General Certificate of Education
Advanced Level Examination
June 2013

Science in Society   SCIS4

Unit 4   Case Study

Wednesday 19 June 2013   9.00 am to 10.30 am

For this paper you must have:
- an AQA 12-page answer book
- a copy of Pre-released source material (Sources A–E).

Time allowed
- 1 hour 30 minutes

Instructions
- Use black ink or black ball-point pen.
- Write the information required on the front of your answer book. The **Examining Body** for this paper is AQA. The **Paper Reference** is SCIS4.
- Answer **all** questions.
- Write your answers in continuous prose.
- Use your own words, rather than simply repeating those used in the sources, to show your understanding of the points being made.

Information
- The additional source material (**Source F**) is printed on page 5 of this booklet.
- The maximum mark for this paper is 60 (36 marks for Section A, 24 marks for Section B).
- You may use a calculator.
- You will be marked on your ability to:
  – use good English
  – organise information clearly
  – use specialist vocabulary where appropriate.

Advice
- Section A: Questions testing your appreciation and understanding of the Case Study Source Material on the subject of global population.
- Section B: Questions that ask you to demonstrate your ability to construct an appropriate explanation for a given audience, and seek your argued opinion on an issue raised by the Case Study material.

SCIS4

Section A

Answer **all** of the questions.

Source A

| 0 | 1 | This is a screenshot of an interactive activity. It gives the numerical position in the world population of a person born on 13th May 1996.

Suggest why the precise value given for this number may be inaccurate. *(2 marks)*

Source B

| 0 | 2 | Use the graph in **Figure 1** to describe how the population in the different groups of countries is projected to change between 2010 and 2100. *(3 marks)*

| 0 | 3 | Why might replacement-level fertility differ for different countries? *(2 marks)*

| 0 | 4 | Why is life expectancy projected to increase globally during this century? *(1 mark)*

Source C

| 0 | 5 | **Source C** discusses issues related to a 'healthy and sustainable world.'

What is meant by the term 'sustainable' in this context? *(2 marks)*

| 0 | 6 | In the Section 'For Businesses' **Source C** identifies food security and access to clean water as being key issues.

Why are improvements in clean water important in improving the health of the global population? *(2 marks)*

Source D

| 0 | 7 | Identify two examples of a correlation between two variables discussed in **Source D**. *(2 marks)*

| 0 | 8 | Summarise why the author of **Source D** thinks that the increase in population is not the main problem facing global society. *(4 marks)*

Source E

| 0 | 9 | Suggest why the paper gives details about which institute or university each author works at. *(1 mark)*

| 1 | 0 | The introduction to **Source E** describes how a number of scientists have calculated the human carrying capacity of the Earth. Suggest why the values calculated have such a large range. *(2 marks)*

| 1 | 1 | Before a computer model can be used to predict future events it must be tested to see if it accurately models the system under investigation.

How did the scientists test their LPJmL-model of crop yields?
You may find Section 3.2 and the first paragraph of Section 4 useful in your answer.
(2 marks)

| 1 | 2 | In Section 3.3 the authors describe three scenarios that they have used: Genghis-Khan, Save-forests, and Burger.

Choose **one** of the scenarios and use Section 3.3 to identify its main assumption(s) and discuss how realistic this scenario is. *(4 marks)*

| 1 | 3 | In Section 5 the authors highlight limitations and problems of very intensive land use in their model.

Describe, using examples from Section 5 of **Source E**, the effect on sustainability and biodiversity of such intensive land use. *(6 marks)*

Source F

| 1 | 4 | From **Source F** identify an opinion that would support **Source D's** view of population.
(1 mark)

| 1 | 5 | Discuss how much influence the media might have on the decision of other couples to have children by publishing this type of story. *(2 marks)*

Turn over for the next question

Section B

Answer **both** questions.

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1 6 **Sources A**, **B** and **E** all use computer models to make predictions about future events.

Write an article which will help visitors to the BBC website to understand how a computer model can be used to generate the graph of population between 1750 and 2050 shown in the interactive activity in **Source A**.

Include in your article:

- a simple explanation of what a computer model is
- reasons why computer models are used
- an explanation of the limitations of computer models.

In your article you may wish to use information from **Source B** and Sections 2 and 3 in **Source E**, as well as knowledge from your study of *Science in Society*. *(12 marks)*

1 7 Discuss the relative importance of limiting population and reducing consumption in addressing the issue of long-term sustainability.

In your answer you should use ideas from the sources as well as knowledge from your study of *Science in Society*. *(12 marks)*

END OF QUESTIONS

Source F

Adapted from an article by Kathleen Gilbert published on www.lifesitenews.com, 27 July 2011

UK environmentalists slam Beckhams as 'bad example' for having fourth child

Instead of joy and congratulations, news of the birth of English celebrities David and Victoria Beckham's healthy baby girl has sparked criticisms from the country's environmentalists that the couple is a "bad example".

The birth of the footballer family's first daughter, Harper Seven Beckham, was the inspiration for a Guardian article highlighting the push by population control advocates for families to have fewer children.

The British paper reports that Simon Ross, chief executive of Britain's Optimum Population Trust, said that "the Beckhams, and others like London mayor Boris Johnson, are very bad role models with their large families". Johnson also has four children.

"There's no point in people trying to reduce their carbon emissions and then increasing them 100% by having another child," he said. "We need to change the incentives to make the environmental case that one or two children are fine but three or four are just being selfish."

"We need to have a far greater public debate about population, whether it focuses on improving family planning or reducing global inequality – and looking again at how we address the strain on our natural resources," said Green MP Caroline Lucas.

While population control is often pushed on the premise of reducing poverty in third-world countries, the Beckhams will have little trouble financially taking on a fourth: Los Angeles Galaxy soccer player David Beckham earned $46 million in 2008, according to Forbes, and a report this year put the couple's total worth at about $271 million, a figure that includes Mrs. Beckham's successful fashion line.

Increasingly, however, population control advocates in first-world countries are pushing families to have fewer children as a moral obligation to help preserve the environment, an argument that has gathered steam in the international community. A 2009 report by the United Nations Population Fund (UNFPA) described the growth of the population as causing humanity to approach "the brink of disaster", thanks to the resulting increase of greenhouse gas emissions.

Others say that arguments to reduce population, such as a supposed lack of space and food or damage to the economy, are seriously misguided and only serve to cover up human rights atrocities in areas such as China under the one-child policy.

END OF SOURCE F

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