

# ENVIRONMENTAL MANAGEMENT

Paper 8291/01

Paper 1

## General comments

It is pleasing that a doubling of the November entry has been accompanied by an improvement in the level of achievement. Additionally, most candidates apportioned their time well, with, seemingly an equal input in to each section. Candidates had clearly read and adhered to the rubric instructions and there were no rubric errors.

## Comments on specific questions

### *Section A*

Although **Question 1** generally achieved the better marks, candidates performed much better in the atmosphere question than in previous sessions. In general, terms were well defined and explanations of data reasonably succinct and accurate. Very few candidates failed to respond to these short answer questions.

### **Question 1**

This question was generally well answered with most candidates responding well to the data; marks were mostly in the 10 to 16 range.

- (a) (i)** Only a very small number failed to achieve 3 marks for this question.
- (ii)** This was less well answered. Although most candidates were able to give one similarity very few provided three distinct supporting reasons; two being the norm. The main fault being simple unsupported statements such as 'they are both rich nations' which needed more detailed explanations.
- (iii)** Through a variety of ways most candidates pointed out the 1000 difference between India and China. The quality of the two reasons did vary from a simple statement to one with elaboration. The weakest answers tended to give three or four brief and distinct reasons instead of the two needed.
- (b)** There was quite a large variation in quality for this section.
- (i)** Although most achieved the one mark available, a significant number took their data from the percentage change column or stated wind instead of biomass.
- (ii)** This was quite poorly answered with most almost ignoring the element of small change over the 2005 to 2006 period. Thus cost, availability and the fact that they are already developed were ignored.
- (iii)** This was well answered by 50% of the candidates with most stating they were expensive. Few realised, however, that geothermal energy does not only involve tapping volcanic sources; the heat derived from bedrock is also used.
- (iv)** Most candidates chose wind farms and provided valid criticisms including: appearance, unreliability, cost and noise. Not many described why wind farms have shown a 45.1% increase. The small number opting for biofuels achieved 2 or 3 marks by referring to the possible loss of agricultural land for food production.

## Question 2

As stated earlier, marks for this atmosphere question were better than in previous sessions. However, it is still apparent that many candidates find this topic difficult.

- (a) Although there were some poor answers most candidates pointed out the connection between temperature and pressure.
- (b)(i) About 75% of candidates correctly located high pressure at X and low pressure at Y.
  - (ii) It was disappointing that less than 50% of the entry were able to point out that air travelled from areas of high to low pressure.
  - (iii) This, oddly, was better answered than the other parts with most candidates able to quote the Coriolis force and describe the deflection of air in each hemisphere.
- (c) The two questions in this part showed quite a large variation in quality. Despite the widespread reports on the 2005 floods in Pakistan, less than 50% of the candidates had an understanding of the causes and effects of the Monsoon climate.
  - (i) This question needed reference to the changing patterns of pressure and air masses across Southern Asia in order to provide the explanation required in the question. Unfortunately most candidates provided a simple description that did little more than repeat the data in the table (Fig. 2.2).
  - (ii) Although this was slightly better answered, approximately 50% of candidates described the effects of floods caused by the Monsoon climate; drought proved to be a better option than flooding.

## Section B

**Question 3** proved to be overwhelmingly popular. **Question 5** attracted about 15% of the entry and very few answered **Question 4**. Essays were generally well organised and according to the ability of the candidate a strong overall feature. Many candidates performed better in **section b** than in **section A**.

## Question 3

Very popular and generally well answered. Part (a) proved to be more straightforward than (b).

- (a) Most candidates approached this question with confidence and plenty of information. Plate boundaries X, Y and Z were generally correctly identified. Weak answers gave brief descriptions of the directions of plate movement and good answers described the distinctive features of conservative, constructive and destructive boundaries.
- (b) There was quite a wide variation in quality, largely dependent upon the example and the assessment of the role of wealth. Good answers used recent tectonic events and developed the role of wealth through contrasts between rich and poor nations. Some other high quality answers used one event and discussed how the nation fared in terms of its economic status with reference to how its situation would change with the alternative scenario. Weak answers described a tectonic event without reference to relative wealth.

The most common and generally successful selected events were: The Haiti and Loma Prieta earthquakes, the eruptions of Pinatubo and Mount St Helens. The 1906 San Francisco earthquake proved to be less successful as it was difficult to relate this to conditions in 2010.

## Question 4

Extensive comments are difficult to make because so few answered the question. Satellite images and climatic hazards are central features in the specification and the unpopularity of the question may be due to the difficulties candidates have with atmosphere questions.

- (a) This was actually quite well answered. The small number of answers used the white areas to point out variations in cloud density, cloud direction and likely weather.

