ENVIRONMENTAL MANAGEMENT

Paper 0680/11
Paper 1 Theory

Key messages

- Candidates should aim to provide sufficient detail to achieve the full range of credit available at this level.
- Candidates should pay attention to the command word in the question (state, describe, explain, etc.) as this will help in the understanding of the level of detail required in the response.
- Candidates should be encouraged to show their working when completing calculations.
- Descriptions of maps and photographs should be precise to prevent potential ambiguity.
- When asked to give opinions or conclusions, candidates should ensure these are supported by relevant evidence and examples.

General comments

Candidates are reminded to refer to the maximum number of marks for a question as this will give a guide to the number of points they should make in their responses.

Candidates generally showed a good knowledge of the new syllabus, although there were specific areas where responses would benefit from additional clarity and detail. For example, in **Question 7(b)** some candidates wrote about the enhanced greenhouse effect or acid rain without including details of the gases involved. Generic phrases such as 'causes pollution' should be clarified with more detail.

When plotting pie charts the expectation is that angles are plotted accurately and the shading in the key is used consistently. Candidates would benefit from using a sharp pencil and ruler for all types of graph work.

Comments on specific questions

Section A

Question 1

(a) Most candidates were able to interpret the table to identify the world region with the lowest insecticide use.

(b) Most candidates were able to correctly calculate the increase in insecticide use within the specified region.

(c) A slightly more challenging question, many responses identified the costs of insecticides or the importance of agriculture to the region. The other marking points were seen less frequently.

(d) Candidates provided a broad range of suitable answers for example, the use of biological control or predators, the use of plant breeding to develop resistant varieties or the use of barriers to the pest such as enclosed growing environments. Some candidates suggested a crop which had been genetically modified and this was credited if linked to pest resistance. The most common error was to state that pesticides should be used; this was not credited as insecticides are a form of pesticide.

Question 2

(a) This question, requiring candidates to describe the vegetation in the photograph, proved to be more challenging. Most commonly, candidates needed to reference the position of the type of vegetation they were describing. Others described the climate rather than the vegetation.

(b) Many responses correctly linked the issue to the long term drought, identifying that the cattle would not have sufficient vegetation to feed on. Fewer candidates identified the need for cattle to have water to drink.

Question 3

(a) Many candidates were able to extract the correct data from the graph and complete the calculation, although some candidates needed to identify the decrease and include the minus symbol to gain full credit.

(b) Most candidates correctly identified the 10-year period (2005–2015). The most common error was to name only one year.

(c) Many responses correctly made the link between carbon dioxide production and the enhanced greenhouse effect and some identified the pressure that may be put on a government by the public or the need to meet international agreements.

Question 4

(a) Almost all the candidates were able to interrogate the data in the table and identify the correct country.

(b) While many responses used the information in the table as requested, some mistakenly limited their responses to the duration within a calendar year rather than the largest gap between eruptions.

(c) Most candidates were able to provide three reasons, with the stronger responses identifying the lack of population in the vicinity of the volcano and the use of scientific equipment to monitor volcanic activity providing an early warning of an eruption. Some answers related more to earthquakes than volcanic eruptions and some accounts lacked detail, which limited the credit awarded in some cases.

Section B

Question 5

(a) (i) Most candidates used the centre point on the pie chart to begin their lines, thus making it easier to read the angles. The most common error was not realising that the interval points around the outside of the pie chart were in 10% spacings. Some candidates completed an additional calculation prior to plotting the data, often incorrectly. A small number of candidates missed out on credit by labelling the segments themselves rather than applying the key as instructed.

(ii) While most candidates identified that the population was ageing or there was a lack of younger people, some found it difficult to suggest two problems this would cause. Some incorrectly suggested there would be a larger amount of unemployment, whereas with a higher number of older people there would be a shortage within the workforce and an impact on the economy, not only from the reduction in output but also the demands and costs for caring for an ageing, dependant population.

(iii) The command word ‘explain’ required the candidates to provide a more detailed answer to the scenario faced in Niger. Responses explaining that large numbers of the population are of child bearing age, and that the high numbers of younger people will be of child bearing age soon were both given credit.

(iv) Many responses demonstrated a good knowledge of how an increasing population would impact on the country, a good number identifying the issue of potential unemployment, but far fewer identifying the impact of a larger number of children and their need for education.

(v) Candidates were generally well prepared for a question relating to population management. Some needed to provide a description of their strategies or further detail to avoid ambiguity in their responses.

(b) A more challenging question, requiring candidates to use a range of information within the syllabus to develop an opinion and provide justification for their viewpoint. It was possible for candidates to conclude either of the opposing views with credit awarded for the evidence they provided to support their view. The higher performing candidates responded well to the question and were able to demonstrate the application of their knowledge from across the syllabus, providing some very considered and well-argued opinions. A number of justifications or arguments contained concepts that did not relate back to sustainability, a key point within the question, and these were not given credit.

