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Introduction

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Introduction

Sustainable development, which meets the needs of the present generation without undermining the ability of future generations to meet their own needs, was widely adopted as a policy goal in the 1990s by many international agencies, governments and non-governmental organizations (NGOs). It was also translated into a theoretical concept that has become a major focus for academic research. Yet the speed and breadth of its adoption were surprising to many people, who regarded it, at best, as nothing more than a vague concept and, at worst, as a means to perpetuate the exploitation of developing countries. What is the reason for such conflicting attitudes? The answer to this question holds the key to a better understanding of sustainable development, and of the geographical perspectives that are explored in this book.

Sustainable development was originally devised as a compromise between two contradictory aims: on the one hand, the pursuit of environmental conservation and, on the other, the pursuit of economic growth and the development that generally followed as a result. Unfortunately, however, sustainable development has assumed two contradictory meanings among different governments and NGOs around the world. Broadly, from the perspective of developed countries, sustainable development is primarily about conserving the environment; while, as viewed from the developing world, it means the continued pursuit of development with the aim of reducing poverty and attaining the status of modern societies.

A similar disparity of views is found among academics. In response to the apparent vagueness of early definitions, economists devised theories of sustainable development and conditions for achieving it. Viewed in this way sustainable development holds the key to understanding the historical development of human civilization and predicting its long-term prospects. However, the two leading economic theories differ in significant respects, and neither of them takes much account of the spatial dimension. For many other social scientists, who are more concerned with the politics of development, sustainable development has as little currency as the ideal of development that the poorer countries of the world have been persuaded to pursue since the end of World War II. Seen from the standpoint of existing political economy theories, sustainable development, like 'development' before it, can never benefit developing countries, but will only continue their long-standing exploitation by developed countries.

These disparate views are perpetuated because there is so little interaction between them. This breeds ever more confusion about the meaning and significance of sustainable development. The subject is discussed by the governments of developed and developing countries at major international conferences – such as the United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in June 1992, and the recent follow-up conference, the World Summit on Sustainable Development (WSSD), held in Johannesburg in August 2002; but they usually talk past one another and there is seldom a meeting of minds. Academics also tend to stay within the realms of the particular type of theory that they favour, instead of exploring the merits of other theories.

It is in a situation like this that geographers have much to offer. Being concerned with the planet as a whole they are ideally suited to studying sustainable development, a field of truly global dimensions. They are also good at seeing the whole picture by combining its many disparate elements. Their skills of synthesis are needed as never before to grasp the full immensity of sustainable development from the many different viewpoints that currently exist. Another geographical skill is important in this particular context – namely, an ability to see the whole in its diversity, rather than feeling the need to enforce conformity upon different views and circumstances. As we shall see in this chapter, this is one of the greatest challenges facing those who study sustainable development. Geographers also apply this skill within their own discipline. As this book shows, different geographers look at sustainable development from different perspectives. Finally, geographers tend to look at a topic from a spatial point of view and cannot understand why other people do not do so too. As the spatial dimension of sustainable development has been relatively neglected, this is one important gap that they can help to fill.

This book is only a first step towards portraying geographical perspectives on sustainable development. It attempts to grapple with the diversity both of political views on the subject and theoretical approaches, and to show how thinking geographically can enhance our understanding of them. The variety of geographical perspectives presented is a microcosm of the range of approaches already taken by other geographers. We are not the first geographers to explore sustainable development, but we hope that this book will demonstrate to both geographers and non-geographers alike that there is more to the subject than they realize, and encourage them to pay greater attention to sustainable development in the future.

This chapter provides a conceptual foundation for the book as a whole by reviewing the current range of views on sustainable development, and by showing how they differ and what they have in common. It begins by introducing the political conflicts that are at the heart of sustainable development. The chapter then outlines some key theoretical concepts and reviews the two leading economic theories in this field. After suggesting how these various disparities might be reconciled, the chapter ends by identifying the key questions that are tackled in the remaining chapters in the book and outlining the principal themes that emerge from this discussion.

Conflicting Political Ideals

The environmentalist ideal: bridging the gap between conservation and economic growth

The idea of sustainable development was first specifically identified in 1980 in an attempt to overcome two fundamental conflicts that became increasingly apparent during the last half of the 20th century. The first of these is the seeming incompatibility between maintaining a healthy environment and the economic growth needed for development. The second is the continuing gap between the quality of life in developed countries (the global 'North') and developing countries (the 'South'). These concerns have given rise to the two conflicting ideals of sustainable development that continue to this day.

Mounting and widespread disquiet about the environmental impacts of unfettered human population growth and industrialization sparked off an 'environmental revolution' during the 1960s. What began as a critique of relatively localized pollution had, by the end of the decade, developed into a conviction among environmentalists that the entire planet was under severe threat from resource depletion and pollution driven by population growth and capitalist greed. During the 1970s these emergent concerns led to environmental protection being accepted as a minor, but significant, goal by the governments of the leading developed countries. However, they still tended to regard a healthy environment as rather a luxury and as something separate from economic activity. This attitude did not begin to change until the 1980s, when there was a realization that the environmental impacts of economic activity could rebound on the whole of humanity, through stratospheric ozone depletion and global climate change.

The rise of environmentalism as a political force was paralleled by increasing efforts on the part of conservationists to protect as many of the planet's remaining pristine natural ecosystems as possible. Yet they encountered major obstacles, particularly in developing countries in the tropics where a significant proportion of the Earth's surviving biological diversity is located. Setting aside large areas for conservation was incompatible with the demand by the peoples of these countries for more space to accommodate their rising populations and for the right to exploit their natural resources in order to achieve more development. National parks whose boundaries had been designated on maps to give maximum protection to a country's natural wealth therefore often remained mere 'paper parks', as it was not feasible to protect them against expanding human numbers. Poor people would not relinquish their hopes for development simply to safeguard the beauty of nature, primarily for the enjoyment of rich people in their own countries and abroad.

