

ECONOMICS FOR EVER

Building sustainability into economic policy

Natural disasters are increasing: the floods in Venezuela and Mozambique and the cyclone in Orissa, India, are just a few recent examples. Many of these disasters may well have been intensified by human activities such as deforestation and by global warming. At the same time, the protest demonstrations at the World Trade Organisation (WTO) meeting in Seattle in December 1999 highlighted worldwide concern that economic growth based on free trade is having negative impacts on society and the environment, especially in poorer countries.

These very different events show how urgently people around the world are trying to address questions that have been asked since the 1960s: is economic growth destroying the planet? And if so, what must be done to change our destructive course? How can we slow down the rate at which we exploit the earth, while still providing a decent standard of living for all the world's present and future people? The questions are still hotly disputed, but the relatively new discipline of 'green' economics is seeking to find some answers.

The analysis provided by green or environmental economists demonstrates that positive economic growth is sometimes in fact negative growth when environmental damage caused by industrialisation is added to the economic equation – in developing as well as in developed countries.

During the year 2000, WTO members will continue to battle over the relationship between free trade and the environment. The UN Commission on Sustainable Development will review progress towards sustainability. World Bank/IMF meetings will confirm how far the environment has entered their core agendas. The World Commission on Dams report may show how the economic benefits of large dams weigh against the environmental and social costs. Running through all these is the common thread that sustainable development is as much a question of economics as of environmental science. We need the economic activity but equally we need to find new ways to measure, influence and control it.

Some argue that free market capitalism will automatically bring about the changes needed. As the prices of scarce environmental resources rise, and as industries and consumers have more money to spend, new technologies will be introduced to reduce the impact on the environment.

Many such technologies already exist, but how quickly and thoroughly will industry adopt them? And how can consumers be encouraged to adapt their habits and expectations to reduce the impact of their consumption on the environment? People and businesses make their decisions on the basis of what they want today or tomorrow, not in a generation's time.

For many critics of free market capitalism – including many who can loosely be described as 'green economists' – the root of the problem is that most environmental resources and services are not counted by the market and do not have a price. This is because they are not produced or owned by anyone, but are common to all. The free market's price mechanism does not work for them, and therefore deliberate effort is needed by governments to influence how and what individuals and industries consume.

This briefing outlines some of the different ways being tried today – by governments, citizens, industries, researchers and international development agencies – to make the environment count in economic planning, and to find the elusive path to sustainable growth.

NEWSPEGS

- ✂ **March 2000:** UN Secretary-General's Report for the UN Millennium Assembly and Summit issued
- ✂ **April:** UN ECOSOC and Bretton Woods Institutions Special High-Level Meeting, New York
- ✂ **11-13 April:** UN Framework Convention on Climate Change workshop on Best Practices in Policies and Measures, Copenhagen
- ✂ **10-14 April:** G77 South Summit, Havana
- ✂ **25 April-5 May:** UN Commission on Sustainable Development 8th session, New York
- ✂ **21-24 May:** World Forum on Energy Regulation, Montreal
- ✂ **22-26 May:** Millennium NGO Forum, UN Headquarters, New York
- ✂ **5 June:** World Environment Day
- ✂ **12-16 June:** UNCTAD Third UN Conference on the Least Developed Countries, Intergovernmental Preparatory Committee, Geneva
- ✂ **June:** Final Report of the World Commission on Dams published
- ✂ **26-30 June:** World Summit for Social Development and Beyond (Copenhagen +5), Geneva
- ✂ **21-23 July:** G7/8 Summit, Okinawa
- ✂ **5 September:** UN Millennium Assembly opens, New York
- ✂ **6-8 September:** UN Millennium Summit, New York
- ✂ **September:** World Bank and IMF Annual Meeting, Prague
- ✂ **24 October:** UN day
- ✂ **13-24 November:** UN Framework Convention on Climate Change 6th Conference of Parties, The Hague
- ✂ **20 November:** Africa Industrialisation Day

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KEY FACTS

- ✍ The health of ecosystems and of global biodiversity is declining; some estimates put the decline at 30 per cent between 1970 and 1995.
- ✍ Conventional economists believe that continuing economic growth will solve the world's environmental problems as they arise. But 'environmental economists' in many countries – including Kenya, South Africa, Thailand, Costa Rica, India, Brazil, the Philippines, Chile, the USA and several European states – are exploring ways of including environmental impacts in economic thinking.
- ✍ Some industrialists say we are about to see a 'new industrial revolution', in which cleaner production methods will enormously reduce the impact of industry on the environment.
- ✍ Using present methods, one ton of paper requires the use of 98 tons of material resources in its manufacture.
- ✍ Since 1980, China has made great improvements in energy efficiency at its power stations and factories, halving its energy consumption per unit output.
- ✍ It is estimated that US\$650 billion of subsidies worldwide – equivalent to nine per cent of all government revenue – supports environmentally destructive types of logging, mining, oil drilling, livestock grazing, farming, fishing, energy use and motoring.
- ✍ The research department of the Organisation for Economic Cooperation and Development (OECD) is currently investigating ways to reduce material throughput and energy use in member countries by 90 per cent.
- ✍ The IUCN supports environmental accounting pilot projects in Pakistan, Bangladesh, Nepal and Vietnam.
- ✍ The World Bank believes that man-made capital such as education, research, creativity and new technologies can replace natural capital.
- ✍ The World Bank is starting to include environmental considerations and sustainability into its Country Assistance Strategies and in the new national Comprehensive Development Frameworks (CDFs).
- ✍ Private investment outstrips government aid by factors of 10 and even 20, but so far there is not much awareness of or commitment to sustainable development among private investors.
- ✍ Global advertising spending – aimed at increasing consumption - was nearly US\$430 billion in 1998 – more than half the level of global spending on the military. Advertising expenditure has grown four-fold in Asia and more than five-fold in Latin America in the last 10 years.

ECONOMICS FOR EVER

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1. THE THREAT OF DEVELOPMENT

The turn of the millennium has seen a record number of natural disasters and extremes of weather: Bangladesh's worst ever floods in 1998, a cyclone in Orissa, India, and floods in Venezuela at the end of 1999, to name but a few. The costs of these disasters – financial and human – are enormous, and sometimes they set development progress back by years. It is also the poor who suffer most. **According to the World Bank, in the period 1990-98, 94 per cent of the world's major disasters struck developing countries, which also bore 97 per cent of disaster-related deaths.**¹

More and more people believe that 'development' is one of the causes of these violent natural disasters - local economic activities such as deforestation, and global greenhouse gas emissions causing climate change. Is development destroying our planet? And can we change the direction of development to avoid catastrophe?

During the past two centuries industrialisation has transformed life on the planet, increasing the human population and creating wealth on a scale that could hardly have been imagined earlier. **In the last 50 years alone, total global economic output has increased from US\$4.9 trillion to more than US\$29 trillion – a six-fold increase in wealth at a time when the world's population has only doubled.**²

For most countries and for most of the 200-year period of the industrial age, the dominant economic system has been free market capitalism. Whatever the faults some people find in it, this system has been successful in encouraging initiative and technological innovation, and in creating wealth.

