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NATURAL ECONOMY

Paper 0670/01

Paper 1

General comments

It was clear that the great majority of Centres had prepared their candidates well for this Paper and that the Paper addressed areas with which the majority of candidates were familiar. All questions seemed to be equally accessible to the candidates and every question elicited a number of responses which gained full marks. Only a very small minority of candidates found the Paper beyond their knowledge and understanding.

Comments on specific questions

Question 1

This question concerned the extraction of minerals and was generally well answered.

- (a) In the first part of this question, candidates were asked to describe the process of open cast mining using information given on a simple diagram. Most candidates were able to do this, though marks were often lost through insufficient detail. Candidates who used their own knowledge of the process gained credit. Most candidates were able to give two ways in which open cast mining can cause environmental damage.
- (b)(i) Again, most candidates were familiar with the dangers of underground mining, though marks were often lost when dangers were stated without being explained.
- (ii) This section concerned the economic side of mineral extraction, and was largely quite well understood.
- (c) This section required candidates to suggest methods of restoring environments damaged by open cast mining. Most were able to make relevant suggestions.

Question 2

This question concerned some of the issues surrounding the provision of clean water.

- (a) In this section, candidates were asked to describe a sequence of events using a diagram. Most were able to do this and gain the four marks available.
- (b)(i) The vast majority of candidates were able to name two water-related diseases.
- (ii) Again, most candidates were able to give two reasons for water related diseases being more common in developing countries.
- (iii) This section proved to be the most testing in this question and relatively few were able to gain the four marks available. The best answers considered the reasons for the increase in demand for water for both domestic and industrial purposes that is likely to take place as a country develops and its people become more prosperous.
- (c) Most candidates were familiar with strategies to avoid water-related diseases, though marks were often lost when some of the advice given was clearly inappropriate for children.

Question 3

This question concerned acid rain.

- (a)(i) Most candidates understood the term acid rain, though marks were often lost when the definition offered was unclear.
- (ii)(iii) These were generally correctly answered.
- (b)(i)(ii) These sections required candidates to consider the effects of acid rain on lakes, buildings, soils and vegetation. Most were able to do this.
- (iii) This section proved to be more testing, and few managed to gain the three marks on offer. Most considered the point that the use of lime could in itself cause environmental damage, but relatively few considered the expense or difficulty of such treatments. The best answers commented on the sustainability of the treatments or that it is best to treat the causes of acid rain rather than the symptoms.
- (c) This question also proved quite testing, and differentiated well between the majority who confined themselves to writing about the necessity of industries and vehicles, and the better candidates who also considered the international dimension.

Question 4

This question concerned rural-urban migration.

- (a) This section required candidates to distinguish between push factors and pull factors. The majority were able to do this.
- (b) The subject matter of this section was well-known to most candidates. Marks were often lost when candidates' answers consisted of statements which lacked explanation.
- (c) This section required candidates to suggest strategies to encourage people to remain in rural areas. Most were able to do this, though weaker candidates tended to lose marks through lack of detail. Just writing statements such as 'infrastructure improvements' is not sufficient to gain marks.

<p>Paper 0670/02</p>

<p>Paper 2</p>

General comments

Typically there was little or no difference in a candidate's marks between **Question 1** and **Question 2**. Indeed a major disparity was such a rarity that it stood out as something exceptional; when it happened, in most cases the lower mark was for **Question 2**, which had a slightly higher overall knowledge requirement than **Question 1**. The probable reason why this made no difference to the majority of candidates was that the extra knowledge element was mainly required for plate tectonics, widely perceived as an interesting topic among candidates. As usual, candidates attempted to fill all the lines left for the answers. Of course the printed lines represent no more than an estimate of the amount of space needed for a full answer to the question; the number left cannot take account of variations in size of writing and in incisiveness of answering between candidates. The problem for some candidates was that they made the assumption that they had given a full answer as soon as all the lines had been used up. Wise candidates, however, took into consideration both question need and number of marks; if they felt that they had not given a full answer in the necessary depth and breadth, they continued their answers into the empty spaces beyond the lines. If there were no spaces, they continued their answer at the bottom of the page or on a blank page, and indicated to the Examiner what they had done.

