Sustainable Scotland

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The Open University, Walton Hall, Milton Keynes, MK7 6AA

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Introduction

Introduction

This course takes you on a wide-ranging journey through the many aspects of sustainability and explores ways to tackle a sustainable future positively. We will look briefly at issues such as ecological footprinting, globalisation, recycling, food production, fishing, waste heat, nature and culture.

This course will appeal to anyone interested in learning more about a sustainable future, as well as those who are interested in contemporary Scottish society.

Understanding what is meant by the terms 'sustainability' and 'sustainable development' can be the first hurdle. Nearly all academic and popular science books on the environment talk about these terms without giving a clear definition. The Brundtland Commission (1987), or *Brundtland Report*, is often referred to and it states that sustainable development 'is development which meets the needs of the present without compromising the ability of future generations to meet their own needs'.

Generally, two types of sustainability are spoken about: weak and strong (Dresner, 2002). Sustainability can also be seen in economic terms, including the idea of natural capital that was used in the *Brundtland Report* (Pearce et al, 1989). The underlying principle here being that if, for example, something is taken out of the earth, something else renewable must be substituted as compensation. The extreme of this idea would be not to take anything out of the earth at all, but that would perhaps be a little unrealistic. If there is no decline in natural capital, then the sustainability is seen as 'strong'. If natural capital can have human-made capital substituted, then that is regarded as 'weak' sustainability.

Attitudes to environmental issues are affected by people's beliefs and background. Often environmentalists are perceived as middle-class people who don't understand the economic situations of those whose livelihood depends on a particular industry. Take the fishing industry for example. Fishing quotas are seen by environmentalists as a chance for regeneration of fishing stock, whereas the fishing folk see it as unemployment and an economic decline in the local area. This particular issue is revisited again later in the course.

People who concentrate on the future of environmental resources for their children and grandchildren are said to have a 'green sustainability agenda'. Those who concentrate on the difficulties experienced by those currently living in a low-income socially-deprived area are said to have a 'brown environmental health agenda'.

There are almost as many perspectives on the environment as there are on political parties.

This OpenLearn course provides a sample of level 1 study in Environment & Development

Learning outcomes

After studying this course, you should be able to:

- understand the terms 'sustainability' and 'sustainable development'
- follow current debates on environmental issues
- understand more about measuring sustainability and footprinting
- consider whether dematerialisation is really happening
- consider what is globalisation and understand the global trade in recycling.

1 Measuring up

A way of measuring sustainability is footprinting. There are several types of footprints that can be measured. One of the footprinting methods you will find people often referring to is ecological footprinting (EF).The Frequently Asked Questions (FAQ) link on the site above gives more details about EF, and includes a link to the standards used to try and ensure that everyone is measuring in the same way. The unit of measurement given in the FAQ section of the site is the **global hectare**, which is explained in the glossary.

Activity 1

One of the priority themes for the Sustainable Scotland Network–>(SSN) is local footprinting for councils and schools. You can check your local council's footprint online, using search engines, or in assocation with the Stockholm Environment Institute. Here's an example of London's footprint by borough.

Have a look through these sites, and make notes on what you have read.

Ecological footprint of a city

Activity 2

Go to this report on Scotland's cities. This will give you another look at EFs from a Scottish perspective.You should concentrate on section 7.2.5 in this report. Why did the Scottish Executive decide to use the Responsibility Principle for this particular analysis?

Make notes on what you have read.

....

Answer

Discussion

Figure 7.1 of the report in Activity 2 provides an effective image of the division of types ofland used in the calculations. It shows the main components of the EF, simplified into 'biodiversity', 'built land', 'energy land', 'bioproductive sea' and 'bioproductive land'. A city's EF is enormously larger than the area of the city itself. It has been estimated, for example, that the area of land and sea required to feed continuously, supply forest products, accommodate, and absorb the carbon dioxide (CO_2) produced by London's 7 million inhabitants living their current lifestyles, is over 39 million global hectares. This is the geographical area of Germany and Denmark

Personal ecological footprint

An Environmental Health Check is a process where people look at their footprint by surveying all of their activities around their house.There are various online EF calculators that you can access by using your browser to search for 'footprint calculator'.

