ENVIRONMENTAL MANAGEMENT

Paper 0680/11

Paper 11

Key Messages

Candidates should be encouraged to:

- look at the command word used in each question;
- take a ruler to the examination;
- complete graphs neatly and clearly.

General Comments

Most candidates made a very good attempt to answer all questions. **Questions 5(a)(i)** and **5(b)(i)** proved to be the easiest questions on the paper, with **Questions 1(a)(ii)**, **1(a)(iii)**, **2(b)**, **4(b)**, **5(b)(iii)** and **6(b)(iii)** the most challenging.

Comments on Specific Questions

Question 1

(a) (i) Many candidates were able to score partial credit but few were awarded full credit.

(ii) This question was not very well done, probably because candidates did not take particular note of how the rain gauge had been sited in the photograph, and therefore suggested features of its position which were already present.

(iii) A very large number of candidates simply wrote 'wind' rather than 'wind direction' and therefore were not awarded credit. A large minority correctly named the equipment as a wind vane, but this could not be credited. It is important that candidates are reminded to read the question properly.

(iv) A good number were able to suggest either thermometer or barometer and gave good reasons to do with direct sunlight and air movement.

(b) A significant number suggested **Q** and gave one good reason.

Question 2

(a) (i) This question was well answered. The commonest error was that basking sharks would eat sand lances.

(ii) Only a minority were able to suggest, in an unequivocal way, the importance of a cold current.

(iii) El Nino was quite well understood by many, although many arguments were confused.

(b) This was a difficult question and it was pleasing to see a reasonably large number of candidates being able to make some sensible suggestions.

Question 3

(a) This question proved surprisingly difficult for many who were unable to get much beyond suggestions of high birth rates and low death rates, without giving any real reasons as to why these two may happen.

(b) (i) Nearly all answered this correctly.

(ii) The calculation did not prove difficult for most, but a large number of candidates lost credit due to inappropriate rounding; 3.05 was frequently rounded to 4.

(iii) A range of very sensible suggestions were made as to how person **X** might reduce the size of their footprint.

Question 4

(a) (i) Many candidates were able to see that the area of the Dead Sea had reduced, although fewer were able to develop the point by suggesting where or by how much.

(ii) The rapid increase in the population surrounding the sea was noted by many, but far fewer were able to go on and translate this into reasons why the sea had reduced in size. Again, a lack of attention to detail lost credit, with candidates just saying that more people would need more water without saying for what purpose they would need it.

(b) This question was not well done by many. Many candidates misread this question and missed that it related to people *conserving* and *reusing* water. Building dams and using aquifers were common suggestions, but were not relevant in this context.

Question 5

(a) (i) Most were able to name three fossil fuels.

(ii) This proved straightforward for most.

(b) (i) The majority of candidates were able to complete the graph correctly.

(ii) About half the entry answered this correctly.

(iii) The distinction between what governments can do and what individuals can do still evades many candidates. This question was not well answered mainly because of the lack of an appreciation of this distinction.

Question 6

(a) (i) Many did not realise that humus, roots and organisms are all organic.

(ii) This was quite well answered, the commonest mistake being suggestions that photosynthesis needs air (correct) and that plants get this from the soil (in this case incorrect as the component of air which is needed is carbon dioxide, which is obtained through the leaves).

(b) (i) Most were able to make a sensible answer to this.

(ii) Many did not understand what was required here and wrote answers which were too vague to be credited.

(iii) Again, answers to this were often too vague to be awarded credit.

ENVIRONMENTAL MANAGEMENT

Paper 0680/12

Paper 12

Key Messages

Candidates should be encouraged to:

- look at the command word used in each question;
- take a ruler to the examination;
- complete graphs neatly and clearly.

General Comments

Most candidates made a very good attempt to answer all questions. **Questions 2(b)(iii)**, **5(a)(i)**, **5(b)(i)**, **6(a)(i)** and **6(a)(ii)** proved to be the easiest questions on the paper, with **Questions 2(a)** and **3(a)(ii)** the most challenging.

Comments on Specific Questions

Question 1

(a) Answers ranged from the very competent, scoring full credit, to explanations involving the equator being nearer to the sun. Many answers would have gained credit if candidates had explained that the Sun's rays pass through less of the Earth's atmosphere to reach the equator.

(b) (i) Many candidates were able to describe how the polar ice area had decreased and sea area increased between 1980 and 2010. Some candidates explained what had caused the changes instead of describing what the maps showed and so did not gain any credit.

(ii) There were some excellent answers referring to increasing levels of greenhouse gases which scored full credit. A few candidates appeared to be confusing the hole in the ozone layer with the greenhouse effect.

(iii) Candidates who read the question carefully, noting the reference to 'governments', usually gained full credit. The most popular measures were promoting the use of public transport, afforestation and generating electricity from an alternative energy source such as wind, solar or hydro. A number of answers would have gained more credit if they had written about afforestation instead of 'not doing deforestation' and given an example of an alternative energy source.

Question 2

(a) Few candidates gained full credit. The most popular choice of ecosystem was tropical rainforest but there were some good answers on hunting and gathering in the tundra which made reference to hunting caribou and seals. Some candidates wrote at length about shifting cultivators in tropical rainforests, others about nomadic pastoralists in deserts.

(b) (i) The calculation for percentage of forest cover lost between 1869 and 2000 was correctly executed with working by the majority of candidates. A common incorrect answer was 40%.

(ii) Some candidates completed the graph correctly but then drew a line joining all five plots, which was not a trend line.

(iii) Most candidates correctly described the trend that forest cover was declining. A significant number, however, described the line rather than what it shows about forest cover.

(iv) A number of candidates wrote vaguely about ecotourism instead of answering the question.

Question 3

(a) (i) Most candidates gained some credit for identifying one or two of the three forest biomes.

(ii) The most successful answers described the main differences between the taiga and the tropical rainforest biomes. Some candidates described different features of the trees in each biome without any comparative points. Others wrote about the climate of the biomes.

(b) (i) There were some excellent answers describing the environmental importance of the world's forests.

(ii) Most candidates were awarded some credit. Some wrote unsuccessfully about not doing things but the better answers included reference to afforestation, selective felling, agroforestry, logging quotas and the creation of national parks and biosphere reserves.

Question 4

(a) (i) Most candidates gained at least partial credit.

(ii) Accounts of why **Q** was most productive for fish and food showed sound knowledge of the requirement for sunlight, nutrients and phytoplankton. Most who wrote about tourism gained minimal credit. Answers related to oil often lacked convincing detail.

(b) (i) There were many excellent detailed answers about the causes of overfishing, although some candidates wrote about the results instead of the causes.

(ii) Many candidates gave answers that went into considerable detail about problems of monitoring strategies to reduce overfishing.

Question 5

(a) (i) Most calculated this correctly.

(ii) Many candidates wrote convincing explanations which revealed a sound knowledge of eutrophication.

(b) (i) Most candidates identified **V** as runoff and **W** as infiltration.

(ii) Marking a place on the diagram where interception occurs proved to be more challenging.

(iii) Some candidates plotted one bar instead of two on the bar chart. A number drew the height of one of the bars incorrectly, usually the shorter bar.