- (b) The more popular choices were atmospheric pollution and global warming rather than tornadoes etc. As a consequence, the second part on limiting their effect revolved around to limit global warming and climatic change. Although not entirely what was expected there were some quite interesting answers.

#### Question 5.

Although answered by a small number, answers were generally of a good quality; part (a) being of better quality than (b).

- (a) The photograph proved to be a useful prompt. The scale of the quarry in terms of depth and debris led to answers containing information on damage to ecosystems, loss of habitats, noise and air pollution. Unfortunately not many candidates recognised the area of coniferous woodland and some answers were very general. Despite this most answers were in the 5 to 10 range.
- (b) This question required reference to how degraded land can be sustainably used and where necessary restored. Some candidates wasted some time by dwelling for too long on how land became degraded rather than the focus of the question. High quality answers were typified by a good choice of examples followed by an essay divided into sustainable exploitation and restoration. Most answers referred to agricultural land and a small number urban development; the latter being of poorer quality.

#### Conclusion

Overall this paper became an effective test of a candidate's understanding of management issues in terms of handling data, use of case studies and knowledge recall. I feel it is still important to encourage candidates to understand the terminology associated with this section as well as practise essay writing; by now Centres should have a good bank of questions.

The main and recurrent issue is the lack of understanding of the atmosphere section of the syllabus. As with previous examinations this unit has the worst performance by the majority of candidates. These questions have the same level of difficulty as other components and it is important that all elements of this section are clearly taught and revised with appropriate examination practice.

# ENVIRONMENTAL MANAGEMENT

Paper 8291/02

Paper 2

## General comments

It is pleasing and encouraging that the doubling of the November entry has been accompanied by an improvement in the level of achievement. Most candidates apportioned their time well, with, seemingly an equal input in to each section. Candidates had clearly read and adhered to the rubric instructions and there were no rubric errors.

## Comments on specific questions

### **Section A**

Responses to **Questions 1** and **2** were fairly equal. Very few candidates failed to respond to these short answer questions. Generally the early parts of **Questions 1** and **2** were moderately well answered and weaker candidates tended to falter in the latter parts. In most scripts, terms were understood and interpretations of data were good to excellent.

### **Question 1**

There was some variation in quality with marks ranging from 3 to 18 mostly due to a significant number of candidates failing to correctly interpret the data on the Colorado River in part **b**.

- (a) (i) Although the majority correctly wrote transpiration for A and groundwater for B, there were some surprising misinterpretations. The most common error was to state a flow for B instead of a store, as required in the question.
- (ii) Most candidates were quite clear about evaporation being the conversion, through heating, of liquid water to a gas or vapour. In contrast a large number of candidates failed to interpret interception.
- (iii) References to the water cycle enabled many candidates to achieve good, if not complex answers, when a simple statement of inputs balancing outputs would have sufficed. A common error was to describe the river basin as a closed system, not realising that the river and evaporation formed important outputs.
- (iv) The answers to this question were a little disappointing. Clues, about discharge being measured in cubic metres of water per second, should have prompted candidates to the 'flashy discharge' found in and around many urban areas. Here concrete surfaces, drains and gutters efficiently direct water to rivers, almost without losses, into the groundwater store; flooding is frequently the result.
- (b) There was quite a large variation in quality for this section on river management.
- (i) The route to a good answer lay in interpreting the changes to river discharge shown in Fig. 1.3. Unfortunately many candidates only mentioned the construction of dams. For three marks it was necessary to outline detail, with data or examples from Fig. 1.2 and Fig. 1.3.
- (ii) Again answers to this question were surprising varied in quality. Good answers mainly outlined how irrigation, water supply and the provision of HEP would be of benefit. Weaker answers only outlined one benefit or were very superficial in their coverage.
- (iii) Again answers were quite varied and at times disappointing. It was only necessary to understand that the reduced discharge of the Colorado has caused increased aridity in area X. This has

resulted in increase salinity and surface aridity with disastrous effects upon both agricultural and natural ecosystems.

## Question 2

Although eliciting slightly better marks than **Question 1**, this question followed a different pattern in that both the early and latter parts of the question were extremely varied.

