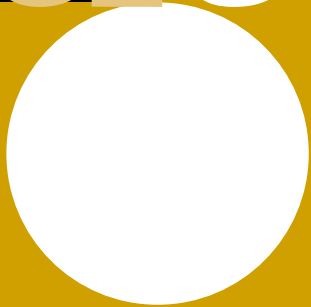


SUSTAINING

OUR
future



The founders of the United Nations set out, in the words of the Charter, to promote social progress and better standards of life in larger freedom—above all, freedom from want and freedom from fear. In 1945, they could not have anticipated, however, the urgent need we face today to realize yet a third: the freedom of future generations to sustain their lives on this planet. We are failing to provide that freedom. On the contrary, we have been plundering our children's future heritage to pay for environmentally unsustainable practices in the present.

The natural environment performs for us, free of charge, basic services without which our species could not survive. The ozone layer screens out ultraviolet rays from the sun that harm people, animals and plants. Ecosystems help purify the air we breathe and the water we drink. They convert wastes into resources and reduce atmospheric carbon levels that would otherwise contribute to global warming. Biodiversity provides a bountiful store of medicines and food products, and it maintains genetic variety that reduces vulnerability to pests and diseases. But we are degrading, and in some cases destroying, the ability of the environment to continue providing these life-sustaining services for us.

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During the past hundred years, the natural environment has borne the stresses imposed by a fourfold increase in human numbers and an eighteenfold growth in world economic output. With world population projected to increase to nearly 9 billion by 2050, from the current 6 billion, the potential for doing irreparable environmental harm is obvious. One of two jobs worldwide—in agriculture, forestry and fisheries—depends directly on the sustainability of ecosystems. Even more important, so does the planet's health—and our own.

Environmental sustainability is everybody's challenge. In the rich countries, the by-products of industrial and agribusiness production poison soils and waterways. In the developing countries, massive deforestation, harmful farming practices and uncontrolled urbanization are major causes of environmental degradation. Carbon dioxide emissions are widely believed to be a major source of global climate change, and the burning of fossil fuels is their main source. The one fifth of the world's population living in the industrialized countries accounts for nearly 60 per cent of the world's total consumption of energy, but the developing world's share is rising rapidly.

Our goal must be to meet the economic needs of the present without compromising the ability of the planet to provide for the needs of future generations.

We have made progress since 1972, when the United Nations convened the first global conference ever to address environmental issues. That conference stimulated the creation of environmental ministries throughout the world, established the United Nations Environment Programme and led to a vast increase in the number of civil society organizations promoting environmental concerns.

The challenges of sustainability simply overwhelm the adequacy of our responses—they are too few, too little and too late

Box 8
Protecting the ozone layer: an environmental success story

Twenty years later, the United Nations Conference on Environment and Development provided the foundations for agreements on climate change, forests and biodiversity. It adopted an indicative policy framework intended to help achieve the goal of sustainable development—in rich and poor countries alike.

Perhaps the single most successful international environmental agreement to date has been the Montreal Protocol, in which states accepted the need to phase out the use of ozone-depleting substances (see box 8).

Nevertheless, we must face up to an inescapable reality: the challenges of sustainability simply overwhelm the adequacy of our responses. With some honourable exceptions, our responses are too few, too little and too late.

This section is intended to convey that reality to the Millennium Summit with a particular sense of urgency. The fact that environmental issues were never seriously considered in the nearly 18 months during which the General Assembly debated which subjects to include in the Summit's agenda makes it plain how little priority is accorded to these extraordinarily serious challenges for all humankind. Leadership at the very highest level is imperative if we are to bequeath a liveable Earth to our children—and theirs.

The 10-year follow-up to the Conference on Environment and Development will be held in 2002. It is my hope that the world's leaders will take advantage of the time remaining to revitalize the sustainability debate and to prepare the ground for the adoption of concrete and meaningful actions by that time.

In the early 1970s evidence had accumulated showing that chlorofluorocarbons (CFCs) were damaging the ozone layer in the stratosphere and increasing the amount of ultraviolet B (UV-B) radiation reaching Earth's surface. Since the ozone layer protects humans, animals and plants from the damaging effects of UV-B radiation, the steady increase in CFCs and other ozone-depleting substances constituted a major potential health hazard. But it took a decade and a half of increasingly intensive effort to achieve an agreement that would resolve the problem.

