

Setting the Context for Evaluating Sustainable Development

The environmental perspective

The subject of sustainable development is one of the key research and policy issues as we enter the early years of the twenty-first century. This book takes the broad view, but the world focus at the time of writing appears to be the concerns on climate change and on pollution levels threatening the survival of the human species. The importance of this focus can be seen by the high regard that the global community places on these problems. At the Rio conference in 1992, 100 heads of states attended, representing 179 governments that committed themselves to an agenda for addressing the perceived problem. In 2002, 109 governments were represented at the Rio + 10 conference in Johannesburg and vowed to continue the focus on what they considered to be an important area. More recently, the Kyoto Protocol regarding carbon emissions has been ratified by most of the countries of the world and the Copenhagen World Summit on climate change has committed itself to an accord to prevent the rise in global temperature going beyond a further 2°C (although this was not made legally binding). This is the maximum that experts feel the world can accommodate without major catastrophe, although many will still suffer. Over the past 5 years the European Union has committed a substantial proportion of its research and development monies to sustainability issues and the majority of governments that have a national research programme have also committed funds to the cause. So why the interest and why is it at, or near, the top of global policy for research and development?

With all new ideas, there is a long gestation period before they are taken up as policy or identified as a key issue for researchers to address. There is little doubt that the current interest in sustainable development has come from the pressure groups and particularly those associated with the green movement who saw the depletion of non-renewable resources (and particularly energy stocks), the pollution of the air and water and the breakdown of social conscience through globalisation as leading to the demise of mankind and the balance of nature (the ecosystem), which presently sustains living creatures. They considered that there was a moral imperative to take the long-term view and to consider the impact of decisions taken now on generations that would follow. It is true to say that within this general thrust there was, and probably will be, a variety of opinions on such matters as the extent of the damage being done to the environment, the responsibility for the current situation and the manner in which it can be remedied.

There is, however, a growing consensus that something is wrong and that mankind has a duty to do something about it. There has been a crescendo of concern from almost every quarter of human society led by some very significant figures in government, academe and pressure organisations. These are the new prophets, forecasting a calamity and demanding that the world turn from its fallen ways! In nearly all cases, their forecasts have been on the conservative side in recent years, particularly with regard to global warming. It appears that the world is getting warmer at a faster rate than was expected, that it appears to be accentuated by the behaviour of mankind and that humankind is facing a losing battle to remedy the situation. Hence, the focus on resilience (i.e. the ability to retain function through adversity) to assist in containing the problem. Leading thinkers and politicians such as Gore (2006), Lovelock (2009), Rees (2004), Jackson (2009) and many others have brought to the attention of the world the potential plight which faces life on earth.

Knowing what to do is of course another matter and there is a spectrum of views (see Fig. 1.1). At one end of the spectrum are those who suggest that we should conserve at all costs, change the way we live and seek a reduction in economic growth as a means of reducing consumption. At the other end are those who believe that necessity is the mother of invention and that a 'technical fix' will be found which will remove the need for such drastic measures to be taken. They believe that the markets will drive up the price of non-renewable resources and that this in turn will encourage innovators to provide sensible alternatives. Against this argument others would say that in the time it takes for the markets to realise what is happening, irreparable damage may have been done to the planet for which future generations may have to pay the full price.

These two extremes can also be viewed through the themes which arose from the Johannesburg Summit. There were two major schools of thought. One appeared to be arguing that man could exercise control and dominion over the earth, mainly by technological advancement. The other thought that humans must review their position as part of nature

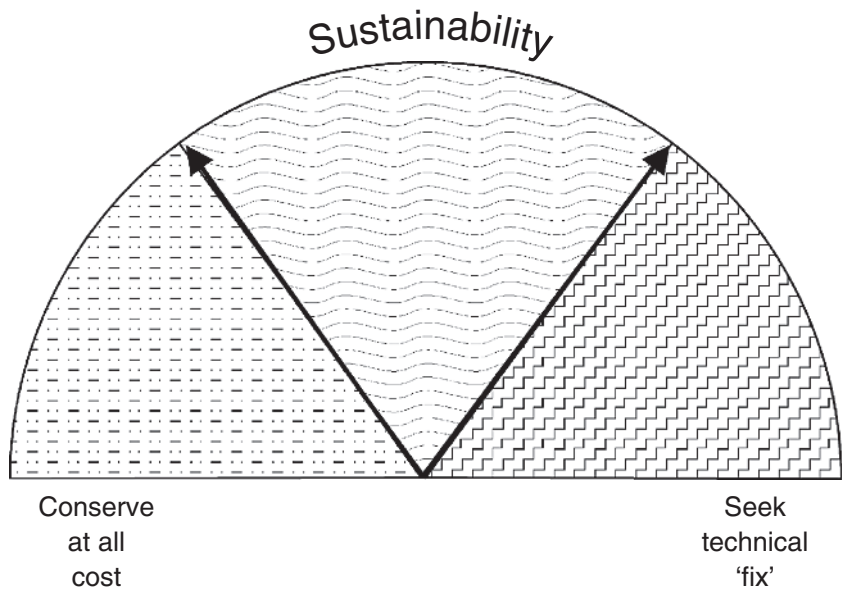


Figure 1.1 The spectrum of views on sustainability.

and seek to work in harmony and in empathy with the cycles of nature and the planet. This polarisation of view is often seen as detrimental to advancement and that much can be achieved by developing the technology whilst appreciating, respecting and recognising the second. There is a paradox in this dialogue because if we were not able to intervene then nature would probably have found ways to limit population growth (as it has with so many species) and avoid the excessive use of non-renewable resources. Population growth is at the heart of the problem – we cannot sustain this number of people with the resources available.

Despite this, much of this debate is at the level of the planet. Saving spaceship earth is the clarion call and we must all be engaged in the earth's preservation and its delicate ecological systems. This attitude may also be debated, for many would point out that the earth has been in turmoil ever since its formation and species have come and gone, climatic changes far outweigh the actions of mankind in terms of their devastation and in the very long term the earth itself will disappear and will probably be engulfed in a black hole or other stellar catastrophe. The response to this would be that we are the first species able to create its own downfall and the first to be able to at least extend its sojourn on earth, so why should we not rise to the challenge and try to extend the life of the species? The focus is on the environment and it is through this filter that human activity will be judged. This does not seem unreasonable as future generations will probably judge the activities of the current generation in the same way that we often judge the misdemeanours of the past: by the way they affect us now.

The question of time is a key one and the text will return to this in due course. Over what period should we view sustainable development? It is a critical issue for the systems and techniques we employ to measure progress. If we take the very long term, the planet is probably doomed anyway. If we take the short term, we can probably muddle through and overcome or manoeuvre around the problems that we have created. How far ahead can we look? Is it one, two, several or hundreds of generations? Most commentators would suggest that our ability to make interventions that would aid future populations is limited to two or three generations. Beyond this, we would probably need to be prophets or exercise witchcraft to know what to do. Predictions made 200 years ago, extrapolating the knowledge of the time, seem naive and stupid with the benefit of hindsight. For example, it was thought that London would be waist-deep in horse manure at the turn of the nineteenth/twentieth century because of the growth of horse-drawn transport! Would it have been sensible to ask the people of Europe 300 years ago to sacrifice their gruel in order that our generation would benefit from having the asset of computer technology? Of course not.

There is perhaps one area where we can predict a potential problem and that is with the demise of non-renewable resources. Who knows of what value these resources will be to those who will follow? We do not know what benefits to health, to quality of life and to the supply of useful products these resources will bring, because our knowledge of their potential is still limited. We do not understand how they may be used in different, complex combinations linked to other knowledge, for example of the nature of genes, to the benefit of our children and beyond. If some of these resources disappear, what legacy are we leaving? We tend to view these resources in terms of what they can provide *now* and not what their potential benefit could be in the *future*. Our outlooks are determined by their impact on us and the horizons that science and technology have set for us at this point in time. Often these are limited to the human lifespan.

Since the mid-1970s, these debates have grown in intensity and have risen up the international agenda to the point where it is heads of government who find themselves gathered together to address the problem. Partly this is a recognition that it is a global problem. Most of the environmental problems are not confined within national boundaries. (A hole in the ozone layer or a leak from a nuclear energy plant does not respect the arbitrary limits of territory designated by human beings.) Partly it is because this subject is recognised as being an issue of morality in which all must cooperate if action is to be taken that will change the course of environmental well-being. No one wants to be seen to show a lack of commitment to such a key issue. Partly it is because in each country there is a political imperative to address these issues because the nature of the problem has permeated the public

conscience. It is unlikely that the subject will go away and indeed for some time to come it is likely to be a major item on the international agenda despite the fact that there are differences of opinion on how the matter should be tackled. For example, President George W. Bush of the USA refused to sign the Kyoto Agreement on greenhouse gas (GHG) emissions in his first term of office because of the vested interests of industry in the USA. It was not until President Obama came into office that a new narrative was created and the USA joined in the debate to limit the speed of climate change. Sometimes the rapidly developing countries such as China and India are criticised for following the development path of the developed nations but the signs are that they are more sensitive to this problem and are addressing the issue whilst still encouraging economic development. They face a dilemma in improving the economic prosperity of their people whilst avoiding the pitfalls of the past. The developed nations such as Europe and the USA face the dilemma of maintaining what they perceive to be a high standard of living whilst at the same time addressing the kind of world they wish to leave for their grandchildren. They may have to decide to make sacrifices now in order to protect the future. This may not be easy.