- (a) There were few difficulties with interpreting the input-output model of population change.
- (b)(i) The major difficulty in part **b** was the lack of understanding of the demographic transition model. Although it was intended that candidates used changes to the gap between the birth rate and death rate, knowledge of the model should have made the task easier. Whilst many accurately connected the dashed line a significant number either omitted the task or were very inaccurate.
- (ii) Very few candidates were able to locate France within stage 4 and Paraguay in stage 2; perhaps the data in the model became a distracter.
- (c) The LEDC and MEDC population pyramids were generally interpreted correctly. Applying two distinct reasons for the contrasts in the diagrams did, however, prove to be difficult. Contrasts in birth rates were most commonly explained with less than 50% mentioning different life expectancies and contrasts in the middle to upper parts of the graphs. Many candidates described one factor very well and ran out of time and/or space for the second factor.
- (d) Although this question has been set in past examinations only a small number seemingly recognised the 'Club of Rome' prognoses.
  - (i) About 30% of the entry recognised that the question needed a description of the relationships between the five elements for the period 1900 to 2000. In this period four were rising and only the resources showed a slow decline. A significant number referred to the whole period 1900 to 2100 and lost marks by outlining rapid declines in all or some of the trends; which did not occur in the 1900 to 2000 period.
  - (ii) Most obtained 2 marks for mentioning the pessimistic scenario for the 2050 to 2100 period and approximately half explained the changes. Some good candidates pointed out the Malthusian prediction.

## Section B

Unlike paper 1 there was quite an even balance between the three questions in terms of both numbers and quality.

## Question 3

Although respectively worthy of 10 and 30 marks, parts **a** and **b** were almost equal in quality.

- (a) Candidates covered the two elements to this part **a** by either separating their descriptions of the data from the three reasons or combining them. Good descriptions utilised the data whilst weak descriptions were general. With some variation in quality, most were able to provide three reasons of which the most popular were LEDC/MEDC contrasts involving cost and knowledge.
- (b) Candidates had a choice of either a LEDC or MEDC with the former drawing upon negative scenarios and the latter a positive scenario. For LEDCs the sustainable methods for water supply included boreholes, reservoir construction and wells whilst for MEDCs, reservoirs, groundwater and desalination were described. Many candidates were unclear about methods for clean and sustainable sanitation and dwelt upon methods currently present within the chosen country. In most cases there was some negative and positive evaluation either in general terms or specifically about each method.

The weaker answers spent too much time on the current problems of water supply and sanitation rather than the methods that might achieve a sustainable supply. Some candidates wrote in very general terms without selecting a country.

#### Question 4

Although not quite as popular as **Questions 3** and **5** there were many good quality answers. Part **a** was found to be more accessible than part **a**.

(a) As sometimes occurs with uncluttered diagrams many candidates found Fig. 4.1 difficult to interpret. All that was necessary was to identify three relationships, the most obvious being:

- low soil fertility and low species diversity
- rising soil fertility and high plant diversity with little agriculture
- rising agricultural productivity, falling plant diversity and increased soil fertility
- high agricultural productivity, low plant diversity and high soil fertility.

It then became necessary to attach a reason to each identification. The general progression being, early increases in plant diversity give way to agricultural productivity as soil fertility increases; this is a result of removal of the earlier vegetation cover for agriculture.

(b) There were some very good answers to this question on land degradation and sustainable methods. Most candidates selected suitable and familiar locations and developed aspects of overcropping, overgrazing, downhill ploughing resulting in soil erosion and loss of soil fertility. Invariably chosen sustainable methods related directly to the causes of degradation. Weak answers mostly achieved relevance but were either very brief or only developed one aspect of the question.

#### Question 5

This proved to be a moderately popular question with answers of an adequate to good quality in the 15 to 35 mark range.

(a) This part question proved to be slightly more difficult than expected. The main difficulty being confining the answer to ecosystems shown within Fig. 5.1 and understanding that a variety of ecosystems operate and interact within a biome. Most candidates were able to give a definition of biotic and abiotic. Good answers made specific use of Fig. 5.1 and weak answers were either too brief or could have been applied to any biome. The most common omission was the need for sunlight for photosynthesis.

(b) The format of this question directed many candidates towards well structured questions. Although varied in amplification, most candidates were able to provide three distinct reasons for the conservation of rain forests, the most popular being habitats, biodiversity, species population, education, economic threats and aesthetics.

The chosen methods of conservation mostly derived from the threats identified in the first part of the essay. National parks were the choice of most candidates and very good answers pointed to the value of ecotourism, NGOs, education and governmental constraints.

#### Conclusion

As with previous sessions, candidates responded well to this paper. Answers to the two questions in **section A** were well balanced and the three questions in **section B** were of similar popularity. There is still a need for candidates to practise writing timed essays and for the terminology of the hydrosphere and biosphere to be learned. Candidates would benefit if they read questions carefully so that they don't miss important elements such as the need for examples. They also need to understand the difference between description and explanation and make use of the mark weighting to a question as an indicator of the time to be spent on a section or subsection.