But this wealth-creating industrial system is built on exploitation of the natural environment – for raw materials, for energy, and for 'services' such as supply of fresh water and absorption of wastes. Until a few decades ago there was little thought about the long-term effects, but since the 1960s there has been a growing realisation that the growth of industrial production may destroy the earth it is based on if it goes on for much longer at its current rate – and if it increases to include the millions who are at present too poor to have a share of its benefits. If everyone, everywhere in the world, consumed as much as Americans do now, we might need six planets to support them.³

Today, the scale and pace of industrial consumption and production (which includes the agriculture that supports it) are using natural materials faster than nature can replace them. They are destroying ecosystems which provide vital services and life-support systems, and damaging the earth's essential functions such as the cycling of water, nitrogen and carbon dioxide. The earth cannot absorb our wastes nor provide the raw materials nor keep us supplied with fresh air and water as fast as we are demanding them.

Another aspect of the free market industrial system that has become increasingly evident is that the system distributes its wealth unequally. **The gap between rich and poor is growing, both within and between countries. A few hundred millionaires now own as much wealth as the world's poorest 2.5 billion people.**

Free market capitalism has proved itself remarkably adaptable. Through automatic adjustment of prices and demand, production and consumption patterns have changed to meet new circumstances. The question being asked now by leaders, analysts and citizens all over the world is: can free market capitalist industrialism be left alone to solve the problems of environmental degradation and inequality that face us, as its champions claim? Or does the world community need new ways of thinking and new institutions of governance to steer development in the direction of environmental sustainability and equity?

2. ECONOMIC GROWTH – THE STORY SO FAR

In the period since 1945, most economic policy has sought to increase industrial production and consumption. This has been the case in the so-called ‘developed’ world (capitalist and centrally planned economies alike) as well as in the post-independence developing countries. ‘Growth’ has always been the aim, and ‘economic growth’ has been almost synonymous with ‘development’.

There are a number of explanations for this perpetual drive for growth:

- ✍ There is an assumption that societies’ standards of living can continually improve, and for poorer countries there is the very understandable desire to catch up with richer ones.
- ✍ Governments gain political support by promising growth.
- ✍ Businesses grow in the search for bigger profits and an ever-sharper competitive edge.
- ✍ Growth is self-perpetuating: businesses grow by borrowing for investment, then have to grow further to repay the debt.⁴

Industrialists and economic planners have generally behaved as if growth could go on for ever – and maintained that the benefits would eventually ‘trickle down’ to the poor.

But human production is based on the use of natural resources, and as it grows, its impact on the environment can be severe. Modern industrial societies are not the first to endanger their long-term survival by damaging their own environments; ancient Mesopotamia, for example, saw its agricultural lands fill with salt as a result of poor irrigation practices. Industrial societies today, however, are damaging their environments on a far larger scale and far more rapidly, because of their vastly higher rates of consumption and pollution.

The crucial change in pace came with the discovery of how to use fossil fuels on a large scale. This began with the burning of coal in Europe, especially Britain, in the mid-18th century. At the same time, the new factory system speeded up production by eliminating the periods of idleness in the use of tools, machines and men that were characteristic of earlier phases of production. These changes led to enormous increases in productivity and the use of materials, and a massive acceleration of economic activity and creation of wealth. They also saw a consequent exploitation of the environment, in agriculture as well as industry.

Pressure on the environment

Environmentalists, and increasing numbers of concerned citizens and politicians, believe that economic growth on the conventional pattern cannot go on for ever. Too much pressure is already being put on most of the earth’s natural resources: we are already starting to run short of materials such as soil and fish because we use and destroy them far faster than nature can replace them.

Equally seriously, habitats and ecosystems are being destroyed at an alarming rate, and much of the loss is irreversible. At present rates we will have destroyed 70 per cent of all coral reefs within current lifetimes – reefs which host 25 per cent of the world’s marine life.⁵ On virtually every measure the health of ecosystems and of global biodiversity is declining; some estimates put the decline at 30 per cent between 1970 and 1995.⁶

All this destruction is the downside of the system which creates wealth. It also has costs for human societies in the short term, though these are often not recognised in conventional economic measures. A country’s economy may be growing briskly, according to standard economic measures, at the same time as it is suffering increasingly rapid erosion of its natural resources and deterioration in its local environment.

Green economists have reconstructed the measures that make up the standard gross domestic product (GDP) for several countries to produce an Index of Sustainable Economic Welfare (ISEW), which includes indicators of quality of life and environmental health. **Based on these new indices the USA, Germany, the United Kingdom, the Netherlands, Australia and Chile have all enjoyed robust economic growth over the past 50 years, but their per capita well-being is in fact declining or has been stagnant for the last 15 to 30 years.**⁷

Conventional growth may have negative effects on individual well-being in lower income countries, too. In the years between 1978 and 1995, China's economy grew at an average rate of 6.8 per cent per year, yet analysts have pointed to deepening inequality, soaring unemployment and social instability. China is now one of the most polluted countries in the world. A World Bank study showed that environmental degradation and resource scarcity have had a profound impact on China, including:

- ✍ a cost of 8-12 per cent in lost GDP
- ✍ US\$14 billion in lost industrial output
- ✍ US\$24 billion of crops lost through water scarcity and pollution
- ✍ health costs arising from air pollution that may reach US\$98 billion by 2020.⁸

If full adjustments were made for this, China's net GDP growth would be negative. Ghana, too, is often cited as a success among African economies, but the World Bank found that its growth rate was negative when damage to the environment and depletion of natural resources were taken into account.⁹

Neo-classical economics

'Classical' economics emerged as a discipline in the late 18th century in rapidly industrialising Britain, concerned with analysing economic activity and the exchange of goods. It was not much concerned with measuring the role of non-traded goods (such as many environmental resources), or the impacts of economic activity on the environment. Today's industrialised economies inherited the same basic ideas, though nowadays most economists recognise that the free market does not function perfectly, requiring occasional government intervention. This modern version is known as 'neo-classical' economics.

Adam Smith, one of the first and most important theorists of classical economics, outlined the central tenet: that an open market for goods and factors of production (labour, capital and nature) will produce the best possible decisions affecting growth, technologies, distribution of income and the satisfaction of needs. Smith assumed that in a free market individuals will always behave in a rational manner to promote their own interests, that the sum of all individuals' behaviour will create a market which serves the good of all, and that the mechanism for achieving this works through variation in the price of goods according to how scarce they might be.

Smith specified that the free market would only function properly under certain conditions:

- ✍ buyers and sellers must be too small to influence the market price
- ✍ complete information must be available to all participants in the market
- ✍ sellers must bear the full cost of the products they sell and pass them on in the sale price
- ✍ investment capital must remain within national borders
- ✍ trade between countries must be balanced, and savings must be invested in the creation of productive capital.

Most economists today recognise that the market system in the real world produces some undesirable effects – such as the increasingly unequal distribution of wealth and power, the domination of markets by the largest producers, pollution and the over-exploitation of natural resources. These can be attributed in part to the fact that the market does not operate under the conditions that Smith's theory postulated. As the financier George Soros observes:

"[Free market] economic theory is an axiomatic system; as long as the basic assumptions hold, the conclusions follow. But when we examine the assumptions closely we find that they do not apply to the real world."¹⁰

Long before Soros, many socialist, communist and other thinkers argued that Smith's ideal market bore little relation to the realities of power and dispossession. Some economists think that the solution is to improve conditions so the market operates with the freedom Smith envisaged; others believe Smith's ideal can never be realised.

