

Environmental problems in an international context

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1.1 Introduction

Why are environmental problems international problems? Just a few decades ago, this question would not have been asked. Therefore why should we be asking it now? Before we can answer these questions, however, we need to have some idea of what 'environmental problems' actually are.

Given the huge number of environmental problems and their disparity, it is no easy matter to identify their characteristic features. The definition which we shall be using in this introductory chapter is a simple one, and we shall be elaborating on it in the next chapter. For the present, we shall consider environmental problems as constituting *those instances in which people's behaviour affects their physical environment in such a way as to place their own health, other people's health, the built environment or natural systems in jeopardy*. This is the case, for example, where pollution occurs, where natural resources are exhausted, and where natural features are damaged. Environmental problems are both physical and social problems. Although one can almost always point to certain scientific data as underlying the definition of environmental problems, it is not possible to see them solely in 'objective' (scientific) terms. The scientific data in question need to be qualified in the context of social norms and values. As we shall see later on (Chapters 3 and 4), both the definition of environmental problems and the ways and means of solving them are the subject of political debate involving large numbers of organised lobbies. All this means that any study of environmental problems has got to include their social context and the conflicts taking place within it.

Even many centuries ago, conditions occurred which, by modern standards, would be classified as environmental problems. One such example can be found in ancient Mesopotamia, where large-scale irrigation led to the salinisation of fertile agricultural land. This was one of the factors which ultimately brought about the decline of the Mesopotamian civilisation. In medieval times, too, many people living in towns and

cities suffered greatly as a result of widespread smoke pollution and contaminated water supplies. Similarly, the Industrial Revolution, which started at the turn of the 19th century, had a dramatic effect on the quality of the physical environment, not only in terms of public health, but also of the disappearance of all sorts of age-old natural features. Again, the extinction of animal and plant species as a consequence of human behaviour is by no means a modern phenomenon.

In all these instances of environmental problems, certain changes took place in the physical environment which were either difficult or impossible to reverse. At a local and regional level, people nonetheless consistently managed to find a means of survival. In fact, the evolution of the human race could be described as a trend towards increasing control of natural systems and the constant improvement of the conditions on which life is dependent. It was not, in fact, until fairly recently that people began to acknowledge the presence of a new, modern, global environmental threat.

For a long time, the natural environment was treated as a boundless resource. Since the 1960s, however, the bottom of the well has gradually been coming into view. It is now clear that the increasing exploitation of the natural systems (in terms of both output and input, as well as the structural changes which are caused in the process) is undermining their capacity for use both now and in the future. Indeed, it seems increasingly likely that humanity is sowing the seeds of its own destruction, in some cases as a result of its material prosperity, and in other cases as a result of its poverty. In other words, we are seeing the emergence both of environmental problems which are associated with a high standard of living, and of those which are caused by its very absence. The interrelationships between environmental problems occurring in different areas are also becoming more and more evident.

A new perspective is emerging in which environmental problems can be seen in the light of worldwide ecological relationships. In this chapter this new perspective is discussed in relation to the concept of *interdependency*. Three types of interdependency have been identified for this purpose: *ecological, economic and political*. These interdependencies are interrelated but they are also closely connected with economic factors which create the problems and hamper their elimination. In order to solve the environmental problems, changes are needed in the political decision-making process.

In order to gain a clear insight into current and possible future environmental problems, we shall focus on each of these interdependencies in turn showing how they have changed in the course of time. We shall also discuss a fourth aspect, the role of technology which can be seen as both cause and solution for environmental problems.

1.2 Ecological interdependencies

Today's environmental problems are no longer incidental difficulties which can be resolved by means of ad hoc solutions. Our readiness to accept this as a fact of life has been largely due to the broadening of our scientific knowledge of the causes of human behaviour and its effect on natural systems. Our knowledge has improved in two respects.

In the first place, at the time when the environment first became an 'issue', we did not know much about it. Whilst knowledge is clearly relative and, as we shall see in

later chapters, our knowledge of many contemporary environmental problems is still clouded in uncertainty, what was known about the environment in the old days was empirical knowledge gained from experience. Today, however, we are increasingly able to anticipate future environmental problems. In a number of areas, there is general agreement that new environmental problems will arise in the future if human behaviour is not changed in good time, even though these problems are not having any visible effects at the moment. Global warming is a good example of such a problem.

In the second place, our current knowledge is such that it is possible to reveal the relations between the various factors which are at work on natural systems. As a result, we have become more aware of the synergistic and cumulative effects (in terms of both scale and speed) of behaviour that takes place in totally different areas of the world. We are, for example, now familiar with the general effects in global terms of the felling of tropical rainforests. These effects were not known at the time when the European forests were cut down. In addition, the new knowledge is disseminated more freely. In other words, scientific research is revealing more and more of the secrets of the Earth as a natural system, as well as of the threats facing it.

For the purpose of this chapter, this particular development is referred to as the process of revealing 'ecological interdependencies'. Although these have always existed, changes in the relationship between human beings and the natural environment have given them features which are characteristic of the time in which we now live. A number of these features will be discussed in the remainder of this section.

Crucial changes in ecological interdependencies

What changes have there been with regard to ecological interdependencies? A comprehensive analysis, assuming that this is feasible, would go beyond the scope of this chapter. For this reason, we shall concentrate on a number of crucial changes.

The first crucial change lies in the fact that the natural environment is now used more widely and more intensively than it used to be. This is due not only to population growth but also to new technological developments, and to new applications which have been discovered in the course of time. As a consequence, certain elements of the natural environment which were previously assumed not to have any economic value are now regarded as possessing a certain value in use. This has been the case, for example, with minerals, for which new applications have been found.

A second crucial change has been the development of new materials (such as plastics) which cannot be broken down directly by natural processes. Here too, new technologies have played an important role. As a result, certain substances are now entering the natural system which were not previously present. Other substances are now entering the natural system in much larger quantities than was previously the case. Both these trends may disrupt or even irreversibly damage the natural regeneration mechanisms.

The problems caused by these changes are the depletion of natural resources and environmental pollution (as a consequence of waste materials). These problems have characteristics which are specific to the time frame in which they are placed and which introduce two further crucial changes.

The third change is that, because many environmental problems cannot be solved on

a local or regional basis, it is no longer possible for people to cut themselves off from such problems. Even if the appropriate measures are taken in certain areas, they will not prove effective if similar measures are not taken at the same time in other areas. Many of today's environmental problems are international or even global in essence; acid rain and the depletion of the ozone layer are two good examples of these. Only international action can solve them.

A fourth change is that certain key effects of today's environmental problems are only felt in the long term. The process of increasing acidification is a clear example of this: even though it has been going on for a long time, the damage it causes to forest, for example, has only recently become apparent. It has now also become clear that it is a difficult process to reverse. Even if there is no further acidification in the future, it will be a long time before we manage to control the effects caused by the process of acidification in the past. The future effects of other environmental problems (such as global warming) can only be estimated by means of projections based on models. If no action is taken now, the victims of such problems will be tomorrow's generation.

It could be said that these developments have made the world smaller. Box 1 illustrates the increase in the scale of environmental problems from three different viewpoints.

