

Routledge Perspectives on Development

Series Editor: Tony Binns, *University of Sussex*

The Perspectives on Development series will provide an invaluable, up-to-date and refreshing approach to key development issues for academics and students working in the field of development, in disciplines such as anthropology, economics, geography, international relations, politics and sociology. The series will also be of particular interest to those working in interdisciplinary fields, such as area studies (African, Asian and Latin American Studies), development studies, rural and urban studies, travel and tourism.

Published:

David W. Drakakis-Smith
Third World Cities, Second Edition

Jennifer A. Elliott
An Introduction to Sustainable Development,
Second Edition

Nicola Ansell
Children, Youth and Development

Chris Barrow
*Environmental Management and
Development*

Janet Henshall Momsen
Health and Development

Kenneth Lynch
*Rural-Urban Interaction in the
Developing World*

Katie Willis
Theories of Development

Forthcoming:

Hazel Barrett
Gender and Development

Tony Binns, Peter Illgner and
Etienne Nel
Indigenous Knowledge and Development

Theories and Practices of Development

Katie Willis

2005
 Routledge
Taylor & Francis Group
LONDON AND NEW YORK

6 Environment and development theory

Relationships between population and environment

- Modernization theory and environment
- Socialist development and the natural environment
- Intermediate technology
- Sustainable development
- Poverty and environment
- Ecotourism

Many of the theories and approaches addressed so far in the book have included implicit reference to the natural environment, but in this chapter, the ways in which 'development' and 'environment' have been considered will be at the centre of the discussion. Theories of economic growth are related to questions of resource use and distribution. Many of these resources come from the natural environment and in many cases development processes can lead to the destruction of significant parts of this natural environment.

Thomas Malthus' perspectives on population and resources

One of the earliest elaborations in the Global North of the relationship between people and natural resources was that of Thomas Malthus. In his 1798 *Essay on the Principle of Population* he talked about the effect of rising population on the natural resource base (Malthus 1985 [1798]). While he did not talk specifically about 'development', his arguments are important for later development debates on this topic. According to Malthus, populations and food supply expand in different ways. Food supply increases arithmetically, i.e. with every generation food supply increases the same amount, by, for example, bringing new land into cultivation. This leads to a linear pattern of growth. In contrast, even if the number of children each family has remains the same, the population will grow geometrically because in each generation there will be

more people to have children (see Figure 6.1). As a result of these different growth rates, Malthus argued that the human population was doomed unless limits were put on population growth rates. Eventually, population would outstrip the food supply and there would be massive starvation and famine and so the population would be reduced. For Malthus, therefore, if humans did not control their reproduction, there would be disastrous consequences. In development terms, these ideas (as we shall see later) have been used to shape later development approaches in the Global South.

Malthus' work has been greatly criticized, not least because of his assumptions regarding the growth of food supply. He did not consider the ways in which new technologies may develop to increase food supply at a much greater rate. Boserup (1965) highlighted how new methods and technologies can be developed to address crises such as limited food supplies in response to increasing population densities. Later technological developments, including fertilizers and new forms of seeds have been important in increasing agricultural productivity. However, just because sufficient food is produced to feed a population does not mean that everyone has access to this food. Issues of distribution are also important.

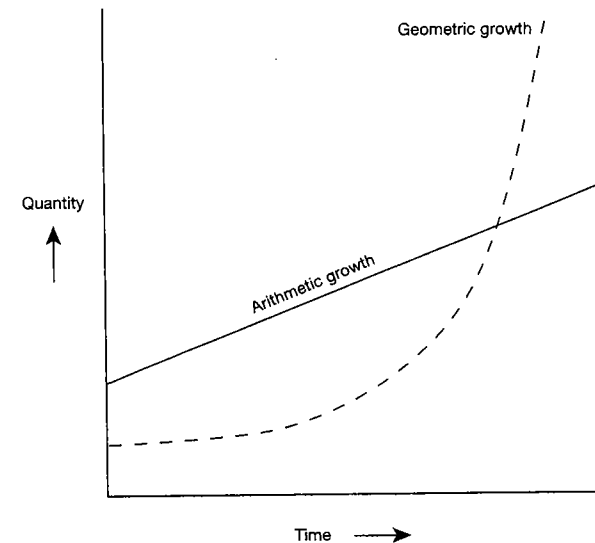


Figure 6.1 Arithmetic and geometric growth.

Environmental determinism

In Malthus' approach, the natural environment acted as an obstacle to population growth. In the environmental determinism approach, the natural environment acts not just as an obstacle, but actually shapes the nature of human society and activity. It is a form of naturalist theory as outlined in Chapter 5. Environmental determinism was popular in the late nineteenth and early twentieth centuries, and stressed the ways in which human behaviour was conditioned or determined by the physical environment.

Following this form of argument, some argued that the differing levels of prosperity, economic development or what some called 'civilization' could be explained with reference to the differences in natural environment (Huntington 1915; Semple 1911). By rooting these explanations in the natural world, some theorists argued that people from the temperate parts of the world were naturally 'better' than those from the tropical zones, and so justified the domination of Europeans over the inhabitants of other places.

As we shall see in the rest of the chapter, there is wide-ranging evidence of the ways in which human behaviour is influenced by the natural environment, but the crude theories adopted by environmental determinists are certainly out of place. They lost favour in the mid-twentieth century, not least because of the ways in which the ideas were used by certain political groups in Europe to justify racial domination. They have also been criticized because they do not consider the role of individuals, communities and governments, among others, to deal with perceived environmental constraints.

Modernization

The modernization approach outlined in Chapter 2 was built on the ideas of mobilizing technology to use resources more efficiently, not least through industrialization and the mechanization of agriculture. The basic attitude to the natural environment was one of seeing natural resources as inputs into a human-devised system. Very little, if any, attention was paid to the potential environmental damage or the long-term sustainability of such an approach.

