

ENVIRONMENTAL MANAGEMENT

Paper 0680/01

Paper 1

Question 1

- (a) (i) No problems with this
- (ii) Many candidates were able to gain two marks by the naming and brief description of a suitable consequence; the mark scheme allowed a good number.
- (iii) Most were able to name either carbon dioxide or methane.
- (b) (i) Here, the commonest mistake was to merely discuss what global warming is without saying anything about its consequences. Again, the mark scheme allowed for a wide range of possibilities.
- (ii) The actions that could be taken by governments were well known and included the use of alternative energy sources, measures to reduce consumption of fossil fuels and those designed to remove carbon dioxide from the atmosphere.

Question 2

- (a) (i) The vast majority of candidates were able to correctly identify the two climate graphs. To gain three marks, the reasons had to be in terms of both temperature and rainfall patterns.
- (ii) It was difficult for candidates to gain a full four` marks here, and few did. A discussion of the necessity of water *and* suitable temperatures for plants was needed here.
- (b) A brief discussion of the use of pesticides, herbicides and any method of biological control was needed here. Most were able to gain two marks for the two kinds of chemical control, but less so the biological control mark.

Question 3

- (a) (i) Few had difficulty gaining these three marks.
- (ii) The main problem in this question was the confusion between run-off and soil erosion, many candidates restricting their discussion to the latter. The role of trees in intercepting and absorbing water was generally well know by those who interpreted the question correctly, but the possibility of increased run off due to non-absorbent pavement surfaces was less commonly mentioned.
- (b) (i) Most were able to gain a mark for a simple suggestion of a domestic use of water, but suitable industrial uses, such as cooling agent, solvent, generation of power in HEP etc., were less common.
- (ii) Water treatment via chlorination, filtration was quite well understood but fewer were able to get a mark for the purpose of the treatment, such as removal of particulate matter or bacteria.

Question 4

- (a) (i) Addition of points to the graph proved an easy two marks for most candidates.
- (ii) Many gained two marks for a discussion of the initial rise and a subsequent levelling off or fluctuation. Fewer went on to gain a third mark for a quotation from the data to support some of this. It is worth stressing that wherever data is given in a question, quoting from it to illustrate a point will often be markworthy.
- (b) (i) Causes of marine pollution were sometimes too vaguely put to gain a mark (e.g. industrial) but many were able to discuss oil, farm runoff down rivers, etc. A minority misread the question and answered in terms of causes of overfishing.
- (ii) This was quite well answered by many, with mention of booms, dispersants etc., being quite common.

Question 5

- (a) (i) Most were able to see that this was coal, but some just named a sedimentary rock.
- (ii) This was not well done. Some indication of particles of matter being 'squeezed' (possibly after movement) was needed. A lot of made up answers were seen here.
- (b) (i) This was quite well answered with dust pollution and noise pollution being the most commonly quoted correct alternatives.
- (ii) The various alternatives here were well known, with reclamation using previously removed spoil and the improvement of the land followed by planting often being discussed in some detail.

Question 6

- (a) (i) The majority were able to gain one mark for a description of the huge reduction in wetland area, but quite a significant minority failed to notice that the area has gone back up again by the present day, and thus did not gain the second mark.
- (ii) There were a number of ways in which these marks could be gained. Discussion of a reduction of the numbers of wetland species due to habitat loss, and/or the disruption of food chains was the most common way in which the marks were gained. An improvement of the conditions for those species which do not rely on wetland was a less common route to the marks.
- (b) (i) This was one of the most poorly answered questions on the paper. Many did not appreciate at all the link between population growth and the need for more agricultural and/or building land. A lot related the changes to changes in rainfall patterns. Drainage of wetland was hardly ever mentioned in answers to this question.
- (ii) Many tried to answer in terms of tourism, which was not considered appropriate in this context. Correct responses discussed the improvement of conditions for wildlife but the loss of potential farmland or building land.