(iv) There were some very detailed accounts of how and why humans affect run-off which made good use of the table, the bar chart and the candidates' own knowledge.

Question 6

(a) (i) Many candidates were able to identify layer **N** as the mantle and layer **O** as the core of the Earth.

(ii) Completing the sentences with the words crust and tectonic appeared to be more challenging.

(b) (i) Most candidates gained at least partial credit for explaining why a strong earthquake occurred off the coast of Japan. There was some excellent knowledge of destructive plate movement and subduction.

(ii) Those candidates who explained that the NE of Japan was close to the epicentre often managed to link this fact with a tsunami and flooding along the coast.

ENVIRONMENTAL MANAGEMENT

Paper 0680/13

Paper 13

Key Messages

Candidates should be encouraged to:

- look at the command word used in each question;
- take a ruler to the examination;
- complete graphs neatly and clearly.

General Comments

Most candidates made a very good attempt to answer all questions. **Questions 1(a)(i)**, **2(a)(i)** and **4(b)(ii)** proved to be the easiest questions on the paper, with **Questions 1(b)**, **2(a)(ii)**, **2(b)(i)**, **4(b)(iii)**, **5(a)(ii)**, **5(a)(iii)**, **5(b)** and **6(a)(ii)** the most challenging.

Comments on Specific Questions

Question 1

(a) (i) Most answered this well, the commonest errors being to place producers and consumers under interaction.

(ii) Those who chose crop farmers generally scored very well.

(b) There were some reasonable suggestions for reasons why there would be concern over the loss of woodland. However, most candidates thought that the loss of bees would be a concern because of the unavailability of honey. Since pollination is included in the syllabus it was surprising that so few mentioned it.

Question 2

(a) (i) Most candidates were able to plot the required lines.

(ii) There were many good suggestions as to why the prediction of population growth is difficult.

(b) (i) This question was quite well answered by some, although many trivial comparisons were made.

(ii) There were many good suggestions about care of the very young, and the very old.

Question 3

(a) (i) Most candidates found this question straightforward.

(ii) This question was generally quite well answered in relation to desert, but many answers about the tundra were unclear.

(b) (i) Many candidates were unable to explain the changes, and only therefore gained credit for the descriptions.

(ii) A good number of candidates were able to suggest a financial constraint on small farms in developing countries but were often not able to gain further credit for suggesting what it is that they could not afford.

Question 4

(a) This question proved to be quite discriminating, a good number suggesting evaporation and run-off as the processes affected, but far fewer were able to suggest why the changes have occurred.

(b) (i) Only a minority of candidates realised that this was measuring drainage.

(ii) Most were able to plot the graph with little difficulty.

(iii) Only a minority of candidates were able to fully explain why sandy and clay soils are less good than a sand, silt and clay mixture.

Question 5

(a) (i) There were a good number of correct suggestions for the building of large dams, although unqualified provision of water was a very common answer.

(ii) The only answer that most candidates gave was the loss of traditional lands.

(iii) There were some carefully thought out suggestions and a small minority were able to consider both sides of the argument.

(b) Many candidates read more into this question than was intended and tried to talk about how the dam might cause floods rather than simply heavy rains.

Question 6

(a) (i) Most candidates were awarded full credit for this. The commonest error was to suggest that nuclear energy is sustainable. A significant minority also thought that biomass is an unsustainable source of energy.

(ii) Very few were able to make three sensible suggestions.

(b) This question was well answered with most candidates making very good use of the information provided.

ENVIRONMENTAL MANAGEMENT

Paper 0680/21

Paper 21

Key Messages

- Read the questions carefully, read each question more than once and underline key question words, such as the command words, (the words which tell candidates what to do).
- The most ignored commands on this paper were in **1(c)(ii)**. 'Looking at the sketch' was the key instruction, and also important was 'describe how'. Knowledge of traditional subsistence farming was needed, but the question required it to be applied to the example of the area shown in the sketch.
- Take careful note of the credit allocation for the question. This is increasingly important for questions with high credit allocations. To be awarded full credit, more is required than simply filling all the lines; depth and/or breadth is achieved by looking for different reasons, or by elaborating more fully, which is sometimes helped by use of an example (or examples).
- **Questions 1(a)(ii)** and **2(a)(i)**, which required descriptions of distributions from maps, were poorly answered. Some candidates did not seem to know what they were expected to do. In distribution questions, candidates need to focus upon stating where they are located, supported by named references to continents and countries (when relevant).
- When asked to give views on a topic or issue, as in **2(c)(iv)** and **2(e)(v)**, what matters is the explanation, not the personal opinion itself. Candidates who 'sat on the fence' by referring to more than one viewpoint tended to limit the depth and value of their explanations, compared with those who concentrated on supporting one clearly expressed view.

General Comments

Most candidates scored about the same for each of the questions, and there was rarely any real divergence. This showed that candidates tended to carry forward the standard set in answering the first question into the second question. Papers that were incomplete or unfinished were rare, indicating that there were no time problems. This meant that good candidates would have had time to look back, and check that their answers matched question needs, and that they had written all that they could for the credit available. Sometimes it was possible to detect answers in which supplementary information had been added later. It was also rare for questions to be left totally unanswered, which suggested good candidate familiarity with the topics being examined.

Questions which were particularly well answered were those which required a graph to be plotted, such as the temperature graph in **1(b)(i)** and the pie graph in **2(d)(iii)**. Other questions which were well answered included **1(d)(i)**, **2(a)(ii)** and **2(c)(ii)**. Less well answered were **1(b)(iv)**, **1(d)(ii)** and **2(d)(v)**.

Comments on Specific Questions

Question 1

Almost all candidates answered **(a)(i)** correctly. In **(a)(ii)** instead of describing the 'main features of the distribution' of savanna vegetation from the map, a significant number of candidates described the 'main features of savanna vegetation', for which no credit could be awarded. Those who did answer the question had few problems earning credit for within the tropics, even if they did not look for additional descriptive details such as on both sides of the Equator in South America and Africa, or across the Equator in Africa. In **(a)(iii)** some candidates lost credit because they named a different type of vegetation in **B** from that named in **A**.

Most candidates scored full credit in **(b)(i)**. The best finished graphs were drawn by candidates who chose a scale of 1 °C for one small square, and placed their dots in the centre of the column for each month. Neither of these were absolute essentials as accuracy was the important factor. Thus all graphs were marked on the basis of the candidate's own marked scale. Failure to mark the scale, which sometimes happened, meant that the credit available for plotting could not be awarded. Despite the question instruction, and the convention that temperature is always displayed in a line graph (because it is showing continuous data), some candidates drew bar graphs. The correct answer of 97 per cent was the one most commonly circled in part **(ii)**. The candidate needed to focus on high temperatures in **(b)(iii)**. Rainfall alone cannot be used to indicate that a climate is tropical. The majority of answers included both temperature and rainfall but needed to start with temperature in order to earn credit. The climate theme was continued in many of the answers given to **(b)(iv)**, sometimes without any reference to natural vegetation. In other answers references were to crops not natural vegetation. Only a minority of candidates, therefore, focused entirely on the requirements of the question. Answers based on differences in the colour of the vegetation between the two seasons were the most common. Many were worth only minimal credit due to lack of breadth. The best answers were those which also referred either to grass height or to trees with and without their leaves. Differences in opportunities for farming between wet and dry seasons was the starting point for most answers to **(b)(v)**. Some made good use of the earlier 97 per cent answer for rainfall concentration in the wet season. Those candidates who also included valid references to temperature in their answers, either favourable (high enough for crop growing all year) or unfavourable (high rates of evaporation in the dry season) were the ones most likely to be awarded full credit.

