

ENVIRONMENTAL MANAGEMENT

Paper 0680/03
Coursework

General comments

Interesting local environmental issues were being explored in the coursework. Getting candidates involved in local environmental problems is one of the extra benefits for candidates of carrying out coursework.

Comments on specific questions

Domain A

Domain A continues to reward candidates with marks, demonstrating the high standard of teaching of the basic processes in the Environmental Management syllabus.

Domain B

Investigative skills, displayed by candidates, were generally good and the reports showed that most candidates carried out extensive research. The analyses tended to be competent but marks on criterion 6 continue to suffer from a lack of the recognition and discussion of the limitations of data.

Domain C

Marks on Domain C remain the lowest for most candidates due to a lack of a thorough sustainable development plan. It is not enough to give a list of choices available to decision-makers. For high marks the choices need to be evaluated and then worked into a possible strategy. An evaluation of advantages and disadvantages is crucial to gain high marks in Criterion 9.

The value positions of all interested parties and a thorough assessment of the factors behind them need to be carried out for Criterion 7.

Choosing a topic for investigation with sustainable development in mind at the outset would improve the marks scored in Domain C.

ENVIRONMENTAL MANAGEMENT

Paper 0680/11
Paper 1

Key messages

- Candidates should ensure they have read and understood command words such as explain, describe and state, and appreciated that they have different meanings which should elicit different kinds of answers.
- Candidates should be encouraged to use the mark allocation and the space provided for each part-question as a guide to the length of their answer. If additional space is required, writing elsewhere is acceptable with an indication that they have done this.

General comments

There was no evidence that candidates struggled with the length of this paper and there was a low rate of omission, where candidates did not answer a question at all. Candidates found **Question 6** the most challenging. Candidates often repeated the same point several times within the space provided for a response. Handwriting legibility continues to be poor in some cases and candidates may benefit from slowing down as paper length does not seem to be an issue.

Comments on specific questions

Question 1

- (a) (i) Most candidates described at least two soil characteristics. The necessity for nutrients was often quoted but few gained the credit for naming a relevant nutrient. Of those who considered the necessity for a suitable pH, some did not gain the mark by saying the soil should not be too acidic without appreciating that it should not be too alkaline either.
- (ii) Candidates often stated strategies to reduce soil erosion but did not go on to explain them as the question asked. For example, 'terracing' would be acceptable for a question asking candidates to state a strategy. A description of terracing would be required when asked to describe a strategy. Here, an explanation was needed.
- (b) Most candidates discussed how removing a rainforest would decrease biodiversity and destroy habitats, but fewer discussed the reasons why an oil palm plantation would perform some of the functions of the rainforest it replaced.

Question 2

- (a) (i) Plotting of the data often did not show sufficient accuracy, with the plotted point for Sichuan, China, not being clear of the 68 000 estimated number of deaths grid line, which it had to be to show a value of over 69 000. There were examples already plotted on the graph to illustrate this. For example, Nepal at magnitude 7.8 had an estimated number of deaths over 9000 and so the plotted point clearly does not touch the 8000 grid line.
- (ii) This question was answered correctly by most candidates.
- (iii) This question was also answered correctly by most candidates, however, fewer candidates were able to answer this question correctly compared with **Question 2(a)(ii)**.

- (iv) All the responses (A, B and C) were given to this question and nearly half of the candidates gave the correct answer.
- (v) Quality of buildings, distance from epicentre and some reference to poverty were the most often discussed factors. Candidates did not gain credit by including magnitude, which was clearly excluded by the stem. Underlying geology was very infrequently seen and the influence of being in a coastal location and subject to tsunamis was also rare.

(b) This question was well answered by most candidates.

Question 3

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

(ii) Again, this question was well answered.

(iii) Most candidates were able to do this, but some swapped push factors with pull factors or put in incorrect letters.

(iv) The most common correct answers referred to education, war and natural disasters. Identification of whether it was a push or pull factor was sometimes the wrong way round, and sometimes a reference to push or pull factor was omitted altogether. Some candidates referred to factors already in the list, rather than giving other reasons as required in the question.

(b) (i) This question was very well answered by most candidates.

(ii) Most candidates were able to give one problem, usually visual pollution or a bad smell. Fewer mentioned disease or a named disease. Water pollution was often quoted, but in a way which was too vague to gain credit. The production of some form of air pollution by waste is an issue whether it is collected or not, so this was not credited.

Question 4

(a) This question was quite well answered; 'between the tropics' or 'near the equator' being commonly given answers. Fewer candidates were able to gain the second mark with some relevant extension of this point.

(b) (i) A reasonable number of candidates described how plants would be unable to photosynthesise once they had lost their leaves. Far fewer were able to connect this to the fact there would be less availability of energy, or materials of some kind, to make the coffee beans.

(ii) This question was not well answered. Candidates did not use the information given about the inability of the rust fungus to grow at lower temperatures found at high altitude and think about how this might change in the future.

(c) This was attempted reasonably well, with the use of pesticides and some kind of biological control being the most common suggestions.

Question 5

(a) (i) This question was answered correctly by most candidates.

(ii) This was well answered by most candidates.

(iii) Most candidates discussed deforestation and linked it to a reduction in interception or soil being held by the roots. Some candidates stated a number of human activities but did not explain the link to surface run-off.

(b) (i) The divided bar graph was correctly completed by most candidates.

(ii) Most candidates completed the paragraph; however the third gap proved a challenge for many.

Question 6

- (a) (i)** There were some good attempts at this question with most candidates achieving credit. Density and height of plants were the most commonly quoted features.
- (ii)** The subject of this question was vegetational succession. Most candidates missed this context and wrote about the fertility of volcanic soils. Those who did realise that succession was the key issue here often gained full credit.
- (b)** This was the most poorly answered question on the paper. Few candidates seemed to have knowledge of the specifics of a biosphere reserve and wrote generally about nature reserves, gaining no credit. The remaining few, who did appreciate the zoning idea of core, buffer and transition, were able to gain credit.

ENVIRONMENTAL MANAGEMENT

Paper 0680/12
Paper 1

Key messages

- Candidates are encouraged to read the question carefully. For example, 'explain one', requires an explanation of one topic/issue rather than references to several topics/issues.
- Candidates should be encouraged to use the mark allocation and the space provided for each part-question as a guide to the length of their answer.
- When a question requires a description of a given resource, such as a distribution map or photograph, candidates should spend time inspecting the resource and use this to answer the question, rather than answering the question from learned knowledge.

