ENVIRONMENTAL MANAGEMENT

Paper 0680/01

Paper 1

General comments

All candidates seemed to find parts of the six questions difficult but there was no clear pattern this year. There were few misinterpretations of questions, sustainable fishing as exploitative fishing in Question 4, subsistence agriculture as sustainable agriculture in Question 5.

Some scripts were difficult to read and some candidates wrote long answers. However sensible use was made of the space at the bottom of the pages and at the back of the answer booklet. The vast majority of the candidates alerted the Examiner to the whereabouts of these extended answers. This is very helpful to the Examiner.

All candidates seemed to finish the paper and there were few blank sections on scripts.

Question 1

There was some good understanding of causes of climate change although many candidates wrote about the consequences, which was not required.

(a) (i) Some candidates found this first question difficult.

(ii) Few candidates named all four processes correctly. Process 4 was the one most commonly incorrect one. Perhaps the idea that death could be thought of as a process was beyond many

(iii) Many candidates wrote about gain through the burning of fossil fuels or loss through deforestation. There were some excellent answers covering gain and loss.

(b) (i) Most candidates associated the build-up of carbon dioxide with global warming and many wrote detailed explanations.

(ii) Some candidates wrote about what governments could do, the question was about people could do.

Question 2

Most candidates understood the purpose of rain gauges but often did not target this knowledge on the demands of the **part (a)** questions. There were some good answers in **parts (b)** and **(c)**.

(a) (i) Many candidates wrote everything they knew about positioning a rain gauge.

(ii) Very few candidates wrote about reading the scale on the bottle (or using a measuring cylinder) to find the amount of rain that had fallen at a particular time each day.

(b) (i) The candidates who read the question and focused on the rainfall graph usually gained at least one mark. A significant number of candidates wrote about the relationship between temperature and rainfall.

(ii) Most candidates realised that some form of irrigation was needed in the summer.

(iii) Most candidates could name one other way of increasing crop yield.

(c) There were some excellent answers about how crops are used for bio fuel, textiles, medicines etc.

Question 3
There was some sound knowledge of water pollutants and disease in **part (b)** but very few ca scored full marks in **part (a)**.

(a) (i) Few candidates named all four processes correctly. Process B was the most challenging.

(ii) Few candidates listed the correct numbers for four areas with low precipitation. A small number tried to name the areas.

(b) (i) Most candidates were able to name one water pollutant but were less successful in stating how it affected people.

(ii) Most candidates were able to name a water related disease. The most popular choices were malaria, cholera and bilharzia.

(iii) Those who chose malaria were able to explain in some detail how it can be controlled. Few of those who wrote about bilharzia mentioned snails. Many who wrote about cholera or typhoid wrote in general terms about 'treating water' without mentioning a method or why the treatment was necessary.

Question 4
The issues associated with overfishing were well understood by many candidates but some found it hard to focus their answers on the questions being asked.

(a) (i) and **(ii)** Most candidates were able to read the percentages for world fisheries lost accurately from the graph.

(iii) Many candidates knew a great deal about fishing and answers extended beyond the space allocated.

(b) (i) Again, many candidates could not only state two strategies for sustainable fishing but exceeded the demands of the question by writing about them in some detail.

(ii) Almost every candidate wrote about how sustainable fishing strategies are not successful owing to the tendency of fishermen to break the law. Answers often extended beyond the space allocated.

Question 5
The graph work in **part (a)** was very good, but performance on the rest of the question was variable.

(a) (i) Almost all candidates calculated the correct percentage for deforestation caused by subsistence agriculture.

(ii) There were some good answers describing subsistence agriculture. However a number of candidates wrote about shifting cultivation or slash and burn agriculture without relating the answer to the subsequent use of the land by a farmer to grow crops for family use.

(b) (i) Very few candidates answered this question correctly, most writing about loss of habitat and soil erosion, which the stem of the question excluded from the answer.

(ii) Answers to this question were more successful with most candidates writing about planting trees.

(ii) There were some good descriptions of how logging in tropical rainforests could be reduced with many candidates exceeding the space allocated.

Question 6
Most candidates found this question straightforward, although few scored full marks in **parts a (ii)** or **(c)**.

(a) (i) Most candidates gained all three marks by interpreting the pie graphs correctly.

(ii) There were some interesting choices of non-metallic minerals, nitrate, potash, sulphur and diamonds. However a large number of candidates named a metallic mineral.

(b) (i) Most candidates could name a negative impact of deep mining on miners with mo[illegible] problems related to lungs and breathing.