2 Material world

Dematerialisation hasn't really happened, because although e-shopping has increased, material things are still the main stuff of commerce and e-shopping requires centralised warehouses, and home delivery traffic. It is not counterbalanced by reduction of travel to shops by consumers, it is just an extra channel rather than a replacement.

Although it is more resource-efficient to download a CD over the internet compared to going to a shop to buy one, a lot of people burn their downloads onto a CD at home. Digital download of books or newspapers tend to be printed off rather than read on screen as it is, as yet, not as comfortable as reading from a paper or a book. So energy and materials such as paper/CDs are now consumed at home instead of in an industrial setting.

The 'weightless economy' has just moved its weight elsewhere. Saving music onto MP3 players may reduce home CD-burning, but people tend to update to a newer version of MP3 player. This is therefore another product using resources for manufacture. Fuchs (2008) gives a figure of 5% of Germany's energy being consumed by use of the internet in 2000, and 8% in 2005 by the ICT industry and home use, including infrastructure.

A reduction in emissions could be made by using ICT to make energy efficiencies throughout all industries via optimisation software and hardware to improve designs in buildings and transport, as well as managing overall consumption: that is the SMART opportunity, according to The Climate Group report. The ICT industry has inaugurated The Green Grid to encourage and share good practice in increasing its energy efficiency. This Green Grid is not without its detractors.

Activity 3

You might want to visit The Register website as there are various IT-related white papers that may be of interest. You have to register with them and the paper is then sent to you by email.

Read the articles and make notes on you have read.

3 Understanding globalisation

Placing Scotland in the wider world demands that we explore what we mean by globalisation and what globalisation means for Scotland.

> **Activity 4**
>
> Before we begin, let's think about globalisation.
>
> Jot down the words and phrases that come to mind when you hear the term 'globalisation'.

What is globalisation?

Globalisation is not so much a thing, as a series of overlapping, connected and interdependent processes. As a term, globalisation is an attempt to capture the profound social, cultural, political and economic changes ushered in by new communication technologies and the development of extensive transport networks for goods and people.

The increasing movement of peoples between different states to find work is an example of our global world. Economic migration (that is, moving to another place to find work) is now fairly common. For example, the expansion of the European Union (EU) to include Eastern European countries in 2004 led to a rise in economic migration within Europe. Many places in Scotland now have well-established and dynamic Eastern European — in particular Polish — communities.

Prior to EU expansion, the Polish community in the UK was relatively small and was made up of unwilling migrants trying to escape first Nazi and then Soviet oppression. Post-expansion we have Polish shops, Polish community organisations (especially churches), Polish food in our supermarkets, and Polish articles in the local press. The above examples demonstrate three of the key features of contemporary globalisation: fluid populations (people are free to move about), economic openness (no barriers to economic migration), and cultural diversity. However, as we will see later in this course, globalisation has been around in some form since humanity began.

3.1 Globalisation and nationalism

Often globalisation is viewed as a challenge to the nations, to states and to forms of activity on a local scale. However, the emergence of global institutions like the United Nations, the World Bank and the International Monetary Fund has coincided with an increase in the number of independent nation states. It seems the rise in global social, cultural, political and economic processes increased the interest in, and exploration of, nations and nationalism. Even where nations (groups that claim a common identity) do seek to become states (form self-determined governments) there is an increased awareness and recognition of nations and nationalism (Hobsbawm, 2000).

