

# EPA JOURNAL

## The World Economy and the Environment: A New Relationship



# Preface

By any measure, the environment is gaining prominence in international affairs. At the same time, environmental topics are increasingly mingled with seemingly unlikely issues ranging from trade policies to agricultural subsidies, from international debt to socio-economic differences among countries. This issue of *EPA Journal* explores these developments under the broad theme of world economy and the environment.

An introductory piece by a key observer, Lester R. Brown, presents an overview of the major environmental problems around the world. Then Susan R. Fletcher, a senior analyst at the Library of Congress, examines how and why these problems are climbing to the top of international agendas. Next, EPA Administrator William K. Reilly outlines a strategy for protecting environmental resources while building and maintaining sound economies in developing and industrialized nations. A report follows from Curtis Bohlen, the new top environmental official at the State Department, on U.S. environmental policies in foreign affairs.

Seven features follow, explaining how environmental problems are triggering sharp debate and realigning perspectives in a number of areas of economic and social policy. The first piece in this series, for instance, argues that environmental impacts should become a major consideration in international trade agreements. The next two articles explain how global environmental problems are giving rise to new concepts in foreign aid and international law. In the next feature, two observers present divergent views on whether global efforts to protect the environment require fundamental changes in traditional notions of national sovereignty and



Solarex Corporation photo

Low-maintenance photovoltaic cells produce electricity directly from sunlight. This makes them ideal for Third World applications such as this irrigation system in the African desert. See story on page 2.

national security. Then a *Journal* forum presents six divergent commentaries on the relationship of a major social issue—population control—to the environment. A feature follows explaining how a key resource—shared water supplies—can become a flashpoint among nations. And the changing role of multi-national industry on the environmental scene is discussed by a corporate representative.

The next section focuses on the Third World. What do developing countries need to deal with their present and potential environmental problems? Do they need to curb their aspirations? Shridath Ramphal, a West Indies educator and former international official, provides a candid discussion of basic economic and social questions that will factor heavily in the fate of the global environment. And in a side story, a writer with the World Resources Institute profiles the environmental

situation in four developing countries—Egypt, Kenya, Mexico, and the Philippines. The unintended consequences of certain economic policies of Western nations including the United States are explored in another article. Then two very different examples of initiatives afoot in matters that affect North-South relations and the environment are described in successive articles.

A series of stories focus on specific situations and case studies that may hold lessons for the rest of the world. Eastern Europe's environmental situation—how failed economies produced a devastated environment and what means can best remedy the environmental problems there—is assessed in a feature by an expert on the subject with World Wildlife Fund and The Conservation Foundation.

Another article reports on efforts to reconcile economic aims with environmental concerns in the Arctic, a region affected by complex international jurisdictions. Then an article profiles the emergence of the European Community, comprising 12 Western European nations, as a key player on the international environmental scene.

In a concluding article, Maurice Strong sounds a hopeful note that a United Nations conference to be held in June 1992 will launch a new era of international cooperation for environmental progress. Strong is chair of the upcoming conference. An accompanying feature highlights other forthcoming international events that relate to the environment—a busy calendar.

This issue of the *Journal* concludes with a regular feature, *Appointments*. □

# EPA JOURNAL

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Front Cover: Cargo container ship in Singapore harbor. Global environmental concerns increasingly are seen as

interrelated with other issues, including world trade. See story on page 17. Photo by Chad Ehlers for Allstock.

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# Assessing the Planet's Condition

by Lester R. Brown

Despite the worldwide growth in the environmental movement since the watershed of Earth Day 1970, the degradation of the Earth has accelerated. No comparable two-decade period in human history has witnessed such a wholesale destruction of the natural systems and resources on which civilization depends.

Since 1970, the Earth's human inhabitants have increased by 1.6 billion. While gaining new residents, the planet has lost trees and topsoil. Over the last 20 years, it has lost well over 500 million acres of tree cover, an area roughly the size of the United States east of the Mississippi, and an estimated 480 billion tons of topsoil, more than the amount on all U.S. cropland.

Atmospheric carbon-dioxide levels have risen 9 percent in the last two decades, and levels of other greenhouse gases, including methane, nitrous oxides, and CFCs, have risen even more. With six of this century's warmest years occurring during the 1980s, the greenhouse effect appears to be more than a scientific hypothesis.

Scientists studying the stratospheric ozone layer tell us the Earth has lost 2 percent or more of this protective shield over the last 20 years. We're warned that a small hole now appears above the North Pole, joining the huge hole that opens up over Antarctica during the Southern Hemisphere spring.

Twenty years ago, it was understood that the acid rain caused by fossil fuel burning in automobiles and power plants was capable of leaving lakes acidic and lifeless, but it was not until the early 1980s that scientists pegged acid rain with destroying forests. Now the connection is painfully obvious. More than half of West Germany's forests are showing signs of damage

*(Brown is President of the Worldwatch Institute, an independent non-profit environmental research organization in Washington, DC.)*

from a combination of air pollution and acid rain. In East Germany, 22 percent of all trees are reportedly dead.

Air pollution, too, is far worse today than it was 20 years ago. Despite improvements in selected cities in the industrial North, the overwhelming trend has been toward deteriorating air quality. In literally hundreds of cities, air pollution has reached health-threatening levels, with concentrations of pollutants well above the tolerance limits established by the World Health Organization.

The biological impoverishment of the Earth is continuing and quickening. Australia has lost 18 of its 200 mammal species since European settlement. Another 40 species are threatened. According to the Polish Academy of Sciences, the pollution of that country's air, water, and soil with toxic materials and the associated die-off of forests and other natural vegetation are expected to eliminate 20 percent of the country's flora and 15 percent of its fauna before the end of the century. Disturbing as these losses are, they are dwarfed by those from the burning of Brazil's rain forest. Worldwide, countless thousands of plant and animal species have disappeared since 1970.

The accumulation of toxic chemicals in soil and water has continued unabated over the last 20 years. In the United States, there are 1,163 toxic waste sites in urgent need of cleanup. Other parts of the world, such as Eastern Europe, areas of China, and Brazil's heavily industrialized south, face even more serious hazardous-waste issues.

The most profound and immediate consequence of global environmental degradation, one already affecting the welfare of hundreds of millions, is the emerging scarcity of food in developing countries. All the principal changes in the Earth's physical condition—eroding soils, shrinking forests, deteriorating rangelands, expanding deserts, acid rain, ozone depletion, the buildup of

greenhouse gases, air pollution, and the loss of biological diversity—are having a negative effect on food production. Spreading hunger in both Africa and Latin America during the 1980s, a worldwide fall of 6 percent in per-capita grain production from the historic high in 1984, and the one-third rise in world wheat and rice prices over the last two years may be early signs of the trouble that lies ahead.

## The Challenge Before Us

An environmentally sustainable global economy is one where trees cut and those planted are in balance, where soil erosion does not exceed new soil formation, where carbon emissions do not exceed carbon fixation, where human births and deaths are in balance, where the ozone layer is stable, and where the extinction of plant and animal species does not exceed the rate at which new species evolve.

We can achieve these goals by stabilizing population size, increasing energy efficiency, shifting to renewable energy sources, reusing and recycling materials, phasing out CFCs, and halting agricultural practices that erode soils and reduce the land's inherent productivity. Although these steps can be simply stated, achieving them will require an unprecedented political mobilization. They call not for fine-tuning, but for a fundamental restructuring of the global economic system.

## Stabilizing Population Size

In a world where the growth in human numbers appears to be out of control, 14 countries, all in Europe, have stabilized their population size. In these countries, which contain just over 5 percent of the



Michael McRae photo.

Wood for cooking is a scarce commodity in many countries. These Tibetans have driven miles to secure this truckload.

world's people, births and deaths are essentially in balance. Other countries, including Japan, France, and Finland, appear headed for zero population growth in the not-too-distant future. In contrast, the populations of India, Ethiopia, Nigeria, and Mexico are projected to double or triple before stabilizing late in the next century.