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| <p>Paper 0680/02</p> |
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| <p>Paper 2</p> |
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General comments

The overall standard of answers to **Questions 1** and **2** was similar. If there was a large divergence in performance, this was mainly related to individual candidate knowledge and understanding of the different topics being examined. Part **(a)** in **Question 1** turned out not to be the usual easy starter question, but this was offset later in the question by the inclusion of a widely familiar case study in part **(b)** and by practical graphical work in part **(d)(i)**. **Question 2** included questions on two topics, plate tectonics and energy, linked by questions on geothermal power. Sometimes there was a marked difference in the quality of a candidate's answer between the two, but without any noticeable difference that was consistent across all candidates. An improvement was noted in the willingness of candidates to refer to named examples in their answers, which enhanced the worth of answers to **Questions 2(a)(v)** and **2(c)(ii)** in particular. The two questions which discriminated most ruthlessly between strong and weak candidates were the cartoon in **1(e)(i)** and likely future use of geothermal power in **2(c)(ii)**. Only more able candidates were able to comprehend the different views suggested between the two men and the female water carriers in the cartoon and to show awareness of the limited availability of suitable natural sites for cheap production of geothermal power.

One of the continuing weaknesses in answering was the desire by some candidates to give reasons when description alone was required by the question; this was noticed most in answers to **Questions 2(c)(i)** and **2(d)(i)**. These candidates were the ones least likely to use values in support of their answers, as they quickly moved away from direct references to the graph and diagram information. Another observed weakness was the reverse of this, namely a failure to give reasons in **Questions 1(c)(iv)** about differences in water use and **1(d)(ii)** about differences in access to safe water supplies between rural and urban areas; instead extended description of actual differences in water use and supply was given. Some candidates failed to make the switch from part **(a)** to part **(b)** in **Question 1**. There were many answers of **B** and **D** in **(b)(i)**, showing that candidates were referring back to the cross-section in **1(a)** instead of answering in relation to a named example of an actual dam. Candidates should be made aware that the lettering and numbering of question sub-sections is significant; a new letter usually denotes a fresh start and a different theme, even though it often follows on from what went before.

Comments on individual questions

Question 1

Part **(i)** was the best answered part of **1(a)**; a majority of candidates stated either lake or reservoir for **B** and many indicated ice or snow for **C**. However, in **(a)(ii)** and **(iii)** many fewer than had been expected noted the closeness of the layer of sandstone rock to the surface at **D**, and the resulting possibilities for obtaining a fresh ground water supply. Many candidates gave unsatisfactory and unlikely answers based on building pipelines to bring water in from elsewhere. A remarkably large number suggested damming the river at **D**, or just using the river, which were specifically outlawed by the question. Choosing **C** made explanation easy in **(a)(iv)**, although some were able to make good progress with the choice of **B** by concentrating upon the possibilities of sediment settlement in the bottom of a large surface water body. While **A** was perhaps the most obvious choice in **(a)(v)**, a good case could also be made for **B** as well. Some of the explanations, however, were too brief for a question with three marks attached to it.

In part **(b)** those candidates who merely used a letter from the cross-section in **(a)(i)** for their dam location could gain no more than three marks for a general answer about the reasons for, and advantages of, dam building; frequently answers were too vague or too limited in range to reach even three marks. Of a different standard were the majority of answers based upon a named dam. Major dams such as Aswan, Three Gorges and Hoover were the most popular choices, but many also used an example from their home country, which improved the chances of them claiming all the marks from the amount of specific information included.

The correct answer of 135 litres was the most common answer in **(c)(i)**. However, answers of 3 times in **(c)(ii)** were almost as common as those for the correct answer of 4 times. Cooking and drinking was almost universally selected in **(c)(iii)**, but some answers to **(c)(iv)** suffered from use of a repeated statement instead of a reason. However expressed, the reason needed to relate to these as essential human activities, not dependent on a person's wealth or place of residence. The worth of some answers to **(c)(v)** was restricted either by too much description and too little explanation, or by over-concentration on one type of country so that real differences between developed and developing were not explained. The strongest answers came from candidates who referred to both types of countries and varied their language beyond the statement of direct opposites, one positive and one negative.