General comments

Most candidates attempted all the questions on the paper. Some candidates misread question stems, for example **Question 4(a)(i) and (ii)** and **Question 6(b)(i)**. Careful reading of the question stem is advised. Candidates found **Question 5(b)(iii)** and **Question 6(a)(i)** the most challenging.

Comments on specific questions

Question 1

- (a) (i) Most candidates were able to match the letters to the missing words from the nitrogen cycle.
- (ii) This was an 'explain' question and so required detail, however, many of the candidates just stated what nitrogen was needed for and so were unable to gain full credit.
- (iii) Many candidates could give a reasonable description of eutrophication to achieve full credit here. Some candidates, however, thought that excess fertilisers caused salinisation.
- (iv) Most candidates could give a way to improve the yield of a crop but, for full credit, more than just naming an improvement was needed; many candidates did not suggest the way the method worked.

Question 2

- (a) (i) This was a simple subtraction and most candidates could perform it accurately.
- (ii) This was a percentage calculation and the figures needed were given in the stem of the question. Most candidates were able to do this.
- (iii) Most candidates were able to explain why urban areas had better access to clean fresh water.
- (b) (i) Most candidates could identify a disease carried by a vector.
- (ii) Credit was lost here by candidates not naming the vector and not describing the strategies. Naming the strategies was insufficient.

Question 3

- (a) (i) Candidates could name alternatives to fossil fuels.
- (ii) Candidates could name the two countries. However, some candidates named 'the rest of the world' as a country, which did not gain credit.
- (iii) Most candidates could calculate the tonnage for Australia.
- (b) (i) This question required an argument, 'to what extent do you agree'. Many candidates could say that the electric car itself was not emitting any polluting gases but not as many could point out that the electricity might have been produced by the burning of fossil fuels. Some candidates seemed to think that electric cars could not cause atmospheric pollution even indirectly.
- (ii) This was well answered and most candidates scored full credit.

Question 4

- (a) (i)(ii) All candidates attempted this and most could correctly identify cold and warm currents, but some candidates did not read the instruction to mark only one of each. This meant they were more likely to make a mistake and lose credit as all their answers had to be taken into account.
- (iii) The correct answer here depended on stating that cold currents have more nutrients and more oxygen. Many candidates did this, but many did not qualify the type of current or simply said that cold currents contained nutrients, which is true but it is the quantity that matters in increasing fish populations. Alternatively candidates could refer to the meeting of currents and/or upwelling.
- (b) (i) Many candidates could state the way that water quality was affected. However, simply saying 'eutrophication' did not gain the credit; what was needed was the way the quality was affected, such as a reduction in oxygen levels.
- (ii) Many candidates showed a lack of knowledge about sewage treatment in their answer. For example, in the removal of solid material by filtering and the use of digesters. Many vague answers were given and often references to using chlorine to kill off bacteria, which is not the function of sewage treatment.

Question 5

- (a) Many good answers were given here, showing that candidates could interpret visual material and link this to their knowledge about land use in terms of agriculture.
- (b) (i) There were some excellent drawings produced for this question but many candidates displayed a lack of knowledge about what terracing actually involves. Many did not label as directed or simply labelled 'terrace' which did not gain credit since the label needed to show what terracing involves, e.g. a wall, step or flat land.
- (ii) Many candidates were unable to say how terracing reduces soil erosion. Many responses simply referred to the binding of soil by tree roots, which is the result of any increase in plants but is not necessarily due to terracing.
- (iii) Only some candidates could describe a benefit to the farmer from having flat land to work.

Question 6

- (a) (i) This question proved difficult and was not answered well. The most common point given was that both occur on plate boundaries. Some answers suffered from imprecise locations being described and others did not provide enough detail.
- (ii) This question was well answered by candidates.
- (b) (i) Most candidates could name a fossil fuel but some had misread the question and named an alternative to fossil fuels.

- (ii) Most candidates gained some credit here, referring to nuclear waste being radioactive and accidents but only the most able candidates wrote sufficient detail to achieve full credit.

ENVIRONMENTAL MANAGEMENT

Paper 0680/13
Paper 1

Key messages

- All parts of each question should be read carefully. This is particularly important when information for a question is provided in more than one sentence.
- Attention should be paid to the command words before starting to write a response. Some candidates did not include enough detail in their answers. For example, responses usually need more detail when the command word is describe, explain or suggest.
- The number of marks allocated to each question (shown in brackets) is a guide to how many points or ideas to include in a response. For three or four mark questions a variety of points need to be made, rather than just one. Where only one or two lines are provided for an answer, a clear, concise response is needed.
- When a question has a resource (a diagram, a map or a graph) it should be studied very carefully, and be referred back to several times before a response is written.

General comments

Candidates appeared to have had no problems completing the paper in the time available.

The standard of English was generally good. The best answers were clearly focused on the questions set, revealing a good knowledge and understanding of the syllabus. Most of these answers were clearly legible.

Some candidates needed to take greater care to ensure that they answered the question set. Some responses would have benefited from including more detail and from being presented and expressed more clearly.

Comments on specific questions

Question 1

- (a) (i) Most candidates stated the name of the rock in which the oil is trapped in the diagram correctly as sandstone.
- (ii) Candidates found this question more challenging than **Question 1(a)(i)**. Many correctly circled 'sedimentary' as the rock type of the rocks named in the diagram. There was evidence that a number of candidates changed their answer several times.
- (iii) Some candidates were able to explain how oil is trapped in the permeable (or porous) sandstone in the diagram by the impermeable (or non-porous or impervious) layers of clay.
- (iv) Few candidates gained full credit for describing how an oil company could extract the oil from the rock in the diagram. Some answers described extracting the oil by mining, as a solid mineral such as coal or an ore would be extracted.
- (b) Many candidates were able to suggest at least one way the environment could be damaged when oil is transported from one part of the world to another. Most answers focused on oil spills in

oceans causing marine and coastal pollution. There were good references to oil pipelines breaking on land and destroying or contaminating ecosystems.