The record addition of 88 million people to world population in 1989 represents the difference between 143 million births and 55 million deaths. Assuming no change in death rates, stabilizing world population thus means reducing the number of births by a staggering 61 percent.

Avoiding a wholesale deterioration in living conditions in much of the world may depend on cutting world population growth sharply, perhaps in half by the year 2000. Difficult though this may appear, it is not impossible. Two countries have cut their population growth rates in half within less than a decade. Japan did so between 1948 and 1955. China matched this performance between 1970 and 1976, during the

years immediately before the one-child family was adopted as a social goal. Thailand came close to cutting its population growth in half between 1975 and 1983.

The difficulty of slowing world population growth cannot be overestimated. The only thing more difficult than quickly stabilizing population size will be living with the consequences of failing to do so.

#### Raising Energy Efficiency

Just as achieving a satisfactory balance between food and people depends on reducing family size, so stabilizing climate depends on reducing energy use. One of the legacies of abundant fossil fuels in the industrial countries and plentiful wood fuel supplies in developing countries is an extraordinarily inefficient set of energy technologies.

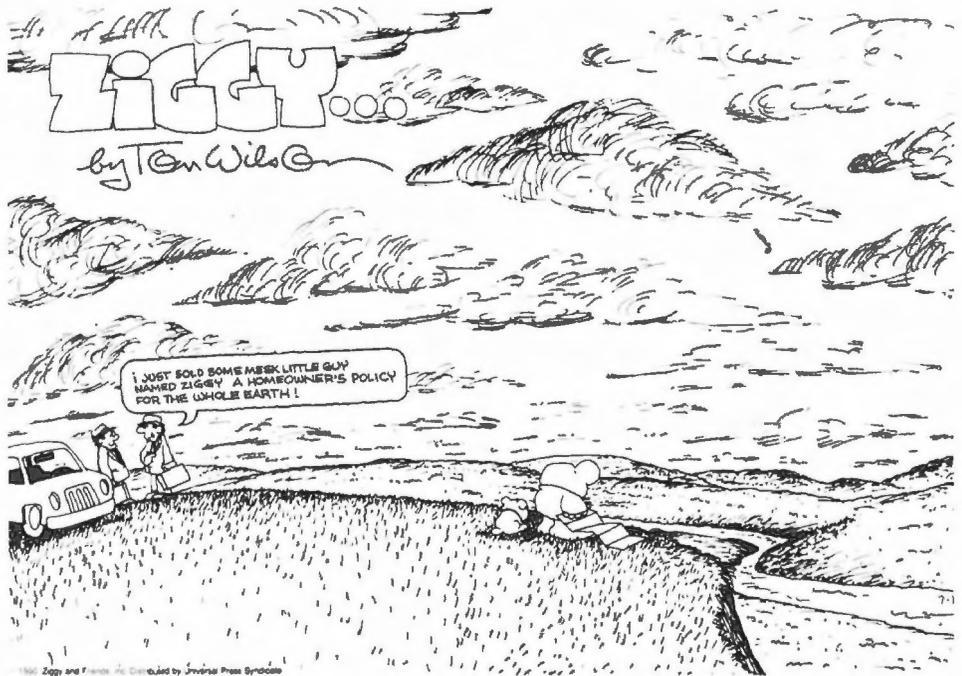
Two basic uses of energy, transportation and cooking, illustrate the potential for raising the energy efficiency of the world economy. The average automobile in the U.S. fleet gets 17 miles per gallon, three times as much fuel per mile traveled as the most

efficient cars now on the market. Similar energy inefficiencies exist in Third World villages, where stoves commonly used for cooking use four times as much wood as the most efficient new designs.

Redesigning the system can sometimes offer greater savings than substituting more efficient technologies. A combination of public transport and bicycle-friendly transportation systems can dramatically reduce dependence on automobiles. In countries such as Bolivia, Guatemala, and Sierra Leone, exciting gains have been made by replacing wood stoves with solar-box cookers. Using sunlight to cook food directly is far more efficient than first converting it into wood and then cutting and transporting the wood.

#### Harnessing the Sun's Energy

Energy reaching the Earth from the Sun takes many different forms. Hydropower taps the energy in the hydrological cycle, which is driven by heat from the Sun evaporating water. Wind power taps the energy in the movement of air



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driven by the differential heating rates of the Earth's surface. Buildings designed by solar architects exploit the Sun's energy for heating during the winter. Photovoltaic cells convert sunlight into electricity. Solar thermal plants concentrate sunlight on vessels containing water or other liquids to power steam turbines and generate electricity. Through photosynthesis, plants store energy from the Sun in various forms, such as the wood of trees or the sugar in cane, that can be used to produce fuel alcohol.

Photovoltaic cells, by themselves, show the potential for a solar-based world economy. They were first used commercially on Earth-orbiting satellites. Indeed, a phone or facsimile from the United States to Europe is relayed by satellites running on electricity generated from photovoltaic cells.

As the cost of manufacturing photovoltaic cells dropped, they became competitive as the power source for pocket calculators. Third World governments are finding it cost-effective to use photovoltaics to provide power for villages not linked to electricity grids. Some 5,000 villages in India now get their electricity from free-standing photovoltaic installations. Indonesia is beginning to install photovoltaic arrays in 2,000 villages. With costs continuing to fall, this source of electricity is poised for a period of rapid growth during the 1990s.

Perhaps the most promising solar technology is the solar thermal power plant, which concentrates sunlight to produce the steam that spins electrical generators. Power plants using this

technology and incorporating recent design advances convert a phenomenal 22 percent of sunlight into electricity. An 80-megawatt plant built by the Luz Corporation in the Mojave Desert is generating electricity at a cost of 8 cents per kilowatt hour, compared with roughly 12 cents for nuclear power and 6 cents for coal-fired power plants. Luz believes it can eventually supply 35 percent of U.S. electricity needs with this technology. Because of its high efficiency and low cost, electricity from solar thermal plants could eventually be used to break down water through electrolysis to produce hydrogen for use as an automotive fuel.

Solar thermal technology could convert semi-arid regions into major power-producing zones. One can easily picture a day when solar thermal plants along the North African coast will produce cheap electricity that is transmitted by cable under the Mediterranean Sea to Europe. Or, that region might supply the cheap electricity needed to produce hydrogen from water. The gas would be fed into the existing system of pipelines that now moves natural gas from Algeria to Italy.

If the international community could be persuaded to levy a carbon tax, one that reflected such indirect costs of fossil-fuel burning as air pollution, acid rain, and global warming, the spread of

these technologies would be greatly enhanced. In much of the world, energy from solar thermal plants would be cheaper than energy from fossil fuels. Such a tax would move the world quickly toward an energy economy that could last forever.

### Reusing and Recycling Materials

The enormous one-way flow of materials through throwaway economies accounts for a large share of the world's fossil-fuel use, air pollution, water pollution, and acid rain. The alternative to a disposable society is one that reuses and recycles. The first priority is to avoid the unnecessary use of materials in the first place. At the industrial level, this may mean the elimination of unnecessary layers of packaging; at the personal level, it may mean replacing throwaway paper or plastic grocery bags with canvas bags that can be used again and again. It means using hand towels instead of paper towels, handkerchiefs instead of tissues.

The next step in the hierarchy involves reuse. Environmentally, the ideal system would be one where beverage containers made of a durable material, such as glass, would be used interchangeably for all beverages.

Standardized containers of one cup, one quart, and half gallon, for example, could be used for fruit juice, milk, carbonated beverages, and beer. Reusing such a bottle would involve simply cleaning it and replacing the old label with a new one. A computerized inventory of all containers in a system would permit their efficient movement from supermarket or other collection points to wherever they were needed. Canada has taken a step in this direction with standardized beer containers used by all breweries.