The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer was a landmark international environmental agreement. It has been remarkably successful. Production of the most damaging ozone-depleting substances was eliminated, except for a few critical uses, by 1996 in developed countries and should be phased out by 2010 in developing countries. Without the Protocol the levels of ozone-depleting substances would have been five times higher than they are today, and surface UV-B radiation levels would have doubled at mid-latitudes in the northern hemisphere. On current estimates the CFC concentration in the ozone layer is expected to recover to pre-1980 levels by the year 2050.

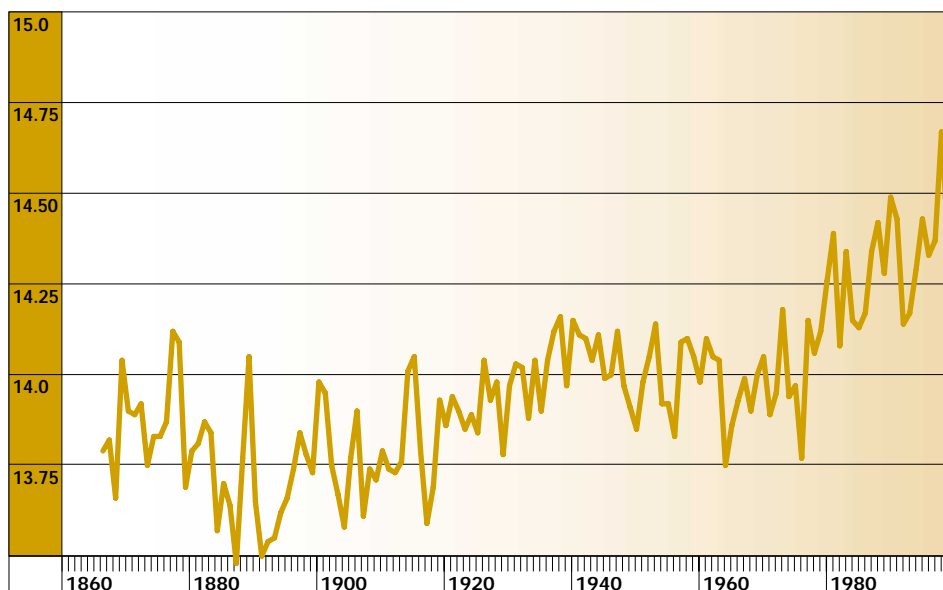
Prior to the Protocol intergovernmental negotiations on their own failed to mobilize sufficient support for the far-reaching measures that were needed. But intensive lobbying by civil society organizations, the presentation of overwhelming scientific evidence—and the discovery of the huge ozone hole over Antarctica—eventually created the consensus necessary for the agreement to be signed.

Coping with climate change

Spurred by a quadrupling of carbon emissions during the past half-century alone, Earth's atmosphere is warming at an increasing rate (see figure 10). The hottest 14 years since systematic measurements began in the 1860s have all occurred in the past two decades; the summer of 1998 was the hottest on record, and the winter of 1999–2000 may turn out to be the warmest. Average temperatures are projected to increase further, by 1.2° to 3.5° C (2° to 6° F) over the course of the present century—which would melt glaciers and the polar ice caps, raise sea levels and pose threats to hundreds of millions of coastal dwellers while drowning low-lying islands altogether.

Portents of this future are already visible. As the warming trend has accelerated, weather patterns have become more volatile and more extreme, while the severity of weather-related disasters has escalated. The cost of natural disasters in 1998 alone exceeded the cost of all such disasters in the entire decade of the 1980s (see figure 11). Tens of thousands of mostly poor people were killed that year, and an estimated 25 million “environmental refugees” were forced from their homes. The damage wrought by these disasters has been exacerbated by unsustainable environmental practices and the fact that more and more poor people have little choice but to live in harm's way—on flood plains and unstable hillsides and in unsafe buildings.

Reducing the threat of global warming requires, above all, that carbon emissions be reduced. The burning of fossil fuels, which still provide more than 75 per cent of energy worldwide, produces most of these emissions. The rapidly expanding number of automobiles around the globe threatens an even greater escalation in emissions. The need to promote energy-efficiency and greater reliance on renewable resources is obvious.