Candidates were well prepared for the content examined in this Paper. The great majority showed commendable familiarity with the features of the water cycle, the importance of clean water, plate tectonics and soil erosion. The questions exposed few serious weaknesses in knowledge and understanding. The main challenge in answering a Paper of this type was to keep on giving maximum mark answers to questions which varied greatly in style and worth. This was best done by maintaining a tight focus upon answering the question set. Most candidates showed themselves to be adept at switching from one type of question to another, from a source-based question to one that was knowledge-based, or from one requiring practical skills to another needing more discursive written answers in order to justify one or more points of view. The more discursive questions on this Paper, **Question 1 (f)**, **Question 1 (h)(ii)** and **Question 2 (b)(iii)**, yielded many strong answers, as candidates supported their views with well chosen information about both aspects stated in the question. Those candidates who referred to one aspect only gave answers which read as being markedly inferior. Less well liked by candidates was **Question 1 (h)(i)** and the requirement to answer by completing the boxes in the table. Selection from the newspaper report, followed by allocation to one of the six boxes, had to be ruthless to produce a fully successful answer. In the event, candidates found it much easier to select and categorise the disadvantages. Frequently advantages were placed haphazardly and inter-mixed with rogue disadvantages that had crept into the wrong column due to uncertainty. Elsewhere the main problem areas for candidates appeared to be confusion over positive and negative percentage changes in **Question 1 (b)(ii)**, a reluctance to name (rather than describe) a type of climate in **Question 1 (e)**, a tendency in **Question 1 (g)(i)** to explain why the water instead of the electricity was clean, considerable deviation from land pollution to water pollution when answering **Question 2 (d)(ii)** and confusion between contour ploughing and terraced slopes in **Question 2 (f)(ii)**.

The graph completion questions were, as usual, a good source of marks for many, but some candidates demonstrated that they remained clueless in **Question 2 (c)(i)** about drawing a divided bar graph, despite the basic graph lay-out having been given with the question. Also there were great variations in types of shading and their effectiveness for the graphs and their keys in **Question 1 (b)(i)** and **Question 2 (c)(i)**. Sometimes the shading types employed were so similar as to be barely distinguishable; in other cases attempts were made to use symbols instead of shading, which usually produced an ineffectual result without any visual impact. Although the bar graph in **Question 1 (d)(i)** was marked solely on the basis of accuracy of column length, some candidates shaded in the two new bars for completeness, which was to be encouraged. However, in order to match the four bars already drawn, to be technically correct this needed to be in solid black, because only a single item was plotted.

Comments on specific questions

Question 1

- (a) In (i) there were few wrong answers; candidates typically named one or more types of precipitation, or gave the more general answer of 'water from the atmosphere'. The mark for (ii) was earned less consistently, as (rather surprisingly) many candidates concentrated upon describing the process itself, without ever referring to weather conditions that caused it to happen. Although a few became word-tied in trying to state the difference between run-off and groundwater in (iii), it was still clear that the difference was well known.
- (b) The key to a successful completion of the pie graph in part (i) was for the candidate to work from the centre of the circle towards the percentages marked around its edges. Some over-concentrated on hitting the percentage of 25%, for example, but without filling one quarter of the circle. A few showed that they had little idea of what needed to be done as they superimposed sectors from the common starting point of 0%. Part (ii) turned out to be a good discriminator. Having correctly transferred the percentages from diagrams A and B, less strong candidates often became hopelessly confused with the signs for positive and negative; they reversed totally or in part the correct answers of +35 and -20. Not all candidates focused upon the command word 'Explain' in part (iii); no credit could be given for simply re-stating percentages. However, in both this part and the next good understanding of the role of vegetation in limiting run-off was conveyed in the majority of answers. The main weakness of answers given to part (iv) was lack of reference to how urban surfaces encourage run-off; only a few mentioned impermeable artificial surfaces such as concrete and asphalt or referred to drains and sewers.