Hitherto, many conservationists had retained the idealistic, not to say naive, belief that something as important as conservation must automatically receive widespread popular support. They gave a lower priority to development and saw no reason why others should not do the same. Eventually, however, they realized that they could no longer ignore the reality and inevitability of development. If they were to achieve their goals of conservation, they would have to recognize that others, particularly in developing countries, held equally legitimate goals of development. This led to the

launch of new integrated conservation and development projects, such as those in the United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and Biosphere Programme, which combined the establishment of protected areas with initiatives to improve the lives of local people.

It was a short step from integrating conservation and development to conceiving the ideal of sustainable development. This first emerged, rather tentatively, in the *World Conservation Strategy* published in 1980 by the International Union for the Conservation of Nature (IUCN), now the World Conservation Union:

Humanity's relationship with the biosphere . . . will continue to deteriorate until a new international order is achieved, a new environmental ethic is adopted, human populations stabilized, and sustainable modes of development become the rule rather than the exception . . . For development to be sustainable it must take account of social and ecological factors, as well as economic ones; of the living and non-living resource base; and of the long-term as well as short-term advantages and disadvantages of alternative actions.

Sustainable development was recommended, in particular, to developing countries as a development path that would not replicate the environmental degradation that had been incurred in the industrialized countries. However, at this stage it was expressed in rather general terms, and lacked both proper definition and any accompanying guidance as to how it might be achieved in practice (Adams, 2001).

The developmentalist ideal: a new beginning for development

Political leaders in developing countries, on the other hand, had a different agenda during the 1980s. The last major political ideal that the governments of the developed countries had persuaded them to adopt was the notion of 'development', by which they would replicate the success of developed countries. From the perspective of the developed countries, this was intended as a well-meaning attempt to reduce the gap that separated them from the poorer countries of the world and thereby increase intra-generational equity. The developed world also backed up its advice with financial aid. However, with a few notable exceptions such as South Korea and Taiwan, most developing countries failed to realize the development ideal. They still suffered from poverty, famine and ill health, and so were in no mood to adopt the new environmental goal that had become popular in developed countries or the supposedly more realistic ideal of sustainable development. Developed countries had become wealthy by despoiling their environments and those of developing countries too. So it was seen as hypocritical of the former now to ask developing countries to protect their environments and control population growth at the expense of the chance of economic development. Indeed, in some countries, such as Malaysia, governments saw population growth as vital if they were to achieve the kind of development that they wanted.

Development planners had already responded to slow rates of development by rethinking the strategies they employed. The initial 'top-down' modernization strategies of the 1950s and 1960s, which equated economic development with economic growth and relied on the centrally directed expansion of industry and

commerce to generate more income for the whole country, had not been generally successful. Where they had succeeded, the benefits had often accrued disproportionately to foreign investors and already powerful and affluent indigenous elites. So during the 1970s new 'bottom-up' participatory strategies were introduced that addressed the requirements of the poorest people first, by attempting to meet the basic needs of specific local populations for water and sanitation, shelter, food, fuel, income and employment. However, the benefits of this new approach were not immediately visible to the rich elite and government leaders. The growth in income that stemmed from the increase in commodity prices in the 1970s had been short lived, and many developing countries now faced a debt crisis because they could not repay the massive development loans they had taken out in the 1970s.

The governments of developing countries, therefore, also wanted a new development ideal. But their priority was for a type of development that could be sustained over a long period of time, rather than brief periods of economic growth, as experienced in the 1970s, followed by periods of stagnation. This would allow them to rid their countries of the scourges of poverty, famine and ill health, and to replicate the modern societies they could see in developed countries.

Some of the more astute government leaders had been influenced by new political economy theories, such as that proposed by Frank (1969). These argued that developing countries were in an inevitable state of economic dependency on developed countries, since the very structure of the world economy put them at a severe disadvantage. A fundamental duality had been created between a politically powerful and economically wealthy Core – originally centred in Europe, but later extending to North America and East Asia – and a dependent Periphery. Within this Periphery local economic and social systems were vulnerable to disruption and destruction to meet the roles allotted to them within the global system, chiefly as suppliers of raw materials to the industrial Core. So changing from top-down to bottom-up strategies would have little impact on poverty because it would only treat the symptoms of uneven global development and not its causes.

The most strident critics even claimed that development was a 'cruel hoax' (Esteva, 1992) imposed on developing countries by their developed counterparts, whose sole aim was to extract their economic surplus and leave them in poverty. Any attempt by the poorer countries of the world to follow the path of economic modernization undertaken by developed countries, and to participate in the world trading system, could only, in their view, lead to further *underdevelopment* because the structure of the world economic system was biased against them. This would divert the bulk of any income they generated to the developed countries, making it unavailable to fund their own development. The ideal of 'development as progress' was therefore an illusion promoted by developed countries to perpetuate a pattern of exploitation that was only transformed, not replaced, when developing countries gained political independence from the industrialized countries that had colonized them.

If correct, such thinking would indicate that only a fundamental change in the economic and political relationships between North and South could ensure real and lasting improvement in the social and economic fortunes of the world's poor. This was the basic argument of the Brandt Commission (1980) report, *North-South: A Programme for Survival*. The report called for more development in developing countries, and for a new spirit of global togetherness to bridge the North-South divide, thus ensuring

greater equity in world development, finance and trade. But these idealistic proposals came to nothing. In response, leading politicians in developing countries became more assertive. They believed that a necessary precondition for sustained future development was that developed countries should offer greater compensation for the exploitation suffered during the colonial era. This would require hard cash in the form of more official aid and the removal of trade barriers. The latter would allow them to supply manufactured goods to the markets of the industrialized world, thereby reducing their dependence on exporting primary commodities of low and variable value.