Reducing the threat of global warming requires, above all, that carbon emissions be reduced

Figure 10
Average temperature at the Earth's surface, 1860–1998 (Degrees Celsius)

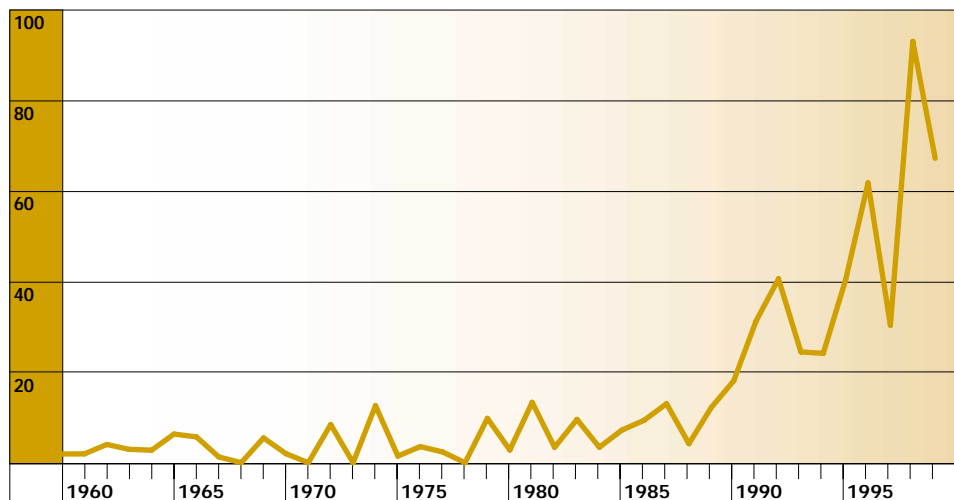
Source: Goddard Institute, Worldwatch Institute, 1999.

Further development of fuel cell, wind turbine, photovoltaic and cogeneration technologies will help. In the developing world, particularly in rural areas that are not connected to energy grids, the rapidly falling costs of solar cells and wind power have the potential to bring energy to the poor at reasonable costs, thereby also enhancing agricultural productivity and generating income.

Stabilizing levels of carbon dioxide in the atmosphere to a range that is considered safe will require overall reductions on the order of 60 per cent or more in the emis-

Figure 11
Economic losses from
weather-related
natural disasters
worldwide, 1960–1998
 (Billions of United States
 dollars, 1997)

Source: Munich Re Group.



Box 9
Using economic
incentives to reduce
global warming and
promote investment
in developing
countries

Addressing the challenge of climate change is one of the most important tasks of the twenty-first century. It will require major reductions in emissions of the so-called greenhouse gases that cause global warming. This in turn will require cleaner and more efficient technologies in the energy, transport and industrial industries if the greenhouse reduction targets specified by the 1997 Kyoto Protocol are to be met. Reductions can be achieved in a number of ways. One of the most ingenious of these, the Clean Development Mechanism (CDM), provides benefits for both industrial and developing countries.

The CDM allows industrial countries to gain emissions credits for climate-friendly investments in developing countries where these would reduce pre-existing levels of greenhouse emissions. Emission credits count towards the reduction targets that the industrial states have to meet.

The prospect of gaining emission credit provides incentives for rich countries to make energy-saving investments in poor countries. The fact that the emissions savings have to be verified and certified provides incentives to create a new service industry dedicated to this task. The climate-friendly investment helps build sustainability in the developing country.

