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# ENVIRONMENTAL MANAGEMENT

**Paper 0680/01**

**Paper 1**

**Comments on specific questions**

**Question 1**

**(a)(i)** In the event the numbers provided for plotting proved quite difficult for many candidates with frequent misreading of the *x*-axis. However, many gained full marks.

**(ii)** The idea of a relationship escaped many here. The commonest response was to spot that points were clustered in two groups, but the large gap between them presumably prevented most from simply stating that as income increases then so does energy use, thus going on to give an explanation of this in terms of energy used in the different countries according to their wealth and access to technology both domestically and industry.

**(b)** This question proved accessible for most with some very good two mark answers being the norm.

**(c)** Again, this proved to be accessible with a range of good answers, which either listed a number of ways without development or less distinct strategies but with some development. Both approaches were able to gain full marks.

**Question 2**

**(a)(i)** A proportion of candidates simply wrote about why there was pollution, having failed to grasp that the important thing was what happened to the pollution in this valley.

**(ii)** The idea that trees bind soil with their roots and therefore loss of trees could lead to soil erosion was widely appreciated. However, a substantial minority answered the question as if it was about large scale deforestation and discussed the rise in greenhouse gases and global warming. More careful reading of the question was needed.

**(b)(i)** Most were able to mention some aspect of spread of disease as a consequence here.

**(ii)** All sorts of good suggestions were made here, but a lot of candidates were unable to sustain this for the full three marks, many getting two and then merely repeating an idea in a failed attempt to get the third.

**(c)** This question was widely misinterpreted. Most talked about ways of reducing or avoiding industrial pollution rather than discussing restorations of previously damaged environments.

**Question 3**

**(a)(i)** This was generally well answered.

**(ii)** This part was quite badly answered with long rambling descriptions of the 'this current does that and that current does this' type. Few were able to summarise the information in a concise way and gain three marks.

**(iii)** The ideas of reduced temperatures and coastal fog were widely known, the lack of precipitation less so.

**(b)(i)** This is a frequently asked question, but there are still many who interpret it as fishing beyond need, quota etc. rather than beyond sustainability.

**(ii)** The reasons for international action on overfishing proved a difficult concept for most, very few gained full or even two marks on this question.

**Question 4**

**(a)** These three parts proved almost universally accessible, many being able to glean the necessary information from the passages.

**(b)** Again, this proved to be one of the easier sections on the paper with many good suggestions made for the differences observed.

**(c)** The benefits of flooding were widely known, many gaining the mark here.

**(d)** This was again well answered with many excellent suggestions made in relation to both 'yes' and 'no' answers.

**Question 5**

**(a)(i)** The Green Revolution does not seem to be widely understood or known about. Quite a few candidates made up answers, clearly having heard nothing about this before.

**(ii)** This question was quite well answered by most, although a large number of candidates lost one mark for not calibrating the x (time) axis properly, leaving an equal gap between each year in the table regardless of whether the time period was equal or not.

**(iii)** Most got this right.

**(b)** Most were able to come up with some good reasoning here.

**Question 6**

**(a)(i)** Extracting a food chain from within a food web proved difficult for a large number of candidates. However, a good number obtained full marks. It did tend to be all or nothing.

**(ii)** A majority knew this.

**(b)(i)** This was generally quite well answered with a whole range of possibilities given, although they were often not developed well enough for the second mark.

**(ii)** Consequences of changes in food webs are always quite difficult to answer and the logic of the steps escaped many, however, many were also able to gain four marks.

**Paper 0680/02**

**Paper 2**

**General comments**

Among middle and lower ability candidates there was a tendency to perform better in **Question 1** than in **Question 2**. In all probability this was due more to topic familiarity than question difficulty. There was little noticeable difference in performance between the two questions among more able candidates, whose greater all round subject knowledge and understanding rendered the topic used less critical. **Question 1** was drawn from the biosphere section of the syllabus and focused in particular upon tropical rainforests, an inherently interesting issue-based area of study for all candidates, irrespective of level of ability. **Question 2** was largely based upon content from the lithosphere section of the syllabus; while most candidates showed general understanding of energy issues, many found it less easy to maintain good standards of answering across all parts of the question.

