTION A

Question 1

(a) (i) The first question required the candidates to complete a pie graph from the data provided. Credit was awarded for accurate plotting and application of the key. Both were completed with a good level of accuracy.

  (ii) Most candidates were able to identify living components of the soil.

  (iii) Candidates typically understood and were able to name a decomposer. A wide range of organisms were given credit.

  (iv) Identifying other components of soil was less well understood within the cohort, although candidates were still able to gain some credit.

(b)   The impact of grass on soil improvement proved to be more challenging. Few identified the role of roots in preventing soil erosion. Some identified the potential for grass to increase the organic matter in the soil, although there was confusion as to whether grass would add or take nutrients from the soil.

Question 2

(a) (i)   Candidates were provided with diagrams to show changes in an El Niño year compared to other years. This provided information which could be used to answer the questions that followed. This question was a topic that was less well understood by the cohort.

(ii)   As with **Question 2(a)(i)**, the quality of responses to this question was variable. Some candidates were able to identify weather changes; weaker responses often referred to other information, which although correct, did not relate to the context of this question.

(iii)   The range of explanations of the reasons for differences in fish catch were quite varied, with many candidates showing confusion of the factors and not describing the impacts and causes accurately.

(iv)   Many responses identified that water temperature would have an impact on the survival of the fish and the stronger responses linked temperature to oxygen availability, which is essential for fish survival.

(b)   While many different answers were given credit in relation to the potential for international disputes over oceans, the majority focused on the availability of fish stocks. Few identified the issue of mineral or oil reserves or the difficulty in defining international boundaries accurately.

Question 3

(a) (i)   This question, requiring the use of data from a graph, was generally answered correctly.

(ii)   Most candidates were able to provide a level of interpretation to the data. Credit was available for the accurate quotation of information from the graph if this was used to support the trend within the data.

(iii)   Most candidates were able to identify a problem caused by smoke particles, most commonly lung disease, described in a range of ways.

(b)   Candidates provided some good suggestions for the increase in pollution in urbanised areas compared to rural areas. The potential for additional credit was missed in some cases due to a lack of detail.

(c)   The responses given showed a general understanding of the reasons why controlling air pollution is difficult. Again, there was potential for additional credit in some scripts if more detail had been provided.

Question 4

(a) (i)   This question, requiring candidates to interpret information from a photograph and apply stages of vegetational succession to the specific image, was generally attempted well.

(ii)   Some candidates were unable to name the type of farming taking place within the image. This was a topic that appeared to be less well understood.

(b) (i)   Candidates had difficulty in describing how the final stage of a vegetational succession varied from previous ones; few identified the increase in size of vegetation and the impact on low growing plants.

(ii)   As with **Question 4(b)(i)**, some candidates showed a lack of clarity in the impact of seed dispersal and did not gain credit.

(c)   The best responses identified the changes in the number of species, the impact on habitats and the development of soil depth. Less successful answers lacked focus on the ecosystem.

SECTION B

Question 5

(a) (i)   Most candidates showed a clear understanding of the potential benefits and negative impacts of tourism on national parks. Many identified the opportunity for income or employment and many also stated the opportunity for education. The negative impacts were less clearly stated, although many identified the risk of litter and the potential impact on the natural behaviour of animals.

(ii)   Most candidates showed a good understanding of the ways in which the impact of tourism could be reduced.

(b)   Candidates appeared to have good knowledge of the reasons why people continue to live in earthquake zones; citing a range of economic, employment and cultural reasons.

(c) (i)   Most candidates plotted the missing points on the graph and were able to apply the correct scale to their plots.

(ii)   Very few candidates were able to calculate the temperature range correctly. Some candidates mistakenly read the lowest point as $-4\,°C$.

(iii)   This calculation, requiring the addition of a selection of data from the table, proved less problematic to candidates.

