

# ENVIRONMENTAL MANAGEMENT

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Paper 8291/11

Paper 11

## General comments

The total entry was nearly identical to the previous equivalent session in terms of both Centres and numbers. Although the overall performance of candidates varied both across and within Centres, the overall standard was slightly higher than previous years. There was a reasonable balance between **sections A** and **B**.

There were very few instances of irrelevant answers. Candidates clearly used their time well, as the input into **sections A** and **B** were similar. There were no rubric errors.

## **Section A**

### **Question 1**

The majority of candidates made a positive attempt to all parts of this question.

- (a) (i) Nearly all candidates correctly identified the three non-renewable resources.
  - (ii) Few candidates realised that the total energy consumption required a subtraction from the top line of the graph, whilst the second calculation only required reference to the grey layer for coal.
  - (iii) Responses to this part were varied. Most responses correctly selected one type of resource but then resorted to a description of the resource rather than giving reasons for the changes.
- (b) Candidates clearly identified two ways in which energy consumption was different and similar. Partial credit was obtained by many candidates, as an explanation was not given.

### **Question 2**

- (a) (i) Candidates attempted an explanation, rather than a description. Many confused their response by mainly referring to vertical movements.
  - (ii) Many candidates did not understand that air moved from high to low pressure.
  - (iii) The majority of responses stated the Coriolis Force or the Earth's rotation. A very small number obtained credit mentioning continentality.
- (b)(i) Most candidates were able to provide a description of the components of the diagram and partial credit was obtained
- (ii) Most candidates correctly referred to a hazard associated with each side of the mountain range.

## **Section B**

**Question 4** attracted about 70% of the entry with **Questions 3** and **5** being equally split. Performance in each of the questions proved to be fairly equal.

### Question 3

- (a) Many candidates did not explain the soil profile and responses tended to make generalisations about climate.
- (b) There were some very good responses to this part. Most focused on human activity as a contributor, with some excellent responses mentioning how such activity can trigger physical processes. Some responses lacked balance, in that the causes of soil degradation were developed at the expense of how soils can be used sustainably.

### Question 4

- (a) Good responses made a clear distinction between two different types of pollution (e.g. smog, acid rain and noise) and then provided succinct descriptions of the effects. However, a large number of responses were based on the presence of smoke and linked this to the many types of pollution that could be connected to these emissions. These responses tended to lack detail on two distinct types.
- (b) The majority of candidates made a good choice of an urban area, with Los Angeles and Beijing being popular. High quality responses linked cause and effect with a good range of measures targeting a reduction in pollution. Some moderately good responses listed measures, but lacked depth. Responses that did not include examples tended to be brief.

### Question 5

- (a) The best responses were well balanced and accurate. However, many were only accurate in reference to mudflows.
- (b) Some candidates provided good responses and gained full credit. Responses that dwelt on natural processes and measures that help to reduce mass wasting tended to be brief. There was little use of studied examples.

# ENVIRONMENTAL MANAGEMENT

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Paper 8291/12

Paper 12

## General comments

There were very few instances of irrelevant answers. Candidates clearly used their time well, as the input into **sections A** and **B** were similar. There were no rubric errors.

## **Section A**

### **Question 1**

The majority of candidates made a positive attempt to all parts of this question.

- (a) (i) Nearly all candidates correctly identified the three non-renewable resources.
  - (ii) Few candidates realised that the total energy consumption required a subtraction from the top line of the graph, whilst the second calculation only required reference to the grey layer for coal.
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**Section B**

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# ENVIRONMENTAL MANAGEMENT

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Paper 8291/21

Paper 21

## Key Messages

In section A, when answering data response questions, there should be careful consideration of information contained in graphs, tables and diagrams to ensure that the data is used accurately. This must be used appropriately to support answers. In section B, effective use of exemplar material, with good attention to detail, is required. Most parts of the essay requirements were fulfilled well. Improved performance in this section of the paper can be achieved by the inclusion of relevant evaluative statements in essays.