To most candidates the type of practical task in part **(d)(i)** posed no problems; there were many full four mark answers. For the diagram to be a visual success, the key needed to separate out rural and urban areas rather than the two countries. Some candidates drew their key using a pen and then used a pencil for showing the same shading on the graph, which was accepted provided that the type of shading was intended to be the same, but it was not the best way to do it. Unfortunately a few candidates forfeited most, if not all, of the marks either by using an irregular scale of values, or by trying to show these values on a line graph. In both cases the visual result was a disaster. While more able candidates experienced few problems answering part **(d)(ii)**, weaker candidates concentrated on describing how people in urban and rural areas actually gained access to water supplies. Successful answers included references to the concentration of wealth, economic development and government investment in cities of many developing countries often to the exclusion of rural areas.

Some candidates failed to concentrate on the question's need to give views about change and development in **(e)(i)**; typically they only described what they saw without any attempt to comment. This was perhaps the most difficult question on the paper for candidates to gain full marks. Part **(e)(ii)** offered many fewer problems; candidates of all ability levels could make some progress here. Two and three mark answers were the most frequent, in which candidates explained why well water was likely to be cleaner than surface water, and how a better water supply could help both people's health and economic activities such as farming. In four and five mark answers candidates usually named examples of water related diseases and made reference to reasons for health improvements in young children and women in particular. In **(e)(iii)** not all candidates concentrated upon referring to reasons why outside help from charities was vital, such as lack of money, resources, know-how and technology, particularly in rural areas in a continent such as Africa. Instead a significant number repeated answers already covered in earlier questions about how bad the water supply situation was, which did not address the question effectively.

Overall, **Question 1** covered a familiar topic for which the vast majority of candidates had been well prepared. Answers to those question parts between **(a)(iv)** and **(e)(ii)** were most often the fullest and best. Hiccups below the usual standard of answering were most likely in parts **(a)(ii)** and **(iii)** and **(e)(iii)**.

Question 2

Some candidates used a lot of words to reach the relatively short and simple answers of converging and diverging (or their equivalents) in part **(a)(i)**; many were attempting to answer a much bigger question than the one set, more like 'Explain what is happening at plate boundaries **A** and **B**'. The answer for only one of the three marks in **(a)(ii)** could be taken directly from the diagrams; the source of the magma in the mantle was clearly shown in diagram **B**. Claiming the other two marks was less easy because it needed more knowledge and understanding, especially about friction caused by movement in the subduction zone and its consequences for volcanic activity. Many had the required knowledge and understanding, although a few focused too much on fold mountain formation. The best answers to **(a)(iii)** were concentrated on the presence of lines of weakness and fractures, as well as the pressure from earth movements allowing magma to reach the surface. Part **(iv)** was the least well answered part of **(a)**. Several headings were available to candidates for establishing one difference, such as cone shape, materials erupted, nature of volcanic activity and location. From only a few Centres was there variety in answering with different candidates using information from different headings; a clear majority relied upon location, for which there was some help on the diagrams. Some of the answers to **(a)(v)** were more appropriate for earthquakes than volcanoes; overall, however, the reasons referred to were more varied than in the previous question. These were accompanied by some useful references to actual eruptions, notably those of Mount Etna. As a result this was quite a high scoring question.

A few candidates failed to appreciate that it was the heated hot water that actually generated the electricity; nor did they realise that the igneous rocks needed to be 200°C in order to heat the water piped through them to 100°C. Otherwise for the majority, the diagram in **(b)(i)** was a useful stimulus. Part **(b)** was, on the whole, a high scoring question. Some weak candidates lost sight of the geothermal power theme in **(b)(ii)** and somewhat unaccountably began to give advantages of the use of volcanic areas for human settlement such as fertile soils, presence of minerals and tourism.

The overall message that could be taken from the graph in part **(c)** was that the production of geothermal power was relatively cheap compared with most other ways of generating electricity, especially many of the alternatives. A majority of candidates realised this. Those who quoted relative costs to elaborate upon this, as well as upon the cheapness of fossil fuels, soon claimed all three marks in **(c)(i)**. A few candidates totally misinterpreted the graph and viewed it in terms of showing amount produced, which generated nonsensical answers. Part **(c)(ii)** was a good discriminator. Many candidates used words to the effect that the relative cheapness of clean geothermal power would make it a great alternative to dirty fossil fuels as they are used up. This had some merit, but was not as good an answer as the one from candidates who showed awareness that opportunities for cheap generation are restricted to areas with certain favourable natural conditions such as Iceland and New Zealand.