Growing crops and keeping livestock was the expected answer in **(c)(i)**. As always, all valid alternatives were accepted, with arable and pastoral a common answer. Cultivation was allowed as an alternative for crop growing, but broader terms such as 'farming' and 'agriculture' were not, even though it was likely that many candidates were referring to crop growing. 'Looking at the sketch' was the all-important instruction in **(c)(ii)**. Those who based their answers entirely around describing what they could see on the sketch were generally awarded full credit for describing the land uses and human activities shown. At the other end of the spectrum, some candidates accurately described characteristics of traditional subsistence farming entirely from knowledge, without any reference to the sketch. In between these two extremes were many part descriptive answers, occasionally over-reliant on stating what was not there. In comparison, part **(c)(iii)** was consistently well answered, with frequent references to the use of machinery and irrigation, as well as to grazing areas fenced off and modern buildings for farm storage.

In contrast to the answers to **(c)(ii)** the sketch was universally used for answering **(d)(i)**. Many of the answers seen were worth more than the available credit, because most candidates both stated evidence and commented on its significance as a cause of soil erosion. Typical answers included more than two pieces of evidence for high soil erosion risk from the sketch. Less well answered was **(d)(ii)**. Most began with **D** tree planting, which was the best known of the four strategies. Further credit was available for a full and precise answer covering a range of risk reducing factors such as interception, roots holding together the soil, and shelter from strong winds and heavy rain; unfortunately many candidates stopped after having described just one of these. The characteristics of the other three stated strategies were little known. Many candidates tried unsuccessfully to state what they thought they meant from the headings provided. For example, **E** dry land farming answers were often about irrigation, which this style of farming tries to avoid as much as possible. Part **(d)(iii)** was also well answered; many candidates made two or more suggestions of difficulties valid for the type of area shown on the sketch. Most used what could be seen on the sketch as their starting point, which meant that their answers were firmly based on the question requirement. Part **(d)(iv)** discriminated between candidates according the number and variety of reasons they gave. Although relatively few candidates referred to examples in their answers, able candidates commented on such a wide range of reasons that their answers went beyond the minimum needed for full credit. Weaker candidates tended to base their answers around just one or two reasons; the ones seen most often were that children were needed as workers on farms, and the lack of family planning (due to factors such as cost, non-availability and lack of education).

The space for showing the mean of 188 mm on the graph was restricted because it needed to be marked in carefully when answering **(e)(i)**. An answer within the range 315 mm and 325 mm was accepted for **(e)(ii)**. Candidates often placed marks on the graph from the highest and lowest values to the scale. Where this was done and both values interpreted correctly, there was little chance of an answer outside the accepted range being given. In **(e)(iii)** most candidates scored partial credit. Typically credit was given for problems for farmers from flooding in very wet months, and for problems with food supplies in very dry months. Candidates who noted the credit allocation for this question elaborated further on the problems caused by living in an area of unpredictable rainfall, especially if dry or wet Aprils occur in successive years.

Most candidates earned credit throughout **Question 1** with only occasional significant losses, which were either for not making full use of the sketch in **(b)**, or for not having the knowledge and understanding to answer the parts requiring longer answers, such as **(d)(ii)**, **(d)(iv)** and **(e)(iii)**, with the detail expected.

Question 2

Most candidates scored partial credit in part **(a)(i)**. This was usually gained for giving some indication of the overall distribution of plate boundaries along the western and eastern edges of the Pacific Ocean, even if the statement made was less precise than this. Only a few candidates looked for more detailed references to locations, such as passing through the island chains off Asia or absent from the west coast of North America, in order to earn further credit for describing the distribution. What was happening to the plates at destructive plate boundaries was well known in **(a)(ii)**. Correct references to the heavier oceanic plate sinking below the lighter continental plate, and being destroyed in the subduction zone, were frequent.

Candidates who were systematic in their approach to answering, and dealt separately with 'Ring' and 'Fire', gave the best answers to **(b)(i)**. In other responses the circular 'ring' like distribution was addressed more effectively than the 'fire' element in the label. Some candidates just gave a passing mention of the presence of volcanoes as explanation. Part **(b)(ii)** was less well answered than part **(a)(ii)** had been, despite being so closely related. There was more confusion between what happens at constructive and destructive boundaries in terms of volcano formation. Only a minority of candidates stated clearly that the melting of the oceanic plate due to its destruction in the subduction zone was the source of the magma. Despite this, credit was awarded for magma being forced up through a vent to the surface, and for lava and other erupted materials building up over time to form a volcanic cone on the surface.

Smoke, ash, rocks and gases were all needed for credit in part **(c)(i)**. Most candidates gave all four, although some listed other named gases associated with volcanic eruptions, but not named in the information here. Authorities evacuating people to shelters in safe areas was the reason referred to most in **(c)(ii)**. Otherwise candidates adopted different approaches. Some successfully concentrated on monitoring of the volcanoes, some on the experience gained from previous volcanic eruptions and others on the likely low population densities. A majority of candidates put forward at least two different reasons. Answers to part **(c)(iii)** varied more in quality. Prevailing westerly winds were the key to the explanation here. Also relevant were the huge size of the ash cloud, and the great height to which it had been pushed into the atmosphere. Some answers were confined to description only of the effects in other countries; these answers were more appropriate to the next part of the question, because they lacked focus on explanation of 'why' the effects were international. Those candidates who concentrated solely on economic effects in their answers to **(c)(iv)** gave the most successful answers. Many put forward convincing cases for Chile having suffered the most economically, while others used the information about Argentina and Australia to argue equally well that these countries suffered more than Chile. The weakest answers were entirely or partly about social effects such as health. A few candidates did little more than repeat the key sentence from the information starting with 'Levels of air pollution were high...' without any further explanation in **(c)(v)**. In the best answers candidates tried to separate the likely causes for sore eyes and skin, (such as from the sulfur dioxide), from those for breathing problems, (such as clouds of ash, dust and smoke).

In **(d)(i)** the tick needed to be placed in the box for 3 or any lower point on the pH scale to indicate acid soil. Fewer candidates gained credit here than in **(d)(iv)** where a point on the scale between 5 and 8 was accepted. In fact, most candidates ticked a pH of 7. Dangers of another eruption was the most chosen reason in answers to **(d)(ii)**. Plenty of other reasons were also used, and a high proportion of the answers were sufficiently well explained to be awarded full credit. Only those candidates who continued with the theme of acid soils, despite the clear instruction to find 'another' reason, failed to earn any credit. The pie graph in part **(iii)** was accurately completed by most candidates. The most repeated mistake was to plot 40%, 30% and 30%. The most effective completed keys were the ones in which the shading used on the pie graph was placed within labelled boxes. How well a candidate understood what was meant by texture determined the quality of the answer given to **(d)(v)**. Having noted the well balanced nature of the three components, candidates who understood examined the individual characteristics of sand, clay and silt to show how well they complemented one another.