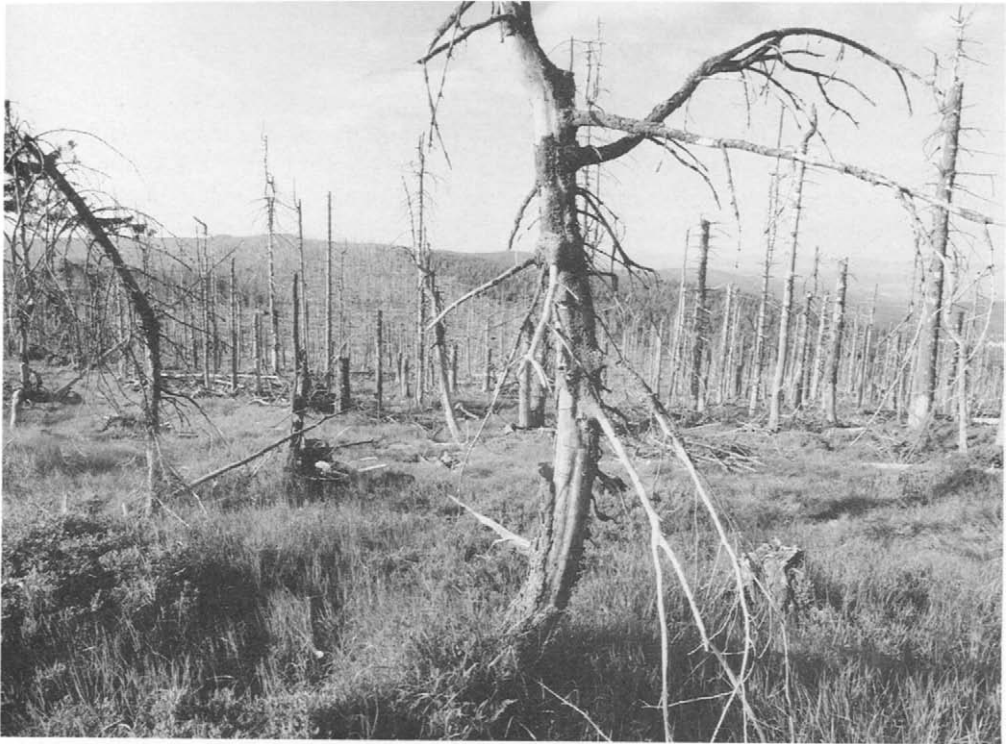


Plate 1.1 Ecological interdependence: dramatic effects of acidification in Karkonosse Park, Poland. Photo: David Drain/Lineair

Increase in scale of environmental problems

Trends in air pollution

- air pollution in towns and cities
- acidification of large areas
- depletion of the ozone layer
- climatic change on Earth

Build-up of phosphates and nitrogen in the soil

- eutrophication of surface water
- presence of fertilizers in soil and surface water
- global disruption of nutrient cycles

Concern about state of the environment

- disappearance of rare plants and animals
- preservation of ecosystems
- preservation of biodiversity around the world

Links between environmental problems

As was noted above, today's environmental problems connect the lives of people in very distant regions of the Earth, connect the Earth with the atmosphere and affect very diverse communities. With the aid of two detailed examples we shall examine this particular point more closely. In doing so, we shall highlight a further characteristic feature of present-day environmental problems: the unequal distribution of causes and effects.

Deforestation is a good example of both the scale on which and the rate at which we are changing our natural environment. During the period since 1850, the area of the Earth which is covered by forest has declined from 6 billion to 4 billion hectares. There has been a particularly sharp increase in the rate of decline during the past few decades. The tropical region, where some 60% of the world's remaining forests are located, has suffered most in this process. For example, whereas just 40 years ago 30% of Ethiopia consisted of forest, today only 1% of the country is covered by forest.

At the beginning of this century, more than half of India was covered by forest. Today, the figure is just 14%. Although there are plenty of other, similar examples, the trend is clear: the tropical rainforests are rapidly disappearing. It is estimated that 20 million hectares are lost every year. The process has both a local and a global impact. Among the local effects are increasing erosion, the silting up of rivers and the flooding of farmlands. On a global scale, the consequences include a loss of habitats for species and an accelerating and irreversible destruction of genetic diversity. The effect of the latter is to deprive future generations of genetic material which they may need for developing medicines and disease-resistant food crops. The same effects may also be felt by whole ecosystems, which could be thrown out of balance as a result. Finally,

deforestation also results in a net release of carbon dioxide, and hence contributes to the greenhouse effect.

The greenhouse effect provides the second example. Although natural sources are the primary producers of greenhouse gases, anthropogenic sources are becoming ever more important in this respect. Carbon dioxide accounts for approximately half of all the gases which we introduce into the atmosphere, and the amount involved has increased dramatically in the course of time. Until around the middle of the last century, the amount of carbon dioxide in the atmosphere represented about 275 parts per million (ppm). This amount has risen during the intervening period to 350 ppm, with the rate of increase being currently estimated at 1.8 ppm (or 0.5%) per annum. The concentration of other greenhouse gases, such as methane, CFCs and nitrous oxide, is also on the increase. The probable result of this process will be a rise in the temperature on Earth and hence a rise in the sea level. This will have a disastrous effect not only on the climate but also on the suitability of large parts of the world for human life. On the one hand, there is considerable uncertainty as to the precise effects. Although there is now proof that the volume of greenhouse gases is increasing, the effects can only be predicted with the aid of models. On the other hand, it is too risky to wait and see whether the predictions actually come true. If they do, and nothing has been done in the meantime, it will no longer be possible to turn the clock back.

These two examples of environmental problems show that there may be a link between what seem at first sight to be unconnected problems. The felling of rainforests, which is restricted geographically to a number of tropical regions, has an impact all over the world. The same applies to global warming, the sources of which are not evenly distributed over the world (see Table 1.1).

The two environmental problems have different backgrounds. In the case of the rainforests, it should be pointed out that these represent vital ecological capital to developing countries. They need – generally for financial reasons – to exploit the rainforests in order to produce exportable goods. In this way, the richer, predominantly Western countries acquire a natural resource which they themselves do not possess. For both parties, however, the benefits are merely of a short-term nature. In the long term, this ecological capital will become exhausted. The same situation holds for many other natural resources in the developing countries: out of economic necessity, natural resources are over-exploited to the advantage of the more powerful, i.e. richer, market players, who consume the ecological capital which in many cases originates thousands

Table 1.1 *Total emissions of greenhouse gases*

Regions	World population (%)	Responsibility for global warming (%)
The West	15	46
Central/Eastern Europe	7	19
Third World	78	35

Source: *New International*, April 1990. Adapted from Elliott (1994), p. 42.

The 'shadow ecology' of an economy

Western nations rely heavily on resources spread around the globe and should be aware of their shadow ecologies and the need to pursue policies that will sustain them. Some countries, of course, are more dependent on dispersal resources than others. Japan is a case in point. Being a resource-poor country, the world's second largest economy has to import most of its energy and renewable resources as raw materials and export them as finished products. Japan's vast population also depends on access to its shadow ecology. Seventy percent of all cereal (corn, wheat, and barley) consumption and 95% of soyabean consumption are supplied from abroad. Poor crop yields in exporting countries due to environmental degradation or bad weather could have a grave impact on Japan's food supplies. Japanese imports of roundwoods account for one-third of the world total

Source: MacNeill *et al.* (1991), p.59.

of miles away from their own countries. MacNeill *et al.* (1991) have referred to this phenomenon as the 'shadow ecology' of an economy (see Box 2).

Global warming, on the other hand, has a different background to that of deforestation. Global warming is primarily the result of an increasing level of prosperity, and of the use of fossil fuels in particular. The concentration of the sources of CO₂ emissions in the most prosperous countries is a clear indication that those countries have been the main economic beneficiaries of this form of environmental degradation. This places an extra burden of responsibility on them in terms of achieving the necessary reductions in emission levels. The reductions which are needed simply in order to prevent the concentrations of greenhouse gases in the atmosphere rising above present levels are estimated to be in the range of 50–80%. Yet these reductions, even if they are attainable, may be counteracted by the effects of the economic growth which the developing countries are struggling to achieve. This growth is based on an increasing consumption of fossil fuels. If no counter measures are taken, CO₂ emission levels in the developing countries in the course of the next century could actually exceed those now recorded in the industrialised countries. This particular environmental problem clearly highlights the need for international co-operation in an area in which all sorts of different interests are at play.