(ii) Similarly naming a negative impact of open cast mining was straightforward for most candidat[illegible]

(c) Few candidates gained all three marks available for describing ways of improving the environmen[illegible] when open cast mining has stopped.

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Paper 2

General comments

As in most previous years, the average mark for **Question 1** was higher than for **Question 2**. The gap this year was perhaps a mark or two higher than normal, but not enormous. Perhaps it was a mixture of **Question 1** being consistently more accessible than usual, particularly for some of the longer questions, and **Question 2** posing a few extra challenges, especially in questions where applied knowledge was needed, such as in **2(d)(iii)**. The general policy anyway is to place first the question which is thought likely to be more accessible, or which examines the more familiar topic, in order to ease candidates (particularly less able ones) into the paper and to make it more likely that they spend most time on questions that they can answer best. Once again there appeared to be no time issues with the paper; the small number of unanswered parts of questions were more likely to be indicators of lack of ability to answer than availability of time to do so.

Some high quality scripts were received from candidates well immersed in the knowledge and understanding of the physical properties of the natural environment, related human activities and strategies for management. These candidates produced answers of real worth throughout the examination. At the lower end of the ability scale, there were some candidates who were comfortable only when answering questions strongly based on source materials provided. These candidates found it more of a struggle to answer well questions which placed a higher premium on knowledge and understanding of syllabus content. For all candidates, consistently the most challenging questions were those which required higher levels of application, such as **2(a)(iii)** based on use of graph information and **2(d)(iii)** based on knowledge.

Some of the questions with higher marks attached to them within **Question 1** were consistently well answered, notably **1(b)** and **1(d)**; most candidates found the more open questions in **1(g)(ii)** and **(iii)** to be quite accessible (compared with the equivalent question **(f)(iii)** in **Question 2**). Questions which discriminated well between more and less able candidates included **(e)(iv)**, **(f)(i)** and **(f)(iii)**. Within **Question 2** questions which regularly yielded good marks were more restricted; they tended to be **(a)**, **(b)**, **(c)(i)** and **(ii)** and **(e)**. However, many of the three- and four-mark questions proved to be more challenging for some, including **(c)(iii)**, **(d)(i)** and **(iii)** and all three parts of **(f)**. Overall, the typical mark for **Question 2** was a few marks lower than for **Question 1**, even though a majority of candidates showed plentiful familiarity with the topic of earthquakes, which made up most of the question.

Based on candidate performance in this paper, the following points emerged which might be useful in guiding future candidates towards improved examination technique.

- Begin to answer the actual question set straight away; do not begin by writing out all or parts of the question itself. Often main mark-earning points were concentrated in the bottom half of the spaces left for answering, frequently within the last two lines.

- Do not just repeat and re-use what is in the question without elaborating or giving examples. Many candidates failed to give examples of 'bad weather' in **1(e)(iii)** and 'natural disasters' in **2(f)(ii)**.

- Look at the number of marks for the question. These are an important guide to the number and range of points needed for full marks. Questions worth 3, 4 or 5 marks need a broader range of points, or more elaboration and use of examples, than those worth 1 or 2 marks.

- When describing from graphs, candidates should always state or use values from the graph to support their answers. This makes answers less vague and more precise, and speeds up the award of marks.

- When asked to give an opinion or view, candidates should state this clearly and support it as strongly and precisely as possible. Justifying and explaining the viewpoint is more important than the view itself for earning marks.

Comments on individual questions

Question 1

While a majority of candidates in **(a)(i)** added a line on the graph to link all nine dots, some drew only a p line (usually from 1922 to 2048) and others left the question unattempted. The correct answers of 118 years in **(a)(ii)** and 12 years in **(a)(iii)** were widespread; the most frequent incorrect answers were 122 and 4 years for candidates who misinterpreted the graph and used 1800. In **(a)(iv)**, among candidates in the lower half of the ability range, there was a general failure to notice or to focus in on the 'expected' growth, which was marked for them on the horizontal axis of the graph between 2000 and 2050. This led to many one mark answers, in which early growth up to 1922 or 1959 was too narrowly compared with later growth (both actual and expected). In contrast, answers that were well homed in on comparing growth before and after 2000 were more likely to identify expected slowing down compared with the furious growth rate between 1974 and 2000. Many candidates claimed the second mark when they supported this by comparing number of years for the population to grow by one billion, such as 20 years from 2028 to 2048 compared with the already calculated 12 years from 1987 to 1999.