Sustainable Development as an Ambiguous Compromise

The Brundtland Report

In an attempt to reconcile these two different perceptions of development, the United Nations (UN) General Assembly established the World Commission on Environment and Development (WCED), chaired by Gro Harlem Brundtland, then Prime Minister of Norway. The solution proposed in the report of the 'Brundtland Commission' (WCED, 1987), as it became known, was to aim for sustainable development, which it defined as:

[Development that] meets the needs of the present without compromising the ability of future generations to meet their own needs . . . It contains within it two key concepts: the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given, and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

This gave a new meaning to the term 'sustainable development' from that identified by IUCN seven years earlier. It recognized the need to ensure inter-generational equity by minimizing the harmful environmental impacts of human activities, in deference to the concerns of the developed countries. However, its primary aim was to meet the needs of the developing countries by reducing poverty. This should have happened already, of course, if these countries had become more economically developed. However, for the reasons given above, many of them had not, and in calling for poverty reduction, the Brundtland Commission added an important new intra-generational equity element to sustainable development. It argued that environmental degradation would continue unless poverty and inequality in developing countries were addressed urgently. Poor people who are desperate for food, fuel or income cannot always afford to have regard for the future environmental consequences of their actions. Consequently, economic growth must continue in order to alleviate poverty and maintain development. The Brundtland Commission did, however, state that this economic growth should be a 'new form' of growth that was less harmful to the environment and did not deplete the Earth's remaining stocks of natural resources.

The Brundtland Report, *Our Common Future* (WCED, 1987), was important for securing wide public exposure for sustainable development and establishing it on the

international political agenda. Both developing countries and environmentalists and conservationists from developed countries could agree with what it said. However, it had two basic flaws. First, it did not say how continued economic growth could in practice be balanced against the need to conserve resources and natural environments. This effectively put human needs before those of the environment (Redclift, 1992a). Second, it was sufficiently ambiguous to enable each of the two main interest groups to interpret the meaning of sustainable development in a way that reflected their own agenda. So governments and campaigners in developed countries believed that sustainable development would mean better environmental protection. Their counterparts in developing countries, on the other hand, believed that it would bring them more development, and that is the ideal of sustainable development which *they* adopted.

The United Nations Conference on Environment and Development

A universal ideal

This ambiguous compromise, which effectively allowed the simultaneous existence of two interpretations of the sustainable development ideal, established sufficient common ground between developed and developing countries for them to agree to meet in the Brazilian city of Rio de Janeiro in June 1992 at the UN Conference on Environment and Development (UNCED) and the 'Earth Summit' of heads of state which followed it. Sustainable development was the core theme of the conference and permeated the texts of the agreements signed there, including the Framework Convention on Climate Change (FCCC), the Biodiversity Convention and Agenda 21.

UNCED made two special contributions to the evolution of sustainable development. First, it succeeded in translating the ideal proposed in the Brundtland Report into a *universal ideal* for all countries, whether developing or developed. This was an incredibly important achievement. For what had been previously just an ideal recommended to developing countries became an ideal to which every country in the world could now aspire. What this meant in practice in developed countries, however, was that the goal of increasing environmental protection that had been gaining momentum there for 40 years was simply given a new name.

Ultimately, UNCED was a failure because the conflicting goals of these two groups of countries could not be hidden once government representatives were in close proximity in a meeting hall. Indeed, UNCED was also notable for the emergence of a new collective assertiveness by developing countries, irritated at the neglect of their needs by the developed countries. This had a major influence on the wording of the agreements reached at UNCED, particularly the Biodiversity Convention, the Rio Declaration and Agenda 21. These were phrased with sufficient ambiguity to be compatible with the conflicting ideals of sustainable development held by the developed and developing countries.

Agenda 21, for instance, is often portrayed as a grand 470-page blueprint for sustainable development (UN, 1993). Yet its final consensus format was only reached by a clever use of language which, as in the Brundtland Report, was ambiguous enough to acknowledge both sets of goals, without attempting to resolve the contradictions between them. Agenda 21 must therefore be regarded as a political document, not a technical manual. Some key aspects of development – such as

population growth and the associated policy debate – even had to be excluded altogether because of their political sensitivity.

The political process of sustainable development

UNCED's second contribution was to launch what may be called the *political process* of sustainable development through which many governments, international agencies, NGOs, firms and individuals have tried to realize the new universal ideal and take action to make our world a better place. The notion of sustainable development as a process was inherent in the text of Agenda 21, which never actually defined it but stated that it would 'integrate environmental and developmental decision-making processes', contrary to the prevailing custom which was 'to separate economic, social and environmental factors at the policy, planning and management levels'. Principle 4 of the Rio Declaration repeated part of the preamble of the UN General Assembly Resolution which launched the whole UNCED process, in stating that 'In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it'.

Since UNCED the political process has become particularly apparent in the increased momentum generated for improving environmental management, both internationally and at national and local levels. National and local Agenda 21 action plans have been devised and implemented in many countries. Governments are committed to reporting their progress to the Commission for Sustainable Development which the United Nations established. A Special Session of the UN General Assembly was held in New York in June 1997 to review progress in the five years since UNCED (Osborn and Bigg, 1998). In spite of all this enthusiasm, however, the basic contradiction remains between the two different interpretations of the political ideal of sustainable development. Developing countries want better development, while developed countries want a better environment, preferably without harming their own development prospects too much.