- (c) The needs of part (i) were widely appreciated; the majority added precision to their answers by naming examples of diseases that are rife in areas of poor sanitation, such as typhoid, cholera and diarrhoea. The often repeated misconception was that dirty water aided the spread of malaria. Those candidates who took into account both the provision of clean water and the treatment of sewage in their explanation were the ones most likely to be given three instead of two marks. In (ii), for the first mark, candidates needed to recognise that population numbers without sanitation were increasing more quickly. For the second mark, they were expected to quote or use values from the graph as support. Only more able candidates did both.
- (d) Careless plotting and lack of attention to the scale in (i) led to some candidates being unable to claim what should have been two easy marks. The number of continents was not specified in the question for part (ii), which meant that some candidates, usually the weaker ones, stopped short by naming only one from Africa and Asia.
- (e) Many candidates seemed to do everything possible to avoid naming a climate, despite writing down descriptions which included the adjectives 'dry' and 'hot'. Desert was the obvious answer, although other types of climate named in the syllabus with seasonal drought were also accepted, such as Mediterranean and savanna.
- (f) Most candidates appeared to enjoy answering this part. Question layout encouraged candidates to explain the vital role of water to life on Earth in (i), which most could do; in the best answers references to plants, and the food chain of animals dependent on them, were included. Weaker candidates made limited further progress in part (ii) because of repetition and the failure to state anything about oil. Stronger candidates either stressed the economic role of oil and referred to the existence of alternatives for at least some of its uses. Many pertinent points were made.
- (g) About one third of candidates answered (i) in terms of why the water (instead of electricity) was, or was made, clean. Others believed that renewable energy source was the answer. The remainder, fortunately the majority, gave the answer required by recognising that this was a pollution-free source of electricity. Those who carried on with their answers to bring out the contrasts with fossil fuels or nuclear power in terms of atmospheric and surface pollution were the ones most likely to claim both marks. Candidates found part (ii) more straightforward. Many full mark answers were seen as candidates elaborated upon the advantages of water supply all year and flood water control for amount and reliability of food output.
- (h) When marking the answers to part (i) it soon became clear that candidates were selecting disadvantages more accurately than advantages and stating them more fully. Distributing disadvantages between economic, environmental and social appeared not to be a problem for most. Under environmental advantages, 'no advantages' was quite a common entry, despite candidates having been introduced previously to clean electricity. In the box for economic advantages, far and away the commonest answer was 'money for big construction companies', which went against the main point that was being made in the newspaper report. At the time this question was set, it was recognised that it would be one of the more challenging questions on the Paper; therefore, the mark scheme was arranged so that any five correct entries gained all four marks, and at least four correct entries gained three marks. This meant that there were plenty of answers which received more than half marks. A few candidates disagreed with the view put forward in (i); some of these assembled strong arguments for large dams in terms of the number and scale of advantages for a country's development and growth and were worth all four marks. The question was easier to answer in terms of the advantages of small dams. In answers from weaker candidates, despite using all the lines, candidates often made only a limited number of points; they were close derivatives from the newspaper report source. Two mark answers were frequent. In stronger answers the advantages of small dams were reinforced by further comment, especially about the way they could be spread more widely throughout the country, thereby aiding greater numbers of people at the local scale.

Candidates, both weak and strong, gained marks throughout in **Question 1**. Weaker than average candidates managed to accumulate one or two marks for many of the answers within parts (a) - (h), punctuated by occasional non-scoring answers. Weaknesses in knowledge and understanding were exposed most in questions worth four or more marks. More able candidates scored highly in the four mark plus questions as well. They arrived at the end of **Question 1** with a total mark above thirty, despite occasional losses of marks in short questions along the way, usually for an answer that was mis-directed towards the question set.

Question 2

- (a) (i) was the easy opening question, answered correctly by almost all. Only candidates who became confused between constructive and destructive boundaries failed to score in (ii). Quite a number of alternative answers were accepted to (iii), some of which could be taken from the map. If a candidate genuinely looked for two ways, two marks was almost always the result. One mark answers were quite common from candidates who stated one correct difference about Y under number 1 and then did no more than state the reverse about X under number 2; in effect, only one two-sided difference had been established. Most answers to (iv) began with nearness to plate boundaries in Italy. How many more marks were added to this basic mark depended upon whether any further details were given about locations or types of activity along plate boundaries. Some candidates failed to extend their answers to take account of the number of marks available for the question.
- (b) Part (i) posed few problems and a comparative element was present in most answers. There were many answers of 20km and a few of 4km to (ii), although people in the top half of the ability range almost invariably realised what had to be calculated and arrived at the correct answer of 16km. In the weakest answers of all to (iii), randomly selected sentences from the newspaper report were written down in a haphazard manner, without a hint of comment. In the next category up, better selection occurred, but the overall impact was low because of the absence of comment towards the nature versus people theme of the question. Superior to these were answers in which one view was expressed and supported, often sufficient to lift the answer above half marks. However, until an overall comment was present about the relative importance of nature and the actions of people, supported by evidence from both, the answer could not reach the full five marks. Responses to this question covered the full range of marks and encompassed many different views.

From (c) onwards the topic area under examination changed.