Environmental problems in different parts of the world

Today's key environmental problems (two examples of which have just been discussed) cannot be regarded in isolation, without reference to the main forms of development. They are the result of population growth, the development of technology and a desire to achieve economic growth that is highly dependent on intensive energy consumption and an intensive exploitation of natural resources. These various factors have led to fundamental environmental changes. Environmental problems which were once restricted to a small area, and may in many cases still have localised origins, are now proving to have an impact all over the world. Environmental problems which

initially seemed to be of concern only to the present generation are now proving to constitute threats to future generations as well. It should also be borne in mind that the world population will double during the course of the next 50 years. This is a process which is difficult to control: one-third of the world population are under the age of 15. Similarly, the degree of economic growth to which countries aspire remains dependent on the same natural resources, all of which will ultimately either be consumed in their entirety (as is the case with minerals) or be changed in such a way that they may even form a threat to human existence (e.g. the atmosphere).

This line of reasoning should not necessarily be seen as simple doom-mongering. Its object is rather to produce a sense of realism and a desire to identify the characteristic features of the problems in question. One of these features has already been touched upon in relation to the examples we have given: environmental problems differ from region to region. One popular dividing line which is often used in the analysis of environmental problems is that between the North and South. The North is in turn divided into the former socialist countries of Eastern and Central Europe on the one hand, and the capitalist countries known as 'the West' on the other (consisting of the USA, Canada, the European Union, Japan, Australia and New Zealand). The South is taken to consist of the developing countries. Although these distinctions are by no means absolute, they are useful in that they cast some light on the relationship between political ideology, the level of development and environmental problems. This relationship may be described in the following terms.

The industrialised Western countries are characterised by a high level of economic activity. Some of them, for example Japan and The Netherlands, have achieved this on a relatively limited land area with a limited local supply of natural resources. Others, notably the USA, have based their development initially on an abundant resource base. A third group, Canada and Australia, continue to export some of their natural resources. Over time in all these countries to a greater or lesser degree, rapid development has been founded on two cornerstones: the exploitation of natural resources increasingly imported from elsewhere (usually from developing countries) and technological innovation. The environmental problems are thus closely linked with the continuing process of economic growth, and may be considered as a consequence of the lifestyle in the West. The problems in question are all adverse effects of economic behaviour which is widely regarded as a benefit rather than a problem. Economic development is determined primarily by forces of supply and demand exerted by relatively autonomous market forces. Government policy is aimed at rectifying any harmful effects (which are taken to include any detrimental impact on the environment) caused by the interplay of these forces. It is in these countries that environmental policy has been most finely tuned as a remedial mechanism. On the other hand, policy makers are generally reluctant to take much account of long-term considerations. In the light of their wealth, these countries bear a certain degree of responsibility for the environmental problems in other parts of the world. Although this responsibility is indeed widely acknowledged, it has, so far, not led to any great amount of practical action.

Compared with the Western world, the countries of Eastern and Central Europe are characterised by a low level of economic activity. Most of them possess a reasonably large local supply of natural resources. The dominance of a communist ideology in

these countries, however, has meant that the existence of environmental problems was denied for a long time and as a result, environmental policy was undeveloped. For a considerable period during the past, Nature was regarded as an obstacle to progress which had to be surmounted. The recent political revolutions have now revealed the environmental consequences of the mismanagement which took place under the communist regimes. There was enormous wastage in the use of the natural system: not only were far more raw materials and energy used per unit in the extraction, transport and production of natural resources than is the case in the West, but large parts of the region have now become so badly polluted that the situation is actually life-threatening. These countries are now going through a process of economic reconstruction. Whilst this offers an opportunity for 'building in' the necessary environmental measures, it has become clear that these countries are not capable of bearing the costs involved, including the ecological clean-up costs, on their own.

The patterns shown by the countries of the South are extremely diffuse. In general terms, however, it could be said that they have a very low level of economic activity (as defined in Western terms) and a wealth of natural resources. The environmental problems experienced in most of these countries are largely the result of a struggle for life which, in many areas, has thrown the local population into a vicious circle. As a result of poverty, people are compelled to overexploit natural resources, for both agricultural purposes (with soil exhaustion, desertification and deforestation as the consequence) and industrial purposes (leading to the exhaustion of mineral supplies). This overexploitation leads to the disappearance of the natural resources on which the sustenance of future generations depends. This, in turn, creates further poverty. The process is aggravated by population growth. It should also be pointed out that, in many countries in this part of the world, it is only a very small, rich elite which actually feels the benefits of overexploitation. Economic growth on Western lines is the explicit target of the political ideologies. In a number of countries, this has led to rapid economic growth and consequently to additional environmental pollution. Without outside assistance, many of the countries in this part of the world will not be capable of combining environmental protection and development. For them, economic development is the prime – and essential – target, and environmental protection is neglected.

1.3 Economic interdependencies

Scientific research has made it possible not only to identify both existing and potential environmental problems, but also to establish their causes. What we get, however, is only part of the picture. The definition of the term 'environmental problem' which we proposed at the beginning of the chapter makes clear that environmental problems are inextricably bound up with human behaviour. Various aspects of human behaviour have already been referred to in the preceding section. They may be described in more abstract terms as productive and consumptive behaviour, and referred to collectively as economic activity. In order to understand the background to present-day environmental problems, we therefore need to know something about the characteristics of, and the changes which have occurred in, this activity. This is the domain of the social sciences.

Social scientists, like natural scientists, have witnessed changes in the knowledge which is needed in order to gain a better insight into environmental problems. It has become increasingly clear, for example, that today's environmental problems are caused by global socioeconomic relationships. Certain aspects of these relationships can be used to explain not only how environmental problems arise, but also why they are not solved. The problem of deforestation is, for example, explained by social scientists in terms of conflicts of interest between the rich and the poor, financial dependencies and international trade relations. For the purpose of this chapter, we shall use the term 'economic interdependencies' to refer to the trends in socioeconomic relations which are relevant to environmental problems.

The relationship between the environment and the economic process is a reciprocal one. On the one hand, the environment has an effect on the results of the economic process. Natural resources are, after all, one of the key factors behind production decisions. On the other hand, the results of the economic process have an impact on the environment. Production and consumption may lead to a decline in the environmental quality that is needed in order to safeguard the continuity of the economic process. Within the scope of this chapter, our interest lies primarily in the second aspect of the relationship: the role of economic behaviour as a cause of environmental problems.

While there can no longer be any doubt that economic behaviour does indeed lie at the source of many environmental problems, societies have yet to convert this awareness into action by instigating the necessary process of economic restructuring. The issue basically consists of three vital elements:

- Not enough attention is paid to the potential for environmental degradation inherent in economic processes.
- Setting economic growth as a policy target encourages environmental degradation.
- Environmental degradation is sustained by international economic interdependencies.

The environment as an external economic factor

In a capitalist economic system, a price mechanism is used to regulate the use of products and services. In theory, the prices of goods reflect their actual cost of production. This does not, however, apply to the environmental costs associated with production and consumption. The costs of more environmental degradation are not reflected in higher prices. Environmental degradation is – in economic terms – an external effect, passed on from those who produce the effects to society as a whole. Those responsible for the external effects of acidification (for example, motorists, farmers, the oil-refining industry) are not compelled to pay for the resulting damage caused to nature, drinking water supplies or buildings.

This insight has led some economists to the idea that price stimuli should play an important role in the prevention of environmental problems. Prices must tell the social truth about the cost of environmental degradation. Scarcity should be reflected in higher prices, which should in turn encourage people to review their priorities. When there is a change in relative prices (scarce resources and polluting activities are priced higher), people do what they have always done: they adapt their behaviour accordingly, become more inventive, and look for environmentally-friendly alternatives.

How much does the environment cost?

'The assessment in monetary terms of the benefits of avoided environmental damage poses particularly large problems. These benefits should be weighed against the costs of avoiding environmental damage. Estimates for the latter can be made easily and quite accurately. For example, the cost of reducing the pollution level of a river that contains heavy metals from the effluent produced by a firm, equals the cost of treating the polluted river plus the cost of adapting the polluting production process. Problems arise when the benefits of a clean river have to be estimated. Some benefits can be expressed in market prices, such as the lower cost of producing drinking water and the higher revenues from fishing. Many benefits, however, cannot be expressed in market prices, simply because there are no markets for public goods like ecosystems and landscapes. What is, for example, the price of a square mile of wetlands?'

