

SPECIMEN PAPER

UNIT 7 - SUSTAINABLE MANAGEMENT AND DEVELOPMENT OF RESOURCES



Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
TOTAL	



Level 3 Diploma Principal Learning
Specimen Paper

Environmental and Land-based Studies

ELS3U7

Unit 7 Sustainable management and development of resources

Date XXXX

You will need no other materials.
You may use a calculator.

Time allowed

- 2 hours

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 90.
- You are reminded of the need for good English and clear presentation in your answers.

The specimen assessment materials are provided to give centres a reasonable idea of the general shape and character of the planned question papers and mark schemes in advance of the first operational exams.

There are no questions on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**

2 Read the article below and, using your own knowledge and with reference to the article, answer the questions which follow.

Sustainable peat bogs

Under Defra’s UK Biodiversity Action Plan and as part of its Peat Project, the government has stated its commitment to the restoration of 1000 hectares of lowland peat bog and to the development and marketing of sustainable alternatives to peat extraction. The aim of the plan is for 90 % of the total horticultural market for soil improvers and growing media to be peat free by 2010.

The National Trust supports this action in the peat free management of its many large gardens that contain both common and rare plant and animal species. It also owns areas of internationally important environmentally sensitive upland bog land that formed over 6 000 years ago but which is now eroding.

In the Trust’s High Peak Estate in England’s Peak District, scientists found that 100 kg of carbon is stored in 3 cubic metres of peat, equivalent to the emissions of one car travelling 2000 miles. They estimate that UK peat lands store the carbon equivalent to about 20 years’ worth of national industrial emissions, ie approximately 3 billion tonnes. It is estimated that the UK contains about 15 % of the world’s peat lands and that, globally, peat stores twice as much carbon as forests.

In the UK, particularly England, peat bogs have been badly affected by the higher ambient temperatures of the 1990’s. This climatic effect and unsustainable agricultural practices may be contributing significant quantities of carbon dioxide to the atmosphere.

Source: based on extracts from ‘The Peak District Appeal’ and ‘Go Peat Free’ on www.nationaltrust.org.uk © The National Trust 2009

2 (a) Suggest **two** likely outcomes for peat bogs if Defra’s Biodiversity Action Plan is successful.

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(2 marks)

2 (b) Explain the scientific principle on which the concept of *carbon equivalents* is based.

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(3 marks)

2 (c) Describe **two** *unsustainable agricultural practices* that may contribute to the degradation of peat bogs in the UK.

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(2 marks)

2 (d) Defra encourages sustainable land management, for example, of peat lands, which can be supported by stewardship schemes linked to landowners.

Describe how agricultural *stewardship schemes* work.

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(1 mark)

Question 2 continues on the next page

2 (e) Many types of farming in the UK are dependent on burning large amounts of fossil fuels for energy. This contributes to rising levels of carbon dioxide in the atmosphere, a factor linked to the problem of global warming.

Summarise how farmers in the UK could manage their land more sustainably to reduce their contributions to atmospheric carbon dioxide.

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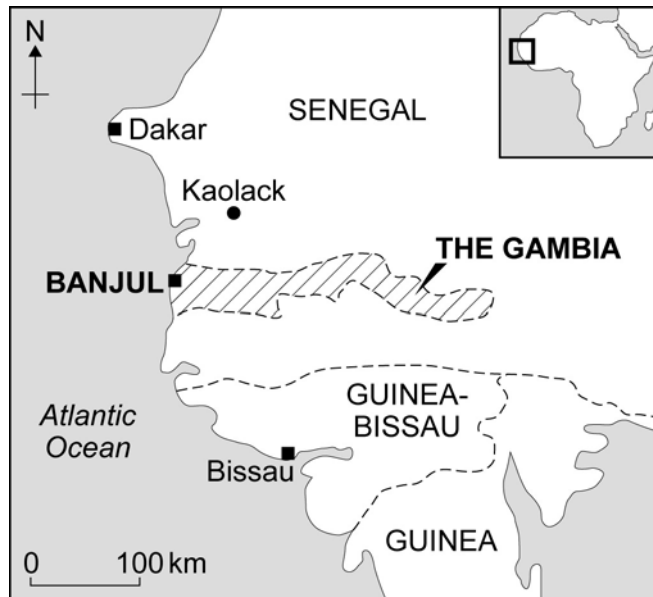
(2 marks)