Provided that candidates restricted themselves to description using only the demand line, it was straightforward for them to gain at least two of the three marks in **(d)(i)**. The most common reason for the loss of one mark was lack of use of any values. For the loss of two or more marks, the causes were either digression into explanation for increased demand, or attempts to relate variations in demand to discovery. The weakest answers given to **(d)(ii)** consisted of nothing more than a list of individual values without any attempt to establish the context; in other words, the candidates had taken the question instruction to quote values and information too literally. Single quoted values such as 'Discovery of oil was 57 billion barrels in 1965' or 'Demand for oil was 25 billion barrels in 2005' were not enough by themselves to indicate oil reserves running out or unsustainable use. An answer of this type was never going to satisfy all the needs of a four mark question. Much superior were answers from candidates who quoted, or better still attempted to use, several values to make a stated relevant point. One of the most effective responses was adding up the totals from the second and third columns under total global oil, in order to make the point that people have already used more oil than is known or likely to be available for use in the future. In **(d)(iii)** all the evidence given suggested that demand will keep rising. This was easy to explain by reference to growth in world population, continued economic development especially in China and India and the important uses of oil in car and air transport. Almost equal credit was given to the opposite suggestion of falling demand, provided that explanation was given in terms of the greater use of alternatives, technological breakthroughs in their development, increased energy efficiency and savings in use imposed by higher prices and lower availability.

Some candidates struggled to go beyond what was already stated in the speech bubble in **A** in part **(e)(i)**. Candidates were definitely more familiar with the arguments in **B** against the use of nuclear power; dangers from radio-activity, contaminated waste, leaks, explosions and accidents were regularly mentioned in **(e)(ii)** to elaborate upon 'dangerous' in the speech bubble. References to Chernobyl were frequent. In **(e)(iii)** the majority opinion among candidates was against nuclear power, but not by a wide margin. One common view was to carry on with nuclear power as an already proven alternative, but to ensure that the security surrounding its use was enhanced. Some of these candidates pointed out that there have been no major disasters since Chernobyl, to prove their point that nuclear can be safe. A frequently expressed opposite view was that nothing could justify the use of something as dangerous as nuclear power, no matter how great the energy need. As is always the case in questions which ask for a candidate's view, the strength of the argument is what is assessed and not the view held. Apart from answers from the relatively few candidates who knew nothing about nuclear power, the weakest answers came from those who gave equal weight to both sides of the argument, they tended to have little new to add what had already been written in **(e)(i)** and **(ii)**.

Although only the more able candidates were able to maintain quality and consistency of performance throughout the different parts of **Question 2**, most candidates managed to answer some parts well. The well answered questions were less predictable than in **Question 1**, because they were more candidate and Centre specific.

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Paper 0680/03

Coursework

General comments

Candidates continue to show their enthusiasm for the environment through a good range of chosen environmental issues. The topics chosen tended to be well researched and presented. There is a general tendency to lose impetus when it comes to putting together a reasoned plan of action for future sustainability and Centres would benefit their candidates by focusing on this aspect of the coursework.

Domain A

Most candidates demonstrated a firm grasp of the processes in the specification, which reflects some excellent teaching of these issues. The candidates were generally good at relating their local problems to the broader aspects of the issue

Domain B

Unusually this year there were many reports submitted that lacked the data that was being discussed. There was also a lack of interview data from many candidates and there were also a significant number of shared results, which in itself is acceptable but many failed to put their own individual mark on this.

Domain C

As in previous years this continues to be the weakest area and discriminates between the more able and the weaker candidates. The Centre marking this year often did not recognize the weakness of candidates here.

Candidates often failed to put together a reasoned argument on sustainability and simply gave a list of possible solutions with little discussion of pros and cons. Criterion 9 continues to prove to be the most problematical where a strategy is needed.

There is also a greater need for candidates to analyze how the different interested parties will support different strategies for a variety of reasons.