Source: Dietz and van der Straaten (1992a), p.31.

The 'creation of a market', however, is not an easy task. Higher prices might be capable of preventing a shortage of finite resources. If certain finite resources become increasingly scarce, their market prices will gradually rise. And even though many of these markets are imperfect, so that they do not respond immediately to price stimuli, rising prices may act as a warning signal and lead to certain adjustments. In the case of renewable resources, it is difficult to use the market to avert a decline in the quality of the resource. In many cases (e.g. air or water quality), these resources are either unpriced or difficult to price (see Box 3). Consequently, an increasing scarcity of these resources will not necessarily make them any more expensive and hence reduce their consumption (there is more discussion about this topic in Chapter 6).

How much does the environment cost?

At present, the quality of the environment is not a factor which plays a role in the economic decision-making process. As we said above, environmental costs are passed on to society as a whole. For this reason, environmental economists claim that the indicators which are used to define the level of a country's material welfare (such as the national accounts) are not a genuine reflection of the actual standard of living. Indeed, it is even possible that figures which ostensibly suggest economic growth could conceal what is in reality a decline in living standards. This would be the case where one sector of the population suffered substantial damage which was not accounted for as a result of certain environmental impacts produced by another sector of the population.

It may be argued that any loss of function of natural systems should be translated into monetary terms and treated as a loss of income. It is this principle which is behind proposals which have been put forward for instituting 'green national accounts'. Unfortunately, there are enormous difficulties, both economic and technical, in producing such accounts. Another proposal is to introduce changes in the tax system,

Market forces and pricing

In a free market, prices are the result of the interplay of supply and demand. Generally speaking, prices are determined by:

- production costs (i.e. the costs of raw materials, energy, capital investment, labour, etc.)
- the profit anticipated in the light of demand and the level of competition.

The price of a product does not, however, include the additional costs incurred during production and use and upon disposal, as a result of environmental pollution, damage caused to public health, waste processing, etc. Until now, these costs have been borne neither by the manufacturer nor by the users of the product. They are either passed on to society in general or – as is often the case – passed down to future generations.

An ecotax could therefore be based on the following principles:

- The polluter should pay the full social and ecological costs of a product.
- A polluting product should be made more expensive than an environmentally-friendly substitute which is available for it, so that consumers are encouraged to buy the latter instead.

In this way, the production of new, environmentally-friendly products would be stimulated, market opportunities for them would be improved, and sales of polluting products would decline. The revenue earned by the government from the proposed ecotax could be used for lowering the tax and social security contributions payable on human labour. This would have the additional effect of allowing human labour to compete more effectively with machinery, leading in turn to an increase in employment and hence a decrease in the numbers of unemployed.

Source: Van Arkel (1992) (translated).

imposing levies on energy and resource use, on polluting emissions and on products with a high environmental impact (see Box 4). According to those in favour of such tax reforms, they will not necessarily lead to an increase in the overall tax burden provided that taxes on labour, savings and investment are lowered at the same time. For the time being, however, the proposals for an 'ecotax' remain proposals. The problems are not only technical but also political, for the imposition of an ecotax could have an undesirable effect on the distribution of income in society. And because any tax reforms would also affect the relative competitiveness of industry, they could only be instituted within an international framework. Only if it is clear that they will be applied across the board in all countries is there any likelihood of such measures being accepted.

Economic policy and the environment

The quality of the environment has both a direct and an indirect effect on the standard of living. It is clear from the above that, as a result of the pressure of international competition, these effects have little or no role to play in economic behaviour.

Environmental degradation is not, however, simply a byproduct of economic activity. It is also the consequence of the priorities set by states in their economic policies. These policies are aimed at stimulating production and tend to ignore its environmental consequences. Economic policies may actually have more impact on the quality of the environment than those policies explicitly designed to protect the environment (see Box 5).

These 'perverse interventions in the market' occur both in developing countries (see, for instance, Boj  *et al.*, 1992, p.32) and in industrialised countries. They are sustained by the interests of powerful lobbies, and have disastrous effects, not only ecologically but also economically, given that inefficient use is made of scarce resources. Again, change is only possible if a vital process of economic reorientation takes place within an international context and is subject to international control.

The environment and economic development

The environmental problems in different parts of the world formed the subject matter of Section 1.2, in which we touched briefly upon the relation between environmental problems and the level of economic development. This is in fact one of the most fundamental issues highlighted by an analysis of environmental problems in an international context. It is also an issue with many facets. Our natural environment may be considered as an indivisible ecosystem, as the planet Earth in relation to the atmosphere. The threats to this system are, however, interlinked by processes relating to differences in economic development. The various stages of economic growth achieved in the various regions are of vital importance. In Central and Eastern Europe, for example, environmental problems are interwoven with a low standard of living and a highly inefficient economic process. In the developing countries, on the other hand, whilst these problems are also closely connected with a low standard (but not necessarily quality) of living, they are equally the result of a need to create a basic means of sustenance for large numbers of people. In the West, finally, environmental problems follow largely from a high material standard of living. This unequal distribution of wealth is in itself one of the greatest threats to the Earth as an ecosystem.

Whilst there is on the one hand a need to move away from modern forms of economic development characterised by high levels of energy use and an intensive exploitation of natural resources, the presence on the other hand of widespread poverty forces many communities to aspire to short-term economic growth at any cost. In many cases, there is no other option but to treat the control of environmental degradation as a lower priority. The results of this trend have begun to make themselves felt over the past few years. We have seen, for instance, a tendency for companies to relocate to developing countries, where the environmental requirements which they have to meet are not as strict as in other countries. Some firms which have been set up in developing countries are so 'dirty' that they would not even be tolerated in other regions (see Box 6).

A country at a low level of economic development will find it practically impossible to take the necessary measures to prevent environmental degradation. Not only does it not have the financial means for buying the necessary technology and creating the right infrastructure, but its economic priorities are also different. There are two other factors which exacerbate the problem.

Economic policy and environmental degradation

Some examples from the agricultural, forestry, transport and energy sectors

Agriculture

Virtually the entire food cycle in North America, Western Europe, and Japan attracts huge direct or indirect subsidies, at a cost to taxpayers and consumers of over \$250 billion a year. These subsidies send farmers far more powerful signals than do the small grants usually provided for soil and water conservation. They encourage farmers to occupy marginal land and to clear forests and woodlands, make excessive use of pesticides and fertilisers, and waste underground and surface waters in irrigation.

Forestry

The pressures on forests throughout the world vary greatly but in both developed and developing countries these pressures are reinforced by government policies. The logging and forestry industries attract a wide variety of direct and indirect subsidies. The Brazilian taxpayer has been underwriting the destruction of the Amazon with millions in tax abatements for uneconomic enterprises. The Indonesians do the same. So do the Canadians. American taxpayers are subsidising the clearing of the Tongass, the great rainforest of Alaska. Perverse incentives that encourage the overharvesting of temperate as well as tropical forests also mark world trade in forest products.

Transport

This sector, especially motor vehicles, also 'benefits' from policies that are ecologically perverse. Fuel taxes in many jurisdictions, for example, still fail to distinguish between the environmental effects of different types of fuel (petrol or diesel, leaded or unleaded). The tax and tariff structure, and direct and indirect subsidies, encourage heavier and more energy-intensive vehicles and road freight as opposed to rail transport in many countries. In some countries, private vehicle expenses can be deducted from taxable income.

Energy

The major obstacle to energy efficiency is the existing framework of incentives for energy exploration, development, and consumption. These incentives underwrite coal, shales, oil, and gas; they ignore the costs of polluting air, land and water; they favour inefficiency and waste. In the United States alone, it is estimated that total energy subsidies, including tax abatements, amount to more than \$440 billion annually. The figure for Canada is at least proportional, about \$4 billion annually. Germany provides heavy subsidies for coal, as do China, India, and other countries. While industrialised countries have been spending billions to distort the market and consumer prices in ways that actively promote acid rain and global warming, they have been spending only a few million on measures to promote energy efficiency.