Part **(b)** was one of the best answered questions on the whole paper, even if there was a wide variation in standard of answer between those candidates with and without knowledge of a national population policy. China was the almost universal choice, but equally good answers were occasionally seen from candidates who chose either Thailand or India. Often the description was stronger than the comment, but not always, and some well structured and argued total answers were presented. Candidates who entered the name of developed countries such as Switzerland and the USA tended to betray from the start a lack of real population policy knowledge; at best their answers contained general comments able to be credited with one or two marks. In part **(c)** poverty and religious/cultural tradition were the two most commonly cited reasons. Although there were many two mark answers, some candidates filled four or more lines referring to or repeating only one reason, for which no more than one mark was available no matter how good the elaboration and detail.

Part **(d)** was another generally well answered question. Each of the four techniques was regularly chosen, and none of them seemed to lead to full marks more easily than the others. Disadvantages in part **(ii)** were particularly well known, even for the likes of heavy machinery damaging soil structure. A good mixture of environmental and human disadvantages were referred to. One widespread misunderstanding by candidates emerged; although chemical pesticides harm wildlife and plants when they leak into waterways, they do not cause eutrophication in streams in the same way that nitrates do when released from fertilisers. In weaker responses in part **(i)**, what was expected to be explanation was often more description than explanation; examples included naming different types of machinery and their uses, and methods for obtaining and distributing irrigation water. There was a good sprinkling of six-mark answers; overall four- and five-mark answers were common. Answers as low as one and two marks were rare.

In part **(e)(i)** candidates could not get a satisfactory answer by direct use of the information provided. Although worth only one mark, this question was a good discriminator. Candidates needed to convey the idea of major change leading to substantial increases in crop output. Part **(e)(ii)** was a much easier question, intended to be accessible to all, since candidates were directed towards direct use of the information given. Few candidates failed to gain both marks. One-mark answers were typical in part **(e)(iii**), for identifying the reason such as shorter and stronger plants or shorter growing season. The failure of many candidates to claim the second mark was due to lack of further explanation. Too many relied upon repeating 'bad weather' from the question without any real application to plant characteristics. The full range of marks were used in **(e)(iv)**. In non-scoring answers, candidates either tended merely to repeat the previous information about the advantages of the new seeds without reference to the theme of the question, or simply argued that large farmers have a larger area of land and therefore can grow more crops. In full-mark answers, candidates referred to large farmers being more likely to be able to afford to buy the new seeds and fertilisers etc. needed for successful growth, and then rounded off with a comment to explain the widening gap, such as poor farmers getting into debt after having borrowed money, or large farmers being able to buy up more and more land from small farmers.

Careful study of the graph in part **(f)(i)** shows that growth was proportionately greater between 1996 and 1999 than after this date. This was lost on those candidates who merely looked at the increase in the total amount between 1996 and 2005, which led to the erroneous conclusion of faster growth since 1999. Many of these candidates just ignored the date of 1999 in the question. It was interesting that some candidates who failed to score any marks in this part then displayed a much better understanding of what the graph showed in their answers to part **(f)(iii)**. Unfortunately for them, marks are never transferred between different parts of separate questions. All correct three-mark answers were the norm in part **(ii)**. A few made a mess

of drawing the graph by identifying the 55% sector for the USA and then attempting to fit all the [illegible] within it, beginning each time from 0 and leaving 45% of the circle not used. In the weakest answ[illegible] **(iii)** candidates merely repeated percentages without any comment, for no marks. Most, howeve[illegible] sensible use of the percentages to emphasise the dominance of the USA and other countries [illegible] Americas for GM production. It was not a requirement for all three marks that bar graph evidence was us[illegible] as well, but in the majority of three-mark answers candidates supported their answers with its use to show that no take-off in growth had occurred.

Part **(g)(i)** was the easy starter for two marks; only the careless, often those who referred to Europe and Africa as one, lost marks. Parts **(g)(i)** and **(ii)** shared a common mark in order to allow maximum flexibility in marking, to the benefit of individual candidates. A candidate could give totally different answers to each part and still be fully rewarded, provided that the justification and explanation were strong enough. Many did so; candidates regularly stated in **(ii)** that they expected an increase once world food shortages became more severe than they are at present and then argued against their further introduction in **(iii)** on the basis of possible damage to ecosystems ... or the other way around. As always when marking this type of question in which candidates are asked to express an opinion or justify a view, it was the quality of the support that controlled the mark level reached. Answers worth one or two marks were often over-reliant upon the information already given about GM crops earlier in the question and narrow in coverage. Answers worth three or more marks were more substantial and precise, and usually broader in their scope. Able, articulate candidates are favoured by this type of question, which is why they are often placed (as here) in the final part.

