ENVIRONMENTAL MANAGEMENT

Paper 0680/01

Paper 1

General Comments

All candidates seemed to find parts of all six questions challenging. The following sub-sections proved particularly difficult for some:

Question 1: (a) (i), (c) (ii) & (iii)
Question 4: all sections with 4b(i) proving very hard
Question 5: (a) (iii), 5(b)(ii)
Question 6: (a) (i), (b) (i)

There were no easy sections but many candidates seemed to find Question 3 (a) (i) and (ii) and (b) (i) fairly straightforward. 5(b)(i) was also very well known.

Candidates were spread across the mark range from 57 to 2. There were no obvious misinterpretations of questions.

Comments on specific questions

Question 1

(a) (i) Very few candidates were able to define both greenhouse gas and greenhouse effect with any precision.

(ii) Most, correctly, gave CO_2 as the answer.

(b) Most candidates gained a mark for identifying the increase in CO_2 in the atmosphere but fewer identified and described the fluctuations. Many candidates did not offer any/creditable explanations and this seemed to be an example of the common failure to read that the instruction that they need to describe *and* explain.

(c) (i) Just over half of the candidates marked gave a correct source of CFCs.

(ii) Fewer could give an accurate source of methane.

(iii) Suggestions about how CFC and methane pollution might be reduced seemed to be partly answering a different question, one asking about reducing CO_2 pollution. Again, an error almost certainly related to a lack of careful reading of the questions.

Question 2

(a) (i) There were different approaches to this question. Most candidates scored above half marks.

(ii) Most candidates realised the soils were fertile/contained minerals but few gained both marks by writing convincing answers that referred to the need for these minerals for crop growth or growth of forage.

(b) (i) Some candidates wrote repetitive or vague answers that only gained one of the two marks available.

(ii) Most candidates were able to write extensively about more than two ways that governments might reduce the impact of volcanic eruptions, frequently extending their answers several lines into the space below the four lines provided.

Question 3

(a) (i&ii) The vast majority of candidates gave the correct answers, 400 million and 6400 million. Some lost a mark for not including units

(iii) Many candidates found this question challenging. Some answers appeared to be about why the population grew rapidly in the last 2000 years, others about reasons for rapid population growth in less developed parts of the world, rather than the question being asked, reasons for the change in world population between 1800 and 2000.

(b) (i) Most candidates were able to gain two marks for listing four push factors that could result directly from an increase in population. No candidates gained zero although some included one or more of drought, crop failure and flooding in their list.

(ii) Some candidates seemed to be writing about the PUSH factors from the rural area since their answers, such as unemployment and crop failure, were taken from the stem of the question. Most, however, understood the question and gained at least one mark. There were some thoughtful answers about more jobs available in urban areas, higher wages, opportunities for higher/university education, better healthcare in hospitals, piped water, more entertainment e.g. cinema.

Question 4

(a) (i) Only a third of candidates could accurately name two of the currents on the map. Some seemed to be making up names; others appeared to think the question was about naming a warm and a cold current.

(ii) Only a third of the candidates could explain that cold currents come from polar regions and warm currents from the equator/tropical regions.

(iii) Many candidates wrote about the effects of the climate in terms of fishing and how Labrador had good fishing grounds because of the cold current. Very few realised the two places were at the same latitude but the currents meant they had very different climates.

(b) (i) Few candidates were able to gain two marks for describing how upwelling happens. Some seemed to think it involves minerals being eroded from the sea bed and deposited on the beach by (constructive) waves. This was the worst answered question on the paper.

(ii) Some candidates had a good understanding of why, in an El Nino year, upwelling stops and there are fewer fish. Nevertheless few candidates gained all three marks. Some candidates scored zero as a result of muddled answers about the temperature of the water or the currents involved and statements about fish preferring warm water because it was full of nutrients.

Question 5

(a) (i) Many candidates gained all three marks with no one scoring 0.

(ii) Most candidates gave nutrients or minerals as the answer.

(iii) Some candidates did not read the question sufficiently carefully, missing the reference to 'these substances' and therefore writing about water or CO_2 (the answers to (i)) or something that would be classed as a nutrient or mineral (answers from (ii)). Good answers mentioned lack of oxygen, acidity, erosion, compaction and too much salt due to salinisation.