During the Industrial Revolution in England, the environmental impacts of rapid urbanization and industrialization were clear. For example, in his descriptions of England's northern towns during the 1840s, Fredrich Engels in his book, *The Condition of the Working*

Class in England, describes the results of over-crowding, poverty and unregulated industrial processes:

Bradford, which, but seven miles from Leeds, at the junction of several valleys, lies upon the banks of a small, coal-black, foul-smelling stream. On week-days the town is enveloped in a grey cloud of coal smoke, but on a fine Sunday, it offers a superb picture when viewed from the surrounding heights. Yet within reigns the same filth and discomfort as in Leeds. . . . In the lanes, alleys and courts lie filth and *debris* in heaps; the houses are ruinous, dirty, and miserable.

(1984: 74)

Not only were these 'development' processes affecting the natural environment, they were also indirectly affecting the health of the urban populations.

Modernization and the attempts to use ever increasing areas of land for agriculture have also had severe environmental impacts. The 'Dust Bowl' of the US mid-west in the 1930s is often used as an example of how modern technology was used to push for increased agricultural production in environmentally marginal zones. With the extension of the railways westwards in the mid-nineteenth century (see Chapter 2), large swathes of prairie land were cultivated using horse-drawn ploughs. Drought-resistant varieties of wheat were planted and farmers were able to make significant profits. However, the agricultural processes meant that during periods of drought there was often insufficient vegetation cover to protect the fine soils and high winds eroded large amounts of topsoil creating severe dust storms. With the Great Depression of the 1930s, farmers tried to increase their yields leading to further damage (Barrow 1995). Approximately 80 million hectares of grain-producing land were destroyed (Kassas 1987, in Barrow 1995). This environmental tragedy also contributed to furthering the misery of the farmers, leading many to flee the area seeking their fortunes in other parts of the USA. It did, however, trigger government action to improve policies to reduce soil erosion and help farmers use appropriate techniques.

Despite the known environmental impacts of such approaches to development, similar patterns were encouraged in the Global South; both by donor governments and agencies, and by national governments themselves. The long-term environmental problems were disregarded in favour of the goals of economic growth and development. Top-down large-scale projects such as dam building, mining, industrialization and rapid mechanization of agriculture were

all promoted as suitable routes to development. The approach was very much one of 'grow now, clean up later'. Unfortunately the 'cleaning up' process is often very long and costly, if it is possible at all. Much environmental damage involves the destruction of ecosystems beyond repair (Box 6.1).

'One-quarter of the people in developing countries – 1.3 billion in all – survive on fragile lands, areas that present significant constraints for intensive agriculture' (World Bank 2003b: 59). African populations are particularly affected, with over one third of the total population living on fragile lands (Figure 6.2). Given these figures, a heavy-handed approach to agricultural modernization will lead to rapid environmental degradation and impoverishment of rural populations. Just as in the case of the US Dust Bowl, inappropriate technology has often been used in the name of agricultural progress in the South.

The so-called 'green revolution' of the 1950s and 1960s was a perfect example of modernization approaches to agriculture. The term was used to describe how scientific principles were applied to

Box 6.1

Destruction of mangrove swamps in Thailand

Between 1961 and 1992, the area of mangrove forest in Thailand fell from 2,299,375 rai (approximately 365,000 hectares) to 1,096,168 rai (approximately 174,000 hectares) (Jitsanguan, 1993 in Bello *et al.* 1998: 189). This destruction was due to a number of factors, including factory and household pollution, logging for charcoal and prawn farming.

Prawn farming has increased rapidly, with the number of farms rising from 3,572 in 1980 to 15,072 in 1990 (Thailand Environmental Institute 1997, in Bello *et al.* 1998: 189). However, these numbers are likely to be underestimates given the potential for unlicensed farming. The rise in prawn farming is linked to its high profitability. Mangroves may be cleared for prawn farms, or mangrove ecosystems may be severely affected by the chemicals and antibiotics used in intensive aquaculture. The clearing of mangroves not only destroys that ecosystem, but it leads to increased soil erosion resulting in increased sediment loads being deposited in the marine environment, devastating coral reefs and seagrass forests.

Source: adapted from Bello *et al.* (1998: 187–91)

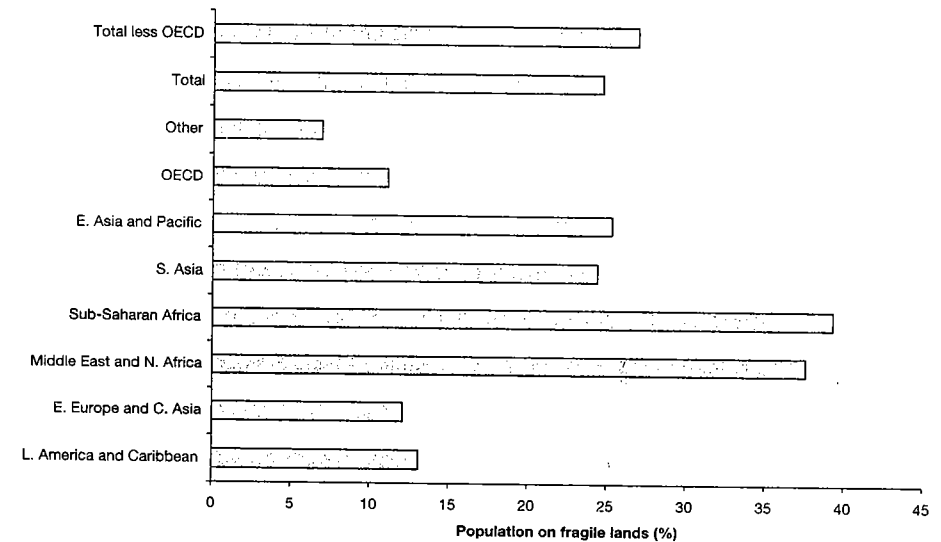


Figure 6.2 Percentage of population living on fragile lands by global region, 2000.

Source: based on data from World Bank (2003b: 61)



Plate 6.1 Temporary road bridge, Ortum, Kenya.