The World Summit on Sustainable Development

Ten years after UNCED, the two interpretations persisted at the World Summit on Sustainable Development (WSSD), held in Johannesburg, South Africa, from 26 August to 4 September 2002. However, the results of this huge gathering were very meagre indeed, consisting of: a short Political Declaration – the Johannesburg Declaration on Sustainable Development; a 67-page Plan of Implementation of the World Summit on Sustainable Development, which was as general, voluntary and devoid of specific targets as Agenda 21; and commitments to halve the proportion of the world's people who do not have access to basic sanitation by the year 2015 and to establish a representative network of marine-protected areas by 2012.

Developed countries were just as reluctant as in the past to give new financial and other commitments to promote development in developing countries, while the intransigence of the US government prevented further progress on the environmental side (see Chapter 12 in this volume).

A formal definition of sustainable development was again missing from the principal documents of the WSSD. However, the Johannesburg Declaration did further the understanding of the concept in the United Nations system by referring to 'the

mutually reinforcing pillars of sustainable development – economic development, social development and environmental protection' (UN, 2002). The Plan of Implementation of the World Summit on Sustainable Development similarly noted the need for:

... the integration of the three components of sustainable development – economic development, social development and environmental protection – as interdependent and mutually reinforcing pillars. Poverty eradication, changing unsustainable patterns of production and consumption and protecting and managing the natural resource base of economic and social development are overarching objectives of, and essential requirements for, sustainable development (UN, 2002).

Nevertheless, the Plan of Implementation was just as reticent as Agenda 21 in explaining how to reconcile continued economic growth with environmental protection. It referred to 'our common pursuit of growth, poverty eradication and sustainable development' (Article 83), and asked states to 'cooperate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries to better address the problem of environmental degradation' (Article 101).

The need for greater clarity

What is so surprising about the political process of sustainable development is that so much has been, and still is being, attempted without a very exact description of what sustainable development should entail. It has been commonly assumed that, starting from only the vague definition in the Brundtland Report, the transition from unsustainable to sustainable development can be achieved by a process of pragmatic experimentation that will clarify the real meaning of sustainable development and how it can best be secured. A less charitable, but perhaps more realistic, view is that this approach is more likely to breed confusion than clarification, and that this will be counterproductive in the long term. The great risk is that the process of experimentation will degenerate into a virtual free-for-all, in which almost anything and everything can be presented as a contribution to greater sustainability.

It is for this reason that academic research has much to offer in clarifying the meaning of sustainable development and the conditions for actually achieving it in practice. We therefore now examine existing theories, prefacing this with a review of the evolution of thinking about development in general, in order to link sustainable development with earlier ideas.

From Economic Growth to Sustainable Development

Over the past ten years a considerable amount of academic effort has been invested into translating the political *ideal* of sustainable development into a more rigorous theoretical *concept*. To put the results of this work into proper perspective, it helps to regard sustainable development as just the latest stage in the evolution of our

understanding of human development. It builds upon, and extends, two other key concepts – economic growth and economic development – both of which are still widely used. Just as the concept of economic development was devised to overcome the limitations of economic growth, so the emergence of sustainable development reflects a similar frustration with the conventional concept of economic development. We therefore begin our theoretical analysis by exploring the definitions and origins of these three concepts.

Economic growth

Economic growth refers to an increase in an economy's output of goods and services, and the overall amount of income that it generates. Measured by the gross domestic product (GDP) index, it is still given a high priority by governments all over the world. This is despite a long history of protests by environmentalists that economic growth destroys the environment and depletes stocks of natural resources because it prioritizes consumption to generate income. Maximizing consumption requires using up the planet's resources and the processes by which these are extracted and transformed into commercial products generate pollution and other forms of environmental degradation (Mishan, 1967). Politicians feel obliged to continue to proclaim the virtues of economic growth because of the almost universal attractions of higher income. Generally, the amount by which a society can advance is seen to depend upon how much extra income its economy can generate, and the rise in average income partly eases the political strains caused by inequalities of wealth and income.

Economic development

Growth in mean income alone does not, however, guarantee that the full range of human needs and aspirations will be satisfied – hence the need for another concept to describe this more all-embracing trend. Economic development can be defined as a rise in the well-being of society as a whole, as reflected in the expanded set of opportunities available to the present generation (Perrings, 1994; Simpson, 1987). It requires not just a rise in mean income, but that this income be distributed as equitably as possible among a population to increase the welfare of the whole of society – for example, by increasing access to food, clean water and housing, and improving standards of health and education. Economic development therefore leads to greater intra-generational equity, though no particular degree of equity is specified as a target that a country should meet in order to be called 'developed'.

The concept of economic development echoes humanity's historic struggle to improve its general standard of living. At the heart of this is the long-standing conflict in the industrialized countries between Labour and Capital over the distribution of income and wealth. But the concept was not specifically articulated until after the end of World War II (Potter et al, 1999), when it was used to refer to the process by which the world's poorer countries would replicate the economic and social achievements of the richer countries. As a result, economic development was initially equated with increasing mean income through the extension of industrialization and the economic growth resulting from this. It was assumed that the income generated by the 'modern'

sector of the economy would automatically ‘trickle down’ to improve the fortunes of the traditional farming population, who still constituted the majority of the citizens of what was known then as ‘the Third World’ and later as the ‘developing countries’. By the 1970s, however, it was clear that this was not generally the case. This led to the present definition of economic development, which equates it with ‘rising well-being’ instead of ‘rising income’. Economic growth can lead to economic development, but only if a combination of market forces and societal institutions ensure that the extra income it generates is distributed relatively evenly throughout society.

