22086301

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**ECOSYSTEMS AND SOCIETIES**
**STANDARD LEVEL**
**PAPER 1**

Wednesday 14 May 2008 (afternoon)

1 hour

Candidate session number

| 0 | 0 | | | | | | | |
|---|---|---|---|---|---|---|---|---|

INSTRUCTIONS TO CANDIDATES

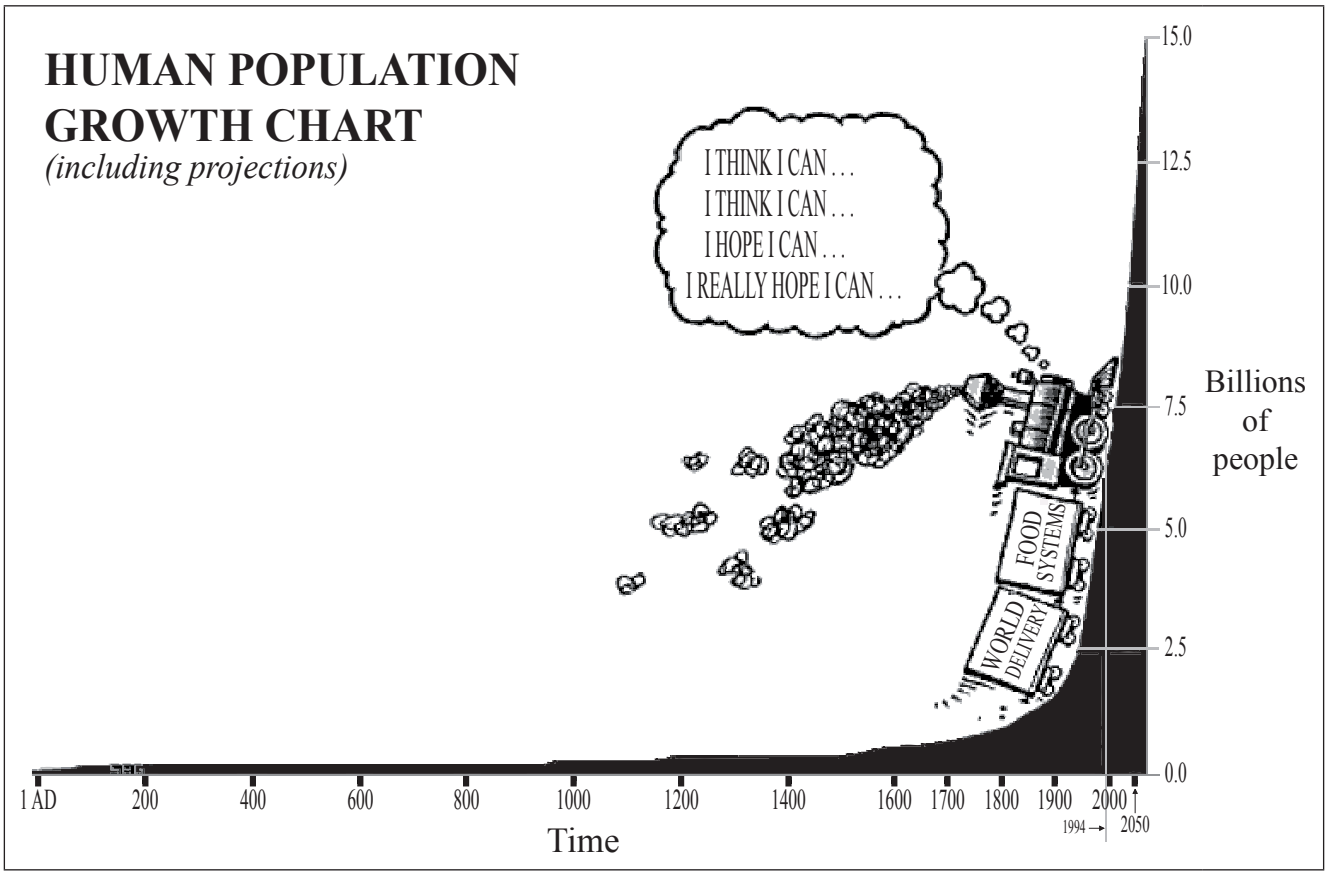
- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all of the questions in the spaces provided. You may continue your answers on answer sheets. Write your session number on each answer sheet, and attach them to this examination paper and your cover sheet using the tag provided.
- At the end of the examination, indicate the number of answer sheets used in the appropriate box on your cover sheet.



