

ENVIRONMENTAL MANAGEMENT

Paper 8291/11
Paper 11

Key messages

- Candidates need to be aware of the equal balance between **Section A** and **Section B** of the paper and should plan their time and answers accordingly.
- In **Section A**, candidates should note the number of marks available for each part question and write answers accordingly. This will give them an indication of the amount of content and detail expected.
- It is important that instructions are followed carefully. Candidates should make sure that they understand the difference in meaning of the command words such as state, suggest, predict, justify, describe, explain, compare and evaluate.
- Candidates should avoid repeating the question in their answers to maximise the time they have available for answering the question posed.
- Candidates should show all working out in calculation questions as credit may be available for the correct calculation method even if an incorrect answer is given.

General comments

There was generally a weak response to all questions across the paper and performance was uneven across the two sections of the paper. Some candidates answered **Question 2** (mass movement events) more effectively than **Question 1** (weather). Topics which proved more challenging were anticyclones, latitude, factors which influence the temperature on the Earth's surface and formation of acidic rainwater.

Few answers showed a good understanding of terms and attention to detail with effective use of exemplar material.

The most effective answers included effective use of appropriate examples to illustrate key points, along with supporting details using appropriate terminology.

Comments on specific questions

Section A

Question 1

- (a)(i) Most candidates gave the correct answer within the appropriate range.
- (ii) Very few candidates were able to identify the weather feature **Y** in **Fig. 1.1** as an anticyclone although a few candidates were able to gain credit for describing the region of high pressure correctly.
- (iii) This question assessed knowledge of the effects of a tropical cyclone on the economy of a region. The most common answers simply referred to flooding and damage to crops and agricultural land and/or tourism. Stronger responses linked the weather effect with the damage to business infrastructure, disruption to transport and damage to communications networks.
- (b)(i) Most candidates were successful in plotting the points and completing the trendline.
- (ii) Most candidates were able to calculate the range correctly. Some candidates calculated the mean temperature rather than the range.

- (iii) This question proved challenging for the majority of candidates. Responses tended to simply describe the position of the cities in terms of how far north they were, rather than explain how their latitude affects the average monthly minimum temperature. Answers to this question could have been improved by comparing the data (degrees latitude and temperature) between Reykjavik and Mumbai and between Reykjavik and Brasilia in the first instance, and secondly, explaining latitude in terms of angle of incidence of the Sun's rays (i.e. amount of solar radiation received).
- (iv) Weaker candidates generally continued their answer from **Question 1(b)(iii)** rather than stating two factors other than latitude that could affect the average monthly minimum temperature. Candidates could have improved their answer by considering the distance from the ocean, prevailing wind direction, albedo and altitude.
- (c) This question assessed knowledge of how acid rain is formed and proved challenging for the majority of candidates. Very few candidates referred to the chemistry required, i.e. reference to SO₂ or NO_x reacting with water and oxygen to form sulfuric or nitric acid, and gave answers limited to the release of toxins or pollutants emitted by factories or cars into the air.

Question 2

- (a)(i) This question was generally answered correctly. Some candidates mentioned erosion and movement of rocks, rather than the physical breakdown of rocks in situ, which was not accepted.
- (ii) Knowledge of the difference between landslides and mudflows was required here. Most candidates were better able to describe the differences rather than the similarities. More successful answers were able to describe the similarities as movement down a slope due to the effect of gravity on unstable slopes.
- (b)(i) This question was generally answered well. Some responses could have been improved by referring to the graph which shows that rock **A** has weathered at a higher rate than rock **B**. Candidates generally covered the reasons for the difference in rate of weathering between rock **A** and rock **B** well.
- (ii) This question assessed knowledge of the causes of sudden mass movements linked to human activity. Weaker responses referred to building on slopes and deforestation/removal of tree roots as the cause for the triggering of mass movements. Candidates could have improved their answers by developing their explanations e.g. the weight of large scale redevelopment or building results in the erosion of the toe of the slope causing the slope to become unstable which then moves. Candidates could also have considered blasting, mining associated with quarrying and/or fracking using explosives.
- (c) Knowledge of strategies to reduce the risk of mass movement events was assessed. The most common strategy referred to in answers was to increase forest coverage or plant more trees and some candidates mentioned rock fall protection, in particular building walls. Generally, answers could have been improved by considering other strategies such as: earthworks on either side of the town to reduce the steepness of the slope, improvements in groundwater drainage, terracing and relocating the river.