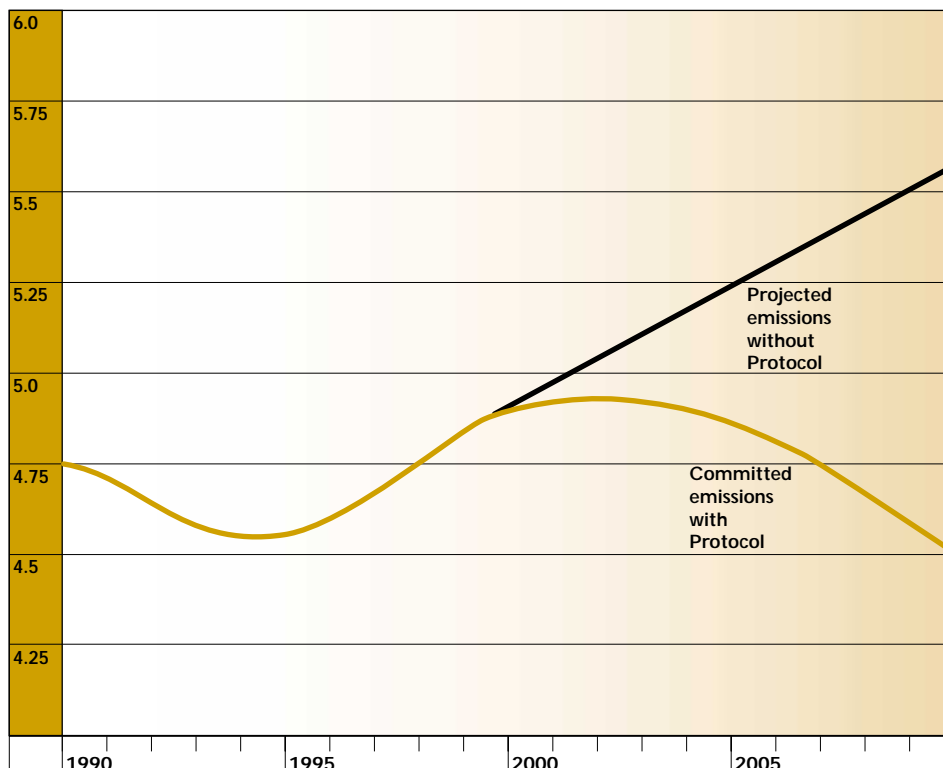
The CDM and other Kyoto mechanisms seek to use incentives to engage the private sector in the vital task of reducing global warming. They are very much in tune with the spirit of the times.

sion of the “greenhouse gases” that are responsible for global warming. Thus far, the international community has not found the political will needed to make the necessary changes.

Implementing the 1997 Kyoto Protocol would mark a significant advance by binding the industrialized countries to verifiable emission limitation and reduction targets averaging 5 per cent below 1990 levels, to be achieved over the period 2008-2012. Recognizing the economic roots of the climate change problem, the Protocol seeks to engage the private sector in the search for solutions. It does so by the use of market mechanisms that provide incentives for cutting emissions, and which stimulate investment and technology flows to developing countries that will help them achieve more sustainable patterns of industrialization (see box 9).

Although the first generation of Kyoto targets represent just one step towards what is needed to reduce global warming, their achievement would result in a sharp reduction in current rates of increase of greenhouse gas emissions by the industrialized countries (see figure 12). Early action is essential. Without success, there will be little incentive for the further rounds of emission limitations that must follow, in which the developing countries will need to become progressively engaged.

I call upon the Millennium Summit to promote the adoption and implementation of the Kyoto Protocol. Specifically, I urge those states



The international community has not found the political will needed to make the necessary changes

Figure 12
Projected impact of the Kyoto Protocol on emissions of greenhouse gases (Gigatons of carbon)

Source: United Nations Framework Convention on Climate Change secretariat, 2000.

About one third of the world's population already lives in countries considered to be "water stressed"

whose ratifications are needed to bring it into effect to take the necessary action in time for entry into force by 2002, as a fitting celebration of our progress since Stockholm in 1972 and Rio in 1992.

In several other areas, there are severe challenges for which we still lack remotely adequate responses.

Confronting the water crisis

Global freshwater consumption rose sixfold between 1900 and 1995—more than twice the rate of population growth. About one third of the world's population already lives in countries considered to be "water stressed"—that is, where consumption exceeds 10 per cent of total supply. If present trends continue, two out of every three people on Earth will live in that condition by 2025.

Groundwater supplies about one third of the world's population. The unsustainable, but largely unnoticed, exploitation of these water resources is a particular source of concern. The withdrawal of groundwater in quantities greater than nature's ability to renew it is widespread in parts of the Arabian Peninsula, China, India, Mexico, the former Soviet Union and the United States. In some cases, water tables are falling by 1 to 3 metres a year. In a world where 30 to 40 per cent of food production comes from irrigated lands, this is a critical issue for food security.