The international policy debates

Table 1.1 shows some of the key events in the development of the world approach to addressing the problems of sustainable development. All have made their contribution since the 1970s and it is this groundswell of views at the very highest levels of global governance that has begun to change the actions of government and the investment in research into sustainable development. Many of the world conferences and the publications were about the context within which the discussion should take place. This context included the debates on the reduction in non-renewable resources and the apparent pollution of land, water and air. However, at the Rio Earth Summit in 1992 (UNCED, 1992) a significant change took place. An agenda for change (Agenda 21) was agreed upon and signed up to by 179 world governments. Not only did they sign up, but they also defined sustainability in a new way, extending its boundaries beyond just environmental issues.

The full implementation of Agenda 21, the Programme for Further Implementation of Agenda 21 and the Commitments to the Rio principles, were strongly reaffirmed at the World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa, from 26 August to 4 September 2002. The Summit confirmed that significant progress has been made towards achieving a global consensus and partnership among all the people of our planet. The Johannesburg Declaration on Sustainable Development highlighted the important role placed by governance at all levels for the effective implementation of

Agenda 21, the Millennium development goals and the Plan of Implementation of the Summit. The leadership of the United Nations was also reaffirmed as the most universal and representative organisation in the world which is best placed to promote sustainable development, and a commitment to monitor progress at regular intervals towards the achievement of the sustainable development goals and objectives was undertaken under the slogan 'Making it happen!' (<http://www.un.org/>). Finally, it also acknowledged the key role played by education as the primary agent of transformation towards sustainable development, increasing people's capacities to transform their visions for society into reality. In recognition of the importance of education for sustainable and responsible development, the United Nations General Assembly declared 2005–2014 the UN Decade of Education for Sustainable Development while UNESCO was requested to lead and to develop an International Implementation Scheme for the Decade.

The signatories of these various agreements embraced the notion that environmental issues often had their origins in the behaviour of the human race. When humans dump toxic chemicals or do not seek to conserve energy, or create social unrest leading to misuse or damage to existing resources, their behaviour has an impact on the environment. When the legal systems and regulations employed by governments make it difficult or even impossible to act in an environmentally friendly way, this aspect of human organisation has a detrimental impact on environmental issues. When the striving for economic growth results in poor use of the earth's resources, this human action and policy lead to more degradation of the environment. When there are big differentials between those who have and those who have not, unrest can follow and the damage can be substantial. The threat of terrorists gaining access to nuclear bombs is now spoken of quite openly and the terrorists gain much of their support from those who are economically or politically disadvantaged.

A tangled web of issues leads to actions that eventually have an impact on the environment. The way we live affects the world on a global scale when we piece the whole of the jigsaw together. In the words of John Donne, 'no man is an island entire of itself' (Donne, 1623). The environment at one level is fairly robust, taking care of the events that occur over time in a very practical way which is often not apparent to a single generation. At another level, it can be presented as a very sensitive entity in which it is easy, through the interactions of man, to destabilise the whole superstructure and the interrelationships which provide the balance and allow the life forms that exist today to survive and prosper. It is the survival of what we have today, the biodiversity, the climatic conditions, the level of water supply and so forth that provides the basis for the argument for sustainability. No one seems to be arguing for natural evolution which could see the demise of the human race in favour of some other life form.

Table 1.1 Significant international conferences showing the growing importance of sustainable development.

Date	Action	Output
1972: 6–16 June	UN Conference on the Human Environment, Stockholm	Need for a common output to inspire and guide the people of the world in the preservation of the human environment: (a) Action plan for the human environment. (b) Educational, informational, social and cultural aspects of environmental issues have to be faced. (c) Construction of a framework for environmental action. (d) Recommendation for action at the international level. (e) Identification and control of pollution of broad international significance. (f) Declaration of the UN.
1992: 3–14 June	United Nations Rio de Janeiro Conference The Convention on Climate Change was adopted on 9 May 1992 and opened for signature a month later at the UN Conference on Environment and Development in Rio de Janeiro (Brazil)	Agenda 21, the Rio Declaration on Environment and Development, the Statement of Forest Principles, the United Nations Framework Convention on Climate Change and the United Nations Convention on Biological Diversity. As an output the subsequent follow-up mechanisms were created: (a) Commission on Sustainable Development (b) Inter-agency Committee on Sustainable Development (c) High-Level Advisory Board on Sustainable Development
1994: 27 May	The First European Conference on Sustainable Cities & Towns, Aalborg (Denmark)	A Charter was signed by European Cities & Towns 'Towards Sustainability' which provides a framework for the delivery of local sustainable development, and calls on local authorities to engage in Local Agenda 21 processes (http://ec.europa.eu/environment/urban/pdf/aalborg_charter.pdf).
1995: 7 April	Conference of the Parties to the UN Framework Convention on Climate Change 1 (COP 1), Berlin	The Berlin Mandate was adopted at the first Conference of the Parties (COP) on 7 April 1995. It acknowledged that the commitment of developed countries to take measures aimed at reducing their GHG emissions to 1990 levels by the year 2000 was not adequate to achieve the Convention's objective. The main objective of the Mandate was to strengthen the commitments for the developed-country Parties after the year 2000 without introducing any new commitments for developing countries, while reaffirming existing commitments of all Parties contained in Article 4.1 and continuing to advance their implementation.

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Table 1.1 *Contd.*

Date	Action	Output
1996: 3–14 June	United Nations International Conference on Human Settlements – Habitat II, Istanbul	This was the second conference organised for discussing the issue of habitation (Habitat I Conference was held in Vancouver in 1976). It specifically focused on current built environmental problems in relation to major global changes (e.g. population growth, migration towards urban areas, tourism, urban regeneration).
1997: 8–19 July	Conference of the Parties to the UN Framework Convention on Climate Change 2 (COP 2), Geneva	At the second COP, a large number of ministers agreed on the Geneva Ministerial Declaration, which provided political impetus to the Berlin Mandate process.
1997: 1–10 December	Conference of the Parties to the UN Framework Convention on Climate Change 3 (COP 3), Kyoto Protocol (Japan)	The Kyoto Protocol sets up targets to reduce GHG emissions. The Protocol was initially adopted on 11 December 1997 in Kyoto, Japan, and came into force on 16 February 2005. Since the UNFCCC came into force, the parties have been meeting annually in Conferences of the Parties (COP) to assess progress in dealing with climate change, and beginning in the mid-1990s, to negotiate the Kyoto Protocol to establish legally binding obligations for developed countries to reduce their GHG emissions. From 2005, the Conferences have met in conjunction with Meetings of Parties of the Kyoto Protocol (MOP), and parties to the Convention that are not parties to the Protocol can participate in Protocol-related meetings as observers. Under the Protocol, 37 industrialised countries (called 'Annex 1 countries') commit themselves to a reduction of four greenhouse gases, in the hydrofluorocarbons and perfluorocarbons produced by them, and all member countries give general commitments. Countries agreed to reduce their collective GHG emissions by 5.2% from the 1990 level. The protocol left several issues open to be decided later by future Conferences of the Parties (COP).
1998: 2–14 November	Conference of the Parties to the UN Framework Convention on Climate Change 4 (COP 4), Buenos Aires	At COP 4 (Buenos Aires, November 1998), Parties adopted the so-called 'Buenos Aires Plan of Action', www.unfccc.int/resource/docs/cop4/16a01.pdf , setting out a programme of work both to advance the implementation of the Convention and to flesh out the operational details of the Kyoto Protocol. This programme of work was conducted in the subsidiary bodies and at COP 5 (Bonn, October/November 1999), with a deadline of COP 6 (The Hague, November 2000). However, Parties were unable to reach agreement on a package of decisions on all issues under the Buenos Aires Plan of Action at that session. Nevertheless, they decided to meet again in a resumed session of COP 6 to try once more to resolve their differences.

1999: 25 October–5 November	Conference of the Parties to the UN Framework Convention on Climate Change 5 (COP 5), Bonn	Ministers and officials from 166 governments agreed on a timetable for completing the outstanding details of the 1997 Kyoto Protocol by November 2000 in order to intensify the negotiating process on all issues before the sixth COP.
2000: 13–24 November, The Hague; 16–27 July 2001, Bonn	Conference of the Parties to the UN Framework Convention on Climate Change 6 (COP 6), The Hague and Bonn	Pledge to contribute €450 million per year by 2005 to help developing countries manage emissions and adapt to climate change. The Convention on Climate Change has been ratified by 37 countries.
2001: 29 October–9 November	Conference of the Parties to the UN Framework Convention on Climate Change 7 (COP 7), Marrakesh	Parties finally succeeded in adopting the Bonn Agreements on the Implementation of the Buenos Aires Plan of Action, www.unfccc.int/resource/docs/cop6secpart/05.pdf , registering political agreement on key issues under the Buenos Aires Plan of Action. The final Kyoto rulebook was set. Countries must cut 80% emissions. The Marrakesh Ministerial Declaration emphasises the contribution that action on climate change can make to sustainable development, calling for capacity building, technology, innovation and cooperation with the biodiversity and desertification conventions. Up to Marrakesh, 40 countries had ratified the Kyoto Protocol.
2002: 26 August–4 September	United Nations World Summit on Sustainable Development, Johannesburg	Key objectives to reach: (a) A revitalised and integrated UN system for sustainable development. (b) A new deal on finance – enabling a deal on sustainable development. (c) An integration of trade and sustainable development. (d) A clearer understanding of how governments should move forward nationally in implementing Agenda 21. (e) A new charter which could lay the foundations for countries to frame their sustainable development policies. (f) A review of the work of the present set of Rio conventions – looking at the overlaps, gaps and obstacles. (g) A set of new regional or even global conventions. (h) A set of policy recommendations for the environmental security issues that face the world. (i) A clear set of commitments to implement agreed action by the UN, governments and major groups.