(b) (i) Nearly all candidates gained both marks.

(ii) Disappointingly only a third of candidates gave a correct answer, predation.

(iii) Fewer than half gave a correct answer, pollination.

Question 6

(a) (i) There were some good answers with some candidates gaining all three marks by successfully applying what they knew about cyclones and the diagram to explain how cyclones form. Others wrote an answer that used the labels from the diagram but showed little understanding of the processes involved.

(ii) About half the candidates realised that the most powerful cyclone would be in area Y.

(b) Few candidates could state an impact of the cyclone on peoples' health. Many wrote that people were killed. However the mark for an impact on the environment was achieved by most.

(c) (i) Most candidates gained at least one mark for explaining the term drought.

(ii) Most candidates achieve one of the two marks for identifying two long term measures to reduce the effect of droughts.

All candidates finished the paper and there were few blank sections on scripts.

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Paper 2

General comments

Despite the great range in overall performance between candidates, it was possible to detect a general pattern of candidate performance within the paper. Typically the higher mark was for **Question 1**, maintaining the trend noted in most previous examinations. It is customary to try to place the question which covers the topic areas likely to be most familiar to the majority of candidates first. **Question 2** was based upon content in the Lithosphere unit and some parts put a higher demand on more specialised knowledge, such as the parts about the formation and distribution of minerals. Not many gaps in knowledge were exposed on the paper, but where they were, they tended to be Centre specific and most often for desalination in **1(c)** and mineral formation in **2(a)(iii)**.

Having sufficient time to complete the paper has never been an issue with this paper. However, there was evidence of answer quality tailing off in parts **(f)** and **(g)** of **Question 2** among weaker candidates. While unanswered questions were uncommon on most of the paper, a significant number of candidates left the page for answering part **(g)** blank. This was unusual for another reason; information was provided for the candidates, which when selectively used, would have allowed them to write answers that could have been worth two or three of the five marks. While a few able candidates were having to keep an eye on the clock by this stage of the examination, after having written long answers to most of the previous questions, they still attempted answers to the final part. It was weaker candidates, who had written shorter answers throughout, who seemed to give up.

Three main areas for improvement in examination technique, useful for alerting future candidates, were highlighted in this examination. One was to avoid giving list-like answers to the longer four and five mark questions in **1(g)(ii)** and **2(g)**. Listed answers such as 'too poor', 'lack of education', 'developing countries' and 'against their traditions' in **1(g)(ii)** failed on most occasions to deliver answers that were worth more than one of the four marks.

Another was the need to refer first in comparison questions to the item that came first in the question. For example in **2(d)(iii)** the focus needed to be on HEP rather than oil, whereas in the next part the focus needed to be switched in favour of oil. A sizeable number of candidates did the reverse in both questions; there were plenty of answers all about HEP in **2(d)(iv)** which were unable to access the full three marks.

The third area for improvement is for candidates to recognise the difference in answer requirements between 'Describe' and 'Explain', perhaps the two most commonly used question command words. Some candidates failed to make any use of the information about malaria provided in **1(e)(i)** where they were asked to 'Describe the evidence'. Instead they concentrated on giving reasons for malaria being such a serious problem in Africa, thereby forfeiting the chance to claim what could have been a relatively easy three marks. The reverse happened in many of the answers to **2(f)(iii)**. Values relevant to the theme of the question were selected from the table, but written down without any attempt to explain choice in relation to environmental impact.

Candidates who begin answers by repeating the question are wasting their time. In one way this does not matter on this paper since shortage of time is not an issue for most. Nevertheless it may be worth repeating the message highlighted in last year's report because the majority of candidates equate filling all the lines with giving a full answer to the question. Most stop answering once all the lines have been filled. Always remember that the lines left for answering are for guidance only, and cannot take into account the many variations in size of handwriting and precision of expression between individual candidates. What is essential is that candidates tailor the number of points made and the amount of development to the number of marks available, even if it means extending the answer into the spaces below or on to a supplementary answer sheet.