- (c) In part (i) drawing a divided bar graph posed problems for some. Attempting to start all three from 0% meant that only the clay could be shown uniquely and separately. Trying to draw separate bars for each of the three within the one bar provided led to weird and inaccurate results. Nevertheless this question offered three quick and easy marks for the majority. Sometimes the final result did not look as visually informative and pleasing as it should have done, either because of shading that looked too similar or through attempts to use non-conventional symbols instead of shading. From those who understood, some excellent answers to (ii) were seen, in which the individual contributions of silt, sand and clay for soil fertility and drainage were examined. The standard form of answer from those without the necessary knowledge of loam soil was to talk about soil fertility in general without anything specific to loam.
- (d) Part (i) asked for the two sources of land pollution 'most likely to be caused by farmers'; salination and pesticides were considered to be the best two answers. Although it was likely that weak candidates guessed at any two, domestic waste was a popular answer among candidates from all ability levels. Whilst its choice was easy to understand, it does not have the direct farming connection of the two best choices. As a result there were many one mark answers to this part. A lot of the best answers given to (ii) were from candidates who used salination. They seemed to find it easier to remain focused on the themes of land pollution and effects on soil. Answers based on pesticides achieved high levels of success, unless the candidate lost sight of the land based theme to this question. Once the focus was lost, both parts of the answer became based upon what happens in rivers and ponds. Answers based upon the other three causes of land pollution varied greatly in quality, a reflection of variable amounts of knowledge and degree of focus upon soil effects. Overall this was a question with wide and unpredictable variations in the quality of responses.
- (e) In (i) few failed to select column A for the one dominated by natural processes, which was reassuring. The key to filling the empty boxes on the flow chart in part (ii) was to find words or phrases which fitted between what went above and below. For example, in box D2 a frequent answer was 'deforestation'. This could not be given a mark because it came down to being the same as 'forest cleared' in the box below. Examiners were allowed to exercise some discretion as to what could be allowed, so that each answer was judged on its merits. In box D2, any mention of fuelwood definitely gained the mark, but there were many other answers in between this and deforestation which had to be judged on their merits. In B2 the best answers were those in which overgrazing or trampling were stated directly or implied. In C4 something implying loss of fertility or breaking up of the soil structure was best. Candidates seemed to know better what was expected

from them than they did for the boxes used in **Question 1 (h)(i)**. Directly or indirectly it was clear that most candidates knew what was meant by monoculture in part **(iii)**. Those who stayed with the soil-based theme of the question gave the most successful answers, especially if there were clear references to both disadvantages of monoculture and advantages of mixed cropping in terms of soil nutrients. Some answers, however, were written entirely in economic terms, which did not best match question needs.

- (f)** Reference to wind direction was needed for a scoring answer to part **(i)**. When wind direction was not used, answers tended to be long and rambling, but ineffective. Answers given to **(ii)** revealed greatest knowledge about windbreaks and least about contour ploughing. Few failed to begin the answer for windbreaks without using either area A or B as the location. It was in this middle part of the answer that more than one factor was most likely to be used in the explanation. Areas A and D were considered to be the two most appropriate areas on the sketch in which to plant trees, either to hold the sand in place (A) or to stop the downhill movement of soil (D) where slopes are steepest. Although both were used by candidates, C was an equally popular choice among them. This was considered to be a less good choice, because the land here was being used for crop growing. Some of the explanations included reference to stopping the wind, which was more appropriate to windbreaks than to planting trees. Area D was a popular choice for contour ploughing, but without any cultivation shown there on the sketch, explanations that followed were almost invariably about terracing. When area C was named, there was a higher chance of subsequent references to contour ploughing, but even this proved to be less than fifty-fifty. When ploughing around the slope, instead of down it, to prevent water following the rows down the hill was used as the explanation in the final part, it was highly likely that it would be contributing to a full six mark answer. Marks in this final question were awarded for both likely locations on the sketch and for explanation of strategies, irrespective of locations chosen. This meant that application and knowledge could be rewarded separately if necessary. It was a poor response that did not claim at least one or two marks, but equally it was a very good one that claimed all six.

The same summary given for **Question 1** applied to the way candidates answered **Question 2**. This was why there were so many identical or similar totals for both answers from candidates. There were two slight differences. One was that a tiny proportion of the entry did not understand sufficient about plate tectonics to enable them to gain more than a token mark in part **(a)**. The second was that at least one of the parts from **(c)** to **(f)** about soils would be significantly less well answered by candidates in the middle and lower ability ranges.

<p>Paper 0670/03 Natural Economy</p>
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General comments

Each Centre submitting coursework for Natural Economy will have received feedback on the performance of their candidates and the application of the mark scheme. Please note that with the replacement of Natural Economy (0670) by Environmental Management (0680) from 2004, the opportunity has been taken to modify the mark scheme for coursework. From 2004 onwards coursework will have a maximum mark of 60 compared to the current 30. This will bring Papers 3 and 4 into line in terms of the maximum marks available. It will also provide for greater differentiation between candidates.