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Table 1.1 *Contd.*

Date	Action	Output
2002: 23 October–1 November	Conference of the Parties to the UN Framework Convention on Climate Change 8 (COP 8), New Delhi	The usual division between developed and developing country positions on many issues was in evidence at COP 8. Parties convened in negotiating groups on a number of issues previously left off the agenda due to the pressing negotiations under the Buenos Aires Plan of Action. The Delhi Declaration reaffirms development and poverty eradication as overriding priorities in developing countries and implementation of UNFCCC commitments according to Parties' common but differentiated responsibilities, development priorities and circumstances, but it does not call for a dialogue on broadening commitments.
2003: 1–12 December	Conference of the Parties to the UN Framework Convention on Climate Change 9 (COP 9), Milan	According to the way the Kyoto Protocol (KP) was written, it will go into effect only if 55 of the signatories ratify. These signatories must account for 55% of the CO ₂ emissions at the then specified date – 1990. There is no problem with the first condition, as 121 countries have ratified the KP but the USA (the country at the forefront of GHG emissions) stated that it was not going to represent the required minimum of 55% of emissions without a Russian ratification of the KP.
2004: 8–11 June	The Aalborg +10 conference, Aalborg (Denmark)	One objective of the Aalborg + 10 conference was to assess the 10 years of experiences since the establishment of the Aalborg Charter and the European Sustainable Cities & Towns Campaign. Nine hundred participants shared their experiences and met in open discussions and dialogues. Currently the Charter is signed by 2764 cities (see: http://www.aalborgplus10.dk/media/short_list_18-02-2009_1_.pdf).
2005: 28 November–9 December	The first Meeting of the Parties to the Kyoto Protocol (MOP 1) along with the Conference of the Parties to the UN Framework convention on climate change 11 (COP 11), Montreal	It was one of the largest intergovernmental conferences on climate change. The event marked the entry into force of the Kyoto Protocol. Hosting more than 10 000 delegates, it was one of Canada's largest international events ever and the largest gathering in Montreal since Expo 67. The Montreal Action Plan is an agreement hammered out at the end of the conference to 'extend the life of the Kyoto Protocol beyond its 2012 expiration date and negotiate deeper cuts in greenhouse-gas emissions' (Wikipedia).

2005: 6–7 December	The EU Ministers on 'Creating Sustainable Communities in Europe', Bristol Accord (UK)	The 2005 Bristol Accord says that: Sustainable communities are a big idea for a bigger Europe. It offers a chance to create thriving and successful places in which the people of Europe will have a more secure and prosperous future. The Accord builds on the work of preceding initiatives in the area, such as the Rotterdam urban acquis 2004 (principles of common successful urban policies), the revised Lisbon agenda for jobs, competitiveness and growth, the goals of environmental sustainability agreed at Gothenburg 2001, the Lille Programme (2000) (long-term cooperation on urban sustainability within the EU) and the effective democratic governance agreed at the Warsaw Summit in May 2005 (see: http://www.eukn.org/binaries/eukn/eukn/policy/2006/5/bristol-accord.pdf).
2007: 24–25 May	Informal Ministerial meeting on urban development and territorial cohesion, Leipzig (Germany)	The 'Leipzig Charter on Sustainable European Cities' says that strengthening European cities and their regions – promoting competitiveness, social and territorial cohesion in Europe and in its cities and regions are key policy issues that impact on the European Council decisions on sustainable development that need to be applied in concrete terms to the spatial development of urban neighbourhoods, cities and regions (see: http://www.energie-cities.eu/IMG/pdf/leipzig_charter.pdf).
2007: 15 December	UN Conference on Climate Change (COP 13), Bali (Indonesia)	Agreement on a timeline and structured negotiation on the post-2012 framework (a successor to the Kyoto Protocol) was achieved with the adoption of the Bali Action Plan (Decision 1/CP.13). The Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA) was established as a new subsidiary body to conduct the negotiations aimed at urgently enhancing the implementation of the Convention, up to and beyond 2012. These negotiations took place during 2008 (leading to COP 14/MOP 4 in Poznan, Poland) and 2009 (leading to COP 15/MOP 5 in Copenhagen, Denmark).
2009: 7–18 December	UN Conference on Climate Change (COP 15/MOP 5), Copenhagen (Denmark)	The overall goal was to establish an ambitious global climate agreement for the period from 2012 when the first commitment period under the Kyoto Protocol expires. Ministers and officials from 192 countries took part in the Copenhagen meeting and, in addition, participants attended from a large number of non-governmental organisations. A large part of the diplomatic work that laid the foundation for a post-Kyoto Agreement was undertaken by the COP 15. At the end of the conference an accord was agreed but this was not to be legally binding at this stage. However, it was signalled that this would be the longer term objective.

Therefore, there is an element of conservation that features strongly in much of the above debates – the maintenance of the *status quo*. Few developing countries want to disturb or reduce their economic competitiveness. However, a recognition that the world is constantly changing and must be accommodated is also there. Evolution is thought to underpin much of this change but it is of course enhanced or aggravated by the activities of humans, not only in science and technology but also in the culture that they adopt and the growth of populations. It is the pace of change that has altered and our impact grows greater by the day. The obligation to the needs of future generations weighs heavily within the argument.

The report of the Rio Summit (UNCED, 1992) recognised these issues and identified some major themes. Mitchell *et al.* (1995) have distilled from the literature of Rio and other reports four principles which underlie the guidance and advice that is given and take us beyond the pure environmental agenda, or at least to a better understanding of *why* environmental conditions change.

These principles are:

- ☐ *Equity*: The concern for today's poor and disadvantaged.
- ☐ *Futurity*: The concern for future generations.
- ☐ *Environment*: The concern for the integrity of ecosystems.
- ☐ *Public participation*: The concern that individuals should have the opportunity to participate in decisions that affect them.

Only one of these themes is directly concerned with the environment. The others are moral imperatives or cultural endorsements or mechanisms by which change can be effected through common ownership of the problem. However, they all impinge on sustainable development and their selection as major themes has come from the environment debate. They arise from a collective view of 'what is best' for the world both now and in the future. They represent our current stance on these issues but it is not necessarily true that these principles will hold in the future even though most of us would subscribe to them today.

Extension of the debate

The scope or focus of the debate has therefore been extended into new realms concerned with social, legal, economic, political and technical aspects of how we live (commonly known under the acronym SLEPT). The shift has introduced a much wider debate about the values we place on various aspects of our lives, how we treat others and what level of intervention it is appropriate for a state or organisation to adopt to address these issues. Hence the move to an agenda with a different focus, known as sustainability. Since the word 'sustainability' has come into frequent

use, many commentators have queried whether it has any meaning – even though they acknowledge that the term has created an important agenda. It is rather strange that a term which has favourable connotations and is used as the basis of some major research funding and government and industry initiatives is still considered rather vague by many individuals. Sometimes the concepts underlying the term get dismissed because the term itself is not sufficiently defined for these people to ‘buy’ into it. For some, the term ‘sustainable development’ is more meaningful as it suggests that it is concerned with interventions by humankind into the environment that can be analysed to see whether they have a positive or negative impact on the environmental issues of concern.

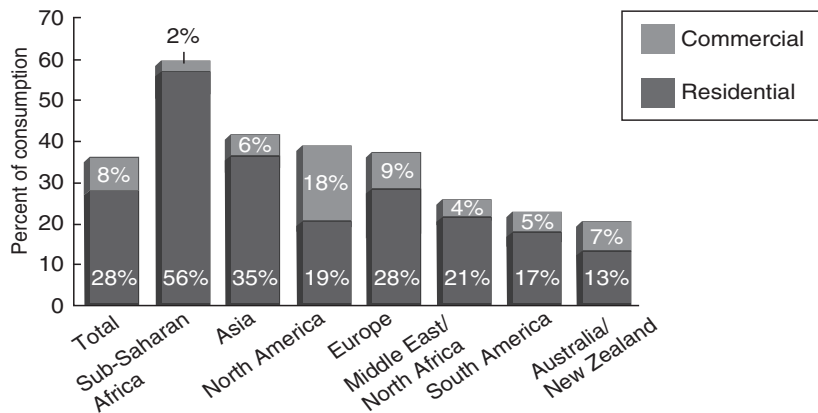
It may be helpful to look at the root words in sustainable development. To *sustain* means to continue without lessening, to nourish, to allow to flourish. To *develop* means to improve or bring to a more advanced state. Sustainable development is therefore about facilitating improvement without jeopardising what exists already. Sustainable does not mean that nothing ever changes, nor does it mean Utopia where nothing bad happens. It is not about maintaining the *status quo* or reaching perfection. Development does not mean continually getting bigger but is about qualitative improvement. In addition, sustainability does not mean sustained growth. At some point a community stops getting larger but it continues to improve the quality of life of its inhabitants.

This book has used sustainable development in its title for the above reasons. The book is largely concerned with the built environment which by definition is concerned with humankind’s activity in creating shelter and accommodation for itself, an act which inevitably changes the environment in some way. In particular the development of cities, and the underlying social cohesion and culture which is created through cities, has a big impact on the use of resources, the way people behave, their interaction with nature and the waste products that ensue from this type of living.