Comments on individual questions

Question 1

To claim both marks in **(a)(i)** the two bars needed to be accurately plotted, and the candidate had to make an obvious attempt to follow the shading pattern already used. Only a few candidates failed to do both of these. Those candidates who compared but without stating any percentages in **(a)(ii)** were limited to two marks; those who just stated percentages without any comment were also limited to two marks provided that comparative percentages were stated, and to one mark if non-comparative percentages were listed. Candidates who answered along the lines that 'water supply and sanitation were low in Europe' were given no marks. Two and three mark answers were the most common. The basic answer in part **(a)(iii)** was that water supply is easier and cheaper to supply than is sanitation. Once this was clearly stated or hinted at in answers, it only needed a minimum of elaboration to reach two marks. Marks, whether zero, one or two, tended to go in line with candidate ability.

The easy mark was in **(b)(i)**. A few candidates, however, made life difficult for themselves when answering **(b)(ii)** by giving poor choices in **(b)(i)** – sometimes lists of totally different sources were given (such as well and river), sometimes desalination (most likely taken from the next question), or even worse oceans. Again the quality of explanation given closely reflected ability. The wording of the question allowed candidates to explain everything from totally safe to totally unsafe, as well as all levels of safety in between. The weakest answers to **(c)** came from candidates who believed that all that was needed was to allow the sea water to evaporate in the hot sun. A lot of candidates considered the coastal locations of these countries to be the major factor. However, those with a real understanding of desalination gave the effective answers based upon the expense of this process and how it is only carried out where the need is great (as in these desert countries) and when the financial resources exist (due to oil revenues).

For most candidates part **(d)(i)** offered an easy chance to claim three marks; inaccurate plots of the percentages were rare. A few insisted on drawing bars, perhaps as the only graphical technique they know. More surprisingly this was the part of **Question 1** most likely to be not attempted by candidates. The reasons for this are difficult to identify, although there are always a few candidates in each examination session who seem to be more uncomfortable with practical graph questions than with the written answers. Many answers to the next two parts, **(d)(ii)** and **(d)(iii)**, were inadequate because candidates merely named one month for 'season' (normally January) and for 'at what time of year' (almost always May). Ranges of months as narrow as two to three months or as wide as six or seven months were accepted, as also were summer in **(d)(ii)** and end of summer in **(d)(iii)**. In other words, the mark scheme was quite flexible provided that candidates looked beyond one month. Whilst almost all candidates showed themselves to be aware of the relationship between the wet season and high incidence of malaria, a good number struggled to relate and explain the increase in cases towards the end of, and immediately after, the wet season in part **(iv)**. Only more able candidates were able to apply what they knew to this particular example in a sufficiently precise way to claim all three marks.

In part **(e)(i)** some candidates ignored the command word 'Describe' and filled all the lines trying to explain why malaria is a more serious problem in Africa than in the rest of the world. From the information given, some items were more useful to candidates for answering this question than others. Most useful were the comparative figures for deaths per 100,000 people between Africa and the rest of the world. Candidates, who made full use of the significant differences in numbers per 100,000 and in the changing trends shown between 1900 and 2000, produced most of the two mark and all of the three mark answers. Weaker candidates tended to use only the comparative values for 1900 and filled the lines by merely repeating what was given, with a minimum of comment. For them, one mark was the typical outcome. The question seemed to be a missed opportunity for some. Full mark answers were much more common to part **(ii)**, with references to reducing the capacity to work and the cost of medicines or preventative measures, dominating in the many two mark answers.

Answers like 'the female anopheles mosquito breeds in water' were never going to be worth a mark with 'water-bred' in the question in **(f)(i)**. A surprising number of candidates were shown to be under the false impression that the disease was spread by contaminated water supplies. However, most did claim the mark. Likewise full two mark answers dominated in part **(ii)**, after candidates identified stage 4 for Method 1 and either stage 6 or 1 for Method 2. Since none of the other stage numbers were persistent distracters, the incorrect answers were likely to have been based on a total lack of individual candidate understanding. Again the vast majority of candidates could identify 'low cost' and 'only needed in small amounts' from the details supplied in part **(iii)**. To score marks in **(iv)** candidates needed to concentrate on describing how the new methods were improvements. Some failed to do this, instead merely stating their good points. The

importance of having the mosquito nets treated with insecticide was the improvement that candidates missed most often.