Question 2

- (a) (i) Nearly all candidates were able to correctly name wetlands as the largest natural source of methane shown in the pie graphs.
- (ii) Nearly all candidates were able to correctly name fossil fuel production as the human activity, shown in the pie graphs, that produces the most methane.
- (iii) Most candidates were able to correctly calculate 36% as the percentage of the methane produced by livestock farming and rice farming.
- (b) (i) Many candidates stated that rising global temperatures are affecting the environment by causing ice caps (or glaciers) to melt. These candidates explained how the melting ice affected the environment by causing either a rise in sea level or flooding. There were good references made to low lying land in the Netherlands and Bangladesh, and to islands like the Maldives and Tuvalu, being in danger from flooding caused by rising sea level.
- (ii) Candidates found this question, asking them to state and explain one way that rising global temperatures are affecting people, more challenging than the previous question. A number of candidates successfully developed their ideas from **Question 2(b)(i)**, explaining how flooding led to the destruction of peoples' homes and livelihoods with references to crops, income, famine, disease and migration.
- (iii) Various strategies people can use to reduce greenhouse gas emissions were suggested. The most common strategies involved reducing greenhouse gas emissions caused by transport by walking or cycling short distances and using public transport or car sharing for longer journeys. There were also references to strategies that saved energy in the home, such as buying low energy light bulbs and insulating walls and ceilings, and to putting solar panels on roofs of houses. There were many vague answers about 'making laws', 'not burning fossil fuels', 'reducing smoke from factories' and 'not using CFCs'. A number of candidates wrote about government strategies when the question was about strategies people can use.

Question 3

- (a) (i) Most candidates were able to correctly calculate the percentage of water in oceans to one decimal place as the question required. Good use was made of the space provided to show working. This benefited the small number of candidates who wrote down the correct figures from the diagram but made a mistake in their calculation.
- (ii) Few candidates were able to achieve full credit by correctly naming both 'oceans' and 'ice and snow' as the two main stores of water shown in the diagram. 'Groundwater' and 'rivers and lakes' featured in many answers.
- (iii) The responses to this question were variable. The strongest answers were from those candidates who used the diagram as a starting point for their responses. This meant that they began their answers by stating that only about 3% of water in the water cycle stores is fresh water as over 97% is salt water in the oceans. These candidates went on to explain how groundwater is difficult to reach, ice and snow is frozen, and water in rivers and lakes can be polluted or carry diseases.
- (b) Most candidates gained credit for suggesting at least one reason why some people do not want dams built. Some reasons were about people being forced to move, losing not only their homes, but also land and jobs and often migrating to cities. Others were about the environment, deforestation and the loss of habitats and biodiversity. A number of candidates wrote about local people being concerned that a dam may break and cause flooding, possibly as a result of an earthquake.

Question 4

- (a) (i) Most candidates completed the table by accurately matching the letters to the four methods used to conserve soil. The most common error was reversing **C** (wind break) and **D** (tree planting).
- (ii) Few candidates answered this question correctly. The successful candidates used the north arrow on the diagram and the line of trees at **C** to correctly suggest that the wind blows from the west or from a westerly direction. Wind direction is always stated as the direction from which the wind blows and this information was provided in the stem of the question. All points of the compass were among the suggestions made by candidates and also 'left' and 'right'.
- (b) This question proved challenging for many candidates. Good credit was gained by candidates who explained how planting trees can conserve soil and prevent soil erosion by stopping soil from being washed away by surface run-off or blown away by the wind. A few candidates gave details about the roles of interception and infiltration. There was little reference made to either leaf litter or humus.
- (c) Most candidates were able to suggest at least one strategy for reducing deforestation. The most popular strategies were selective logging, forest reserves, reforestation, agroforestry and ecotourism. The strongest responses were accompanied by a brief description. For instance 'selective felling, taking only mature trees and leaving the smaller trees to grow', 'reforestation, planting small trees to replace the ones that have been cut down' and 'planting three trees for every one removed'.

Question 5

- (a) (i) This question proved more challenging than **Questions 5(a)(ii)** or **(a)(iii)**. Most candidates correctly stated two types of energy production shown on the diagram that use heat. A number of candidates gave a renewable form of energy as one of their answers. Some candidates named the boiler and turbine as types of energy.
- (ii) Most candidates answered this question correctly with very few candidates unable to state two renewable sources of energy shown on the diagram.
- (iii) Most candidates were able to state two sources of energy shown on the diagram that are fossil fuels.
- (b) Most candidates were able to explain at least one advantage or disadvantage of using wind power to generate electricity. The most common advantages were that wind power does not cause pollution, is a renewable source of energy and running costs are low. The most common disadvantages were about air not always moving to provide wind and noise pollution caused by the blades on wind turbines.
- (c) These two questions proved challenging for many candidates, perhaps they missed the significance of the introductory sentence, 'Iceland is located in the northern Atlantic Ocean close to the Arctic Circle on a plate boundary'.
- (i) There were many vague reasons suggested for why people use more energy per person in Iceland than in any other country. The most successful answers were about the cold climate.
- (ii) The most successful suggestions for how living on a plate boundary meets most of the energy needs of people in Iceland were about plate boundaries being a good location to obtain energy. There were some sound descriptions of how, in geothermal power stations, cold water is pumped down into the ground and heated by hot rocks and then hot water and steam is pumped up to turn turbines to generate electricity. Some candidates appeared to misread the question, answering a different question, possibly about what energy is needed for in Iceland.

Question 6

- (a) Many candidates described the distribution of the main cocoa producing countries shown on the map with reference to the proximity to the Equator. There were also references to the northern part of South America, to the area between the Tropic of Cancer and the Tropic of Capricorn and to the islands of Southeast Asia (sometimes described as the area between Asia and Australia). Some candidates referred to Asia, Africa and South America as a whole with no reference to distribution. A number of candidates explained why cocoa was grown in the countries shown on the map instead of describing the distribution of the countries.
- (b) The explanations of what is meant by intensive farming were variable with few candidates gaining full credit. Some wrote definitions of commercial farming. Others confused intensive with extensive farming. A number of candidates wrote that it was a type of farming that involved hard work.
- (c) Many candidates successfully described at least one problem that growing only one crop can cause. The most common problems described were linked to financial dependency on one crop, disease, loss of nutrients and the need to buy fertilisers and pesticides. There was excellent use of the term monoculture by a number of candidates.
- (d) Most candidates were able to suggest at least one reason why 72% of the cocoa produced is exported to countries in North America and Europe. There were some good answers from candidates who began by writing that cocoa cannot be grown in North America and Europe because the climate is unsuitable. Other reasons were linked to cocoa being a cash crop (or a primary product) and the need for foreign exchange in developing countries. Many wrote about the popularity of chocolate and how it is manufactured from cocoa in more developed countries.