# ENVIRONMENTAL MANAGEMENT

**Paper 8291/03**  
**School Based Assessment**

## General comments

The increased entry of June 2010 has continued with this November's entry almost doubling. Although there was some variation in quality, nearly all candidates can be congratulated on the content and presentation of their work. Although there is still a need for some Centres to encourage their candidates to structure their reports better, a generally high standard of written style and detail was achieved by most. It was also pleasing that there was less use of the Internet and greater reliance on primary data.

Although it was also pleasing that there were no major administrative problems a few Centres did not send their reports to arrive at the board by the end of October. All reports should be received by this date and it is also helpful when reports are received in advance of the deadline.

As a general comment, it is important that candidates are made fully aware of the requirements of this school based assessment. Written reports should be of approximately 2000 words in length and ideally structured into the four sections: introduction/hypothesis; methodology; results and analysis; conclusion and evaluation. At the project proposal stage candidates are frequently reminded to use the syllabus for information on project design and assessment; thus there should be little confusion. If there is, then please contact CIE immediately.

## Comments on assessment criteria

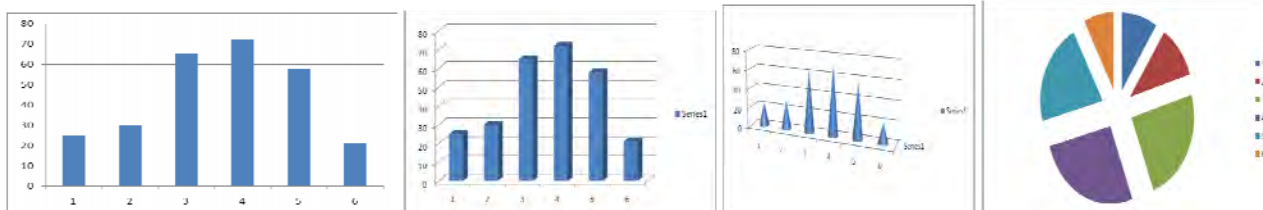
### **Criterion C1**

Most candidates included a hypothesis or question, supported by a clear explanation of the principles underpinning the topic. Fortunately most Centres heeded advice and the majority of candidates avoided writing over lengthy preambles and got straight into a hypothesis or question with a brief elaboration. This is helpful as it indicates a tight focus upon the research topic.

The second half of this skill area was less well done. Many candidates still write very vague and non-specific methodologies without any justification of why the equipment or techniques were being used. This is a little odd because they only have to refer back to their proposal form. It might be a useful exercise for candidates to write their methodologies before they even start the research; the report can always be modified at a later date if the methodologies change in the interim.

### **Criterion C2**

With the exception of skill C2e there are few issues with section. This session saw a greater reliance on graphical representation with many enjoying developing computer generated graphs. One issue with this is the presentation of a wide variety of bar graphs to show similar information. It is better to stick to one design, particularly as it makes comparisons easier e.g. all the following depict the same information; why not use one type of graph?



The most important skill is to make the graph appropriate to the data: line graphs for continuous data, bar graphs and pie charts for discrete data. Due to the very basic way in which graphs can be generated, C2e should be credited for the use of an appropriate statistical technique that is used to verify, test for significance or develop a correlation. Some Centres actually try to credit C2e when it is not present in any part of the report.

Finally, although most do, candidates should attach some textual analysis to the data they present; photographs, tables and graphs all deserve some explanation.

### Criterion C3

Having read interesting and well presented early and middle sections to reports, it was disappointing to see a significant number of very weak conclusions and evaluations. It is worthwhile using the detail from the syllabus.

- C3a reads *'Full conclusions are drawn, supported by reference to the data.'* Very often conclusions could only receive limited credit as there was no reference to data from earlier sections.
- C3b reads *'Knowledge of environmental and management principles are used to explain trends and patterns in own results'*. This element is very often found within the analysis of data as well as the concluding section. However trends in the data and environmental trends and patterns were not always present, yet some candidates received credit.
- C3c reads *'There is an evaluative assessment of the report in terms of its limitations and level of success'*. This element is not an evaluation of the content of the project, sometimes expressed as recommendations for further action. It is a brief statement about which parts of the candidate's own work and report went well or showed limitations. If the project went well, why? If it had limitations, why? What can be done to improve the work?

It is important that candidates are not credited with meeting this criterion when it was absent from the project.

### Concluding comments

Overall, it is my impression that most candidates derive a lot of enjoyment from this difficult part of the Environmental Management assessment. The samples I received certainly made for very interesting reading. This practical part of the assessment aims at giving candidates the opportunity to select a topic in which they have a particular interest and become involved in issues that are of local interest and importance.

There is still, however, a need for all candidates to be reminded of the requirements of this coursework element and for teachers to be vigilant about presentation, structure and length.