There were wide variations between how well the information in the stem of this question was selected and used to answer the first four parts of **(e)**. Those who did little more than state one or two relevant pieces of information in **(e)(i)** did less well than those who tried to explain their significance to the question. The great majority of candidates correctly circled 60% in **(e)(ii)**. Part **(e)(iii)** was a good discriminator between strong and weak candidates. The best answer needed two parts to it: that 60% of the country's population live in Java, yet the island is only 7% of the total area of Indonesia. Stating only one of the percentages without the other gave a much weaker answer. Alternatively, Java's stated high density of population could be used as

the basis for answering. In this case the challenge was to explain that it was extraordinarily high. The answer in **(e)(iv)** was 11 per 1000 (or 1.1% as some answered). Whether this answer was given or not depended upon the candidate knowing what was meant by natural increase. The final question, **(e)(v)**, was another example of many candidates only scoring partial credit, and only a few gaining full credit. Many candidates gave reasons only for the choice made, whereas in most of the higher scoring answers candidates also explained why they thought their chosen way was superior to the other two. In weak answers, worth only minimal credit, candidates added only a little to that already given to them in the boxes.

Candidates accumulated credit throughout **Question 2**. The level of credit was mainly a reflection of how consistently individual candidates accumulated credit. Perhaps the most testing question was **2(d)(v)** with its great reliance on candidate understanding of the term soil 'texture'.

ENVIRONMENTAL MANAGEMENT

Paper 0680/22

Paper 22

Key Messages

- Read the questions carefully, read each question more than once and underline key question words, such as the command words, (the words which tell candidates what to do).
- Take careful note of the credit allocation for the question. This is increasingly important for questions with high credit allocations. To be awarded full credit, more is required than simply filling all the lines; depth and/or breadth is achieved by looking for different reasons, or by elaborating more fully, which is sometimes helped by use of an example (or examples).

General Comments

Despite the two topics examined being so different, most candidates scored about the same for each of **Questions 1** and **2**. This meant that the standard set in answering the first question was carried forward into the second. Even when a candidate did show a marked preference for one of the two questions, it was as likely to be for **Question 2** as for **Question 1**. Pressure of time to complete the paper was not an issue. Some candidates successfully continued their answers onto the blank pages within the booklet. Candidates showed consistently good familiarity with the topics examined.

Questions which discriminated well between more and less able candidates were **1(b)(iii)**, **1(e)(i)** and **(ii)** and **2(a)(ii)**. These questions gave able candidates the opportunity to make the most of their knowledge and understanding, while not denying access and credit to less able candidates.

Questions which were consistently well answered were those involving the use of practical skills such as shading the world map in **1(a)(iii)** and drawing the pie graph in **1(c)(i)**. Written questions for which high credit was consistently awarded included all the parts of **1(c)**, **2(b)(iii)** and **(iv)**, **2(d)(ii)** and **(e)**. Among the more difficult questions for candidates were **1(a)(iv)** and **2(b)(i)**.

Comments on Specific Questions

Question 1

Almost all candidates answered **(a)(i)** and **(ii)** correctly. Most understood what needed to be done in **(a)(iii)** and many were awarded full credit for both accurate plots and good visual appearance between continents with low and high average incomes per head. If there was a plotting mistake on the map, it was often that only that part of Asia south of the North-South divide was shaded in. A good appearance was created by candidates who acted on the question instruction to use 'denser shading or stronger colours for the high values'. More able candidates made the best progress in **(a)(iv)**. For 1, the values and map showed really good fits between North America and Latin America, and between Europe and Africa, because of the big differences in average incomes between adjacent continents. For 2, the fit within Asia was less good; here the line split the continent in half, and included some quite rich countries in the Middle East on the south (poorer) side of the line. For 3, the question was more open and answers were more varied. Most were of some relevance. Most candidates scored partial credit for this question, which indicated some understanding of the question requirements.

In **(b)(i)** the only acceptable answer was average income per head. Almost as popular an answer was 'Japan' instead of one of the five measures, perhaps because it was the country which had the highest income per head. The best answers to **(b)(ii)** were given by candidates who mentioned one or more of the water-borne diseases such as diarrhoea, typhoid and cholera, since these are spread as a result of contaminated drinking water. Those who tried to base their answers around water-based diseases, notably malaria, fared less well due to lack of relevance to the question set. **Question (b)(iii)** produced the biggest

range in answer quality of any question on the paper. Some candidates gave high quality answers, displaying real understanding, based on variations in income per head in the four Asian countries. These candidates highlighted where they supported the line (between Japan and China) and where they did not (between Russia and South Korea). Other measures were used as well to support this, but only where relevant. Some less able candidates gave answers in which reference was made to three or more of the other non-income measures, which usually led to confused and muddled answers. In between were many answers that scored partial credit, generally for commenting either on the good fit between Japan and China, or the less good fit between Russia and South Korea, but not on both.

The pie graph was almost invariably completed accurately in **(c)(i)**, even though a few candidates failed to fill the boxes in the key. Those, who understood that the graph showed that 90% of the money went to developed countries and/or only 10% to developing countries, gave the clearest answers to **(c)(ii)**. Answers about the advantages of guaranteed and stable prices for banana farmers were needed in **(c)(iii)**, compared with references to either improved sanitation or community canteens (or both) and their advantages for the community's quality of life needed in **(c)(iv)**. Although some candidates gave the same or similar answers to both, most candidates managed to select the information relevant to each one from the comments, and answered both questions well. Only minimal credit was awarded to most candidates for their answers to **(c)(v)**, usually for reference to lower profits. Further credit was awarded to candidates who looked for another reason. Small outputs and less reliable quality were the two other reasons most used.

Food, non-governmental and governmental types of aid were the three answers for **A**, **B** and **C** in part **(d)(i)**. In **(d)(ii)** the answers were short-term, long-term and long-term. In **(d)(iii)** only the first two answers were marked, unsustainable in **A** and sustainable in **B**. Most candidates scored most or all of the available credit, which showed good levels of understanding about the nature of different types of aid. The candidate's own answer for **C** of sustainable or unsustainable was the one marked in **(d)(iv)**. Many of the candidates who chose unsustainable tended to give narrow answers which referred only to the construction phase. In stronger answers candidates also referred to reduced effectiveness with time, such as silting up behind the dam and loss of silt on the farmland below the dam. Those who chose sustainable tended to base their answers on water store and/or energy for the long-term. How well the basic idea was elaborated upon determined whether full credit was awarded. Advantages and disadvantages were equally well known in **(d)(iv)**. The two ideas referred to most were relief of suffering after a natural disaster (however expressed) and aid dependency. References to others were plentiful; candidates who noted the credit allocation for the question and kept looking for more points until they reached four gave the best answers.