One important weakness in the actual operation of the market is that many environmental resources are paid for inadequately or not at all. Resources such as fresh water, air, coral reefs and the sea are treated as if they were free, or of very low market value, because they are not owned by any identifiable individual or organisation (indeed, they are sometimes called ‘commons’). There is no mechanism for fixing a price for them, so people use them with little regard to their value or their long-term availability. Some resources – fish or forests, for example – do have a price if they are traded as commodities, but this price fails to reflect their rarity value or their ability to reproduce themselves. Prices fixed by the free market are never likely to reflect (until it is too late) the fact that much damage to the environment is irreversible.

Another notable feature of neo-classical economics in practice is its very short-term outlook. In decisions about whether to conserve or use a resource immediately, economists assume that an amount of money earned today is worth more than the same amount earned in the future, because today’s earnings could be invested and accumulate interest. For instance, US\$250,000 today would be worth nearly US\$2 million in 20 years’ time if invested at an interest rate of 10 per cent.

This ‘discounting’ means that future benefits are valued less than today’s benefits. By this reckoning, for example, it usually makes conventional economic sense to cut down a forest now rather than keep it in existence for future generations.¹¹ Those dealing in the shares of large companies usually look no further than two years ahead when assessing the health of a company in which they are considering investing. The longer-term risks, costs and benefits related to environmental resources are routinely ignored¹² – a perspective which fits in well with the short-termism of most politicians.

Neo-classical economics must not take all the blame for this short-term thinking. In fact, most individuals also make decisions based on their short-term interests – whether that be a poor person who needs to survive until tomorrow, or a rich one who wants to enjoy all the benefits of the high-consuming life in the here and now. Changing people’s habit of thinking for today rather than tomorrow is even more difficult than changing economic measurement systems.

Conventional economists and most governments in the industrialised world argue that economics is a science – inevitable, objective and value-free. Paul Ormerod, an economist who is critical of much conventional economic analysis, characterises it thus:

“Economists view the world as a machine. A very complicated one, perhaps, but nevertheless a machine, whose workings can be understood by putting together carefully and meticulously its component parts. A lever pulled in a certain part of the machine with a certain strength will have regular and predictable outcomes elsewhere in the machine.”¹³

Many green economists, on the other hand, challenge the idea that neo-classical economics and free markets are objective and ‘value-free’. They say that values are embedded in all economic models, and rather than deny this we should acknowledge it and decide what values we want our economic systems to promote. Amartya Sen, 1998 Nobel laureate in economics, writes:

“Modern economics has been substantially impoverished by the distance that has grown between economics and ethics”.¹⁴

He challenges the assumption that individuals act as ‘economic man’, seeking only to maximise self interest: “It would be extraordinary if self interest were not to play quite a major part in a great many decisions, and indeed normal economic transactions would break down if self interest played no substantial part at all in our choices. The real issue is whether there is a plurality of motivations or whether self interest alone drives human beings”¹⁵

Or, as Adam Smith put it: “Man...ought to regard himself, not as something separated and detached, but as a citizen of the world, a member of the vast commonwealth of nature”.¹⁶

Measuring growth

A common tool of economic measurement is annual gross domestic product (GDP), a measure of the total production of goods and services in a country's economy. GDP was introduced as a measure in Europe after the Second World War, and since then has been progressively adopted around the world as the accepted international standard of economic measurement. Critics point out that GDP includes not only productive activities and useful services, but also some that could be considered negative. For instance, GDP might include a productive activity that causes pollution, the money spent on cleaning up the pollution and also expenditure on treating the damage to health caused by the pollution.

GDP is likely to count the destruction of environmental resources as a gain rather than a loss; felling a forest might count positively as timber production or the creation of building land, not negatively as loss of flood protection, for instance, as some would argue is more appropriate. The negative social and environmental results of production are not subtracted from GDP to provide a real 'total' picture of a country's progress.

Who's afraid of economic growth?

There are many different views on whether the dominant, growth-oriented economic system will be able to solve the environmental challenges we face. The conventional neo-classical view holds that continuing growth will solve our environmental problems as they arise. In the words of *The Economist*, "Greater prosperity is... the best way to improve working conditions and the environment."¹⁷

According to this argument, free market mechanisms will solve environmental problems in two ways. Firstly, as societies become wealthier they will have more money to spend on cleaning up environmental problems. Some studies have shown that while the level of environmental degradation initially increases as societies develop, after a certain point of development it starts to decrease. Also, according to this theory, consumers will start pressing for better environmental performance once they reach a certain level of wealth – for instance, they will not go to polluted beaches or buy food which contains too many chemical residues.

Secondly, the price mechanism will ensure that technological development and innovation solve environmental problems as they arise. When a resource becomes scarce, its price in the free market goes up. It then becomes cost-effective for a business to invest in research to find a substitute, or to develop new technology to reduce its use of the resource – thus taking the pressure off that resource and solving the problem.

This is already happening in many areas: for instance, it is becoming cost-effective to reduce energy use, and may soon become cost-effective to obtain more energy from renewable resources, reducing our reliance on oil and coal. Julian Morris, from the free market Institute of Economic Affairs, argues:

"Whilst it seems reasonable to suppose that relatively few entrepreneurs view resource conservation as a primary goal, most would probably agree that it is nevertheless a key element of business success...The notion that this system can be improved upon by government intervention – as many argue – is implausible."¹⁸

These arguments have been dominant within industry, international financial institutions and many government circles until very recently. Now some are starting to find them less convincing, at least in their purest 'free market' form. Increasingly, people are turning to the wide variety of green economic theories which challenge the conventional model.

3. GREEN ECONOMIC THEORIES

Green economic theories do not constitute a single school of economic thought. Economists in many countries – including Kenya, South Africa, Thailand, Costa Rica, India, Brazil, the Philippines, Chile, the USA and several European states – are exploring different ideas, carrying out research, debating and experimentally applying green economic policies. But there are some common basic principles:

- ? we need to reduce our impact on the environment
- ? we can organise production/consumption differently to do this
- ? we need economic tools and policies to steer us in the right direction

The heart of green economics is the proposition that humanity should live off its environmental income rather than its environmental capital, income being defined as that which can be harvested indefinitely without reducing the assets (or capital) on which it depends. It is an idea which has obvious appeal, as well as long-established roots in conventional economic thinking.

Yet within the common ground of these basic principles exists a wide range of positions. At one end of the spectrum there are conventional economists who are concerned about environmental protection but who do not believe any changes to economic theory and practice are needed. At the other end there are those environmentalists who believe that the causes of our environmental problems are to be found at the heart of the free market economic system itself.