There is already fierce national competition over water for irrigation and power generation in some of the world's regions, which is likely to worsen as populations continue to grow. Today, the Middle East and North Africa are most seriously affected by water scarcity, but sub-Saharan Africa will join them over the next half-century as its population doubles and even triples.

Sheer shortages of freshwater are not the only problem. Fertilizer run-off and chemical pollution threaten both water quality and public health. More than one fifth of freshwater fish stocks are already vulnerable or endangered because of pollution or habitat modification.

The most serious immediate challenge is the fact that more than 1 billion people lack access to safe drinking water, while half of humanity lacks adequate sanitation. In many developing countries, rivers downstream from large cities are little cleaner than open sewers. The health impact is devastating.

Unsafe water and poor sanitation cause an estimated 80 per cent of all diseases in the developing world. The annual death toll exceeds 5 million, 10 times the number killed in wars, on average, each year. More than half of the victims are children. No single measure would do more to reduce disease and save lives in the developing world than bringing safe water and adequate sanitation to all.

The World Water Forum's Ministerial Conference, which met in March 2000, recommended a set of realistically achievable targets on water and sanitation. I ask the Millennium Summit to endorse these targets and to build on them in the years ahead.

Specifically, I urge the Summit to adopt the target of reducing by half, between now and 2015, the proportion of people who lack sustainable access to adequate sources of affordable and safe water.

To arrest the unsustainable exploitation of water resources, we require water management strategies at national level and local levels. They should include pricing structures that promote both equity and efficiency. We need a “Blue Revolution” in agriculture that focuses on increasing productivity per unit of water—“more crop per drop”—together with far better watershed and flood plain management. But none of this will happen without public awareness and mobilization campaigns, to bring home to people the extent and causes of current and impending water crises.

Defending the soil

In principle, there is no reason why Earth could not support far more than its present population. In reality, however, the distribution of good soils and favourable growing conditions does not match that of populations. Increasing land degradation exacerbates that problem. Nearly 2 billion hectares of land—an area about the combined size of Canada and the United States—is affected by human-induced degradation of soils, putting the livelihoods of nearly 1 billion people at risk. The major culprits are irrigation-induced salinization, soil erosion caused by overgrazing and deforestation, and biodiversity depletion. The direct cost alone, in terms of annual income forgone, has been estimated at more than \$40 billion a year.

Each year an additional 20 million hectares of agricultural land becomes too degraded for crop production, or is lost to urban sprawl. Yet over the next 30 years the demand for food in the developing countries is expected to double. New land can and will be farmed, but much of it is marginal and, therefore, even more highly susceptible to degradation.

Increases in farm productivity, boosted by new high-yield plant varieties and a nine-fold increase in fertilizer use, have prevented the Domsday scenarios of global famine that were predicted in the 1970s—but often at considerable environmental cost. The rate of increase in global agricultural productivity slowed dramatically in the 1990s, and sub-Saharan Africa never enjoyed its benefits. The absence of secure land tenure is also a serious impediment to improved agricultural productivity and soil management.

Meanwhile, world population is expected to increase by more than 3 billion by mid-century, with the biggest growth coming in the countries that already contain the largest number of hungry people and the most stressed farmlands.

Thus the world faces a real threat to future global food security. Plant scientists currently are unable to repeat the huge gains in plant yields they achieved in recent decades, land degradation is increasing, returns from fertilizer application are diminishing in many areas and there are serious constraints on expanding irrigation.

Advances in agricultural biotechnology may help developing countries by creating drought-, salt- and pest-resistant crop varieties. But the environmental impact of

We need

a “Blue Revolution” in agriculture that focuses on increasing productivity per unit of water—“more crop per drop”

***Conserving
agricultural
biodiversity is
essential for
long-term food
security***

biotechnology has yet to be fully evaluated and many questions, in particular those related to biosafety, remain to be answered.

I intend to convene a high-level global public policy network to address these and related controversies concerning the risks and opportunities associated with the increased use of biotechnology and bioengineering.