The key to achieving full credit in **(e)(ii)** was a good choice of country or area in **(e)(i)**, for which the candidate was able to state places, name specific tourist attractions and show awareness of management. Sometimes it was the candidate's own country, or a location within it, which allowed enough information of a precise nature to be included for a full credit. Sometimes the choice was too narrow, such as just the Taj Mahal, which made it more difficult to generate a high scoring answer, despite it being an appropriate choice for the two question themes. Some answers were unbalanced, stronger on tourist attractions than management, or vice versa. These answers could still score well because only minimal credit was retained for each question theme. For tourist locations outside their home country, popular choices were Kenya, Thailand and islands in the Indian Ocean, particularly the Maldives. Following on from a good choice of location, full or almost full credit was quite common. All credit was not automatically lost for less appropriate choices of location, either too big such as Africa, or from a developed country such as Australia. Partial credit could still be earned, usually for sensible references about tourist management, such as ecotourism initiatives, of significance worldwide.

Candidates were awarded credit throughout all parts of the question. Part **(b)** proved to be a little more difficult than **(c)**. Otherwise an even performance was what mattered most.

Question 2

Cyclone, drought and flood were the climatic hazards in **(a)(i)**, while earthquake and volcano were the two that were tectonic. On the rare occasions when the lists were wrong, flood was the most likely hazard to be included under tectonic. In **(a)(ii)** the best answers came from candidates who concentrated on trying to give definitions, and were able to do so. All of the five hazards seemed to be well known, and equally familiar to candidates. Some candidates focused more on causes or effects; most clearly understood what the hazard was, without actually stating a definition. For marking purposes, a certain amount of 'give' and 'take' between answers was allowed, so that part credit was given for answers showing knowledge without being actual definitions. Partial credit was most commonly awarded. The question discriminated well since it was more able candidates who gained the highest credit. Volcanoes proved to be a good candidate choice in **(a)(iii)**. Candidates were able to describe a wider range of ways, more fully, for predicting their occurrence

than for the second most popular choice, cyclones. References to using weather satellites to track cyclones over the sea, well before hitting land, thus allowing time in advance for evacuation to shelters, were given by only a few of those who made this choice. Most drought and flood answers were less successful because they lacked adequate references to weather forecasting. The choice of earthquakes made it impossible for the candidate to answer the question. One widespread misinterpretation among the latter group of candidates was that seismographs predict earthquakes, whereas all they do is register the magnitude of movement as it occurs. In **(a)(iv)** the choice of earthquake was credited since it was so obviously the best choice. Some candidates essentially did no more than repeat the words in the question as explanation; something extra about plate movement was needed for full credit.

Accurately completing the divided bar graphs in **(b)(i)** proved to be more challenging for candidates than shading the world map and drawing the pie graph had been. Some drew two separate bars within each divided bar, which was not credited; it was possible still to earn credit for completing the key correctly. Others plotted 90% and 98% correctly without realising that the remaining percentages were for developed countries. Usually they shaded each graph differently, because essentially they were drawing two non-divided bar graphs. This meant that they were unable to complete the key. Others, who knew what to do, found drawing the divided bars a quick and easy task. In part **(ii)**, because candidates were not restricted by the wording of the question to the five natural hazards listed in earlier parts of the question, tsunami was as acceptable an answer as cyclone for the first natural hazard in the box. The best answers to the next two were earthquake and drought in that order. Quite a number of candidates inserted flood for one or more of the answers, but this was not the best choice for any of the three when all the methods of preparation stated were taken into account. In most answers to part **(b)(iii)** poverty, either directly stated or inferred, was the underlying reason, while the attitude of the government and authorities was also regularly referred to. Candidates tended to refer both to poor preparation in advance and inadequate response in the aftermath. Virtually all candidates managed to gain at least partial credit; it was those who took note of the credit allocation by elaborating and explaining more fully who scored highest. These candidates often gave specific examples of preparations made in advance in known hazard regions, such as how to make buildings more earthquake proof. Question needs in part **(b)(iv)** were well understood, which made it one of the best answered questions, particularly by candidates who based their answers on people living close to active volcanoes. Many gave precise answers, based on fertile soils, but in addition with frequent references to other economic opportunities, such as for minerals, energy and tourism.

To be awarded credit for **(c)(i)** candidates needed to do more than state what '1 in 100' years meant; they had to go back to the stem of the question at the top of the page to make use of the information about the last flood of equivalent size. That was in the 1920s, almost one hundred years ago. Those who sought their answers from the map answered **(c)(ii)** well; those who tried to use information from the written introduction of the question at the top of the page, answered it badly. The initial credit for distribution was around the sides of the River Indus, typically followed by references to it extending the full length of the country (however expressed). These two points were made by the majority of candidates. Finding a third descriptive point about distribution proved to be more difficult. Some did it by using the key to estimate the general width of the area affected (for example, 200 km or more wide); others did it by describing the locations of areas unaffected in the north east or south west. The best answers to **(c)(iii)** were the ones based on the tremendous amount of rain that had fallen in the mountains of the north, such that the Indus was still in flood 1000 km further south. Those who gave narrow answers only about the Sindh or deserts missed the point of the question. In **(c)(iv)** answers addressed the large number affected better than why few lost their lives. Most showed little awareness that this flood was such a major event, that it takes time for flood waters to make their way downstream, so that people could not fail to hear about it (even in remote rural areas) and would have had time to get out of the way. What candidates did realise was that people in rural areas could do nothing to stop the waters flooding houses and cropland and causing damage on a massive scale.

Those who gave examples of immediate effects such as loss of crops, or destruction of farmland by mud and stones were awarded credit in **(d)(i)**. Answers referring to transport and disease could not be credited because the question asked for effects on 'cropland'. The most obvious long-term effects were layers of fertile silt deposited and underground water stores filled. Mention of one of these gained further credit. In **(d)(ii)**, information from the report strongly supported the answer of there being only a low chance of getting out of the poverty cycle, such was the scale of the losses and destruction among poor farmers 'with little before the flood' and 'nothing after it'. When this was the chosen line of answering, how well and fully the candidate answered determined how much credit was awarded. Many answers were from candidates who understood well enough, but who did not seek to give their answer extra breadth or depth. A considerable minority took the view that in future more fertile soils and refilled water stores would allow escape from the poverty trap. With this approach, it was less easy to gain high credit, mainly because it ignored the massive immediate problems widely covered in the report. For some candidates mixing these two approaches to answering worked well.

Candidates were free to refer to any natural hazards in their answers to part **(e)**. In practice, most followed the order of the question and referred to earthquakes first, followed by drought. The needs of this question were well understood. Most candidates made enough progress to earn at least partial credit by referring to the serious effects of earthquakes in urban areas and of drought in rural areas. Those who earned higher credit also tried to explain how/why rural areas were different from urban areas for loss of life from earthquakes, and how/why water and food supplies were different and more assured in urban areas during times of drought. In other words, they gave fuller and more effective answers.

Most candidates finished off the final two parts of **Question 2** with some of their stronger answers. The topic matter was familiar throughout.

ENVIRONMENTAL MANAGEMENT

Paper 0680/23

Paper 23

Key Messages

- Read the questions carefully, read each question more than once and underline key question words, such as the command words, (the words which tell candidates what to do).
- Command words 'explain how' in **1(a)(iii)**, 'how' and 'why' in **2(b)(ii)** and 'state' and 'explain' in **2(c)(ii)** were the one most likely to be ignored or misinterpreted in this paper.
- Always support descriptions from data tables and graphs by referring to relevant values. Many answers to **Questions 1(a)(ii)** and **1(e)(i**) were only awarded partial credit because of the lack of supporting use of values from the table or graph.
- Take careful note of the credit allocation for the question. This is increasingly important for questions with high credit allocations. Candidates need to look for more depth and/or breadth, which can be achieved in a variety of ways according to the nature of the question set, such as by looking for different reasons, or by elaborating more fully, or by the use of an example (or examples). Candidates need to be aware that this is not the same as filling all the lines left for answering.