ENVIRONMENTAL MANAGEMENT

Paper 0680/21
Paper 2

Key messages

- Most candidates used diagrams and information well to engage with the questions; however, a number of responses showed a reliance on simply restating this information and thus did not receive credit.
- Candidates responded well to the level of response (six-mark) questions within the paper, although candidates should avoid vague responses or simply producing a list.
- Responses showed a good understanding of key terms, although some definitions cited lacked detail and providing examples proved challenging. There was confusion as to the definition of the term 'biomass'.

General comments

Candidates engaged well with the paper and there were few examples of candidates not attempting questions across the whole cohort. Answers were generally comprehensive and candidates used the space allocated to them for their responses.

Calculations were completed well, and the quality of graphical plotting was good.

Comments on specific questions

Question 1

- (a) (i) Most candidates were able to interpret the diagram and identify that fresh water was 3% of the total.
- (ii) Candidates were able to explain the defined term, although some responses would have benefited from greater precision.
- (iii) Most candidates correctly stated that the water was frozen.
- (iv) The completion of the pie graph was successfully attempted by most candidates. Most candidates correctly used the key within their answers.
- (v) This question gave candidates the opportunity to provide a more extensive answer, which was evident in many responses. Many candidates were able to cite a variety of pollution sources and how they are created.
- (b) (i) A wide range of potential answers were accepted and candidates readily utilised the information within the diagram.
- (ii) The identification of an appropriate water storage scheme proved to be more challenging, with many candidates not stating one that was a result of human activity.
- (iii) Most candidates were able to correctly identify the potential for hydroelectric power.
- (iv) This question, testing knowledge of terms from the water cycle, was extremely well answered by the cohort overall.

- (v) Many candidates understood the impact of the removal of woodland on flooding, although they found the increase in the town's area to be more challenging and sometimes repeated their response from the previous part.
- (c) (i) Comparing the data from the four pie graphs was completed well by most candidates, almost all correctly identified Bangladesh.
 - (ii) Most candidates gave the correct answer.
 - (iii) Most candidates were able to complete the calculation correctly.
 - (iv) A good number of candidates understood the difference in infrastructure between a developed country and a developing country but often focussed on the requirement of water for agriculture. Fewer candidates identified the use of water for toilets, washing machines and other household equipment.
- (d) (i) Candidates were able to read the data from the map, and correctly identified an appropriate neighbour to Cameroon.
 - (ii) Most candidates were able to describe the distribution of the area affected by drought, although some struggled to articulate this clearly.
 - (iii) The ranking of countries in order was completed accurately by most candidates.
- (e) Candidates had differing success in answering this level of response question. Some responses were misdirected and described why some areas had drought where others did not, rather than the effects on people. Correct responses varied in detail. The statements from some candidates were simplistic or in a list form.

Some candidates only focussed on the use of water in agriculture and how this would affect people, whereas other candidates also included comments on investment in water storage infrastructure and the degree of development of a country.

Question 2

- (a) (i) A question requiring use of information from a table. Most candidates correctly identified a type of subsistence farming.
 - (ii) Candidates understood farming types where animals are grazed.
 - (iii) While described in a number of ways, most candidates understood and were able to state the difference between commercial and subsistence farming.
 - (iv) A more challenging question, responses were very varied, few identifying the correct classification.
- (b) (i) Most candidates described the location of the river. Vague terms such as *near* and *close* should be avoided. Many candidates showed good practice by describing location points using the points of the compass.
 - (ii) Most candidates were able to select the correct places within the table.
 - (iii) Candidates were skilled at finding evidence from the table to meet the requirements of the question. Most achieved full credit.

- (c) (i)** Candidates were asked to choose two from three methods of increasing agricultural yields. Most candidates chose pesticides and demonstrated a good understanding of the impact of pesticides and explained this well.
- The use of irrigation was described but many responses did not articulate how it would increase yields or the fact that it would only have an impact when soil water was in short supply. High yielding varieties of seeds was covered less often, and many candidates did not adequately explain how they increase yield. Some confused the term 'variety' with a 'range' of different seeds used.
- (ii)** This question was answered well and clearly many candidates were well prepared to answer on the topic of eutrophication. Alternative responses relating to soil fertility were often only given in more general terms.
- (d) (i)** A challenging question attempted by most candidates. Some responses were a reiteration of the information from the diagram and showed little understanding that could be credited. The role of the plastic sheeting was misunderstood by many, missing its role to reduce evaporation from the soil and to reduce weed growth.
- (ii)** Most candidates identified that the system provided control of water availability, although they were challenged to gain full credit. A range of different responses were given credit.
- (e) (i)** Utilising graphical data, most candidates gave a detailed description, many providing dates and quantities. Weaknesses in some responses included a lack of a summative sentence of the overall trend rather than the more detailed analysis of the changes within the plots.
- (ii)** Most candidates correctly identified the appropriate five-year period.
- (iii)** Most responses showed good skills in plotting and completing the graph accurately using the data provided.
- (iv)** While most candidates completed the calculation correctly some did not gain credit as the units were omitted. A reminder was provided as part of the question instructions.
- (v)** Candidates found this question challenging. Many responses were too general, referring to environmental concerns with insufficient detail to gain credit. There was some confusion over the term 'green revolution', some equating it to the introduction of GM crops, others describing it as a political revolution.
- (f) (i)** While most candidates understood the term 'renewable energy source', they had difficulty in defining it succinctly.
- (ii)** Most candidates were able to calculate the percentage of people in Burkina Faso and Nepal that rely on sources other than fuelwood, obtaining the data from the text at the start of the question.
- (iii)** Generally, there was a level of confusion over the term 'biomass' and some responses, although correct, did not necessarily apply to all forms. Many referred to, or compared their answers to fuelwood, which had been the focus of the earlier parts of the question.

A number of candidates mistakenly stated that biomass emits no pollution, although the higher achieving responses often identified carbon capture from crops during photosynthesis. Some candidates also cited the land needed to grow fuel crops and the potential impact on food crops as well as habitat loss through land clearance.

ENVIRONMENTAL MANAGEMENT

Paper 0680/22
Paper 2

Key messages

- Candidates engaged well with questions involving the use of diagrams and information. Some responses however, were a restatement of this stimulus material and thus did not receive credit.
- The plotting of graphs was a skill that was demonstrated to a high standard overall, although it is important for candidates to fully label axes and follow the style of any existing plots if completing a graph. For example, when completing a bar graph it is expected that bars should follow the width of any bars already drawn.
- Candidates generally showed confidence in their answering of the level of response six-mark questions. These provide the opportunity for candidates to discuss a topic at more length and provide a range of reasons why. It is important that both sides of an argument or situation are debated to obtain the higher levels of credit. It is expected that responses for this type of question should involve extended writing rather than a list of bullet points.
- Candidates were generally well prepared for most topics although there was often a weak understanding of rationale and management of agro-forestry and community forestry systems. The purpose of buttress roots and drip-tip leaves on tropical rainforest trees also proved to be challenging for some candidates.