Section B

Question 3 and **Question 5** were almost equally popular while **Question 4** was chosen by fewer candidates. Question parts **(a)** and **(b)** were both well tackled in each case with the vast majority of candidates completing both parts.

Question 3

- (a) The majority of candidates tended to simply describe the maps in **Fig. 3.1** rather than compare and contrast the volcanic hazards. Candidates could have improved their answers with better reference to the data in **Fig. 3.1** by comparing the size of volcano hazard zones, distances, number of settlements and lahar hazard zones with respect to valleys and coastal plains.
- (b) Successful responses needed to show a good understanding of strategies to predict volcanoes, strategies to prepare for volcanic eruptions and by using contrasting examples. Less successful

answers showed a lack of knowledge of the different monitoring methods. Most candidates were able to discuss the strategies to prepare for volcanic eruptions such as evacuation plans, rescue and aid.

Question 4

- (a) This question assessed data handling skills with regard to trends in global energy supply and global energy consumption. Most candidates were able to describe the general trends in the data in **Table 4.1**. Less successful answers simply quoted the data with little analysis or explanation. More successful responses referred to the difference in contributions between fossil fuels and renewable energy sources as well as population increase and improvements in technology.
- (b) This question assessed knowledge of the sustainable use of energy, the sustainable use of land and required candidates to refer to countries at contrasting levels of economic development. Less successful responses provided a list of renewable energy sources with vague references to countries of different levels of economic development. There was little or no reference in their answers to the sustainable use of land. Generally, candidates could have improved their responses by considering the increased use of various renewable energy sources and conserving energy by improving efficiency as well as other strategies such as carpool schemes, improving public transport and local reduction in waste.

More successful answers addressed the sustainable use of land and areas of natural beauty. Candidates could have improved these responses by discussing the environmental impact of new developments, protecting land from urban sprawl, reducing the carbon footprint of new schemes and the creation and effective management of national parks.

Question 5

- (a) The most successful candidates were able to compare the air quality between three urban locations by describing the data in **Fig. 5.1** and were also able to suggest reasons for the variation in air quality. Weaker candidates often listed the differences in air quality between the locations with little reference to numerical data.
- (b) Many candidates chose to focus on describing general sources of air pollution from cars and other transport rather than discussing managing industrial pollution. Answers were often quite lengthy and had some detail but without creditworthy material that addressed the question.

Candidates could have improved their answers by considering the use of fossil fuels in industrial processes, the treatment of waste gases such as SO₂ and NO_x, water pollution and metal wastes, and the challenges of the cost of new and clean efficient technology. Candidates also needed to discuss the levels of investment required for renewable energy schemes/green technology and the challenges this poses for low income economies.

ENVIRONMENTAL MANAGEMENT

Paper 8291/12
Paper 12

Key messages

- Candidates should be aware of the equal balance between **Section A** and **Section B** of the paper and should plan their time and answers accordingly.
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- It is important that instructions are followed carefully. Candidates should make sure that they understand the difference in meaning of the command words such as state, suggest, predict, justify, describe, explain, compare and evaluate.
- Candidates should avoid repeating the question in their answers to make full use of the time allowed.
- Candidates should show all working out in calculation questions as credit may be available for the correct calculation method.

General comments

There was generally a good response to all questions across the paper, although in some cases performance was uneven across the two sections of the paper. Some candidates found **Question 1** (plate tectonics) less demanding than **Question 2** (renewable energy resources). Topics which proved more challenging were biofuels and the enhanced greenhouse effect.