Eco-efficiency and new technologies

Most environmental economists are not against economic growth per se. The world economy has to produce more goods and services to meet the needs of the poor and of the future's larger population. But these **goods must be produced using much lower levels of natural resources and producing less waste**. For example, if industrialised countries, in order to minimise climate change, meet their targets to reduce consumption of fossil fuels by 60 per cent, then their economies can 'grow' by three per cent a year for the next 50 years – but only so long as there is a 95 per cent improvement in the efficiency with which these fossil fuels are used.

Many new technologies and management goals and systems that could move industry towards much greater 'resource productivity' already exist and are being adopted by leading industries. **So is cleaner production the solution to the world's environmental problems? Some industrialists and technologists think so.** They talk of a 'new industrial revolution' in which not only is the consumption of materials and energy enormously minimised, but water and air actually leave factories cleaner than when they entered.¹⁹

But many environmentalists see weaknesses in this vision of 'green capitalism'. Some are highly sceptical, and say **the rhetoric is a cloak for 'business as usual' by what they regard as unaccountable corporations that will, if the need arises, sacrifice sustainability for short-term returns.**²⁰

Others argue that reductions in adverse environmental impacts might be counteracted by increases in production, thus increasing the total impact on the environment even though the impact per unit actually falls. For example, car fuel efficiency has improved dramatically in recent years, but people now drive further and general levels of car ownership have increased. Paul Hawken, a leading commentator on the 'greening' of business in the USA, says:

"Despite much good work, we still must face a sobering fact. If every company were to adopt the best environmental practices of leading companies... the world would still be moving towards sure degradation and collapse."²¹

A further objection to 'eco-efficiency' as a path to sustainability is that it does nothing to address wider attitudes to consumption. Many analysts feel these have to change if global environmental sustainability is to be achieved.

Nor does it question the usefulness of particular products. The creation of demand for consumer goods through advertising is in itself one of the world's biggest industries. In the USA advertising accounts for 2.3 per cent of GDP, nearly half the amount spent on education. According to the United Nations Development Programme (UNDP), global advertising spending was nearly US\$430 billion in 1998 – more than half the level of global spending on the military. Advertising expenditure has grown four-fold in Asia and more than five-fold in Latin America in the last 10 years.²² This vast investment in advertising to secure the continuance of the economic system that has given birth to the advertising industry gives rise to the observation that 'production determines consumption'. As the philosopher John Rawls has pointed out:

"An economic system is not only an institutional device for satisfying existing wants but a way of fashioning wants in the future."²³

Valuing environmental resources

For many green economists, the most important activity at the moment is working out monetary values for environmental goods, so that the costs of using them can be included in development decision-making. For example, a developer deciding whether to fell a forest would balance the obvious cash benefits, such as timber for sale and new land for agriculture, against other values which would be lost if the forest were destroyed. These might include medicines which could be developed from some of the forest's biodiversity, income from tourism, the livelihoods of people living in the forest, and ecosystem functions such as water catchment, soil protection or carbon dioxide absorption. Whereas in the past the forest's only monetary value would be as timber and land, environmental valuing attempts to make the environmental roles of the forest equally or more economically valuable.

For its proponents, setting a monetary value on natural resources is seen as the most effective way to get the industrial process – including investment decisions, planning processes, and economic policy-making – to start protecting instead of destroying the environment. If they can work out the values of resources and impose them – for example, through taxation – the market will then work to ensure that the resource is used sustainably. Regulations and controls, on the other hand, are difficult to enforce and always likely to be evaded. Another school of thought, however, notes that, "Valuing environmental assets is even more difficult than quantifying them physically, and therefore is generally not attempted."²⁴

The work of establishing values for environmental resources has been going on for several decades. However, establishing monetary values for environmental goods is not at all straightforward; there are many different approaches and as yet there is no standard or widely accepted set of rules. Some green economists believe that a monetary value can be found for virtually everything in the environment – although to achieve this would involve the compilation of large amounts of complex information.

Use value

The simplest kind of value (apart from that of goods which are already traded as commodities, such as minerals or fossil fuel) is 'use value'. This is based on the value to people of the use they make of the resource, and is easiest to establish where that use is immediate and localised. The 'use value' may be calculated on the basis of how much it would cost to provide the same service by artificial means.

One example comes from a forest in the Catskill Mountains near New York City, which soaks up water and provides a steady flow of high quality water which is piped directly to drinking taps in the city. By the early 1990s, development in the watershed area was damaging the quality of the water being piped. It was found that a filtration plant would cost about US\$8 billion to build and US\$300 million a year to run – a total of US\$11 billion over 10 years. Restoring the watershed to its natural condition, however, would cost less than US\$2 billion, thus in effect saving the city around US\$9 billion over 10 years.

Once planners realised this, the question was how to raise the money to pay for the watershed restoration. It was proposed that investors should be offered 'securities' – contracts from the city which

would give a return based on what the city would save by not building the filtration plant. A US\$2 billion investment would earn US\$4.5 billion (half of the \$9 billion savings). Over 10 years that would have amounted to US\$450 million a year, giving a return on the investment of 22.5 per cent. In the end the city decided not to pursue this long-term venture and simply borrowed the money. Nevertheless, for cities or nations with poor credit ratings, securities could be a way of financing environmental protection.²⁵

The concept of 'use value' was the basis of the US\$1.1 million deal struck between the Costa Rican quasi-governmental organisation INBio and Merck, a major pharmaceutical company, in 1993. INBio agreed to provide Merck with 10,000 bio-samples from nature parks in the country and in return, if Merck developed profitable drugs from these samples, then INBio would receive a percentage of the royalties.

Damage costs

Other means of working out value include calculating the cost of the damage that would be caused if the activity continued. On a small scale this can be used to reduce pollution: a charge based on the cost of cleaning up and dealing with health impacts can be imposed as a fine or a per unit charge. The eventual effect of this is to make it cheaper for the polluting industry to reduce the amount of pollution in the first place.

On a larger scale, the idea of damage costs has been used to convince sceptics that it is worth acting now to do something about global warming. Many efforts have been made to calculate the costs to the world of not acting – costs which include displacement of whole populations and changes in agricultural production patterns.

Option value and 'willingness to pay'

It is harder to attach a price to the value of ecosystem services which are less specific and localised, such as the continued existence of global biodiversity or a stable climate. **When possible future use of a resource can be foreseen but the monetary value of this use cannot be estimated very precisely, a value known as an 'option value' can be put on it, which can then be considered in any decision about whether or not to conserve the resource for the future.** The value that attaches to the future use of a resource may be very uncertain and depend on a number of different factors. For instance, a tropical forest may be a potential source of new drugs, but fulfilment of this potential depends to a large extent on how much the pharmaceutical industry is prepared to invest in research.²⁶

Where it is not clear that a particular environmental resource or feature has any practical 'use value' or its uses are considered too diffuse or long-term to capture in any realistic pricing calculation, other techniques may be used. **One is particularly controversial: 'willingness to pay'.** People who will be affected by the loss or preservation of the resource in question are asked how much they would be willing to pay to keep it, whether they value it for aesthetic, leisure, religious, material or other reasons. One difficulty with such a technique is that the results vary depending on whose opinion is sought. Poor people, for example, are unlikely to say they are willing to pay as much as richer people.

