

BIODIVERSITY HELPS TO ACHIEVE SUSTAINABLE DEVELOPMENT

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Introduction

Focus on how I consider biodiversity helps to achieve sustainable development and what action we should take in addition to existing activity.

First I wish to clarify what is biodiversity and what it means.

What is Biodiversity?

Contrary to the views of many people biodiversity goes well beyond individual species, important though they are, and beyond species in their habitats. Biodiversity is individual species **and** species together **and** species in their habitats **and** habitats and their ecosystem **and** biological processes. Other natural processes are also relevant, such as energy flows, water circulation and atmospheric circulation.

What does Biodiversity mean?

Biodiversity is inclusive rather than exclusive, people are a fundamental part of biodiversity. Society and biodiversity are interdependent. Biodiversity must be seen as one of society's capital assets, in other words it can be used for human benefit.

But it is essential that we recognise how certain types of use can be beneficial and others not so. We therefore need to use nature's resources within their natural limits, to ensure that we understand natural processes and the changes which can de-stabilise them.

There are many definitions of biodiversity, including the one by Tom Lovejoy in his recent Reith lecture on biodiversity.

A very apposite description of biodiversity has been drawn up by the UK Department for International Development in its paper "Biodiversity Matters".

"Biodiversity is nature's wealth, in the `variety of life` in all its many forms. From the smallest microbe to the largest mammal, from individual genes to complex ecosystems - all life is characterised by variety. This variety is nature's constantly changing deck of cards. Each card is a potential opportunity - from a pest resistant crop or a new medical cure to healthier cattle. The loss of biodiversity means the loss of opportunities, possible forever.

Biodiversity includes people, too. Where we live is intricately bound up with how we live. Nature's variety is reflected in our diverse cultures and beliefs. This cultural diversity can be diminished by loss of biodiversity".

How does biodiversity help achieve to sustainable development?

International accords on sustainable development and biodiversity were negotiated as part of the Rio package in 1992. A great deal of action has occurred in the United Kingdom on biodiversity, particularly in relation to Species Action Plans and Habitat Action Plans. However, there is much less effort on other aspects of the Convention on Biological Diversity, such as the equitable sharing of genetic resources and the sustainable use of natural resources and, as yet, ineffective connection between work on protected areas (a fundamental part of the Convention) and the biodiversity agenda. There has, as yet, been very little consideration of how biodiversity in all its many and varied guises can contribute to sustainable development.

In Scotland, Sarah Boyack, Minister for Transport and the Environment, has given a challenge to all organisations involved in biodiversity, including SNH and all of the other members of the Scottish Biodiversity Group.

“Tackling social issues, environmental issues and the economy separately does not deliver sustainable development. The joined up approach does. Picking off the three biodiversity principles one by one may have the same difficulty. I am therefore asking for real new thinking. What will make a reality of biodiversity? Do we need to add anything to our programme for sustainable development? What will embed biodiversity in our political, economic and social culture?”

First, we need to be clear about sustainable development. Scotland cannot look at sustainable development in isolation from the wider UK policy and therefore I have deliberately taken the four aims of sustainable development set out in the DETR strategy for sustainable development for the UK “Sustainable Development: a better quality of life” published in May 1999. The four aims set out in that publication are:

- social progress and social equality
- effective protection of the environment
- prudent use of natural resources
- maintaining high and stable levels of economic growth and employment.

It is important that we do not seek to tartanise these aims but to use them as the essential framework for action in Scotland. Social inequality remains a substantial issue in Scotland within both urban and rural areas, a great deal of social progress in the context of improved health and living standards is still needed to achieve greater equality overall. It is extremely pleasing to note that two of the aims relate to environment itself: it is often forgotten that sustainable development cannot be achieved without proper care and management of the resources, services and processes of the environment. “Effective protection” and “prudent use” to me give exactly the right signals and are completely in tune with the contents of the Convention on Biological Diversity. The fourth element is, quite legitimately, about economic growth and employment.