(iv)   While many candidates made an attempt to describe the trends within the data, some responses showed confusion and some lacked detail. There was a general understanding of the need to quote specific data to support the answer; this was achieved with a variety of success.

(v)   Most candidates were able to identify the element of weather being measured by each instrument. Fewer candidates could name the instruments.

(vi)   Most candidates were able to describe the types of problems people would experience after a flood. The question related to floods in general so responses were credited even if they were not typical within the scenario described in the previous parts of this question.

(d)   Most candidates were able to identify the impact of global warming and the melting of the ice. The most common incorrect answer was to link the change to the movement in plate boundaries.

(e) (i)   Many candidates found the labelling of the diagram challenging, most commonly incorrectly identifying the location of the oceanic plate.

(ii)   Many candidates correctly identified the subduction zone at point **X**.

(iii)   Indicating the movement of the plate boundaries proved challenging for many candidates. Most identified the correct general direction but did not clearly show the movement of the oceanic plate in the subduction zone.

(f)   A longer response question marked using a level of response mark scheme. Responses gaining credit looked at the potential of geothermal energy and evaluated its suitability to meet future demand. Many responses could have gained further credit by providing greater detail and including specific examples. The strongest responses provided a balance of views from a global perspective, for example, the fact that not all areas have ready access to geothermally heated groundwater.

Question 6

(a) (i)   Most candidates correctly identified bitumen from the information provided in the resource.

(ii)   While most candidates were able to identify one reason, only a small number were able to provide two suggestions to obtain full credit. Some candidates were unable to link their reasons to economic factors.

(b) Candidates appeared well prepared for a question on crude oil formation. Many answers were detailed and achieved full credit.

(c) (i) Many responses showed good knowledge of the impacts of deforestation.

  (ii) A significant number of responses described ways of developing forests, such as through replanting, rather than focusing on the efficiency of use of the existing trees.

  (iii) Many candidates found it difficult to provide a comprehensive answer relating to the sustainable management of forests. Few identified that increased demand for timber would have an impact on sustainable cultivation. Many responses were vague and would have benefited from greater detail.

(d) (i) Responses showed an understanding of the issues that would impact people during a wildfire. The stimulus material provided a framework, which candidates enhanced with their own knowledge.

  (ii) Definitions of the term 'ecosystem' were variable. Some candidates had clearly prepared and learned the definition whereas many others were vague and did not demonstrate a good understanding of the term. Descriptions were often more closely linked to the definition of a 'habitat'.

  (iii) The impacts of the fire on the environment were generally well understood, with most responses focusing on habitat destruction, and stronger responses extending to acid rain and loss of trees resulting in soil erosion. The best responses also linked the ash and soot in the atmosphere to the reduction in plant growth.

  (iv) This question gave scope for candidates to form an opinion on the effectiveness of the local government's response to the emergency. Using the information, it was possible to conclude that this response was either effective or not effective. Those scoring maximum credit provided an answer which highlighted both positive and negative effects.

(e) (i) Most candidates were able to use the bar graph to identify the amount of oil available in Canada.

  (ii) Most candidates were able to use the graph to identify a country with more oil reserves than Canada.

  (iii) Many candidates were able to calculate the percentage of oil stored as oil sand successfully. Credit was allowed for correct calculations using the response from **Question 6(e)(i)** if that answer was incorrect.

(f) (i) This question was attempted with some success by most candidates. The command word was 'describe', which meant a description of the restoration method was needed to gain full credit. A number of the responses only stated a method of restoration.

  (ii) This was the second longer response question marked using a level of response mark scheme. There was clear evidence of candidates being prepared for this type of longer response question; answers having a logical structure, developed ideas and forming a conclusion rather than producing lists or bullet points, which could have limited the potential credit available.

  The phrasing of the question gave candidates scope to look at a wide range of environmental and social issues, highlighting the challenges faced in providing employment and developing the economy while conserving the environment. A range of conclusions could be drawn as a result; the best responses identified both positives and negatives and supported their arguments with specific examples.