Source: MacNeill et al. (1991), pp.34-37.

The export of environmental problems

Every year, millions of tonnes of hazardous waste are traded on the world market. A large proportion of this is exported from industrialised countries to developing countries. Environmental legislation in many parts of the West is so strict that the processing of waste has become an extremely costly business. For the developing countries, on the other hand, the import of hazardous waste represents a source of income. These countries do not, however, possess the technology which is needed in order to process the waste in a safe manner involving minimal pollution.

A number of international agreements have now been made which are aimed at limiting this type of 'environmental exploitation'. What is still needed, however, is a good monitoring system for keeping check on waste flows, as well as a system of sanctions which would allow penalties to be imposed on those found to be acting in breach of the rules. In the absence of such systems, there is currently a flourishing black market which is estimated to be worth many hundreds of millions of dollars a year.

The first is the consequence of the worsening financial situation in which the developing countries now find themselves. Third World debt is currently estimated at over \$1000 billion. Many countries spend all of their export revenues (and more besides) on paying off the interest on loans; interest payments are now in excess of \$70 billion per annum. A watershed was reached in 1982 when for the first time, there was a net transfer of capital from the developing countries to the industrialised nations. According to current estimates, the net amount of capital which the poor countries transfer every year to the rich countries is over \$50 billion.

The second factor is closely associated with the economic emphasis placed on policy aimed at improving the financial position of developing countries. The institutions responsible for this policy, such as the International Monetary Fund, place great emphasis on the need for increasing exports, attracting industrial investment and restricting government expenditure. This leads to an additional exploitation of natural resources, whilst at the same time no financial resources are available for conducting a programme of environmental protection.

Viewed from a global economic standpoint, environmental problems are primarily a matter of inequality. If we bear in mind the rate of economic growth which the poorest countries are presently experiencing, and the rate of growth which they hope to experience in the future, the combined effect could easily be to cancel out any positive impact which might be achieved by the environmental policies pursued in the rich countries. This places a dual international responsibility on the shoulders of the rich countries, who will need to be the key instigators of action in order to protect the global environment. The Western nations will need not only to assist the developing countries to realise their equitable aim of achieving economic growth, but also to give them the financial and institutional help which they require in order to carry out essential environmental protection policies. By linking economic development with environmental protection (and this is exactly what the developing countries themselves have



Plate 1.2 Economic interdependence: international economic relations affecting local economies, Harare, Zimbabwe. Photo: Ron Giling/Linear

been urging in various international fora), the West can lay the foundations for a new, just and equitable international order. International trade forms an important aspect of this process (see Box 7).

1.4 The role of technology as a ‘double agent’

An understanding of the ecological and economic interdependencies, as well as of the relationship between these two factors, may help give us a clearer insight into the contemporary environmental problems. It may also show us the way towards finding an answer to the questions which we asked at the beginning of the chapter. In anticipation of the discussion which follows below, we are now able to give a broad outline of the possible answer. Environmental problems are international problems in the first instance because they have an impact on a very large geographical scale, and in the second place because they are caused and sustained by economic relationships which also affect very large areas of the world. The global context in which current environmental problems – and their causes – should be seen makes them all the more difficult to keep under control. Unfortunately, this awareness does not bring us any closer to finding a solution to these problems. An understanding of a third area of knowledge is needed in order to do this: technology.

International trade and environmental problems

A key area of debate is the role which international trade should play in realising a more equitable and ecologically sound international order. International trade and the desire felt by developing countries to achieve economic growth are frequently incompatible with the needs of environmental protection. Current trading patterns and world market prices take no account of any excessive consumption of natural resources, and particularly of non-renewable ones, or of other external environmental factors. Nor do they attempt in any way to do so. Some 90% of world trade is regulated by the GATT (General Agreement on Tariffs and Trade), the underlying philosophy of which is that free trade is conducive to economic growth, and that, in order to achieve free trade, it is necessary to remove import and export restrictions, and other trade barriers. Viewed from the GATT angle, any restrictions placed on international trade for reasons of environmental protection are damaging to economic growth. GATT in fact prevents countries from imposing environmental safety requirements on imports, with the result that, where countries decide to impose them on their own exports, they undermine the competitiveness of their own industry. In other words, the interests of free trade are at the present time in conflict with those of countries who wish to ensure that environmental costs are included in the prices of their products.

At the same time, free world trade can stimulate economic growth in the developing countries. Thanks to the low price of labour there, they can often compete with the West once any Western trade barriers have been removed. This conflict of interests between the environment and development can be resolved only if all countries decide to charge polluters for the cost of adverse environmental effects.

In short, international trade is not a problem in itself. It can often stimulate greater productivity and consequent saving in the use of resources and improved technology which prevents waste and pollution. This positive effect on the environment can be enhanced with the aid of an enforceable system of internationally accepted environmental quality targets. At the same time, liberal trade policies should encourage efficient production through countries specialising in those activities in which they have a comparative cost advantage. Looked at this way, international trade may be seen as a means of helping developing countries not only to achieve economic growth, but also to realise environmental aims.

The role of technology in relation to environmental problems may be described as that of a double agent. On the one hand, it is technology which has enabled more natural resources to be exploited more intensively. In fact, technological developments are themselves one of the causes of environmental problems. On the other hand, new technology can help to solve these problems, for example by helping to create alternative sources for future energy supplies.

Technological solutions are regarded by some with great suspicion, and by others with great optimism. The former attitude is often adopted by environmental activists, who are afraid that society will pin its hopes on technological progress and close its eyes to the fundamental social changes which they consider to be necessary. In their

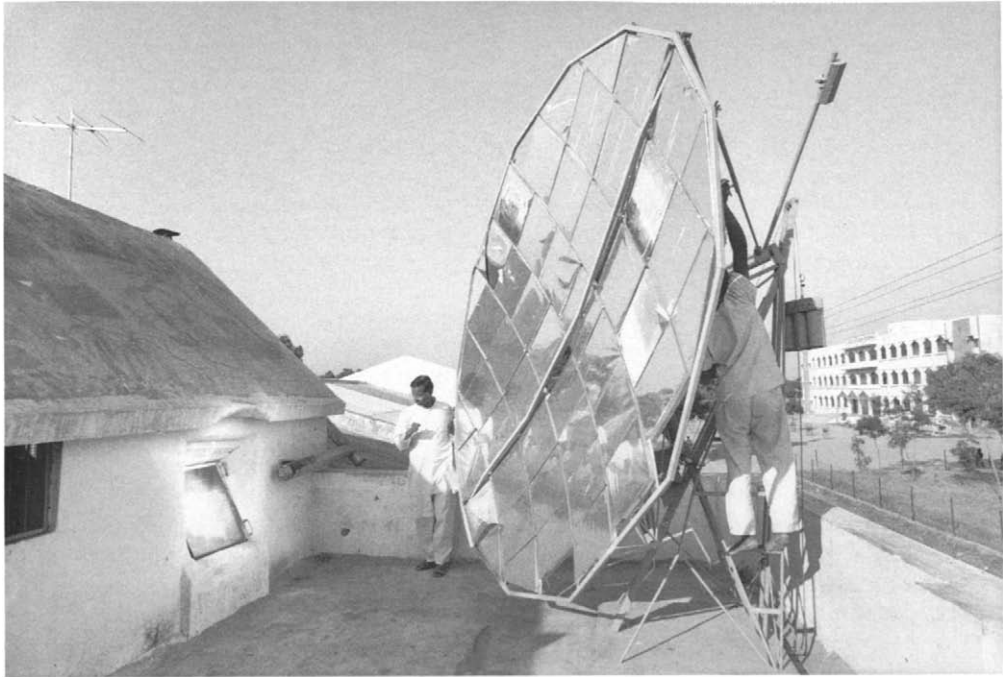


Plate 1.3 New technology: solar cooker in a school in Gujarat, India. A big pot behind a window collects the sun's focused rays. Photo: Sean Sprague/Lineair

view, a new economic order is needed in order to solve the problems. The optimistic attitude, on the other hand, tends to be the preserve of those who are interested in maintaining the status quo and therefore wish to block the adoption of any meaningful environmental policy. Both attitudes are, however, one-sided. Whilst it is true that technology can in principle offer certain solutions, these solutions cannot achieve success without social sacrifices being made.