I have been reflecting a little further though, partly after having read some of the Reith lectures and hearing the discussion in the final lecture, that there are a set of ethical and morale considerations about the environment and may be therefore we should have a fifth aim -

- respecting the environment for its own sake.

It seems to me that there are eight different ways in which biodiversity can help to achieve sustainable development. I will examine each of these in turn. I commented also on my assessment of their current importance for the achieving the aims of sustainable development.

1) The services provided by nature: ecosystem services

It is only in recent years that we have begun to recognise the importance of ecosystems processes and the services that they provide for society. This is not new knowledge, indeed any text book on ecology sets out these principles which have been announced many decades ago. The CBD was instrumental in bringing these issues back on to the political and scientific agendas with its reference to “ecosystem approach”. Work by scientists in the USA and the UK has brought to the fore the importance of water, nutrients, species and ecosystem products such as timber, grass, fish, meat and fruits, to life in all countries. New principles have been established (the Malawi principles) and fed into the Conference of Parties for the Convention on Biological Diversity. The work by Constanza and his colleagues in the USA has sought to put monetary values on ecosystem services. The methodology is challenging but the outcomes from this work must force us to think much harder about the significance of ecosystem services to society rather than the narrow minded view taken by traditional economists that if it does not have a direct monetary value it cannot be taken into account. This factor scores against all of the aims of sustainable development.

In Scotland, some very preliminary guesstimates have been made of the value of ecosystem services and natural capital. The total value of ecosystem services at 1994 prices has been estimated at £82 billion with coastal ecosystems thought to contribute £74 billion of that total. To put these very large figures in context, the Scottish Executive estimates that Scottish gross domestic product is some £58 billion per annum. Whilst I stress the guess factor in these figures, they nevertheless give a totally different perspective on the value of our environmental assets.

The same could be said at a UK level if the Constanza methodology was used. If that is the case therefore we have yet another very good argument for building ecosystem services into the National Accounts and therefore more support for “green accounting”.

2) Sustainable Use of Biological Resources

Many people take the sustainable use element of the CBD as something for developing countries rather than industrialised countries. Nothing could be further from the truth. If we look at some of our agricultural production systems, fuelled primarily by the EU's Common Agriculture Policy, and our wild fishery catching statistics, fuelled by the EU's Common Fisheries Policy, then there has to be real questions about the sustainable use of the natural resources themselves upon which the production of these types of food are dependent. IPA critical natural resource is also the soil. Whilst it is encouraging that the Government is moving ahead with the soil protection strategy for England and Wales, SNH considers that a similar approach is required in Scotland and is working jointly with SEPA to set out the basis for such an approach.

The development of Codes of Practice and demonstration projects on sustainable use need much more active consideration and hopefully action. This one scores highly on ethics and prudent use, perhaps less so on effective protection and there were inevitable risks involved.

3) Genetic Resources

We tend to think of the genetic resources of the earth as being locked in the tropical rain forest or in the warmer oceans. However, if we accept the calculation, for example, that Scotland has some 90,000 species of which over half are in the marine environment, and we also recognise that there is a high dependency for rural communities on agriculture, and poor health and lifespan histories especially in the Clydeside conurbation, then surely there is the basis for some hard thinking about whether genetic resource can with the use of the ingenuity of science and technology provide some social benefits as well as economic endeavour. Overall this does not score highly and it is as yet an under explored and exploited aspect of biodiversity.

4) Equitable Sharing of Genetic Resources

I interpret the underlying thinking which led to the inclusion of this issue in the CBD as to ensure that the scientific and technological knowledge for exploiting genetic resources resided in industrial countries, most of the genetic resources themselves were in developing countries as were quite a lot of the needs. But perhaps from a Scottish, and indeed UK, perspective we should look at the application of our science and technology to the genetic resources in this country and elsewhere and how they can benefit the societies of developing countries. Perhaps this is more an agenda for the UK Government, particularly DFID through its poverty agenda. It is, nevertheless, one we should not ignore in a Scottish context given the scientific and technological base in, for example, the medical and agricultural fields. This aspect of biodiversity scores highly particularly in relation to social, ethical and prudent use aims.