Question 6

(a) (i) Most candidates successfully calculated the average using the data in the table.

(ii) Most candidates answered these three statements correctly using the data in the table.

(iii) This question was attempted by most candidates. Many identified the link to disease and gained credit for a named example. Fewer identified that water is an essential human need and some responses needed to provide an explanation as directed by the command word within the question.

(b) (i) Most candidates were able to correctly interpret the information in the graph to determine the water consumption in Europe in 2010.

(ii) While most responses described trends, there were a number of responses that did not make a valid comparison between the two continents.

(iii) Most candidates correctly completed the calculation and circled the correct response from the options provided.

(iv) This calculation proved to be more challenging to some candidates, although partial credit was given for the correct method even if the arithmetic calculation was incorrect. It is important that candidates show their working so that partial credit may be awarded in these cases.

(v) There was a general recognition that the increase in demand for water was related to an increase in the global population. Stronger responses went on to explain the impacts of an increased population such as the need for additional water for irrigation to meet the need for food.

(c) Many candidates were able to write confidently on the subject of water pollution from towns and cities, although a number of responses focussed on the impacts of fertiliser use and eutrophication. These were not considered to be important sources of water pollution in towns as they tend to be rural activities.

(d) This was the extended response question marked using a level of response mark scheme. This question was marked according to the level of response and allowed candidates to write about a topic in depth and respond to a specific context or statement, in this case the relative impacts of water pollution and the enhanced greenhouse effect. Both viewpoints were valid, with candidates achieving credit by the quality of their argument and the evidence used to justify their viewpoint. A small number of candidates provided their answer in bullet points which did not allow the depth of their knowledge to be clear. The best responses arrived at a conclusion and were able to evaluate the question from both viewpoints as well as providing relevant examples to support their case.

Question 7

(a) There was variability in the quality of the descriptions about the formation of oil. Common errors included the omission of the location (seas), not referencing the requirement for heat and pressure to support the transformation and in some cases, an omission of the timescale involved.

(b) While attempted by most candidates, relatively few were able to provide sufficient advantages and disadvantages to gain full credit. References to the enhanced greenhouse effect or acid rain needed to be linked to the gases involved. Some candidates were confused as to whether oil was a renewable resource or not.

(c) (i) Almost all candidates interpreted the map correctly and gained credit.

(ii) Almost all candidates interpreted the map correctly and gained credit.

(iii) Most candidates were able to gain some credit. A wide range of different explanations were credited including the availability of oil, the use of alternative energy sources and the industrialisation of an area. Some responses did not recognise that the data related to the oil use per person so a larger population did not impact on this figure.

(d) (i) The task of describing the distribution of oil spills on the map proved more challenging for many. Most identified the large incidence of oil spills close to the Netherlands and Belgium as well as the number of oil spills in the English Channel. Candidates described these locations in a variety of ways to gain credit. Statements identifying where oil spills did not occur were not credited.

(ii) Correct responses identified the roles of booms, skimmers and detergents to control oil spills. Other methods such as burning the oil and use of mechanical methods on beaches were also given credit. The most common error was to describe ways to prevent an oil spill (such as double hulled ships) rather than describing the actions after an oil spill.

ENVIRONMENTAL MANAGEMENT

Paper 0680/12
Paper 1 Theory

Key messages

- Candidates should aim to provide sufficient detail to achieve the full range of credit available at this level.
- Candidates should pay attention to the command word in the question (state, describe, explain, etc.) as this will help in the understanding of the level of detail required in the response.
- Candidates should be encouraged to show their working when completing calculations.
- Descriptions of maps and photographs should be precise to prevent potential ambiguity.
- When asked to give opinions or conclusions, candidates should ensure these are supported by relevant evidence and examples.

General comments

It is important that candidates are confident in all subject areas and are also able to combine their knowledge from different areas of the syllabus to form opinions.

Candidates are reminded of the need to act upon the command word within the question as this will give an indication of the depth of response required. Some opportunities to gain credit were missed due to the lack of detail or justification provided.

Most candidates were able to apply skills in plotting data effectively although there were a few cases where errors in understanding scales or not applying the key limited the credit achieved.

Some candidates showed a lack of understanding of the advantages of fossil fuels (in this case, coal) although they clearly had an understanding of their disadvantages.

Comments on specific questions

Section A

Question 1

(a) Almost all candidates used the divided bar chart to get the correct answer.

(b) Most candidates were able to identify both the country and the value. Both were required to be stated correctly for credit to be awarded.

(c) Most candidates were able to name two greenhouse gases. Some candidates incorrectly named nitrogen and oxygen, components of air but not acknowledged as greenhouse gases.

(d) Candidates suggested a number of different reasons, from the level of development and industrialisation through to personal ownership of electrical equipment. Many candidates gained credit.

Question 2

(a) This question was more challenging for many candidates, requiring them to describe the high risk water supply locations within South America. While this could be done in a variety of ways, most candidates related the locations to the coast. Commonly, candidates needed to use more precise descriptions such as defining location by the compass points rather than using terms such as above or below or left and right. A few candidates gave additional comments that were not solely related to South America, which could not gain credit.