Cost Benefit Analysis

Cost Benefit Analysis (CBA) is a tool used by governments and investors to make decisions about development projects: the project will be approved if calculations show that the economic benefit is likely to be greater than the economic cost. Increasingly, environmental impacts are included in CBAs of major infrastructure projects such as dams. In addition to the direct cost of the work, an assessment is made, using many of the above techniques, of the environmental damage the project is likely to cause and the value of the damage or the income which will be lost. This is then included in the comparison with the expected income from the project. For instance, will the electricity generated by a new hydroelectric scheme be worth more or less than the agricultural production, fishing livelihoods, beautiful valleys and natural watershed management which it might destroy?

CBA has become discredited in many eyes because in case after case – from major dams in India to new road schemes in the United Kingdom – the costs have not been borne by those who have reaped the benefits, and those who suffer have not been sufficiently compensated.²⁷ On the other hand, because CBA has been widely accepted, it can be a useful tool in calling attention to the real costs of environmental damage and depletion. After the 1997 forest fires in Indonesia, the Worldwide Fund for Nature carried out a CBA-type study of their impact, which gained a great deal of media attention and succeeded in putting the issue firmly on the political agenda.

Criticism of market-based approaches

In some form or another, the idea of calculating a monetary value for environmental resources is being gradually accepted by many governments and development agencies, and is beginning to feature at the level of national economic planning.

Valuing and creating artificial prices is also an essential tool in the implementation of multilateral environmental agreements. The World Conservation Union (IUCN), for instance, is testing different ways of valuing wetlands, which can be used to help countries protect their wetlands under the 1971 Ramsar Convention on Wetlands of International Importance.

Market-based approaches like these are increasingly accepted by governments, and others, as a practicable approach to sustainable development, but they are by no means universally welcomed. On the one hand there are those who say the market should be left to its own devices because governments are incapable of allocating meaningful prices to environmental goods. On the other hand, green critics also reject attempts to set prices on environmental goods, on different grounds:

- ? prices can never reflect the dynamism of nature – in other words no amount of human calculation can match the ingenuity of nature as it adapts to changing circumstances
- ? exploitation of some environmental ‘resources’ (killing great whales, for example) is morally wrong
- ? pricing alone cannot prevent behaviour that causes irreversible changes – in fact, it may even encourage it.

This approach favours the development of ‘parallel accounts’. These aim to establish environmental and social goods as values in their own right, and to measure them without attributing any monetary values to them. Economic activity is seen as just one set of activities within a healthy natural ecosystem.

Can human skills replace natural resources?

One fundamental issue on which green economic thinkers disagree with one another is whether one type of resource is as good as another in contributing to sustainability.

A formula for sustainability proposed by the World Bank identifies ‘four capitals’ which should be passed on undiminished to future generations:

- ? produced or physical capital (such as buildings and machinery)
- ? human capital (skills and knowledge)
- ? social capital (such as social stability and organisations)
- ? natural capital.

The World Bank, which in the past few years has started including the environment in its analyses, now shares common ground with some green economists. It believes that these different types of capital can be substituted for one another, with ‘sustainability’ achieved if the total value of the four together remains constant. If some natural capital is reduced, they argue, an increase in the value of ‘human capital’ – through education, for instance – is an adequate substitute.

Put another way, **this is the argument which has been going on since the Club of Rome’s controversial *Limits to Growth* publication in 1972, centred on whether there are limits to how**

heavily we can use the environment before it collapses. For instance, how much pollution can we pour into the sea before marine ecosystems are irreparably damaged? How much soil-eroding agriculture can the earth tolerate before it can no longer produce our food?

Some say there are limits, and our planning for the future – including how we use economics – must recognise this and ensure that production and consumption are contained within those limits. Others say the limits should not worry us unduly, because with technology changing so fast we will be able to find substitutes and alternatives for every resource we seem to be over-exploiting at the moment. In other words, man-made capital such as education, research, creativity and new technologies are an adequate substitute for natural capital.

The Club of Rome's predictions back in 1972 were that the world would soon run out of various raw materials essential for industrial production, such as copper. In fact, this has not happened, as new materials have been developed to replace many of those that seemed to be in short supply. Further, the prices of primary commodities have generally fallen, instead of rising as would be expected if they were scarce. These facts are often used to lend weight to the argument that technology will generally solve environmental problems, and that the case for environmental 'limits to growth' is unproven.

On the other hand, many environmentalists argue that different environmental problems have emerged as a more immediate threat, arising from pollution and over-exploitation of environmental services such as the water cycle and the atmosphere. For them, falling prices of primary commodities are evidence that free market price mechanisms do not work to maintain the environment, and they agree with the Club of Rome's fundamental understanding of the global environment as finite.

The view that almost everything in the natural world can be transformed into man-made capital is known as 'weak' sustainability, or 'economic' sustainability. In this view consumption can be held constant, but only as long as the income generated by natural resources is reinvested in other forms of capital. Many mainstream economists believe that a prosperous economy, on the current model, can indeed deliver this kind of sustainability. Where there is capital and ingenuity, they argue, there will be technological breakthroughs, and now that the environment is a major concern, inventive genius in a thriving free market will solve these challenges.

'Strong' sustainability, on the other hand, holds that man-made capital is not an adequate substitute for natural capital, the loss of which is frequently irreversible. Critical natural capital such as biodiversity, fresh water or fertile topsoil must be preserved and must be monitored by physical indicators – which measure how much of it there is and how healthy it is, not how much it may be worth in money terms. Governments, the argument runs, must intervene in the market to fix prices so as to ensure that the consumption of environmental goods is properly managed – something the free market will never effectively accomplish.

Sharing the environment

If the environment is a finite system, we have to measure how we are using it not in monetary terms but in physical terms. We must try to see what amounts of different natural resources are available, then work out what amount of different human activities can be supported by these resources (or what their 'carrying capacity' is). The next step is to measure how much we are actually using, so that we can limit our use where necessary.

Total Material Requirement

One of the prototype methods which has been developed to gain a better understanding of what we use is the Total Material Requirement (TMR) approach. **This aims to identify the total flows of resources (including energy) that make up services and commodities**²⁸ Mining, harvesting, transport and building infrastructure (such as roads) use large amounts of raw and finished materials which are not visible in the goods and services when they are priced and sold; for example, one ton of paper requires the use of 98 tons of material resources in its manufacture.²⁹

TMR analysis reveals that these 'hidden' materials account for 55 to 75 per cent of the total flow of materials into and out of four major industrial countries (Germany, Japan, the Netherlands and the

USA). In an ever more global economy, a significant proportion of the natural resource exploitation used to support national economic activity now actually takes place outside industrialised countries.