Unanswered parts of questions were few and far between and were a feature of the answer papers from only a tiny minority of candidates. Simply stated, most did not know the answers to some of the more knowledge-based questions. Scripts which contained consistently strong answers throughout were in greater abundance. It was almost inevitable that a candidate lost a few marks along the way, either as a result of failing to appreciate fully a particular question need or from paying insufficient attention to the number of marks available for the question and shaping their answers accordingly.

The following questions were the ones in which a shortfall of marks was most often noted.

- **Question 1 (b)(iv)** – Frequently answers contained more statement of energy losses between feeding levels than explanation. Some candidates kept repeating that levels were 'different' without ever stating how they were different.
- **Question 1 (c)(ii)** – Candidates almost without exception showed that they understood the meaning of 'sustainable', but only a few were able to apply the general points to this example and develop answers worth more than two marks.
- **Question 2 (a)(v)** – This question suffered from a shortage of answers containing direct description from the graph.
- **Question 2 (d)(i)** and **(ii)** – Widespread misunderstanding of 'energy conservation' was exposed by this question among candidates of all ability levels. Neither 'storing energy' (whatever that meant), nor saving energy from fossil fuels by direct replacement through greater use of alternative sources, were the same as energy conservation.

Shortage of time for completing the answers was not an issue, except in a few exceptional cases. Where it was, it often appeared to be the result of candidates working slowly through the short questions and giving answers that were too long for the number of marks attached to them. Some candidates wasted time and space by repeating the question before beginning the answer proper. Since many candidates continued to regard an answer with all lines full as a full answer, (irrespective of writing size and succinctness of expression), too many marks were left unclaimed. As usual, it was acceptable for candidates to continue answers beyond the lines into empty spaces and onto blank pages. This only made sense when they had relevant information to add to their answers; then it was a valid attempt to try to ensure that all marks were claimed.

Some truly excellent scripts were seen this session. Lines available were packed with relevant detail and comment in both questions. These candidates maintained answer quality throughout, always impressive in an examination paper composed of structured questions. They demonstrated outstanding knowledge of the content of the environmental management syllabus, and as good an understanding of current environmental issues. They were able to offer meaningful comment from more than one viewpoint. Some scripts seen this year were equally good as any seen in previous years.

## Comments on specific questions

### Question 1

**(a)** Although some candidates merely listed individual plants and names of animals in part **(i)**, the majority made a better choice and used the values showing numbers of tree species and/or percentage of known plant species. Some skirted around the answer needed in **(ii)**; again they concentrated on individuals instead of looking at biodiversity as a whole, often without any mention of its usefulness for food or medicines. Those candidates, who introduced ideas of genetic diversity in relation to food supply and drugs, gave the most precise and fullest answers.

**(b)** Much good understanding about feeding levels and food chains was shown in answers to part **(b)**, especially in the first three parts. Differences between producers and consumers, and between herbivores and carnivores, were well known. In **(iii)**, candidates were required to choose an entry from each of the feeding levels for 1 mark and to give a likely or realistic chain for the second mark; the second mark proved to be the more difficult one to claim. Some used an example of a food chain they had learnt; unfortunately, few of these applied to the Amazon rainforest as demanded by the question. Some other candidates worked in the opposite direction against the arrows, without success. While many candidates gave full and accurate answers to **(iv)** by referring to the great size of energy losses and reasons for energy loss due to respiration, movement etc., others struggled to give answers which explained why amounts of biomass were different. Uncertain understanding meant that quite a number of candidates continued to use 'different' from the question instead of making an explicit statement of the decline in amount of biomass between feeding levels one and three. For the few who believed that amount of biomass increased in size because the animals were larger in levels two and three, the task was hopeless.

**(c)** For 2 marks in **(i)** candidates needed to use information from both the sketch and map, which some (generally weaker candidates) failed to do. While 'sustainable' was almost universally understood in **(ii)**, applying this understanding to the question set was more challenging. The most common route to a 2 mark answer was to recognise that a wild product was being collected without any destruction of forest trees, and that the rubber trees were able to recover so that the forest ecosystem was left intact. An additional point was needed for a third mark, which only a few managed to offer by reference to the large area needed to support one rubber tapper and his family, or to the presence of nothing more than a track through the forest linking the rubber trees with minimal damage to forest surroundings. Some candidates did not help their own cause by the belief that the rubber trees had been planted and could be replanted when exhausted. Answers to **(iii)** included references to many credit-worthy problems. It was good to see references to the problems associated with reliance on primary products, such as low value, fluctuating prices and being at the mercy of world markets, included in answers from some of the more able candidates. Less able candidates referred more to local problems of rubber collection and to distance from markets.