The impact of the built environment

Unfortunately, most of the interventions created by building accommodation in which to reside or to work have a negative effect on the environment. For example, the UK government has suggested (DETR, 1998) that consumption associated with the built environment is as follows:

- ❑ Consumption of each person in the UK averages 6 tonnes of material per year broken down into 1.5 tonnes for new infrastructure (roads, railways, etc.), 1.5 tonnes for new buildings and 3 tonnes for repair and maintenance.
- ❑ Of the 300 million tonnes of quarried aggregates per annum only 10%–15% is recycled.



Source: McGraw-Hill Construction, 2008

Figure 1.2 Building sector share of total energy use around the world. (By Permission of Earth Trends. Taken from *Global Green Building Trends*, SmartMarket Report, McGraw-Hill Construction, 2008. Used with permission.)

- ❑ Over 70 million tonnes of construction waste is created per annum which represents 17% of the total UK waste.
- ❑ Around 70% of energy use can be directly or indirectly attributed to buildings and infrastructure.

These are frightening statistics and reveal how important the built environment is to any policy and evaluation of environmental sustainability.

It is even more bleak when the contribution of the building sector to total energy use around the world is considered. Just in commercial and residential building the amount of total energy use varies from 20% to 56% of total energy use (see Fig. 1.2).

So where does the built environment fit into the big picture? As Fig. 1.3 shows, there is a growing complexity as we move away from the actions of individuals towards the actions of groups and nations and their interaction with the global environment. The more people involved, the more the interactions and the more decisions become driven by policy. These policies may not be coordinated and therefore may conflict with each other. If this is coupled with the normal vagaries of nature, a very complex set of interacting systems emerges. This is what makes the holistic study of the environment and sustainability such a difficult research issue.

The built environment is just one strand of development found in this complexity and there are many more. Nevertheless, the construction and use of buildings is an important factor in the overall game. Buildings and structures use raw materials, some of which are non-renewable. They use energy to extract these materials and to manufacture components and, once in the structure, these affect the heating and cooling

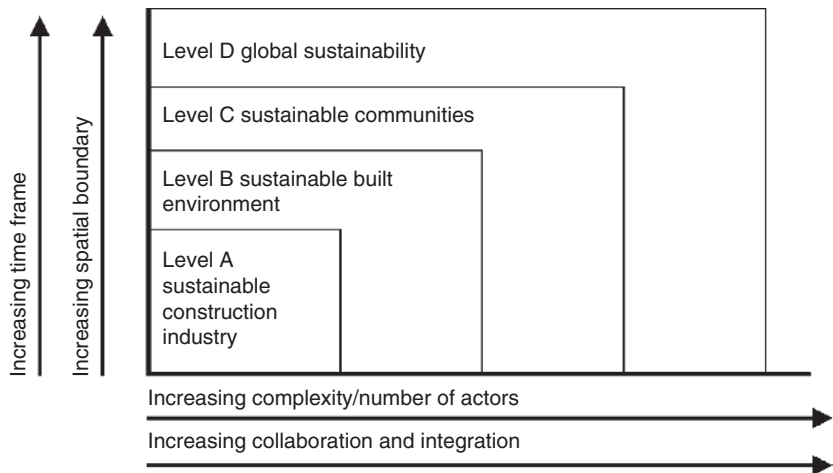
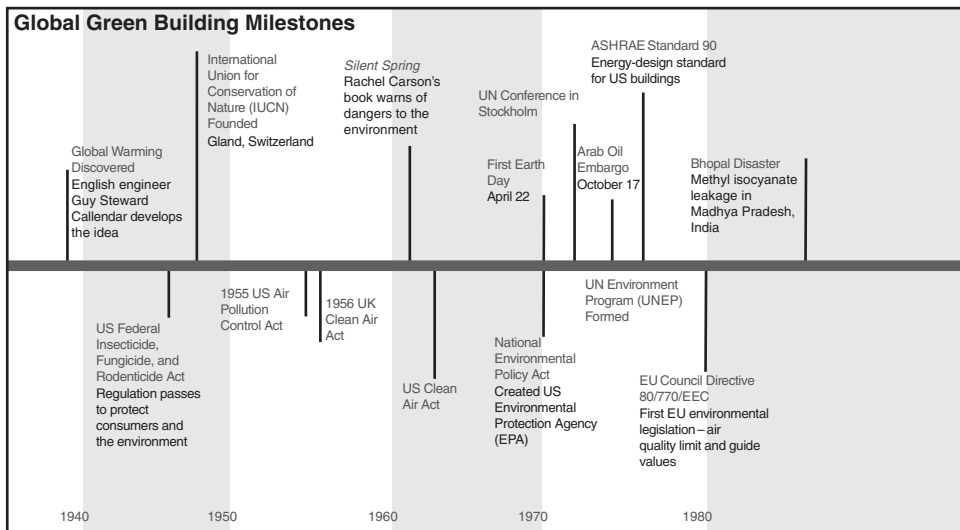


Figure 1.3 Levels of response to sustainable development. (Source: Construction Research and Innovation Panel Report, *Sustainable Construction: Future R & I Requirements: Analysis of Current Position*, 23 March 1999.)

requirements of the accommodation space. The manner in which people use the space could well affect the energy requirements too; for example, if a family has a pet dog in the house it is likely that they will open the back door more frequently to let the dog out. This in turn will increase the energy loss, creating demands for the use of more fuel which may come from a non-renewable source. These are factors affecting environmental sustainability but as we shall see later this is only a part of the problem even though it is the biggest driving force at the present time.

Figure 1.3 attempts to show the relationship between different parts of the built environment, including the communities that exist within it and the global environmental agenda. It starts with the construction industry and its suppliers, moves on to the built environment and the infrastructure required to sustain human activity, and then moves up to the communities themselves. This structure is quite useful for classifying the broad areas that need to be addressed for sustainability when viewed from the built environment perspective. It shows a continuum between the elements but gives focus for particular groups of decision-makers. Broadly, level 'A' would be addressed by building contractors, consultants and clients of individual structures, level 'B' would be primarily the decision-making area for the planners and local government and level 'C' would be the province of central government.

This series of statements is, of course, too simplistic. For example, as public participation is increased, so the representatives of citizens will need to be engaged. Ideally, we would want a common structure that allowed information to flow freely from one level to another and a



Source: McGraw-Hill Construction, 2008

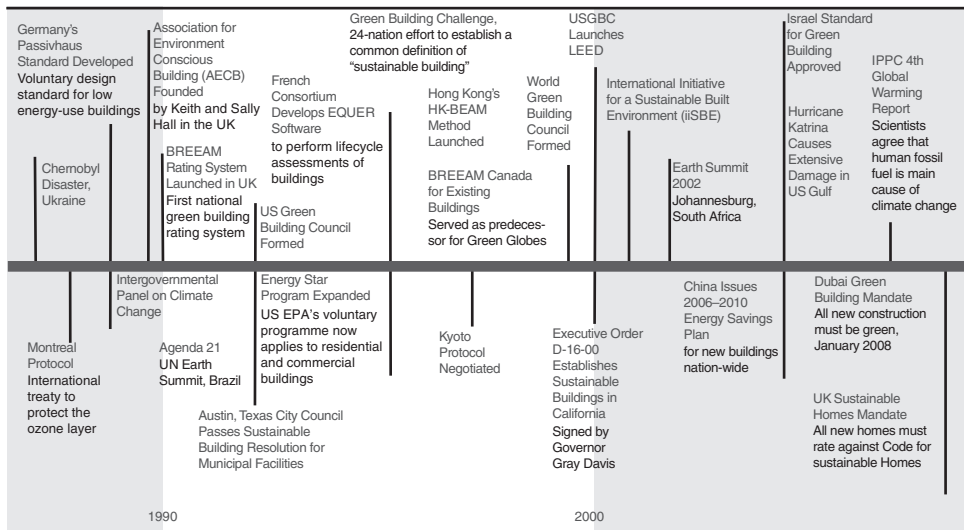
Figure 1.4 Global green building milestones. (Taken from *Global Green Building Trends*, SmartMarket Report, McGraw-Hill Construction, 2008. Used with permission.)

common language to allow full communication both across disciplines and between different levels.

This book attempts to provide the starting point for such a language and structure and there will be more on this later in this chapter and beyond. There is of course an interdependence between all the issues. The environment determines our need for a certain type of accommodation, the built environment is largely determined by the communities that dwell there and the buildings reflect the needs of the individuals and groups, the culture and the location of the structures. So what are the driving forces in the built environment which encourage a change of practice towards 'green' buildings?