10

Turn over for the next question

**DO NOT WRITE ON THIS PAGE
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- 3 The map below shows the position of The Gambia, a small West-African country. It is a Less Economically Developed Country (LEDC) which traditionally fed its population using sustainable agricultural methods.



Read the article below which describes The Sukuta Women's Co-operative Project (SWCP) in The Gambia.

Using your own knowledge and with reference to the article, answer the questions which follow.

The Sukuta Women's Co-operative Project

The project was funded by the Islamic Development Bank to ensure the sustainability of farming and increase its resilience to the effects of climate change, especially drought. Many of the measures taken to increase the sustainability of food production involved technological inputs.

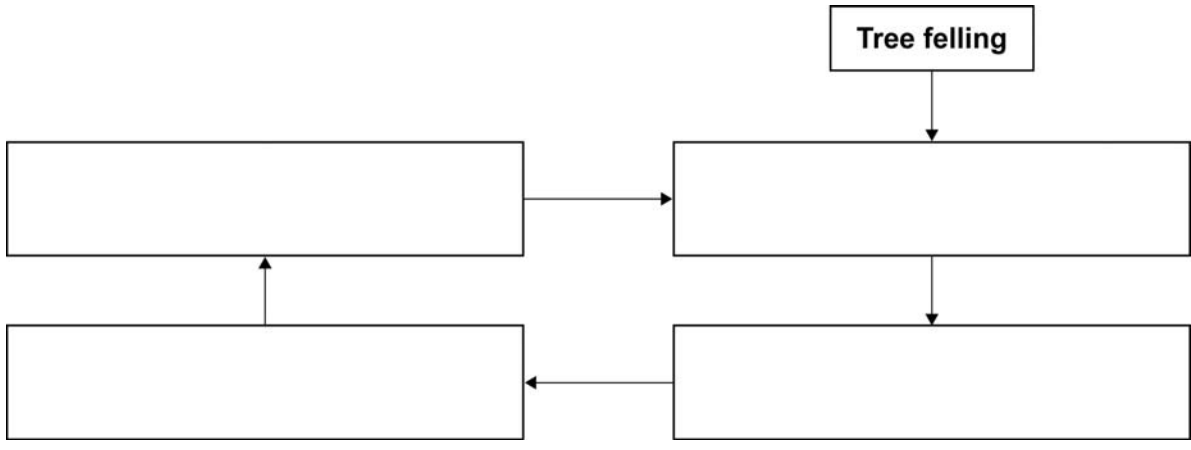
A bore hole was sunk and fitted with an electrical pump to provide a water supply for spray irrigation. Trees were removed to enable mechanised spray irrigation and the application of soluble inorganic fertilisers.

The outcome of these management activities has not produced the desired increase in agricultural productivity. Tree felling has exposed the soil to the sun and soil temperature reaches 60°C on most days. The high soil temperatures have caused the oxidation of organic matter (humus) in the soil and reduced much of it to rapidly draining mineral sand, a process known as desertification. There is now less protection of the land from high intensity seasonal rainfall and soil erosion is a serious problem.

Source: adapted from KRIS SPENCER, *Geography: Success at A level* (2000) by permission of Oxford University Press, Inc.

3 (b) Positive feedback amplifies or increases the rate of change in a system and leads to a continuous deviation away from stability.

In the space below, annotate the flow chart to evaluate the relationships between the factors that contributed to the collapse of sustainable agriculture in the *Sukuta Women's Co-operative Project*.



(4 marks)

3 (c) Explain, with reasons, what strategies might have been used to recover the sustainability of the *Sukuta Women's Co-operative Project*.

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(5 marks)

- 4 The passage in the textbox is a statement from the *Natural England* website.

