ENVIRONMENTAL MANAGEMENT

Paper 0680/03
Coursework

There were too few candidates for us to be able to produce a meaningful report.

ENVIRONMENTAL MANAGEMENT

Paper 0680/12
Paper 12

Key messages

It is important for candidates to read each question carefully before starting to write an answer.

When candidates draw or complete graphs the shading used should be accurate and clear. Care needs to be taken to ensure the shading matches the key.

In questions where the command word is Describe, Explain or Suggest, candidates should try to develop each idea fully rather than writing a list of simple, basic points.

The mark allocations, shown in brackets, and the number of answer lines provided should be used as a guide to how much needs to be written to answer each question. Examiners do not expect candidates to write outside the lines that are provided.

General comments

Nearly all candidates completed all the questions, which suggested good familiarity with the topics being examined. Candidates should be encouraged to learn the meanings of specialist terms used in the syllabus.

The standard of English was mostly good and there was little evidence of candidates being short of time. The handwriting of some candidates was difficult to read. The importance of writing answers legibly should be emphasised.

Candidates found **Questions 1** and **4** to be the most straightforward and **Questions 2** and **6** to be the most challenging.

Comments on specific questions

Question 1

(a) The majority of candidates completed the table accurately. The most common error was reversing **D** (subduction zone) and **F** (trench) with some candidates reversing **E** (oceanic plate) and **C** (continental plate). The weakest answers only gained credit for **B** (volcano) and **A** (mountains).

(b) Many candidates correctly described in detail what happens at a destructive plate boundary, like the one shown in the diagram. The most successful answers began with a statement about the oceanic and continental plates moving towards each other and then described the processes that result in the formation of volcanoes, earthquakes and fold mountains.

(c) An earthquake was described in the stem of the question and located on the diagram of the plate boundary. Numbered lines were provided for writing three reasons why only eight people died in the earthquake. Many candidates wrote about the low magnitude of 4.9 and the location in the mountains where few people were likely to live. There were many suggestions describing how people in the area were likely to be prepared for an earthquake. Few answers referred to distance from the epicentre or the time of day. Some candidates wrote what was essentially the same reason twice, using a different form of words. Others wrote reasons as continuous prose, ignoring the numbers on the lines. A minority of candidates added extra numbered reasons below the allocated answer space. Answer lines with numbers are sometimes used as a way of helping candidates to structure their answers and candidates are encouraged to use these.

Question 2

(a) The majority of candidates completed the bar graph correctly. Some candidates did not match their shading to the key.

(b) Most candidates correctly named two surface water stores. A minority of candidates named two of the uses of water (domestic, farming and industry) shown on the graph.

(c) Candidates found this part challenging. Some candidates wrote about wells but did not describe how the water could be conveyed to the Earth's surface. Others wrote about aquifers and the use of buckets, hand pumps or electric motors with no mention of a well or borehole. There were a few attempts to describe an artesian well.

(d) (i) The majority of candidates were unable to state what is meant by desalination. Many wrote vaguely about salt removal from water when they needed to refer specifically to water in oceans or seas.

(ii) Many candidates knew that desalination is expensive and needs a lot of energy. There were some good suggestions about the need for a coastline for access to water in a sea or ocean and how some countries are landlocked.

Question 3

(a) (i) Most candidates made good use of the report to explain how the cold temperatures and thick ice made searching for oil under the Arctic Ocean difficult. There were some references to the need for permissions to drill for oil in a National Park. Few candidates considered the high costs of specialised equipment or to pay the wages of suitably skilled and qualified workers in this extreme environment. Fewer mentioned how transport costs and lack of infrastructure would cause problems for exploration teams in such a remote area.