After the reuse option, the recycling of glass containers, aluminum cans, used automobiles, waste paper, and other materials comes next. The Netherlands and Japan, for example, already recycle half or more of all their waste paper. This contrasts with less than a third in the United States and United Kingdom. The story is the same for glass. The Netherlands recycles 53 percent, compared with only 12 percent in the United Kingdom and 10 percent in the United States.

In some instances, a new technology, such as the electric arc steel furnace, which depends exclusively on scrap metal, is boosting the recycling prospect. In the United States, the amount of steel produced by electric arc furnaces has increased from 8 percent in 1960 to an estimated 36 percent in 1990. All this comes from recycled scrap. With comprehensive recycling, mature industrial societies with stable populations can operate largely with material already in the economic system, using virgin ores only for supplemental purposes. It may be only a matter of time until national governments are mandating source separation and recycling as some local governments are already doing.

### Reforestation of the Earth

Each year during our lifetimes, the Earth's tree cover is smaller than the year before. Reversing this trend depends on dealing with the causes. In the Brazilian Amazon, rain forest is burned to make room for cattle or crops; in India, deforestation proceeds in ever-widening circles around cities as residents forage for firewood; in Southeast Asia, foreign timber firms are overcutting the forests; and in Europe, air pollution and acid rain are killing trees.

Brazil is taking its first steps to slow the loss of its forests by removing tax subsidies for forest clearing and by enforcing the requirement of a permit before burning. In India, more efficient fuelwood stoves and solar cookers can help stem deforestation. In Southeast Asia, stabilizing forest cover depends on a change in logging practices, one that moves away from forest mining toward sustained yields and ecological protection. In Europe, maintaining forests lies more in reducing air pollution and acid rain.

The other basic remedy is planting trees. Unfortunately, the history of recent decades is strewn with Third World reforestation failures. Only South Korea has succeeded in dramatically increasing its tree cover. A well-organized program launched in the early 1970s to reforest its once denuded hills and mountainsides enabled this thriving country to cover an area with trees that is roughly two-thirds that planted in rice.

China launched an ambitious tree-planting effort in the 1970s, one intended to increase the country's tree cover from 13 percent of its land area to 20 percent by the year 2000. A combination of low survival rates and the enormous surge in demand for housing during the decade-long boom following economic reform in the late 1970s prevented any increase in tree cover. In fact, demand for forest products continues to outstrip the sustainable yield of China's forests.

India, which together with fellow population giant China holds half of the developing world's people, launched a plan to plant five million hectares of trees per year beginning in 1984. Actual plantings, though, have not averaged more than 1.5 million hectares. On balance, India, like China, is still losing tree cover.

Some industrial countries are launching massive tree-planting

#### Countries with Zero Population Growth, 1989

	Annual Rate of Change (percent)	Population (million)
Austria	+0.1	7.6
Belgium	+0.1	9.9
Bulgaria	+0.1	9.0
Czechoslovakia	+0.2	15.5
Denmark	0.0	5.1
East Germany	+0.1	16.6
Greece	+0.1	10.0
Hungary	-0.2	10.6
Italy	0.0	57.6
Luxembourg	+0.1	0.4
Norway	+0.2	4.2
Sweden	+0.2	8.5
United Kingdom	+0.2	57.3
West Germany	-0.1	61.5
Total Population		273.9

\*Source is U.N. Monthly Bulletin of Statistics. Zero population growth is defined as a change of less than + 0.2 percent per year.

programs, largely for environmental reasons. Australia announced a national environmental plan for the 1990s, which included the planting of a billion trees, roughly 70 trees for each Australian. If successful, this effort would restore two-thirds of the tree cover lost since European settlement.

In early 1990, the United States announced a plan to plant a billion trees a year during the decade. If successful, this effort would cover some 16 million acres with trees, an area more than one-fifth that planted in corn. This would dwarf any past tree-planting efforts, including the 2.2 million acres planted with trees under the Department of Agriculture's Conservation Reserve Program from 1986 through 1989.

Reversing the Earth's deforestation will not be easy, but of all the principal actions needed to create an environmentally sustainable global economy, it may be the easiest.

### Soil Stabilization

As the 1990s begin, the world's farmers are losing an estimated 24 billion tons of topsoil from their cropland each year, an amount roughly equivalent to the topsoil covering Australia's wheatland. A world that each year loses this much topsoil and adds some 90 million people is in obvious trouble.

Restoring the Earth's tree cover will do double duty to preserve soils by reducing rainfall run-off and lessening wind erosion. As with reforestation, however, soil stabilization success stories are few. Among the major food-producing countries, only the United States, which was losing 1.6 billion tons of topsoil annually in excess of new soil formation, has a successful erosion-reduction program.

This program takes effect in two five-year phases. From 1986 through 1990, the goal was to convert the most highly erodible cropland into either grassland or woodland before it became wasteland. The 34 million acres converted through 1989, roughly one-tenth of all U.S. cropland, has reduced soil erosion by some 600 million tons, or roughly one-third of the total erosion.

The second phase, from 1990 through 1995, requires that for the remaining highly erodible land, farmers implement a plan approved by the Soil Conservation Service if they wish to



Bob Krist photo. Black Star.

Due to unusually strong currents and tides, which help retain polluted backwash from the Rhine River, the Dutch Wadden Sea is one of the world's most polluted water bodies. In 1988, a mysterious plague, probably related to the pollution, attacked the already endangered Dutch harbor seal population. Shouldered by John DeBoer, this orphaned pup is going to the Pieterburen Seal Sanctuary in northern Holland.

maintain their eligibility for federal farm programs. This program is expected to eliminate another 300 to 500 million tons of annual soil loss, reducing U.S. soil losses by 0.9-1.1 billion tons, or nearly 70 percent. This success on U.S. cropland, which accounts for one-sixth of the world grain harvest, is a landmark achievement, a breakthrough for the entire world.

Unfortunately, none of the other three major food-producing countries, the Soviet Union, China, and India, which are losing as much or more soil than the United States, has an effective program to check their losses. For countries that cannot easily retire their most erodible cropland, terracing and contouring to check water erosion, planting hedges and tree belts to check wind erosion, and other stringent conservation measures are needed. Reducing soil erosion in the remainder of the world will not be easy, but with the U.S. model to draw upon, it will be easier.

### The Decade of Reckoning

The gap between what needs to be done to reverse the environmental degradation of the planet and what is actually being done is growing wider year by year. There is little precedent for the scale of activity needed during this decade. Modest increases in energy-efficiency investments or family-planning budgets will not suffice. A wholesale reordering of priorities like that occurring after World War II is in order.

Time is of the essence. Species lost cannot be recreated. Soil washed away may take centuries, if not millennia, to replace, even under careful management. Once the Earth gets warmer, there will be no practical way of cooling it.

The issue is not whether we will survive as a species but under what conditions we will be living in the future. By the end of this decade, we either will have rallied and turned back the threatening trends, or environmental deterioration and economic decline will be feeding on each other. □

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# The Environment: Moving Up on the International Agenda

by Susan R. Fletcher

Winds of change are sweeping the world, creating dramatic new political realities. Beyond political change, another broad concern is emerging as a major foreign policy priority: protection of the global environment. Over the past two years the environment has emerged on the foreign policy agendas of countries all around the world.

As Cold War tensions have receded, the environment is being characterized by some world leaders as a major national security issue. Citizens are organizing in "green" parties to demand protection from environmental degradation. Leaders in sectors from business to defense are announcing new measures to address global environmental problems.

As environmental problems enjoy new prominence, a new sophistication is emerging in the way they are analyzed and treated. It is clear that they are no longer amenable to being compartmentalized, that their causes and their solutions are deeply rooted in the full spectrum of human activities. Environmental leaders are beginning to realize that the solutions will depend upon integrating environmental considerations into mainstream activities, such as trade, industry, transportation, and agriculture. More and more, national and international environmental problems are being seen not as two separate arenas of activity, but as a continuum.