ENVIRONMENTAL MANAGEMENT

Paper 5014/12
Paper 1

Key messages

Most candidates attempted all of the questions within the paper. Some candidates needed to have read the questions more carefully to ensure that they understood what was being asked. Factually correct information that did not apply to the context of the question could not be awarded credit.

The application of mathematics within the paper was generally good, although candidates were challenged by percentage increases and also some key mathematical terms such as calculating the range.

A greater proportion of candidates were able to use appropriate technical terms, although they were not always able to define them accurately.

The quality of responses within the extended writing questions showed good improvement; candidates demonstrated skills in developing a reasoned response. These skills should continue to be encouraged in centres. Candidates could have benefited from including specific examples to support their statements.

General comments

Candidates showed evidence of good preparation for some subject areas. Subjects such as the impact of earthquakes were well understood. Responses also showed a good understanding of concepts such as habitat loss.

There was a general weakness in the understanding and application of agricultural practice, for example, relatively few candidates were able to describe intensive production accurately and similarly did not clearly describe the impact of pesticides, the alternatives available or the application of genetically modified crops.

There were some instances of candidates missing out on the requirements of the task or question, most notably when a response was required to be circled on the paper as in **Question 5(a)(ii)**.

There has been a general improvement in the quality of writing for the extended responses – candidates relied less on a series of bullet points. This is good practice and provided scope to meet the higher demands of some of these questions, particularly where candidates backed up their statements with examples.

Comments on specific questions

SECTION A

Question 1

(a) (i)   The first question required the candidates to interpret information in a diagram related to an earthquake. Most responses correctly identified the two points, showing good preparation for this topic.

   (ii)   Most candidates were able to use the diagram to describe the relationship between the level of damage and the distance from the epicentre.

(iii)   Most candidates were able to provide descriptions of some likely impacts of the earthquake on the town. The strongest responses gave a diverse range of examples rather than a series of very similar impacts, which ensured maximum credit was achieved.

(b)(i)   Most candidates attempted to provide a reason why towns are located in earthquake zones, although some responses referred more to the reasons why people might be located there rather than the development of a town.

(ii)   The preparation for questions in this subject area was evident within many candidates' answers; many were able to provide two distinct examples of how damage may be minimised, often focusing on the design of buildings.

Question 2

(a)(i)   Candidates were required to interpret data from the first graph to answer this question. A great many were able to do this effectively. The most common error was the omission of 'million' from the response. It is important that candidates take a moment to check that their response is realistic within the context of the question.

(ii)   Using the data within the second graph, most candidates correctly stated the percentage.

(iii)   Candidates were given credit if they used an incorrect figure due to an error within **(i)** or **(ii)**. The most common error was stating 252 000 rather than 2 520 000.

(b)   A wide range of responses were provided, most identifying the limitation of the cloth in removing smaller particles, diseases and pollution. Relatively few responses also considered the time taken to obtain the water from the water source and the impact that illness would have on a person's ability to work.

(c)   While most candidates understood that there was a wider availability of good quality drinking water in developed countries, many simply related the reason to people being richer. Few identified the investment in infrastructure, bringing water to individual houses or the greater legislation or monitoring that is in place to ensure water quality.

Question 3

(a)(i)   Most candidates were able to correctly use the diagram to identify that the apparatus measured temperature. A few candidates named the item as a thermometer which, although correct, did not answer the question set.

(ii)   This question required the candidates to state the reading shown on the thermometer. This was completed successfully by most candidates.

(iii)   This question required the use of different readings to calculate the range of temperature. Although many responses correctly read the values from the scales, they did not go on to calculate the range.

(b)(i)   A more challenging question requiring the candidate to relate the temperature readings to their knowledge of a desert climate. Responses ranged from a simplistic statement relating to the thermometer readings to stronger responses that also identified the significance of the temperature range between day and night. The best responses also included other weather conditions, perhaps also providing typical annual rainfall data.