Some commentators argue that nationalism and an increasing interest in **folk cultures** is a reaction to globalisation. Economic and political globalisation threatens nations and states, while the globalisation of **culture** is seen as threatening local indigenous cultures. It is clear that the dominance of our minority world social, cultural, political and economic structures is a threat to national economies and local cultures. For example, the threat that English (and other languages associated with economic and cultural dominance) has on indigenous languages. However, it is not clear whether our interest in nationalism and local cultures is a reaction to globalisation, or actually part and parcel of globalisation. For

example, the globalisation of food markets is seen as a direct challenge to local food markets where the import of cheaper food undermines the market for local produce.

3.2 Global food trade

The global trade in food is seen to be associated with negative environmental impacts and is often considered unsustainable. The globalisation of food has also led to the development of global food brands. However, despite the threat of globalised food cultures, local food and an interest in local produce and recipes seems to be fairly strong.

- Are local food networks and the re-emergence of local specialities (sometimes fused with other cuisines — French/Italian/Indian) simply a form of resistance to global food markets, or are they part of the globalisation process?
- Do we recognise the importance of our local food suppliers and local dishes in the face of the homogenisation of food cultures, or are locality and specialism something that global food cultures allow us to appreciate more fully?

For example, research on local food markets in the West Highlands has found that the local food economy, is almost entirely dependent on the consumption of local food by tourists. The re-emergence and recognition of the importance of local food, and local food economy, is related to global tourism and marketing (Macintyre, 2005). What is interesting about this example of the West Highlands is the way that wider social and economic changes in the way we distribute, store and consume food are having effects that we might not expect on the agricultural community and rural consumers. On one hand the reach of large multinational (global) companies and the movement of food around the world appear to be eroding the connection between the producers of food and local markets. On the other hand a new local food market has emerged that is dependent on an aspect of those global processes, the free movement of people.

One of the inherent contradictions within our connections with the wider world (understood as the fluid and free movement of goods, services and peoples around the globe) is that while it can (and sometimes does) make everywhere seem familiar and the same — same shops, same food, same films — it also allows places and people to communicate their distinctiveness and difference. Potentially, it also means that dispersed and marginalised groups can communicate and come together and (in some cases) market their difference. These connections mean that globalisation also helps to support and nurture difference, including distinctive local cuisines and local food cultures.

Activity 5

You have now been given a few examples of the different ways that globalisation shapes our lives.

Look back at the notes you made in your learning log in Activity 4 and see if you would now like to change any of the terms.

- Which terms would you like to change?
- Why would you like to change them?
- What would you add?

3.3 Global economy

We tend to think of the global movement of goods and people, and the interdependence of geographically distant places, as a fairly recent phenomenon. It is not. Goods and peoples have moved around the world for hundreds of years. From the trade routes of the ancient Silk Road, which spread across the Asian continent, to the spice routes of the Far East, from the shipping of tea to the transporting of potatoes and tobacco, from the people who followed the retreating ice sheets up into present day Scotland to the Vikings and the Scots coming over from Ireland, the movement of goods and peoples is not new.

One of the things we tend to think about as being characteristic of globalisation is the reach of the global economy, the way that the wider economy can affect and change local economic circumstances. However, the changing global economy has been affecting livelihoods in Scotland for generations (Hunter, 1976). Hunter argues that the collapse of wool and kelp markets after the Napoleonic War (1799–1815) was a direct contribution to the Highland Clearances.

During the Napoleonic War, landowners were keen to retain their tenants and employ them as a willing workforce in what was a buoyant rural war-time economy. After the war, landowners divided crofts into agricultural units that were not quite sufficient to feed a family and pay rent so as to force the crofters to work for them. This was the first wave of clearances. The collapse of the market for goods produced on Highland estates in the face of more competitively priced imports meant that the tenants were now without employment. This led to a second wave of clearances characterised by emigration to the 'New World' and migration to cities in the central belt to seek permanent and or seasonal work.

4 Global trade in recycling

Let's look now at the global trade in recycling. Scotland is connected to the wider world by what it discards in a number of interesting ways. For example, a Clyde-built ship is likely to find its way to the Bay of Bengal to be dismantled.