The current response of the built environment community

In a complex market such as the built environment it is sometimes difficult to discover the key milestones which are identifying a response to the issues of sustainable development. There is no doubt that the 'green' agenda is permeating much of the developing policy for new building. This provides a basis for future development but does not deal with the immediate problem. Governments seem to be moving towards a reduction in carbon emissions which could be as much as 50% by the year 2050. If this is true then the contribution of the built environment could



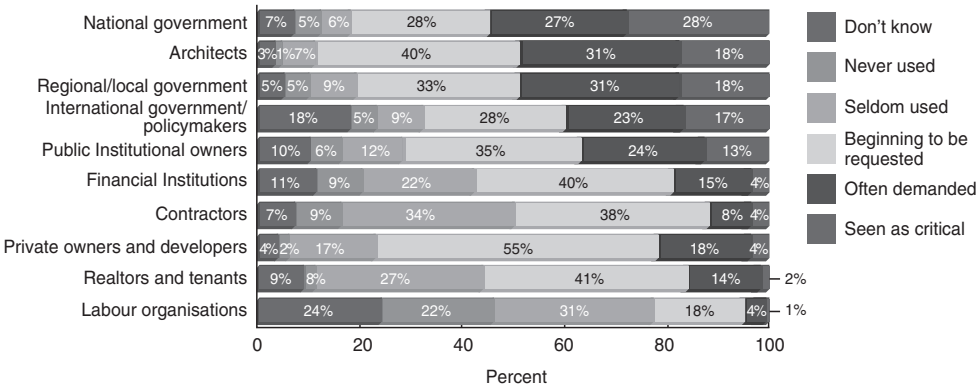
be a problem. Professor Mike Kelly, Chief Scientific Adviser to the Department of Communities and Local Government in the UK, has suggested that 87% of the existing building stock will still be standing by 2050 which means that major renovations and refurbishments of existing buildings are needed to make the required targets.

Nevertheless, governments in consultation with industry are endeavouring to create the legislative framework and the tools to address the issues involved. Figure 1.4 is taken from an excellent 'Smart Market' report entitled *Global Green Building Trends* (Bernstein & Bowerbank, 2008), one of several by the same publishers. It shows the global responses to the green agenda against the significant broader agenda of international agreements and actions.

There is a wealth of information in these reports but the following provides a particular insight. Figure 1.5 shows the importance of green building to stakeholders when viewed across the globe. It is interesting to note that it is government followed by designers who are leading the way.

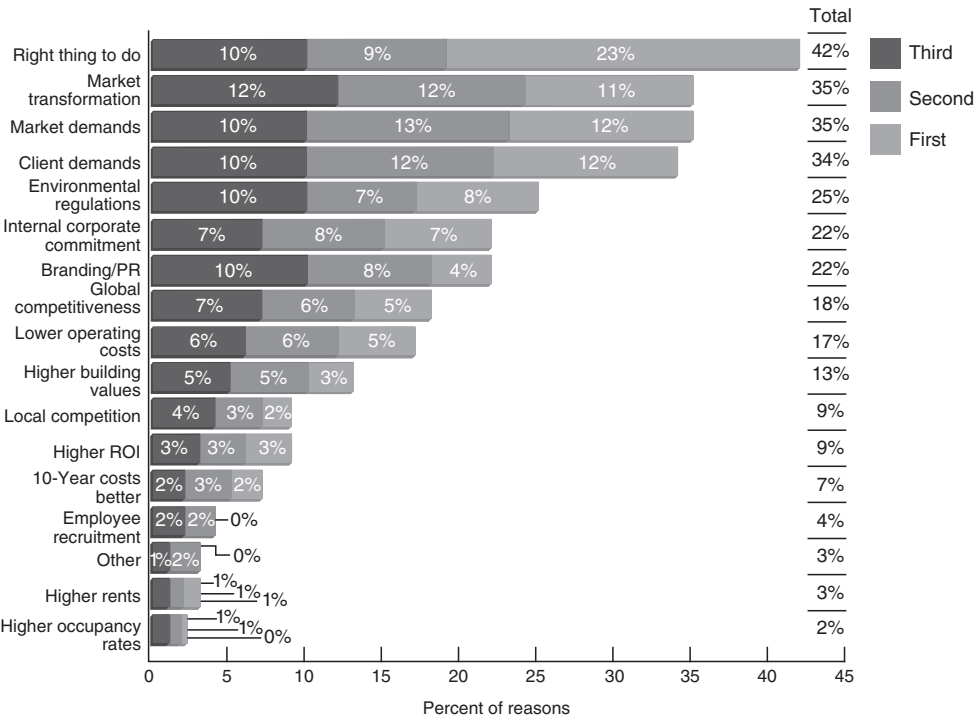
However, it is when the client bodies demand this service that real change will occur and there are signs that this is happening. The business reasons for green building (global) are shown in Fig. 1.6 and market demand and transformation together with client demand occupy three of the top four positions. However, the moral driver of doing what is perceived to be right takes top spot. The market is following public opinion. It does vary from continent to continent but nevertheless this ranking would not have been identified even a decade ago.

Many clients, however, are not business orientated and have social objectives. Their reasons are slightly different and they are firmly concerned with what is right for the world and their community.



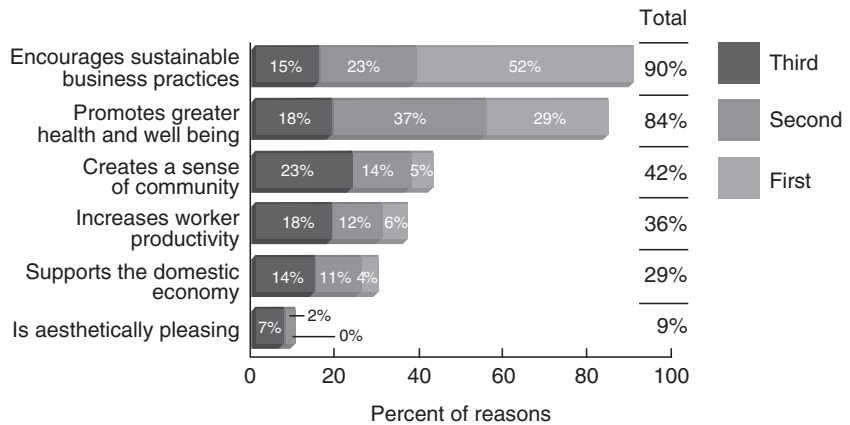
Source: McGraw-Hill Construction, 2008

Figure 1.5 Importance of green building to stakeholders – global. (Taken from *Global Green Building Trends*, SmartMarket Report, McGraw-Hill Construction, 2008. Used with permission.)



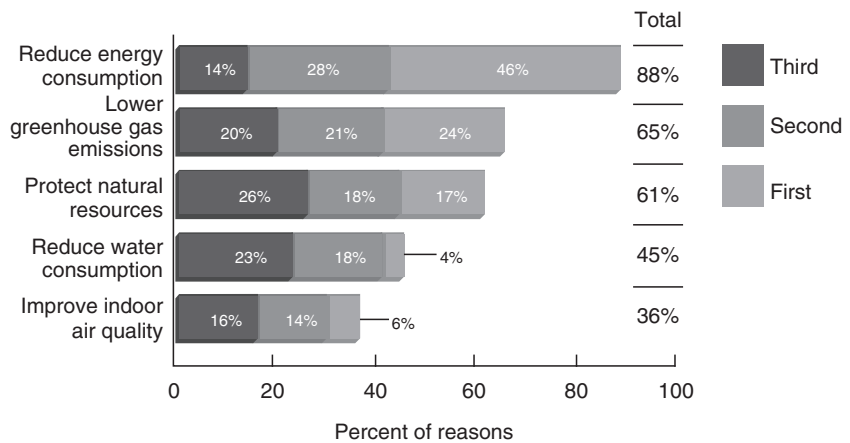
Source: McGraw-Hill Construction, 2008

Figure 1.6 Business reasons for green building – global. (Taken from *Global Green Building Trends*, SmartMarket Report, McGraw-Hill Construction, 2008. Used with permission.)



Source: McGraw-Hill Construction, 2008

Figure 1.7 Top global social reasons for green building. (Taken from *Global Green Building Trends*, SmartMarket Report, McGraw-Hill Construction, 2008. Used with permission.)



Source: McGraw-Hill Construction, 2008

Figure 1.8 Top environmental reasons for green building. (Taken from *Global Green Building Trends*, SmartMarket Report, McGraw-Hill Construction, 2008. Used with permission.)

Figure 1.7 shows the top global *social* reasons for green building. It is clear that the encouragement of sustainable building practices is agreed by virtually all but perhaps the second most important factor *provides greater health and well-being* is something of a surprise. However, this factor appears to be assuming more importance as time goes by as people recognise the health benefit of the technology.

Finally, the top environmental reasons for green building are shown in Fig. 1.8 and these follow the pattern of public debate with regard to climate change and environmental sustainable development.

Sustainability: a definition

The discussion to date has centred around the transition from the general environmental debate to the wider discourse which includes those factors that influence the environment and therefore contribute to sustainability and to the role that the built environment has to play in these matters.

It was the 1992 Earth Summit in Rio that provided a fresh understanding of the intimate link between the earth's environmental problems and such issues as economic conditions and social justice. It showed that the social, environmental and economic needs must be met in a balance with each other for sustainable outcomes in the long term. It showed that if people are poor, and national economies are weak, the environment suffers; if the environment is abused and resources are over-consumed, people suffer and economies decline. The conference also pointed out that the smallest local actions or decisions, good or bad, have potential worldwide repercussions. The Rio conference outlined the way that various social, economic and environmental factors are interdependent and change together. It identified the critical elements of change, showing that success in one area requires action in others in order to be sustainable over time.

A major achievement of the Rio conference was the development of what became known as *Agenda 21* – a thorough and broad-ranging programme of actions demanding new ways of investing in our future to reach global sustainable development in the twenty-first century. Its recommendations ranged from new ways to educate to new ways to care for natural resources and new ways to participate in designing a sustainable economy. The ambition of *Agenda 21* was extraordinary, for its goal was to make a safe and just world in which all life has dignity and is celebrated (see <http://www.johannesburgsummit.org>).