Many answers showed a good understanding of terms and attention to detail with effective use of exemplar material.

The most successful answers included effective use of appropriate examples to illustrate key points, along with supporting details using appropriate terminology.

Comments on specific questions

Section A

Question 1

- (a)(i) Most candidates were able to label the diagram in **Fig. 1.1** with two arrows correctly.
- (ii) The majority of candidates correctly identified **X** as oceanic crust and **Y** as continental crust.
- (iii) The majority of candidates correctly identified the type of plate boundary shown in **Fig. 1.1** as destructive.
- (iv) This question was generally well answered with candidates correctly describing subduction of the oceanic plate at a destructive plate boundary.
- (b)(i) Most candidates were able to describe the distribution of major earthquakes shown in **Fig. 1.2** as being found on plate boundaries. More successful answers explained why and referred to friction between plates, the build-up of pressure and the release of a large amount of energy.

- (ii) Most candidates were able to gain some credit for referring to having access to fertile soils. Stronger responses referred to proximity to the coast for fishing, tourism, geothermal energy or lack of education about risks.
- (iii) This question was generally answered well with candidates able to offer a wide range of strategies to reduce the scale of damage and loss of life which can be caused by living close to a plate boundary.

Question 2

- (a) The two terms were generally understood with most candidates gaining credit. Weaker answers tended to suggest that non-renewable resources could not be reused/used again which was not accepted.
- (b) This question was usually answered correctly with most candidates providing at least two reasons for not building a wind farm. Weaker candidates tended to repeat one of their reasons using alternate wording.
- (c)(i) The majority of candidates were able to draw correct bars on **Fig. 2.1** for coal and natural gas.
 - (ii) Some candidates were able to calculate the range correctly. Weaker candidates found extracting the data from **Fig. 2.1** challenging and some did not attempt the question.
 - (iii) This question proved challenging for most candidates with very few being able to refer to the efficiency of combustion method, the extent to which emissions may be managed or the type of coal.
 - (iv) The vast majority of candidates showed no knowledge of how biofuels were produced. A successful answer would refer to the process of photosynthesis during which plants absorb carbon dioxide and the balance between this and the amount of carbon dioxide being emitted when burnt.
 - (v) The most successful candidates demonstrated detailed knowledge of the greenhouse effect with developed points. Weaker answers were generally vague with some confusion between the greenhouse effect and ozone depletion. Answers could be improved by including ideas on energy transfer and the trapping of thermal energy in the atmosphere.
 - (vi) Most candidates identified rising sea levels due to ice caps melting as a correct answer with a smaller number of candidates giving drought as their answer.
- (d) The strongest candidates answered this question well. Weaker responses restated information in **Fig. 2.2** with little supporting explanation of how the scheme aims to manage atmospheric pollution. Some referred to pollution in general including litter and plastics in the ocean which was not relevant.

Section B

Question 3 and **Question 4** were almost equally popular while **Question 5** was chosen by fewer candidates. Question parts (a) and (b) were equally well tackled in each question with only a small number of candidates not completing both parts.

Question 3

- (a) Most candidates were able to describe the trends in the graph in **Fig. 3.1** and compare global urban population with global rural population. Stronger candidates were able to discuss the challenges associated with the increase in urban populations.
- (b) Successful responses showed a good understanding of the pressures caused by urban sprawl, how national parks and conservation areas are protected and were able to evaluate the success of national parks and conservation areas. Stronger candidates provided a balanced argument and included evaluative statements in their answers.

Question 4

- (a) Most candidates made good use of the diagram in **Fig. 4.1** with stronger responses providing a balanced answer between the effects of a tropical cyclone and how the house design may mitigate these effects. Weaker candidates tended to simply list the design structures that would withstand the tropical cyclone.
- (b) Stronger candidates were able to compare and evaluate the impacts of widespread drought on both LEDCs and MEDCs, recognising that LEDCs will have long term reliance on international aid and support while the basic needs of MEDCs will be met by importing, with the effects likely to be short term.