(b) This question required candidates to apply their knowledge to the location marked on the map. Many correctly identified that the location was a significant distance North of the Equator and correctly concluded it was likely to have higher precipitation or cooler temperatures, which might impact on the availability of water. Some incorrectly suggested that the area was near the coast so water would be available by desalination.

(c) This question showed a general understanding within the cohort of the factors that would affect the overuse of water. The size of the population was the most commonly cited factor.

(d) The question required candidates to suggest two strategies to reduce the impact of drought. This was generally answered well, many identifying the potential to use more drought resistant crops or developing a (named) method of storing or using water efficiently. The simple statement that 'water should be stored' required further clarification to gain credit.

Question 3

(a) Most candidates attempted to answer this question. The most common correct answer was the presence of gullies or cracks within the soil surface where soil had been moved. Some stated that all the topsoil had disappeared, which could not be determined from the photograph.

(b) Most candidates correctly suggested the impact of heavy rain. Fewer identified the potential risk from wind erosion or the impact sloping ground would have.

(c) Most responses for this question included a mention of the role of planting vegetation so that the soil was stabilised by the roots, and a few also identified the role vegetation might have as a wind break. Those who suggested adding organic matter to the soil were also given credit due to its impact on soil structure, although stating the addition of fertiliser without further information was not considered sufficient as this might merely supply nutrients and not improve soil structure.

Section B

Question 4

(a) (i) Candidates were required to interpret the scales on the graph correctly in order to calculate the change in population. The most common error was to omit the correct units within their response (billion).

(ii) The correct responses identified that the rate of increase was reducing. A number of candidates described the graph rather than the rate of increase in world population.

(iii) While many candidates understood the reasons for a range of potential populations within the prediction, they did not always explain these sufficiently well to gain full credit; commonly the potential reason for variance was missed.

(b) (i) Most candidates were able to place the continents in the correct rank order and gained full credit.

(ii) Most candidates correctly identified the continent with a predicted population decrease.

(iii) This calculation proved to be more challenging to some candidates, although partial credit was given for the correct method even if the arithmetic calculation was incorrect. It is important that candidates show their working so that partial credit may be awarded in these cases.

(iv) Many responses showed a good knowledge of factors that affected population growth. Responses often focussed on the issue of an increase in birth rate, but factors that reduced the death rate were also given credit.

(v) Most candidates were able to name factors that cause migration. Those that simply responded 'push and pull factors' were not given credit unless a suitable example was also included.

(vi) This was the extended response question marked using a level of response mark scheme. This question allowed candidates to write about a subject in more depth and combine knowledge from a range of areas within the syllabus to form a conclusion. The use of the phrase 'To what extent do you agree with this statement?' invited the candidates to provide a conclusion, which all but the weakest responses did. A range of possible conclusions were valid provided they were supported with reasons. The strongest responses also supported their viewpoint with specific examples and were able to evaluate both sides of the argument. The weakest responses gave their answer as a list and did not elaborate on their statements to form a more developed argument.

Question 5

(a) Many candidates gained full credit for their description of the formation of coal. Some candidates displayed some confusion with the process for the formation of oil. Common omissions were the requirement for heat and pressure within the process or the inclusion of the timescale.

(b) While many candidates had a basic understanding of the disadvantages of using coal, there was less awareness of the potential advantages (such as the relative cost, accessibility, etc.). As this question implied a comparison with other energy resources, the use of a comparison was helpful. Some candidates stated that coal may cause 'air pollution' as a disadvantage; this was too vague to gain credit. Candidates that went on to name the gases involved and the problems caused achieved credit.

(c) (i) This question tested the candidates' ability to plot data on a graph. This was completed successfully in most responses, with few examples of the scale being incorrectly read.

(ii) Most candidates were able to identify the correct answer from the data, although it was expected that the full name was provided (Asia and Oceania).

(iii) This was answered correctly by most candidates.

(iv) A more challenging question, requiring candidates to describe the changes in Europe within a specified period. Most candidates achieved some credit. It was important for candidates to describe the main trends rather than the data for each particular year. Common errors were the incorrect use of data or its omission and the description of the trends for a different time period to the one specified.

(v) While most responses were able to correctly identify the reasons for an increase in the energy used in Asia and Oceania (increasing population, greater affluence, increased industrialisation), candidates found identifying the reasons for the changes in consumption in Europe more challenging. Some incorrectly referenced the change to alternative sources (which would still be included in the total). Relatively few focussed upon the role of greater energy efficiency in the change to the amount of energy used.

Question 6

(a) Most candidates gave a good overview of the changes in the data, although there were some errors in the use of data, and in some cases data were omitted.

(b) (i) Candidates were required to complete the pie chart. It was important that the segments were presented in rank order, commencing at the top and working clockwise. There were some plotting errors within the cohort. Most candidates correctly linked their pie chart to the key.