0113

**1.** **Figure 1** shows a cartoon about global population increase.

**Figure 1**




[Source: adapted from www.greenberg-art.com/.Toons/.Toons,%20Environ/Populationchart.html]

(a) Determine the projected human population in 2050. *[1]*

. . . . . .

. . . . . .

(b) Describe the pattern of population growth shown in **Figure 1**. *[1]*

. . . . . .

. . . . . .

*(This question continues on the following page)*

*(Question 1 continued)*

(c) Describe **two** ways in which food systems might be changed to meet the increased demand for food in the future. *[2]*

1. . . . . .

. . . . . .

2. . . . . .

. . . . . .

(d) Describe **two** obstacles facing governments who wish to reduce population increase in their countries. *[2]*

1. . . . . .

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2. . . . . .

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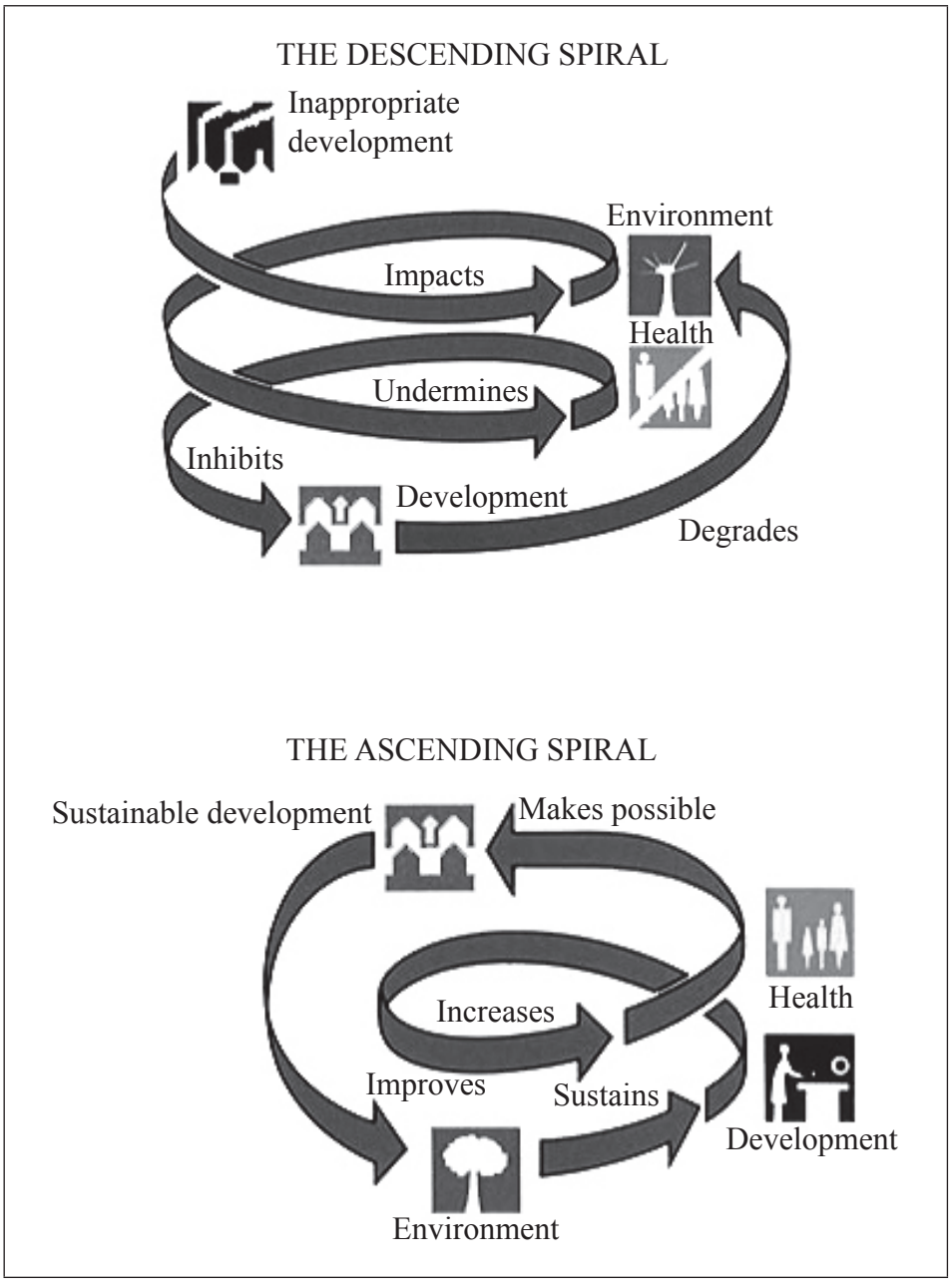
**2.** **Figure 2** is a diagram from UNESCO showing relationships between development, the environment and health.