However, all is not sweetness and light. New tensions are also being created. The need to protect the Earth's

environment has become a motherhood-and-apple-pie issue, but as policymakers attempt to move beyond rhetoric to action they are discovering inherent difficulties in moderating old policies and priorities.

Two root causes underlying today's environmental problems are rapid population growth and the waste and consumption that accompany affluent lifestyles. As the developing world's population continues to grow at a rapid rate, adding the equivalent of Mexico each year, environmental degradation increases along with it.

Correspondingly, the slower growing and much smaller populations in the developed world produce a disproportionate amount of pollution. Both issues are politically difficult and rarely are tackled head-on in the conferences and debates on environmental issues.

Why is this concern for the global environment emerging now?

International environmental issues have been around for the past two decades. They were first crystallized by the Stockholm Conference on the Human Environment in 1972. One major outcome of that conference was the establishment of the United Nations Environment Programme (UNEP). However, in the United States and elsewhere, environmental issues have continued to be dealt with primarily in a national context.

In the 20 years following the Stockholm Conference, research efforts have produced what many have called a sea-change in the way we see the environment and our relationship to it. Scientific evidence has revealed that human activities are profoundly affecting the basic life support systems of the planet. It is now clear that the environment cannot be protected just by the actions we take in our own back yard; the health and well-being of people in one country may depend upon choices made by individuals and

policymakers far from their national boundaries. Increasing numbers of people now perceive their own vested interest in international issues.

Topping the list of these issues are stratospheric ozone depletion and the global increase in greenhouse gases. Despite continuing debate over their impacts, these atmospheric changes have been the linchpin in mobilizing public concern over global environmental conditions in general and in stimulating interest in specific issues, such as tropical deforestation and biological diversity.

The disturbance of business-as-usual by new priorities, however, is rarely comfortable or welcome. Governments of industrialized countries are reluctant to commit their citizens to the lifestyle changes that are implicit, for example, in reduced fossil-fuel use. Developing countries, for their part, resent being asked to remedy problems not of their own making. They want to achieve economic growth and are pursuing the development path set forth by their affluent neighbors. They are loath to give up this model until they see acceptable alternatives—and until they are assured they will receive assistance to meet increased costs.

## **Integrating the Environment into Other "Mainstream" Concerns**

The first response to environmental concerns by most institutions over the past two decades has been to compartmentalize them. This provided a focus, but it left the other components of the institution to proceed with business-as-usual. The United Nations, the World Bank, and departments of the U.S. federal government are among many examples.

It has been difficult for the environmental arms of such organizations to get the attention of the top leadership or to incorporate the environment into an agency's priorities. The move currently underway to

*(Fletcher is a Senior Analyst in International Environmental Policy at the Congressional Research Service. This article reflects the views of the author and not necessarily those of the Congressional Research Service or the Library of Congress.)*

upgrade the U.S. Environmental Protection Agency to cabinet level is being undertaken primarily for two reasons: to increase the effectiveness of the Agency as it participates in the formulation of national policy, and to provide the United States with a ministerial-level environmental representative in international negotiations.

### National Security

There is no agreed-upon definition of national security in U.S. law. However, most individuals would probably characterize it as the responsibility of the government to protect the safety of its citizens. What kinds of safety? Usually safety from armed attack or from threats to territorial integrity.

One of the "threats" to national security posed by environmental deterioration falls under this rubric, and that is direct conflict over scarce resources. As population continues to grow, resources, notably water, can come under competitive pressures among users. The competition may extend across national boundaries. Some observers believe, for example, that water shortages rival oil as a potential trigger for military conflict in the Middle East.

Environmental problems also present a new kind of threat that is perceived by increasing numbers of citizens, especially those in the developed world. The physical safety of all people may be threatened by the degradation of the atmosphere and the oceans brought on by activities in countries far from their borders. These activities are not hostile in intent; they are the everyday actions of ordinary people trying to secure their own personal comfort.

What is different about this new threat is that the natural systems of the Earth act as an intermediary factor. Nations cannot protect their citizens by throwing up barriers at their borders. They must instead cooperate with other nations in protecting the basic life support systems of the planet. As Secretary of State James Baker stated this year: "Environmental threats



Wide World photo

respect no border. They threaten human lives and territorial integrity from within and without."

Awareness of the new kind of threat to national security has been reflected in the prominence given to environmental problems at recent international meetings. These include both the 1989 and 1990 G-7 Economic Summits. For the first time, the environment has been elevated to a highly visible position in the international economic spotlight.

Within the United States, a new perspective on national security was provided by Senator Sam Nunn and

other members of the Senate Armed Services Committee when they announced they will pursue a major transfer of military science and technology to a strategic environmental research program. According to the *Washington Post*, this reflected "a growing theme in Congress to broaden definition of 'national security' to include threats to the environment, health and education." The announcement gave a substantial boost to the environmental interest that was

West Berliners rejoined East Berliners when the Berlin Wall came down in November 1989. Are we entering a post-Cold War era in which attention can be redirected toward other priorities including preservation of the global environment?

stimulated by Secretary of Defense Richard Cheney earlier this year when he initiated a comprehensive assessment of how the Defense Department could help meet the global environmental crisis.

Skeptics worry that these moves are no more than an effort to forestall cuts in the defense budget; however, whatever else they mean, they are plainly a major step toward incorporating environmental issues into mainstream national security considerations.

### **Sustainable Development**

The term "sustainable development" has become a byword because it provides a context for integrating concern for the environment into the central economic activities that drive human societies. The term derives from a 1987 report by the World Commission on Environment and Development, known as the Brundtland Commission for its Chairwoman, Gro Harlem Brundtland of Norway.

Although the term "development" had usually been applied to developing countries, *Our Common Future* discussed economic activity more broadly, focusing on the ways it could be redirected in both industrialized and Third World countries into patterns that were environmentally benign. The report found a need for a new type of development path and defined sustainable development as that which "meets the needs of the present without compromising the ability of future generations to meet their own needs."

Hailed as the "Bible" of environmentally sound development, the report was a comprehensive treatment of the interaction of environment and economic activity. It strongly endorsed the need for economic progress in poverty-stricken nations. Indeed, the application of sustainable development was particularly important for these countries, the report argued, if they were not to seriously degrade their natural resources. For many existing development efforts, designed with a

short-term focus, such degradation resulted from unforeseen side effects. There were many examples of such projects: dams that silted up rapidly and lost their productive capacity when surrounding forests were not protected; agricultural improvements that resulted in erosion; irrigation installations that resulted in salinization of soils; and roads that contributed to deforestation and destructive settlement patterns.

Over the past decade, the U.S. Congress has legislated a number of requirements for environmentally sound planning that must be incorporated into foreign-assistance efforts. The requirements apply both to bilateral aid and to multilateral development banks, like the World Bank. However, this effort cannot succeed unless the recipient countries establish policies that will accommodate the requirements. Some developing countries still look askance at environmental priorities, arguing that they have more urgent issues on their agendas. It is only in those countries where the adverse economic impacts of environmental degradation have become obvious that a higher priority for the environment has emerged.

In the context of problems like global warming and ozone depletion, it is the Brundtland Commission's position that the development path of the industrialized countries is also proving to be unsustainable and that changes will be required in production techniques. In the United States, many proposals that address global warming focus on energy policy, seeking incentives for greater use of renewable resources and for increasing energy efficiency.

### **Trade**

As major negotiations have neared final stages in the Uruguay Round of the General Agreement on Trade and Tariffs (GATT), environmental groups have awakened to the pervasive impacts that trade activities can have on natural-resources management and environmental regulation.