Plate 6.2 Slash and burn agriculture, Sarawak.

agricultural processes to improve yields in the South. It was clearly an attempt to escape from Malthusian limits on food supply. The main elements of the 'revolution' were high-yielding varieties (HYVs) of maize, wheat, rice and barley, as well as developments in fertilizers, herbicides and pesticides. There were some very positive results including India achieving self-sufficiency in wheat by 1980 and Indonesia moving from being a rice importer to a rice exporter. However, environmentally there were problems. These included reductions in genetic diversity, increased demand for water because of irrigation needs and pollution from agrochemicals

(Barrow 1995). In addition, the green revolution resulted in increased inequality as those farmers who could afford to participate reaped the benefits, while others were often forced to abandon their own land and become agricultural labourers. Current debates about genetically-modified crops reflect similar positions. For some, GM crops represent a technical solution to food shortages, while for others, they are an environmental threat and will contribute to the growing dominance of the agro-chemical companies and reduced autonomy for small farmers.

Socialist approaches to the environment

The modernist aims of many communist or socialist governments have also resulted in the implementation of development strategies which are extremely environmentally destructive. The control or taming of nature has often been a key element in the development strategies of centrally-planned economies, with rhetoric regarding the

superiority of such societies being reflected in the domination of nature. According to Marx, development involved human ability to transform nature to increase standards of living. In *Capital*, Marx's perspectives on humans' dominance of nature is reflected in this description: 'He [sic] develops the potentialities slumbering within nature, and subjects the play of its forces to his own sovereign power' (1909: 283).

Some of the largest individual development projects have been implemented within centrally-planned economies. This is partly a reflection of the desire to be seen to be achieving greater infrastructure successes, but also because of the ability of governments in such economies to marshal resources to achieve these aims. The USSR provides us with a number of examples of such mega-projects, the environmental effects of which are still evident today. For example, in the 1950s the Soviet leader Nikita Khrushchev sought to increase agricultural production by bringing new lands into cultivation. The so-called 'Virgin Lands Scheme' was launched with the intention of bringing 250,000 km² of land into wheat cultivation in Northern Kazakhstan and Western Siberia. While cultivation was expanded and production went up, the environmental damage was enormous. Massive areas were exposed to soil erosion leaving vast swathes unusable for any purpose. Soviet attempts to increase cotton production in Central Asia also had disastrous effects, not least on the Aral Sea (Box 6.2).

The environmental impacts of such mega-projects are still on-going and this has not prevented the continued use of such projects in some centrally-planned countries. The most high profile example today is that of the Three Gorges Dam across the Yangtze River in China. Despite significant evidence suggesting the incredible environmental damage that will be done as part of the project, not to mention the social problems arising from the mass relocation of an estimated 1.9 million people, the project progressed. It has not been funded by the World Bank, reflecting some change in multi-lateral agency approaches to such mega-projects (IRN 2003). However, it should also be recognized that electricity generation through hydro-electric power is much cleaner than coal-burning power stations. It is estimated that the new dam will save the annual burning of 50 million tons of coal and the release of 100 million tons of carbon dioxide (Xiong 1998, in Woodhouse 2000: 146).

Box 6.2**The Aral Sea Basin crisis**

Since the early 1960s the Aral Sea in former Soviet Central Asia has been shrinking. In 1960 the average volume of water in the Aral Sea was 1,090 km³, but by 1988 this had declined to 358 km³. By 1993 the volume had declined further and the shrinking had led to the sea splitting in two. The large sea contained 279 km³ while the small sea contained 21 km³. This is having a devastating impact on both the natural and human environments. As water levels fall and the lake bed is exposed, salt and dust are blown into rivers and irrigation systems, leading to increases in pollution and a deterioration in human health. In addition, populations earning a living from the Aral Sea are suffering as it shrinks, leaving fishing boats high and dry. For example, the fishing port of Aralsk now lies 60 km from the shore. In addition, the two smaller seas have increased levels of salinity making them unsuitable for many forms of aquatic life.

The roots of this crisis lie in the Soviet period (see Chapter 3). The Soviet ideology stressed the power of humans over nature and many large-scale environmentally-damaging schemes were adopted to further economic growth. Vast quantities of water were diverted from the Amu Darya and Syr Darya rivers to irrigate cotton. As these rivers were the main source of water for the Aral Sea, this diversion meant far lower inputs into the Aral Sea and a subsequent shrinking. Cotton acreage in Uzbekistan increased from 1.3 million hectares to 2.1 million hectares in the period 1960–80. This increase and improved yields because of irrigation led to rising Soviet cotton yields from 2.2 million tons in 1940 to 9.1 million tons in 1980. Yields in Uzbekistan are now down to 1960 levels because of land degradation and salinity problems with irrigation waters.

With the collapse of the USSR, the problem has not improved. Attempts at coordinating a strategy are limited by the fact that there are now a number of national governments involved. While Kazakhstan, Turkmenistan and Uzbekistan border the Aral Sea, the other Central Asian states of Kyrgyzstan and Tajikistan also need to be involved as the two main rivers run through their territory. Given the importance of agriculture to all these countries, agreement about controlling water use for irrigation will be difficult.

Sources: adapted from Spoor (1998); World Bank (2003b)

Limits to growth

Modernist projects with their focus on technological solutions to perceived limitations of the natural environment was challenged by the increasing environmental movements in many parts of the world during the 1960s. A number of high profile environmental cases in the North, drew attention to the possible environmental problems which could accrue from particular forms of development. For

example, in 1962 Rachel Carson's book *Silent Spring* was highly significant in drawing the attention of a Northern, particularly US audience, to the environmental side effects of certain forms of modernization. Her book dealt with the environmental impacts of the insecticide DDT, in particular the way that it was stored in organisms that ingested it, and so was passed up the food chain in larger and larger quantities, leading to the deaths of mammals and birds.

In addition, in 1972 Meadows *et al.* published *The Limits to Growth* commissioned by the Club of Rome, a non-governmental research organization dealing with 'global problems'. The report placed the relationships between economic growth and the natural environment at the centre of the debate. However, unlike the environmental movement, which stressed the issue of environmental destruction as a problem in its own right, the Club of Rome's focus was much more on how current development methods would lead to catastrophe for the human population in terms of both rapid declining populations (as predicted by Malthus) and huge decreases in rates of industrial growth. Meadows *et al.* stated 'we can thus say with some confidence that, under the assumption of no major change in the present system, population and industrial growth will certainly stop within the next century, at the latest' (1972: 126).