Another example is the EU-led UK Waste Electrical and Electronic Equipment (WEEE) regulations that are an attempt to ensure the safe disposal of electrical waste. Research has found that this has led to concerns about the market for electrical waste in **majority world** countries created in part by the legislation. Hand-sorting of potentially hazardous electrical waste by some of the poorest people(s) in the world remains a problem for human and environmental health in the majority world.

Our waste connects us with the world. One of the most interesting examples is paper. Recycled paper from Scotland often finds itself baled and transported to China. Here it is made into packaging, packaging that wraps many of the consumer goods that we purchase in the shops in this country.

Activity 6

You can find out more about the human and environmental cost of these waste practices in Greenpeace's report on breaking ships, as well as Greenpeace's reports on electronic waste. And if you're really interested you can find out exactly how large the demand for recycled paper is in China through the report, 'Environmental aspects of China's papermaking fiber supply' from the Forest Trends website.

Read the articles and make notes on what you've read.

The global trade in recycled paper is linked to the demand for goods. The collapse of various banks and credit markets in autumn 2008 led to decreased consumer confidence. Reduced consumer demand leads to less production, fewer products. Fewer products means less packaging — less packaging means less demand for recycled paper.

Smith (2008) writes about the effects that this collapse had on local authorities in the UK, while Branigan (2009) presents a more general overview of the effects of global economic changes on recycling.

Activity 7

Think about the following issues:

1. 1 The links between local environmental projects like GREAN (Golspie Recycling and Environmental Action Network, or any projects you are involved and/or interested in, and the global trade in recyclable materials.
2. 2 The links between your everyday consumption and the global recyclables trade.
3. 3 The appropriate scale for the reuse and recycling of products — just how sustainable is it to transport such goods around the world?
4. 4 What effect does the unregulated hand-sorting of our waste have on communities in the majority world?

5 Food production

Many of us now feel quite detached from the systems of food production that sustain our lives. Therefore, we make no apology for using this section of the course to focus on food production, the changing demands we place on production systems, and how that has impacted on the landscapes and seascapes of Scotland.

Although many other factors affect what we actually eat, just like any other animal we have to ingest food to maintain body function and to develop and grow. It is one of our most basic needs.

Activity 8

Have a look at your shopping basket. What kind of food stuffs does it contain?

....

Answer

Discussion

It probably contains some more recognisably processed food:

- ready to eat macaroni cheese;
- ice cream or frozen beef stroganoff;
- biscuits and cakes;
- treats like confectionery.

It probably also contains some products that have been processed a little (but we might think of as being quite natural):

- cold meats, smoked herring, yoghurt and cheeses;
- bread, pasta or milk (which may even be soya);
- pickled onions or beetroot, dried fruit or fruit juices.

It probably contains some relatively unprocessed products, for example:

- meat, fish and dairy;
- grains and pulses (lentils and barley for soup, or rice);
- fruit and vegetables.

We can see that as we move through each category, the source (i.e. meat, fish and fruit) becomes clearer.

Activity 9

Look at this yoghurt case study from Envirowise/Yeo Valley .

....

Answer

Discussion

On the surface it seems like a relatively natural product and part of a healthy lifestyle. However, the example showed us that yoghurt production is (or can be) very resource and energy intensive.

What our shopping basket also tells us is that we have developed a fairly sophisticated food culture that draws in diverse raw materials, often transporting

> them long distances, and we store and process them in complex and ingenious ways.

Food culture

In Scotland most of us do not purchase or consume food simply for maintenance and/or growth. Eating is not simply about survival, we have developed 'food cultures'. That is, particular peoples, in particular places have developed particular styles of food preparation that relate to the food resources around them; olive oil around the Mediterranean Sea, maize in Africa and porridge in Scotland. Today, of course, these cuisines are no longer rooted in particular geographical locales and we can eat our way round the world within larger towns and cities.

Of course, the food culture(s) we are brought up with, our socio-economic status and even where we live affects both our choice of food, and the choices that are available to us.