(ii) This question, requiring the candidates to define the two types of agriculture stated, was answered well and most achieved full credit, with only an occasional example of the two definitions being reversed.

(iii) Candidates were well prepared for a question on the causes of deforestation and most were able to supply a suitable response.

(iv) While many candidates were aware of the impacts of deforestation, some responses required greater focus on the command word 'explain' and needed to provide more detail or further clarification in order to gain credit.

(c) (i) Most candidates were able to interpret the food chain correctly; the most common error was to identify the heron as the tertiary consumer.

(ii) Many responses achieved full credit by positioning the organisms in the food chain in the correct order and showing the pyramid decreasing in size with similar style boxes used.

(iii) Most candidates were able to describe photosynthesis and many responses successfully achieved full credit. It was expected that the inputs and outputs were both mentioned, together with the site of the reaction and the requirement for sunlight.

(d) Candidates were required to make an accurate and direct comparison between the percentage losses of the two wetland habitats. Some candidates found this challenging.

ENVIRONMENTAL MANAGEMENT

Paper 0680/13
Paper 1 Theory

Key messages

- Candidates should aim to provide sufficient detail to achieve the full range of credit available at this level.
- Candidates should pay attention to the command word in the question (state, describe, explain, etc.) as this will help in the understanding of the level of detail required in the response.
- Candidates should be encouraged to show their working when completing calculations.
- When asked to give opinions or conclusions, candidates should ensure these are supported by relevant evidence and examples.

General comments

Candidates are reminded to refer to the maximum number of marks for a question as this will give a guide to the number of points they should make in their responses.

Candidates generally showed a good knowledge of the new syllabus, although there were specific areas where responses would benefit from an additional focus, such as the concept of contour ploughing and an understanding of the water cycle.

Where questions require the candidates to form an opinion, it can be useful to use supporting examples within the response to strengthen the point being made.

In general, candidates used data to support their answer where this was required in the questions.

When plotting graphs it is expected that candidates make good use of the available space. Some responses did not do this and therefore created a very small scale that was difficult to read accurately. Candidates would benefit from using a sharp pencil and ruler for all types of graph work.

Comments on specific questions

Section A

Question 1

(a) Most candidates were able to interpret the scale on the graph correctly. To gain full credit candidates needed to apply the key correctly and draw bars of a similar width to those already shown.

(b) The calculation was completed successfully by most of the cohort.

(c) Most candidates showed skill in determining the difference between birth and death rates, completing this task correctly.

(d) Candidates were well prepared to suggest reasons for a high birth rate. The lack of availability of contraception and the high number of people of child bearing age were commonly quoted.

(e) This question required candidates to sketch their own population pyramid and proved challenging for many. The pyramid should have straight sides, narrowing towards the older age range. The strongest responses also showed slightly more females than males within the older age groups.

Question 2

(a) Most candidates were able to describe suitable methods of extraction from an opencast mine. Stronger responses were able to give the stages of extraction in the particular order that they would take place.

(b) Candidates were generally well prepared for this type of question and were able to identify a range of environmental impacts of opencast mines. The most common error was a lack of precision in the response, for example stating 'pollution' rather than the specific type of pollution, e.g. 'water pollution from mining run-off'.

Question 3

(a) This question required the candidate to plot the information provided as a bar chart. A grid was provided and it was expected that the response would include labelled axes, an appropriate use of a scale and the accurate plotting of bars of similar width. Candidates should use at least half of the available grid space when completing graphs.

(b) Candidates made some good suggestions as to the reason for the abundance of plastic waste in the world's oceans. Many responses identified the lack of recycling opportunities, as well as the increase in the use of plastics and the time it takes for plastics to break down.

Section B

Question 4

(a) (i) A good number of candidates were able to use the information provided to complete the calculation correctly and produce the correct answer. In questions of this type, it is important that candidates check that their answer is of the correct order of magnitude.

(ii) Most responses demonstrated an understanding of reasons why electricity demand had increased, with a variety of suggestions from an increase in population through to the increased industrialisation of the continent.

(iii) Most candidates were able to identify the energy resources not included in the two charts; most errors seemed to be as a result of inaccurate reading.

(iv) This calculation proved challenging for many; whilst they accessed the correct figures, they did not necessarily use the correct process. It is important that candidates show their working so that partial credit may be awarded in these cases.

(v) The instruction to 'suggest reasons' allowed for a wide range of potential responses to be awarded credit, and many identified the reduction in the emissions of carbon dioxide, the impact of acid rain and the increasing price of fossil fuels. Some stronger responses also cited the need to comply with international agreements and the impact of public pressure on governments.

(vi) Most candidates had knowledge of other energy resources used to generate electricity and were able to identify two items that had been included in the group named 'other'. Candidates needed to take care not to repeat a resource already listed within the pie charts.