The basis for these doom-laden predications, were the results of a complex systems model which looked at five main processes: population growth, non-renewable resource use, pollution, food supply and industrialization. The relationships between these different factors and the current and predicted levels were also included in the model. By running the model with changes in the levels of the different factors, estimates could be made of when the 'limits to growth' would be reached (see Figure 6.3). The authors stressed that while the predicted levels may not be completely accurate, the overall trends were correct. These predictions about future catastrophe led these researchers and others with similar views to be categorized as 'neo-Malthusian'.

As we saw above, Malthus has been criticized for not considering the ways in which technological advances could increase the food supply. Meadows *et al.* ran their model to include a range of technological advances, such as improved mining techniques to increase access to minerals, but they still came to the same conclusion – if current rates of consumption and economic development continued, disaster would strike before 2100. The

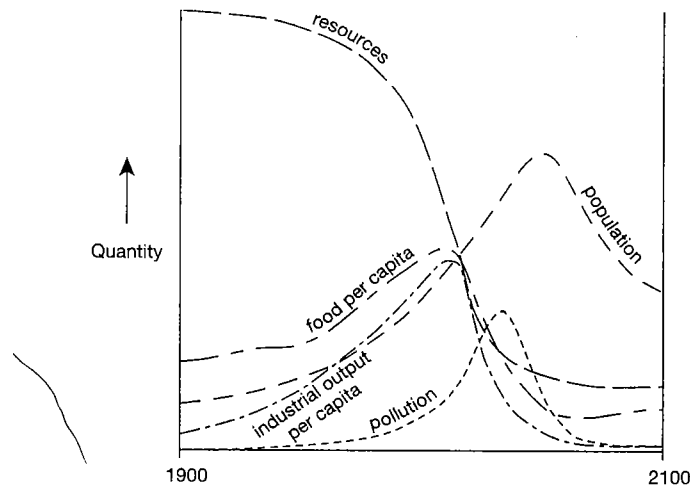


Figure 6.3 Limits to growth model.

Source: adapted from Meadows *et al.* (1972: 124)

model does not include the social dimensions of life because they are so complicated and difficult to assess. The authors are very explicit about their exclusion of these factors, but do state that decisions about income distribution, for example, could have significant impacts on when the 'limits' would be reached. In their final chapter, they state that it is crucial that decisions are made immediately about the trade-offs needed to achieve global equilibrium, i.e. not to reach the limits to growth. They state,

As soon as society recognizes that it cannot maximize everything for everyone, it must begin to make choices. Should there be more people or more wealth, more wilderness or more automobiles, more food for the poor or more services for the rich? Establishing the societal answer to questions like these and translating those answers into policy is the essence of the political process.

(1972: 181–2)

In the concluding commentary from the Club of Rome executive, they state that it is crucial for the 'developed countries' to take a lead in this process as they are the major users of resources. Rather than stopping development in the South, resource use must be cut back in the North and attempts must be made to promote more effective and sustainable development throughout the world.

The Club of Rome report is, therefore, adopting a view of development which places economic growth at the heart of the process in terms of helping to improve poorer peoples' standards of living. However, the nature and rate of this growth must be controlled, so as to ensure that future generations have access to non-renewable energy sources, minerals and agricultural land, as well as a non-polluted environment. They do not make any specific suggestions as to the nature of policies which should be introduced, although they clearly do not suggest leaving this to market forces. Governments throughout the world are considered key in implementing policies to help reduce birth rates, conserve non-renewable resources and control pollution.

Intermediate technology

The concept of intermediate technology was developed by E.F. Schumacher and is outlined in his book *Small is Beautiful*. The subtitle to the book is *A Study of Economics as if People Mattered* and demonstrates what he felt the focus of economics should be. Rather than concentrating on maximizing flows of money and economic growth, Schumacher argued that economic policies everywhere in the world, should be people-centred (see also Chapter 4). This was not only to allow individuals to be creative and experience the full range of what it was to be human, rather than merely a cog in a large economic machine, it was also in recognition of the environmental destruction that was occurring through the use of existing economic approaches. This environmental destruction was not only in terms of resource depletion, in particular the use of energy reserves, but it would also lead to the reduced carrying capacity of the world, i.e. the maximum number of people who could be supported using the world's natural resources.

For Schumacher the answer was not to return to a pre-industrial, 'primitive' stage; rather it was to implement policies which were appropriate to the needs of particular groups of people. In countries where there were large numbers of people without formal employment, Schumacher stated that it was bad practice to implement policies using high-tech equipment which could do the work of hundreds of people. Such an approach would result in a dual economy with the majority of the population scraping a living, while a few gained from being part of the modern capitalist economy. In contrast, Schumacher stressed the use of technology that would employ large numbers of people in productive activities, particularly

in rural areas. This form of technology he termed 'intermediate technology' to highlight its position between the 'primitive' forms of tools used in the past and the very advanced high-technology equipment that had been introduced into many parts of the South in the process of development (Box 6.3).

Sustainable development

Many of the debates outlined so far in this chapter became subsumed under what has become known as 'sustainable development'. During the 1960s and 1970s the environmental impacts of various development processes were increasingly recognized by a range of groups. In 1983 the United Nations set up an independent organization called The World Commission on Environment and Development (WCED) chaired by the then Prime Minister of Norway, Gro Harlem Brundtland. The aim of the WCED was to examine the problems of environment and development facing the world and to consider possible solutions. These solutions should be considered not just for current generations, but with an awareness of long-term issues.

Box 6.3

Rainwater harvesting: the Sri Lankan pumpkin tank

Collecting rainwater can provide an important source of water for drinking, domestic use or agriculture in areas where other sources are either unavailable or too expensive for poorer families. The pumpkin tank system is named after the shape of the water tank and is based on a tank with a capacity of about 5m³. Rainwater is gathered off pitched roofs using guttering which then drains into the tank. The cost of the guttering is about US\$140 and the tank itself, which is made out of cement moulded around a metal frame, costs about US\$125. Technical assistance and the materials are provided by the Community and Water Supply and Sanitation Programme.

For one family, the Abikon family, who live in Demeteralhina in Badulla District, Central Sri Lanka, having a pumpkin tank has meant they can increase their water consumption because family members no longer have to walk to the spring about a kilometre away from their home. Increased water supplies mean they can look after their cows better and maintain hygiene standards.