6 A short history of fishing

When we think about fishing in Scotland, we tend to think of herring, the **'Silver Darlings'**, and the herring boom of the nineteenth and early twentieth century. However, Scotland had a fairly established fishing industry during the medieval period (Coull, 2001a). The centre of that fledgling industry was centred around the Firth of Forth and the Clyde.

The Dutch dominated the herring industry in the 1600s using large vessels that cured and processed the catch on board. Attempts to replicate the Dutch model in Scotland foundered. However, as the shoals of herring were fairly close to shore, the Scottish model became one where small open boats would land the catch and it was then processed onshore. Even as boat sizes increased through the 19th century, the practice of onshore processing continued.

The migration patterns of the herring dictated the position of the curing stations, and the East Coast (access to the North Sea), North Scotland, the Shetlands and the Western Isles became increasingly important in the 19th century. Coull (2001b) notes that as the profitability of fishing dwindled so the focus of the industry moved to more remote and marginal ports. Thus today the majority of the UK's fishing fleet is now based in the north-east of Scotland.

Activity 10

Visit these sites for historical information and a tour of the
Scottish Fisheries Museum.

Make notes on what you have read

While we might think about over-fishing and dwindling catches as a contemporary problem, the ecological effects of the intensive exploitation of marine resources has been recognised for some time. For example, in 1902 the International Council for the Exploration of the Seas (ICES) — actually the countries around the North Sea — was set up to monitor stocks and catches and to make conservation recommendations.

The effects of larger boats on local fisheries were also being recognised. Perring's (2001) history of fishing on Fair Isle notes that by 1906 the Shetland Times was beginning to carry stories about the impact of trawlers on the Shetland fishery. However, it was only after WWII that any regulations were put in place. These mainly related to mesh size (Coull, 2001b). After Britain joined the Common Market (later the EU) at the beginning of 1973 it became a member of the Common Fisheries Policy (CFP).

Activity 11

Familiarise yourself with the CFP, as the EU CFP framework is the single most important policy factor in the sustainable fisheries within Scotland.

Make notes on what you have read

7 Waste heat

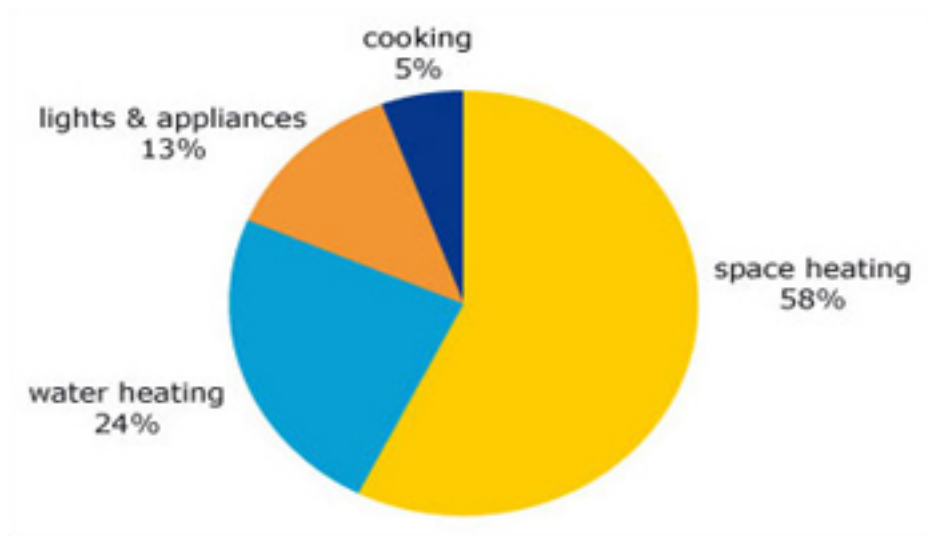Look at the typical use of energy in a home:

Figure 1: UK domestic energy consumption by end use, 2000

As you can see, over 82% of our energy use is for heating the space we live in or heating the water we use.