Of course, not every country has to produce all its own food. Shortfalls in supply can be met by imports from food-surplus countries, an increasingly common practice. But, apart from emergency aid, this is a solution to food production deficits only if the countries and people in need of food have the purchasing power to acquire it. According to the Food and Agriculture Organization of the United Nations, no fewer than 82 countries lack those resources.

Preserving forests, fisheries and biodiversity

Increasing populations and economic growth continue to drive a seemingly insatiable global demand for forest products. Some 65 million hectares of forest were lost in the developing world between 1990 and 1995 because of over-harvesting, conversion into agricultural land, disease and fire. The high demand for timber in the industrialized countries was a major factor behind this depletion.

Nevertheless, growing demand need not necessarily generate ever-greater destruction of forests. Major efficiency gains can be achieved in the production of paper and wood products; greater use of recycling can conserve materials and electronic publishing can save paper. Reforestation provides for future timber needs and helps to absorb carbon from the atmosphere, thus reducing global warming. It enhances flood control and helps to prevent soil erosion.

The need to preserve biodiversity is a less self-evident conservation issue than polluted beaches, burning forests or expanding deserts. But it is as critical, if not more so. Conserving agricultural biodiversity is essential for long-term food security, because wild plants are genetic sources of resistance to disease, drought and salinization.

Biodiversity is not only important for agriculture. Plant-based medicines provide more than 3 billion people with their primary health care and comprise a multi-billion dollar a year global industry. But as scientific and commercial awareness of the value of plant-based medicines grows, the plants are coming under increasing threat. According to a recent survey of nearly a quarter of a million plant species, one in every eight is at risk of extinction. The survival of some 25 per cent of the world's mammal species and 11 per cent of bird species is also threatened. As long as deforestation, land and water degradation, and monoculture cropping continue to increase, the threats to biodiversity will continue to grow.

Ocean fisheries continue to be stressed despite the large number of regulatory agreements in place. Fish catches have increased nearly fivefold during the last half-century, but almost 70 per cent of ocean fisheries are either fully exploited or over-fished. Unregulated, winner-take-all fishing practices using so-called factory ships, often heav-

ily state subsidized, cause overexploitation of ocean fisheries and can also destroy the livelihoods of small fishing communities, particularly in the developing world. Coastal waters can be protected from unregulated foreign fishing fleets, but they confront different threats. Fish breeding stocks and nursery grounds are threatened in many regions by the growing degradation of coral reefs. More than half the world's coral reefs are currently at risk as the result of human activities.

The complete collapse of many once-valuable fisheries provides compelling evidence that a more sustainable and equitable ocean governance regime is needed. The importance of conservation is increasingly recognized, but it can flourish only if governments and the fishing industry work cooperatively to support it.

Building a new ethic of global stewardship

The ecological crises we confront have many causes. They include poverty, negligence and greed—and above all, failures of governance. These crises do not admit of easy or uniform solutions.

Moreover, there is every reason to expect that unpleasant ecological surprises lie ahead. It is worth recalling that neither global warming nor ozone depletion were on the agenda of the 1972 United Nations Conference on the Human Environment in Stockholm. Nor would anyone in 1970 have predicted that the cost of natural disasters would increase 900 per cent between the 1960s and 1990s.

It is true that technological breakthroughs that are unimaginable today may solve some of the environmental challenges we confront. Perhaps they will, and we should surely provide incentives to increase the likelihood of their occurring. But it would be foolish to count on them and to continue with business as usual.

So the question remains, what should our priorities be? I recommend four.

First, major efforts in public education are needed. Real understanding of the challenges we face is alarmingly low. As more and more of us live in cities, insulated from nature, the need for greater awareness grows. Consumers everywhere have to understand that their choices often have significant environmental consequences.

Much of the burden of consciousness-raising to date has fallen on civil society organizations. With energy, commitment, but few resources, non-governmental organizations have advocated environmental issues in public debates almost everywhere. Schools and universities also have a critical role to play in raising public consciousness, and governments themselves must step up their contributions.

Second, environmental issues must be fundamentally repositioned in the policy-making process. Governments typically treat the environment as an isolated category, assigned to a relatively junior ministry. This is a major obstacle to achieving sustainable development. Instead, the environment must become better integrated into mainstream economic policy. The surest way to achieve that goal is to modify systems of national accounts so that they begin to reflect true environmental costs and benefits—to move towards “green” accounting.