Source: adapted from ITDG (2003)

In 1987 the WCED published its findings in a report entitled *Our Common Future* (although it is also known as *The Brundtland Report* after the WCED Chair). The Report laid out the environmental challenges facing the world, and examined how environmental destruction would limit forms of economic growth, but also how poverty and disadvantage contribute to environmental destruction. The Report stressed the importance of 'sustainable development' as a goal towards which the international community should work. According to the WCED, 'sustainable development' is: 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED 1987: 43).

Building on this environmental focus, the United Nations held an international conference in Rio in 1992 to consider ways in which sustainable development could be achieved. 'Sustainable development' has become a key element in development theorizing and policy-making, for example the 2003 *World Development Report* is entitled *Sustainable Development in a Dynamic World: Transforming Institutions, Growth and Quality of Life* (World Bank

2003b). However, the term's meanings are highly debated. As Jenny Elliott (1999: 6) argues, 'the attractiveness (and 'the dangers') of the concept of sustainable development may lie precisely in the varied ways in which it can be interpreted and used to support a whole range of interests and causes.'

A broad distinction can be made between 'light green' or 'technocentric' approaches to the relationship between humans and nature, and 'dark green' or 'ecocentric' approaches, although the boundaries between the two are certainly not clearly defined (O'Riordan 1981; Pepper 1996). In technocratic approaches the focus is on humankind and the



Plate 6.3 Community tree nursery, Marich, NW Kenya.

improvements in human standards of living and quality of life. In general, these approaches do not involve radical changes in the current economic and political systems, rather a technical approach is adopted. This may be in the form of improved industrial or energy-generating systems which reduce pollution for example. Other technocratic solutions would include changing resource management procedures, for example by using market mechanisms to regulate human-induced environmental problems (see below).

In contrast, dark green or ecocentric approaches start with the premise that it is the Earth which is much more important than ideas about human progress and rapid economic growth. Because of this, the approaches are much more radical and call for massive shifts in the economic and political structures. In particular, there is a focus on much smaller-scale, local forms of organization similar to Schumacher's ideas of 'small is beautiful'. For economically richer countries and groups, the ecocentric approach would involve a huge reduction in consumption.

Global governance and environmental protection

Many environmental problems are not restricted within national borders. For example, the source of water and air pollution can be in one country, but the effects can be experienced elsewhere. Recognition of how global climatic systems work has also highlighted how actions in one place have potentially very serious effects on millions of people throughout the world (Barrow 1995; Middleton 1995).

The production of carbon dioxide as part of fuel burning has been implicated in the process of human-induced global warming. When fossil fuels, such as coal or oil burn, they release carbon dioxide, which then forms a layer in the Earth's atmosphere, which prevents heat radiated from the earth from escaping. This has been termed the 'greenhouse effect', because it results in the earth's atmosphere becoming warmer and warmer. While this process can have beneficial results in particular locations, for example by producing climatic conditions conducive to growing particular crops, overall the greenhouse effect is regarded as having negative consequences because of its association with sea-level rise and potential increases in desertification (Barrow 1995; Middleton 1995). Other greenhouse gases such as methane and nitrous oxide, while naturally occurring, are also being emitted in greater quantities because of industrialization, agricultural intensification and urbanization.

Because of the global nature of many environmental problems, attempts have been made to organize responses on a global scale. The idea of 'global governance' has been used to describe political decision-making at a global level. This is not global 'government' in the sense of an elected body that represents the citizens of the world, but rather the way in which political power is exercised at this scale. Organizations such as the UN can be described as 'global governance organizations', consisting of nation-state representatives (see Chapter 7 for further discussion).

In terms of global governance and environmental protection, the 1972 UN Conference on the Human Environment in Stockholm is often held up as a key moment and in the following year the UN Environment Program (UNEP) was established (Barrow 1995). Since then there have been numerous attempts to produce global agreements on issues around pollution, whaling and biodiversity among others. The *Brundtland Report* and the 1992 Rio Conference brought these issues to even greater public attention and also highlighted the potential conflicts between North and South regarding the environmental agenda. For many Southern nations, the concept of controls on economic growth because of environmental concerns was interpreted as a way of limiting development progress in the South by denying access to methods that were used by Northern countries in their industrialization processes.

When the global distribution of greenhouse gas emissions is examined, it is clear that emissions are disproportionately concentrated in the industrialized nations of Western Europe and North America (Table 6.1). For example, while the USA makes up only 4.7 per cent of the world's population, it contributes 22.5 per cent of carbon dioxide emissions (UNDP 2002). Attempts to control future emissions need to recognize these distribution patterns, in particular the importance of giving industrializing countries the opportunities to engage in some forms of industrial development, without 'excessive' environmental damage.

The 1997 Kyoto Protocol was an international agreement to restrict future greenhouse emissions. However, while the agreement has been followed in some countries, ratification of the Protocol remains limited despite a number of follow-up meetings which have tried to clarify the mechanisms for implementing the proposal (Rowlands 2001; UNDP 2002: Table 19). The problems with Kyoto should not, however, hide the fact that international agreements on environmental protection can be successfully implemented. For

Table 6.1 Energy consumption and carbon dioxide emissions by region

	Electricity consumption Kilowatt-hours p.c.		Carbon dioxide emissions		
	1980	2000	Metric tons p.c.	Share of world total %	1999
<i>Developing countries</i>	316	810	1.3	1.9	36.6
Least developed countries	59	77	0.1	0.2	0.5
Arab States	489	1,406	2.8	3.7	4.0
East Asia and Pacific	253	918	1.4	2.3	17.9
Latin America and Caribbean	845	1,528	2.4	2.5	5.4
South Asia	132	376	0.6	1.1	6.4
Sub-Saharan Africa	463	457	1.0	0.8	2.0
<i>Central and Eastern Europe and CIS</i>	–	2,977	–	7.2	12.5
<i>OECD</i>	4,916	7,336	11.0	10.8	51.0
High-income OECD	5,932	8,688	12.6	12.3	46.4
High income	5,873	8,651	12.6	12.4	48.2
Middle income	583	1,391	2.3	3.2	35.9
Low income	106	352	0.4	1.0	10.3
World	1,444	2,156	4.3	3.8	100.0

Source: adapted from UNDP (2003: Table 19, pp. 300–3)

example, the 1987 Montreal Protocol led to reductions in the manufacture and use of chlorofluorocarbons (CFCs), which were implicated in the development of holes in the ozone layer that protects the Earth's surface from particular forms of ultra-violet radiation (Barrow 1995).