**(d)** In general good use was made of the values in the graph; some candidates offered very detailed answers to this question, well beyond what was needed to ensure the award of full marks. The most convincing answers came from candidates who contrasted the great fall in forest destruction between 1996 and 1997 with the steady rise from 1998 onwards, culminating in a big jump of 7,000 sq km between 2001 and 2002.

**(e)** The weakest answers were from those who listed information without comment. In contrast, those who made use of the values, such as by calculating how many millions of square kilometres of forest remained, gave many of the best answers. Approximate values were adequate for purpose here, although in fact the majority were accurate.

**(f)** Scale size was not critical, but use of uniform scale was of vital importance. Those candidates, who used an uneven scale for population and plotted one value for every big square, produced a perfectly straight line and lost the variations in rates of growth between different ten year periods. Despite question instructions, some drew bar graphs and not all of them were weak candidates. Even so, 4 mark answers were frequent among candidates because most were well versed in practical graph skills.

**(g)** Candidates found economic problems easier to identify and comment upon than social problems. The best answers to **(ii)** followed from debts in **(i)**, which appeared to encourage greater explanation. Some candidates began the answer by naming a particular economic activity, in which case it was more variable whether debts, or another economic factor like rural poverty, were then referred to in **(ii)**. The best answers to **(iv)** followed either from landless families or population pressure answers to **(iii)**. Some candidates lost the social theme of the question by concentrating upon rural poverty or even debts in **(iv)**. In many of the best answers to part **(v)** candidates began by expressing a definite opinion, supported it with a varied range of points, and passed comment either in passing or briefly at the end about why they considered the other view to be less good. Some candidates supporting the first view as stated in the question used the valid argument that developing countries like Brazil needed to maximise use of their natural resources, in much the same way that developed countries had already done with their own resources, and that developing countries could learn from the mistakes of others by incorporating methods of forest use that were more sustainable than total clearance. One good point often well made by candidates, who supported the second view, was that there were other ways to tackle the cause of Brazil's problem, namely continued population growth. When brief references to examples of population policies were also included in passing, some particularly effective answers were generated. Least satisfactory were answers in which no clear view was expressed, and support for either view was limited to just one idea. Marks of 4 or more for this question were awarded with some regularity.

Responses were generally quite strong throughout **Question 1**. The sub-topics covered were widely known and understood, so that most candidates could maintain the momentum throughout all parts of the question. Examples of candidate answers continuing beyond the lines provided for answering were quite widespread, especially for **(g)(v)**, the final part of the question. This showed that many were ending as strongly as they had begun.

**Question 2**

**(a)** For most candidates, part **(i)** seemed to be the easy starter question that was intended, although some reversed the positions of hydroelectricity and nuclear energy at the bottom of the list, while a few totally misinterpreted the question need and listed energy sources in order of appearance in the graph from top to bottom. In part **(ii)** few problems were experienced by candidates who homed in on the question theme of total amount of energy. Those who answered in terms of one or more of the individual types of energy typically failed to score even 1 mark, unless a value for total amount of energy made an appearance somewhere in the answers. In part **(iii)**, an acceptable answer for a five year period was within 1983 and 1990, which was usually given by candidates who had homed in on 'faster growth'. Those who did not, however, tended to look for highest totals of energy and gave wrong answers using years between 1995 and 2000. No such problems were experienced in answers to **(iv)**; three reasons were widely given, typically including population growth, industrialisation and increased use of technology, even though they were expressed and elaborated upon in many different ways. In too many answers to part **(a)(v)** candidates expected the Examiner to take for granted that they knew which of the five were fossil fuels. In reality, while virtually all included oil and coal, some did not include natural gas as the third fossil fuel. From answers to **(i)**, most should have realised that these were the top three consumed every year, but only a minority of candidates included an explicit statement to this effect. For the third mark candidates needed to give some idea of fossil fuel use compared with that of the two non-fossil fuels, either in tonnes or in percentage terms. The ratio shown for recent years was about 9:1 in favour of fossil fuels. Poor answering technique left some easy marks unclaimed in this part.