## Comments on Specific Questions

### *Section A*

#### **Question 1**

- (a) (i) Partial credit was obtained by the majority of candidates, who made a good interpretation of Fig. 1.1, identifying the overall increasing trend in the sea level. Good responses calculated the correct change in sea level.
- (ii) Most candidates gained partial credit by linking cause to effect.
- (iii) Good responses emphasised the differences in the range, comparing current statistics from recorded levels in recent time, with the increasing widening of the range and indicating the estimates becoming more uncertain and more unreliable with time. Candidates needed to acknowledge the uncertainty of factors affecting the rate in order to gain full credit. Some candidates simply repeated their answer to (ii), giving the cause of the sea level rise rather than focusing on the increase in the range over time.
- (b) (i) The majority of candidates gained full credit by referring to Fig. 1.2 and recognising that the low lying deltaic region at sea level could be easily inundated and submerged.
- (ii) Full credit was obtained by candidates who adhered to the components of the question, achieving a good balance between explaining the ecological and socio- economic effects and using the data in Fig. 1.2 to support their description. These responses also described the decrease in total land area as a result of the inundation of land with saline water and explained the losses to agricultural land, freshwater ecosystems together with effect on ground water, by the intrusion of salt water. The displacement of the population inland, with impact upon population density and resource availability was also considered effectively with reference to carrying capacity.

#### **Question 2**

- (a) The majority of candidates referred to the data provided in some way. However, not all candidates went onto interpret and explain the data for full credit.
- (i) Some responses indicated a misconception that the same plants were growing larger and completing a life cycle between the early and late stages.
- (ii) Partial credit was awarded for the majority of candidates.

- (iii) Responses that suggested differences in morphology and physiology, growth rates and the amount of productive biomass differ for pioneer and climax vegetation and lead to different rates of depletion gained full credit. These responses tended to explain that biomass increases in the early stages, while in the late stage of succession the maintenance of the biomass level, coupled with rapid replenishment as a result of rapid recycling of nutrients, results in slow depletion
- (iv) The information from Table 2.1 was used effectively to identify the relationship between low stability and small biomass /low diversity and between high ecosystem stability and large biomass /high biodiversity. However, the explanation of these relationships tended to be omitted in some responses. Developed answers explained how the increase in plant diversity and biomass in the later stage would result in more complex feeding relationships, with more complex food webs and energy flow through trophic levels, together with more nutrient cycling. Very good responses explained the increased stability as a result of the whole ecosystem being resistant to change due to biotic factors dominating the ecosystem. This was compared to the pioneer community with a low biomass and diversity where abiotic factors dominate the environment, with few species adapted structurally and physiologically to survive the hostile conditions.
- (b)(i) Through observation of Fig. 2.1, good responses gained full credit. Credit was lost where responses focused on indirect human factors such as littering of the area, water pollution or hotel development, as these were too general to gain credit.
- (ii) Partial credit was awarded too many candidates, for stating ecotourism and linking tourism and conservation. Full credit was obtained where responses discussed ways of allowing tourism, whilst protecting the environment and related the conservation of the ecosystem by preventing damage to the vegetation and the erosion of the sand dune system.

## Section B

### Question 3

- (a) Many candidates gained credit as a result of applying knowledge of the water cycle specifically to the example provided. Many responses successfully described changes resulting from the operation of the natural water cycle. Responses needed to include factors shown in the diagram, rather than focusing solely on other factors.
- (b) High quality responses included the use of examples, with reference to the water resources of the area chosen. Less developed responses referred to an area, but lacked detail, particularly with reference to the actual water resources. These essays tended to focus solely on the issue and difficulties arising from pollution and a lack of waste disposal and sewage treatment.

### Question 4

- (a) Most candidates achieved credit in part (a) of the question by describing and comparing the two graphs of population growth, explaining the differences in the availability of resources and the subsequent effects on population growth in the two models. Very good responses linked the idea of population size exceeding the availability of resources, to the issue of overpopulation as a direct link to part (b) of the question.
- (b) Good essays provided a balance between issues and policies of both LEDCs and MEDCs and used a number of examples. There was a developed definition of overpopulation. These essays recognised circumstances in which both high and low population densities could result in overpopulation, by considering the ways in which a population exceeds the carrying capacity based upon available resources within a country, or through the unsustainable use of resources. The inclusion of Policies aimed at reducing the growth rate, as well as those aimed specifically at the increase of resources available to a country, characterised high quality answers. These responses also included relevant evaluative comments.

**Question 5**

- (a) Partial credit was obtained by candidates who described the transition of the changes that could be observed in the structure and diversity of the vegetation shown for each of three biomes, but did not provide an explanation.
- (b) Good use of examples of National Parks were generally included. Whilst most candidates expressed some understanding of the general roles of National Parks, some responses were more uncertain in their evaluation of the specific role of National Parks in the conservation of natural areas and the preservation and protection of the flora and fauna.