5) Nature for its own sake

Societies have always put high value, albeit in cultural terms, to nature itself as exemplified by such terms as “the wonder of nature”. We should recognise that nature is of benefit for its own sake from an ethical and moral point of view. If we argue that the human species is part of nature, then why should we treat other species in nature as having different ethics and moral codes from those of the human species? Furthermore, for many people “the wonder of nature” is important to their own well-being, either because of their direct engagement and contact with it, or because of its existence value (to use a modern environmental economics term), or because they can engage with it indirectly through modern media. We probably have not captured this aspect of biodiversity as much as we could in terms of the economic prosperity aim of social development. Whilst there is great opportunity for environmentally sensitive tourism, for example, in many parts of Scotland at least we are well below the carrying capacity of the environment. This does not score at all well on economic prosperity on the basis that there are many opportunities which have not yet been taken up.

6) Importance of Individual Species

Individual species are important from a social and economic point of view because they have a “trophy” value as an asset which can be hunted by camera or rifle, which in turn brings income to host areas and businesses dependent upon it and certainly contributes to the well-being of individual participants. Individual species also can be used as a “signature” of the health of the environment particularly if they are higher up the food chain. From a Scottish perspective, for example, sea birds and birds dependent on less intensive agriculture systems are extremely good indicators, as are raptors in the uplands. This is the lowest scoring of all the biodiversity elements but perhaps has the propensity to score higher under economic prosperity.

7) Species and habitats

Species and their habitats are essential elements of the overall system. There are important interactions and dependency between them and therefore they score very highly in terms of the need for effective environmental protection of the individual species themselves and their habitats and prompt assurance of the prudent produce of natural resources. They are also of increasingly high value as “must see” items in the itinerary of travellers and therefore bring social and economic benefits. However, from a Scottish point of view there is still much more opportunities to develop these assets without undermining their long term sustainability. This is a low scoring contributor particularly in terms of economic prosperity and social progress.

8) Protected Area for Biodiversity

Protected areas are usually seen as a means to an end of protecting biological diversity, and indeed landscape, geological and geomorphological diversity. However, they are as an important component of the CBD (Article 8) as is genetic resources and sustainable use. Also given the very large investment on protected areas within the UK and Scottish they should be regarded as a critical input to sustainable development in their own right. They therefore score highly on most of

the sustainable development aims. This is the top scoring element along with ecosystem services.

I have sought with some degree of bravado and risk to examine the contribution which the eight elements of biodiversity identified above make to the five aims of sustainable development. I have used a very simple, highly subjective, scoring scheme of minimum contribution of one to a maximum contribution of five. I have done the scoring to reflect what I regard as the present position from a Scottish prospective.

What is noticeable that all the scores are above the medium point, ie greater than 13.5 for each of the eight biodiversity contributors and greater than 20 for each of the sustainable development aims. Overall, my judgement is that ecosystem services and protected areas are the greatest contributors to sustainable development, closely followed by equitable sharing of genetic resources and sustainable use. This again emphasises the importance of more effort on these issues relative to the effort which is currently placed on other issues which score more lowly, ie individual species and species and habitats. From the prospective of contribution to the aims of sustainable development, then the ethics of nature perhaps rather curiously scores highest but I recognise there may well be personal bias here. There is nothing to chose between three of the aims: environmental protection, social progress and resource use. The contribution to economic prosperity and employment scores lowest of all. I think this underlines the importance of greater attention being given to the connection between elements of biodiversity and the economic components of sustainable development. Particular emphasis ought to be played on sustainable use and genetic resources in addition to eco system services and protected areas.