**(b)** The most frequent answer to **(i)** was '160' instead of the correct answer of five times. The question did not ask 'How many years longer …'. To gain both marks in **(ii)** candidates were required to know that this was the already discovered amount, and that it was available for future use. Some gave short relevant answers, while others struggled to rework words in the question, especially 'known', in a desperate attempt to give the impression that they understood the meaning of reserves. A few stated mistakenly that some of the reserves of minerals were already being used. Powers of written expression varied greatly between candidates in their answers to **(iii)**. Some candidates used the values given and did the calculation, which was usually effective because the Examiner was left in no doubt when known reserves were being divided by annual production. Some merely subtracted the years (2002 from 2042) and must have thought that the question was insultingly easy. Part **(iv)** was straightforward; the correct answer of 25% was also the most popular. Part **(v)** discriminated well between candidates. Variations in answer quality reflected amount of accurate supporting detail used. Precise information was expected, not general statements such as 'cheaper', 'easier' and 'cleaner' that were characteristic of very weak answers. The best answers from able candidates were packed in two-sided detail, with positive statements about methods of mining for both coal and oil incorporated in A, about the ease of transporting and using a liquid compared with a bulky and dirty solid substance in B, and about types of emissions from low grade coal in C. Some answers were very impressive.

**(c)** 2 mark answers to part **(i)** were the norm. If a candidate dropped a mark, it was most likely for one of two reasons. Either an inappropriate symbol was chosen (usually the barrel of oil) or the diagram plot was reversed between developed and developing. Many took too narrow a view of question need in part **(ii)** and only referred to the row showing energy use. Of more significance was double the use of energy in developed countries from a population five times smaller than in developing countries. 3 mark answers to part **(iii)** were very rare. Although many answers were given 1 or 2 marks for references to the diagram about most reserves being found in developing countries and for comment on the need for developed countries to rely greatly upon exports from developing countries, few were able to take the answer further by referring to areas with great oil reserves such as the Middle East and their significance. There was quite a lot of confusion in answering; some candidates began with 'no' when it became clear that they meant 'yes' and some substituted 'developing' when the sense of the answer suggested 'developed'.

**(d)** Lack of understanding of 'energy conservation' in this part was so widespread that it was referred to within the general comments at the beginning of this report. In **(ii)** more candidates referred to alternative energy sources than to any of the energy conservation methods named in the syllabus, which are 'increased efficiency in use', 'insulation' and 'power from waste'. However, it was not all gloom and doom, because some candidates referred to examples of both which enabled marks to be awarded within parts **(i)** and **(ii)**. Reference to alternative sources was needed in **(iii)**; this was a much better answered part. In fact, many very strong answers were seen based upon use of a range of named alternative sources through which to illustrate disadvantages such as cost and availability (in terms of both areas and time). Only the occasional candidate did not understand the meaning of alternative energy sources in **(iv)** and referred to one of the fossil fuels instead.

The answers given to **Question 2** by individual candidates were on the whole less consistent than they had been to **Question 1**. Although many candidates went through a sticky patch in answering, they found other questions with which they were more comfortable. There were few gaps, although it was noticeable that weaker candidates struggled to fill all the lines allocated to answers in part **(d)**.

**Paper 0680/03**

**Coursework**

**General comments**

There was a good range of environmental topics submitted but there still needs to be care taken that there is a sustainable element to the topic for it to score on **Domain C**. The practice of a whole Centre topic is acceptable so long as there is evidence of individual effort and that the report is the work of an individual candidate.

The reports were well produced, although Examiners are still seeing too much packaging and they ask yet again for Centres to reduce this. Simple cardboard wallets are desirable; hard files being difficult to handle.

**Domain A**

Candidates, as before, do well here and if the choice of an environmental problem is well thought out then this is an easy section on which to score some good marks. However, some candidates limit their discussion of "process" to a too narrow field and should look at the global issues and ask themselves why the problem is there and where is it coming from. Such an example of this is with "waste management"; there is an obvious environmental impact but there is also a consumer element and the solution could be tackled from its source as well as from the management of waste disposal.