Natural England is an independent public body whose purpose is to protect and improve England's natural environment and encourage people to enjoy and get involved in their surroundings. Our broad remit means that our reach extends across the country. We work with people such as farmers, town and country planners, researchers and scientists, and the general public on a range of schemes and initiatives.

Put simply, our aim is to create a better natural environment that covers all of our urban, country and coastal landscapes, along with all of the animals, plants and other organisms that live with us. Natural England's role in the climate change adaptation is shaped by our purpose – to conserve, enhance and manage the natural environment for its intrinsic value and for the benefit of current and future generations, thereby contributing to sustainable development.

Source: www.naturalengland.org.uk

The information below is *Natural England's* description of the Dorset Downs Character Area and map of the area.

The Dorset Downs Character Area is part of a high, rolling chalk landscape in Southern England. Most of the area is included in the Dorset Area of Outstanding Natural Beauty (AONB) and contains a wide range of wildlife, historic and landscape features, including:

- Dry valleys cutting through high chalk grassland
- Open arable fields enclosed by hedges on lower land
- Some chalk streams draining into a few surviving water meadows
- Managed broadleaved woodland and conifer plantations
- Historic remains of Roman, Bronze-age and Medieval land use

Source: www.naturalengland.org.uk

Location of Dorset



Table 1 shows Natural England's suggested responses to the impacts of climate change on the natural environment of the area.

Table 1 Responses to climate change in the Dorset Downs

Sector	Socio-economic changes	Impact on Dorset Downs Character Area	Response
Agriculture, horticulture and forestry	Increase in demand for organic produce Changes in payments and subsidies	Increase in invertebrate and bird species due to reduction in pesticides used Reduction in diffuse pollution Improved stewardship Reduction in monoculture	Extension of the habitat network through habitat creation on arable field margins
Water resources	Increase in water metering Introduction of variable tariffs Increased pressure on water resources due to population increase	Potential increase in water available for habitats as potable consumption reduces Potential decrease in water available for habitats	Wetland habitat creation and restoration Resist development in areas of water stress through the water resource and spatial planning system
Energy	Increase in oil price and concern over security of supply	Switch to renewable negative landscape impact of wind turbines and bio-fuels	Resist inappropriate structures on the landscape through spatial planning system Strengthen landscape designations in Dorset Downs Character Area
Buildings	Increase in new build rates to meet demand from population growth and urban expansion	Pressure on land	Resist development in sensitive areas through spatial planning Strengthen landscape designations in Dorset Downs Character Area
Transport	Demand for new infrastructure – roads, railways, runways etc. to meet growing demand	Habitat fragmentation, landscape impact Positive impact on access to countryside	Resist development in sensitive areas through spatial planning Improve public transport access to Character Area – reduce demand for travel

Source: Natural England Publication: NE116 - Responding to the impacts of climate change on the natural environment: Dorset Downs

4 (c) Assess the effects of possible conflicts of interest for the industrial infrastructure within the area with respect to:

4 (c) (i) sustainable water supplies

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(2 marks)

4 (c) (ii) sustainable power.

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(2 marks)