Question 2

The three questions that made up parts **(a)** and **(b)** were straightforward questions based on use of the map and information below it. The only significant mark losses were in **(b)(ii)**. Some candidates filled all five lines just to make the general statement that impacts of the earthquake decreased with distance from the epicentre. No attempt was made to describe how the amount and type of damage changed with distance away from the centre. Indeed often there was no mention of any damage, only the repeat of the word 'impacts' from the question itself.

Few candidates failed to complete the bar graph accurately in part **(c)(i)**; if there was a mistake, it was most likely to be inaccurate plotting of 33% for concrete and factory-made bricks. Two-mark answers were more common than full three-mark answers to **(c)(ii)**, as many candidates failed to use supporting values from the graph in at least one of their answers. This was a requirement for full marks for a question with the instruction to 'Describe what the graph shows'. Part **(c)(iii)** was another question which separated strong from weak candidates. The most successful answers came from candidates who used the graph to interpret likely percentages for damage estimates for a Richter scale 8 earthquake, then stated these and compared them with damage described for places near the epicentre such as Pisco, Ica and Imperial. The weakest answers came from candidates who spent most of the time making the narrow, irrelevant point that 7.9 was only 0.1 different from 8.0 on the Richter scale and therefore damage can be expected to be similar. They did no more than state that the damage in Peru was about the same. Some candidates mistakenly tried to explain less damage in Lima on the basis of earthquake proof strengthened buildings, without taking the city's location over 150 km away from the earthquake epicentre into account.

The majority of answers to part **(d)(i)** were disappointing. Instead of focusing on the shading showing the locations of major earthquake zones, as requested in the question, significant numbers of candidates had eyes only for the cities. Their sole focus was on the relationship between the locations of the cities and earthquake zones. Only in better than average answers to this question were attempts made to describe the linear pattern of the earthquake zones, including references to such as from north to south up the west coasts of the Americas, from east to west from southern Europe through South and Central Asia, and from north to south following the island chains on the western side of the Pacific. The locational elements of the world distribution, both positive (as above) and negative (such as absence of zones in most of Africa and Australia), were left un-noticed by the majority. To be successful, answers to parts **(d)(ii)** and **(iii)** needed to be focused on plate boundaries and what happens there. In too many there were references only to plate movement, or lack of it in the case of part **(ii)**, without making any telling explanation. To gain all four marks in **(iii)** something precise for the country named had to be included, such as San Andreas fault for west coast USA answers, Nazca and South American plates for Peru or Chile, and Eurasian and one or more from Pacific, Philippine and Indo-Australian plates for Asian countries. Accurate general explanation for how earthquakes are caused at destructive and/or conservative boundaries could gain the other three marks, and did so from more knowledgeable candidates.

Answers to the two parts of **(e)** were much better. In answering part **(i)** candidates needed to ta[illegible] marks into account. Some candidates made and re-made only one valid point; while the ques[illegible] specify three reasons, broader answers were more successful than those restricted to just one reas[illegible] frequently referred to were the horrendous costs, the impossible logistics and the lack of non-earth[illegible] locations in Iran, all expressed of course in many different ways. The question in part **(ii)** specified th[illegible] strategies. The ones most commonly and successfully used were education, preparation of emergency services and earthquake-proof buildings. The fourth mark was awarded on the basis of fuller description, included for one or more of them.

The reasons for poor candidate performance were probably many and varied, but the questions which made up part **(f)** (both individual parts and overall) were the worst answered questions on the paper, by some margin. Many answers to part **(f)(i)** suffered from candidates continuing with the previous earthquake theme. Instead of answering the question set about big city growth, they explained why earthquakes were a much greater problem in developing than in developed countries. Only the minority who immediately switched to reasons such as rural to urban migration and high rates of natural population increase gave direct and relevant answers. Many answers to **(f)(ii)** went little further than repeating the theme of the question. Some again were entirely earthquake answers. Only those candidates who showed an awareness of natural disasters most likely to affect coastal areas, such as tsunamis, cyclones and flooding, were able to develop answers which matched the theme of the question. These were the ones that were worth two or three marks. Again many answers to **(f)(iii)** were entirely earthquake orientated; this time much of the information already stated in part **(e)(ii)** was repeated, with only a minimum of comment towards the theme of the question, usually along the lines that either preparations are more likely in urban than in rural areas or in developed rather than developing world cities. Only those candidates who attempted to take a broad look at natural disasters were able to make the range of points expected in a four-mark answer. Answers given by a few very able candidates stood out for the clarity and variety with which their views were stated and explained. Included were some perceptive comments about likely continued city growth in the developing world and the apparent growing frequency and intensity of some natural disasters, particularly climate related ones.