(ii) There were some excellent answers explaining how oil spills could harm the wildlife by depriving organisms in the sea of oxygen and outlining various possible food chain effects in the ocean and on land. Reference was also made to oil coating feathers and fur, and reducing birds' and mammals' ability to maintain their body temperatures. Some candidates repeated the same idea e.g. lack of oxygen or toxicity, for different species of wildlife. The number of marks and the number of lines indicate the length of answer needed; candidates should not repeat the same idea to fill the space. This was a four mark question and four different ideas were expected.

(b) Few candidates described three ways of reducing the impact of oil spills as many wrote about double hulls. There were some excellent answers describing how booms, skimmers and detergents can be used on an oil spill. A number of candidates emphasised the importance of a quick response to reduce potential environmental impacts.

Question 4

(a) The majority of candidates completed all the gaps in the passage using the information about the temperature inversion in the diagram. The most common error was not realising that the emissions were being trapped by the warmer air to produce smog.

(b) (i) Most candidates answered the question well with a number of explanations of how high levels of air pollution can affect the health of people living in cities. The most common explanation was breathing problems with reference to specific diseases such as bronchitis, asthma and lung cancer. Many also referred to eye and skin irritation, headaches, nausea and heart attacks. A minority of candidates wrote about environmental effects of acid rain and global warming.

(ii) The majority of candidates described a variety of ways of reducing air pollution in cities. There were frequent references to cycling, walking, car sharing, using public transport and installing catalytic converters in vehicles. Some candidates wrote about government strategies such as flue gas, desulfurisation, subsidising public transport and banning vehicles on certain days. For the latter, there were often detailed descriptions of how only vehicles with odd-numbered registration plates would use the roads on one day, and the next day would be the turn of even-numbered registration plates, with references to cities such as Beijing and Delhi.

Question 5

(a) (i) The majority of candidates completed the pie graph correctly. Some candidates did not match their shading carefully to the key and a small minority drew zigzag instead of straight dividing lines.

(ii) Many candidates found stating two examples of the organic component found in soil challenging. The most common examples were dead plants, dead animals, humus and manure. Very few candidates mentioned living organisms such as earthworms.

(iii) A minority of candidates were able to name one source of mineral particles in soil. Some named a mineral; others gave an example of organic content.

(b) (i) Many candidates answered this question in detail with good accounts of how tree roots help hold the soil in place and how leaves intercept rainfall, preventing soil from being washed away by surface run-off. There were some vague statements, which needed further detail. For example, there were many references to wind. Some of these needed to be supported with a description of how trees can act as a wind break preventing soil from getting loosened and blown away by wind.

(ii) The best answers were about terracing, mixed cropping and contour ploughing. The strategy was named followed by a description of how it could conserve the soil by preventing erosion. Some candidates did not read the question carefully and wrote about planting trees when the question asked for one other strategy with **one** emboldened for emphasis. A number of candidates wrote about more than one strategy using the answer lines and the space below. Writing more than a question asks for can waste examination time.

Question 6

(a) Many candidates described the distribution of areas of tropical rainforest with reference to the proximity to the Equator and stated that the largest area was in the northern part of South America. Fewer candidates referred to tropical rainforest being located between the tropics of Cancer and Capricorn with many seeming to have difficulty in referring to this area on the map. Use of the terms ‘the tropics’ or ‘the tropical zone’ to refer to the region of the Earth between the Tropic of Cancer and the Tropic of Capricorn would have been acceptable.

(b) Most candidates were able to suggest two advantages and two disadvantages of shifting cultivation in tropical rainforests. A large number of candidates seemed to miss the significance of the information above the diagram; in particular, the sentence about shifting cultivation being a type of subsistence farming. This meant that many candidates wrote about the advantages and disadvantages of agricultural methods that are not used in subsistence farming. The most common advantages of shifting cultivation suggested were that ash provides fertiliser and that the forest will grow again. The most common disadvantages were about the loss of soil fertility and the growth of weeds. The suggestions for advantages were more successful than those for disadvantages. Many candidates wrote, as disadvantages, that burning the trees would cause air pollution and global warming.