Pricing the earth

Despite the overall acceptance that the natural environment needs to be considered as part of development policies, the section on sustainable development shows us that there are very different ways in which sustainable development is conceived. This is reflected in the range of policy suggestions. Given the problems with implementing radical 'ecocentric' approaches, it is not surprising that governments throughout the world have focused on technocratic solutions to perceived environmental problems.

Within a free market system, environmental controls may be regarded as limits to free trade, or provide too great a brake on potential economic growth. This does not mean that controls or restrictions are not applied as in the case of CFCs and the Montreal Protocol. For example, there are international agreements on the trade in hardwoods and endangered species because of the recognition that allowing free trade in these goods would result in reduced biodiversity and other potentially damaging environmental impacts. In practice, while these restrictions work to some extent, there are still significant examples of these rules being flouted (Box 6.4). In some cases, the rule-breakers are individuals who operate without the knowledge of the law enforcement authorities, but in others, rule breaking may be ignored by the authorities, who see the need for foreign currency as being much more important than the environmental protection agenda.

Box 6.4

Logging in Cambodia

Cambodia is one of the world's poorest countries, with a GNP p.c. figure of US\$270 in 2001 (World Bank 2003b). In the 1990s as part of an attempt to generate income, the Cambodian government granted large numbers of logging concessions. Unfortunately this led to widespread deforestation and disaster for villagers who used to earn a living from tapping trees for resin.

Because of these problems some of the concessions were cancelled and increasing restrictions were placed on logging. This was part of a World Bank sponsored project which aimed to improve forest management. Despite the change in regulations, logging continued unabated, so the Cambodian government suspended all logging concessions. Because there were worries about the implementation of this ban on logging, donors, including the World Bank, insisted that an independent organization should monitor the situation. The Global Witness organization was selected and found widespread evidence of the flouting of the anti-logging rules. As a result of their findings, the organization was asked to leave Cambodia.

Further World Bank funding is being withheld until the situation is resolved, but legal loopholes mean that by reclassifying forest areas as plantation land, logging can still continue.

Source: adapted from *The Economist* (2003a)

Another approach to environmental protection within a free market model is the attempt to put a price on nature, or on environmental destruction, so creating a market for these goods. While the US government under Bill Clinton signed up to the Kyoto Protocol, the administration of George W. Bush has since declared that it will not be bound by the limits placed on US industry. This demonstrates the difficulties of accommodating national interests and global interests. However, the Bush Administration has also suggested an alternative to domestic limits in emissions. If the intention of the Kyoto Protocol was to limit future greenhouse gas emissions at a global level, then as long as the overall total emissions do not go above a set limit then the overall environmental damage will be limited. The proposed solution puts a price on carbon emissions and suggests a trade in emissions. This is a variation on the Clean Development Mechanism (CDM) process incorporated within the Kyoto Protocol (Box 6.5).

Box 6.5

Clean Development Mechanism of the Kyoto Protocol

As many forms of atmospheric pollution are regarded as 'global' problems, targets for emissions reduction could be set for the globe as a whole. Within the Kyoto Protocol, there is a proposed system which could operate along these lines called the 'Clean Development Mechanism' (CDM). The overall aim of this scheme is to help reduce greenhouse gas emissions on a global scale, but to allow Southern countries to 'develop'.

The Kyoto Protocol is based on setting targets for national emission reductions. Under the CDM it would be possible for national governments to meet their targets by reducing emissions in Southern countries. This would be through providing technological assistance in energy generation, for example. There is ~~great debate~~ about what level of national emissions reduction could actually be met by reduction elsewhere. Australia, Canada and the USA are among the countries arguing that there should be no limit, i.e. a country's total reduction target could be met by providing assistance to Southern countries to reduce their emissions. European countries tend to support a limit. There are also concerns that Northern assistance would be concentrated in a few countries, most notably India and China, leaving the majority of Southern countries having to meet their reduction targets without foreign help. The transfer of technology could also replicate current patterns of foreign direct investment and profit repatriation.

Sources: adapted from CDM Watch (2004); Rowlands (2001); Yin and Pearson (n.d.)

Placing an economic value on nature has also been used in an attempt to reduce debt burdens. The so-called 'debt-for-nature' swaps became popular in the late 1980s/early 1990s and were presented as a win-win scenario. Under debt-for-nature swaps, organizations would take on responsibility for a portion of a country's debt in return for agreement that a particular piece of land would remain 'undeveloped'. For example, in 1987 the environmental organization Conservation International paid \$100,000 to private banks for \$650,000 of Bolivian debt. While the banks clearly did not receive the full amount owed, given the prospect of having to wait for many years until the Bolivian government was in a position to pay the money back, the reduced payment was accepted. Conservation International then forgave the debt, i.e. said that the Bolivian government did not have to pay them as the new 'owners' of the debt. However, in return for this forgiveness the Bolivian government had to agree to fund a biosphere reserve (Murray 1991, in Elliott 1999: 88). While these schemes may have important local effects in both economic and environmental terms, they can be criticized for a number of reasons. For example, the amounts of debt involved are minute compared to the overall debt burden (see Chapter 2), and once the swap has taken place the longer-term financing of the environmental project is not guaranteed (Barrow 1995: 292).

Poverty and environment

The relationship between poverty and the environment is a complex one, but it is clear that there are some connections. Poor people are often forced to live in environmentally-fragile or degraded areas. In cities, these locations may include unstable hillsides, areas prone to flooding and pollution, as well as lacking basic infrastructure such as drinking water. These poor environmental conditions may lead to health problems, such as respiratory diseases or water-borne infections, which in turn can affect individuals' ability to earn a living, so exacerbating their economic and social vulnerability. In addition, people living in poverty can often not afford to improve their local environment and in many cases may be forced to contribute to environmental degradation through, for example, using local forest resources for building materials and fuel (McGranahan 1993) (Box 6.6).