General Comments

The credit awarded for **Question 1** and **Question 2** were often similar. From time to time a particular candidate showed a marked preference for one of the topics being examined, sometimes for biosphere (**Question 1**) and sometimes for lithosphere (**Question 2**). There was no persistent discernible candidate preference for either question. Candidates completed the paper comfortably within the time allowed; this meant that good candidates had opportunities to look back and check their answers. Sometimes extra writing added at a later stage could be identified. There were few unanswered questions. Least well known was what was meant by 'niche' in **1(a)(iv)**. Also how and why malaria causes many deaths in **2(e)(i)** was not well known by the majority of candidates. Other questions answered less well on average included **1(a)(v)** and the explanation of volcanoes in part of **2(a)(iv)**.

Questions which were generally well answered by candidates included **1(b)(ii)** in which candidates showed plentiful good understanding of non-sustainability, and **1(c)(i)** and **(ii)** in which a good range of reasons were given to support the choice of Cameroon as the country where the risk of rainforest destruction was greater. In **Question 2**, the various parts of **(c)** were usually well answered. In both **Questions 1** and **2** the pattern was for candidates to gain some credit in each part, without necessarily earning full credit in the higher scoring parts.

Comments on Specific Questions

Question 1

Most candidates were awarded at least partial credit in **(a)(i)** for stating that the natural rainforests are close to the Equator and within the tropics. What distinguished the better answers were supporting references to distribution for named areas, such as largest extent in South America. Low temperature range and rainfall above 100 mm for most months were the two most commonly stated descriptions in answers to **(a)(ii)**. Candidates who looked for more, and quoted or used more of the values given, were the ones who were awarded further credit. In the highest scoring answers to **(a)(iii)** candidates directly related the characteristics named to the hot wet climate, referring to the way that it allowed not only continuous growth, but also the most ideal climatic conditions on Earth for plant growth. A minority of candidates managed to state what was meant by niche in **(a)(iv)**. Of these, only a few could give a plant example in tropical

rainforests, such as liana or epiphyte. In **(a)(v)** many candidates tried to re-work information already given in the question, such as tall trees and branches concentrated at the top and so only gained minimal credit. Much superior, although quite rare, were the answers based on known tall tree characteristics in rainforests, such as leaves with drip tips and buttress roots.

The best choice to answer the biodiversity theme in **(b)(i)** was from the last three lines of the newspaper report which stated that the rainforest has more than half of Africa's species of wild plants and animals. In **(b)(ii)**, the thrust of the newspaper report was that the activities mentioned were non-sustainable. Most candidates realised this, and used the report information well to support their chosen answer of unsustainable. There were many high scoring answers. Some also included perceptive comments about how some of these activities could be made more sustainable.

Choosing Cameroon in **(c)(i)** made it easier for the candidate to put forward strong reasons in **(c)(ii)** based on more population pressure and poverty than in Gabon. Full credit was awarded most regularly to those candidates who not only made clear the significance of the information given in the table, but also showed how one item led to another. The weakest answers came from those who merely stated information from the table without much comment about the theme of the question. The considerable number of candidates who chose Gabon had a harder task to put forward a convincing case. Many did this by looking further ahead into the future and commenting on the vulnerability of having such a large proportion of the country's rainforests intact once forests in surrounding countries had already been destroyed. Even so, giving convincing, high scoring answers for Gabon was a much more difficult task than for Cameroon.

Many candidates found it difficult to vary their language for differences in environmental impact between plantations **A** and **B** in part **(d)(i)**. Low scoring answers of 'low impact' in **A** and 'high impact' in **B** were common. Those who conveyed the idea that the rainforest was working much as normal in **A** while some variety of forest habitats had been lost in **B** gave the best answers. Most commonly referred to in **(d)(ii)** was the need or otherwise for the use of pesticides; comment about this was relevant to both parts of the question. Candidates who commented more broadly, especially about the advantages of growing a variety of crops in **A** compared with monoculture in **B** scored the most credit. The answer given by most in **(d)(iii)** was higher output, given either as a general statement or through the use of the figures from the information box. Decreasing soil quality was the most common reason given in part **(iv)**. Other reasons suggested from the information were that the cocoa trees are now beyond their productive life and there have been no new plantings, and that the cocoa trees are vulnerable to disease. Most candidates only scored minimum credit for stating only one reason without significant elaboration.

More able candidates identified fluctuations, and the significant rise in world prices since about 2007/8, as the two main characteristics shown in the graph for **(e)(i)**. To gain full credit candidates needed to quote values. Other characteristics were suggested by candidates, many of which were valid, but worth only minimal credit because they covered only a small number of years, such as the fall between 1997 and 2000. Answers based on variations in supply and demand, relevant for both fluctuations and for recent rapid increase in world cocoa prices, were widespread in **(e)(ii)**. Candidates tended to look for reasons for these variations which meant that many were awarded full credit.

Credit was awarded with some consistency throughout **Question 1**, particularly from part **(b)** onwards. What was critical in distinguishing higher scoring candidates from the rest was the extent to which they earned high or full credit in the higher scoring parts of **(b)**, **(c)**, **(d)** and **(e)**.

Question 2

Care and precision were required to answer the first three parts of **(a)** accurately. On the diagram for **(i)** the arrow heads needed to show the plates colliding, since it was a destructive boundary. For **(ii)** the best position for **C** was at the top of the vent, not in the vent or beyond the rim of the volcano. Crust was given as often as the correct answer of mantle in part **(iii)**, while 'fold mountains' or 'mountain range' were much better answers than just 'mountain' for **E**. Almost all earned some credit in these first three parts, but few scored full credit. In **(a)(iv)** mention of processes in the subduction zone could be credited under either heading. In general, candidates found it easier to apply processes to the formation of earthquakes than volcanoes, with understanding of rock melting as the source of the magma shown only occasionally.

With the help of the diagram, many managed to show understanding of the difference between focus and epicentre in **(b)(i)**. Less successfully answered was **(b)(ii)**. Candidates typically filled all or most of the answer lines but addressed only one point in the mark scheme, that the force of the earth tremor decreases with distance from the epicentre. Surprisingly little use was made of supporting information for this from the

diagram, such as almost total destruction in the centre, including fire damage, compared with buildings little affected further away.