(c) Many candidates correctly suggested strategies to conserve tropical rainforests. The most common strategies suggested were, making large areas into nature reserves such as national parks and biosphere reserves, selective logging, educating local people to manage the forest sustainably and legislation to regulate the trade in wood and wood products. Some answers just stated ‘plant trees’ as a strategy; this idea needed developing, using terms such as ‘replanting’ or ‘reforestation’ to describe more clearly the planting of trees on land where there has been recent tree cover. Afforestation is the establishment of a forest or trees in an area where there has been no previous tree cover. Candidates should understand what is meant by deforestation, afforestation, reforestation and agroforestry and be able to use each term appropriately.

ENVIRONMENTAL MANAGEMENT

Paper 0680/22
Paper 2

Key messages

Candidates are encouraged to read the question instructions carefully so that no question part, such as graphs, is missed out.

Candidates need to follow the command words, especially 'describe' and 'explain'.

If bullet points are used they must be sufficiently detailed to provide a suitable level of explanation.

General comments

Candidates completed the paper in the allotted time. Numerical and graphical questions were frequently answered well. **Question 1** was answered better than **Question 2**.

Many candidates could have achieved higher marks if they:

ensured that the graph completion questions were done
were accurate in reading and interpreting graphs
ensured that when describing from a photograph they stated what is there and ignored what is absent
wrote full explanations when necessary
planned answers to the 'How far do you agree with this statement?' questions, rather than just agreeing

Comments on specific questions

Question 1

(a) (i) Most candidates answered this correctly. A few were incorrect in their placing of the divide between industry and transport.

(ii) This question was answered well; there was some inaccuracy in reading the nitrous oxide bar.

(b) (i) The vast majority of candidates were able to read the graph correctly and carry out the subtraction.

(ii) A considerable number of candidates described one graph rather than clearly stating a difference between the two graphs. Some stated that methane decreased after 1993 when they meant that its rate of growth decreased. Such answers could not be credited as methane concentrations were still increasing.

(iii) The best answers dealt with emissions from cattle, decay of organic material and rice growing as the major sources. Some made use of the graph in **(a)(i)** and quoted burning biomass. Weaker answers tended to be repetitive, dealing with decay of different types of organic matter.

(iv) Some candidates missed out this question. A few plotted the last point for 2015 instead of for 2014.

(v) Good responses related the increase to increased population and development such that more fossil fuels were burnt, with examples of purpose, and that more vegetation had been cleared for agriculture. Weaker responses needed to explain, rather than just stating burning fossil fuels in cars and power stations, as such a statement lacks reasons for the increase in the carbon dioxide concentration.

(c) (i) The best answers focussed on the natural greenhouse effect and on the use of carbon dioxide plants for photosynthesis. Some candidates seemed unaware of what greenhouse gases are and so had little idea of their importance.

(ii) Some good, succinct answers were seen stating the case of increasing temperatures, melting of ice caps, rise in sea levels and flooding of low-lying land. Some correctly identified impact on habitats and species such as polar bears.

(d) (i) Better responses used information from the resource, i.e. the drinking water being saline and the flooding of fields with salty sea water, and their own knowledge to discuss the detrimental impact of salt water on plant growth

(ii) Nearly all candidates gave the correct answer of 33 000.

(iii) The best answers identified the probability of sea levels rising and that these low-lying islands would be submerged beneath the Pacific at some time in the future. They also noted that the situation would get worse with more and more farmland flooded, less land to live on, etc. Weaker answers neglected the 'in the near future' and largely repeated their answers to **(d)(i)**.

(iv) This question required careful thought. The best starting point was with the vast numbers, fifty million compared to one hundred and thirteen thousand. This would lead on to the fact that a vast amount of land was needed and that there was no such land unless it was very dry, cold or mountainous and therefore unsuitable. The cost would be much too high for a developing country to afford.