**Domain B**

Yet again there is evidence of the involvement that candidates have in their coursework and the benefit they derive from the exercise. Candidates score well here and show a high level of ability in carrying out and analysing their data. Even a poor choice of topic in terms of sustainable development can score here. Presentation skills continue to improve.

**Domain C**

As always this is the most difficult section for candidates and as always the choice of a good sustainable development issue is the key to good marks here. One piece of advice to candidates would be to pull together their often excellent list of options available to the interested parties into an "action plan" for domain 9 with some discussion of the pros and cons of each course of action.

**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 state of India. The majority of candidates understood and made good use of the source material and their written responses were usually clearly expressed. The mathematical and graphical questions did not pose any difficulties for nearly all the candidates. The section of **Question 1** requiring a drawing of ten slum settlements did pose difficulties for a significant minority of candidates.

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

## Comments on specific questions

### Question 1

**(a)** Some climate data for the state was presented and most candidates could select the correct responses from the table.

**(b)** Many thoughtful responses suggested why weather forecasting would be important to people in the area.

**(c)** The Examiners had hoped to see nearly all candidates draw ten separate shelters and that they would either be well spaced in the slum area or clustered along the road. This was the case for some candidates but others simply placed an x somewhere on the diagram and others filled the entire slum area with just ten shelters.

**(c)** In part **(ii)** the location near the road made the container easy to empty was all that was needed for the mark. In part **(iii)** the diagram presented did not seem to have enough impact upon the candidates, only a few realised that the slope would cause water to run downhill through the shelters after it had filled up the waste container and spread water related diseases through the shelters.

**(e)** It was clear that the candidates appreciated the risks of living in a slum settlement and generally they scored highly here. Suggestions for new services to do with roads or transport were not given credit as the diagram shows road and railways next to the settlement.

### Question 2

This question explored the difficulties of farming an important cash crop in the state.

**(a)** Candidates needed to think about advantages and disadvantages of growing GM cotton. Parts **(i)** and **(ii)** were usually correctly answered. In part **(iii)** the candidates needed to bring some of their own knowledge and understanding of farming methods to their explanations, unfortunately some candidates simply repeated the source statement, this was not enough for maximum marks here.

**(b)** This tested candidate's knowledge of practical methods of gathering data. Only a small number of candidates realised that the samples should come from the same field to ensure that variables such as pH, temperature, rainfall and soil conditions would be the same. This surprised the Examiners as this type of question has appeared regularly in previous papers and the candidate responses have shown that controlling other factors in an investigation was generally understood.

**(c)** A wide range of appropriate safety precautions were suggested. The mathematics in parts **(ii)**-**(iv)** were correctly completed by nearly all the candidates and they often went on to correctly describe the trend in the data in part **(v)**.

**(d)** This required candidates to complete a questionnaire to find out more about growing cotton. There were many examples of excellent questions and good layout with a sensible range of alternative answers, these gained maximum marks. Responses with either poor questions or limited alternatives for response still gained some credit.

**Question 3**

This question changed the focus to the environment around a village in the state and candidates had to make a series of judgements about environmental issues.

**(a)** Candidates needed to have read and thought about the source material provided before writing their answer. Only a minority of candidates gave three good reasons for the villagers taking part in forest management, these candidates took an idea from the source and made a clear statement of their own such as tree cover reducing the risks of flooding or soil erosion. In part **(ii)** medicinal plants were often cited and most went on to make the second point that the plant population could become locally very rare or extinct.

**(b)** The monkeys' value was considered from the villagers' point of view by all the candidates and a range of good answers were seen.

**(c)** The answers often lacked focus on either what life would be like in the village or damage to the environment, there was much copying of the source without any input form the candidate.

**(d)** There were very few candidates who did not write at length about their plan for sustainable development. The best answers contained a clear understanding of maintaining supplies form the local environment without degrading it and then working on some of the other factors such as clean water supplies and having control over mining activity. Some candidates only scored limited marks by suggesting a list of improvements that would have turned the village into a major town or city without suggesting how these changes could have been supported.