The proposed "harmonization" of standards for food safety has raised fears that harmonized standards—not only for food safety but also for environmental

regulation—could operate to seek the "lowest common denominator" and that more stringent levels of protection would be labeled as barriers to trade, thereby invoking sanctions. Other measures, such as limits on a nation's ability to control exports, could remove needed protection for such resources as forests.

Current proposals in the U.S. Congress, and being advanced in other GATT countries, urge a thorough review of the potential environmental impacts of the agreement before it is finalized.

### **Economic Incentives and Funding Measures**

The role that economic policies such as tax incentives or commodity subsidies may play in resource degradation has been a relatively recent focus of attention. Fertilizer subsidies, for example, may result in degraded ground water due to overuse of chemicals; tax incentives for businesses to extend their operations into the Amazon may encourage burning of the forest, thereby contributing to greenhouse warming.

Another major economic factor that can affect the environment is foreign debt. Many countries make the most of commodity exports in an effort to repay international banks or other lending agencies. In some cases this has translated into the deforestation of land to convert it to export agriculture, and the displacement of subsistence farmers by plantations. Debt relief is now seen as an environmental as well as an economic goal. A small start was made with debt-for-nature swaps in which debt has been canceled in return for domestic-currency payments toward land-preservation and conservation goals. Currently, increasingly larger debt-relief options are being proposed in return for environmental policy changes. These swaps may accomplish significant gains in conservation but have been too small to make a major dent in any country's foreign debt.

Foreign aid has played a varied role with respect to environment. A small but growing portion of U.S. assistance goes directly toward projects to protect

the environment; strategies for managing natural resources have been formulated for Africa and are being formulated for Asia. The major concern over the environmental impacts of foreign aid has focused on large-scale projects like dams, roads, or agricultural development. Environmental assessments like those performed for the past 12 years by the U.S. Agency for International Development are now increasingly required by the World Bank and other assistance organizations.

### **Business and Industry**

The past two decades have seen bitter battles between environmental groups and business interests. However, industry rhetoric recently has become noticeably "greener." Sustainable development has been adopted as an objective by many business leaders; a Global Environmental Management Initiative has been announced by the Business Roundtable; the chemical industry has begun a program called "responsible care."

Some industries have found that environmental conservation can be profitable. 3M was an early leader with its "Pollution Prevention Pays" program. U.S. waste management companies are finding that the current public interest in recycling has provided expanded business opportunities. The control technology industry has flourished in the United States in response to regulatory requirements. U.S. chemical companies are in the forefront of developing the alternatives to chlorofluorocarbons (CFCs) that will be in demand as the signatory countries to the Montreal Protocol phase out use of CFCs in refrigeration, insulation, and the like. One major reason for this environmental awareness lies in the demands of both customers and shareholders.

### **Domestic Environmental Policies and International Priorities**

As the United States has taken an ever-greater interest in the global environment, its domestic policies—those that affect forest resources, energy utilization, transportation, and the like—have in turn taken on new significance in the international arena. The example set by the United States with its own environmental performance will influence its ability to play a leadership role internationally.

The enlarged agenda of international issues places new stress on domestic policies; conversely, domestic concerns introduce new frictions in foreign policy. The tension between Europe and the United States over how fast to move in reducing greenhouse-gas emissions is a prime example. Reductions agreed to in an international convention would require changes in domestic policies that affect many elements of lifestyle. These changes would be difficult to make from a political standpoint; our reluctance to enter into international agreements reflects that difficulty.

Another example is forest management. Many non-tropical countries want protection for tropical forests both to preserve biological diversity and to reduce the burning that contributes to greenhouse gases. Tropical countries, on the other hand, observe the forest management controversies in the United States and elsewhere and note that efforts to protect forests have often failed in developed countries.

As the United States formulates international environmental objectives, it will have to re-examine its domestic policies if it is to have credibility with other nations. Since domestic and foreign-policy agencies do not as a rule interact, coordination between them will require a new set of considerations for both.

### **Mechanisms: Environmental Interest Groups**

One major force behind the increase in public awareness of environmental issues has been grassroots organizations. These non-governmental organizations,

or NGOs, range from the National Wildlife Federation and Sierra Club to smaller, local groups. They have been critical players at the domestic level, informing the public about problems, assessing solutions, pressing and lobbying for legislation, and, in some cases, filing suits to require compliance with environmental laws.

In recent years, several of the larger, national organizations in the United States have played important roles in identifying international environmental issues and in pressing for change in U.S. policies on foreign assistance. Pressure from such groups has also led to passage of a number of laws that require the United States to seek environmental reforms in the practices of the World Bank and other multilateral development banks. Many of the reforms have been put into place, and the pressure for improvement continues.

In countries around the world, NGOs are mushrooming in numbers and size. Even in countries where the political system is not as open as in the United States, such groups are managing to keep citizens informed and to change institutional priorities.

A more formal approach to the political system has been taken by the "green" parties that have formed, for example, in many European countries. As these organizations have gained elective office, many of their environmental concerns have been adopted by mainstream parties.

Internationally, cooperation among NGOs is increasing their sophistication and their effectiveness. However, as the groups proliferate, their views and goals may diverge. This can be especially troublesome for groups from different cultural and economic backgrounds who mirror the tensions of their governments as they try to reach agreement on what the priorities should be.

### **Legal Measures: Conventions, Treaties, and Laws**

The world has extensive experience in reaching agreement on conventions and treaties to govern international activities affecting the environment. The problems now on the agenda, global warming, forest protection, and biological



The bozone layer: shielding the rest of the solar system from the Earth's harmful effects.

diversity, pose particularly challenging difficulties. In these cases, global attention is being paid to behavior within national borders, and this has raised hackles about interference in national sovereignty.

In 1989, as public concern grew over the contribution to greenhouse gases made by vast areas burned in the Amazon forest, Brazil's president expressed outrage at statements made by visitors from the United States. When they declared the Amazon to be a global resource, he defended Brazil's right to do as it wished with the resources within its borders. However, over the past year Brazil has responded to concerns of its own citizens with a number of environmental measures, including laws designed to protect its forests. The United States, itself, has been unwilling to agree to specific fossil-fuel curtailments, which many European nations are advocating, because of possible economic hardships to Americans and the potential for

adverse political repercussions.

International action came swiftly in the case of ozone depletion, and the ozone treaty and its protocols are hailed as a model of international cooperation. However, close examination reveals acrimonious debate on providing financial aid to developing countries to help them phase in CFC substitutes.

CFCs, used in a limited number of human activities, and for which there are substitutes, are more easily dealt with than the greenhouse gases produced by the burning of fossil fuels and many agricultural processes. Reductions in emissions of these gases could involve profound changes, such as taxes on carbon-based fuels and the setting of fuel-efficiency and building standards.

**International Institutions: UNEP**

In 1972, UNEP was established to encourage component agencies of the United Nations, such as the Food and Agriculture Organization and the United

Nations Development Programme, to incorporate environmental priorities into their activities. In the creation of UNEP, the United Nations recognized the pervasive nature of environmental issues, and the need to integrate them into each agency's mission.

In recent years, UNEP has been acknowledged as the major force behind such agreements as the ozone-protection protocol and the hazardous waste treaty. UNEP's Executive Director, Mostafa Tolba, has received high marks as a key negotiator in these and other issues. Currently, UNEP and the World Meteorological Organization share responsibility for the Intergovernmental Panel on Climate Change, which is preparing a report on the causes and responses to global warming. The report is expected to be followed by negotiations on a climate-change prevention treaty.

However, UNEP remains a small agency with a limited budget. As environmental concerns grow, and interconnections with other arenas expand, the United Nations is likely to need an expanded capacity to deal with a wide array of issues.

In 1989 the United Nations called for a World Conference on Environment and Development to be held in Brazil in 1991. The conference will mark the 20th anniversary of the Stockholm Conference and is expected to be a watershed of expanded institutional capability at the international level.