Question 5

- (a) This was challenging for many candidates with weak answers limited to the factors of vegetation and slope angle with little development or explanation. Stronger responses considered more detailed aspects of the three factors chosen from **Fig. 5.1**.
- (b) Many candidates found this question on soil management challenging and it was generally not well answered. Weaker answers were superficial and tended to focus on use of fertilisers and nutrients in soil. More successful responses should include a range of soil management strategies along with a balanced comparison of sustainable farming in small and large farms, and discussion of whether large scale farms can manage soil sustainably.

ENVIRONMENTAL MANAGEMENT

Paper 8291/21
Paper 21

Key messages

- Candidates need to be aware of the equal balance between **Section A** and **Section B** of the paper and plan their time and answers accordingly.
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- It is important that instructions are followed carefully. Candidates should make sure they are clear about the differences in meaning of command words such as state, suggest, explain, describe, discuss and assess.
- Candidates should avoid repeating the question in their answer to make best use of examination time.

General comments

There was a reasonable response to all questions on this paper and performance was relatively even across the two sections of the paper. Topics which were found to be most challenging were the explanation of succession and how pollutants reach the sea. A significant number of candidates had trouble describing changes to biodiversity when a climax community is reached.

Many responses could have been improved by demonstrating a deeper understanding of terms and paying greater attention to detail with the effective use of exemplar material.

In this session, the more successful answers included effective use of appropriate examples to illustrate key points along with supporting details using appropriate terminology.

Comments on specific questions

Section A

Question 1

- (a)(i) This was poorly answered with few candidates able to name an environmental event responsible for primary succession.
- (ii) Few were able to describe the stages of the succession with weaker responses simply repeating the names from the diagram (moss then grass then shrubs). Other responses suggested it was the slow growth of the pine trees and not the need to develop fertile soil. A few good responses explored the different stages and how they worked to lead to the next stage.
- (iii) Some were able to describe the difference but many weaker responses suggested it was simply the order they occurred – primary followed by secondary.
- (b)(i) Changes to biodiversity during succession was not well understood. More successful answers were able to refer to competition for resources and to predator/prey relationships.
- (ii) Most candidates could name abiotic factors. Responses showed less understanding of how the different factors changed over the course of the succession. Weaker answers suggested climate change as a factor.

- (iii) The most common answer given was to protect species. Candidates who focused on the sand dunes tended not to consider the protection of the shoreline and creation of fertile land. Candidates mainly gave a single developed point rather than a series of points.
- (c) This was generally well-answered with deforestation being the most popular response followed by wildfires.

Question 2

- (a)(i) The concept of materials leaching from landfills and entering water courses and finally the sea was not well understood. Many responses focused on the dumping of materials despite the text stating that they had been banned since the 1970s.
- (ii) Successful candidates understood the concept of bio-accumulation in a food web and were able to describe this. Weaker answers focused on the chemical being in the water and getting onto the skins of the killer whales and dolphins.
- (iii) This was generally well-answered. Weaker responses suggested banning the PCBs and these candidates needed to read the text more carefully.
- (b)(i) This was generally well-answered with good use of the source data.
- (ii) Some understanding was shown with stronger responses referring to the plastics being ingested as food and animals become entangled in the plastics.
- (iii) Candidates showed a good understanding of strategies to prevent marine pollution.

Section B

Question 3

This was a less popular choice with very few candidates opting to answer it.

- (a) Generally, a well understood concept and the few candidates who answered were able to describe advantages and disadvantages.
- (b) Candidates did not provide a full range of possible strategies for maintaining a sustainable supply of drinking water or successfully contrast different levels of income such as the expense of desalination plants.

