

Teachers' Notes

Sustainability and Sustainable Forestry

These case studies are intended for use with students studying Geography at KS3/4 or the Scottish Guidelines for P7-S2 or Intermediate Higher Still.

As we feel it is important that students understand the basic concept of sustainability, we have designed these case studies so that the reader has to work through the information and activities provided on Sustainability before being able to begin studying Sustainable Forestry as a specific area.

There is no definitive way of explaining the concept of sustainability as it is forever changing and will always be subject to political interpretation. The Sustainability case study aims to *introduce* the concept in general terms for students, with a view to looking at environmental issues in more detail. Students may benefit from extension work on some of the issues introduced in both case studies, as suggested below.

Sustainability

Activity 1

(a) Some useful extension work could involve looking in more detail at the writings of Thomas Malthus, The Brundtland Report, The Rio and Johannesburg Summits and Agenda 21. A particularly good website is www.ace.mmu.ac.uk/ which provides useful information on a host of environmental issues for students including advice on 'doing your bit for sustainability'. This site also includes a series of environmental games which add an element of fun, but with a serious purpose.

(b) Another excellent resource looking at general environmental issues is the 'Green Pack' produced by the Regional Environmental Centre for Central and Eastern Europe. Among other things, in this pack is a Dilemma Game based on twenty-two case studies on different environmental topics. Each case study provides an environmental dilemma followed by several possible responses to the problem both positive and negative aspects of each response are then provided to demonstrate the complexities of the situations. This can be ordered from www.rec.org

A further two useful websites focusing specifically on sustainable lifestyles and suggestions as to how to live life more sustainably are www.globalstewards.org/ and also www.sustainableworld.org.uk/ respectively.

Students should enjoy visiting a very comprehensive site provided by Home Grown Organic Foods, Canada www.hgof.ns.ca/index2.php?function=hlth_nut where they can click on 'Quips and Quotes' and

read a thought-provoking piece entitled 'A Modern Day Parable About Living Life More Simply'.

Students should consider how we all create waste and fail to recycle enough. Other issues worth looking at are energy and how we waste it. Our reliance on fossil fuels, unnecessary car journeys, lack of public transport etc.

(c) In discussing the concept of the three-legged stool, students should be made aware of the importance of all three components. Too often in the past enterprises were only considered sustainable if they were economic, that is to say could provide a return for someone's investment. Far too little attention was paid to the environmental implications of many activities. Our over-dependence on fossil fuels is a case in point when we continue to use them despite ample evidence of the role they play in global warming, for example. It is however, important too that the social dimension be taken into account for example, with the need for more equity in decision making especially at local level. How often do we see local objections to particular planning applications by companies over-turned when the company goes to appeal at national level. What price local democracy in these circumstances?

(d) Consider a Local Agenda 21 and what factors might be taken into consideration in the students' own particular area. What are some of the key issues? Create a scrapbook over a period of time summarising the main local issues from your local newspaper. Discuss these issues and how they might be resolved in an 'ideal' world. Emphasise how each local area will have its own problems and priorities.

Activity 2

By comparing the footprints of a number of Countries, students should see just how uneven and unfair is the consumption of resources in different countries of the world. For example, to support the consumption of the average American lifestyle on a global basis without any sustainability problems for would require about SIX Earths.

By calculating their own footprint (based on family data) each student has an expression of how they compare with the national figure which currently suggests that we are consuming resources at a rate which could only be sustained by just over three Earths.

Activity 3

In choosing ten items in just a few minutes students will probably give little consideration to just how essential are their choices. Do they actually need all their listed items? Have they forgotten items crucial to their survival? They might need to bring a fishing rod, rifle or snares to hunt food with, tools, a first aid kit, matches for a fire, etc. They will not need personal stereos, mobile phones and all the trappings of modern living but instead return to a much simpler way of life which is at least sustainable.

The idea of the Global Village is to show that to reach agreement with regard to the way forward on a global scale is exceedingly difficult by virtue of a number of intervening obstacles. These include problems relating to language, religion and culture, poverty, illiteracy, wars, famine, disease and so on which leave many people in the world in conditions which are unsustainable. This lack of social equity is a powerful factor in creating instability and needs to be addressed perhaps by means of the rich societies helping the poor through aid in the form of money or technical support and by removing barriers to free trade which so disadvantages poor countries. It is in the interests of the rich countries to do so in the long-run.

Activity 4

This quiz has been designed to provide factual, non-biased information and, where possible, all statistics have been UN sourced.

The answers to the Sustainable Development Quiz are as follows.