In **(g)(i)**, most candidates did stick to description this time instead of trying to give reasons. The worth of some answers to **(g)(ii)** was greatly reduced by the use of lists. Many of the reasons suggested were valid, but they were stated in such a short, general way as to be of little value. It was no surprise that poverty dominated the answers; well developed, this could take the answer up to three marks. The most effective answers came from candidates who explained using other reasons, especially ignorance (as opposed to just 'uneducated') and problems of distribution to the rural areas, where the majority of Africans live.

Question 1 examined familiar, previously visited, topic areas, for which most candidates were well prepared. Despite highlighting weaknesses in this report, this question was well answered by the majority of candidates and was quite high scoring. The key to a high total mark, as always, was consistency of performance between the different parts, which favoured candidates without gaps in their knowledge and who best obeyed question commands.

Question 2

Four mark answers to part **(a)(i)** were most common when the regions lettered F (Southern Africa) and G (Middle East or the Gulf) were chosen, irrespective of the part of the world where the candidate lived. Location knowledge for other regions was shown to be patchy, with perhaps Alaska for region A being the most regular mistake. To answer part **(ii)** well some mineral choices were better than others; oil was perhaps the best choice for stating a wide variety of uses. Uranium was a less good choice unless candidates were able to elaborate upon its two major uses, in the way that many more showed they could do after having chosen diamonds. A lot of answers to part **(iii)** suffered from inadequate knowledge of mineral formation. Some candidates approached the answer by referring to the past conditions needed for the formation of fossil fuels, but it was impossible to write a full mark answer without reference to geological conditions. Some candidates confused minerals as used here with minerals as nutrients in soils. Certainly there were many vague, general answers about how climate or soils or the movement of the plates affected mineral formation.

The answer to part **(b)(i)** was intended to be 75 years; this was far and away the most common answer, although a range between 70 and 80 years was allowed since candidates had at least shown that they understood what needed to be done. Most answers to **(b)(ii)** were too narrow; typically candidates filled all the lines making the one point that they are non-renewable resources, often without more telling points such as the millions of years for new deposits to form, and present human use occurring at a faster rate than they can ever be formed. Few candidates showed awareness of the widespread availability of minerals in the rocks of the Earth's surface compared with their limited occurrence in deposits of sufficient size to be economic to mine.

The two questions that made up part **(c)** were higher scoring. The majority of candidates understood the main difference shown between the two diagrams and chose to explain A in part **(ii)** on the grounds of fewer stages in the operation and less energy use for transport and in factory processes. The most common answers which failed to progress beyond two marks were those in which the candidate tried to justify the choice of B as being better for the environment, which was a big challenge in this particular example.

For a two mark answer to part **(d)(i)** a candidate needed to state how it fulfilled the two essential requirements for HEP generation, namely a supply of water, and a head of water to provide the force to drive the turbines. Both were needed. Candidates could use either direct evidence from the sketch (such as presence of the dam and reservoir, difference in height with the HEP station sited on the valley floor) or what was likely in high mountain areas such as the Alps (water from melting ice, high annual rainfall and great variations in height between mountain tops and valley bottoms). Non-scoring answers were rare. The best answers to part **(ii)** came from candidates who approached the answer in a logical way – starting with building the dam high in the mountains, and then leading the water by a pipe under the mountains so that it could drop with great force into the HEP station on the valley floor. Unfortunately more common were answers in which the human additions were treated as separate items, or ones in which candidates imagined the sketch showed what they knew about other HEP schemes, such as water being discharged out of the dam directly into the HEP station. The result was that one and two mark answers were much more common than those worth three marks. Some candidates made hard work of reaching the two most obvious answers of renewable and less polluting in part **(iii)**, sometimes prolonged by beginning with oil and only later switching to explain how HEP was different. Then in **(d)(iv)** many answers were over-focused on HEP sometimes to the exclusion of direct statements about oil. Many candidates, who in the end did reach three marks, needed to fill all the lines, and sometimes more, to do this. The mark scheme included many simple

advantages of oil, which must have been known by many more candidates than actually used them, such as ease of use, variety of uses (as a fuel), ease of transport, a long history of use and its relative cheapness (at least until recently).