(e) Quite a number of candidates seemed unaware of international agreements or even why there needs to be an attempt to reduce the level of greenhouse gases in the atmosphere. Basic answers simply stated that they were ignored or that people were unaware of such agreements. Better answers identified countries that had not signed up to the treaties or that carried on emitting greenhouse gases regardless. Some also mentioned the problems of monitoring and measurement or the cost of replacing fossil fuels with alternative sources. Only a few identified the growth of world population and the increasing development and industrialisation in many parts of the world as a major factor.

Question 2

(a) (i), **(ii)** and **(iii)**
Most candidates correctly answered these questions; a few were unable to calculate the population of Asia, with some doubling the population in one year.

(iv) This question required explanation. Many candidates wrote brief statements such as 'women are educated in developed countries' or 'later marriage in developed countries' without going on to explain how this led to a slow rate of population increase. The best answers developed their initial points. Weaker answers were often brief lists or simply stated differences in birth and death rates with no explanation. A few thought it was to do with the size of a country's population.

(b) (i) Many candidates gave a correct answer of a year in the range 1985 to 1990. Some seemed confused by the year scale and gave 1958 as the answer.

(ii) A considerable proportion of candidates did not read the question carefully and described changes from 1850 to 2100. Good answers simply stated that both had increased and that Europe's population increased faster than that of Africa.

(iii) It was expected that candidates would note that Europe's population is predicted to decline a little towards the end of the period; some candidates ignored this. Most identified the rapid rise in Africa's population.

(iv) There are a few developed countries that have a decreasing population. Better responses understood this and included reasons why, such as an ageing population results in a comparatively small number of women of childbearing age. Some candidates incorrectly thought that countries where the death rate was still high, i.e. developing countries, were those facing a decreasing population. There were some mentions of war and famine, though often these were in the form of a list with no further reasoning.

(c) The responses of most candidates were usually concerned with the reasons for loss of forest and occasionally wetland habitats; the need to grow more food; house more people; provide land for industry; mining or the creation of reservoirs. Some referred to pollution but did not explain how a stated type of pollution damaged a natural habitat. A few referred back to global warming and the impact on Arctic and tundra habitats.

(d) (i) Nearly all candidates identified the area in the photograph as part of a desert; some thought that this was sufficient to answer the question. The best responses noted it is the lack of rainfall / water that makes deserts areas of low population density. These responses went on to explain why the lack of water meant that few, if any, plants can grow, meaning that livestock cannot be kept to support a human population.

(ii) This question was well answered. The most common answers covered the root systems, water storage and methods to minimise transpiration losses.

(e) (i) Many candidates ignored the command word of 'describe'. Answers frequently stated what was not shown on the photograph and some thought it was a rural settlement even though the stem stated it was on the edge of the city. The best answers described the building materials, the small size of the structures and the fact that they were not too close together. Weaker answers wrote about water or insanitary conditions, while others wrote about why squatter settlements develop. Marks could only be awarded for descriptive points of the settlement.

(ii) Relatively few candidates attributed these dwellings to rural-urban migration and the reasons for it. Most stated the lack of space and high cost of housing inside a city.

(iii) A few excellent answers were seen. These candidates understood that community participation referred to the inhabitants of such a settlement working collaboratively to improve the settlement and their lives. They frequently quoted examples and answered the question, usually by stating that the community would need assistance. This included the government giving them legal rights to the land and providing services and materials. Many candidates immediately agreed with the statement and were then unable to support that agreement. In answering such questions, candidates need to think of how else the settlement could be improved and then decide to what extent they agree with the statement. The statement may not be the best way and candidates may need to argue against it. Some thought and planning before starting the answer would have meant that quite a few candidates would have realised that community participation on its own is not necessarily the best way to improve the settlement and that other factors need to be considered and included in the answer.

ENVIRONMENTAL MANAGEMENT

Paper 0680/42
Paper 4

Key messages

Candidates should be encouraged to:
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 'plant growth will be affected' without any further detail. Better performing candidates suggested how growth might be affected and used their own knowledge to support their suggestion
label both axes of any graph with units.