(vii) Many candidates were able to describe the process of electricity generation with confidence and in a logical order. While all gave a description of the use of water, some incorrectly stated that the water was turned to steam to drive the turbines, whereas in this case it was the movement of water which was the force that drives the turbines.

(b) Candidates were required to use their knowledge to form an opinion within this question. A wide range of potential evidence sources were cited including the relative use of energy by industry compared to the home. Some candidates identified that the impact of all homes making changes would be significant, while others saw the need for governments to invest in new technology for electricity production. Candidates could provide reasons to agree or disagree with the statement.

Question 5

(a) (i) This question, requiring candidates to define some common terms used in the water cycle, was completed with varying success.

(ii) Many candidates were able to explain why the level of vegetation had decreased. Many correctly identified the need for more farming land, the impact of urbanisation and the demand for additional resources that require mining.

(iii) A number of candidates were able to interpret the information within the flow chart to assist them in explaining why soil erosion had increased. While it was clear in some responses that there was an understanding of the factors, the explanations were less clear.

(iv) This was the extended response question marked using a level of response mark scheme. This question was marked according to the level of response produced by the candidate and allowed for a more detailed and expansive answer, bringing together areas of the syllabus and forming an opinion. The strongest responses provided a coherent and logical answer, supported by relevant examples. Many candidates did not understand the term ‘contour ploughing’ and therefore were more challenged in evaluating management techniques to reduce soil erosion.

(b) (i) Many candidates were able to use the diagram and its scale to determine the size of the sand particle correctly.

(ii) Most candidates successfully named at least one other soil component.

(iii) This question required candidates to state differences between the properties of sandy and clay soils and was less well known in general across the cohort. There were some examples of candidates who were able to describe four distinct differences. A common error was to provide the opposite characteristic rather than a different one (e.g. well drained and poorly drained). The pH of the soil may vary in both sandy and clay soils so this was not a feature that would vary consistently between the two types.

Question 6

(a) (i) A number of candidates found this calculation challenging; some used the incorrect axis to complete the calculation, a few others were confused by one of the figures being negative, which impacted on their final answer.

(ii) Candidates were required to use the information in the photograph as well as the climate data graph to identify the reasons for flooding. Many used the photograph well, identifying the risk due to the shape of the valley and the steep sides, but were less successful at connecting this to the climate information and the release of a large amount of water when the ice and snow melts.

(iii) Most candidates understood the impacts of flooding and applied this to the people in the valley. Some responses missed out on credit as they related their answer more to the broader environmental impacts rather than focusing on the specifics of the impacts on the people.

(b) (i) Many candidates showed confidence in the interpretation of the storm hydrograph and had little difficulty in stating the river flow before the start of the rain.

(ii) Most candidates were able to describe the river flow during day 2 and many responses included data to support the trends they were describing. Some needed to read the question more carefully as they described the trend over the four days.

(iii) This question proved to be more challenging to many candidates; many did not understand the time delay in water reaching the river. Where this was understood as a concept, it was often poorly explained.

(iv) This question required a description of the ways the risk of floods may be managed. Some candidates provided simple statements without an accompanying description. Responses often identified the use of dams or levees and the use of afforestation as suitable techniques. Few described the opportunities to dredge the river to increase its capacity.

ENVIRONMENTAL MANAGEMENT

Paper 0680/21
Paper 2 Management in Context

Key messages

- Candidates should read the source material and the question carefully before starting their response.
- Candidates are advised to follow the rubric of the question. If one example is asked for, candidates should provide one example only.
- Candidates are encouraged to attempt every question, including diagram completion. Diagram completion often does not have dotted response lines and candidates should take care not to overlook this style of question.
- Data from either graphs or tables should be used to help describe trends or patterns.

General comments

This paper invited candidates to consider environmental issues and methods of gathering and interpreting data in the context of one country, Iceland. 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.

Comments on specific questions

Question 1

(a) (i) Most candidates calculated the correct answer, 82 400.

(ii) Most candidates calculated the correct answer, 1 511 451.

(b) (i) Nearly all of the candidates attempted to describe the population density of Iceland. Some candidates only presented the population density data given in the key of the map without clearly identifying the areas of different density across Iceland. Stronger answers also used information from the source material on pages 2 and 3 of the question paper.

(ii) Many candidates completed the divided bar chart and key successfully. Other candidates did not complete the key or made a plotting error.

(iii) Many candidates gave either one or two creditworthy factors that could affect the death rate. A small number of answers were too vague to gain credit.

(c) (i) Nearly all of the candidates selected the correct month, October.

(ii) Candidates nearly all calculated the correct answer of 4.7.

(iii) Candidates found this part-question challenging. Successful answers used information from the table and related this to growing crops.

(d) (i) Most candidates completed the word equation for photosynthesis correctly.

(ii) Most candidates gained some credit for explaining there are only a small number of hours of daylight for part of the year or that light is needed for photosynthesis. Few candidates suggested that the plants would grow faster given more light.

(e) (i) Nearly all candidates correctly stated the sequence of events as **B A C E D**.