Since the beginning of conference preparations last fall, world leaders and NGOs have called for a growing number of actions to be concluded "by 1992." One goal, for example, is to have a greenhouse convention ready for signing at the conference.

In the two years until 1992, citizens can demonstrate their concerns through their purchasing patterns, their votes, and through their organizations. If the 1990s are indeed to become the decade of the environment, it will be a challenge at home and abroad, to governments and individuals alike, to deal with a broad menu of issues. □

# A Perspective from EPA

by William K. Reilly

**"C**onservation means development as much as it does protection," President Theodore Roosevelt said nearly a century ago. "The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation, increased and not impaired in value."

Teddy Roosevelt's observation was a prescient and succinct expression of the importance of practicing careful stewardship of our natural heritage. Today, we all benefit from his vision whenever we visit a national forest, park, or wildlife refuge. Moreover, Roosevelt's ethic of stewardship is now receiving renewed and urgent attention around the world. It is taking on new resonance as developed and developing nations alike struggle for healthy economic growth that does not deplete the planet's irreplaceable resources or irrevocably damage the environment.

The term now being used internationally to describe Roosevelt's vision of conservation is "sustainable development," originally defined by the Brundtland Commission as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

As the quote from Teddy Roosevelt indicates, the ideas behind sustainable development are not new; they arise from several disciplines including economics, ecology, and ethics. What is new is the Brundtland Commission's synthesis of these ideas into a framework for international cooperation to preserve the global environment. The commission's message to the world: If we begin to move in the direction of sustainable development now, our planet can have both a healthy economy and a healthy environment.

The Brundtland Commission's report, which has generally been well received, has two broad themes. One is that the economy and the environment, rather than being in conflict, are intertwined, and that economic and environmental policies should reflect that profound

reality of modern life. The second theme is that societies should reconcile their present-day economic and environmental priorities with ethical considerations about the well-being of future generations.

But while these ideas are well-received, we are still a long way from consensus on a practical understanding of what they mean. We are also a long way from incorporating the concept into our laws and institutions and applying it systematically.

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## ***EPA is considering an array of economic incentives to encourage businesses, industries, and individuals to reduce waste and pollution.***

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In several articles in this issue of the *Journal*, sustainable development is discussed as part of the solution to environmental problems that have international security implications—problems that seriously threaten the very health of the planet. We are losing trees and topsoil at an alarming rate. The protective shield of ozone is thinning out. The Antarctic, considered by most of us to be one of the last great pristine regions on the globe, is under growing stress from pollution. The buildup of greenhouse gases threatens a change in climate, with uncertain regional variations.

We should continue to seek an operational definition of sustainable development that can be applied systematically to these and other global problems. In the meantime, we can and should encourage steps to move economic development in sustainable directions.

• First, we should continue to improve EPA's traditional regulatory and enforcement performance. We are making substantial progress in this area: Last year was a record-setting year for enforcement of EPA regulations that curtail air and water pollution and toxic releases. In particular, EPA has dramatically increased the number of criminal and administrative

enforcement actions. EPA's aggressive enforcement posture should help convince many potential violators that it just does not pay to pollute.

• Second, we must do all we can to foster pollution prevention. Although we will continue to emphasize enforcement, our traditional air, water, and various toxic pollution-control programs are nearing the point of diminishing returns. Unless we come up with new approaches, it will cost us increasingly more to get fewer environmental protection benefits. In addition, we are facing a set of problems that are more vexing than the ones we tackled in the past.

The decentralized, diffuse nature of today's problems—pollution from urban and agricultural run-off, long-range air deposition of toxic substances, automobile emissions, and municipal waste disposal—cries out for a new framework of solutions. Fortunately, there is a growing consensus that pollution prevention—preventing the generation of waste in the first instance—offers this framework. Therefore, EPA has embarked on a far-reaching program to integrate pollution prevention into everything the Agency does—and into the very fabric of the nation's environmental ethic. We expect our pollution-prevention efforts to increase the sustainability of economic activity in this country significantly.

• Third, we need to incorporate the costs of fouling the environment into economic activities. By explicitly linking the environment with economic development, we can maximize pollution prevention and avoid undermining the long-term integrity of productive natural systems.

Economic development theory has never had much to say about conservation of natural resources. Depletion of the natural resources upon which the economies of developed and developing countries depend has never been factored into national income accounts.

But, as former EPA Administrator Bill Ruckelshaus said, "We are busily

(Reilly is Administrator of EPA.)



Once considered worthless, wetlands are now known to provide many benefits, including filtering pollutants and recharging underground water supplies. Injury to a wetland ecosystem is damage to environmental capital.

Ty Smeades photo. Iowa Department of Natural Resources.

writing checks against the environment like there is no tomorrow, and our checks are starting to bounce." EPA, therefore, is working with the Organization for Economic Cooperation and Development, the United Nations Environment Programme, and other organizations to find ways to incorporate the costs of natural-resource degradation and deterioration of natural systems directly into the calculation of national economic growth and productivity.

Ideally, these accounts would recognize the environment as a key economic asset, deducting depletion of environmental capital and environmental clean-up costs from measures of national income. Just as conventional assets, such as a piece of machinery or a savings bond, can be sources of income, so too can environmental assets provide benefits.

Wetlands, for example, provide habitat for species that are a source of income for commercial fisheries and tour-boat operators. Wetlands also provide valuable recreational opportunities, help protect against flooding, recharge underground supplies of fresh water, and filter pollutants from the water. Injury to a wetland ecosystem may undermine these benefits. This would be damage to environmental

capital—a form of capital depreciation that should be deducted from national income, just as depreciation of physical capital is now deducted in calculating a nation's Net National Product.

Moreover, EPA is considering an array of economic incentives to encourage businesses, industries, and individuals to reduce waste and pollution. EPA's strategy is to encourage millions of individuals voluntarily to prevent pollution in response to economic signals. And because economic incentives influence rather than prescribe behavior, consumers and businesses can make their own choices based on individual circumstances.

Market-based incentives make environmentally sound choices more attractive. For instance, the Clean Air Act Amendments (which at this writing are before a Congressional conference committee) contain market-oriented incentives in the provisions that allow utilities to trade, buy, or sell credits for sulfur-dioxide (SO<sub>2</sub>) emissions. The goal is the same as under a regulatory scheme: reduce SO<sub>2</sub> emissions. But the choice of methods means greater flexibility and thus greater cost-effectiveness in achieving these reductions. Market incentives can have a powerful influence on economic development, causing it to move voluntarily and smoothly in the direction of greater sustainability.

● Fourth, we must cultivate a national environmental ethic through education. The solution to many of our pollution problems starts with the actions of millions of individuals. Last fall, in Spokane, Washington, President Bush said, "Through millions of everyday, individual decisions, we are determining the fate of the Earth. It's surprisingly easy to move from being part of the problem to being part of the solution."

The burgeoning solid-waste disposal problem in this country is a good illustration of the extent to which individual actions accumulate to create a massive environmental problem. EPA's latest report on municipal solid waste shows a jump of 13 million tons in the amount of waste generated annually in the United States between 1986 and 1988. Currently, about 180 million tons of solid waste are being generated each year. This means that the average U.S. citizen now throws away about four pounds of garbage every day—hardly a sustainable activity! This is a record level of per-capita waste generation for this country; it's twice the per-capita level of West Germany, and three times that of Italy. We can do better; we must do better.

People cannot be expected to change their lifestyles to protect the environment until they understand the

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part they are playing in its degradation and the part they can play in its improvement. Therefore EPA is working to foster a new environmental awareness—a stronger environmental ethic—in people's daily lives by launching an Agency-wide environmental education program.

Last May, EPA and the National Governors' Association co-chaired the highly successful National Environmental Youth Forum to promote environmental education. In June, I announced the creation of an EPA Office of Environmental Education. Among other priorities, this office will encourage the development of a national environmental ethic in our schools.