General comments

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

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

Candidates should be encouraged to work through past papers to see how to make the best use of the information given for each question.

Comments on specific questions

Question 1

(a) Many candidates completed the calculation successfully.

(b) (i) Most candidates suggested at least one reason why poverty was widespread.

(ii) Some candidates made suggestions that were too vague. However, candidates that thought about advantages to Nicaragua were able to suggest suitable answers.

(c) (i) Many candidates found this question challenging. Candidates did not use the information given in the question to produce an appropriate answer. Better responses used the given scale to produce and answer in km within the allowable range.

(ii) Most candidates selected route **A** or **C** with an appropriate reason.

(d) (i) Candidates that had a clear understanding of food webs readily described two related effects of disturbance on a food web. Some candidates only gave very general answers such as 'some fish will die' without relating this to any change in a food web.

(ii) Many candidates named a specific pollutant, usually oil. Very few candidates described a reduction in water quality.

(e) (i) Nearly all candidates tabulated the data with very few errors. Some headings did not include units.

(ii) Some candidates only gave very general statements, which were not sufficient to answer the question.

Question 2

(a) All the candidates showed some knowledge of the changes that could occur in the Pacific Ocean. There were many very clear descriptions.

(b) (i) Many candidates calculated the answer correctly. The most common mistake was not finding the difference between the two values as 472, which meant the correct answer could not be calculated.

(ii) The majority of candidates identified the reduced supply of beans whilst the demand either remained the same or increased. This caused the increase in the price of beans.

(iii) Nearly all the candidates gave one good reason why the beans were a good source of nutrition.

(c) (i) Many candidates did not appreciate that, in method one, a measured volume of water had not been used so method one could not be repeated.

(ii) Most candidates identified one variable that needed to be controlled. Many candidates stated that the number of beans should be the same even though this was clearly stated in the method.

(iii) Some candidates suggested measuring a change in colour of the beans. The most successful answers wrote about the effect of extreme weather on crops and how a low supply and a high demand increase prices.

(d) (i) Some candidates correctly drew the graph and fully labelled both axes. There were many examples of either incomplete or no labelling of both axes. The table of data provided candidates with the labels for both axes.

(ii) A significant number of candidates did not describe the trend as an increase in survival time ending in no further change of survival time. Candidates should remember that any description of a trend needs to account for all the data shown in a table or graph.

(iii) Nearly all the candidates selected either September or February as a bad time to plant beans. Their supporting reason was sometimes too vague to gain credit.

(iv) Candidates that appreciated how legumes fix nitrogen easily gained both marks. A significant minority of candidates just suggested these beans did not need fertilisers without any further clarification.

(e) (i) Most candidates described how this type of erosion may occur. Some answers described wind erosion, which was not relevant for this question.

(ii) A minority of candidates gave very clear, detailed answers. Some candidates suggested using the ranging poles and pebbles in some impractical ways. A small number of candidates only gave a list of the equipment and described what it could be used for, which did not answer the question.

(iii) Most candidates suggested a question that was relevant. Only a small number of candidates asked a question that had already been asked in the table of information.

(iv) Nearly all the responses suggested that the flow rate in the gully would slow down because of the check dams. Only a small number of candidates suggested that this would allow more time for water to infiltrate. Instead, many responses suggested that the living check dam plants would use large quantities of water.

Question 3

(a) (i) Most candidates correctly named this instrument.

(ii) Most candidates completed all parts of the table correctly.

(iii) Many candidates made suggestions that lacked clarity. In some cases, responses only discussed wind speed instead of only considering the information from the wind rose. Some responses did clearly appreciate that the wind direction was very consistent in this location.

(b) (i) Some responses only referred to wind turbines not releasing gases. This was not an acceptable answer as carbon dioxide needed to be identified.

(ii) Responses that appreciated the context of this question gave three good reasons why the government would want to avoid power cuts.