Some good environmental issues were investigated this year and all Centres appeared to prepare their candidates well for the component. **Assessment Objective C** still causes problems but many candidates are acquiring more understanding of what is required. There was a new tendency this year, that of failing to address the resource and impact issue globally and generally as well as locally and specific. A thorough coverage of the processes and sustainable management cannot be achieved without a general consideration of the issue. It is recommended that candidates are provided with a copy of the assessment criteria before they commence their coursework so that they can check that their work goes some way at least to meeting each criterion.

Comments on specific Assessment Objectives

Assessment Objective A

Candidates continue to score well here but limiting themselves to a descriptive account of practicalities can lead to a loss of marks for the relative processes and understanding of the resource issue.

Assessment Objective B

Candidates who opt for coursework continue to show in Assessment Objective B how much they benefit from doing investigations. They appear to get thoroughly involved and enjoy the discovery aspect. They also exhibit very useful presentation skills and generally score well in Assessment Objective B.

Assessment Objective C

There were some excellent titles this year which gave great opportunities for discussion of sustainable development. One pitfall to beware of is the description of all the possible options without building them into a coherent strategy. This would lead to a very firm mark for criterion 8 but very weak for criteria 9 and 10.

Paper 0670/04

Alternative to Coursework

General comments

This Paper considered Natural Economy issues in Ecuador. The questions required candidates to demonstrate their own knowledge as well as making use of information given in the introduction to each question. The candidates attempted all the questions and had the time to complete the Paper. Many graphs were very neatly drawn.

Comments on specific questions

Question 1

The use of Criollo pigs as a food source was considered.

- (a) The table was completed successfully by most candidates.
- (b) The percentage of piglets that died was often correctly calculated.
- (c) Many candidates correctly suggested that the villagers could not afford to buy these drugs.
- (d) The majority of candidates correctly completed the graph, although there were some scale errors. Most candidates stated the relationship between rainfall and piglet death correctly. However, a small number of candidates suggested an inverse relationship without seeming to look at either their graph or the table of data. The reason for more deaths due to water related disease, was usually correctly referred to.
- (e) The advantage of using or not using the drug was not as well understood. Some candidates discussed drug addiction rather than an increase in food production or stopping the spread of disease. By not using the drug the stock animals that survive will have some (genetic) disease resistance.

Question 2

- (a) Candidates suggested loss of food, habitat or breeding partners as reasons for the decrease in species. Some candidates found this question difficult and simply repeated part of the second paragraph of information provided.
- (b) The Examiners were expecting answers involving references to genetic resources/scientific research, but many candidates seemed to be at a loss as to why people from other countries might be interested in 'hot spots'.
- (c) Some candidates thought that Europeans would buy the rainforest for their own use. This was not given credit. A minority of candidates suggested altruistic reasons, including the fact that they had enough disposable income to help conservation.
- (d) Candidates often had good ideas in completing the table, with a fair number able to gain the full six marks. Unfortunately some candidates thought oil and minerals counted as forest resources and so scored few if any marks.

Question 3

This question focused upon the effects of oil exploration in a rainforest environment.

- (a) There were good economic reasons given for increasing oil production.
- (b) The candidates that realised that eight drilling rigs were going to be used calculated correct answers. These were in the minority. This emphasises the need for candidates to read the questions carefully, as the stem of the question stated 'By using eight new drilling rigs instead of the old ones'.
- (c) The size of the borehole was often picked by candidates, but the explanation could be too vague to be given credit. The table or the candidates' calculations gave other alternatives.

Question 4

This tested candidates understanding of field techniques for taking meaningful measurements from the environment.

- (a) Many candidates could suggest one or two weaknesses of student A's fieldwork.
- (b) Suggesting biological or environmental measurements that could be taken seemed to be beyond many candidates. It is expected that candidates have carried out some basic fieldwork; the poor answers suggest this type of work needs more attention. The Paper is alternative to coursework so this type of question can be expected in the future.
- (c) The table was nearly always completed successfully.
- (d) It pleased the Examiners to see that most candidates used the scale provided to place their sample points clearly and logically.
- (e) There were some good clear answers from the candidates who appreciated that the written description was of the fieldwork that had been carried out. Unfortunately, too many candidates gave vague rambling accounts which did not answer the question. The use of bullet points followed by whole sentences may have helped. The suggested safety instructions were usually good.

Question 5

- (a) The questionnaires were usually well laid out with plenty of alternative answers. The source material was quite extensive to try to give candidates alternatives for their questions. Only a minority of candidates found it difficult to ask any useful questions here.
- (b) There was a range of good ideas as to why some farmers would want to use genetically engineered bananas and why others would be fearful of their use.