General comments

Candidates generally found the paper accessible; there were few instances of questions not being attempted. Candidates showed skills in relating the number of points in more detailed answers to the number of marks available and used the space allocated to them to write their responses fully.

Responses were typically well laid out and handwriting was generally of good quality.

Comments on specific questions

Question 1

- (a) (i) Using numerical data from the table, most candidates were able to correctly identify the biome with the largest surface area as being desert.
- (ii) Again using the data in the table, this subtraction was accessible to most candidates.
- (iii) A calculation requiring the addition of data from the table, this was answered correctly by most candidates.
- (b) Using the map, candidates were required to describe the locations of the tropical rainforests. Most candidates who attempted the question gained credit, although this was achieved in a variety of ways; reference to the Equator, the Tropics and precise locations in continents being the most common.

- (c) (i)** Candidates were required to complete the two missing bars in the graph using the data provided. It was expected that bars would be the same width as those already present within the graph. Candidates were not penalised for differences in shading. Most candidates were able to interpret the scale and apply it correctly.
- (ii)** A question requiring candidates to describe the rainfall pattern from the graph in the stimulus material. A good number of responses achieved full credit; some focussing on naming the months which have the highest or lowest values, others naming the dry season, while others stated numerical values. All approaches were credited.
- (iii)** Although there was relatively little variance in temperature throughout the year, August and September were slightly higher values and either was accepted.
- (iv)** Attempted by most candidates, although some candidates incorrectly attempted to calculate the average temperature rather than complete a calculation of the range of the data provided, which was of average temperatures.
- (d) (i)** Candidates were required to name the two layers shown on the diagram of tropical rainforest. This proved challenging for many; responses often taking inspiration from other labels within the diagram if unsure. The concept of the emergent layer was not widely known amongst the responses provided.
- (ii)** Most candidates were able to interpret the scale and estimate the height of the tallest tree.
- (iii)** A more challenging question in two parts. Many responses simply stated the role of roots rather than why the trees had buttress roots in this scenario. The best responses correctly identified the need to support the tall trees and that roots are shallow and cover a large area to maximise nutrient uptake. Typically, there is little issue in sufficiency of water.
- Similarly, a number of candidates had difficulty in describing the need for drip-tip leaves. The need to shed water was commonly cited but not the need to maximise photosynthesis or the fact that the climate had high (regular) precipitation.
- (e)** Most candidates understood causes for deforestation in tropical rainforests. Credit was given for distinctly different reasons rather than for different products manufactured from the timber.
- (f) (i)** Candidates were required to draw a bar graph accurately including the use of an appropriate scale and labelled axes. Candidates should be encouraged to make use of a significant proportion of the graph grid, rather than a small section. A common error was the omission of labelled axes.
- (ii)** Using the data from the table, candidates had little difficulty in performing a subtraction to calculate that there had been a decrease in rainforest area by 11%.
- (iii)** While many candidates focussed on the negatives (loss of fuelwood, food sources, etc.), some higher achieving candidates also identified positives (new employment opportunities, availability of timber, etc.). Some candidates described how the loss of trees would impact on the amount of oxygen produced (by photosynthesis) and the influence of broader climate issues. These were not credited as they have broader impacts rather than just on the local people.
- (g)** This question was more challenging for many candidates. The concept of sustainable harvesting of hardwoods was not well understood by many. The strongest responses identified the opportunity to allow smaller trees to mature, with selective felling within forests. Higher achieving candidates also identified some of the challenges in monitoring forest to prevent illegal and inappropriate exploitation of the forests. They also identified that forests may be cleared for reasons other than for harvesting hardwoods.

- (h) A level of response question, candidates could choose to write about two management methods from four options. Some responses showed a clear knowledge of the subjects chosen and how they might improve sustainability. Weaker responses merely stated a definition of the method with little expansion on how the techniques would be applied within this context.

While candidates generally understood about fuelwood planting and reforestation, a number of those who chose agro-forestry or community forestry provided poorer descriptions or understandings.

Question 2

- (a) Most candidates had little difficulty in completing the passage with the appropriate words provided. There was a clear understanding of the topic.
- (b) Describing the location of volcanoes proved to be more challenging for many candidates. Most identified they were mainly located on plate boundaries, and could provide examples of areas of major clusters. Few responses described volcanoes located in the middle of plates (such as the African plate).
- (c) (i) Most candidates attempted to label the diagram of the volcano, but few achieved full credit.
- (ii) The completion of the pie graph provided few difficulties for candidates. There were a few accuracy errors but the majority identified that the whole of the circle needed coverage. A few candidates did not link their graph to the key.
- (iii) There was a significant difference in the quality of response to this question. Many candidates identified that there were opportunities to predict the eruption which are not possible with earthquakes and that as a result the area may be evacuated. Some candidates did not appear to appreciate the impact a volcano may still have. The widespread nature of an earthquake was also commonly recognised.
- (d) (i) As with other similar graph questions, candidates were expected to draw bars of the same width as the ones already present. There were few plotting errors, but despite the prompt within the question a number of responses did not include a label on the y-axis.
- (ii) Most candidates identified the three months correctly. All three were required to gain credit.
- (iii) The calculation in this question did not cause many candidates difficulty.
- (iv) Most candidates gained some credit in this question, identifying the risk of attack to visitors and/or the risk of incorrect food to the animals. Fewer candidates correctly identified the impact of visitors on the behaviour of the animals or indeed how feeding them would change their behaviour and encroach on the visitors.
- (e) (i) Most responses identified that geothermal energy was a renewable resource and most also identified the reduction in air pollution. Some responses lacked detail, simply citing 'pollution'. Some responses also included benefits compared to wind and solar power as well as benefits when compared to fossil fuels.
- (ii) This question was answered well by many candidates, it was clear that this was a topic that was clearly understood, although some responses still gave examples of geothermal energy and tourism. Most understood about the potential for fertile soils and how this would improve productivity and also the opportunity to extract valuable minerals. Fewer responses included ideas about the impact of traditional practices and family history in an area.
- (f) (i) A wide range of responses were accepted as a definition provided they considered the minimal impact on the ecosystem.
- (ii) Most candidates were able to extract the relevant information from the stimulus material to identify the opportunities for employment as well as increased income for full credit.