We also know that our thermal power stations reject more in heat energy than they deliver in electrical energy. Using section 4 of the Scottish Energy Study (2006) as our reference, it appears that waste heat from our theremal stations is a little greater than what we need to heat our homes and services sector.

In practice it is, of course, not this simple. Our power stations tend not to have sufficient local opportunity for heat use (e.g. Torness is a long way from housing), and the cost of installing the necessary infrastructure is high. In addition, the waste heat would need to be extracted at a higher temperature to be useful, which marginally reduces the efficiency of electricity production.

There is, of course, public perception to consider. Perhaps public opinion would not accept domestic heating from a nuclear power station's heat. That would not stop the heat being used for other purposes, however.

This does raise the question about future power stations and whether we could be planning them to make effective use of the waste heat.

Combined heat and power (CHP) case study

We have identified that CHP can make heat available and provide electricity at much higher efficiencies. We'll now look at a case study of a small-scale CHP scheme which reveals other potential benefits, particularly if the scheme is designed to provide community benefits.

Activity 12

Please go to the Green Building Press website, and consider what community benefits this scheme in Aberdeen has provided.

Make notes on what you have read.

7.1 Using waste heat

So far we have looked at efficiency and identified that the losses in conventional power stations are huge but potentially this waste heat could be used in district heating. There are, however, geographical difficulties with this because the use for the heat needs to be relatively close to the source of the heat, the power station.

However, the 2006 Scottish Energy Study report recommended that:

> 'We would also like to see ways of utilising the substantial amounts of waste energy, largely in the form of heat, that are lost at electricity generating plants and from industrial processes … More specifically, as around two-thirds of the energy generated in our coal-fired electricity generating stations is lost then at the very least we suggest that Scottish Power develop a scheme for the use of this waste heat for the communities around its Longannet plant. Ideally, this should also occur at Cockenzie but we recognise the relatively short life span of the plant. For other plants, such as at Grangemouth refinery and petrochemical complex and at Torness, we would like to see the operators take the initiative, along with the local enterprise companies, to stimulate the development of businesses that have high energy requirements, including the horticultural sector.'

The important point here is the intention to use the heat, whether it be for domestic, industrial, commercial or even **horticultural use**.

CHP systems tend to be smaller scale, enabling them to be sited nearer to large residential or office/industry areas. The Sullivan Report (Scottish Building Standards Agency, 2007), which we will examine later, makes particular recommendations to encourage future use of local energy centres and CHP. We also identified that combined cycle gas turbine (CCGT) systems of electricity generation are both more efficient and produce lower CO_2 than coal-fired power stations.

Given that for the foreseeable future there will continue to be a need for conventional power stations, we will now look at what might be done to clean up the existing coal-fired power stations.

8 Nature and culture

Let's look at some of the thinking that has informed our understanding of nature. Culture influences the way we understand nature. I want to illustrate this point with reference to the changing ways that people have viewed the Highlands and Islands.

Up until the 18th century, the rough and mountainous landscapes of the Highlands were considered to be wholly unappealing. In part this was political. The relative inaccessibility of the area meant that it was largely outside the political control of Edinburgh or London. However, it was also related to a taste for productive agricultural landscapes and rolling parks that echoed ancient Rome.

While we cannot pick on one factor to account for the fact of the change that saw these landscapes become considered as things of beauty, we can unpick a few historical trends. The military conquest of the Highlands meant it was much safer to travel in. The emergence of geology as a science saw an increased interest in wild places. As we conquered and subdued 'wild' nature, making it into agricultural landscape favoured by early landscape artists, so the interest in wild, sublime nature grew. Wild mountainous landscapes went from sites of fear — places that would corrupt the soul — to places of spiritual health and awakening (Hope Nicolson, 1959). This was coupled with an increased interest in 'native people' and was informed by European Romanticism.