Studies have shown that the potential for improvement is actually much greater than some environmental activists may suspect. Experiments conducted in The Netherlands, for example, have demonstrated that, if the technology already available was implemented on a large scale, it would be possible to achieve the national environmental targets (which are among the most demanding in the world) and at the same time still enable economic growth of 2–3% per annum to be realised. If all the available technology was now put to use in The Netherlands, the country could achieve the same level of output and yet reduce energy consumption and waste production by 50–60%. It would also be possible to bring about a sharp decrease in the deposition of acid substances (Maas, 1993).

The same situation holds for other countries, too. Turkenburg, for instance, has confirmed that it is technically possible to combine economic growth and population growth with the necessary reductions in CO₂ emission levels. He believes, however, that it will be difficult to bring this about in practice. On a global scale, there is a potential for achieving a 50% saving in energy consumption by around the year 2010. In the long term, the reduction could actually be as much as 80%. In addition, we have

Three factors play a role in the depletion of stocks of finite natural resources

Resource-saving technological progress

Technological progress has generated large savings in the consumption of natural resources. This applies both to mineral fuels and to other resources. To give three examples: the amount of energy which the OECD countries require in order to produce one unit of GNP is much lower than 100 years ago; the amount of glass used to make one milk bottle has been virtually halved in the course of 50 years; and the amount of aluminium used in the production of a can of beer has been reduced by over 80% over a 40-year period. In other words, the consumption of natural resources does not necessarily mean less production capacity for future generations. The same standard of living can be achieved on an ever-declining base of natural resources.

The presence of suitable substitutes

An increasing scarcity of certain natural resources can also be counteracted by switching to other, less scarce resources or to new materials. Such substitution processes have already taken place, and are still taking place. More and more metals, for example, are being replaced by silicon-based materials, supplies of which are abundant. In a more general sense, we are witnessing a tendency to restrict the use of scarce resources to relatively high-tech applications. As far as mineral fuels are concerned, the scope for using substitutes is (for the time being at least) far more limited.

Reuse of natural resources

Some natural resources, metals in particular, should not strictly speaking be regarded as being finite at all. In theory, metals can be fully reused without any time limit. Already, between 30% and 40% of all aluminium used in the OECD countries is recycled. At the same time, it has also become clear that the marginal cost of recycling is going to increase in the future. This does not alter the fact that an increase in recycling will be accompanied by a decrease in waste production.

Source: SER (1991), pp.14–15 (translated).

the technology that is needed in order to produce more clean energy from sources such as the biomass. We even have the technological capability in the long term of getting all the energy we need from the sun, either directly or indirectly. These are, however, options which have not yet progressed beyond the planning stage, and which require a special institutional infrastructure, the presence of dedicated research centres and the funding of targeted research projects (Turkenburg, 1993).

It has also been demonstrated that technology can offer a solution in particular to the problem of the depletion of finite resources. We have already discussed in Section 1.3 the positive effects which market forces can have. This point is further elaborated in Box 8.

This discussion makes clear that there is no reason for rejecting out of hand all optimism about the potential benefits of technology. At the same time, we should remember that technology cannot solve every environmental problem (a case in point

being the decline in biodiversity as a result of deforestation). Moreover, technology is not enough in itself. Like many other things, technological innovations need to be organised. Any innovation leads to all sorts of changes in the social setting in which it is framed. In other words, the problems will not be solved simply by relying on the innate resourcefulness of the human race. The right social conditions must be in place for stimulating the use of new technologies. One of the prerequisites is a framework for transferring technology to those countries which do not have sufficient financial means for gaining access to it without assistance. Here too, international co-operation is essential.

1.5 Political interdependencies

Whether solutions can be found to environmental problems depends primarily on whether people are both willing and able to change their behaviour. A key problem is how to organise the process of change. In the international context account must be taken of the role of sovereign states, their interrelationships, the international frameworks in which they are active, as well as their relations with organised interest groups (such as international companies and environmentalist groups). If today's environmental problems are to be tackled in an effective manner, a wide range of players will need to be brought into action. In essence, the issue is a political one. In order to gain a grip on these problems, the political decision-making process must be used as the channel through which the ongoing development of the socio-economic system must be controlled, so that it does not outstrip the capacity of the ecological system to support it.

The international nature of contemporary environmental problems means that international political action is needed in order to solve them. However, the international political system consists of a large number of countries, each of which claims its own sovereignty, and all of which are embedded in political and economic structures which are based primarily on a desire for (economic) growth, peace and security, and not (or to a much lesser extent) on any wish to solve environmental problems. The fundamental problem in this connection is that the environment, as a complex system whose many facets are closely bound up with each other, has to be controlled by a highly fragmented political system. Two important issues need to be considered in this respect:

- Which countries/sectors/players are going to be required to play a pioneering role in finding a joint solution to environmental problems, and which countries/sectors/players are going to benefit more than others? This may be referred to as the 'distribution issue'.
- What type of development, both political and economic as well as social and cultural, will provide the best basis for a successful, long-term coexistence between human society and its environment? This is referred to as the 'development issue'.

The resolution of the distribution and development issues is contingent on processes of change within the international political system. For this reason, a third category of interdependencies (in addition to the ecological and economic) which we shall discuss is that of the 'political interdependencies'.

Environmental problems on the international political agenda

In the early 1970s, the environment for the first time achieved a prominent place on the international political agenda. There were, however, two important drawbacks: firstly, the key contemporary issues of peace, security and development were also fighting for a place on the same agenda, and secondly, there was no institutional framework within which environmental problems could be discussed effectively in an international context. Nevertheless, three crucial events resulted in the environmental issue ultimately taking its definitive place on the international political agenda. They were:

- the United Nations Conference on Human Development, which was held in Stockholm in 1972
- the publication of *Our Common Future* (generally known as the Brundtland Report) by the World Commission on Environment and Development in 1987
- the United Nations Conference on Environment and Development, Rio de Janeiro, 1992.

The Stockholm Conference

A first important step was taken with the first world environment conference, the United Nations Conference on Human Development, which was held in Stockholm in 1972. The Stockholm Conference became a key symbol for political acknowledgement of the growing worldwide awareness of the environment. Delegates from 113 countries, in both the northern and southern hemispheres, attended the Conference. The Conference resulted in the publication of the Stockholm Declaration, which enumerated 26 joint principles relating to human rights and responsibilities for the global environment, as well as a Plan of Action consisting of 109 recommendations. The Conference did not, however, lead to the formulation of a common strategy for solving environmental problems. This was largely due to the fact that most of the environmental issues addressed by the Conference affected only the Western world, and very little time was allocated to discussing the problems affecting the South. The developing countries were disappointed, and disassociated themselves from what they regarded as the 'Stockholm problems'. They felt that environmental pollution was a problem which only the rich Western countries could afford to have, which they had caused, and which they therefore should solve. These feelings were reinforced by the West's desire to point to economic growth as the source of environmental problems, and hence to adapt growth across the world. The countries of the South, on the other hand, considered growth to be vital if they were to eliminate poverty, and hence environmental problems. The Eastern bloc, finally, was taken up fully with its ideological conflict with the West, and had no time for environmental problems. Any such problems which were regarded as being caused by command economies were dismissed as being incidents of a temporary nature. The time was clearly not yet ripe for adopting an international approach to environmental problems.

International strategies for dealing with environmental problems were devised only sporadically and were generally restricted to a small number of countries (i.e. to combat the effects of acid rain, river pollution, etc.). Even the setting up of the United Nations Environment Programme (UNEP) in 1972 in the wake of the Stockholm

Conference failed initially to give an impetus to international co-operation to combat environmental problems. This was chiefly because the UNEP did not have enough resources to take the appropriate initiatives. Moreover, the United Nations impact on international relations between countries and regions in any event was only marginal in the 1960s and 1970s.