- (iii) Responses showed some confusion, suggesting that some candidates thought that the whales were kept captive. Most responses identified that as the whales generated economic benefits this would encourage their conservation. Others identified that the activities increased the education of the tourists increasing their awareness for retaining the whales.

- (g) A level of response question allowing candidates to complete a more extended piece of writing. There was a significant difference in the quality of the answers provided. The strongest responses provided a range of ways in which damage may occur and in some cases cited specific examples. Poorer responses tended to focus on one issue.

Some candidates produced their responses in short bullet points or lists. While these were credited, this approach limited the level of credit awarded.

ENVIRONMENTAL MANAGEMENT

Paper 0680/23
Paper 2

Key messages

- Many candidates were able to use appropriate technical terms but were less able to explain or define them where this was required within a question.
- While most candidates attempted most questions, some did not read the question accurately and provided information that, although correct, was not creditworthy within the context of the question. In some cases there was a poor understanding of topics, although concepts such as food webs and the impact on specific species were answered with confidence.
- The completion of the divided bar chart within this paper was carried out with a good degree of accuracy.

General comments

Most candidates attempted all the questions. A significant number used the cues within the questions, including command word, number of marks and answer space, to maximise their opportunities for credit when providing a response.

Comments on specific questions

Question 1

- (a) (i) Asking for the definition of the term 'rural to urban migration', most candidates were able to provide an appropriate description relating to the movement of populations towards towns and cities.
- (ii) Most candidates correctly classified the four items into push or pull factors, a subject that was well understood.
- (b) (i) Using the map to define the location of the Caatinga region, most candidates obtained some credit, with detailed, more complete descriptions gaining full credit.
- (ii) Using the information within the question, many candidates gained credit, although often missed the implications of crop failure on food supplies or income.
- (iii) Interpreting the photograph to describe the vegetation proved more difficult for many candidates. Most identified the cactus but did not adequately describe the other vegetation shown. Some incorrectly described the climate within the photograph, which was not the requirement of the question.
- (iv) Higher achieving candidates were able to explain how shallow, spreading roots were beneficial in a desert climate, correctly identifying their ability to maximise water uptake after precipitation.
- (v) This was attempted by most candidates; the depth of explanation being the limiting factor to the credit awarded.

- (vi) A topic that was generally well understood, candidates understood the concept of managing an area as a national park and how this might benefit its restoration. Many responses achieved maximum credit.
- (c) (i) Most candidates were able to identify the point of intersection of the two lines and correctly read the date.
- (ii) Most candidates stated the population correctly; the only common error was to cite the population of Rio de Janeiro.
- (iii) A calculation requiring the candidates to subtract one population figure from another. Most candidates were able to do this correctly.
- (iv) Most responses showed an understanding of the change in balance of deaths to births which would impact upon the increase in population, although a number of candidates did not provide a reason for either an increase in birth rate or a decrease in deaths.
- (d) (i) Most candidates were able to complete the divided bar graph accurately and correctly apply the key.
- (ii) The diagram of a house provided a stimulus to many different marking points, although candidates did not obtain marks by describing or restating information from the diagram without suggesting how they might improve the quality of life. Good responses covered a range of improvements, for example how risks to health could be reduced by underground sewers, through to practical aspects, such as concrete floors being easier to clean.
- (e) This level of response six-mark question allowed candidates to write about the topic more extensively. It was clear from the responses that a significant proportion of candidates were well prepared for such a question on managing population growth. The best answers provided a wide range of different management strategies, and in some cases, cited specific examples.

Question 2

- (a) (i) Requiring candidates to interpret temperature data on the graph in three different ways, common errors were the application of the incorrect scale or the erroneous quoting of precipitation data. It is common to provide two sets of information (with differing scales) on the same graph and interpretation is a skill required of candidates.
- (ii) Using the precipitation data from the graph, candidates were given credit for describing the pattern shown but not the month to month variation. Credit was also given to the use of numeric values derived from the bar graph.
- (iii) The mark was awarded for stating the number of months where the precipitation would fall as snow (those when the average temperature was below 0°C). Some did not read the question correctly, naming the months rather than giving a figure.
- (b) (i) Candidates found this question challenging. A number of candidates did not provide an answer or did not answer well.
- (ii) Many candidates struggled to suggest why decomposition is slower, not making the link to cold soil conditions or snow acting as a barrier between the foliage and the decomposers.
- (c) (i) A better understood topic, most candidates were able to identify a producer from the food web.
- (ii) As above, candidates were able to identify a predator of squirrels with little difficulty.
- (iii) The top consumer (a bear) was correctly identified by all but the weakest of candidates.
- (iv) With numerous combinations available, most candidates were able to complete a simple food chain from the information presented at the start of the question.

- (v) Whilst more complex, most candidates understood the impact on populations (through lack of predators or increased predation) and gave appropriate examples. Those not achieving full credit often provided responses that were too brief (for example lacking a third impact).
- (vi) Candidates found naming appropriate factors impacting on squirrel populations more challenging, citing non-environmental factors or ways that squirrels could be protected.
- (d) (i) Focussing on a different climate and vegetation type to **Question 2(b)**, more able candidates understood the need for trees to shed leaves in dry conditions to conserve water.
 - (ii) Some responses suggested that candidates were well prepared for a question relating to drip-tips on leaves and performed well. Other responses were less successful.
- (e) (i) The diagrammatic representation of the production and impact of acid rain proved a good stimulus material for candidates to be able to explain the formation of acid rain. Weaker responses tended to omit the gases produced that were involved in the process.
 - (ii) A wide range of possible answers were allowed, from the loss of leaves or death of plants through to the acidification of soils or water. Candidates who described leaves as being 'burnt' were not given credit.
 - (iii) Many responses from candidates were far more wide-ranging than the focus of the question and thus were not creditworthy. The strongest responses identified the impact on the natural carbon sink, the reduction in photosynthesis and the additional carbon dioxide emitted by the burning of timber and/or decomposition. These factors were linked to the increase in the greenhouse effect and the increase in temperature as a result.
- (f) A variety of detail was provided in the responses to this question. The strongest responses identified the impact on resources as well as employment situations and the impact on a country's economy.

More commonly candidates wrote with some knowledge on the impact on biodiversity and loss of habitats, although additional points on the potential displacement of people, soil erosion or desertification were less common.