Environmental issues must be fundamentally repositioned in the policy-making process

Only when they reflect a fuller accounting can economic policies ensure that development is sustainable

Box 10
Why we need a millennium assessment of global ecosystems

Today, when factories produce goods but in the process pump pollutants into rivers or the atmosphere, national accounts measure the value of the goods but not the costs inflicted by the pollutants. In the long run, these unmeasured costs may greatly exceed the measured short-term benefits. Only when they reflect a fuller accounting can economic policies ensure that development is sustainable.

The System of Integrated Environmental and Economic Accounting, pioneered by the United Nations in 1993, is a response to this challenge. It augments traditional national accounts with natural resource and pollution flow accounts. This additional information enables governments to formulate and monitor economic policies more effectively, enact more effective environmental regulations and resource management strategies, and use taxes and subsidies more efficiently.

Although this system of green accounting is still a work in progress, it is already employed by national governments. The Government of the Philippines started using it in 1995. Another 20 or so countries, North and South, are using elements of it. I encourage governments to consider this system of green accounting carefully and identify ways to incorporate it into their own national accounts.

During the past three decades we have become increasingly aware that the natural ecosystems on which human life depends are under threat. But we still lack detailed knowledge of the extent of the damage—or its causes. Indeed in some cases, data on freshwater quality, for example, we now have less information than we did 20 years ago because of short-sighted cuts in environmental monitoring programmes.

Good environmental policy must be based on reliable scientific data. To ensure that this data is available to policy makers we need a truly comprehensive global evaluation of the condition of the five major ecosystems: forests, freshwater systems, grasslands, coastal areas and agroecosystems.

The proposed Millennium Ecosystem Assessment seeks to produce just such an evaluation. An initiative of the World Resources Institute, the World Bank, the United Nations Development Programme and the United Nations Environment Programme among others, it will draw on and collate existing sources of data and promote new research to fill the missing knowledge gaps.

The Millennium Ecosystem Assessment promises important benefits to many stakeholders. It will provide the parties to various international ecosystem conventions with access to the data they need to evaluate progress towards meeting convention goals. National governments will gain access to information needed to meet reporting requirements under international conventions. The Assessment will strengthen capacity for integrated ecosystem management policies and provide developing nations with better access to global data sets. The private sector will benefit by being able to make more informed forecasts. And it will provide civil society organizations with the information they need to hold corporations and governments accountable for meeting their environmental obligations.

The Millennium Ecosystem Assessment is an outstanding example of the sort of international scientific and political cooperation that is needed to further the cause of sustainable development.

Third, only governments can create and enforce environmental regulations, and devise more environment-friendly incentives for markets to respond to. To cite but one example, governments can make markets work for the environment by cutting the hundreds of billions of dollars that subsidize environmentally harmful activities each and every year. Another is by making greater use of “green taxes”, based on the “polluter pays” principle.

Creating new incentives also encourages the emergence of entirely new industries, devoted to achieving greater energy efficiency and other environment-friendly practices. The success of the Montreal Protocol, for instance, has created a large market for ozone-safe refrigerators and air conditioners. Nothing would be more foolish than neglecting the enormously positive role the private sector can play in promoting environmental change.

Finally, it is impossible to devise effective environmental policy unless it is based on sound scientific information. While major advances in data collection have been made in many areas, large gaps in our knowledge remain. In particular, there has never been a comprehensive global assessment of the world's major ecosystems. The planned Millennium Ecosystem Assessment, a major international collaborative effort to map the health of our planet, is a response to this need. It is supported by many governments, as well as UNEP, UNDP, FAO and UNESCO (see box 10).

I call on Member States to help provide the necessary financial support for the Millennium Ecosystem Assessment and to become actively engaged in it.

Different regions of the world face very different environmental problems, which require different solutions. But the peoples of our small planet share at least one common view about their predicament: they want their governments to do more to protect their environment. They ask that for themselves, and even more so for their children—and for the future of the planet itself. Given the extraordinary risks humanity confronts, the start of the new century could not be a more opportune time to commit ourselves—peoples as well as governments—to a new ethic of conservation and stewardship.

***The peoples
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