As the basis for the programme, the conference took the definition of sustainable development provided by the World Commission on Environment and Development (WCED) and its 1987 report entitled *Our Common Future* (WCED, 1987). The Commission was chaired by Gro Harlem Brundtland from Norway and the report is sometimes referred to as the *Brundtland Report*. The Rio conference took much of the argument in this report as the basis for its own recommendations. It is one of the most important documents in the field of sustainable development.

The definition is as follows:

‘Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs’.

(WCED, Brundtland Commission, 1987)

This simple statement has provided the basis for most of the debate and actions those engaged with sustainability have chosen to follow.

However Brundtland went on to say:

‘In essence sustainable development is a *process of change* in which exploitation of resources, the direction of investments, the orientation of technological developments and institutional change are all *in harmony* and enhance current and future potential to meet human needs and aspirations’. (Note: author’s italics.)

There are a number of points to be made from these statements for what follows in this book. Firstly, the definition itself has been criticised because it is argued that it is difficult, even today, to determine people’s needs. To try to forecast what they might be in the future is an impossible task. It is too difficult – let’s all go home!

However, the further statement above does give a better picture of what can be done. It refers to sustainable development as a *process* and not an end goal or destination. It is therefore open to further learning and adaptation, and to evolution as knowledge progresses. It is about creating a learning environment in which all participants strive to improve the situation that exists for the needs of today and tomorrow. It acknowledges aspirations as well as needs and therefore engages the drive for improvement that is seen in all societies. It is not necessarily conservative and conservationist but it does recognise that a change of approach is needed in which the wider sustainable objectives are part of the agenda for change. In addition, it recognises that it is about *harmony* and balance between often conflicting aspirations and needs. It therefore requires, on occasions, compromise and negotiation rather than imposition. No doubt there are times when imposition is essential, for example, when irreparable damage might be done to the environment if action is not taken quickly. However, on the softer issues related to social issues a local democratic approach, where consensus is sought, might provide an appropriate solution.

If we can add to the list of definitions it might therefore look like this:

Sustainable development is a process which aims to provide a physical, social and psychological environment in which the behaviour of human beings is harmoniously adjusted to address the integration with, and dependence upon, nature in order to improve, and not to impact adversely, on present or future generations.

Again this definition has limitations because it may require an adverse decision on the quality of life by humans now in order to provide the security required for future generations. The approach of the rest of this book could be included to further qualify this definition but it has been left at this generic level for further evolution as the debate continues.

(Please note: There is a site dedicated to definitions of sustainable development, see: <http://www.gdrc.org/sustdev/definitions.html>)

Seeking a shared set of values

If we are to engage in democracy, both in the imposition of laws regulating behaviour and in local debate and negotiation, there needs to be a set of shared values which allows discussion to take place. At one level it could be argued that the preservation of the human race and the planet to which we belong is a motivation we have in common. This is probably true, but there are some Eastern philosophies that might not consider the preservation of the human species as the pre-eminent driver for sustainable development. Nevertheless, most human societies by implication would place it high on their agenda. Even if some would place a different emphasis on the balance between species, all would agree that the preservation of the planet and its ecosystems are of considerable importance.

The establishment of a set of values is important if we are to strive for harmony. Indeed one definition of a philosophy can be 'the system of values by which one lives'. The system is supported by logic and reasoning but underpinning the conclusions is this concept of value. The problem is, of course, that there are many shared value systems. Figure 1.9 is a typical landscape of a city and it can be seen that there are many systems at work.

The photograph identifies many systems of which the following are just a few:

- ❑ *Religious system* centred around the church. In days gone by this might well have been the dominant set of values in the locality.
- ❑ *Community system* based on the interdependence between the activities taking place and the community that demands and/or uses them.
- ❑ *Transport system* which uses vehicles and cars and taxis to ferry people and products around the locality and beyond.
- ❑ *Biological system* which sustains human life but also maintains the landscape environment that people and other life forms enjoy.
- ❑ *Residential system* which allows people to have accommodation to meet their needs.
- ❑ *Business system* which provides wealth and economic activity in the region to support the local community and others.
- ❑ *Retail system* which allows the local community and those working in the area to purchase new items to develop their standard of living and sustain themselves.

It is not difficult to see that behind this list of systems there are also a multitude of different stakeholders. Stakeholders are those people who have an interest in the area either political, social, economic or legal. They will have different stakes but all contribute to the area's well-being and most will have an effect on its advancement or decline. They will

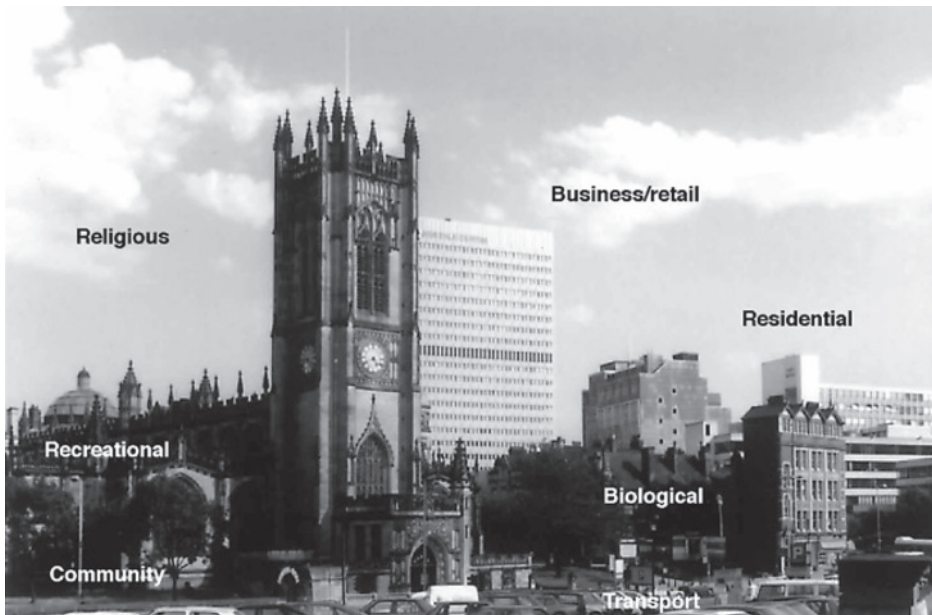


Figure 1.9 Value systems at work in the city environment.

include citizens, lawyers, developers, shop owners, priests, bus drivers, taxi owners, local authorities, politicians and many more. It is also not difficult to see that there is potential conflict between the systems identified as represented by their stakeholders. For example, the demand for business may squeeze out the residents from the area or create transport systems which are different from those desired by the citizens who live there or which have a detrimental effect on the health of both humans and plants. The noise level may increase to the point where the quality of life of the citizens is damaged and it may affect their ability to worship in the church. However, without the business centre it may be impossible to create the jobs people need to sustain themselves and the wealth which supports their life improvement. If the area is successful, the land costs rise and it may be that new forms of development take place which destroy the sense of community enjoyed by those living in the area and attract a different kind of person or activity which is hostile to the current environment.

There is a very complex interdependency between all these systems. Is it pie in the sky to expect that we can have harmony in such an environment? Many would say that it is, and yet our legal systems and governance attempt to create the framework in which, at the very least, minimal protection is given to many of these demands. In some cases, the legal systems can work against each other and set in motion plans and activities which are not conducive to sustainable development. Another important factor is the timescale over which the decision will

be considered. What seems right and appropriate now may well seem entirely inappropriate in a generation or even less. Sometimes, and sometimes quite often, the changes that affect an area may come from adjacent areas over which the decision-makers in the locality have little control. Indeed, sometimes they may be dictated by policy decisions at national or international level. The harmony we aspire to may be difficult to achieve and yet it is something for which we strive. What is clear is that, whatever we do, it is likely to be imperfect and whatever systems we set up to address these issues must have within them a high degree of flexibility and be able to be altered and adapted within a variety of time frames.

Striving for a common framework and classification system

If we can accept that some degree of stakeholder engagement with decision-making relating to the built environment is desirable, it is also important to consider within what framework or structure we need to have the dialogue. If the dialogue is to be helpful it needs to be at various levels, depending on the participants. For example, it is unlikely to be helpful to have a highly technical discussion with a citizen who may be unaware of the techniques being employed in the assessment. However, it is also the case that every contribution should be able to be pulled together within an understandable structure which identifies where the comment or report is targeted and how it helps the elements of sustainability. The field is littered with models and reports and opinions which are partial and unstructured. It is difficult for anyone to piece these together in a structured way in order to derive coherence from the diverse contributions and also to allow comparison with other assessments. It is rather like a group of people who are getting together and are trying to communicate when each only knows part of a language and each language is different. Confusion will reign and in the end it will be the dominant participant who knows slightly more than the rest who may get his or her own way either because this person is seen to be superior or because his or her ability to communicate is just a little better. 'In the country of the blind the one-eyed man is king!'

A major part of this book is the attempt to deal with this issue of structure and it will be returned to in Chapters 3 and 6. However, it is worth noting at this early stage that the following are required from such a classification:

- ☐ The framework should be common to whatever form of sustainable development is being considered.
- ☐ The framework should allow for the evolution of knowledge about sustainability as time progresses.