ENVIRONMENTAL MANAGEMENT

Paper 0680/41
Paper 4

Key messages

- Read the source material and the question carefully.
- Use data from either graphs or tables to help describe trends or patterns.
- Avoid statements such as 'use the same amount of chemical' without any further detail. Candidates should always make suggestions using precise terminology such as concentration, volume or mass.
- 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 state of the United States of America. Many candidates understood and made good use of the source material and their written responses were clearly expressed. The mathematical and graphical questions did pose some difficulties for a small number of candidates.

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

Candidates may benefit from working through past papers to help see how to make the best use of the information given and apply their knowledge in context.

Comments on specific questions

Question 1

- (a) (i) Most candidates gave the correct answer, 1 677 000.
- (ii) This calculation was not always carried out by an appropriate method. Many candidates divided their answer to (a)(i) by 6.5 million to give the correct percentage of the population of Tennessee living in the four cities listed in the table. Some candidates divided their answer to (a)(i) by 6.5 or 65 000 000.
- (iii) Nearly all the candidates presented the population data for the four cities in the correct rank order, from highest to lowest.
- (b) (i) Candidates gave a wide range of suggestions of factors the scientist could control. Many of the answers were inappropriate and did not gain credit as the context of the investigation had not been carefully thought about.
- (ii) Most candidates realised that plot **A** was required to allow a comparison to be made. This was also identified as a control experiment.
- (iii) Most candidates correctly selected at least one difference between plot **A** and plot **B**. A small number of candidates described the information given without pointing out any differences.
- (iv) Candidates that gave the correct answer gained full credit. Candidates that calculated the difference between the two plots as 0.4 gained partial credit.
- (v) Many candidates suggested that repeating the field trial could be a method of checking the results. All the other points on the mark scheme were only rarely suggested.

- (c) (i) Many candidates did correctly suggest that the yellow spots might be caused by factors other than a zinc deficiency. Other candidates gave answers that lacked detail.
- (ii) Most candidates found it difficult to describe a suitable sampling technique that could be used to check the plants in a field.
- (iii) Candidates found it difficult to suggest advantages to the farmer of adding zinc at the same time as fertiliser. However, saving time and fuel were suggested by some candidates.

Question 2

- (a) (i) Candidates often explained that switchgrass was a renewable source of energy. Only a small number of candidates gave clear descriptions of the idea that the crop would be carbon neutral.
 - (ii) Candidates often identified transport costs as a factor to determine the distance between farms and the biorefinery. The other points on the mark scheme were also seen regularly.
 - (iii) The candidates that could think about this question from the state authority's point of view usually suggested one or two correct answers. There were a large number of suggestions that lacked detail and did not gain credit.
- (b) (i) Most candidates completed the table correctly.
 - (ii) Many candidates found this question challenging. Those who gained credit successfully used the data and information to compare the two different crops.
- (c) (i) Many candidates suggested a selection process that involved random selection of the farms to be sampled.
 - (ii) Most candidates suggested at least one advantage of carrying out a survey by telephone.
 - (iii) Most candidates suggested a form of subsidy to farmers to encourage more farmers to grow switchgrass.
 - (iv) Some candidates only suggested that less fossil fuels would be burnt. A small number of candidates described the other points on the mark scheme, gaining more credit.

Question 3

- (a) Nearly all the candidates attempted to answer this question. However, the role of bacteria in maintaining soil fertility was not clearly explained in most cases. The candidates that did give relevant details of the nitrogen cycle gained full credit.
- (b) (i) Many candidates plotted the graph correctly. Both axes must have complete labels including units (as shown in the data table) to gain full credit.
 - (ii) Most candidates correctly described the trend shown in the graph.
 - (iii) Most candidates gave the correct value from their graph. A small number of candidates did not indicate how they had selected this value on their graph as instructed by the question.
 - (iv) Most candidates gave two or three reasons why farmers wanted crops to grow long roots.
- (c) Most candidates were able to partly describe how to restore land after mining has finished, gaining some credit.

ENVIRONMENTAL MANAGEMENT

Paper 0680/42
Paper 4

Key messages

- Read the source material and the question carefully.
- Use data from either graphs or tables to help describe trends or patterns.
- Avoid statements such as 'use the same amount of chemical' without any further detail. Candidates should always make suggestions using precise terminology such as concentration, volume or mass.
- 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 state of the United States of America. Many candidates understood and made good use of the source material and their written responses were clearly expressed. The mathematical and graphical questions did pose some difficulties for a small number of candidates.

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

Candidates may benefit from working through past papers to help see how to make the best use of the information given and apply their knowledge in context.

Comments on specific questions

Question 1

- (a) (i) Most candidates gave the correct answer, 849 000.
- (ii) Most candidates divided their answer to (a)(i) by 6.5 million to give the percentage of the population of Tennessee living in the five counties listed in the table. Some candidates divided their answer to (a)(i) by 6.5 or 65 000 000.
- (iii) Nearly all the candidates presented the population data for the five counties in the correct rank order, from highest to lowest.
- (b) (i) Most candidates correctly calculated average values for aluminium and selenium and entered them in the table.
- (ii) Most candidates calculated the range for sulfate and selenium correctly. A number of candidates stated the range but did not carry out the calculation.
- (iii) Nearly all the candidates correctly named **B** as the stream which had the lowest concentration of pollutants.
- (iv) Most candidates were able to recognise the relationship between pH and the concentration of pollutants in the three streams and describe it.
- (v) Although most candidates correctly named stream **A** as the most polluted, some of the reasons given lacked specific detail.