Despite reservations about equating economic development with economic growth, the former is often still measured in broad income terms by the index of GDP per capita, which is estimated by the mean income received by each person in US dollars. ‘Developed countries’ are distinguished from ‘developing countries’ by their level of GDP per capita, and each group is divided into further sub-categories on the same basis. However, since average income is not a reliable guide to well-being, a number of alternative indices have been proposed. One of these indices merely corrects for the distortions introduced when the GDP per capita of all countries is measured in US dollars, by estimating income instead on the basis of ‘purchasing power parity’, in order to reflect more truly the goods and services that may be actually purchased by a unit of national currency in each country. A more radical alternative is the United Nations Human Development Index (HDI) (UNDP, 1991). This has become increasingly popular since the early 1990s because it takes account of distributional features, such as health and educational standards, which are crucial to economic development as it is now defined. The HDI has its limitations, but it is a valuable tool, building on attempts since the late 1960s to use multiple indicators to monitor social and economic improvement.

Economic development, as defined above, is an objective *concept* that can be used to describe both positive and negative economic and social changes. It often shares the opprobrium of critics of the original development *ideal* described earlier, but the two are not the same. The concept requires neither a preferred rate of economic development nor a high level of economic development – two alternative interpretations of the development ideal. On the contrary, if measured by a properly estimated index or set of indicators, the concept can be used to either prove or disprove the rival claims of those who promote or criticize the development ideal. Although current indices have their limitations, they can distinguish between countries that are developing in objective terms and those that are not, between countries that are developing rapidly and those that are developing slowly, and between countries that have reached a high level of development and those at a lower level.

Sustainable development

The concept of economic development, however, takes no account of the environmental impacts of the activities needed to generate the income upon which it depends. This is because its view of human welfare is restricted to social welfare alone. Sustainable development was initially proposed by IUCN (1980) as a compromise between development and conservation, two goals that were previously regarded as incompatible. It offered the hope that humanity could continue to advance socially and economically, while still conserving the life-support systems provided by the global environment that make an indispensable contribution to human welfare.

Unfortunately, as IUCN did not define exactly what it meant by sustainable development, it was left to the Brundtland Report to fill the gap. This it did, although only the first part of its definition – advocating development that ‘meets the needs of the present without compromising the ability of future generations to meet their own needs’ – subsequently became widely accepted. Without the important qualifying sentences about reducing poverty in developing countries this definition is entirely consistent with the original environmentalist ideal, which aimed to achieve greater inter-generational equity in access to natural resources and environmental services.

While the Brundtland definition was easy to understand, it was too vague to use as a basis for operational monitoring and theoretical study. So academic researchers have tried hard to devise better definitions. By the early 1990s no fewer than 70 attempts had been made to improve upon it (Holmberg and Sandbrook, 1992; Pearce et al, 1989). By the late 1990s this had allegedly risen ‘into the thousands’ (Pezzey, 1997). Some, like Pezzey, have concluded that trying to arrive at a ‘perfect’ definition is therefore a fruitless task. Yet there is much to be said for a simple definition proposed by environmental economists (Pearce, 1991; Solow, 1986) that sustainable development is that which ‘leads to non-declining human welfare over time’. This is equivalent to the first sentence of the Brundtland definition but is more specific and offers greater scope for monitoring sustainable development because it identifies a quantity – human welfare – and a rule for how this should vary over time. Of course, a lot depends upon how human welfare is defined. In this context it is generally assumed to include not only the economic and social dimensions of welfare (the increase in which constitutes economic development) but environmental welfare, too.

What this means, in practice, is that a country, or any other territory, will develop sustainably provided that: (a) any rise in its income today (ie economic growth) is not obtained at the expense of its social welfare today or that of any future generation; and (b) any rise in its income and social welfare today (ie economic development) is not obtained at the expense of its environmental welfare today or that of any future generation. This can be applied to any territory, and even to the world as a whole, if some assumptions are made about the equity of distribution of the social element of human welfare.

Until now a lack of universal agreement over the definition of sustainable development has allowed different interpretations – both as a political ideal and a theoretical concept – to continue. With each passing year, more definitions and interpretations are proposed, and so the notion becomes even more diffuse. However, just as important as achieving a perfect definition is identifying the specific conditions which, linked to a particular definition, can be used to determine whether development is sustainable or not. Two important sets of conditions, derived from theories devised by ecological economists and environmental economists, are reviewed below. The terms ‘sustainable development’ and ‘sustainability’ are often used interchangeably. However, the latter also has a more restricted meaning, as the goal of constraining human impacts on the environment in order to protect life support systems (Bowers, 1997). It is therefore a necessary, but not sufficient, condition for sustainable development (Rao, 2000).

If we now look back at the *political ideal* of sustainable development from the viewpoint of the *theoretical concept* we can see that they are not the same. This is because the ideal as interpreted by developing countries – namely, a call for better

access to world trade and a substantial transfer of resources from developed countries to reduce their poverty – is merely a *strategy* intended to enable them to achieve the earlier ‘development’ ideal. The strategy is a response to what they perceive to be an inherent bias in the structure of the world economic system that prevents their rate of economic development from being as rapid, and their overall level of economic development from rising as much, as they would like. However, there is no need for a new concept to describe this lack of progress. It can be described perfectly well by the concept of economic development.

The theoretical concept of sustainable development, on the other hand, is unique in that it adds to the economic and social dimensions and the notion of intra-generational equity included in the concept of economic development: (a) an environmental dimension; (b) an inter-generational equity element. The latter requires that the judgement of whether a country is or is not developing sustainably must be determined by the quality of its long-term *development path*, with a consistent rate of improvement rather than short spurts of economic growth.

Sustainable development and economic development also differ in another important respect. For a territory to have developed sustainably it must, in principle, have followed an ideal development path since it was first settled by human beings. Given the human propensity for uneven development and environmental degradation, this is practically impossible. Therefore, unlike the process of economic development, which can be achieved at widely differing rates in many countries, the process portrayed in the theoretical concept of sustainable development is a *theoretical ideal* that will probably never be achieved in practice. Attempts to realize either it or the political ideals of sustainable development will also face the same obstacles that currently hamper economic development in developing countries. Nevertheless, countries can still aim to move their actual development path closer to the ideal sustainable development path and thereby increase their *degree of sustainability of development*.