But we also must educate consumers. Educated consumers can demand, and get, environmentally safer products, products with less packaging, and more recycled and recyclable products. Both government and industry can help make consumers aware of the environmental impacts of their choices. EPA's research programs are beginning to look at the kinds of products that are safer for the environment.

- Fifth, we can learn from and encourage sustainable development projects. World Wildlife Fund, for example, is sponsoring a project called "Wildlands and Human Needs" with major support from the U.S. Agency for International Development. This umbrella project weds small-scale economic enterprises with conservation of natural resources in the biologically rich landscapes of the developing world. Native people are able to earn a living while protecting the natural resources on which their long-term economic well-being depends.

Specific projects include tree nurseries in Costa Rica and a kerosene-fuel business coupled with fuel-wood plantations in Nepal that enable the Nepalese people to leave the forests intact. And in Rwanda, local people are being helped to harness the lucrative tourism potential of mountain gorillas, while preserving their forested habitat.

There are many other organizations around the world with exciting projects that give practical application to the principles of sustainable development

in developing countries. The "Alliance of Forest Peoples" in Feijo, Brazil, advocates harvesting products from rain-forest reserves as more economically viable and sustainable than forest clearing. The local government has accepted the argument that the future of the area lies in forest management and has approved several rain-forest reserves.

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***Without healthy economic development, we will see even more environmental degradation throughout the developing world.***

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Here in the United States, Oregon is applying the tenets of sustainable development to the Columbia River Basin—an area roughly the size of France. In response to legislation mandating major changes in river operations to restore fish and wildlife in the area, the state is building new fish hatcheries in the basin and reopening fish passages that were blocked by previous developments.

Last year, I took part in the release of a report on the state of the Great Lakes. It was prepared by the Institute for Research on Public Policy of Ottawa, and The Conservation Foundation of Washington, DC. The report looked back at the history of the 1972 "Great Lakes Water Quality Agreement" between the United States and Canada under which so much has been accomplished.

Virtually all of the goals prescribed in that agreement have been nearly, if not fully, achieved. Fecal coliform has been reduced, nutrients are down, algae is down, biological oxygen demand is down, and dissolved oxygen is way up. The fish are back in lakes, like Lake Erie, where it was not at all certain that they would be.

And yet, even with \$10 billion of investments, with wastewater treatment plants functioning as they are supposed to function, the fish have accumulated toxic substances in their tissue to the degree that they cannot be eaten with any frequency. By no means have we brought the Great Lakes back to a state

of satisfactory ecological productivity. By no means have we achieved sustainability for this resource. So the report called for a new orientation in Great Lakes environmental policy. It called for a policy of sustainable development.

I mention this report and these projects because they do something that we desperately need at this point: They are trying to give practical meaning to an abstract concept by showing there are real, lasting benefits to people and their environment.

- Finally, regular reports on the capacity of the environment to support development should be published. The actions taken to move toward sustainable development will be more effective if they are supported by objective, accurate data. The environmental health of countries, regions, hemispheres, and the whole planet must be assessed. Many developed countries are capable of the monitoring and data analysis necessary to evaluate their own environmental health. For the developing nations, however, international finance institutions like the World Bank should take responsibility for publishing annual reports on the ability of the environment to support continued economic development in individual countries as well as in the larger, global community.

Without healthy economic development, we will see even more environmental degradation throughout the developing world. We need to foster sustainable economic development to improve the quality of life in developing countries. And in developed countries we need to foster sustainable development to maintain the quality of life we already have attained.

We must take this undefined term of sustainable development and make it, through our actions, more concrete, more specific, more real for political leaders, for business leaders, for ordinary citizens, for the world's poor, and, ultimately, for future generations. □

# Report from the State Department

by Curtis Bohlen

The world community is beginning to address environmental concerns. One example is the International Whaling Commission's decision, supported by the United States, to place a moratorium on commercial whale harvesting.



Davies photo. Copyright Greenpeace.

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***This unprecedented interest in environmental issues stems from the growing realization that these issues are truly global in nature.***

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In a relatively short time, environmental issues have risen high on the U.S. foreign-policy agenda. While the main focus of international relations has traditionally been on political and military issues, the environment is now a major aspect of the international scene. The annual G-7 "economic" summit now includes a significant environmental component, while high-level environmental conferences have become regular international events.

This unprecedented interest in environmental issues stems from the growing realization that these issues are truly global in nature. Threats to the environment such as stratospheric ozone depletion, potential climate change, or loss of biodiversity affect all nations, regardless of their level of development or the nature of their

political or economic systems.

Fortunately, the world community has been moving quickly to address a range of environmental concerns. Twenty years ago, the few environmental agreements in effect dealt primarily with fish and game management or ocean pollution. Today we have in place agreements covering such concerns as depletion of the ozone layer, hazardous-waste shipments, transboundary air pollution, and trade in endangered species. In addition, negotiations on a number of other issues such as climate change and forest conservation are or will soon be under way.

In the United States, where conservation has a long tradition, environmental protection is a cornerstone of our approach to foreign policy. U.S. international environmental

(Bohlen is Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs. He was recently confirmed in that position.)

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policies recognize that the quality of life, a sound economy, and even national security depend on a healthy environment. This is why we are working hard to develop the international consensus necessary to address the broad array of environmental problems.

The negotiations concerning the depletion of the stratospheric ozone layer provide a particularly good example of how an effective global response to a pressing environmental concern can be achieved. In the early 1980s, the United States led the call to set up a framework through which the international community could objectively analyze the problem and develop appropriate responses.

This framework, established in 1985, provided the focus necessary to reach an agreement two years later to cut production of ozone-depleting substances by half. Furthermore, when continuing assessments indicated that more action was required to protect the ozone layer, further steps could be agreed to expeditiously. With strong U.S. support, the international community recently agreed to phase out the production and use of most ozone-depleting substances by the end of the century.

We are now seeking to establish a similar process to address the much more complex problem of global climate change. With our strong support, the International Panel on Climate Change (IPCC) was set up in 1988 to consider all aspects of this issue. The IPCC's first report on what is known about climate change and how it might be addressed is nearing completion. Using this information, negotiations on a framework convention on climate change will begin soon, with the goal of reaching an international consensus on how best to deal with this issue.

Another cornerstone of U.S. international environmental policy is a strong emphasis on natural-resource conservation. For example, we have acted vigorously to protect endangered species through the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which establishes mechanisms for monitoring and controlling the effect that international trade is having on

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***Some have stated that international environmental issues will dominate the foreign-policy agenda of the 21st century.***

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wild species of plants and animals. CITES was particularly crucial for our efforts to protect the African elephant through a ban on international trade in elephant ivory. The demand for ivory had been identified as the main cause of the precipitous decline of elephant populations.

With regard to marine resources, U.S. efforts in the mid-1980s were instrumental in the International Whaling Commission's decision to establish a moratorium on the commercial harvest of whales. We are now working with a number of Pacific Basin countries to address the large take of marine mammals, seabirds, and other living marine resources in high-seas driftnet fisheries. Agreements are currently in place to obtain the information necessary to determine what steps may be required to protect these resources.

Environmental concerns also present new opportunities for U.S. foreign-policy initiatives—for example, in the context of assisting the economic and political development of the countries of Eastern Europe. To help the East Europeans help themselves in the

crucial areas of environmental protection and restoration, we are offering our considerable domestic experience in dealing with these issues.

We are now providing clean-coal technology to industries in Krakow, Poland, which has very serious pollution problems. We are also working through bilateral science agreements with various countries to expand our cooperation on environmental matters. For the region as a whole, the United States has established a regional environmental center in Budapest due to open this fall (see box on p. 52).