# ENVIRONMENTAL MANAGEMENT

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Paper 8291/22

Paper 22

## Key Messages

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# ENVIRONMENTAL MANAGEMENT

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Paper 8291/03

Individual Research Report

## General comments

The traditional November pattern of a small entry from a large number Centres continued. Generally the research reports were of a high standard. For the most part, the research reports were accurately assessed and although the comments made on the candidate report card are generally valuable, a significant number of Centres do not complete this section.

When assessing candidates reports there are three important issues for Centres to consider.

- Some Centres are awarding credit for criteria not actually present in the written report. This particularly applies to the use of a statistical tool, a clear evaluation and within the conclusion no reference to the data contained in the report
- The better reports are derived from field work involving the collection, collation and presentation of primary data. Projects that are derived entirely from secondary data are prone to plagiarism and it is often difficult to obtain data and information that can be collated and presented in a suitable form, by the candidates themselves
- Some reports were overly lengthy. It is not necessary to write long preambles (150 to 200 words is sufficient) and attach appendices that contain all questionnaire returns.

It is important that candidates are made fully aware of the requirements of this School based assessment. Although advice is always given on the need to refer to the syllabus for information on project design and assessment, it is occasionally ignored. Written reports should be of approximately 2000 words and those that conform to the stages of scientific method usually comply with the recommendations for both length and quality. The better reports use these stages as section or chapter headings. This model of scientific method can be used to provide a check on how well the project is progressing. When writing their reports, candidates should be asking of themselves:

- will my hypothesis or question actually yield viable results
- are my methods realistic, practical and relevant; do they include data recording, collation and presentational techniques
- are the results and analyses fully representative of the methods referred to the previous section
- does my conclusion sum up and do my results relate to the original hypothesis or question
- have I evaluated my work in terms of both its successful features and its limitations
- what can be done to improve my work?

## Comments on assessment criteria

### **Skill C1**

Most reports started with a clearly stated title accompanied by well-developed hypothesis and a short introductory statement.

The introduction leads into the methods section of the report. Good quality research requires the initial formulation of a plan detailing research sites, equipment, expected data and how it will be collated and presented. This is still the weakest part of Skill C1, as very often the stated methods did not satisfy the needs of the topic title and hypothesis. Many candidates did not assess whether or not their developed plan will be effective in testing their hypothesis or answering their question.

## **Skill C2**

This important Skill Area proved to be quite varied. A significant number of high quality research reports did very well in this section and made excellent use of relevant collected data presented as graphs, tables, diagrams and photographs. However, some simply inserted a number of photographs loosely connected to the topic. Many of these did not contain any form of reference from the text and evidence of data collection was limited. There was also occasional mismatch between the methodology and the presented related results i.e. the methods stated in C1 did not yield related graphs, tables and photographs.

Some Centres awarded the statistical tool mark when there was no evidence of statistics. There is a difference between statistical methods that are used to describe data and statistical tools that are used to analyse data. The former might include bar charts or line graphs, whilst the latter would include correlation, chi squared, t test etc.

## **Skill C3**

Several reports did not make reference to the data in the report. Although references were made to the environment and its management, they were not used to explain the trends and patterns derived from results contained in the body of the report.

High quality reports did contain a detailed summative conclusion that utilised results to assess the original hypothesis.

Many candidates still confuse an evaluation with a conclusion and in some cases an evaluation was absent from the report. The evaluation needs to be a brief survey of those things that went well and not so well i.e. success and limitations.

## **Concluding comments**

Candidates and their teachers continue to engage enthusiastically with this element of the Environmental Management examination. As in previous sessions, the better topics and final reports are derived from locally based research utilising primary data.

Those candidates who rely on secondary data, particularly the Internet, need to take care. It should be noted that whilst Internet data can be utilised to produce graphs and tables, these should be of the candidates own construction. Plagiarism and copy/pasting are not permitted and could invalidate the research project. There were very few administrative errors, but there is still a need for all Centres to be fully aware of the assessment and recording procedures. The main issues are:

- some Centres did not return the MS1 form
- only whole numbers should be recorded on the various assessment form and some Centres put half marks on the candidate record card then transfer them MS1
- credit is often given for elements not present in the research report, particularly for criteria C2e and C3c