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Paper 0680/04
Alternative to Coursework

General comments

The paper focused on Tanzania, in Africa. The questions considered the possible effects of development on biodiversity and sustainable agricultural activities. The style of questions was similar to those of past papers and candidates had no difficulty presenting answers to all the questions. Overall candidates seemed to be engaged in the context presented to them, although there were occasions when the examiners felt that the candidate had spent insufficient time reading and thinking about some questions. The majority of answers were well presented and easy to read.

Comments on specific questions

Section A

Question 1

- (a) (i) Three strategies were presented to candidates and they had to assess the likely impact of these on a rare and endangered animal. Most candidates suggested that Strategy 1 would lead to extinction but many candidates did not identify the limitations of keeping the animals in captivity or that Strategy 3 should enable some animals to survive in their natural habitat.
- (ii) Many candidates were aware of the need to carry out an environmental impact assessment, and many described this clearly.
- (iii) The majority suggested that the extinction should be prevented either because of its effects on food chains, or because humans should always try to avoid causing extinction. A small number argued that the development project was very important and if the animal became extinct this was an acceptable loss. Both types of answer gained credit.
- (b) (i) Candidates often found it difficult to explain that collecting from the wild depletes the population and therefore reduces breeding so the population is further reduced.
- (ii) Nearly all candidates selected **Farm B** and gave one or two good reasons for their choice.
- (c) (i) There were a large number of correctly plotted graphs with both axes labelled correctly with units.
- (ii) Most candidates identified that juveniles in enclosure **X** grew to a greater length than those in enclosure **Y** but many did not express the fact that they were growing faster or that they achieved a 35 mm difference by the end.
- (iii) Most selected the correct diet.
- (iv) There seemed to be only a limited appreciation that the natural vegetation would need to regenerate or that there would be a risk of disease.
- (v) Some candidates suggested that by taking more animals from the wild they could just produce even more animals. This missed the point about maintaining genetic diversity and preventing inbreeding or developing hybrid vigour.

Question 2

- (a) The details of a traditional cultivation were given to candidates and many did suggest advantages and disadvantages that were in the context of the questions. A small number of candidates only gave answers from their knowledge without consideration of the information given.
- (b)(i) Some candidates gave two sensible factors that should be the same whilst others often stated the number of plants, on this occasion not worthy of credit as the number of plants were shown on the diagram.
 - (ii) Only a minority of candidates weighed the yield. Many just said count the maize plants.
 - (iii) Some candidates made reference to a quadrat, although not required here. If this had been developed to a yield per unit area (with repeats) it could have gained credit.
- (c)(i) There were a wide range of sensible suggestions, many candidates clearly had some good ideas about variation within a set of data.
 - (ii) Nearly all candidates showed working and arrived at an answer, a common error was to not calculate a percentage from the ridge only method.
- (d) Both parts of this question were generally well answered with a logical sequence of events. The examiners often awarded three or four marks.

Question 3

- (a)(i) Candidates did not require any specialist knowledge of mercury poisoning. If they used their knowledge of the effects of heavy metal pollution in the contexts presented, they could gain maximum marks. Only a minority of answers gave details of the possible effects on humans and the food chains locally. There were a number of references to pollution of the marine environment which did not help to answer the question.
 - (ii) A good number of candidates outlined a logical series of consequences for the village when gold extraction stopped and they usually gained two or three marks here. Only a very small number of candidates just said they would run out of money.
- (b) Irrigation, generating energy or domestic water supply were often cited here.
- (c)(i) The answers of age, number and breed of goats as factors to keep the same were given but not as frequently as expected.
 - (ii) Measuring the success of the trial seemed to be more readily answered. However, it would help to give some details as to how the measurements could be taken and even giving appropriate units helped candidates gain credit.
 - (iii) A large number of well presented tables were seen and units were required for the headings in the table.
- (d) The majority of candidates completed the diagram successfully and gave the correct answer of 15.
- (e) The candidates that recognised that 1 kg of crop waste was eaten every other day usually worked out the correct answer. For those that carried out the correct method but arrived at the answer of 8 goats were given one mark.
- (f) The examiners allowed some overlap between the two sections but did not credit the same point twice. Nearly all the answers confined themselves to development in this local context and they gave a wide variety of good answers. Vague statements about helping the economy of the country did not gain credit unless some detailed explanation was given.