Environmental space

Many argue that as well as a technological need to find the means of living within the biosphere, we also have a moral obligation to share its resources equally and to establish consumption limits not just for the whole of humanity but for every country and individual. One start at making this idea practicable is the concept of 'environmental space'. Friends of the Earth defines total environmental space as: **"the total amount of pollution, non-renewable resources, agricultural land and forests that we can be allowed to use globally without impinging on the access of future generations to the same amount"**.³⁰

Once the totals have been calculated, the performance of economies can be measured against these entitlements – based on the principle that each country should have the same amount of environmental space per head of population. Friends of the Earth in the Netherlands estimated back in 1992 that this would mean 0.22 hectares of agricultural land for each individual on earth by 2010. At that time the consumption of an average person in the Netherlands was based on 0.45 hectares (much of it outside the Netherlands, which imports a large proportion of its food). For timber, they estimated that by 2010 each person on the planet should live off 0.4 cubic metres, but in 1992 people in rich countries were already consuming 1.1 cubic metres per head, while people in poor countries were using just 0.1 cubic metres. Overall, they estimated that to contribute its fair share to a sustainable world the Netherlands would have to cut its per capita consumption of energy by 60 per cent, of piped water by 38 per cent, of wood by 65 per cent, and of agricultural land by 45 per cent by 2010.

Measurements such as those based on environmental space can strengthen claims that current levels of economic activity are unsustainable, but they are not at present significantly influencing economic decision makers. However, if the evidence about the adverse effects of global warming continues to build, the case for equalising shares in the world's emission of greenhouse gases will become more compelling. A so-called 'emissions trading system' could be an efficient way of distributing rights to emissions which could be based on principles of global equality. However, the political obstacles involved in reaching such agreements, as was seen at the Kyoto climate change summit in 1997, are enormous.

4. CURRENT DIRECTIONS

Industry level

Producers have not usually had to pay for the damage they have caused to the environment and those who live in it. These costs are known as 'externalities' because they are borne by others, external to the production and selling process. British economist Arthur Cecil Pigou pointed out back in the 1920s that externalities could be 'internalised' by using the price mechanism. This is the origin of the 'polluter pays' principle, which holds that taxation or some other compensation mechanism should be used to ensure that a polluter pays the full cost of making good any damage that a production process has caused.

This principle is now quite widely accepted and is starting to be applied around the world. In the early 1990s Colombia decided that all polluters of rivers in the Antioquia region (and this included towns, factories and farms) had to pay for each unit of organic pollution they were responsible for discharging. During the programme's first year, discharges reportedly dropped by 18 per cent and some factories cut their discharges by 52 per cent.³¹

Reducing the pollution generated by producing goods – 'clean production' – is part of eco-efficiency, but not the whole of it. Eco-efficiency also means a broader overhaul of production processes, with a 'cradle-to-grave' analysis of the materials and energy used from the sourcing of raw materials to the delivery, use and eventual disposal of the finished product. Opportunities for reducing the amount of materials and energy used can be found through reducing waste, saving energy, reducing the distances goods and parts are transported, using by-products and recycling. According to business

magazine *Tomorrow*, “Eco-efficiency is a winning concept, attracting fast-growing attention worldwide – with an impressive number of governments now lining up to move the whole agenda forward.”³²

The eco-efficiency challenge has been embraced by some major players in the corporate sector, such as the World Business Council for Sustainable Development. The research department of the Organisation for Economic Cooperation and Development (OECD) is currently investigating ways to reduce material throughput and energy use in member countries by 90 per cent.

In 1998 the European Union adopted the goal of achieving four-fold (‘Factor Four’) efficiency gains in resource use over the coming 10-20 years, with the longer-term aim of a 90 per cent (‘Factor Ten’) improvement.

Delivering such eco-efficiency gains is a huge challenge, but enthusiasts believe it is technically possible. New production systems, new managerial styles, and technologies such as information technology already exist which could radically alter demand and supply for many natural resources.³³ Nano-technology – the ability to manipulate matter on the molecular scale – is still at the laboratory stage, but if it becomes commercial it could have the potential to eliminate an estimated 99 per cent of the energy and materials used in factory production.³⁴

Claims of success are being made all over the world:

- ✍ In Eastern Europe, one of the most polluted regions of the industrialised world, a network of private energy service contractors are making profits for themselves and their customers by reducing their energy use.³⁵
- ✍ In 1999 authorities in Mauritius began construction of a power station near the capital Port Louis which will mix bagasse (the waste product from sugar cane) with coal, to produce at least 40 per cent of the island’s electricity.
- ✍ An engineer in Singapore has designed an air conditioning system which uses 60-70 per cent less energy than the norm.³⁶

Many industries, and some governments representing the interests of major industries, resist such changes because they fear the costs of redesigning and building new plant will harm their competitiveness. But increasingly, industrial leaders in the introduction of eco-efficiency claim that initial investments are quickly repaid in greater ‘resource productivity’ and improved competitiveness. This claim is now backed by a growing body of evidence. An analysis of 300 companies in the Fortune 500 Index, by Canadian consultants Innovest, suggests that environmentally-minded companies outperformed their competitors by around 2-3 per cent.³⁷

National level

Pressure from clients and customers is, in some countries, a significant factor in persuading businesses to make such investments. Nevertheless, it may not be enough simply to assume that the market can be left alone to bring about changes on the scale required. Governments may have to intervene in the form of regulations, or price regulations, to encourage businesses to take the necessary steps.

India’s government has begun to commit itself to improving energy efficiency. In the mid-1990s it introduced tax incentives for energy efficiency investments, notably a 100 per cent depreciation allowance in the first year for certain categories of energy-saving equipment. It has also supported limited financing for energy-efficiency investments in the industrial sector.

Some emerging economies are achieving notable efficiency gains and may be able to leapfrog the so-called ‘dirty production’ stage. China, whose economy has boomed over the past decade and a half, is a prime example. With a fifth of the world’s population and an even greater proportion of its coal, China’s carbon dioxide emissions have doubled in the past 14 years and are now the world’s largest after the USA. But a recent UNDP study found that, since 1980, China has made extraordinary improvements in energy efficiency at its power stations and factories, halving its energy consumption per unit output. China uses less energy per dollar of GDP than the USA.

In other words, even very poor countries can keep the growth of their emissions well below their rate of economic growth. Given China's impressive achievements in the energy field, the USA's refusal to accept the emissions reductions agreed in the Kyoto Protocol on Climate Change unless it saw 'meaningful' commitments from 'key developing nations' seems hard to justify.

National environmental accounting

Work to devise ways of reflecting a country's environmental resources in its national accounts has been underway since the 1970s. In Norway, France, the Netherlands and Indonesia, government statistical departments began working to modify national accounts some years ago, while the Philippines, Namibia, Mexico, South Africa and Chile are among the countries which have started experimenting more recently. Several international government and non-governmental agencies and many researchers are working in this area.

In some countries, such as the USA, highly polluting industries feel threatened by the idea of national environmental accounting. By contrast, many developing countries for whom natural resources form a high proportion of their economy are interested in the idea but do not have strong enough national accounting capacity to introduce the additional burden of environmental accounting.

There is still a long way to go in developing standardised methods and building the capacity to use them if the idea of environmental accounting is to be widely adopted and sceptical countries convinced of the benefit of such innovations. The UN Statistical Department has since the late 1980s been coordinating efforts with a mainly OECD group of government statisticians to improve and standardise methodologies.

The IUCN, which supports environmental accounting pilot projects in Pakistan, Bangladesh, Nepal and Vietnam, is also currently undertaking a review of such experiences worldwide. The review aims to assess what has been learned so far about the best methods of national environmental accounting, and the extent to which such accounting has proved useful to and been taken up by policy makers. Early results of the review suggest that environmental information is indeed starting to be utilised, for instance by the government of the Philippines.