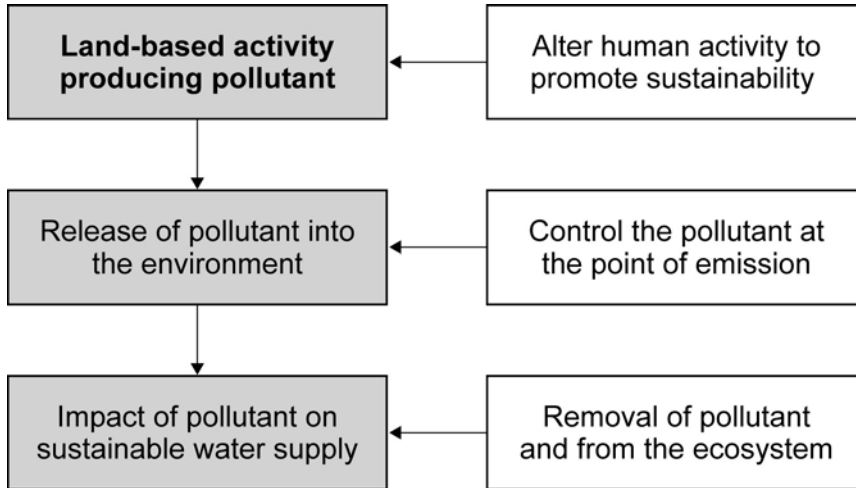
13

Turn over for the next question

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5 Pollutants are introduced into the environment through human activities and they may create long term problems for the sustainable use of resources.

5 (a) The diagram below represents a model for a water pollution event as a result of land-based activities.



Source: adapted from JILL RUTHERFORD, *Environmental Systems and Societies* (2009) by permission of Oxford University Press, Inc.

5 (a) (i) With reference to **one** pollutant, explain how the pollution risk to water for public supply may be removed.

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(5 marks)

6 The information in the text box below is an extract from a public information page about waste management on the Birmingham City Council (BCC) website.



What Happens to our Waste?

The waste disposal service arranges for:

- the disposal of sorted waste collected from households by or on behalf of the City Council within Birmingham
- the provision of sites for the public to dispose of their waste free of charge
- the safe disposal of difficult, hazardous and toxic waste from domestic sources or found in public places
- the provision of centres for recycling and composting waste

Source: © Birmingham City Council

6 (a) Evaluate the aims of Birmingham City Council’s waste disposal services and the probable outcomes for sustainable resource management and environmental protection.

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(8 marks)

Question 6 continues on the next page

6 (b) The publicity information below describes and illustrates the Tyseley Energy from Waste plant which deals with some of Birmingham City's waste.

The Energy from Waste plant

The Tyseley Energy from Waste plant was built by Veolia ES Birmingham Ltd in 1996 to replace an existing 1970s mass burn incinerator and to allow the City Council to reduce its reliance on landfill.

An easily identifiable landmark from the Small Heath Highway, the Energy from Waste plant burned 313 000 tonnes of rubbish in 2006/07, producing enough electricity to power 40 000 local homes.

The plant runs 24 hours a day, 365 days of the year and is well within UK and EU standards for emissions; all that is seen coming from the chimney stack is steam.

The Energy from Waste plant recovers several thousand tonnes of metals each year after the incineration process. The bottom ash, which is what remains in the furnace, is used in road building programmes.



Source: © Birmingham City Council

Using the information provided, assess the contribution this energy infrastructure development makes to the sustainable use of resources.

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(5 marks)

6 (c) Assess the influence of the publicity photograph of the *Energy from Waste* plant on the public's perception of the sustainable development of Birmingham.

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(2 marks)

6 (d) Suggest ideas that the City Council might engage the people of Birmingham in developing or supporting its strategies for waste disposal as part of a Sustainable Development plan.

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(3 marks)

Turn over for the next question

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7 The British Trust for Conservation Volunteers (BTCV) is a national charity dedicated to the conservation of the natural environment that works with volunteers to carry out practical conservation tasks.

Below is a diary entry from the BTCV Bedfordshire website following work done at a local site.

Cowslip Meadow 21/08/08

Cowslip Meadow is a well hidden nature reserve of near SSSI quality. It is a fantastically diverse habitat and Great Crested Newts, Water Voles and Marsh Orchids are to be found there. The willow herb that we were there to remove, is invasive and outcompetes other, more valuable plants such as meadowsweet. We also removed some ragwort from the site.

Source: BTCV Bedfordshire

7 (a) Evaluate the importance to society of local habitats such as *Cowslip Meadow*.

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(5 marks)

7 (b) Evaluate the purpose of wildlife conservation by organisations like the BTCV.

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(3 marks)

7 (c) Justify improvements that local people could make to their gardens to support Bedfordshire BTCV's wildlife conservation plans for the area.

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(3 marks)

END OF QUESTIONS

There are no questions on this page

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