Capital: A Unifying Thread in Development Theories

To show the links between these three concepts of economic growth, economic development and sustainable development it helps to use the notion of ‘Capital’. This has long played a major role in both economic and political economy theories of economic growth and development, and it now features prominently in economic theories of sustainable development.

Capital accumulation as the key to economic growth

‘Capital’, ‘Labour’ and ‘Land’ (or ‘Environmental Resources’) constitute the three scarce factors of production recognized by economists. Their allocation is the basic problem tackled by the discipline of economics. Adam Smith (1776), one of the leading classical economists, identified the accumulation of fixed, or reproducible, Capital (which is embodied in productive machinery) as one of the key factors leading to economic growth, the other being the specialization of Labour.

The concept of capital has, however, become more sophisticated over time as economic understanding has matured. The focus on fixed capital as a factor of production has been retained, although it is now common to regard fixed capital and the circulating – or financial – capital required to purchase it as interchangeable. Meanwhile, conventional fixed capital has been divided into:

- Productive Capital, which refers specifically to industrial machinery;
- Economic Overhead Capital, which is the public infrastructure, such as roads and railways, needed to support economic activity; and
- Social Overhead Capital, which is embodied in the schools, hospitals and other institutions that supply the public goods required for social advancement.

These different dimensions of fixed capital are now also collectively referred to as 'Man-Made Capital' in the sustainable development literature.

An important characteristic of capital is that at any time it has a particular spatial distribution over the surface of the world that is typically uneven, both on a global basis and within individual countries. This reflects preferences regarding the optimum location of capital accumulation, which geographers have used to explain the uneven spatial distribution of economic growth and economic development. Preferential concentrations of capital in some regions have been traditionally linked to innate economic advantages of location and resource endowment. However, the unequal terms on which inter-regional trade is conducted have enabled the most powerful economies to supplement their own indigenous capital by appropriating resources from elsewhere. At the global level this is reflected in the enduring differences between the capital-rich Core of developed countries and the capital-poor Periphery of developing countries, as portrayed in the political economy theories discussed above. In recent decades the magnitude and speed of capital flows around the world have risen to such an extent that the world economy is said to have become increasingly globalized (Dicken, 2003).

Human Capital and economic development

A further step in elaborating the concept of capital was taken in the late 1950s, when the notion of 'Human Capital' was proposed to describe the combination of knowledge, health and skills that contribute to personal productivity (Mincer, 1958; Schultz, 1961). Investing in the accumulation of Human Capital, it was argued, is central to economic development, just as investing in the expansion of fixed capital is the key to economic growth. The importance attached to Human Capital has since increased, not least as a result of the new endogenous growth theory advanced in the 1990s, in which technological innovation – another key factor contributing to modern economic growth – is linked to the accumulation of Human Capital (Romer, 1990).

While the idea of Human Capital was originally confined to the sum of attributes embodied in human individuals, it has since been extended in scope to include the wealth associated with productive social interaction and collaboration. The formal and informal structures through which individuals and groups in society cooperate for mutual benefit also accumulate during development and are essential for a sustained

rise in welfare. These structures are referred to by some authors as Social Capital (Ostrom, 1990), although others assume them to be included in Human Capital.

The capitalization of nature

Economic theories of sustainable development have stressed their continuity with previous development theories by extending the concept of capital to include nature. Natural Capital has two main components: Resource Capital and Environmental Quality. Resource Capital comprises the stocks of all natural resources. It can be divided, in turn, into Renewable Resource Capital and Non-Renewable Resource Capital, which respectively refer to stocks of renewable resources, such as forests and fisheries, and non-renewable resources, such as minerals and oil. Environmental Quality, on the other hand, is related to the condition of the three main environmental sinks: the land; freshwater and marine environments; and the atmosphere. The present quality of these sinks depends upon the characteristics and functioning of the renewable resources in natural ecosystems. Human beings have extensively modified these by exploiting resource stocks and depositing waste into the sinks.

The term Critical Natural Capital was devised to refer to that part of Renewable Resource Capital and its associated environmental services which, through its contribution to the major global cycles, is essential for life support – for example, areas of tropical forest with high biodiversity and carbon stocks (Pearce, 1991). As discussed below, the reason for doing this was to make the environmental economics theory of sustainable development more realistic by recognizing that there are limits to the amount of substitution that is possible between Natural Capital and Man-Made Capital, and to how low stocks of Natural Capital can fall without threatening the functioning of the biosphere.

Portraying the natural environment in terms of Natural Capital was a major step in conceptualizing sustainable development, because it enabled changes in the natural world, such as the depletion of natural resource stocks and environmental pollution that result from human activities, to be directly compared with the changes in human society made possible by the income generated by these activities. This allows a more complete assessment of the net costs and benefits of economic development, something that is not possible with conventional economic models. Indeed, one reason for the widespread depletion of resource stocks and environmental degradation in the world is that there is no obligation to pay the full economic costs associated with such activities: many important environmental features and functions lack values in the market place. On the other hand, ‘capitalizing nature’ is controversial. Indeed, any attempt to assign economic values to environmental features, such as the maintenance of river flows from watersheds or the beauty of a particular landscape, can lead to claims that this demeans nature and promotes its destruction (Pearce, 1991).

Having reviewed these changing conceptions of capital, we now show how economists have used them to construct theoretical explanations of sustainable development.