(ii)   A multiple-choice question; this proved challenging for many of the candidates who were unable to indicate the most likely latitude for these temperature readings.

(c)(i)   The impact of rising temperatures on desert vegetation was less well understood as a whole. While many identified the immediate impact on the plants themselves, fewer described the impact on evapotranspiration or how it might impact future biodiversity.

(ii)   The concept of the need for international action was fairly well understood; many candidates identified the fact that pollution spreads across the world and crosses international borders.

Question 4

(a) This question required candidates to interpret data on birth and death rates. The understanding of this information was tested by requiring candidates to state which point of the demographic transition model was being described by each scenario. Most candidates were able to correctly identify the stages.

(b) While many candidates understood the impact of a rapidly growing population, many responses focussed on the social impact or the economic impact rather than both of these. Relatively few candidates achieved maximum credit.

(c) Many candidates were able to identify how better education would impact upon population growth, with better careers and later marriages featuring frequently within answers. Some responses did not link to the educational aspect and described other population management factors such as legislation, which was not given credit within the context of this question.

SECTION B

Question 5

(a) (i) Describing the distribution of coffee growing areas on a world map was attempted by most candidates, and most identified the significance of the tropical regions. Some responses also included the naming of specific countries where coffee was grown and these were also given credit.

(ii) Using the data in the table, most correctly identified that *Coffea canephora* was the species most tolerant of the widest range of soil pH. Incorrect responses were spread between the other coffee species. A few candidates did not provide a response and may have benefited from reading the question more carefully.

(iii) While many candidates were able to interpret the widest pH range in the previous question, few understood the reasons why an incorrect soil pH would impact on plant growth. The strongest responses identified the inability of a plant to take up key nutrients or their lack of availability at a different soil pH.

(iv) Relatively few candidates understood the factors that affect soil pH. The most common correct factor cited was the impact of acid rain. Some identified the impact of agriculture. The application of fertilisers gained credit; however, the application of pesticides is unlikely to have a significant impact on soil pH and did not gain credit.

(v) This question required the candidates to make a recommendation based on using the information in the table together with a description of a growing site. While there was only one species that fitted the criteria best, candidates were given credit where they identified a suitable attribute of another coffee species.

(b) (i) Candidates were required to identify the type of farming shown in the photograph. The photograph did not show any livestock and included coffee in plantations (labelled). This meant the correct response was commercial croplands.

(ii) Many candidates had difficulty in adequately defining 'intensive farming'. The key features required were an indication of high inputs and high yield from an area of land.

(iii) This question, requiring candidates to identify both an advantage and a disadvantage of increasing mechanisation of harvesting, was found to be challenging. Some responses identified 'cost'. This needed contextualisation to be creditworthy. The most common error was a lack of focus on harvesting and relating the answer to farming in general.

(c) (i) Most candidates provided responses which gained some of the credit available and the more comprehensive answers gained full credit. These typically included a range of different ways to control pests.

(ii) A calculation requiring the addition of a percentage to a value. The most common error was for candidates to omit to add their increase to the original amount.

(iii)   Many responses correctly identified the risk of toxic effects on humans, although many incorrectly suggested that the use of pesticides would impact on the flavour of the coffee. Wider issues, such as the impact on the environment, were less commonly commented upon.

(iv)   While many candidates were able to identify the opportunity to provide disease resistance with genetic modification, few were able to describe the process by which this took place.

(v)   Candidates had difficulty in providing three distinct reasons why people might not be in favour of the introduction of genetically modified crops. Most commonly, responses identified people's concerns that the long term impact is not fully known. Many incorrectly identified a change in taste.

(d) (i)   Most candidates were able to identify some of the impacts of the removal of trees on the local ecosystem. Many focused answers on the reduction of habitats. Some also identified the broader impacts of changes to weather patterns. These were credited if they were related back to the local ecosystem. Most responses included some links to soil erosion.