Box 6.6***Household environmental conditions in Hanoi***

The district of Phuc Tan is a squatter settlement on the banks of the Red River in Hanoi. Many of the residents are migrants who have come to the city from rural Vietnam because of economic problems. The economic reforms, called *doi-moi* aim to improve Vietnam's economic position by opening up the economy to foreign investment and increasing the role of the market after about 30 years of communist rule. However, these policies have meant great impoverishment for large numbers of Vietnamese.

Because of its location, Phuc Tan regularly floods, leaving residents living in damp and very unhealthy conditions. The district does not have connection to the electricity grid, meaning residents have to cook using other fuels. The most popular fuel is kerosene, which gives off noxious fumes, but other popular fuels are charcoal and wood. The lack of a sanitation system means human waste is collected in buckets and then thrown into the river. The river is also used as a dump for household waste as the city refuse collection system does not extend to this area. Some residents can afford to buy water, but those that cannot are forced to use polluted water from the river or local wells.

Source: adapted from Kilgour (2000)

These inter-connections demonstrate that environmental protection measures are about more than just the natural environment; rather, attempts at sustainable development need to be placed within the much wider context of poverty alleviation, meaningful community participation in decision-making and a recognition of the importance of social and cultural contexts (Elliott 1999; WCED 1987). These complex relationships were clearly highlighted by David Drakakis-Smith in his discussions of sustainable urban development (1995, 1996, 1997). He claimed that for sustainable urban development to be achieved five areas of urban life need to be addressed: as well as the environmental aspects, demographic, social, economic and political dimensions need to be considered.

McGranahan *et al.* (1999) stress, however, that when considering the relationships between poverty and environmental destruction, it is important to recognize the scale of the environmental issue concerned. Global warming is a problem at a global scale, although

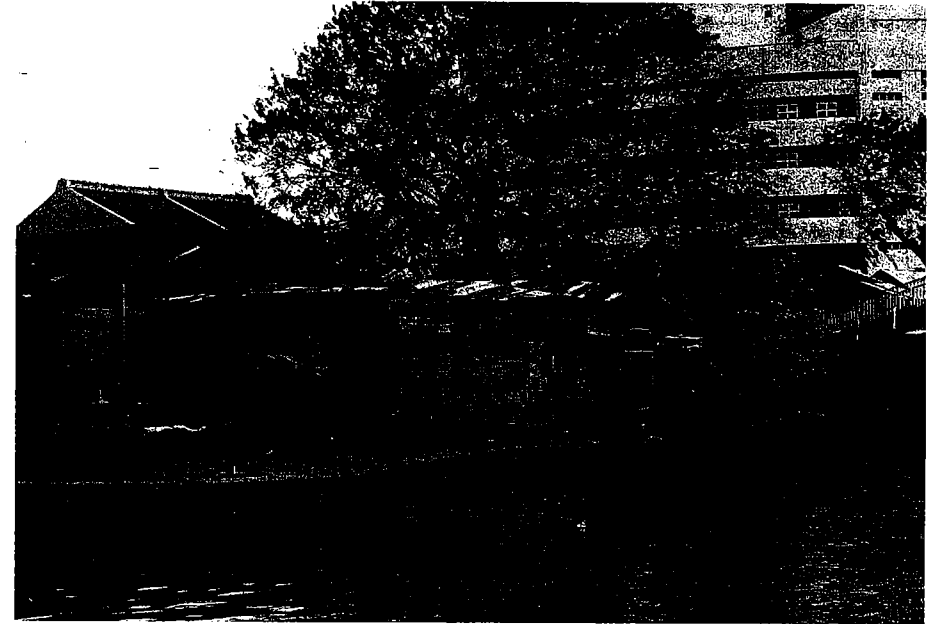


Plate 6.4 Squatter housing, Melaka, Malaysia.

of course certain locations and populations will be more directly affected than others. In contrast, poor quality water and sanitation problems are problems throughout the world, but their impacts are felt locally. In relation to debates about urban environmental problems and sustainable cities, the general patterns are:

The urban environmental hazards causing the most ill health are those found in poor homes, neighbourhoods and workplaces, principally located in the South.

The most extreme examples of city-level environmental distress are found in and around middle-income mega-cities and the industrial cities of the formerly planned economies.

The largest contributors to global environmental problems are the affluent, living preponderantly in the urban areas of the North.

(McGranahan *et al.* 1999: 109)

Because of this, approaches to sustainable development will differ depending on the nature of national and local economies and societies, and political priorities.

Ecotourism

Tourism represents one of the fastest growing economic sectors in the world and can provide significant income for many Southern nations. However, tourism is also associated with severe environmental destruction as unregulated infrastructure development takes place and an area's population increases much faster than the services, such as sewage systems and local water supplies, can cope with (Simon 1997). In addition, large numbers of visitors in environmentally-sensitive areas such as mountain regions can lead to soil degradation, pollution and the disruption of local ecosystems.

The sustainable development agenda has led to attempts to make tourism development more environmentally friendly and this has led to the phenomenon of 'ecotourism'. Sustainable tourism in its broadest sense encompasses more than environmental protection (see discussion of indigenous tourism in Chapter 5) (Hall and Lew 1998). As with 'sustainable development', 'ecotourism' can cover a multitude of activities. It may be used to refer to tourism to areas of outstanding natural beauty or interest. In other words, the 'eco' refers not to the way in which the tourism is being organized, but the purpose of the visit such as wildlife-watching. However, even within 'ecotourist' projects that are set up to reduce the environmental impact of the activities, there are wide variations. Requiring little adaptation to the 'traditional' form of mass tourism, hotels increasingly give guests the opportunity to reduce water and energy use and pollution from detergents by using towels for more than one day. As Butler (1998) argues, while this does have a small environmental impact, it also helps public relations, but it does nothing to deal with larger sustainability issues.