(ii) Most candidates gave descriptions that clearly indicated at least one benefit of using geothermal power rather than fossil fuels for electricity generation. Some candidates made reference to toxic gases without any further detail; these answers did not gain credit.

(iii) Candidates nearly always suggested an appropriate energy resource.

(f) (i) Some candidates found it difficult to determine the correct percentage from the pie chart.

(ii) Many candidates found it difficult to suggest why the fishing industry consumed very little electricity. A small number of candidates gained credit.

(g) (i) Most candidates gave at least one creditworthy reason why the proposed location for the smelter might be suitable.

(ii) Candidates found suggesting further questions to be used in the questionnaire somewhat demanding. Some candidates wrote a question that was too similar to one already given in the questionnaire shown. Some suggested questions did not relate to expanding the aluminium industry.

(iii) Most candidates suggested one or two creditworthy limitations of the sampling method described in the question. A few candidates gave responses that used the syllabus terminology of random or systematic sampling in a correct and meaningful way.

(iv) Nearly all candidates answered this question correctly.

(v) Most candidates gained credit for giving the reason why it was safe for farmers to allow goats to eat the crops. Some candidates did not follow the instruction in the question to give a reason; the answer ‘yes’ was insufficient without a reason.

(h) (i) Most candidates could identify at least one impact of surface mining.

(ii) A range of creditworthy ideas were regularly suggested. Some candidates found it difficult to suggest why bauxite might not be extracted from an area.

(iii) Candidates frequently described several aspects of land restoration after mining had finished. The suggestion that the hole should be filled with topsoil was not given credit. A layer of topsoil applied after the hole had been filled with either mining waste or domestic waste was given credit.

Question 2

(a) (i) Most arrows were correctly drawn in opposite directions. Some candidates left the boxes on the diagram blank for this question, suggesting that they did not read the instruction carefully.

(ii) Candidates nearly always gave a description that explained, to some extent, how a new island might be formed.

(iii) Most candidates suggested that the island would be free of human influence. Other creditworthy points were suggested by a small number of candidates.

(b) Most candidates gave at least two ideas as to why the ash cloud caused widespread disruption. The full range of creditworthy ideas were seen throughout candidates’ responses.

(c) (i) Only a small number of candidates gave answers that were too vague to gain credit.

(ii) This question was answered well and a wide range of opportunities were described.

(d) There were many clear and comprehensive descriptions of how sulfur dioxide caused environmental pollution. Many candidates gained full credit.

Question 3

(a) (i) Most candidates displayed a thorough knowledge of how tree removal caused soil erosion.

(ii) Most candidates identified at least one other strategy of reducing soil erosion. Some candidates repeated the strategy given in the stem of the question, which did not gain credit.

(iii) Most candidates gave good descriptions as to how to conserve biodiversity. Many creditworthy points were seen with a number of candidates gaining full credit.

(b) This question gave candidates information about the Alaskan lupine plant and was generally well answered. Most candidates applied their knowledge to the specific context of this question to gain credit. All of the creditworthy points were seen regularly. Candidates should avoid simply copying out the text already given in a question, without adding their own interpretation of the information.

(c) (i) Most candidates were able to use the information to determine the regions of the field to sample and complete this part of the tally chart correctly. A small number of candidates found this difficult.

(ii) Most candidates were able to complete this part of the tally chart correctly.

(iii) Nearly all candidates correctly selected region 8.

(iv) Candidates found this calculation challenging. Very few candidates found the total number of Alaskan lupine plants in the 10 sampled regions of the field (40 plants) and used this to work out an estimate for the whole field (30 regions) to give the correct answer of 120.

(v) Candidates found it very difficult to express their conclusions clearly. The use of the data given was frequently either incorrect or misleading.

(vi) Many candidates did not give a clear reason as to why the student should have sampled more fields. There were frequent references to reliability or accuracy that were not given credit.

ENVIRONMENTAL MANAGEMENT

Paper 0680/22
Paper 2 Management in Context

Key messages

- Candidates are advised to follow the rubric of the question. If one example is asked for, candidates should provide one example only.
- Candidates who have practical experience of sampling techniques such as quadrats and transects are more likely to be able to accurately describe these methods.
- Candidates are encouraged to attempt every question, including diagram completion. Diagram completion often does not have dotted response lines and candidates should take care not to overlook this style of question.

General comments

This paper invited candidates to consider environmental issues and methods of gathering and interpreting data in the context of one country, Iceland. Many candidates understood and made good use of the source material.

Candidates should avoid simply copying out the text already given in a question, without adding their own interpretation of the information.

Many candidates would benefit from practising table completion. This should include the use of units in the column or row heading rather than in the individual table cells.

Plotting bar and line graphs and interpreting pie charts was challenging to some candidates. Bars should be the same width and have shading that matches existing bars or a key. Plotting should be completed with a sharp pencil.

Using scale drawings was an area of weakness for many candidates.