Divided bar graphs are a less widely used alternative to pie graphs. They are easier to draw than pie graphs, especially when a graph paper background is provided. There were many accurate constructions in part **(e)** from candidates who knew what to do. The most common mishap was to show Brazil as 42 per cent instead of 41. A minority were determined to try to draw a bar graph within the frame, despite the percentage scale being provided; others attempted to show all the percentages beginning at 0% and not going beyond 41%. These candidates could still claim the mark available for shading in or designating the countries, provided this was done clearly.

The three questions in part **(f)** proved to be more challenging than expected. Even in what had been imagined to be the very easy part **(i)** there were many answers of Brazil instead of the named crop (sugar cane). More worryingly was the frequency of corn and USA answers. These suggested that either the information in the table was not fully understood, or that candidates were running short of time and could not study the table as carefully as was needed. Then in part **(ii)** some lost the mark by merely re-stating that it was cheaper by quoting the average costs of production (0.4 and 0.7), instead of explaining either by reference to lower fossil fuels inputs or greater output per hectare. Something similar happened in part **(iii)**. Many answers were dominated by descriptively repeating the values in the table, which for this answer needed to be used in a more explanatory manner. In the best answers the lower fossil fuel use in Brazil was linked to the greater reduction of carbon dioxide, followed by mention of the likely environmental benefits of this.

The typical answer to part **(g)** was worth two or three marks, based on selective use of the information supplied to support the candidate's expressed view. Marks higher than this were reserved for candidates who introduced a broader perspective or an overview. This was most frequently done by reference to the other alternative energy sources and how their possibilities for further use compared with biofuels. Only more able candidates showed themselves able to do this, which is why the question can be said to have discriminated well between candidates. However, there were some candidates who appeared still not to understand what biofuels were. Perhaps they missed the explanation given at the start of **(e)**; they saw biofuels as emitting all the same polluting gases as from burning oil and diesel in motor vehicles.

For many candidates the total mark for **Question 2** was below that for **Question 1**, to a large measure because of a decline in performance from part **(f)** onwards. The more able the candidate, the less that this general summary of performance applied.

ENVIRONMENTAL MANAGEMENT

Paper 0680/03

Coursework

General comments

Although candidates continue to choose a good range of environmental issues to investigate, there are still some problems with the sustainability issue of some of their choices. Without a resource, for which a sustainable argument can be engaged in, then Domain C will score weak marks. This was a particularly significant problem this year and the Centres' marking, on the whole, did not recognise the issue.

Comments on specific questions

Domain A

This continues to be a strong section for many candidates showing a good understanding of the processes in the specification and this is reflected by the good marks scored in Domain A. However, as aforementioned this year there was a significant amount of over marking of this section for some candidates who were not addressing sustainability in their work.

Domain B

There was some excellent experimental work carried out as well as some very thorough survey and questionnaire work. Interviews tended to be well analysed and there was good use of secondary data such as newspaper articles.

Domain C

The lack of future sustainability in a significant number of pieces of work led to some very weak Domain C sections. Candidates need to carry out a thorough consideration of possible choices along with an evaluation of the consequences of each so that a plan of action can be formulated with a consideration of its impact.

ENVIRONMENTAL MANAGEMENT

Paper 0680/04

Paper 4

General comments

This paper invited candidates to consider environmental issues and methods of gathering and interpreting data in the context of one island in the Indian Ocean. Many candidates understood and made good use of the source material and their written responses were sufficiently clearly expressed that the Examiners could be confident that marks awarded were deserved. 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.

Overall the pattern of this paper is very similar to past papers and Centres should work through past papers to help candidates see how to make the best use of the information given for each question.

Comments on specific questions

Question 1

(a) The graph was often plotted with a suitable scale. However both axes need to be labelled and in some cases the plots were not clearly distinguished by a key.

Part **(ii)** required candidates to study the graph (or data) and describe the trend for species diversity. Most candidates could make the point that species diversity increased with increasing distance from the road or made the point that species diversity remained constant after 20m but unfortunately very few made both points to gain maximum marks.

