

# What is Biodiversity?

Biological diversity – more commonly known as biodiversity – is a collective term used to describe the totality and variety of life on Earth. In addition to individual organisms themselves and the genetic variability among them, the term also covers the ecosystems in which they live, in other words the various ways in which species interact both with each other and with their surrounding environment.

The term biodiversity, coined in the mid-1980s, has come to prominence because of its value in helping to understand and characterise the ways in which biological organisms and processes are increasingly threatened by human activities. One of the by-products of modern industrial society has been the damage – ranging from the destruction of forests to the chemical pollution of the atmosphere – that it has caused to the natural environment on which all biological processes on Earth depend. Conserving biodiversity is the strategy designed to limit this problem.

Such damage is not new. It has been associated to some extent with all forms of industrial activity. What is new is a growing realisation that many of these changes (such as the loss of natural species) are irreversible. It is also being acknowledged that many of the processes being interfered with are essential to the well-being of humanity, since we rely on the existence of biodiversity for our food, our clothing, our building materials and our medicines. In addition, the biodiversity that surrounds all human societies is a potent source of cultural and spiritual values.

Realising that humanity pays a price for the loss of biodiversity has led governments, both individually and collectively, to take measures to curb the negative effects of social activity on the natural environment – in other words, to protect global biodiversity. Yet these protective measures can, in turn, create their own problems. Since they are designed to curb various forms of social and economic activity, they can – unless carefully handled – also reduce the benefits that such activities bring with them.

In some parts of the world, this may be a relatively minor inconvenience such as requiring motorists to pay more for petrol that is less polluting to the environment. Elsewhere, however, livelihoods may be at stake: forbidding the cutting down of forests in areas where these provide the only fuel for cooking or the only source of economic income, can prove disastrous for the communities concerned.

## Biodiversity and development

Reconciling the need to protect global biodiversity with the equally strong – some would argue even stronger – need to promote social and economic growth, particularly in the developing world, has therefore become one of the biggest challenges of the modern era. It is, for example, embedded in the concept of 'sustainable development'. This is a loose term used to express

the idea that development strategies are only acceptable if they are achieved in an 'environmentally sustainable' way – one that preserves global biodiversity for use and enjoyment by future generations.

Other commitments are to be found in a range of international agreements that have been passed over the past 20 years. These include the Convention on Biological Diversity (CBD), which commits signatory states to a broad range of measures conserving biodiversity. At the same time, it seeks to ensure that this protection is achieved in a way that is compatible with efforts by signatory states – and developing countries in particular – to promote their social and economic development.

Most recently, the need to reconcile the preservation of biodiversity with social and economic development – and in particular with the reduction of global poverty and the promotion of health – is a central concern expressed in the Millennium Development Goals that have been accepted by all members of the United Nations. For example, goal 7 is a commitment to 'ensure environmental sustainability', and includes a specific pledge to 'integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources'.

The challenge of putting these commitments into practice is particularly pertinent because the vast majority of the Earth's biodiversity resides in the developing world. According to some estimates 80% of global biodiversity exists in developing-world forests. In addition the number of species yet to be discovered is believed to be between 10 and 30 million.

The loss of species is of major concern to those committed to preserving biodiversity. Evolutionary history has witnessed continuous births and deaths of species – the fossil record reveals that there have been at least five major extinctions in the past 500 million years. As many as 90% of species may have disappeared, leaving just a few lineages to give rise to most of the groups of organisms that we are familiar with today.

There is a growing body of evidence demonstrating that we are facing another great extinction. Worse still, the rate of loss appears to be accelerating; more species have become extinct in the past 500 years than at any other time in history. Modern agricultural and industrial practices, combined with large increases in population and changing consumption patterns, have all taken their toll. Unless biodiversity loss can be slowed, species numbers could fall below a critical threshold beyond which they are unlikely to recover.

Yet efforts to prevent this scenario must be compatible with promoting the well-being of the human societies that frequently – particularly in the developing world – live in close proximity.

This means promoting development policies that simultaneously preserve biodiversity and enrich the livelihoods of those societies in close contact with it.

## Acknowledgement

The above information comes from the Science and Development Network whose aim is to enhance the provision of reliable and authoritative information on science- and technology-related issues that impact on the economic and social development of developing countries. It seeks to achieve this objective primarily through running a free-access website, but also by building regional networks of individuals and institutions who share its goals and by organising capacity-building workshops and other events in the developing world. See [www.scidev.net](http://www.scidev.net)