Our Common Future

In the absence of any adequate measures taken on an international political scale, the environmental problems simply grew even further. It was not until the mid-1980s that the politicians 'discovered' the scientific evidence for the international nature of the environmental problems, and the issue was placed at the forefront of international political debate (see Box 9).

The establishment of the World Commission on Environment and Development (WCED) during the United Nations assembly in Nairobi in 1982 was a further important step towards international political awareness of environmental problems. In 1987, the WCED published a report entitled *Our Common Future* (generally known as the Brundtland Report), the most frequently quoted part of which is undoubtedly the passage describing the concept of 'sustainable development': 'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs In essence, sustainable development is a process of change in which the exploitation of resources, the directions of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations' (WCED, 1987, p.43 and p.46). The report had a great impact and was well received all over the world (see Box 10).

The WCED concluded that world issues such as the environment, development and peace are all closely connected, and that there has been a growing realisation among national governments and other institutions that it is impossible to separate economic development issues from environmental issues. This relationship was explained in Section 1.3, in which we saw on the one hand that many forms of development erode

9

Nothing new about international environmental problems

'The greenhouse effect and the possibility of climatic change taking place have been known since the beginning of this century. The depletion of the ozone layer became obvious in 1974. The acidification of forests and lakes in Scandinavia and Canada has been a cause for concern since the Second World War. The destruction of tropical rainforests was already raised as a nature conservation issue in the 1940s.'

Source: CLTM (1990), p.5 (translated).

Reasons for Brundtland's worldwide popularity

- It was targeted at the long term, and dealt with both environmental and developmental problems (introducing the concept of sustainable development for the latter).
- It emanated from the United Nations, and was therefore regarded as being authoritative and impartial. This was demonstrated at the United Nations conference in Rio de Janeiro in 1992, where the question of how to achieve sustainable development was one of the topics of discussion.
- It was based on the premise of economic growth, which meant it was acceptable to the developing countries.
- It was published at a time when environmental problems which affect the whole world (e.g. ozone layer depletion, the greenhouse effect) were becoming plain for all to see. The environment was no longer a regional issue.
- It was published at a time when the rich countries were starting to take an interest in the environmental problems in the poor countries (e.g. the destruction of the tropical rainforests and the international trade in hazardous waste).

Source: CLTM (1990), p.7.

the environmental resources upon which they must be based, and on the other hand that environmental degradation can undermine economic development. It is therefore futile to attempt to deal with environmental problems without widening the perspective to encompass the economic system. In addition, the whole notion of security, in terms of political and military threats to national sovereignty, has to be expanded to include the growing impact of environmental problems.

The years at the end of the 1980s and the beginning of the 1990s seemed to herald a new era in international politics. The collapse of the socialist system in the East created a need for new relations between the East and West. The security issue was transformed from a global political problem (centring on East versus West) into a question of regional conflict management (as in the Middle East, Somalia, the former Yugoslavia, etc.). The problems relating to the environment and economic growth, on the other hand, appear to have become, to a much greater extent, matters of daily concern. The failure of the socialist system has thrown the environmental problems in the East into true relief. The desire to transform the economies of the former socialist countries into more capitalist-orientated systems has added a new dimension to the world's environmental problems. Whether a decision is taken to develop a more market-based system of production and consumption or to leave things more or less as they are, in both cases there is a risk of damage being caused to the environment. The Eastern countries are now seeking the help of the West in getting through this transitional period, and this in turn requires a fundamental change in the Western attitude to international relations. It is also becoming increasingly clear that the South (and particularly countries such as China, India, Brazil, Mexico and Taiwan) will play a more and more important role as an origin of global environmental problems.

Population growth, economic growth and technological progress are key factors in this respect. The first step has now been taken on the road to an international political debate on a new world order in which environmental issues will play a much more pivotal role than before and which will accommodate the institutional framework needed for this.

The Rio de Janeiro Conference

The concern about the environment, poverty and social and economic inequality led to the calling of the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992, the third of the key events referred to above. More than 150 countries took part in the Conference, the chief benefits of which were agreement that 'peace, development and environmental protection are interdependent and cannot be seen in isolation of each other' (Principle 25 of the Rio Declaration) and a growing awareness that the North and South depend on each other to ensure that the planet continues to be a life-sustaining ecosphere. The Conference resulted in the promulgation of the Rio Declaration, in which 27 principles are listed for the sustainable development of the world community. Although the Declaration is not legally binding, most countries have stated their willingness to use it as an important guideline for their own national policies.

A further outcome of the Conference was the signing of Agenda 21, a plan of action for the 21st century incorporating more than 100 different programmes in the field of sustainable development. Despite the fact that agreement was reached on a wide range of issues, however, the funding of Agenda 21 (representing a figure of around \$675 billion per annum) remains clouded in uncertainty. An important achievement of the UNCED was the signing of a Climate Treaty, a Biodiversity Treaty and a Forests Declaration (see Box 11).

Limitations of the international political system

The fact that certain agreements were reached at the UNCED does not necessarily mean that all the countries in the world decided to give absolute priority to solving environmental and developmental problems. Although the principle of sustainable development was formally adopted during UNCED and the Conference accentuated the interrelationship between the environment and development, the countries of the North seemed nevertheless to regard environmental protection as forming the chief problem, whereas the southern countries regarded underdevelopment and poverty as the key issues. The issues preoccupying the North were climatic change and the depletion of the ozone layer. The South, on the other hand, were exercised by poverty, food supplies and desertification. In addition, the North wanted the South to tackle the problem of population growth and to halt the decline in the quality of the 'global commons' (such as the tropical rainforests). The South for its part claimed that the North was largely responsible for the world's environmental problems (e.g. climatic change and the depletion of the ozone layer), and insisted that the North should supply it with the resources and technology which were needed in order to eradicate environmental problems caused by underdevelopment. The South was making these demands



UNCED: Climate Treaty, Biodiversity Treaty, Forests Declaration

Climate Treaty

The Climate Treaty, the signatories to which committed themselves to limiting the increase in the emission of greenhouse gases, was signed by 154 countries.

A number of Arab countries decided not to sign the Treaty in the light of their oil interests. Malaysia refused to sign because the Treaty, in accordance with the explicit wishes of the USA, did not impose any firm obligations on the rich countries. The Climate Treaty is indeed less far-reaching than had originally been hoped. A number of countries, including The Netherlands, have agreed to go beyond a straightforward implementation of the Treaty based on a literal interpretation of the text. The Climate Treaty is binding.

Biodiversity Treaty

The Biodiversity Treaty was signed by some 150 countries. The Treaty is aimed at the protection of flora and fauna, and contains agreements on the accessibility of genetic material and the costs associated with gaining access. To the dissatisfaction of the developing countries, the USA refused to sign the Treaty, which is binding on signatories.

Forests Declaration

Major disagreements arose between the developing countries and the industrialised countries over the management of the forests in the various parts of the world. The question of national sovereignty played an important role in this connection. The developing countries were unwilling to enter into commitments which could be construed as permitting violations of their sovereignty, which many of them had in fact only recently acquired. The industrialised countries for their part did not show any generosity in offering help in the form of forestry expertise to countries with rainforests in their territories. As a consequence, hardly any commitments were undertaken in relation to this field. The Conference did not progress beyond a non-binding Forests Declaration; a Forests Treaty proved to be an unattainable target.

Source: 'Relatie Noord-Zuid nieuw leven ingeblazen' (A new life for the North-South relationship). In: *Internationale Samenwerking*, September 1992, pp.42–43. Publication of the Dutch Ministry of Foreign Affairs (translated).

at a time when global environmental problems had created a situation in which, for the first time in history, the North found itself dependent on the South.

The question remains whether the current international political system is capable of dealing adequately with today's environmental problems. There are a number of grounds for doubts.