ENVIRONMENTAL MANAGEMENT

Paper 0680/03
Coursework

General comments

This year a good range of environmental issues were chosen for study, most of which fitted the Environmental Management criteria. Candidates, however, need to be aware that a study which is no more than a geographical survey will not score marks on Domain C. The comments from Centres continue to be informative and most marking was accurate, fully recognizing the criteria for this type of coursework.

Comments on specific questions

Domain A

Processes continue to be taught well and consequently candidates score good marks in Domain A.

Domain B

Candidates showed enthusiasm for their work with some very through approaches, illustrating the benefit of carrying out coursework, in that candidates get involved in the issues that they have chosen.
Interviews tended to be well analyzed and there was good use of secondary data such as newspaper articles.

Domain C

Domain C continues to be the weakest area but there were some very thorough evaluation of the problems this year, particularly with reference to conservation issues. The advice is still to think about this section at the outset when choosing the resource to study.

ENVIRONMENTAL MANAGEMENT

Paper 0680/04
Alternative to Coursework

General comments

This paper invited candidates to consider environmental issues and methods of gathering and interpreting data in the context of one country, Sri Lanka. 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 best use of the information given for each question.

Comments on specific questions

Question 1

(a) An encouraging number of candidates stated a specific reason why fish were an important part of the diet. A range of valid alternatives were given credit.

(b) The majority of candidates stated an advantage to the villagers, but some reasons why it would be of advantage to the government were too vague to gain credit; for example many implied that the government took the fish and sold them.

(c) (i) There were many good responses to this drawing and many gained all three marks. Unfortunately a small number of candidates did not attempt this question.

(ii) nearly all correctly calculated 2500 kg.

Part (iii) required candidates to think how they might proceed to develop the lagoon given certain facts. This proved to be demanding, for instance only a minority of candidates suggested that site C must be the location of the coconuts.

(d) Again, given certain facts, the candidates were asked to suggest whether the development of mangroves was a sustainable project. Unfortunately many candidates only repeated the information in the sources without adding any of their own ideas and thus gained little or no credit. **Part (ii)** asked about relevant research that should be carried out, as at present breeding fish in ponds is not carried out. A wide range of sensible answers were seen.

Question 2

(a) This section asked a series of questions about water collection and in general the candidates responded well. **Part (i)** asked why the first flush should be rejected. It was pleasing to see many candidates realised the rain might be acidic to begin with, and impurities from the roof were also correctly given as an answer. Ideally both could have been given for two marks.

Part (ii) most candidates realised that mosquitoes would spread malaria due to being able to breed in the water.

Part (iii) asked for another reason for filtering water and a good range of sensible answers were given. **Part (iv)** asked for reasons why the water container was not put underground, again a wide

range of sensible answers were given, however some were poorly expressed therefore, gain full credit.

(b) Most candidates realised that repeating readings would make the overall data more reliable.

Part (ii) asked for the data to be presented in a graph and most answers gained three or four marks. A common omission was to not state the units that water had been measured in.

Part (iii) All the marking points were seen regularly and it was pleasing to be able to award 2 marks on a regular basis.

Part (iv) This calculation proved to be more demanding than expected. Candidates needed to find the average of the collectors (17) and multiply this by 40 to arrive at the correct answer of 680 litres.

Part (v) Most candidates gave the improved accuracy marking point.

Part (vi) There were alternative routes to gain marks as described in the mark scheme. The general point that there would be little or no water available from other sources was rarely made.

(c) Only a small number of candidates gave an incorrect answer suggesting a river had to have waterfalls. Most gave answers equivalent to a steep gradient. **Part (ii)** was easily answered by being specific. Vague answers about pollution did not gain credit.

(d) The process of siltation of dams was well understood by candidates from a minority of Centres. A wide range of inappropriate answers were given that could not gain credit.

Part (ii) a correct estimate of between 6-7 years for the working life of the dam was given by nearly all candidates.

Part (iii) candidates often found it hard to express their ideas clearly as to why a forty-year loan would reduce development after 10 years. Only a small number of candidates stated that the electricity would no longer be generated so there would be no income to help pay back the loan.

(e) A wide range of advantages and disadvantages were given and most candidates gained at least 3 marks.

Question 3

(a) (i) The calculation was correctly worked by most candidates.

Part (ii) The concept of nitrogen fixation was quite widely known, some candidates still gained a mark for referring to improving soil fertility.

Part (iii) Many candidates gave two good answers here.

(b) The source material for this question attempted to steer candidates in the direction of crop rotation. There were nine marking points available, all related to sustainable farming. Whilst the majority of candidates attempted to organise the farm along these lines, and there were some excellent answers, it was disappointing to see a small number of candidates just referring to buy more fertilisers and pesticides.