Question 4

- (a) Weaker answers described the three zones of the conservation area model with little added detail or explanation of the reasons and science behind the structure. Few candidates offered detailed responses explaining the three zones.
- (b) Stronger responses attempted to detail some conservation methods and hinted at governmental and political influences. Weaker answers focused on the words political and economic and tended to be repetitive and superficial. 'Governments did not give money' was a simple recurring theme.

Question 5

- (a) Candidates were able to predict the possible areas where the two rivers flowed and provide reasons for the differences in the pie charts. The use of data was good.
- (b) The stronger responses provided developed and detailed examples and often referred to named rivers. Weaker answers generally mentioned people getting ill but were unable to suggest possible organisms or diseases caught from sewage in the water. Candidates at this level of response tended to provide superficial statements with no development or supporting data/facts.

ENVIRONMENTAL MANAGEMENT

Paper 8291/22
Paper 22

Key messages

- Candidates need to be aware of the equal balance between **Section A** and **Section B** of the paper and plan their time and answers accordingly.
- In **Section A**, candidates should note the number of marks available for each part question and write their answers accordingly. This will give them an indication of the amount of content and detail expected.
- It is important that instructions are followed carefully. Candidates should make sure they are clear about the differences in meaning of command words such as state, suggest, explain, describe, outline and assess.
- Candidates should avoid repeating the question in their answer to make best use of examination time.

General comments

There was a reasonably good response to all questions on this paper and performance was relatively even across the two sections of the paper. Topics which were found to be most challenging were the explanation of conservation of groundwater stores and why population growth has not fulfilled the theory of Malthus. A significant number of candidates had trouble describing why a country might expect a sudden rise in population.

Some answers showed a weak understanding of terms and lacked attention to detail, with ineffective use of exemplar material.

In this session, the more successful answers included effective use of appropriate examples to illustrate key points along with supporting details using appropriate terminology.

Comments on specific questions

Section A

Question 1

- (a)(i) This was generally answered well. The most common incorrect answers were ice sheets and glaciers.
- (ii) The calculation was correct in the majority of responses.
- (iii) Candidates showed a good understanding of the environmental problems caused by melting ice sheets and glaciers. A common misconception was to refer to them as being salt water.
- (b)(i) Candidates were generally able to match the aquifer to the description.
- (ii) Responses demonstrated understanding of causes of groundwater depletion.
- (iii) Candidates were less able to explain strategies to conserve groundwater and a common error was to repeat the first strategy in different words. Deforestation is not a recognised strategy.

- (c) This question as a whole was answered effectively. Candidates were generally good at describing the changes in demand for water as an area becomes increasingly urbanised. Explanations were less detailed, especially in weaker responses.
- (d) This was very well-answered. A good knowledge of the disadvantages of building a reservoir was demonstrated.

Question 2

- (a)(i) Candidates showed reasonable knowledge of carrying capacity and were able to define it. Weaker responses did not refer to depletion of resources.
 - (ii) In most cases, candidates were able to describe the stages of the graph line and showed understanding of the terminology.
- (b)(i) The majority of responses demonstrated the description skills required to interpret the graph.
 - (ii) Candidates were successful at suggesting factors likely to lead to the predicted changes in population. Responses tended to focus on countries with low levels of income rather than also showing knowledge of population checks and balances in countries with high income levels.
 - (iii) Correct answers were less prominent with candidates not showing understanding that the predicted collapse has not happened because of developments, particularly in agriculture and medicine. Weaker responses tended to focus on population control methods.
- (c)(i) A reasonable understanding of population pyramids was demonstrated. Weaker responses tended to simply quote numbers for different levels of the pyramid rather than describe the shape and the reasons why it was that shape.
 - (ii) Many candidates did not recognise that the very large group of young people would grow, mature and reproduce in the future leading to a population boom. Many responses were a repeat of answers given to **Question 2b(i)** and **(ii)**.

Section B

Question 4 was the most popular choice with **Question 3** the least popular.