Part **(iii)** asked candidates to assess whether there was any evidence that roads reduce plant biodiversity. The most frequent response was that it did but the figures that could have been quoted from the sources were rarely given in support of the answer. These figures were the only evidence candidates had to work with.

Part **(iv)** asked how the survey could have been carried out in a more reliable manner. The need for repetition was given by many candidates, though sometimes their answers were rather ambiguous.

Part **(v)** asked candidates to give a reason for collecting data 200m away from the road and many candidates did clearly make the point about comparison or to act as a control.

Part **(vi)** asked candidates to describe a method for collecting data at random. A small number of good answers was seen; unfortunately many of the sampling methods described were actually systematic. It is expected that candidates have had first hand experience of sampling methods before attempting an examination paper as an alternative to coursework.

(b) Most candidates appreciated that if the road was longer the builders would earn more money.

Part **(ii)** often only yielded one mark for a general remark that there would be fewer plants at A and C. Only a small number of candidates clearly made the contrast between plants being damaged on both sides of the road as opposed to just one side.

Part **(iii)** was hoping to elicit candidate responses giving details of the ways in which the seashore could become polluted. Unfortunately most candidates only suggested the road would be destroyed by flooding.

Question 2

(a) A small number of candidates did not attempt the calculation but the majority gained at least the first mark.

In part **(ii)** most candidates successfully explained why overgrazing would be difficult to identify in the dry season.

Part **(iii)** asked candidates to complete a questionnaire. The layout was good in most cases and the questions were often appropriately constructed. The Examiners were looking for two questions which focused attention on the changes that might have taken place in recent years; maximum marks were only gained by a small number of candidates.

(b) Many candidates understood the question but only gave general purpose answers about using the questionnaire rather than giving answers related to the specific context of goat keeping.

In part **(ii)** most candidates realised that a comparison between villages was possible.

(c) Candidates were required to study the plan of the grazing area and consider a sensible number of quadrats for sampling the area. Whilst many did select a sensible number of quadrats the scale of the area was not always taken into account and rather large quadrats were drawn.

Part **(ii)** asked for specific ideas as to what should be measured in the quadrats. Only a minority suggested measuring the height of the plants or using a suitable table. The majority went no further than suggesting recording the number of species present.

Part **(iii)** asked candidates to describe the sequence of events leading to desertification. There were some very clear and orderly answers but too many were spoilt by statements that were too vague to be given credit.

Question 3

(a) It was clear that most candidates had some understanding that the description of fishing activity was an example of a sustainable way of life. There were some excellent answers but some promising answers did not quite display sufficient understanding because the candidates had not added their own thoughts to the source material. All the marking points were given by at least some candidates.

(b) This was quite a complicated question and many candidates did gain between two and four marks by working through the consequences of removing too many sea cucumbers and sharks. The general point that a species may not be able to reproduce as fast as it is being fished out was made by a significant number of candidates but not the majority as expected by the Examiners.

(c) Many clear explanations were given that gained three or four marks. Only candidates that had difficulty working in English sometimes failed to provide enough detail to gain credit.

(d) An understanding of how a government could control fishing was required to answer the question. There were many good answers involving a specific fishing season, exclusion zones and licences. Only a very small number of candidates just wanted to apply quotas again.

Question 4

(a) Most candidates realised that a development-free zone would allow both tourism and traditional agriculture to take place. Unfortunately a few candidates were determined to carry out development because they had not read the question carefully.

Part **(ii)** required an answer to the question 'what is an ecotourist?' Many candidates did suggest these were people with a specific interest in seeing wildlife or wildlife habitat. Candidates that suggested they were environmentally-friendly tourists did not gain credit. Part **(ii)** required candidates to study the climate data provided and then explain that the climate would be more suitable for tourists between November and March. A reference to the change of temperature was the most important point. Candidates that only referred to a wet and dry season did not gain credit.

(b) Many sensible developments and restrictions were given by candidates and many answers gained six to eight marks. There was a good understanding of the developments that would be appropriate in the particular context of this island as well as restrictions. Only a very small number of candidates gave answers that were not related to the information given in the source.