Figure 2

8.1 The Romantic movement

The Romantic movement argued that we were born pure and natural, so an interest in (apparently) simple peasantry took hold. For example, Boswell and Johnson's trip to the Highlands and Islands in 1773 was seen as chance to visit the 'noble savage' on their doorstep (Gold and Gold, 1995).

For early environmentalists like Dunbar-born John Muir, who was one of the main campaigners for the Yosemite National Park in the USA and founder of the influential Sierra Club in 1892, nature was no longer simply a supplier of raw materials and a sink for waste.

Nature, and being in nature, came to be seen as a cure for the mental and physical ills associated with the cities of the late 19th century (Hannigan, 1995). This attitude continues and informs the outdoor movements and the environmentalism of today.

> **Activity 13**
>
> You can learn more about John Muir and Yosemite on the Smithsonian website.
>
> As you read the article, note the kind of language that John Muir uses to describe the park

8.2 Changing views

The tension between the outdoor movement and those who promote renewable energy projects like wind farms as a source of income and green energy in remote rural places is an example of the way that the outdoor movement continually seeks to protect the outdoor experience as natural. In a similar way the environment movement is split between local concerns about protecting landscapes from unnatural objects like wind turbines and global concerns about anthropogenic climate change. Our views and our background (our culture) condition the way we see nature or landscape and our attitude towards them.

For me, one of the most interesting aspects of this changing view of landscape is the way that in the West Highlands the taste for 'natural' landscapes developed alongside social and economic processes that saw people cleared from their smallholdings to make way for sheep and later for hunting deer – the Highland Clearances. The architects of the clearances repositioned themselves as custodians of the wild landscape. Landseer's painting, Monarch of the Glen, is a typical depiction of an empty Highland landscape where the actual removal of the people from these glens is literally painted over in the painting that adorns the drawing rooms of the upper classes (Makdisi, 1998). Later, many of the families who actively cleared people from the landscape were the founders of the National Trust of Scotland (Lorimer, 2000).

The natural beauty of the empty glens in Sutherland is anything but natural. They are carefully managed landscapes that still carry the echoes (in the crumbled walls of people's homes) of a culture that was forcibly removed. These are essentially cultural landscapes. Cultural landscapes can be understood as the landscape created by our practices (for example the managed grouse moors of the Cairngorms), and also the way we interpret and represent those physical forms, for example the picture postcards of 'your wee bit hill and glen' (Williamson, 1960s).

8.3 Cause for debate

The division between nature and culture continues today in debates around nature and nurture. For example, is gender something that is biologically determined (it's our nature, in our genes) or is it determined by our upbringing (nurtured)? We can also see echoes of Romanticism and the 'noble savage' continuing in our representation of peoples who live a subsistence existence in remote parts of the world. They are seen as being somehow primitive with some people arguing that these 'primitive' cultures are closer to, or more in tune with, nature. This seems to neglect the growing evidence that overhunting by our 'primitive' ancestors may have caused the extinction of a number of large mammals like the woolly mammoth in Europe and marsupials in Australasia.

These 'back-to-nature' ideals inform our thinking on sustainability, with debates about the environment sometimes split into those who think that the answer to environmental problems lies with using the knowledge and skills we have to solve those problems, and those who feel that it is those knowledge and skills that messed up the environment in the first place.

Activity 14

Let's take organic agriculture as an example of the above debate:

- Do you think that organic agriculture is a return to traditional farming practices, where older farming cultures foster a closer relationship with the environment and nature?

- Do you think that we should be using modern scientific techniques to understand how we can work with nature?

Make a note of your thoughts.

Thinking through questions about the relationship between nature and culture, it seems that culture is shaped by nature, and in opposition to nature. Then, in turn, what we do shapes nature. This ebb and flow prompts us to think about sustainability in lots of different ways.

Conclusion

This free course provided an introduction to studying Environment & Development. It took you through a series of exercises designed to develop your approach to study and learning at a distance, and helped to improve your confidence as an independent learner.

Glossary

Click on the link below to open the course glossary.

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