The obvious answer of greater earthquake magnitude in **(c)(i)** was given by most candidates. How well **(c)(ii)** was answered was often a reflection of examination technique. Those candidates who answered this question in the best way began with a brief statement either by directly quoting from the table, such as the kilometre values for comparable depths of focus below the surface, or by using the values to state that it was 6 km closer to the surface. This was then followed by an attempt to explain. Only simple explanations were expected such as 'focus closer to the surface and therefore greater surface effects'. The weakest answers were given by candidates who stated information directly from the table without comment, for which partial credit was available depending on the range of what was stated. In practice, many answers were a mixture of the two, with statement and explanation complete for one or two of the factors, and statements from the table only for the other two or three factors. Lack of wealth formed the basis for most answers to **(c)(iii)**, but only those who had obviously taken note of the 'how' and 'why' command words in the question developed their answers sufficiently well to claim full credit. Many of the best answers to part **(c)(iv)** moved from the physical factor of continuing risk of more earthquake shocks, into mention of factors more social in nature such as fear, limited hope and loss of community. The credit allocation suggested to more able candidates that they needed to look beyond just one reason.

Many gave the correct answer of 85% from the pie graph in **(d)(i)**, although a few gave 15% instead. The lower of the two divided bar graphs was almost always accurately completed in **(d)(ii)**; in the upper bar graph, showing the 9% for landslides, etc. as either 7% or 10% was the most frequent plotting mistake. A few left the key box empty even if they had completed the two bar graphs fully and accurately. Overall this was a high scoring question with many obtaining full credit. In part **(iii)** some candidates merely quoted 42% and 15% from the lower table, which was not enough. Candidates needed to show that they had used both tables, in order to highlight the lower occurrence but higher death rates from drought, or vice versa for floods. In part **(d)(iv)**, many candidates showed basic understanding of the question. Typically candidates made points such as affecting larger areas, for a longer period of time, and reducing food output among people totally dependent on farming for their survival. Higher scoring answers covered a fuller range of points. Occasionally references were seen to the example of the Sahel, which enhanced these answers.

Many candidates gave similar answers to both parts of **(e)**. In **(e)(i)**, only those candidates who paid full attention to the question concentrated on describing the ways in which either malaria or cholera are transmitted to people. Malaria was the more popular choice, yet on average those who chose cholera gave the better answers. Widespread misunderstanding was shown about the malarial mosquito needing dirty, contaminated waters in which to breed, as well as about methods of transfer from person to person. Answers to **(e)(ii)** were much more successful. Reasons for the increased presence of standing surface water or contaminated water after natural disasters were well identified; there were also many references made to the disruption of normal health care services in the wake of a disaster. Many were awarded full credit.

The general standard of answers given to **Question 2** was little different to that for **Question 1**, even if there was some divergences in performance for individual candidates between the two questions. In many ways the pattern of answering was similar as well, with a consistent accumulation of credit, particularly from part **(b)** onwards.

ENVIRONMENTAL MANAGEMENT

Paper 0680/03

Coursework

General comments

Centres continue to encourage their candidates to carry out some interesting environmental topics. The firm grasp of the specification was apparent in these projects and it is encouraging to see how concerned candidates are about their own local environment.

Comments on specific questions

Domain A

Candidates showed that they benefitted from being allowed to apply the theory to real examples of environmental concerns producing some very good marks in Domain A.

Domain B

Candidates worked hard on this section implementing a wide range of techniques including some excellent first hand practical work. Safety, however, was not always considered as thoroughly as it could be.

Domain C

The main focus of Domain C needs to be a thorough review of possible choices for which interested parties can be canvassed as to their opinions.

With this in mind a considered management plan can be devised with its own constraints and advantages. This is still rarely seen and it would benefit candidates to look ahead when they begin their investigation to consider what options are available in reference to sustainability.

ENVIRONMENTAL MANAGEMENT

Paper 0680/41
Alternative to Coursework

Key Messages

Centres should work through past papers to help candidates see how to make the best use of the information given for each question.

General Comments

Many candidates understood and made good use of the source material and their written responses were clearly expressed. The mathematical and graphical questions posed some difficulties for a minority of candidates.

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

Comments on Specific Questions

Question 1

(a) Most candidates understood the term 'wide industrial base'.

(b) There were many detailed descriptions of the graph that gained full credit.

(c) (i) Most candidates suggested that yields would improve, but the other marking points were rarely given.

(ii) The most common answer commented on the loss of biodiversity; all the other marking points could be related to this suggestion but only a small number of candidates went on to give any further explanation.

(iii) There were references to 'superweeds' and loss of varieties of crops. However, the concept of genetic resistance to 'round up' being passed by pollination onto other species was only suggested by a very small number of candidates.

(d) (i) Most candidates suggested two appropriate factors to be kept the same.

(ii) Most graphs were well plotted with both axes labelled. There are still a significant number of candidates who do not label both axes and therefore limit the amount of credit that can be awarded.

(iii) The decisions about the effect of urea on plant growth and the descriptions from the graph were usually very good.

(e) (i) Most candidates realised that the plants would be absorbing phosphate, but there were some statements that were too ambiguous to gain credit.

(ii) The majority of candidates made the correct choice of locations.

(iii) The sequence of events leading to eutrophication was well described by most candidates. Some candidates suggested, incorrectly, that plants used up oxygen whilst still alive. The decomposition of dead algae by bacteria leading to oxygen depletion was fully described by a significant number of candidates. Maximum credit was often awarded.

(f) (i) The majority of candidates provided correct calculations and a final answer.

(ii) Most candidates gave creditable answers as to why growing the same crop year after year leads to reduced yields.

(iii) Nearly all the candidates gave a correct answer, crop rotation being the most common.

(g) Most candidates answered the question by expressing a view that production would either increase or decrease. The source information was sufficient for candidates to explain their point of view and all the marking points were seen regularly. Only a small number of candidates gave answers without any clear decision as to whether they thought it would increase or decrease; some credit was awarded for clear statements but the maximum credit could only be awarded to candidates with a clear line of argument.

Question 2

(a) There were many answers that could not be given credit as they either just repeated information given in the question or made statements that contradicted information given. Many recognised that the oil from soy was a renewable fuel, however, only a small number developed their answer further.

(b) (i) The calculation was correctly completed by many candidates.

(ii) A minority of candidates suggested that the differences might be linked to the economic status of a district and the age of the cars.

(iii) Ways in which the sampling could have been improved were clearly stated and many candidates gained full credit.

(c) (i) The table was completed successfully by nearly all the candidates.

(ii) This question required some thought about the details of the method as given in the question. The detail that was missing related to the boxes, and a significant minority of candidates made correct suggestions.

(iii) The correct answer was nearly always given.

(iv) This question was demanding, and it was hoped that candidates would think about experimental error; some did, but the majority just described the two surveys which did not answer the question.

(d) (i) Most candidates correctly suggested that there were more particles in April.

(ii) The differences in climate between April and November were carefully described by a minority of candidates. Most either thought that the climate was similar, or made vague statements. Candidates who quoted the values from the table generally received more credit.

(iii) It was rare to see a temperature inversion either stated or described. Some candidates seemed to answer the question in the context of the climate in their country, rather than that given.

(e) (i) Most candidates readily identified the interests of the farmers, however, they often failed to suggest a convincing reason for the city residents' response.

(ii) The questions were often well laid out but candidates did not use their knowledge of renewable energy sources to any great extent. A small number of candidates only provided further questions about the use of cars.

(f) The full range of answers were seen. Some were excellent and easily gained full credit. Most answers had some creditworthy points.

ENVIRONMENTAL MANAGEMENT

Paper 0680/42
Alternative to Coursework

Key Messages

Centres should work through past papers to help candidates see how to make the best use of the information given for each question.

