

## **6 Soil biology – into the next millennium**

### **6.1 Introduction**

There can be little doubt that the thin, delicate layer of soil that covers one-third of the surface of our planet plays a vital role in sustaining life on Earth. We may not have always appreciated this fact and afforded soil the respect it merits, but as we approach the end of the twentieth century, a century of extraordinary scientific and technological achievements, it is becoming clear that the continued survival of our civilisation depends even more than ever upon our relationship with the land and soil.

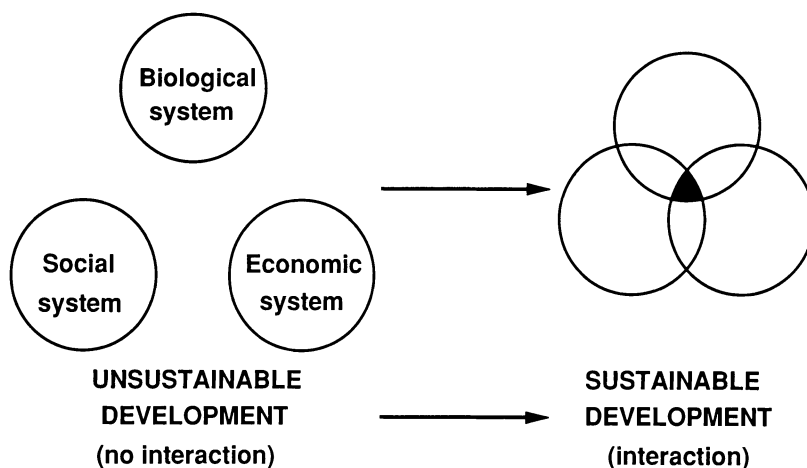
The bonds that formed over thousands of years of intimate association between our ancestors and the land, as source of food and fibre, have been strained during the last few centuries. Industrialisation and urbanisation have severed the link for many people; food and clothing are now provided by institutions; festivals, once a celebration of the bounty of nature, are now occasions almost exclusively for increased consumption.

Yet despite these trends, which have taken place only very recently in our long history, there are signs that a new awareness is growing of the importance of the environment around us and of the land, air and water which sustain us. These signs are evident in the debate which was most obviously stimulated (though not initiated) by the report in 1987 of the World Commission on Environment and Development. This report was instrumental in launching the concept of sustainability. A notable outcome of this was the unique meeting of political leaders from around the world at the United Nations Conference on Environment and Development at Rio de Janeiro in June 1992. A series of global initiatives emerged from this Earth Summit.

This final chapter examines several issues, particularly those which relate to the management of soil and land, which reflect the increasing awareness of the impact of human activity on our planet.

### **6.2 Sustainability – so what's new?**

“Sustainability is not business as usual with a few concessions to environmental management. Sustainability is a challenge to confront new realities, to devise new ways of doing things . . .”. This quotation comes from a symposium on Sustainable Land Management (Hayward and



**Figure 6.1** Sustainability as a trade-off between three interacting spheres of activity. After J. Holmberg and R. Sandbrook (1992) in *Policies for a Small Planet*, ed J. Holmberg, Earthscan Publications, London, pp. 19–38.

McChesney, 1992) held in New Zealand, a country which in 1991 introduced the Resource Management Act which uses the concept of sustainability as the basis for future management of natural resources. There are enormous implications here for the management of land and water.

Sustainability cannot of course be a fixed goal; if we use the analogy that we are borrowing the Earth from our children, then it becomes clear that we cannot anticipate the needs of future generations. What it does entail is a continuous trade-off between the three main components of our world which can be considered as biological, economic and cultural. Figure 6.1 shows a schematic representation of what is involved.

There are other aspects to sustainability: many of the issues are common to all inhabitants of the Earth, and therefore require concerted action. To this end the industrialised countries have a clear ethical and moral obligation towards the developing countries. Progress towards sustainability requires effective participation of all groups in society. Furthermore, the distinction between agricultural priorities and environmental effects becomes irrelevant; in the future a more holistic approach will be needed to all issues involving management of soil and land.

### 6.3 Environmental quality

Environmental quality is largely influenced by human activity in terms of, first, the exploitation of resources and second, the production of waste