**Figure 2** Sustainable development spirals




[Source: adapted from www.portal.unesco.org/education/en/ev.php-URL_ID=29459&URL_DO=DO_TOPIC&URL_SECTION=201.html]

*(This question continues on the following page)*

*(Question 2 continued)*

(a) State, giving **one** reason, what kind of system feedback is illustrated by the descending spiral. *[1]*

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(b) Discuss the meaning of the term *sustainable development* with reference to **Figure 2**. *[2]*

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(c) Evaluate the strengths and limitations of the models shown in **Figure 2**. *[2]*

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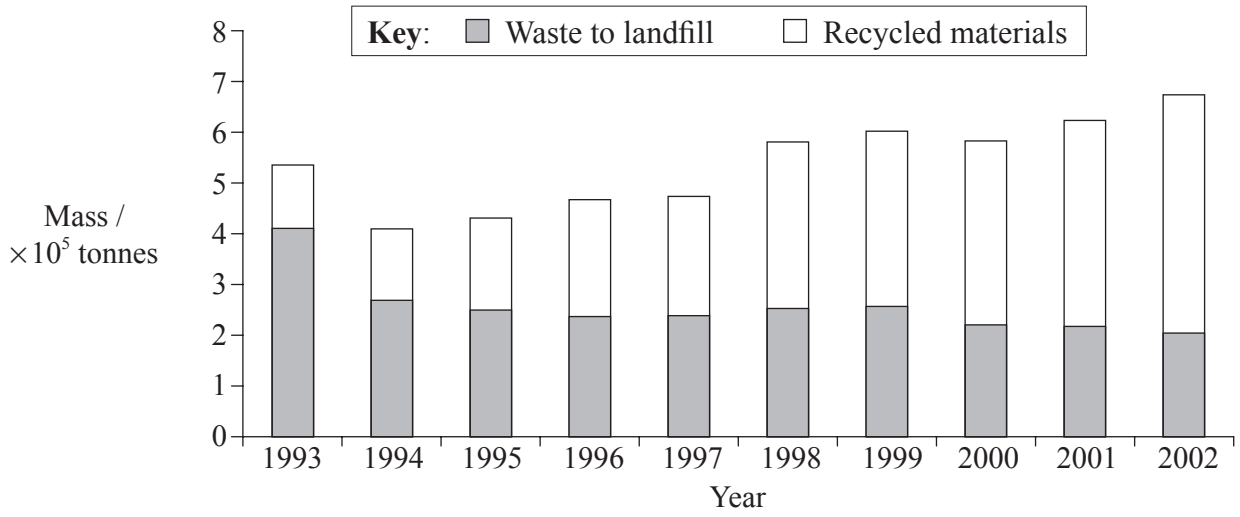
**3.** **Figure 3** shows amounts of waste being recycled or sent to landfill in Australia between 1993 and 2002.

**Figure 3**




[Source: adapted from www.environmentcommissioner.act.gov.au/_data/assets/image/12231/graph2_03.jpg]

(a) (i) State, to the nearest hundred thousand tonnes, how much material was recycled in Australia during 2001. *[1]*

. . . . . .

. . . . . .

(ii) Explain why the amount of waste sent to landfill in Australia has remained relatively constant since 1994 despite the increase in recycling. *[2]*

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*(This question continues on the following page)*

*(Question 3 continued)*

(b) (i) Outline **two** ways in which technology can reduce the amount of solid domestic waste that is sent to landfill within a country. *[1]*

1. . . . . .

. . . . . .

2. . . . . .

. . . . . .