General Comments

Many candidates understood and made good use of the source material and their written responses were clearly expressed. The mathematical and graphical questions posed some difficulties for a minority of candidates.

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

Comments on Specific Questions

Question 1

(a) The majority of candidates earned full credit for this question, with the most common answers relating to low cost and the ability to carry bulky goods.

(b) (i) Most candidates were able to do this calculation.

(ii) Many candidates answered this correctly, although a minority gave too many or too few zeros.

(c) (i) Very few candidates understood this question, and there seemed to be little appreciation that lead was harmful to human health. Many referred incorrectly to adults having better immunity. More worryingly a significant number thought that as adults are bigger they need more lead in their bodies.

(ii) This was well answered by most candidates.

(iii) This was a demanding question and many simply repeated their answer to **1(c)(ii)**. A few suggested that the very young had more exposure to lead. The idea that lead pollution might have got worse was not expressed.

(d) (i) A large number of answers were too vague to gain credit. It was often suggested that all the population should be used. However, a sample must be only a portion of a whole population. More able candidates usually commented on using children of all ages from all areas of the district.

(ii) Most candidates were able to state that the concentration of lead in the blood of children living in district **1** was higher than in district **2** or district **3**. However, very few went on to expand their answer with careful use of the data.

(iii) Candidates who carefully considered the source information were able to earn full credit. The most common ideas related to lead-free petrol, non-lead water pipes and various comments about controls on dumping waste.

(e) Very few candidates realised that dogs could be used as an early warning system, as they would suffer from lead poisoning before humans.

(f) (i) Most candidates asked questions about the number and ages of children, with fewer mentioning the local industries or health issues.

(ii) The responses to this question showed that many candidates have not been taught about how a questionnaire could be successfully designed and used. Only a small number of candidates gained full credit.

(g) (i) The vast majority gave the need to dispose of wastes as the main reason for the location of tanneries. Few stated the need for washing the skins, and some thought that the location was necessary for the cattle to drink.

(ii) The point of highest pollution had to be downstream of the tanneries. Many candidates put an **X** in the waterway but in the wrong section; others placed their **X** on land.

(h) (i) Most correctly gave the high rainfall as the reason for flooding. However, it was rare to see any of the other points in the mark scheme.

(ii) This question was generally well answered, although a significant number seemed to think that farming happens in shanty towns.

(iii) This was a demanding question requiring thought about the source information, followed by sensible suggestions about the factors used to select shanty towns for improvement. As expected the answers were variable, although all the marking points were seen and some candidates did gain maximum credit.

(iv) Most candidates realised that species died out. A significant minority did not consider any of the other information given, such as decline in biodiversity, and so did not receive further credit.

(v) The concept of heavy metal poisoning has been examined in the past. On this occasion the topic did not appear to be well understood. Very little detailed discussion of what happens with organic pollution was given, and only a very few gave any detail of why chromium pollution is so dangerous.

Question 2

(a) (i) Many candidates suggested that it was to make more profit, rather than saying that the farmers were trying to maintain their income.

(ii) Most candidates knew that increased production would further decrease prices, although not so many elaborated correctly about supply and demand

(b) There was lack of detail given in many answers. Increasing soil fertility was the most common answer, but candidates seemed not to appreciate that the farming methods were different from each other. Mixed farming was often not understood.

(c) (i) There were many very good bar charts gaining full credit. Some candidates failed to label both axes.

(ii) Almost all candidates correctly selected pepper.

(iii) Most candidates suggested a crop, but failed to give a reason for poor yield.

(d) (i) Most candidates produced a table and received high or full credit. However, there were some examples of information given in the question being copied without any input from the candidate.

(ii) Most candidates understood the issues surrounding organic farming and gave good answers.

ENVIRONMENTAL MANAGEMENT

Paper 0680/43

Alternative to Coursework

Key Messages

Centres should work through past papers to help candidates see how to make the best use of the information given for each question.

General Comments

Many candidates understood and made good use of the source material and their written responses were clearly expressed. The mathematical and graphical questions posed some difficulties for a minority of candidates.

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

Comments on Specific Questions

Question 1

(a) (i) The location of the state was correctly given by almost all candidates.

(ii) The reason for the climate of the state was correctly identified by nearly all candidates.

(b) (i) Most candidates gave appropriate reasons why the plots were next to each other; similar soil conditions was the most frequently given answer.

(ii) A correct factor to be controlled was given by many candidates.

(iii) Many candidates seemed to think that sampling the orchards meant picking all the apples. Only a minority gained full credit for describing suitable sampling methods.

(iv) Most candidates presented good graphs, although some failed to label one axis so could not be awarded full credit.

(v) There were some good arguments in favour of 60 trees per plot as the highest cropping density. The figures given were used to justify this choice. Only a small number of answers referred to the extra costs of more trees.

(vi) The size of the apples was an important factor that many candidates did not identify. There were a range of vague answers about quality of fruit which were not worthy of credit.

(c) (i) The difficulties of managing high density orchards were only well described by a small number of candidates. Most candidates gained some credit, but they could have gained more by describing the costs in more detail.

(ii) Many candidates gave an appropriate range of months based on the data provided.

(iii) This calculation of temperature change with altitude was successfully completed by a good number of candidates. The working usually showed clearly how the answer had been obtained.

(iv) The advantage of growing at higher altitudes was appreciated by many candidates. Many went on to develop the answer further for full credit.

(d) (i) Many candidates gained credit for placement of thermometers, but failed to give further detail.

(ii) The advantages of having temperature data for an orchard proved too difficult for most candidates.

(iii) The table headings were completed successfully by most candidates.

(iv) Few candidates understood the advantages of having a record of temperature readings for a whole year.

(e) (i) Many candidates carried out the calculation correctly, and made suitable comments based on the information given in the diagram of an orchard.

(ii) Many of the candidates who had correctly calculated the distance in **(e)(i)** failed to relate this to the diagram, as they did not take account of the prevailing wind arrow. A small number of candidates shaded the diagram with careful use of the scale given.

Question 2

(a) (i) Almost all of the candidates correctly calculated the volumes of overburden and coal.

(ii) Most candidates gave sensible environmental consequences of removing the overburden.

(iii) Most candidates understood the significance of the data presented and completed the table correctly.

(iv) Some candidates displayed knowledge of the effects of heavy metals on biological systems. Most candidates gained some credit but their answers lacked detail.

(b) (i) More able candidates suggested values that were appropriate to the treatment of the waste as shown in the diagram. Some candidates found it difficult to relate the numerical pH scale to increase or decrease in acidity.

(ii) Suitable methods of carrying out a survey in the field were poorly understood by most candidates. Although questions of this type appear regularly, this remains an area of weakness.

(iii) The answers were mostly correct.

(iv) This calculation was only correctly completed by a minority of candidates.

(v) Most candidates answered this correctly.

(c) (i) Only a minority of candidates realised that the increase in species would be brought about by seeds being brought in from other areas.

(ii) Many candidates commented on bird droppings as they had done for part **(i)**. This suggestion gained credit here.

(d) The source information was extensively used, and when candidates added their thoughts to this stimulus information they were awarded credit. However, some candidates did little more than repeat information given, which is not sufficient to gain credit.