Question 3

- (a) Candidates who answered this question had difficulty matching the pollution with the mouths of major rivers and spotting the large number of polluted areas in the almost enclosed Nordic and Baltic sea areas.
- (b) Candidates were able to describe the processes leading to eutrophication and hypoxic zones, but did not link the causes to factories and farms along the rivers leading to the coast. Similarly, the responses to strategies for prevention were limited.

Question 4

- (a) Candidates demonstrated good descriptive skills with stronger responses using the scale to estimate the size of area lost. Similarly, the use of the causes pie chart was good with most able to describe the different contributions.
- (b) This was generally well-answered with a good understanding shown of the causes and effects of deforestation. The assessment was the weakest part of many answers although some candidates with good assessment skills were able to access the highest grades.

Question 5

- (a) Candidates who chose this question were able to demonstrate a reasonable understanding of the problems of an arid country and also had a sound understanding of the use of water for industrial, domestic and agricultural purposes.

- (b)** Candidates were mostly able to explain a range of water supply strategies and to link these to different needs. Candidates were able to provide some assessment of the methods, especially desalinisation plants. Responses also discussed water conservation processes. Successful comparisons of countries with different economies were seldom seen, particularly in weaker responses and good answers were not strong in this area.

ENVIRONMENTAL MANAGEMENT

Paper 8291/03
Centre-based Assessment

Key messages

This year's report falls into two sections:

- general comments and candidate performance report
- three appendices covering Cambridge Assessment administrative procedures.

General comments

The level of credit achieved varied across almost the full range available; most scripts were in the upper part of the range. Candidates selecting the same or a similar topic evidenced independent data processing and reporting skills, and there appeared no issue of plagiarism demonstrating that candidates had been given good individual guidance in this respect.

There were a number of candidate reports that achieved very high levels of credit; these demonstrated an excellent approach to the organisation and structuring of projects, whilst at the same time providing strong evidence of collected and collated primary data, often combining this with secondary data sources. Generally, where full credit was not achieved, this was due to not showing evidence of the use of an appropriate data analysis statistical tool, or not providing a clear and reflective evaluation of the investigation, i.e. strengths or weaknesses of the study in terms of the executed methodology.

A significant number of the higher achieving candidates clearly demonstrated the ability to balance and combine secondary data in support of their primary data when discussing and forming conclusions to their study. This led to the submission of very rigorous reports and well planned investigations overall.

High achieving candidates most often submitted detailed sources of references in support of their environmental proposals. These respondents were also most likely to have submitted a detailed and considered methodology in their outline proposal form prior to undertaking the investigation.

Other issues were as follows:

- There was commonly some leniency, particularly in assessment criteria **C2(a)** and **(e)** and **C3(a)** and **(b)**; additional credit was awarded where the work did not show the required level of skill.
- Credit was, in some cases, given for criteria not actually present in project reports, e.g. no credit can be awarded for use of a statistical tool when one has not been used, nor can full credit be given for conclusions that do not relate to the candidate's specific data.
- Where projects tended to rely on secondary data only, reports could be overly long at times and extend beyond the syllabus word count. Candidates need to take care to provide a clear and concise report that aligns with criteria **C2(c)** and **C2(d)**.

There were many project reports demonstrating an excellent approach towards organisation and structuring of coursework in a logical order: introduction, methods (justified), results and analysis, conclusion and evaluation. However, there were a few candidates who submitted essentially an extended essay on a particular topic. It is extremely important that centres as well as candidates recognise the difference between a research report and an extended essay, given the range of assessment criteria. The use of section or chapter headings as well as a contents page were often seen in the reports of the highest achieving candidates.

Candidates should carefully consider each of the following:

- 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 in the previous section?
- Does my conclusion sum up and relate my results 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?

For administration purposes, it is important that the correct mark from the Coursework Assessment Summary Form has been entered correctly on the MS1 form for each candidate; this should be a mark out of 40. Note also when awarding marks, the use of half marks is not permitted. It would also be helpful where there is a second marker to highlight the agreed mark on documentation before transferring it onto the MS1 form.