- ❑ The framework should not impose solutions but should facilitate thought and debate on the issue.
- ❑ The framework should be understood by all participants.
- ❑ The framework should allow different levels of knowledge to be brought together for common understanding.
- ❑ The framework should contribute to the wider question of global sustainability.
- ❑ The framework should have a theoretical base from which practical decision-making can be implemented.
- ❑ The framework should encourage a vocabulary and thought process that aids communication.
- ❑ The framework should allow the complex interrelationships within sustainable development to be made explicit when required, together with their interdependency.
- ❑ The framework should provide a mechanism by which knowledge gained can be transferred in a clear and understandable way, assisting in the overall education process of society and of the participants in particular.
- ❑ The framework should be holistic and encompass all issues likely to impact on sustainable development.

This is not a trivial list. Many of these issues are fundamental and can apply to a variety of complex problem-solving issues. Although the structure itself is likely to require refinement in the light of new knowledge, it should be sufficiently robust for its own underlying principles to be kept intact.

The characteristics of assessment and measurement for sustainable development

Once a structure is agreed it should be possible to develop a method to establish whether progress has been made in sustainable development. This is difficult but is nevertheless vital to the field of study. If it is not possible to establish whether we have improved our performance in our move towards sustainable development it is difficult to justify any decision that might be made now or in the future. How do we monitor progress without some assessment? In addition, it is important to know whether this assessment, if it takes place, is confined by the techniques employed to assess. There is a danger that it might be restricted to those aspects that are easy to measure. This is not unlike the drunk being asked at night why he is searching under a lamp post for a coin he has lost and replying 'This is where the light is!' Measures that are easy may not produce the right results.

It may be useful at this stage to distinguish between *measurement* and *assessment*. Measurement involves the identification of variables related to sustainable development and the utilisation of technically appropriate data collection and data analysis methods. Assessment involves the evaluation of performance against a criterion or a number of criteria. Both performance and criteria can only be defined by a value-based judgement; they are not empirically verifiable. Indeed the term *performance* must refer to a goal-orientated behaviour, that is, a behaviour rendered meaningful by the existence of a criterion that specifies when a goal has been attained. So a publicly meaningful assessment can only be achieved if the value system underlying performance and criteria is shared by both experts and public (Francescato, 1991). This latter statement reinforces the discussion in the previous section – there must be common language and structure to make it intelligible.

The methods employed in assessment are dealt with in Chapter 5, together with the appropriate application areas. There are considerable limitations to all evaluation methods (see Bentivegna, 1997), but these should be made as explicit as possible in order for all participants to engage properly within the process, otherwise the techniques can be misused to exact power.

Certain principles should underlie all assessments in sustainability if they are to be used for maximum benefit. They should be:

- ❑ *Holistic*: They should encompass all the key aspects needed to establish sustainable development.
- ❑ *Harmonious*: They should endeavour to balance or be used to balance the criteria upon which sustainable development should be judged.
- ❑ *Habit-forming*: They should be a natural tool to all concerned and encourage good habits.
- ❑ *Helpful*: They should assist in the process of evaluation and not confuse matters by further complexity or conflict.
- ❑ *Hassle-free*: They should be easy to use by a wide range of people and not require extensive training unless they are to be used by experts, and even then the results and their limitations should be simple to explain.
- ❑ *Hopeful*: They should point towards a possible solution and not leave the users in a state where there appears to be no answer.
- ❑ *Humane*: They should seek solutions which by their nature assist the development of human beings without pain, suffering or undue anxiety.

Again, this is a daunting list which may at this stage of our knowledge be impossible to achieve in its entirety. Nevertheless, it provides an aspiration which should be in the back of our minds as we develop systems for evaluation. It is a sounding board for our development of such techniques.

A review of the literature on assessment techniques will reveal a number of what are called *indicators* for sustainable development. In some ways, this is a recognition that the subject does not always have absolute values which we can measure and present as fact. It may be possible to provide hard measures for physical entities such as carbon emissions and levels of radiation in the soil, but it is not possible to be so precise with issues relating to social questions or human behaviour. In these areas, we can use measures to indicate what is happening but we cannot necessarily measure the direct impact on the environment or sustainability. For example, the downward spiral of economic activity leading to inner city decay might suddenly change when an inner city area suddenly becomes fashionable as people move into it from the centre of a city because the centre has become too expensive. It is not possible to be sure that this will happen but it may be possible to plot trends that suggest the probability that it might. This could then be an indicator of the regeneration of an urban environment and subsequent sustainability. On the other hand, if the city were to have no water supply, this would be measurable and would lead to an unsustainable future, as has occurred in several cities around the world. These issues will be explored later in the book.

Another issue that is also relevant to this discussion is the categorisation of users or stakeholders of such information. There are bound to be different levels of knowledge among them and the techniques will have to be used where they are most appropriate. It would be easy to establish a very complex list of such people and this in turn would add to the complexity of addressing sustainable development. In fact, the French (ATEQUE, 1994) have suggested a comprehensive classification of participants in the built environment. The following list has been developed by the *Intelcity Roadmap* (EU-IST 2001-37373) from the ATEQUE classification of actors influencing the built environment (*Intelcity Roadmap* – version 4, June 2003).

Civic service providers: the pole of collective interest (ten actors):

- ☐ elected representatives
- ☐ city administrators
- ☐ government agencies
- ☐ regional authorities
- ☐ local authorities
- ☐ research institutions and technical centres
- ☐ vocational training institutions
- ☐ consumer associations
- ☐ non-government agencies for environmental protection and other relevant interests

- ☐ information and communication technology (ICT) standards organisations

Private service providers 1: the pole of operational decision-making (seven actors):

- ☐ property development companies
- ☐ non-managing building and infrastructure owners
- ☐ managing building and infrastructure owners
- ☐ banks and other financial backers

- ☐ ICT development companies
- ☐ non-managing ICT infrastructure, broadcasting and content owners
- ☐ managing ICT infrastructure, broadcasting and content owners
- ☐ development control officers
- ☐ ICT component producers and distributors
- ☐ network and ICT equipment manufacturers and managers
- ☐ network development control officers

Private service providers 2: the pole of design (ten actors):

- ☐ designers – architects, engineers, etc.
- ☐ property and construction technical consultants
- ☐ town planners
- ☐ landscape architects
- ☐ construction economists
- ☐ designers – software engineers
- ☐ ICT technical consultants
- ☐ ICT systems designers
- ☐ network developers
- ☐ information and society technology (IST)/ICT economists

Private service providers 3: the pole of production (six actors):

- ☐ construction material producers and distributors
- ☐ construction contractors and managers

Mixed public/private service providers: the pole of use (five actors):

- ☐ transport and utility service providers
- ☐ facilities managers
- ☐ insurers
- ☐ network and network service providers
- ☐ network and ICT facilities managers

Citizens: the pole of use (six actors):

- ☐ users of buildings
- ☐ users of public open space
- ☐ users of transport and utility services
- ☐ users of city ICT services
- ☐ users of ICTs
- ☐ users of network and network services

However, a much simpler grouping which might also define the nature of the techniques that might be employed could be as follows:

- ☐ *Citizens*: This general group would include all laypeople engaged in the process who have no formal training in evaluation but nevertheless should be engaged with the decision-making process.
- ☐ *Clients*: This group would be largely the people who directly commission development within the built environment. They are interested in the impact on their own or corporate objectives. In private development, this can either be for the client's own

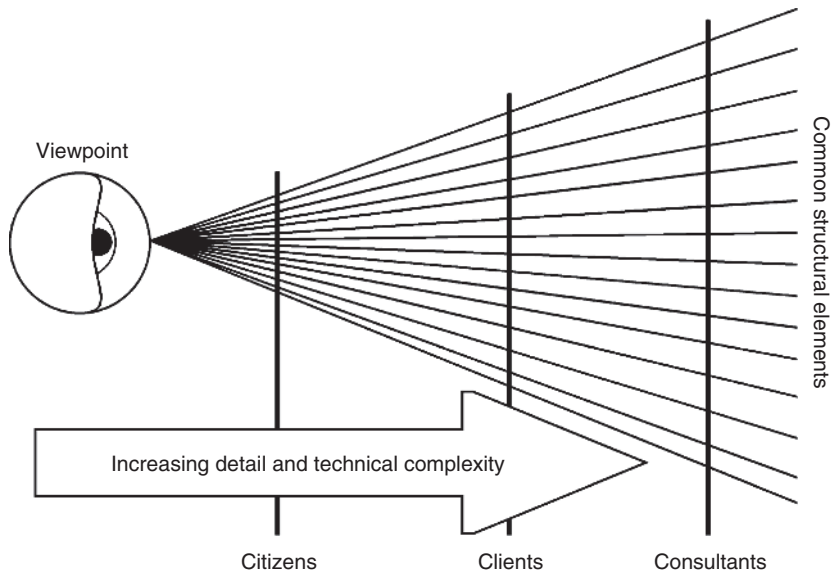


Figure 1.10 A consistent and integrated view for all parties to the sustainable development process.

accommodation or speculatively for tenants and users. In the public sector, their interest will be to establish value for the community.

- *Consultants:* This group would include the specialists and experts employed to create change and see through the procurement process. Their main objective will be to provide for a reasonable fee a service that satisfies the demands of their client base, as defined by themselves or the people who pay them.

Each may require a different set of techniques but within a standard structure and with consistency in the messages that derive from the techniques (see Fig. 1.10). This approach is still in its infancy but will be addressed further in Chapter 5. The key issue is whether the techniques employed encourage debate within the stakeholder group and whether they direct the decision-makers to a more sustainable development and/or one that has the flexibility to adapt to new circumstances relating to sustainability over time.