'Ecotourism' projects which really get to grips with the concept of minimizing the environmental impacts of tourism need to look at limiting numbers to control pressure on resources, what form of accommodation is provided and where it is located, and the sourcing of building materials, food and other inputs. Making the tourism experience more expensive can be a way of limiting the number of visitors and can also create a fund which can be used for local environmental projects. However, such schemes do not always result in the desired outcomes in environmental terms (Box 6.7). Once projects grow beyond a very small scale, it is almost impossible to prevent environmental impacts. The question is how much environmental damage is allowable in the quest for tourist income?

Box 6.7

Ecotourism in Nepal

Every year thousands of tourists travel to Nepal attracted by the potential for mountain trekking. In 1993, 300,000 tourists visited the country, with about a quarter coming to participate in trekking activities. In an attempt to protect the natural environment, while also allowing for an important source of income for economic and social development, the Annapurna Conservation Area Project was set up in 1986. This Project includes charging tourists trekking in the area, involving local people in decision-making and ensuring that tourist development does not lead to environmental destruction.

In the mid-1990s this scheme generated over US\$1 million a year in trekkers' fees. In addition, expenditure during visits contributes to the Nepalese economy. There are clear differences between those trekkers who travel independently and those who are part of an organized group. Group participants spend more overall, but often this is spent outside the ACAP area by the agencies which are coordinating the trek.

A survey conducted by Pobocik and Butalla found that many villagers benefited economically from the trekking trade. This was either directly through providing accommodation, food or portering services, or indirectly from the increase in money coming into the area. However, disadvantages identified included potential threats to local culture and issues of deforestation. The increased use of fuelwood because of the numbers of trekkers has led to more rapid deforestation and the need to travel further for fuelwood. Wood has also been used for the construction of lodges and teahouses.

In social terms, the ways in which local people, particularly porters, are treated by trekking groups has caused concern, with accidents and illness being much more common among the porters than the trekkers. This is a reflection of the weight they have to carry and also the conditions in which they work.

Sources: adapted from KMTNC (2003); Pobocik and Butalla (1998); Tourism Concern (2003)

Local production for local markets

An alternative approach to sustainable development is to focus much more on local-level activities. Rather than expending energy on transporting large amounts of goods, in particular agricultural products, around the world, for some theorists, a more locally-based self-sufficiency approach is advocated as being much more

environmentally friendly. This approach clearly goes against ideas of comparative advantage and the need for specialism in production and trade to allow for greater efficiency in production. The comparative advantage arguments do not, however, consider other factors such as environmental destruction.

For many producers in the Global South, the drive is to break out of the limitations of local markets to sell products on a national or international stage. Patterns in some parts of the North, however, have moved towards more local consumption. This may not be purely to reduce the environmental impacts of transportation, but they are an important part.

A good example of such an approach is the increase in farmers' markets in parts of Western Europe and North America. While local produce markets have been very important in some parts of Western Europe, in the UK for example, consumers have often been unable to buy locally-produced goods. Instead, they purchase foodstuffs from the local supermarket, which have often been imported from all over the world (Goodman and Watts 1997). Farmers' markets are set up to allow local producers to sell their produce directly to the public, rather than through large supermarket chains. Consumers may choose to purchase fruit, vegetables, meat, bread, cheese and other products from these markets for a range of reasons. They may want to support local producers; rather than the share-holders of large supermarket chains; they may feel that the quality of the food is better, particularly as they can ask questions about production processes. Finally, a local focus may be regarded as reducing harmful environmental impacts caused by what could be interpreted as unnecessary transportation of goods thousands of miles (Holloway and Kneafsey 2000).

While such reasons are clearly important and have a solid environmental grounding, this 'retreat' to more local production and consumption could have harmful effects on producers elsewhere in the world, particularly in poorer countries (although see localization section in Chapter 7). If these poorer countries have adopted outward-oriented trade-focused development policies to increase economic wealth and contribute to improvements in standards of living, what would happen if their overseas markets shrank? Currently farmers' markets and similar locally-oriented forms of trade are limited and there are no signs that such approaches will have a serious impact on world trade patterns. However, this is a small-scale example of some of the complex debates around the scale

of development. These will be considered further in the next chapter, which deals with how the processes that have been termed 'globalization' have affected the ways in which development has been conceived and policies adopted.

Summary

- All development theories include reference to the natural environment.
- Many development approaches have used the natural environment as a source of wealth.
- There are limits to the natural environment, but these can vary spatially and temporally.
- Sustainable development has become a key element of many development policies, but meanings can vary widely.
- There is a relationship between poverty and environmental destruction, but the link is not always clear.

Discussion questions

- 1 What were Malthus' arguments about the relationship between human populations and the natural environment and why have they been criticized?
- 2 Given the debate about the definitions of 'sustainable development', is it still worth using the term?
- 3 How can market-led approaches be used to protect the natural environment?
- 4 Why is local production regarded as a solution to many environmental problems?
- 5 Can global-level agreements about the environment ever work in practice?

Further reading

- Barrow, C.J. (1995) *Developing the Environment: Problems and Management*, Harlow: Longman. Clearly-written book covering environmental processes, how human activities are affecting the natural environment and how the natural world can be managed.

172 • Environment and development theory

Drakakis-Smith, D. (1995) 'Third World cities: sustainable urban development I', *Urban Studies* 32 (4-5): 659-77. A useful introduction to debates about sustainability in cities.

Elliott, J. (1999) *An Introduction to Sustainable Development*, 2nd edition, London: Routledge. An excellent introduction to sustainable development debates in the Global South.

World Commission on Environment and Development (1987) *Our Common Future*, Oxford: OUP. The report of the Brundtland Commission that informed policy-making about sustainable development.

Useful websites

www.irn.org International Rivers Network. Works with local communities around the world to campaign for sustainable water and energy supplies, as well as flood management. Much of their work deals with campaigning against the construction of large dams.

www.itdg.org Intermediate Technology Development Group. Founded by E.M. Schumacher the organization works with poor communities in the South to find appropriate technologies to meet their needs. The website includes many examples of small-scale technological approaches which have had an enormous benefit.

www.tourismconcern.org.uk Tourism Concern. British-based organization which campaigns for ethical, fair trade tourism. There is a strong environmental focus in their work.

www.unchs.org/scp United Nations Centre for Human Settlements Sustainable Cities Programme.