Firstly, the international political system consists of many countries all of which claim their own territorial sovereignty. Generally speaking, countries are very wary of surrendering any of their sovereignty. Joint initiatives are normally started on a voluntary basis, and in just about every instance the participating countries have let

their own interests take precedence. As long as there is no authority which has the power where necessary to order countries to join such initiatives, it will remain difficult to promote any joint action at an international level. Joint action can, however, be encouraged if those countries which bear most of the responsibility for the origins of environmental problems take the initiative in drawing up plans for concrete action. For example, if the USA, as the world's largest producer of CO₂, is not willing to take the first step in reducing emission levels of greenhouse gases, no other countries will take any action because whatever they do will not ultimately solve the problem.

Secondly, although all sorts of collaborative ventures have come into being at an international level, few, if any, of the political and economic structures now in place are based on the concept of sustainable development. The existing institutions, such as the European Union, the World Bank, the International Monetary Fund (IMF) and the General Agreement on Tariffs and Trade (GATT), however, have taken environmental problems on board, even though they were not originally designed to deal with such issues. But integrating environmental policy into their other policies is a far from easy matter. The number of organisations which have been set up specifically to deal with certain environmental problems is small. The International Whaling Commission is an example of such an organisation.

Thirdly, international institutions do not generally have much power in relation to sovereign states. The European Union is an exception to this rule. However, in order



Plate 1.4 Political interdependence: United Nations headquarters in New York. The United Nations is the only international political organisation with almost universal membership of nation states. Photo: Ron Giling/Lineair

to prevent the EU as a supranational body from acquiring too much power, the member states have adopted the principle of subsidiarity. This principle has a bearing on environmental problems because the member states are able to use it (in addition to the principle of sovereignty) in order to prevent the EU from interfering in their 'domestic' affairs. The subsidiarity principle means that decisions are taken as closely as possible to the citizen. Under the terms of the EU's fifth Environmental Action Programme, 'the Community will take action, in accordance with the principle of subsidiarity, only if and insofar as the objectives of the proposed action cannot be sufficiently achieved by the Member States and can therefore, by reason of the scale or effects of the proposed action, be better achieved by the Community' (Commission of the European Community, 1992, p.73).

Whilst the member states of the EU have surrendered some of their sovereignty on the one hand, the principle of subsidiarity is intended on the other hand to prevent a situation from arising in which all matters are regulated at a supranational level. The decision as to when and where the principle can be applied will depend largely on the political will of the individual member states. In order to ensure that adequate action is taken to counteract environmental problems, the EU has also introduced a further concept: that of 'shared responsibility'. Shared responsibility requires a much more broadly based and active involvement of all economic players (such as public authorities, public corporations, the private sector and the general public). The objective in the involvement of and interplay between these economic players is to strike a new balance between the short-term benefits to individuals, companies and governments, and the long-term benefits to society as a whole.

Fourthly, the structure of government in virtually every country is not designed for dealing with environmental issues. The environment and the economy are still regarded as two separate domains. As a result, it has been more or less impossible to integrate environmental targets into all other policy fields. In addition, politicians are used to thinking on a short time-scale (there is little credit to be gained from long-term goals given that there will always be an election coming up in the short or medium term) and do not like to take decisions in an atmosphere of uncertainty. Both these aspects are frequently involved in decisions affecting environmental issues. A further complication lies in the fact that international policy planning is regarded as falling under the competence of the Foreign Ministry. This policy evolved against a background of trade and security, and is defined in terms of 'getting the best possible result for the country'.

Finally, it should be pointed out that a lot of decisions which have an impact on the environment are taken outside the jurisdiction of governments. Multinationals and financial institutions play an important role in this, with non-governmental organisations (NGOs) often performing a corrective role. If all the relevant parties are to be involved in the decision-making process, a political system will need to be created that is relatively accessible at both national and international level.

Clearly, radical changes will have to be made before national and international politicians can start to act in terms of sustainable development. The most vital processes of change will be needed in the area of the strategic competence of the state apparatus, i.e. the capability of the apparatus of government to set comprehensive long-term policy targets, to co-ordinate the implementation of policy, and to see it

through to the achievement of the targets set. These are prerequisites for sustainable development. The implication is that national governments will have to surrender part of their sovereignty to international institutions (many of which do not yet exist), and that NGOs and multinational firms should become much more closely involved in decision making. Governments and international bodies must be prepared to allow the other parties to play a role in the process; this will be a test case for the quality of democracy all over the world. In addition, international networks will need to be created which cross the present demarcation lines between today's institutionalised structures. The first cases of such international co-operation have involved NGOs which have formed international alliances, in some cases even with native tribes. Governments will have to join forces with all other parties in order to turn the concept of sustainable development into concrete action.

1.6 Conclusion

Changes in the physical environment have created a new political challenge: the question of how to deal with the maintenance of the world's basic stock of natural capital. This chapter has shown that this problem is closely linked to the more general social issues of economic interrelations and economic development. It is also clear that a great deal depends on the attitude taken by the developed countries. It is these countries which must take the initiative in tackling global environmental threats. And it is these countries which will have to assist the poorest countries in solving their environmental problems, which have both local and international effects. And in doing so, the developed countries will need to foster the development of the developing countries, for environmental problems are also a matter of international inequality. The problems must be tackled within the context of a world system that is characterised by great cultural, political and economic heterogeneity.

No one would claim that there is a simple solution to environmental problems. This might perhaps be the case if there was outright opposition to solving them. There is, however, no point in trying to name possible culprits: the problems are much too complex for this, and indeed much too firmly rooted in international economic and political relations. The question is more one of how to start a process of change which can bring a solution closer to hand (Glasbergen, 1995). The internationalisation of environmental problems in an ecological, economic and political sense has created a need for a fundamental change in the social structures in both the North and the South. 'Sustainable development' is the concept which underlies the nature of the change. The concept has already brought about an important change of thinking, in that a large number of countries are now united on its significance, i.e. the linking of the environment and development as the basis for a new, just and equitable international order.

Yet this political acknowledgement of the importance of sustainable development is not in itself enough. Sustainable development implies processes of change not only in human behaviour vis-à-vis the environment, but also in the way in which people behave towards other people. International cultural diversity may not only provide opportunities for people to learn from each other, but may also place the whole process

in jeopardy where 'different' is taken to mean 'underdeveloped', 'inferior' or 'undesirable'. The recent international recognition of environmental problems is, however, a sign of change. Countries have taken the first cautious steps towards sustainable development. The next question is whether fine words are going to be translated into (more) action.

The following chapters discuss in further detail the problems we have just outlined. As a methodology for the book we took the position that the natural environment and the social environment should be studied as interrelated entities.

The problems addressed are not of the simplest. Furthermore, international environmental problems constitute a relatively new area of research, and an area which, by its very nature, is a highly complex one. Both the natural and social sciences contribute to our understanding of the environment. Comprehensive and more or less complete theories are not yet available. Environmental studies as it has developed is applied science and is problem-driven. Many disciplines have only recently developed partial approaches to environmental problems but even within one and the same discipline there are often various theoretical approaches. In social sciences, environmental problems even constitute a relatively new challenge, the challenge to develop an understanding of the 'material' aspects of society and how they relate to social processes and relations. These are aspects that the founding fathers simply excluded from their theories. In addition to this, attempts are being made to bridge the gap between the partially developed theories from the natural sciences and those from the social sciences.

The state of the art can best be typified as one of perspectives. These starting points for developing theories are used to analyse and to understand the relation between society and nature. Each of these perspectives represents a different method of conducting a critical analysis of environmental issues in an international context. The present variety of theoretical perspectives will be used in this book for a first conceptual and theoretical analysis, which is illustrated with a wide range of concrete environmental problems.

We start with a natural science view of environmental problems, after which some chapters look at the issues from the perspectives of a sociologist, a political scientist, a legal expert, and an economist. The final chapter brings some lines together, focusing on the concept of sustainable development again. This concept is most frequently used for the integration of theoretical approaches on the way towards a more multidisciplinary or interdisciplinary environmental science.