Comments on specific questions

Question 1

(a) (i) Most candidates identified that a significant portion of Iceland is covered by permanent ice and snow. Some responses stated that towns were located around coastal areas for economic, farming or agricultural reasons. Weaker responses stated that people lived near the coast but did not give a reason for this.

(ii) Most responses calculated the population correctly.

(iii) The question required a distribution description. Stronger answers described the three sections of the population pyramid; the high percentage of young dependents, working age population and a reduction in numbers from 60–64 onwards. Weaker responses gave a list of population for multiple bars without relating this to the overall population distribution.

(iv) Many correct factors were suggested. It was not sufficient to state ‘push and pull’ factors without qualifying with examples.

(b) (i) Many candidates were not confident in their graph plotting skills. The precipitation bar was often not the same width as the other bars and was not shaded to match the existing bars. The values for temperature were often incorrectly plotted.

(ii) Good responses dealt with both the temperature and precipitation aspects of the graph; fewer candidates gave an explanation that supported the information they described from the graph.

(c) (i) Most responses stated that the length of time and cost were significant factors; other relevant suggestions were less commonly seen.

(ii) This was well known by candidates. There were a number of responses that gave more than the two techniques required by the question. Candidates are advised to follow the rubric of the question as no further credit is available for additional suggestions in such questions.

(d) (i) The process of water being heated by hot rocks and turned into steam was generally poorly described. Higher performing candidates clearly stated that the steam caused the turbine to rotate and that this caused the turbine to turn the generator and produce electricity.

(ii) Most of the responses correctly named a renewable energy resource other than geothermal power.

(iii) Most candidates were able to gain some credit for considering the environmental impacts of geothermal power compared with fossil fuels for electricity generation. Higher performing candidates considered both positive and negative environmental impacts.

(e) (i) Candidates found this a challenging question and many answers were incorrect.

(ii) This was found to be one of the most challenging questions on the paper. Many responses repeated the question and did not gain credit.

(f) (i) Many candidates were unable to use the scale to determine the distance between the port and the proposed location in km.

(ii) Most candidates used the information in the map to correctly suggest the lake as the source of fresh water. Some candidates suggested the ocean but as the question asked for fresh water, it was necessary to state that the water was desalinated in order to gain credit for this approach.

(iii) The role of an environmental impact assessment was unfamiliar to many candidates.

(iv) Good responses recognised that there were no questions directly about expanding the aluminium industry and that the questions were potentially biased. Some candidates did not follow the instruction in the question to give reasons. A simple statement agreeing or disagreeing with a point of view is insufficient at this level and the reasons and explanations should be the areas candidates focus their response on.

(v) Two limitations of the sampling method were sometimes seen. A few candidates gave responses that used the syllabus terminology of random and systematic sampling in a correct and meaningful way.

(g) (i) Some good tables were seen. Most had column or row headings and some gained additional credit by including the units in the headings. A common error was to include 5 km without converting this to 5000 m.

(ii) Some candidates had difficulty drawing a conclusion from the numerical data. Approximately equal numbers of candidates incorrectly suggested that the levels were unsafe as those who correctly explained they were below the safe level of 30 mg / kg.

Question 2

(a) (i) This part-question was often left blank, suggesting that some candidates did not read the question carefully enough and did not appreciate that an answer was required on the map.

(ii) Most candidates were able to correctly identify the type of plate boundary shown on the map.

(iii) The stronger answers were precise in their descriptions, such as 'on the ridge' rather than 'in the middle'. These responses referred to north, south, east or west rather than up or down.

(b) Many correct suggestions were seen here. Some candidates were able to provide two different reasons for maximum credit.

(c) (i) Stronger answers used the text provided in the question as stimulus and added to this information. For example, 'air traffic was disrupted so this caused a decrease in profit'; 'flooding may have caused crops to be washed away, which led to food shortages'. Weaker responses that copied out the text rarely gained credit.

(ii) Candidates gave good descriptions of what the graph showed about the volcanic eruptions.

(iii) Many good answers were seen that were presented as bullet pointed lists of reasons for the higher number of deaths.

(iv) Candidates commonly suggested the increased fertility of soils and tourism; many found suggesting another reason more challenging.

Question 3

(a) (i) Candidates found this question particularly challenging and very few were able to suggest how forests are involved in carbon storage. For carbon capture, respiration and photosynthesis were often confused.

(ii) This was generally well known. Using fertilisers or pesticides was a common incorrect answer.

(iii) Many detailed descriptions of what eroded soil looked like were given rather than the *impacts* of soil erosion; these descriptions did not answer the question.

(b) It was common to see large sections of the text repeated in answers and this rarely achieved credit. Stronger responses used the text to support their explanations. For example, 'the lupine spreads 30 cm so takes up a lot of land space'; 'it makes a herbal drink which could be sold for a profit'; 'it creates a shady canopy so other plants cannot photosynthesise'. A bulleted list that separated the benefits and negative impacts was often a successful approach to this question.