- (c) Only a small number of candidates were able to suggest how low concentrations of selenium could cause the death of fish in streams. Many candidates suggested, wrongly, that it lead to eutrophication.
- (d) (i) Many candidates understood the concept of a control and explained the need to compare the water samples from the streams that were not polluted with mine water.
- (ii) Candidates' attempts to calculate the cross sectional area of Stream F met with varying success. The most successful responses estimated the number of whole 0.1 m^2 squares within the grid provided and entered this calculation into the table.
- (iii) Some candidates seemed to misread the question, answering a different question, possibly about the speed of the lowest velocity and the size of the largest cross sectional area.
- (iv) Most candidates gave detailed accounts of how the scientist could measure the velocity of each stream using the equipment listed. Some candidates' accounts appeared to be measuring the whole length of a stream instead of a measured distance. Good use was made of the marker poles to identify start and finish lines. There were also clear descriptions of the need to synchronise starting the stopwatch with the release of the float at the first marker pole, and stopping the stopwatch when the float passed the second marker pole. A number of candidates wrote about repeating the method several times and calculating an average. Good use was made of the notebook to record the time and calculate the velocity, with many candidates concluding their answers with the equation for the calculation of velocity.
- (v) Most candidates completed the table by multiplying their answer to (d)(ii) by 0.18.
- (e) There were some convincing advantages suggested for reducing pollution in a stream by adding limestone rocks. There were references to limestone being a cheap rock and that putting it in the stream was a straightforward, quick strategy. Disadvantages included flooding and the fact that limestone rocks were not a permanent solution as the limestone would dissolve. The strongest answers stated that limestone would not remove the pollution, with weaker answers stating wrongly that it would.
- (f) (i) A number of candidates did not answer the question set. Instead of writing about the advantages and disadvantages of constructing a wetland to reduce pollution, they seemed to be writing about the advantages and disadvantages of wetlands. The more successful answers suggested, as advantages, that it used natural processes instead of chemicals but a disadvantage was the expense of construction.
- (ii) Only a small number of candidates were able to select all correct five months (May to September inclusive) and give reasons related to bacteria needing high temperatures and moisture to remove pollutants. A number of candidates seemed to think that bacteria worked best in low temperatures.
- (iii) Those candidates who read the question carefully and revisited the climate data in the table wrote successful explanations involving rainfall and/or the seasons in Cumberland county.

Question 2

- (a) (i) Nearly all the candidates described how total coal production was decreasing in Tennessee between 2008 and 2012.
- (ii) Many candidates gave a number of reasons for the change in coal output between 2008 and 2012. There were frequent references to fall in demand, depletion of coal reserves and the move towards the use of renewable energy.
- (b) (i) Nearly all candidates presented a bar graph that was plotted correctly. There were some graphs with no, or incomplete, axes labels.
- (ii) Most candidates used their graph to successfully estimate the likely number of miners employed in 2013.
- (iii) There were some good reasons suggested for the decline in the number of miners in recent years. These included increased use of machinery, less coal underground to mine and mines closing.

- (c) All of the examples of environmental damage listed in the mark scheme were frequently provided by candidates. A number of candidates included examples about the effect of mining on local people, this indicated that they had not read the question carefully and the examples did not gain credit.
- (d) Some candidates thought mining would stop completely in the next few years, others thought it would not. A number of candidates put both points of view and then stated which one they supported. There were many thoughtful responses from candidates who selected information from the fact sheet and presented their own ideas as to why this might be good or bad for the future of coal mining in Tennessee.

ENVIRONMENTAL MANAGEMENT

Paper 0680/43
Paper 4

Key messages

- Read the source material and the question carefully.
- Use data from either graphs or tables to help describe trends or patterns.
- Avoid statements such as 'use the same amount of chemical' without any further detail. Candidates should always make suggestions using precise terminology such as concentration, volume, mass.
- 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 state of the United States of America. Many candidates understood and made good use of the source material and their written responses were clearly expressed. The mathematical and graphical questions did pose some difficulties for a small number of candidates.

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

Candidates may benefit from working through past papers to help see how to make the best use of the information given and apply their knowledge.

Comments on specific questions

Question 1

- (a) (i) Most candidates gave the correct answer, 185 000.
- (ii) This calculation was not always carried out by an appropriate method. Many candidates divided their answer to (a)(i) by 6.5 million to give the correct percentage of the population of Tennessee living in the five counties listed in the table. Some candidates divided their answer to (a)(i) by 6.5 or 65 000 000.
- (iii) Nearly all the candidates presented the population data for the five counties in the correct rank order, from highest to lowest.
- (b) (i) Most candidates did not make the link between growing successfully and the need for nitrogen. If nitrogen is not provided by a fertiliser the plants are highly likely to be legumes that fix nitrogen. All the points on the mark scheme were seen, but only very occasionally.
- (ii) Most candidates gave one way in which soil erosion could be reduced by not ploughing the soil. All the marking points were seen but only a small number of candidates gained full credit.
- (iii) Some candidates correctly suggested saving time or fuel. However, a number of candidates did not seem to think about the question from the point of view of the farmer.
- (c) (i) Most candidates were able to plot a graph using a suitable linear scale. Some candidates forgot to label both axes and include units.
- (ii) Most candidates correctly described the trend for each period as directed by the question.

- (d) (i)** Only a small number of candidates gave one or two answers that gained credit.
- (ii)** Candidates that selected the correct data from the table were able to calculate a percentage difference correctly. However, many candidates that did not read the question carefully selected incorrect numerical values to work with.
- (iii)** The candidates that could think about this question from the farmer's point of view usually suggested one or two correct answers. There were a large number of vague suggestions that did not gain credit.
- (e) (i)** A large number of candidates did not express the idea that one sample was unlikely to be representative of the whole field. Some candidates gave sensible reasons as to why the sample might not be representative.
- (ii)** Most candidates completed the positions of the quadrats correctly. Candidates could look at the way the first two quadrats had been drawn in and follow the same method to complete the other four quadrats successfully.
- (iii)** Most candidates completed the table correctly.
- (iv)** Most candidates identified the anomalous result correctly.
- (v)** Most candidates suggested disease as a possible cause of the anomaly. All the points on the mark scheme were suggested by some candidates.
- (f) (i)** Some candidates repeated the information given in the factsheet without answering the question. Some candidates identified answers associated with cost and herbicides. Only a small number of candidates suggested other ideas.
- (ii)** A possible problem of herbicide resistance was often described. There were very few references to passing resistance on to other plants by cross pollination.
- (g) (i)** Many candidates stated that diesel released carbon dioxide. There were often vague references to toxic gases that were not worthy of credit. However, many candidates did describe a risk to human health.
- (ii)** A number of candidates stated, incorrectly, that biodiesel did not release carbon dioxide. Again there were often vague references to toxic gases that were not worthy of credit. However, many candidates did recognise the reduced contribution to climate change.

Question 2

- (a)** Nearly all the candidates described at least one aspect of an appropriate investigation. Candidates often described the use of each piece of equipment without using these in the context of a laboratory investigation. Some candidates gained full credit.
- (b) (i)** Many candidates only suggested one or two points from the mark scheme. Only the highest achieving candidates identified four advantages of using fly ash to make bricks.
- (ii)** Some candidates suggested these bricks would cause buildings to collapse rather than thinking about the risks to human health.
- (c)** All the points on the mark scheme were suggested by candidates and some gained full credit. Some candidates limited much of their answer to generic statements rather than answering in the context of this particular question.