Action for Biodiversity for Sustainable Development

To-date too many actions have been purely for individual species or groups of species within their habitats rather than the more integrated ecosystem approach. Also there has been far too little attention on genetic resources and sustainable use. On the basis that biodiversity can make a much greater contribution to sustainable development in Scotland and in the UK as a whole, then specific actions need to be undertaken. I suggest a 7-point agenda.

1) Knowing whats happening

It is vital that we know what is happening in the natural environment as a result of natural processes and human interaction. Whilst the development of indicators is helpful, these are only a means to an end rather than an end in themselves and we must be careful to ensure this the case in practice. Adoption of the state/pressure/response approach of environmental audit is therefore the best way forward. Identifying effects and, as far as possible, the causal factors is critical. Choosing indicators therefore that are sensitive not only to changes but also can be surrogates of causal factors should be the way forward.

2) Protecting Species

We should continue and complete work on implementation species action plans but make sure that the habitats on which species depend becomes a much greater focus of attention. Collapsing a whole range of Species Action Plans into a series of focused Habitat Action Plans surely must be the way forward. Also ensuring that existing protected areas and those which are planned (particularly as part of the Natura 2000 network) contribute to species and habitat protection is vital.

3) Integrated Approaches

Translating the ecosystem approach into practical strategies at national and local levels is the way forward. Many European countries have adopted these approaches as reported in the forthcoming publication "Integrated planning: international perspectives" rising from a workshop hosted by SNH and under the auspices of IUCN. In the UK, for example, the zonal programme of SNH and the natural areas programme of English Nature are extremely good examples, albeit at different stages of development and implementation, of integrated approaches.

4) Influencing Attitudes and Awareness

Awareness of species issues and attitudes towards species are extremely high, as manifested by the ease by which species stories get into national newspapers. Focused educational events and programmes both in the informal and formal sectors of education are important. The use of websites, widely reported public lectures, such as the Year 200 Reith lectures, are also important. The development of a green component in National Accounts and in calculations of National Domestic Product, and the development of biodiversity headline indicators alongside those for, for instance, employment and inflation, should be critical components for development.

5) Investigating and Implementing new Approaches

I should re-emphasise that investigating genetic resources and the benefits which they might give within Scotland and the UK and to the wider world, as well as demonstrating best practices on sustainable use and drawing up codes of practice, are essential components of a wider agenda if biodiversity is going to have a greater input into sustainable development.

6) Advocating Changes in Policies, Law and Resources

We should recognise that there has been considerable advance within policy within the UK, and potentially within the European Union. There are also new laws especially in the EU. Nevertheless, there is still insufficient integration of policies and law and also insufficient integration as to the way that public resources are applied. Using the objective information of knowing what is happening and why in the environment, and a good understanding of public attitudes towards to the environment, environmental agencies should continue advocating changes in policies, law and the application of resource within Scotland, and at the UK, European international levels. We need to plan so that we can strategically opportunistic.

7) Test the Application of Biodiversity has a contributor to Sustainable Development in Key Ecosystems

A key issue, for example in a Scottish and UK context is the management of a river basin. Very helpful material was produced recently by UNESCO's Man and live Biosphere Programme which identified 16 issues which need to be considered in relation to the management of a river basin and spelt out particular actions which were pertinent. For example, on protected areas it made the point that these are usually too small to allow biodiversity to evolve in absence of human intervention. EX-Situ conservation points to the need for collections of ancient local varieties of crops and livestock and to keep them in gene banks. Integrated river basin management is required and can helped by positive attitudes from managers of all bodies concerned and the use of modern decision support systems. Comments of a similar order can be made for highland forest, marginal lands, cultural aspects, aquatic component, the deciduous forest, river bank management, flood prevention, transport infrastructure, arable land, second homes, urban ecosystem, estuary and deltas and coastal islands.

Conclusion

A considerable amount has been achieved on biodiversity in Scotland and in the UK as a whole. However, insufficient connection has been made between biodiversity and sustainable development and this has to be an urgent priority. In addition, the whole range of components of biodiversity, including all those identified in the Convention, need to be addressed.