Comments on assessment criteria

Skill C1

Most candidates performed well in this skill area, and there was often an excellent level of detail demonstrated surrounding the background knowledge in relation to the hypothesis or research question.

Either as the project title, or as part of an introduction, hypotheses or questions were stated by most candidates, frequently being clearly written and not implicit to the introduction. This was important as a significant number of candidates concluded that their hypothesis was correct, yet there was no evidence anywhere in the script of a research question or hypothesis. High achieving candidates most often included the location of the hypothesis within a contents page.

Stating and justifying a methodology was in the main adequate. Good quality research requires the formulation of a plan detailing research sites, equipment, expected data and how it will be collated and presented. Candidates need to recognise that a detailed methodology is crucial when testing their hypothesis or answering their research question; without this element, there is the risk that the report will become an extended essay, thereby potentially reducing achievement of **C2** criteria.

Where a candidate's report had a limited methodology, which was often a brief list without any explanation or justification, it can be difficult for assessors to judge whether or not their methodology would be effective in testing their hypothesis or answering their question. Candidates should not rely on the assumptions of an assessor in this aspect, **C1(c)**.

Skill C2

To achieve full credit for **C2(a)**, candidates need to make sure all graphs and tables are clearly presented; this includes labelling all axes as well as providing a title. Graphs were sometimes inappropriate for the type of data to be represented; line graphs are suited to continuous data and bar graphs for discrete data. Graphs should have axes containing labelled units and both lines and bars should be easily interpreted.

There were a limited number of candidate reports that would be better described as extended essays and contained very little data presented in the form of graphs and/or tables. As a result, it was difficult for candidates to achieve credit in any criteria that required reference to data; this also negated the use of a statistical tool. Often these reports were heavily reliant upon photographic evidence with a limited amount or no quantitative data provided. This factor reduced the credit available for the associated criteria. It is better that photographic evidence supplements other forms of information.

The use of a statistical tool was a weakness for some. There is a difference between statistical methods that are used to describe data and statistical tools that are used to analyse data. Candidates need to consider the nature of the data and select an appropriate statistical test. A simple mean is unlikely to yield appropriate analysis unless it is backed up with graphical representation and/or further processing. Some centres awarded credit for **C2(e)** when there was no evidence at all of the use of a statistical tool.

The majority of candidates deserved full credit for the general organisation of their work and the quality of written communication.

Skill C3

This skill frequently formed the weakest part of a candidate's work. The main weakness in **C3(a)**, the conclusion, was a lack of reference to the data presented in the report. **C3(b)** was also often very limited, as only a small number of candidates referred to related environmental management principles, without which full credit cannot be awarded. This element also needs reference to the actual data within the report.

The evaluation needs to be a brief summary of those things that went well and not so well, i.e. success and limitations. There was confusion between an evaluation and a conclusion. Some candidates appeared to evaluate their secondary data instead of appraising their methodology (success and limitations of the methodology). A relatively small number did not include an evaluation for criterion **C3(c)**. Candidates may find the checklist useful within the general comments section of this report.

Concluding comments

It is essential that centres provide very close guidance in respect of the candidate's project title, as a significant number of candidates tried to review global data (often in relation to climate change) which is an extremely challenging topic given the assessment criteria and word count. Careful consideration must be undertaken in order that the title is not too broad in scope, which can limit the effective testing of the hypothesis. Occasionally, more than one hypothesis was described, and candidates again need to be aware that this may also have an impact in respect of their methodology, **C1(c)**, in it being able to securely test all hypotheses. Centres have a key responsibility to provide close guidance at the project proposal stage.

In addition to the topic chosen, there is the opportunity to learn some research techniques and put them into practice during completion of the assessment. The stronger topics and final reports were often derived from locally based research and the utilisation of primary data.

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