(ii)   Candidates were required to produce answers which related to the preservation of the specific trees in the area. This meant that responses which linked to replanting were not given credit within this situation. Stronger responses identified the need for farmers to have land and suggested providing other areas for crops, which would preserve the current trees.

(e)   A longer response question marked using a level of response mark scheme. The strongest responses from candidates looked at a range of sustainable agricultural techniques and evaluated their suitability to meet future demand. Many responses lacked sufficient detail and could have benefited from including specific examples. The best answers provided a balance of views and a global perspective. Few responses were written in bullet point format which is an important development in the way this type of question is answered.

Question 6

(a) (i)   Many candidates found this question challenging. Candidates needed to circle their estimate. A number of candidates estimated the percentage of the final total rather than the percentage increase.

(ii)   Most responses correctly named construction materials as showing the greatest growth and were able to link this to the growth in world population and either the need for more houses or infrastructure.

(iii)   Relatively few responses adequately suggested reasons for the change in proportion of different metals used and most did not convey the idea that global use of all metals had increased greatly. The strongest responses included the change in demand due to new technologies and the ability to recycle existing materials. Cost was credited if the response was suitably contextualised.

(b) (i)   The reduction of waste from industrial processes was poorly described. Credit was awarded for stating a method and additionally for providing a suitable example.

(ii)   Candidates needed to calculate the missing data on a pie graph. Most candidates correctly added up the percentages provided to calculate the percentage required. Some attempted to measure the angle of the segment which was a more complex method. Both methods were capable of providing a suitable answer.

(iii)   Using the pie graphs, most candidates were able to rank type of waste in order of size. Some candidates incorrectly used the middle income countries data.

(iv)   Using the data, candidates were required to provide trends that included how the proportion of the specified wastes changed with income.

(v)   The pie graphs showed data on household waste so responses needed to relate to household waste rather than other waste generated within a country. Most candidates gained some credit, either for the organic waste or the paper and cardboard waste. A small number of responses gave both similar consideration and gained maximum credit.

(vi) Most candidates were able to use the information in the text to identify how the new scheme would benefit local people.

(vii) Few candidates understood how the organic matter would reduce the need for water through acting as a mulch or suppressing weeds which might compete with the crop. Many candidates suggested that greater soil nutrients or a faster growing plant would need less water.

(viii) Most candidates correctly identified the opportunity for the organic waste to provide methane or biogas as a fuel.

(c)(i) Good examples of building design features were seen, which related to both cold and warm climates. A number of candidates did not focus on the requirements of the question and described how building design might make the building resistant to earthquakes rather than design features which would reduce the use of future resources such as electricity.

(ii) A diverse range of scenarios were accepted as suggestions for reasons why building regulations might not be as strict, the most common responses including the cost implication in building, the abundance of energy resources or the lack of enforcement of regulations.

(d)(i) While many candidates could see the advantages of importing gas from a neighbouring country, many did not fully grasp the risks this might involve linked to international relations, the risk of significant price rises or continuity of supply.

(ii) While many responses contained an idea relating to waste emissions, this was poorly articulated in many answers. Some incorrectly stated that methane use did not produce carbon dioxide. The best responses made a comparison between coal and methane.

(e) This was the second longer response question marked using a level of response mark scheme. As with **Question 5(e)**, there was evidence of a general development in the structuring of answers rather than the production of a list or bullet points, which could limit the potential credit awarded.

The phrasing of the question gave the candidates scope to look at a wide range of waste disposal methods as well as their impact on the environment. Many candidates were able to do this well and provided suitable examples. Weaker responses lacked supporting evidence to back up their statements. Most answers demonstrated a good command of language.

ENVIRONMENTAL MANAGEMENT

Paper 5014/21
Paper 2

Key messages

- Candidates should read the source material and the question carefully.
- Data from graphs or tables should be used to help describe trends or patterns.
- Candidates should always make statements using precise terminology.
- Both axes of any graph should be fully labelled with units.