(ii) Explain why the technological solutions you have described in part (b)(i) may still have negative environmental effects. *[2]*

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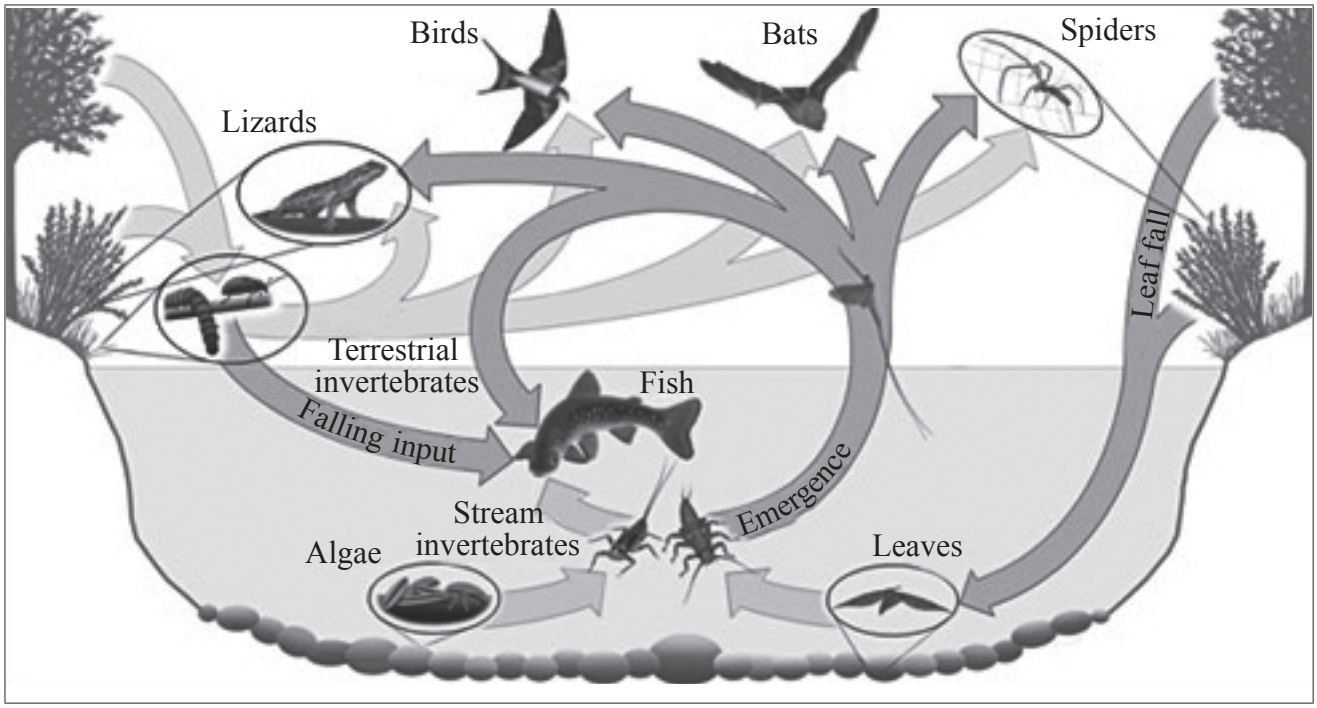
**4.** **Figure 4** shows a food web for a small-scale ecosystem.

**Figure 4**




[Source: www.isu.edu/departments/strmecol/images/Baxteretal_FWBiol_2005_Fig1b.jpg]

(a) State which trophic level is occupied by the bats in **Figure 4**. *[1]*

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. . . . . .

(b) Describe **two** impacts of a reduction in stream invertebrates on the food web of the ecosystem shown in **Figure 4**. *[2]*

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*(This question continues on the following page)*

*(Question 4 continued)*

(c) Describe a method used to measure a **named** factor in a small-scale ecosystem you have studied. *[3]*

Named factor: . . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

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(d) Describe **two** ways in which the bank side vegetation plays an important role within the ecosystem in **Figure 4**. *[2]*

1. . . . . .

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2. . . . . .

. . . . . .

(e) Name the natural process of change in vegetation that may occur over time on the banks of the river in **Figure 4**. *[1]*