Economic Theories of Sustainable Development

There are two significant challenges in theorizing about sustainable development. First, deciding how to integrate the economic, social and environmental dimensions of development. Second, ensuring that any theory has practical relevance. These tasks are complicated by the need to achieve internal consistency within a given theory and to treat development as a long-term phenomenon. The two leading theories of sustainable development, devised by ecological economists and environmental economists, use some of the same terms and regard development as a long-term path, but they take different approaches to integrating the three dimensions of development. This has given rise to a number of conditions for determining whether development in a particular territory is sustainable. As environmental economists also use one of the ecological economics conditions this does not promote clarity, but we try to minimize the potential for confusion by identifying the origins of each condition as clearly as possible.

Ecological economics theory

Ecological economics is a new interdisciplinary field of study that aims to remedy the traditional neglect of the environment in economics. To realize this aim it portrays the human economy as a subsystem of the global ecological system (see Figure 1.1). Rather than attempting to integrate environment and society by forcing the former into what some regard as an ‘unnatural’ economic framework, it views the flows of income and materials within an economy as part of the wider transfer of energy and materials within the biosphere. Thus, the long-term viability of human activities is deemed to depend upon how well they comply with the rules governing the biosphere.

The Ideal Condition for sustainable development

At the heart of the ecological economics approach to sustainable development is the relationship between the scale of the human economy and the scale of the biosphere, or ‘natural economy’. If the scale of the human economy grows too large in relation to that of the biosphere, then it will threaten not only its own sustainability but that of the biosphere too. The Ideal Condition for sustainable development is therefore, that the scale of the human economy must not exceed the critical level – equivalent to the ultimate carrying capacity of the planet (Folke et al, 1994) – at which it threatens the sustainability of the biosphere (Daly, 1999). Any development path is compatible with this condition as long as it does not breach this upper limit.

Constant Natural Capital – the Strong Sustainability Condition

The Ideal Condition is, however, difficult to put into practice as there are no reliable estimates of ultimate carrying capacity. Consequently, a ‘minimum safe condition’ for sustainable development has been devised to substitute for it. Known as the Strong Sustainability Condition, it simply requires that there is no decline in Natural Capital. This equates the requirement for non-declining human welfare, advanced by Pearce (1991) in his definition of sustainable development, with one generation passing on to

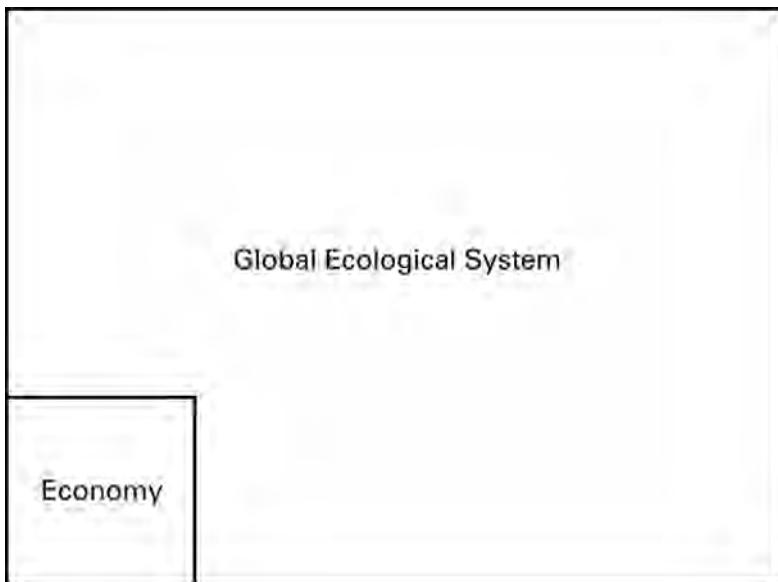


Figure 1.1 The Ecological Economics Model of the relationship between economy and environment

the next the same quantity of Natural Capital that it received from its predecessors. This does not mean that human beings cannot alter nature in any way. Stocks of non-renewable resources may, for example, decline, provided that renewable resources stocks rise to compensate for this. Since ecological economists regard Natural Capital and Human and Man-Made Capital as complements, rather than perfect substitutes, they think it wrong to assume that a fall in Natural Capital can be fully offset by a rise in Human and Man-Made Capital.

The Daly Principles

Daly (1990) proposed a set of operational principles for sustainable development (see Table 1.1). The first repeats the Ideal Condition, which sets an upper limit on the scale of human activity, while the remaining four are strategies for realizing the Strong Sustainability Condition. Daly originally combined the third and fourth principles, but they are separated here for convenience.

The Daly Principles are necessarily a prescriptive approach to sustainable development, outlining a desirable set of strategies. Implementing the last four principles perfectly would move the actual development path of any territory closer to its ideal sustainable path. The second principle points to the role of technological change in allowing the scale of human activity to grow without impacting unduly upon the environment. However, it is rather ambiguous in not stating whether technological innovations are likely to occur inevitably in response to market signals, or whether some form of state intervention is required. Adhering to the last four principles would preclude any further decline in Natural Capital by preventing the depletion of renewable resources and the degradation of environmental sinks, and by off-

Table 1.1 The Daly Principles

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- 1 Limit the human scale to a level which, if not optimal, is at least within the carrying capacity and is, therefore, sustainable.
 - 2 Achieve technological change that increases efficiency and durability while limiting throughput.
 - 3 Preserve the harvesting rate of renewable resources at a level below the regenerative capacity of the environment.
 - 4 Preserve waste emission rates at a level below the assimilative capacity of the environment.
 - 5 Restrict non-renewable resource use to levels equalled by the creation or accessing of renewable substitutes.
-

setting any loss of non-renewable resources with a rise in renewable resource stocks.