General comments

This paper invited candidates to consider environmental issues and methods of gathering and interpreting data in the context of one country, Mexico. Many candidates understood and made good use of the source material and their written responses were clearly expressed. The mathematical and graphical questions posed some difficulties for a small number of candidates.

Candidates had no problems completing the paper in the time available.

Comments on specific questions

Question 1

(a) Most candidates described at least one problem associated with rural to urban migration.

(b)(i) This calculation was usually carried out by an appropriate method that produced a correct answer.

(ii) Nearly all candidates identified some possible benefits to the government. Some answers made a general comment about the benefits to a farm rather than identifying a clear benefit to farm workers.

(iii) Most candidates gave at least one good reason for farm workers leaving their job and moving to the city. All of the points on the mark scheme were seen regularly.

(c)(i) Nearly all candidates completed the calculation correctly.

(ii) Most candidates correctly calculated the average number of strawberries per tray.

(iii) Only a small number of candidates clearly stated that **method one** was not representative of the whole strawberry field.

(iv) Many candidates made at least one suggestion as to why **method three** was better than **method two**. A number of candidates gained full credit.

(v) Most candidates completed the sampling grid correctly from the information given.

(vi) Nearly all candidates presented a table that gained full credit.

(d)(i) Some candidates misread the question and calculated the average temperature rather than the average temperature range.

(ii) Most candidates gave descriptions of the data without explaining why plant growth could occur all year round in this region. A small number of candidates showed very good understanding and suggested all of the creditworthy points.

(iii) Nearly all of the candidates stated the six months when irrigation would be needed. There were a small number of answers that only gave five months so they could not gain credit.

(iv) About half the candidates named a water saving method of irrigation.

(v) There were many good descriptions of how over-watering can damage soils. The key points of dissolving salts followed by evaporation and salt deposition at the surface were made by at least half the candidates.

(vi) The problems associated with growing the same crop year after year were described; in some cases candidates needed to be more precise in their answers to gain full credit.

(e) (i) Candidates suggested sensible risks to human health from cooking on open fires.

(ii) Most candidates calculated the percentage of the population cooking on open fires correctly.

(iii) Most candidates gave at least one sensible reason why people did not want to change to the new cooking stove.

(iv) Almost all candidates gave at least one sensible method the government could use to encourage more families to use the new cooking stove.

(v) Nearly all candidates gained some credit for suggesting how using the new cooking stoves could reduce the impacts on the environment. All the points on the mark scheme were seen regularly, although only a small number of candidates made three clear points to gain all of the credit available.

Question 2

(a) (i) Candidates often made suggestions that only partly answered the question. The information given in the question was an indication that overfishing was unlikely in this location.

(ii) Most candidates found it difficult to suggest basic sampling methods that could be used at each of the sites **A** to **F** in the same way.

(iii) Candidates had little difficulty plotting the data for this bar graph. Full credit could have been achieved more frequently if more responses had included both axis labels and ensured they were complete.

(iv) Most candidates selected the appropriate sample site and gave a reason for their choice.

(v) Many candidates gained some credit for describing the impact of raw sewage on a lake ecosystem. However, only a small number of candidates described the impacts in a logical order, gaining maximum credit.

(b) Candidates suggested a range of strategies for development around a lake without damaging the lake ecosystem. A small number of candidates gave four different suggestions that gained all of the credit available.

ENVIRONMENTAL MANAGEMENT

Key messages

● Candidates should read the source material and the question carefully.
● Data from graphs or tables should be used to help describe trends or patterns.
● Candidates should always make statements using precise terminology.
● Both axes of any graph should be fully labelled with units.

General comments

This paper invited candidates to consider environmental issues and methods of gathering and interpreting data in the context of one country, Mexico. Many candidates understood and made good use of the source material and their written responses were clearly expressed. The mathematical and graphical questions posed some difficulties for a small number of candidates.