The purpose of most of the attempts, according to the IUCN, is to provide better information for the economy - on whether degradation of natural resources or environmental services is likely to affect productivity, for instance, or what the cost of environmental protection policies might be. If there is an intention to protect the environment, this is secondary.

National environmental accounting can include many types of information - some physical data and some values. Data may include physical data on natural resource stocks and pollution, and calculations of the cost of pollution damage, as well as actual expenditure on and investment in pollution reduction. Environmental services may also be included, based on industry's willingness to pay. The Philippines is a leader in using this approach.

'Green GDP' or 'sustainable GDP' is one among many approaches to national environmental accounting. It is an aggregate measure of conventional GDP minus depletion of environmental assets minus costs of environmental degradation. Such an aggregate figure can reveal substantial losses of environmental resources which would be hidden in conventional GDP accounts. In Costa Rica, for example, it was estimated that in 1989 the depreciation of three resources - forests, soil and fisheries - amounted to about 10 per cent of that country's GDP. Green GDP has not been widely adopted by governments, but can be a useful tool in drawing political attention to environmental issues.³⁸

Fiscal instruments: making prices work for the environment

Most green economists would agree that market forces can be invoked to achieve positive environmental ends - including even some economists who do not believe that markets would achieve such ends if left to themselves. Much of green economics, therefore, is about developing effective market mechanisms, within environmental limits that have been agreed through political discussion.

Environmental protection can often be increased by phasing out ‘perverse subsidies’ (subsidies which have been introduced to support a key industrial sector but which have had the undesired effect of encouraging activities that damage the environment). It is estimated that US\$650 billion of subsidies worldwide – equivalent to nine per cent of all government revenue – supports destructive types of logging, mining, oil drilling, livestock grazing, farming, fishing, energy use and motoring.³⁹ That amount far exceeds what is spent on subsidies to protect the environmental resource base, such as soil-conserving farming practices.

- ✍ The US government for example, spends millions of dollars each year in payment to loggers who clearcut some of the country’s only rainforest in the Tongass National Forest in Alaska.
- ✍ In India, state governments in Gujarat and elsewhere give cheap or free electricity to farmers who use it to pump water out of underground aquifers faster than the rain can recharge them. And though the subsidies are often defended in the name of the poor farmer or urban food buyer, most of the subsidy ends up in the pockets of richer farmers.
- ✍ Governments in the advanced industrial nations gave their farmers US\$284 billion in 1996. Most went to rich farmers and locked them into heavy dependence on the use of pesticides and other practices that erode soil and pollute water.

But since the mid 1980s, Belgium, France, Japan, Spain and the United Kingdom have all eliminated or radically reduced once high coal subsidies. As a result, coal output halved between 1986 and 1995. Subsidies for fossil fuel in nations outside the industrial West, though still high, are less than half what they were a few years ago.

Eco-taxes

Taxes on pollution and resource depletion are being introduced or considered by governments around the world as a means of influencing the way that scarce resources are consumed, both at industry and household level:

- ✍ Pollution taxes in the Netherlands led to a 72-99 per cent reduction in heavy metal discharges into waterways between 1976 and 1995.
- ✍ Landfill taxes in Denmark have boosted the re-use of construction debris from 12 to 82 per cent.
- ✍ Singapore has been highly successful in managing traffic congestion through a sophisticated system of road tolls - its air quality is now among the best in the world.

Eco-taxes, say their supporters, mean a shift, not an increase, in the burden of taxes. Today nearly 95 per cent of the US\$7.5 trillion in tax revenues raised each year worldwide is levied on things people generally want, such as employment, income and profits. Sweden was the first nation to realise it made more sense to tax heavily the things people do not want, such as pollution. In 1991 the Swedish government collected US\$2.4 billion from new taxes on carbon and sulphur dioxide emissions – equal to 1.9 per cent of all tax revenues – and used the money to cut income taxes.⁴⁰

Taxes on fossil fuel use – ‘carbon taxes’ – are likely to be needed in countries with high levels of carbon dioxide emissions, if they are to reduce their emissions in line with the 1997 Kyoto Protocol on Climate Change. The aim of such taxes would be to shift consumers to more efficient use of fuels. The idea is proving unpopular so far in Europe. People fear the increased costs of fuel will be socially regressive, falling disproportionately on the poor, and will make industries uncompetitive. Despite the opposition, however, such taxation proposals are here to stay.

Local control

Another issue that is appearing on political agendas around the world is ‘environmental governance’. Enforcing limits or constraints on the use of globally scarce resources means creating effective and robust institutions for the purposes of policing and management. For critics of the ‘corporate world order’, the concept of sustainable development requires that populations seek to gain control of the resources of their own communities. The more economic power becomes concentrated and detached from any local interest, the more likely it is to be used to benefit global power holders at the expense of local community interests.

One possible solution proposed is to extend the ownership of corporate structures more widely. Employee Stock Ownership Plans, for example, are said to “reconnect personal conscience to market capitalism”. But in order for such an approach to work, significant investment is required in educational programmes to enable workers and other stakeholders to participate meaningfully and responsibly.⁴¹

Control of resources by governments may be no better than control by corporations. Countries as diverse as Mexico and Iran now recognise that nationalisation of forests, for example, was a mistake, and they are now handing control to local organisations. The management of resources such as grazing ranges or fisheries is often best undertaken by community organisations.⁴²

Around the world, civil society organisations are demanding a more participatory approach to decisions about, and management of, environmental resources. In Chile, for example, in the run-up to the 1999 national election a coalition of non-governmental organisations (NGOs), social organisations and academics issued a “citizens’ challenge to confront the inertia and sociopolitical stagnation in which Chilean society finds itself at the century’s end”. Their vision of how to move forward the process of rebuilding after the restoration of democracy includes “social equity, environmental sustainability and deepening of democracy”.⁴³

The government in Guyana has welcomed a similar demand.⁴⁴ The country is rich in natural resources (bauxite, gold, diamonds and tropical rainforests) but is one of the world’s poorest and most heavily indebted countries. Since the late 1980s, under the influence of World Bank and International Monetary Fund (IMF) structural adjustment plans, its economy has been dominated by foreign-owned extractive export industries, such as logging and mining, which largely benefit foreign investors and multinational corporations.

In 1994 a new government agreed to work with the people of Guyana and an international NGO (the Bretton Woods Reform Organisation) to design and carry out an Alternative Structural Adjustment Programme. The idea was to combine direct grassroots involvement with the technical skills at the disposal of governmental officials and other interest groups, with the aim of refocusing the economy on meeting the basic needs of the entire population. Food security and small-scale enterprises are key elements of this plan, while the export of primary commodities is actively discouraged.

International agreements

Economics, green and conventional, have a great bearing on whether international environmental agreements can be effectively implemented. **Where an agreement seeks to introduce regulations which are seen by governments as being against their economic interests, such agreements are unlikely to be ratified** – contrast the relative success of the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer with the 1997 Kyoto Protocol on Climate Change, which the USA has not yet ratified. The Montreal Protocol succeeded, insofar as it did, partly because it was easy for the major industrial coolant manufacturers in the West to replace ozone-depleting products with other chemicals. The Kyoto Protocol, on the other hand, has fed US fears that reduced fuel use and an increase in fuel prices would undermine the American economy and standard of living.