(c) (i) Candidates were not confident describing this experimental procedure. Descriptions often included irrelevant and confused material and this question was often left blank. Those candidates who have had practical experience in sampling techniques are more likely to perform well on this type of question. Descriptions of practical techniques are often best approached using bullet points.

(ii) Two abiotic factors were often correctly stated.

(iii) Very few candidates were able to suggest how the total number of plants in Iceland could be estimated. This question was often left blank.

ENVIRONMENTAL MANAGEMENT

Paper 0680/23
Paper 2 Management in Context

Key messages

- Candidates are advised to follow the rubric of the question. If one example is asked for, candidates should provide one example only.
- Candidates who have practical experience of sampling techniques such as quadrats and transects are more likely to be able to accurately describe these methods.
- Candidates are encouraged to attempt every question, including graph completion.

General comments

This paper invited candidates to consider environmental issues and methods of gathering and interpreting data in the context of one country, Iceland. Many candidates understood and made good use of the source material.

Candidates should avoid simply copying out the text already given in a question, without adding their own interpretation of the information.

Completing the pie chart was challenging to some candidates and this is an area in which many candidates would benefit from further practice.

Comments on specific questions

Question 1

(a) (i) Many responses offered creditworthy suggestions for why the capital city was on the coast. A few candidates did not use the information given in the map.

(ii) Some candidates gave a correct estimate of the number of people who do not live in the capital city. Others were unable to suggest a sensible value.

(b) Candidates performed well on this question and accurately described the trends shown by the graph.

(c) (i) Almost all candidates identified the correct month.

(ii) A few responses gave the range as –2.8 to 2.2, this was not the calculated value. Some candidates did not use the negative number correctly.

(iii) Stronger answers suggested creditworthy problems that related to the climate data provided. A few candidates struggled to express their ideas clearly and often repeated the same point multiple times.

(d) (i) This question was answered well.

(ii) Some responses were left blank; others gave confused descriptions and did not use the information in the diagram to help form their answer. Stronger answers tended to bullet point their response into steps.

(iii) Almost all candidates gave a correct answer.

(iv) Some good answers were seen. A few responses were vague and stated 'pollution' with no further detail. This rarely is sufficient to gain credit and should be qualified, e.g. visual pollution.

(e) (i) Some correctly completed pie charts were seen; others did not complete the key or left this question blank.

(ii) Candidates found this question particularly challenging.

(iii) Some good descriptions were seen of ways to reduce domestic electricity consumption.

(f) (i) Most candidates gave one correct suggestion but were unable to give any further detail.

(ii) One correct reason was usually given. Many candidates then repeated themselves and were unable to gain further credit.

(iii) The syllabus terms random and systematic sampling were not well known.

(iv) Some good descriptions were seen. Weaker answers stated 'causes more pollution' without further detail; this was too vague to gain credit.

(v) Some candidates were familiar with the idea of recycle, repurpose, reuse.

(g) (i) Most candidates predicted the order correctly.

(ii) Some candidates found it challenging to interpret the numerical data and reach a correct conclusion. Some candidates did not give reasons for their answer.

Question 2

(a) (i) Many candidates found it challenging to clearly explain why the youngest rocks are found along the Mid-Atlantic Ridge.

(ii) Some good answers were seen here; others gave vague comments such as 'in the middle', which was not sufficiently detailed to gain credit.

(b) This was well answered by most candidates.

(c) (i) Creditworthy reasons were usually given.

(ii) A number of candidates directly copied material from the text of the question paper without adding further explanation or applying their own knowledge and so gained no credit.

(iii) Most responses correctly stated that the volcano was in the south and the prevailing wind direction took the ash cloud south-eastward.

(iv) This was answered well by many candidates. Both benefits and limitations needed to be considered for maximum credit.

(v) Candidates found this a challenging question.

(d) (i) Candidates were confident in interpreting the table of information and performed well on this question.

(ii) One correct reason was usually seen; candidates had difficulty providing a second relevant reason.

Question 3

(a) (i) Good explanations were common.

(ii) The impacts of deforestation were well known. Occasionally, 'pollution' was seen and this was not detailed enough to gain credit.

(iii) Many candidates stated either one or two ways but did not describe their ideas.

(b) (i) Most candidates gave a good explanation as to why adding nitrogen compounds to the soil is a benefit to farming.

(ii) It was common to see large sections of the text repeated in answers and this rarely achieved credit. Stronger responses used the text to support their explanations. For example, 'they die after 20 years in some areas, so this allows other plants to grow in the nitrogen rich soil'; 'the leaves are bitter so they are not eaten by animals and their growth is not controlled'. A bulleted list of reasons was often a successful approach to this question.

(iii) Candidates were not confident describing this experimental procedure. Descriptions often included irrelevant and confused material and many candidates left this question blank. Those candidates who have had practical experience of sampling techniques are more likely to perform well. Descriptions of practical techniques are often best approached using bullet points and labelled diagrams.