- (1) A
- (2) A
- (3) B
- (4) C
- (5) C
- (6) B

- (7) B
- (8) B
- (9) C
- (10) A

Students might like to look at ways of improving the sustainability of their classroom or even of the school itself. Useful information on this topic can be obtained from a number of websites. The best is probably the Tidy Britain Group who organise 'Ecoschools'. Find this at: www.tidybritain.org.uk.

Another is www.wastewatch.org.uk on recycling in schools and also Friends of the Earth at www.foe.co.uk Friends of the Earth describe themselves as a one-stop shop for all your environmental questions.

Sustainable Forestry

The activities which accompany the resources on Norwegian forestry are designed to provide students with knowledge and understanding of a number of environmental issues - in this case the concept of sustainability, but also involve them in a variety of skills of broad cross-curricular value. In addition, the content of the case study could be used in a number of different contexts ranging from Geography to Environmental Studies and should even be flexible enough to be incorporated into PSHE, Religious Education or Citizenship by virtue of the underlying moral and ethical questions which underlie the whole notion of sustainability.

Teachers should feel free to use the activities direct on a supported self-study basis or adapt them to suit the age group and ability levels of the students in question.

Activity 1 the intention is to introduce Norwegian forestry by relating it to a situation with which the student may be familiar. This then leads on to a summary of the Norwegian Forest Industry reinforced by a series of questions.

Activity 2 looks at comparative statistics between Norway, Sweden, Finland and the UK so that the relative importance of forest operations can be compared.

Activity 3 focuses on owner-occupiers to look at reasons why the Norwegian Forest Industry can now be viewed as very sustainable. That ownership / heritage leads to increased sustainability could form the subject of a debate with students being encouraged to find their own examples demonstrating their personal understanding of sustainability in this context.

Activity 4 summarises the role of the Norwegian Government in supporting forestry and the reasons for the setting up of the 'Living Forests' initiative. Students should be made aware that the PEFC accreditation has been established as a direct result of consumer pressure. This could provide a basis for students to debate on consumer power / resistance and the part it plays in sustainability.

Activity 5 looks at the Standards introduced to increase the sustainability of forests and make them acceptable for certification. This activity encapsulates the main themes of sustainability as summarised in the first case study. Students should be encouraged to look back over this case study and recap on the main themes in relation to this activity.

Activity 6 is a brief resume of the Acid Rain problem. Students should note that most of the causes of Acid Rain i.e. SO₂ and NO₂ emanate from industrial fumes and traffic fumes respectively and mainly from outside countries; notably Britain, Germany and Eastern Europe. Having been first identified in the 1960s and 1970s recent evidence has shown that the negative effects on trees may have been exaggerated even although the 'jury is still out' on the negative effects on the water supply. There is evidence however that the emission of SO₂ and NO₂ may indeed be reducing due to technological improvements such as Flue Gas Desulphurisation (FGD) in power stations and catalytic converters in cars.

Activity 7 allows the student to present an investigation on Acid Rain by means of a poster. There are a host of good websites on Acid Rain. One of these is an American one www.epa.gov and another which teaches the students how to carry out readings of their own using fairly simple equipment is at www.angelfire.com Students should also be encouraged to think about how countries such as Norway can deal with the problem of Acid Rain and what lessons can be learned from this.

Activity 8 involves the student in researching the sorts of products available in value added markets such as furniture and garden furniture.

Activity 9 asks students to consider the use of wood as a fuel - the oldest source of energy known to man and consider the advantages and disadvantages. In discussion they should consider some or all of the following.

Advantages

- Compared with fossil fuel, wood burning reduces CO₂ emissions by 70%.
- Wood is renewable.
- It is less environmentally damaging to obtain than

mining coal or even drilling for oil or gases especially if replanted.

- Its geographical distribution is more widespread than fossil fuels.
- New technology has reduced the emission of soot (particulates).
- The ash can be used as a fertiliser.
- By replanting trees after cutting CO₂ is reabsorbed.

Disadvantages

- Wood still emits some CO₂.
- Some soot is inevitably produced.
- An over-concentration on quick-growing or non-native varieties might lead to a loss of biodiversity.

Activity 10 students should be encouraged to use their artistic talents in designing a poster advertising the benefits of liquid biofuels. They should also note that currently liquid fuels cost about twice as much to produce as oil, for example. Given this consideration, what strategies might they have to adopt in trying to 'sell' its increased usage by the public.

Activity 11 students should copy the diagram summarising the many and varied functions of forests.

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Author: Jim McCracken

Jim McCracken asserts his moral right to be identified as the Author of Sustainability and Sustainable Forestry.

Created and produced by:

EPR, 126-128 Cromwell Road, London SW7 4ET.

Tel: 020 7373 7716 Email: action@epr.org.uk

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