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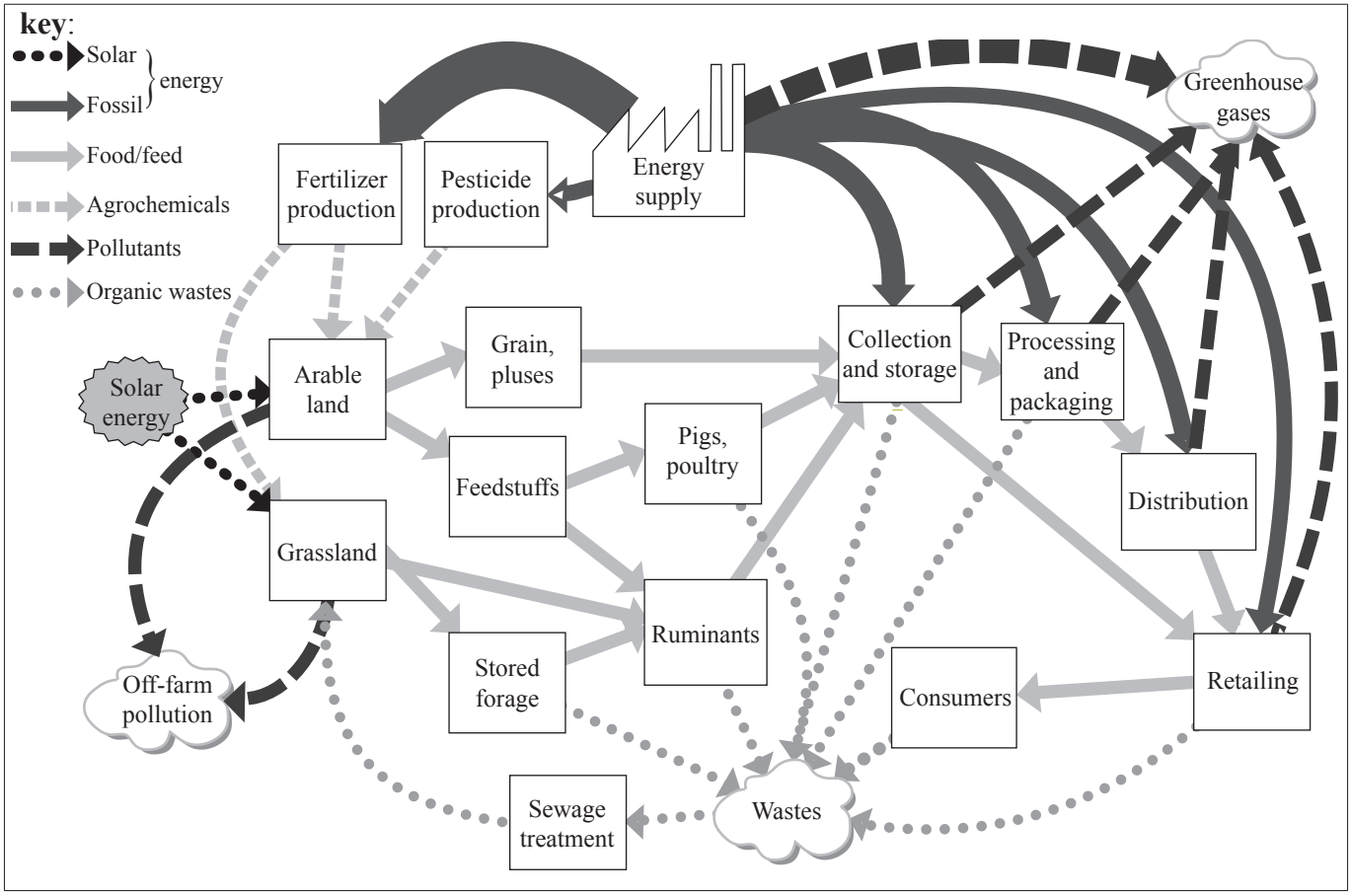
**5.** **Figure 5** shows flows through a food production system.

**Figure 5**




[Source: adapted from www.systems.open.ac.uk/objects/DickM/foodchain2.gif]

(a) Explain, with reference to **Figure 5**, how this food production system may contribute to global warming. *[2]*

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*(This question continues on the following page)*

*(Question 5 continued)*

(b) Distinguish between the terms *pollutant* and *organic waste*. *[2]*

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(c) Explain how the energy efficiency will differ between the arable components and the livestock components of the system in **Figure 5**. *[1]*

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. . . . . .

(d) State, giving **two** reasons, whether this system is more typical of a food production system in an LEDC **or** an MEDC. *[2]*

1. . . . . .

. . . . . .

2. . . . . .

. . . . . .

(e) Outline **two** factors that currently restrict the large scale use of renewable energy sources. *[2]*

1. . . . . .

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2. . . . . .