Candidates had no problems completing the paper in the time available.

Comments on specific questions

Question 1

(a) (i) Many candidates correctly calculated the temperature range. Others misread the question and calculated the average temperature.

(ii) The temperature difference between the two locations was calculated correctly by many candidates.

(iii) This calculation required candidates to work out the expected temperature at Farm **A**. Farm **A** was at a lower altitude so candidates needed to work out the difference in temperature between the two farms and then add this to the April temperature. Most candidates gained some credit, with a few gaining full credit.

(b) (i) Only a small number of candidates correctly identified photosynthesis as the process that captures carbon dioxide.

(ii) Some candidates clearly identified that Farm **A** would be warmer than Farm **B**. Candidates who recognised the temperature difference usually gave a correct suggestion to explain why the fruits ripened more quickly on Farm **A**.

(iii) Most candidates identified that the time period between January and May had low rainfall, and many of these went on to explain the implications on the absorption of fertiliser. A small number of candidates focused on temperature from the table of data and, therefore, could not explain why fertiliser was added.

(iv) Many candidates suggested that some fertiliser would be washed away from the trees. In some cases the impact on the trees was described rather than the impact on the environment. The candidates who realised that fertiliser may enter water bodies nearly always gained maximum credit for some description of the events leading to eutrophication.

(v)   Nearly all candidates gained at least some credit for suggesting reasons why crops were not grown between the trees. Some candidates were able to provide three distinct reasons and gained full credit.

(c)   Most candidates gave at least two benefits of exporting avocado fruits that were worthy of credit. Candidates needed to consider benefits for farmers and benefits for the government to gain full credit.

(d)(i)   Candidates found this challenging. A small number of candidates performed a correct calculation to give the correct percentage increase.

(ii)   Almost all of the candidates displayed some knowledge of how deforestation can lead to soil erosion. A small number were able to give sufficient details to gain maximum credit.

(iii)   Most candidates gave at least one method of developing new varieties of plants. Many candidates showed awareness that plants could be modified by transferring genes.

(e)(i)   Most candidates completed the calculation correctly.

(ii)   Most candidates completed the calculation correctly.

(iii)   About half the candidates described a suitable safety instruction that should have been included in the method.

(iv)   Nearly all candidates gave two correct uses of the seeds and skin of avocado fruits on a farm.

Question 2

(a)(i)   Many candidates plotted the data correctly as a bar graph, although some candidates did not label both axes correctly.

(ii)   The trend was correctly described by most candidates.

(iii)   Candidates had little difficulty in suggesting at least one reason for the trend in copper price.

(b)(i)   Many candidates gave one correct suggestion as to why development at mine **F** was stopped. Some candidates incorrectly suggested that all the copper had already been extracted from the mine.

(ii)   Many candidates had difficulty in describing the need for an environmental impact assessment before a mine is developed.

(iii)   Most candidates suggested at least one strategy for reducing the impact on the environment after a mine has closed. Some candidates were able to fully describe the strategies and gain all of the credit available for this question.

(c)(i)   Most candidates provided at least one reason why local people would want mining to start again.

(ii)   Most candidates made some suggestion as to how starting mining could reduce the impact of logging in the area; however, only a small number of candidates gained full credit.

(iii)   Many responses gave some possible reasons for water pollution caused by mining; however, many answers needed greater clarification to achieve full credit.

(d)(i)   Many candidates found it difficult to describe a suitable sampling method.

(ii)   Most candidates were able to suggest at least one benefit of tourism to local people.

(iii)   Candidates needed to use the information given. Those that did so were able to suggest why local people considered this example of tourism to be a sustainable activity.

(iv) Most candidates presented one further question to add to the questionnaire that was worthy of credit. The question needed to be about tourism.

(e) Many candidates made at least one sensible suggestion as to how the festival could help conserve the monarch butterfly.