A helpful further approach might be that defined by LUDA – *Large Urban Distressed Areas* (<http://www.luda-project.net/>) in their Regeneration Process Framework which is shown in Fig. 1.11. This brings together many of the issues and participants which are critical to an understanding of evaluating sustainable development and echoes of this structure can be found in the chapters which follow.

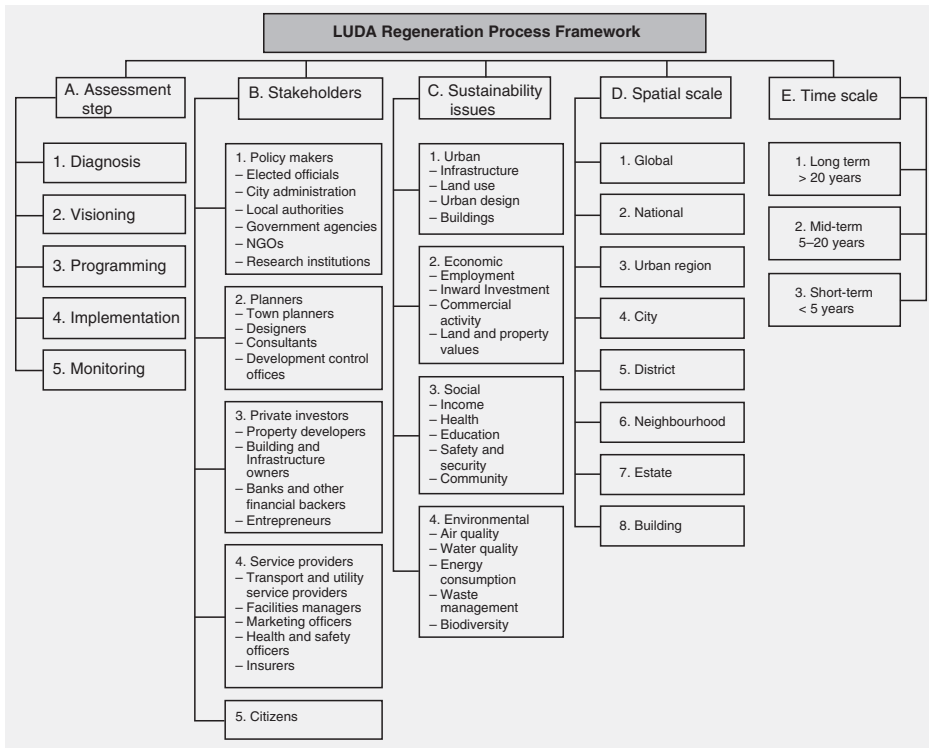


Figure 1.11 LUDA – ‘Large Urban Distressed Areas’ – Regeneration Process Framework. (Taken from <http://www.luda-europe.net/hb5/evaluation.php>. Used with Permission.)

Management and intervention for sustainable development

The discussion so far has focused on the underlying issues related to sustainability and our understanding of the term itself. The concept of evaluation has been brought in and some of the issues related to measurement and assessment have been addressed. But for what purpose are these structures and measures? They are of little value on their own unless we can use them to do something which will alter events. To do this, it is implied that human beings must intervene to ensure that something positive results. There is an irony here because it is often human intervention in the past that has created the severe problems we have today. Now we have a different set of assumptions from the past based on our improving knowledge of the earth and its ecosystems, but we also recognise that even today our knowledge is far from complete. We also recognise the complexity of the systems we are dealing with. This must mean that we have to tread carefully when

putting forward ideas for change and we must allow for flexibility so as to be able to respond to the better understanding we may have in the future.

The discipline charged with the task of controlling and implementing change is that of management. Managers are thought to possess the skills which allow change to occur efficiently and effectively. However, what is the responsibility of management? *Webster's Dictionary* defines the role of management as 'to bring about or contrive' or 'to direct or conduct the affairs of something'. This raises a whole series of questions. It is not clear, in the case of sustainable development, what 'management' is to 'bring about'. We have argued previously that it is a *process* rather than a *destination* and the end goal in terms of what the sustainable world might look like is changing and unstable.

The timescales and complexity of the issues that contribute to sustainability are also major factors. In sustainable development we are talking about long-term issues and a whole variety of things that act together with a complex network of interdependent issues which may well be changing as time progresses. No one manager has control over the whole series of factors and in addition the timescales mean that, even if he or she did have such control, it is almost certain that the management would change over time. This raises the question of who would hold the blueprint for sustainable development that we might design right now. In reality it is likely to be held by a large number of organisations and people who may well be going through several transformations over relatively short periods of time. Who will feel the ownership and responsibility to see the process through?

Part of the role of management must be to bring the stakeholders together and strive for a degree of harmony between them. It must also be about timing and determining the process and trying to get the optimum balance between all the factors making up a sustainable development. But optimum for whom? Each stakeholder will have a different view, no doubt! The manager will also be responsible for the interactions between people and organisations, and for when they should be consulted and when they should act. It is obviously a very complex problem which cannot be viewed in the normal management sense. Indeed, it seems to be more about changing a culture within a community and then establishing a learning environment responsive to that culture which is constantly reviewing its previous decisions as time goes on.

Managers have an important role to play in the process and new management systems are required to deal with such a long-term and complex issue. It is not goal orientated in quite the same way as conventional management operations, at least not at the strategic level. At a tactical level, decisions have to be made and they would follow

normal management practice except that the complexity of relationships and ownership of the problem could still be very diverse indeed. The choice of system is critical to what follows. There is a tendency for some prescriptive systems to control in a way that is counterproductive for the learning environment required for continuous improvement. It is when managers have the insight to see that systems cause their own behaviour that these issues can be tackled effectively. These matters will be explored further in Chapter 8.

Implementing management decisions

At some stage in any process that is going to change events someone will have to make a decision. This statement is not as naive as it sounds. We can define the problem of sustainable development for ever and a day; we can bring out statistics that make clear the degradation of the environment; we can develop systems that are meant to provide a framework in which we can work; but if we do not get to the point where we can make a decision, all will have been in vain. To be able to do this we need to be clear about what decisions need to be made and who will make them. The question is 'Can this be left to chance or does some order need to be brought to the process?'

If it is left to chance there is every likelihood that something will get missed. If we make the process too prescriptive, either the balance between issues will get distorted or we will be led in a specific direction dictated by the system we are following. Neither of these approaches is desirable. We need to create a flexible decision-making environment where all factors are considered and where a structured approach can be taken which has order without regimentation. We need to know we have covered everything, and that all parties are aware of progress and the critical points for 'go' or 'no go' so that we can work in harmony together.

This would suggest that a protocol of some kind is required to achieve such an end within the process of planning, designing and building, and perhaps one of the most valuable approaches is that developed by Cooper *et al.* for a process protocol (see Chapter 8) in terms of the development process for construction (Cooper *et al.*, 2004). A protocol is any rule, code of behaviour or etiquette used to achieve or perform an action. It can therefore be formal or informal but in the majority of cases would contain some clearly agreed approach or standard. In Cooper's Process Protocol there are a number of hard and soft 'gates' in the process through which the decision-makers pass. The 'soft gates' allow progress to be made without all decisions being firm while the 'hard gates' are points in the process where the process itself cannot continue unless a firm decision is made by those engaged at

that point in time. It has been suggested that this procedure might be applicable to sustainable development, and the Cooper research team have considered working on a protocol for sustainable construction which can be superimposed upon the overall protocol as already developed and integrated within it. It has already been applied to Disaster Management (see Chapter 8) which is addressing an extreme form of unsustainability where the very fabric of community is being challenged.

There is certainly a case to be made for a generic model that will provide a template for evaluating and implementing sustainable development at all levels in the sustainable development process. In a complex arrangement with a vast array of potential stakeholders, some form of standardisation is essential if all are to know how, and when, they can participate. It would provide a level of transparency which would aid participation and allow all participants to understand the process and the techniques being employed. The danger would be if this became too bureaucratic and slowed down processes just because of the weight of the management overhead involved. It is a balance between getting as close as we can to the right solution and the time and effort required to get there.

Summary

This chapter has attempted to provide a context for the subject of sustainable development within the built environment. It has introduced some of the arguments and has set the scene for what will follow. Sustainable development has been presented as a process that is emerging and evolving to reflect the knowledge that is emerging and evolving at the same time. It has argued for six requirements in the development of models and processes to be considered to address the evaluation of sustainability:

- ❑ *Working definition:* Here it has been suggested that the WCED definition might be appropriate even though it has inadequacies.
- ❑ *Shared value system:* We need a consensus around a set of values in order that all stakeholders can participate.
- ❑ *Robust classification system:* This is needed to provide a structure for discussion within which knowledge-building can take place.
- ❑ *A set of assessment/measurement tools:* These are required to assess whether progress has been made.
- ❑ *Management framework:* If humans are to intervene in the process they must operate within a system that they understand, and because of the timescales involved they must develop such systems to be flexible and to provide an active learning environment with a culture of self-improvement.

- ❑ *Process protocol*: This is required to ensure that all knowledge with regard to sustainable development is addressed at the right time and with the right technique or approach, otherwise some stakeholders will be disadvantaged.

One further issue needs to be explored and that is the question of the time horizon up to which any decision-making is intended to apply. This is a big subject but it is critical to our understanding of process and what can be achieved by any group of decision-makers. This requirement is fundamental to the whole of the evaluation process. Much modern planning can be considered to be short term and without consideration for future generations. It is often dictated by economic criteria prevailing at the time whereas truly sustainable development requires the long-term view. We will return to this in Chapter 2.