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(f) Explain how burning fossil fuels contributes to the formation of tropospheric ozone. *[3]*

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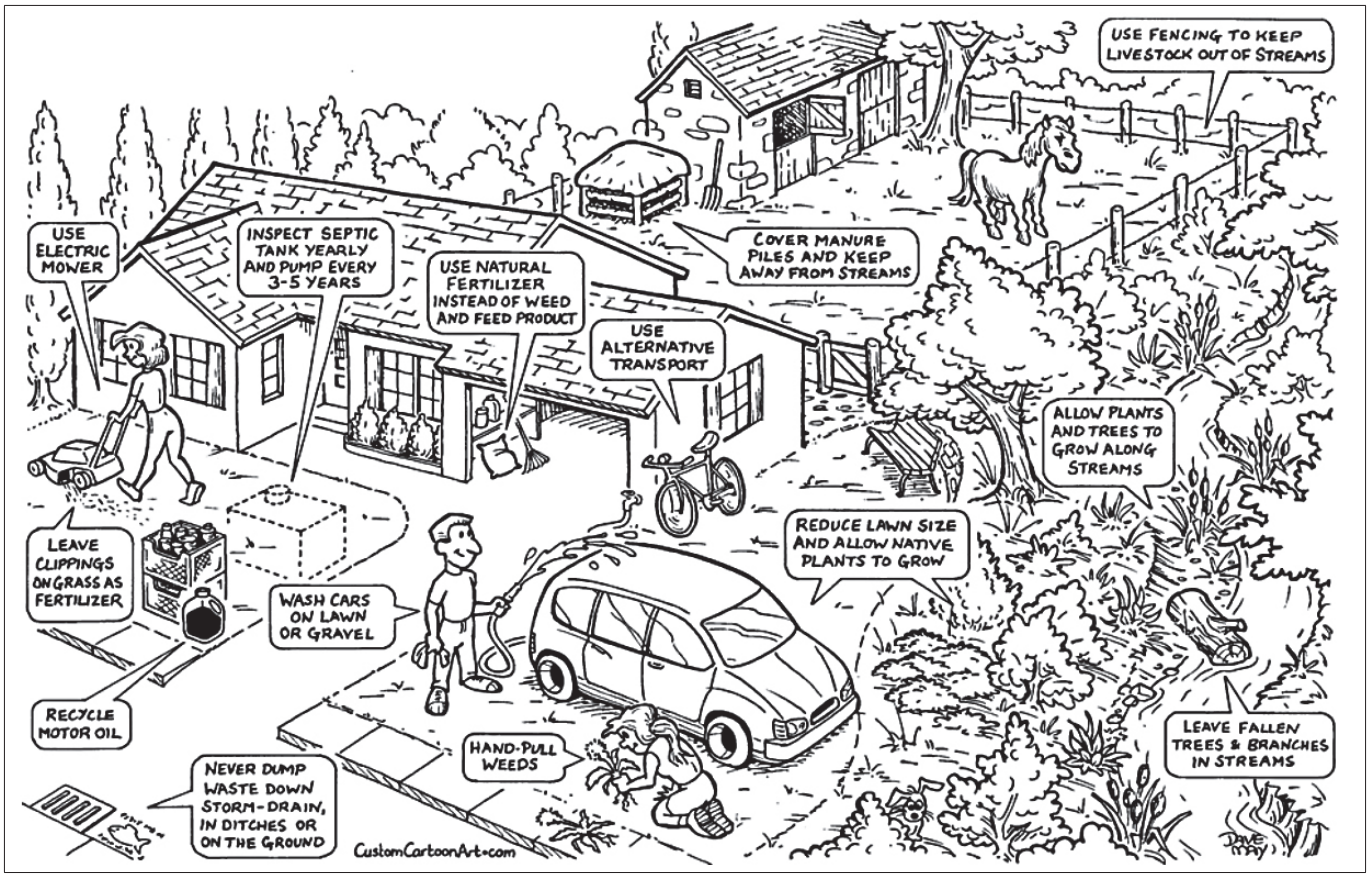
**6.** **Figure 6** is an information poster designed to show how individual actions can help to promote sustainability.

**Figure 6**




[Source: www.customcartoonart.com/ images/Eco%20Poster.gif]

(a) Explain why the poster recommends that manure piles are kept away from streams. *[1]*

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*(This question continues on the following page)*

*(Question 6 continued)*

(b) (i) Identify, giving reasons, **two** actions from **Figure 6** which will promote species diversity. *[2]*

Action 1: . . . . . .

Reason: . . . . . .

Action 2: . . . . . .

Reason: . . . . . .

(ii) Explain why species diversity is considered to be an advantage to an ecosystem. *[2]*

. . . . . .

. . . . . .

. . . . . .

(c) Suggest **two** reasons why grass cuttings and natural fertilizers are recommended as fertilizers rather than artificial fertilizers in **Figure 6**. *[2]*

1. . . . . .

. . . . . .

2. . . . . .

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