When an agreement has been reached, pricing mechanisms to trigger reduced consumption are important implementation tools. Yet carbon taxes on fuels which produce carbon dioxide emissions, for example, are generally unpopular. Widespread public debate is required to increase understanding of eco-efficiency and the wider values and goals of green economics.

International agreements can invoke market as well as fiscal mechanisms. This will be the case if the ‘sink capacity’ of forests (their capacity to absorb carbon dioxide from the atmosphere) is included as part of the Clean Development Mechanism of the Kyoto Protocol. If countries are allowed to count planted or protected forests against their industrial emissions of carbon dioxide, they may also be allowed to sell this sink capacity to other countries to help them meet their own emissions reduction quotas. In this case a market in ‘sink capacity’ will develop. The value of a forest will be based on a physical measure of its absorptive capacity (not on a simple monetary measure such as its commercial value as timber), and the market price will be set, presumably, by purchasing countries’

willingness to pay for this capacity. This may in turn be based on complex and indirect considerations of the cost of other ways of creating an equivalent reduction in carbon dioxide emissions.

5. INTERNATIONAL INSTITUTIONS

The World Bank

Few if any developing countries today risk pursuing an economic vision which is at variance with that of the World Bank and IMF. Apart from the direct power of its purse, the World Bank exerts influence on economic thinking through the presence of World Bank-trained economists in universities and research institutions in many countries. Indeed, the phrase 'Wall Street-Washington complex' is often used to describe the system that governs much of the world's economic decision making. Hence, if the World Bank and other multilateral institutions were to reorient their economic planning tools to take account of environmental limits, most countries would be likely to do the same.

As far back as the early 1970s the World Bank began to make pronouncements on its environmental responsibilities, and it has included measures of environmental depletion such as changes in land use, deforestation and air pollution in its annual publication *World Development Indicators*. But until very recently its critics felt that these were little more than after-thoughts, not integrated into the Bank's major focus -- growth.

The Bank itself acknowledges that its structural adjustment and liberalisation programmes have tended to accelerate the over-use of environmental resources and services.⁴⁵ Nor does it have a particularly good record on energy. Support for the energy sector, with little concern for clean and efficient production methods, has formed a significant proportion of its lending; since 1992 it has lent six times as much for fossil fuel projects as it has for renewable energy and energy efficiency.

But there are now some signs of change. The Bank is starting to respond to the arguments on sustainability, including those put forward by NGOs. Recently the Bank's President James Wolfensohn, and its then Chief Economist Joe Stiglitz, emphasised that in the past the Bank and other development agencies "focused too much on the economics, without a sufficient understanding of the social, the political, the environmental and the cultural aspects of society." The introduction to the Bank's *World Development Indicators 1999* states:

"Given the close link between economic activity and environmental change, there is a strong argument for developing indicators that integrate the economy and the environment more closely."⁴⁶

During Wolfensohn's presidency there have been several new initiatives set in train:

- ✍ An Environmental Indicators and Evaluation Unit was established in the mid-1990s.
- ✍ A number of research programmes have been launched, including one looking at the impact of trade liberalisation on the environment.
- ✍ Sustainability is being integrated into the Bank's key Country Assistance Strategies, with pilot projects (including a study of the environmental consequences of shrimp aquaculture in Thailand) due to report in 2000.
- ✍ A new method of consulting with governments and civil society to enable them to plan their own development paths – Comprehensive Development Frameworks (CDFs) – is being piloted in 11 countries in 1999-2000. All CDFs incorporate sustainability goals.
- ✍ The Bank's Operations Evaluation Department is carrying out an Environmental Review, which is likely to inform a new Environment Strategy Paper due for publication in 2000.
- ✍ The Bank's *World Development Report* in 2002 is to focus on sustainable development.
- ✍ The Bank is supporting a major programme to strengthen the capacity of developing countries in environmental management.

Genuine Savings Indicators

Many of these and other future World Bank processes are likely to be based on a newly introduced way of assessing countries' development: the Genuine Savings Indicator (GSI). The GSI aims to represent "the value of the net change in the whole range of assets that are important for

development: produced assets, natural resources, environmental quality, human resources, and foreign assets".⁴⁷

Calculating the GSI involves assessing the cost of pollution damage (including human sickness) together with the cost of depletion of a country's natural resources. These are then deducted from the country's total savings. The World Bank's *World Development Indicators Report 1999* lists figures for the depletion of energy, minerals and forest, and for damage caused by carbon dioxide.

A case study carried out by the Bank in Ecuador showed that, for the period 1970-1994, genuine savings based on the GSI were near zero once the depletion of the country's oil resources was set against the conventional savings rate of 20-30 per cent of national income.⁴⁸ The calculation shows that if oil profits had been reinvested, for instance in education, the GSI might have remained positive.

Even while welcoming this new methodology, green economists have called attention to limitations in the concept, methodology and data involved in calculating the GSI. In the Ecuadorian study, the only natural resources included were those commodities for which prices and depreciation values can be calculated fairly easily. Other essential natural resources such as water and soil, and ecological functions such as carbon storage and biodiversity, were not included. The Ecuadorian economist Fander Falconi, for example, has objected to the 'weak sustainability' assumption – that natural resources can be converted into monetary values and replaced by other types of resources – which underpins the GSI.

Private sector finance

Private investment outstrips government aid by factors of 10 and even 20 to one in the most dynamic emerging economies. **Private capital could play a vital role in investment for sustainable development, but so far there is not much awareness of or commitment to sustainable development among private investors.** A 1998 UNDP survey of American financial experts showed that environmental factors barely register when they are assessing corporate performance – only 10 per cent said they included criteria relating to environmental issues in their analyses. The reason, according to green business journal *Tomorrow*, is that there is no absolute proof of a correlation between environmental and financial performance.

Ethical funds, which direct private investment towards companies that meet certain social and environmental standards, have grown in popularity with small private investors in the rich countries in recent years. They still represent less than one per cent of the total investment market, they have exerted some influence on the climate of discussion. There are also clearing banks – for example, the Cooperative Bank in Britain, with over a million customers – which have detailed sustainability strategies and actively seek out investments in enterprises that meet rigorous sustainability criteria.

The Future

Individual governments' ability to regulate their own inward investment on sustainability grounds – for instance, by requiring that certain pollution standards are met – may be limited in the future not only by financial pressures but also by investment rules which are tabled for inclusion in any new round of free trade negotiations at the World Trade Organisation.

However, among institutions with the power to shape the future course of private investment, there is growing recognition of the necessity to deal with environmental as well as social challenges. According to Kazi Jalal, Chief of the Asian Development Bank's Office of Environment and Social Development:

"Asia is the world's most polluted and environmentally degraded region. You can see how population pressure in Asia is causing poverty, and poverty is causing environmental degradation, and environmental degradation is retarding the economic growth rate because the resources of the environment are also resources of development... It is a vicious cycle and unless you consider these social, economic and environmental problems in one context, you are not serious about meeting the challenges."⁴⁹

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