The last four principles have been widely adopted as the basis for sustainable development strategies as they can easily be translated into practical actions. They have inspired many national and local initiatives, from increased recycling and renewable energy use to conserve natural resource stocks, to improvements in public transport to cut fossil fuel consumption and air pollution. Yet despite their practicality, the Daly Principles, and the ecological economics model upon which they are based, focus almost exclusively on the environmental aspect of development and neglect its social and economic dimensions and intra-generational equity. This has, ironically, helped to perpetuate sustainable development's isolation from mainstream economic planning. Consequently, the principles have nothing to say about the reduction in poverty and social inequality which is at the heart of economic development. Nor do they give any guidance about how to offset such socio-economic progress against the inevitable environmental impacts that it entails. It is the need to make such trade-offs that will make it difficult in practice to implement the principles perfectly.

Environmental economics theory

Environmental economics theory is more comprehensive than its ecological counterpart as it encompasses and differentiates between all three dimensions of development: the economic, the social and the environmental. It also provides a more descriptive framework for analysis, and uses terminology that is more consistent with the concepts of capital and welfare recognized in existing economic and political economy theories of economic growth and economic development. In contrast to ecological economics, it is based upon a modified neo-classical economic model in which the environment is integrated into the economic system (see Figure 1.2). Development is portrayed as an accumulation of Human and Man-Made Capital at the expense of a reduction in Natural Capital. Development is generally deemed sustainable when a balance is struck between these processes of gain and loss, so that capital stocks do not decline.

Three Constant Capital Conditions

Three principal conditions – the Strong, the Weak and the Very Weak – have been proposed to determine whether a development path is sustainable (see Table 1.2).



Figure 1.2 The Environmental Economics Model of the relationship between economy and environment

Table 1.2 The Constant Capital Conditions

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- 1 Strong: there is no reduction in the total stock of Natural Capital.
 - 2 Weak: there is no reduction in the stock of Critical Natural Capital.
 - 3 Very Weak: the value of depleted Natural Capital does not exceed the value of the rise in Human and Man-Made Capital derived from it.
-

Essentially, the Very Weak and Strong conditions are alternatives to one another, while the Weak condition is used to qualify the Very Weak condition.

The Strong Condition equates sustainable development with inter-generational equity in access to Natural Capital alone. It simply restates the Strong Sustainability Condition of ecological economics and is therefore open to the same criticisms.

The Very Weak Condition, on the other hand, requires each generation to pass on at least as much Total Capital as it received from the preceding generation. Hence, the sustainable development path is portrayed by the trend in Total Capital, ie the sum of Natural, Human and Man-Made Capital, rather than just Natural Capital as in the Strong Condition. This is also referred to in some texts as 'weak sustainability'. The condition derives from the Hartwick-Solow Rule, which was originally devised by resource economists before the notion of sustainable development emerged. This was stated by Solow (1986) as:

A society that invests in reproducible capital the competitive rents on its extraction of exhaustible resources will enjoy a constant consumption stream in time . . . The accumulation of reproducible capital exactly offsets the inevitable and efficient decline in the flow of resource inputs . . . This can be interpreted as saying that an appropriately defined stock of capital, including the initial endowment of resources, is maintained intact. Consumption can be interpreted as the interest on that [stock].

If Total Capital is not to decline, then logically any fall in Natural Capital in the course of development must be at least offset by a rise in Human and Man-Made Capital of equivalent value. This crucially assumes substitutability between the different forms of capital, and that it is justified – and practically feasible – to compare these two changes directly.

One of the weaknesses of the Very Weak Condition is that it does not impose absolute limits on the depletion of Natural Capital. Thus, it would be entirely possible

to deplete Natural Capital totally and still achieve sustainable development, according to this condition, as long as the value of the Natural Capital lost was less than that of the Human and Man-Made Capital gained.

The Weak Condition was introduced by Pearce et al (1989) in response to this criticism, and in recognition of the limits to substitutability between Natural Capital and Human and Man-Made Capital. If the Very Weak and Weak Conditions are applied together, Natural Capital may still be drawn down, but only if it does not reduce the stock of Critical Natural Capital, whose maintenance is, as noted above, crucial to the life-support functions of the biosphere.

Other important limitations remain, however. Natural Capital and Human and Man-Made Capital are assumed to be good substitutes; but clearly there are limits to how far human technology can substitute for the workings of nature. It is not easy, either, to compare changes in Natural Capital and Human and Man-Made Capital directly, given the absence of good data on resource volumes and the difficulties of valuing changes in different forms of capital in equivalent units. Aggregating Human and Man-Made Capital as a single variable is also problematic. It gives no scope to balance change in the economic dimension of development against change in the social dimension. As a result, it ignores the equity of welfare distribution that is central to the concept of economic development.

Reconciling the Political and Theoretical Discourses

Confusion over the meaning of sustainable development is quite understandable. As this chapter has shown, sustainable development is the subject of both political and theoretical interpretations, or discourses. Moreover, each of these major sets of discourses, in turn, consists of a number of competing discourses; in the case of theory, for example, there are the ecological economics and environmental economics discourses. How can these differences be reconciled? We would make five observations.

First, in theoretical discourses sustainable development is essentially a matter of optimizing the balance between the economic, social and environmental dimensions of development. In practice, associated with each of these dimensions is a set of interest groups, broadly representing Capital, Labour and Environment. Each is apparent in different forms – for example, in the case of Capital, individual capitalist entrepreneurs, bankers, corporations or even states that pursue a predominantly capitalist agenda, such as the USA. Therefore, from the point of view of an economist, what should be just a simple mathematical optimization problem for planners becomes distorted in the real world by these political pressures, so that the actual optimum path reflects the balance of power between them. Consequently, none of the discourses of the competing interest groups – even that of the Environment – can ever be regarded as the ‘correct’ one. So a society that did develop sustainably would *never*, virtually by definition, fulfil all of the requirements of the environmentalist discourse, or of the other two competing discourses. This should give those who equate sustainable development with a ‘green society’ pause for thought.

Second, taking these political influences into account, the typical political ideal of sustainable development adopted by developed countries reflects the hypocritical way