Also, through an emphasis on environmental protection, we have strengthened the effectiveness of U.S. foreign-assistance programs by promoting the sustainable management of tropical forests and other resources. For example, in Indonesia an ongoing project focuses on the management and conservation of products from tropical forests which might otherwise be destroyed for short-term benefits. We are likewise encouraging the multilateral development banks to promote environmentally sound economic growth in their lending programs.

Some have stated that international environmental issues will dominate the foreign-policy agenda of the 21st century. Certainly it is evident that international environmental concerns will be increasingly important in our diplomatic efforts. Continued integration of environmental and foreign policies will be vital as we prepare to face the problems, challenges, and opportunities of the decades to come. □

# International Trade: In Search of an Environmental Conscience

by Steven Shrybman



Maryland Port Administration photo

**T**rade agreements can substantially undermine national and international efforts to address ecological problems by ignoring the environmental implications of the economic forces they put into play or by deliberately subordinating environmental concerns to economic objectives. For much of the world, trade practices determine the scale and character of resource exploitation and use. This is particularly true for many developing countries where export of basic commodities and resources often represents more than 50 percent of Gross Domestic Product.

*(Shrybman is Counsel for the Canadian Environmental Law Association.)*

Shipping—a symbol of international trade. The Maersk shipping line, headquartered in Denmark, is a weekly visitor at Dundalk Marine Terminal in Baltimore, Maryland.

Unfortunately, these and other trade-environment linkages are poorly understood and rarely recognized. The outmoded notion persists that the economy and the environment somehow exist independently of each other.

The rules that govern most world trade are set out in the General Agreement on Tariffs and Trade (GATT), which is currently being renegotiated. Other important trade negotiations have either just concluded, like those between Canada and the United States, or are underway—between the United States and Mexico, and among the member

nations of the European Community. The results of these negotiations will greatly influence global economic activity for the 1990s, the decade that will, from an ecological perspective, be the most critical in human history.

Nowhere is the failure to integrate the environment and the economy clearer than in the GATT negotiations in which, with only limited exceptions, evaluating the environmental implications of trade proposals is not even on the table. To make matters worse, the negotiations are veiled in secrecy, and virtually no opportunity exists for public comment or debate. Since environmental organizations, in particular, are excluded from the process, trade proposals are routinely put forward without any consideration whatsoever of their potential environmental effects. The most likely outcome of such a process is trade agreements which enshrine economic principles that are often at odds with environmental objectives.

There are some bright spots on the horizon. Governments are beginning to heed calls from the Brundtland Commission and others to integrate environmental and economic policy, development, and planning.

The G-7 economic summit in July 1989, for example, placed an unprecedented emphasis on environmental issues. The final communique from Paris addressed the "urgent need to safeguard the environment for future generations" and recognized that "environmental protection is integral to issues such as trade . . ." More recently, at a meeting on sustainable development in Bergen, Norway, ministers from the Economic Commission for Europe, representing Eastern and Western European and North American countries, agreed to "accelerate . . . the dialogue on the inter-linkages between environmental and trade policies . . . to ensure that trade does not bring about harmful

environmental consequences.”

However, while the need to integrate environmental and economic planning is gaining acceptance in theory, only tentative efforts are being made to actually put the principle into practice. While governments proclaim the principles of sustainable development, many important national and international “economic” institutions remain largely unaware of or indifferent to them.

### **Ignoring The Environment**

Having considered the overall situation, let's examine some specific examples. In the language of multilateral trade, the agenda of current negotiations is to “liberalize” international trade by reducing import and export controls and by eliminating “non-tariff trade barriers.” Let's consider each aspect of this trade agenda from an environmental point of view.

*Export Controls and Sustainable Resource-Management Policies:* For countries seeking to conserve non-renewable resources, the ability to control exports is often critical. Just as import controls, such as tariffs, can be used to protect local manufacturers, export limitations, such as quotas, can be used to protect indigenous resources. However, the GATT currently restricts the right of governments to control exports, and the objective of ongoing GATT talks is to further limit that right.

Not surprisingly, eliminating natural resource export controls is of considerable interest to developed countries that have co-opted the largest share of those resources and would like to ensure that such resources remain freely and cheaply available. North America, for example, which represents 6 percent of the world's population, consumes 25 percent of its energy resources. Developed nations as a whole, representing approximately 20 percent of the world's population, consume 80 percent of its natural resources.

To fully appreciate why controlling exports is critical to developing countries, it is important to note that

international trade is carried out largely by private corporations, not national governments. For example, according to a survey by the United Nations Center on Transnational Corporations:

Eighty to 90 percent of the trade in tea, coffee, cocoa, cotton, forest products, tobacco, jute, copper, iron ore, and bauxite is controlled in the case of each commodity by the three to six largest transnationals.

Transnational corporations also control “80 percent of the world's land cultivated for export-oriented crops.” In exercising this control in the developing world, they have encouraged the

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### ***Recent developments in Eastern Europe and the plight of many countries in the Third World underscore the need to reconsider current trade policies and agreements ....***

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expansion of agricultural and resource production to serve export markets, rather than the needs of local people. The impacts can be appalling. For example, the Brundtland Commission has noted that during the 1980s, when drought and hunger were taking hold in the Sahel region of Africa, five countries in the region produced record amounts of cotton.

Less apparent, but probably even more destructive over the long term, are the ecological consequences of such policies. As the Worldwatch Institute points out, the wholesale export of vital resources from countries that are not self-sufficient in food or other essential resources has often lead local peoples to over-exploit remaining resources, such as rain forests, simply to eke out the barest existence.

*Import Controls and Environmental Regulation:* The most familiar type of import control is the tariff, and another objective of the GATT talks is to achieve “a substantial reduction or, as appropriate, elimination of tariffs by all participants.” Eliminating import

controls is likely to undermine environmental initiatives in several ways.

To begin with, there is growing evidence that the developed world is transferring its polluting industries and wasteful “resource-management” practices to the developing world. While quantification is difficult, a study undertaken for the Brundtland Commission estimates that in 1980 developing nations would have incurred over \$14 billion in pollution-control costs had they been required to meet the prevailing U.S. environmental standards. For an industry able to export goods to the United States free from tariff restrictions, the absence of pollution-control costs can be an attractive incentive to relocate or establish new operations. This not only discourages environmental regulation in the developing world, it pressures developed countries to weaken standards, or avoid new ones, in order to keep industry at home.

The same dynamics have encouraged a flourishing trade in hazardous waste. As documented by the Worldwatch Institute, disposal costs in some developing countries are as low as \$40 for wastes that would cost as much as \$250 to \$300 to dispose of in the United States. Specific instances have been documented of hazardous enterprises associated with the asbestos, smelting, and chemical industries being transferred to developing countries. Often desperate for economic growth, these countries have simply been willing to accept risks of environmental, public, and occupational health consequences. While efforts are under way to negotiate treaties to control the trade in hazardous waste, the thrust of current policies to weaken controls runs counter to them.

### **Subordinating Environmental Objectives**

*Environmental Regulation as Non-tariff Barrier:* Another way in which trade agreements can defeat environmental regulations is to attack them as non-tariff barriers. A recent decision by

the Court of Justice of the European Community illustrates how environmental programs can be forced to take a back seat to a country's trade obligations.

The case before the European Court concerned Danish laws that required all beer and soft drinks to be sold in refillable containers. As noted by the Court, Danish regulations were "highly effective" and made no distinction between beverages bottled in Denmark and those imported to the country. Nevertheless, other member states of the European Community objected, as did retail trade associations. Both complained about the costs of collecting *used bottles and argued for the right to sell disposable containers.*

In considering these complaints, the Court took into account the European Community treaty which imposes a duty on all member states to preserve, protect, and improve the quality of the environment. (No similar obligation exists under GATT.) It found the Danish regulations to be just such measures and accepted them as genuine and successful. However, the Court went on to find that Denmark had failed to prove that its reuse laws were "not disproportionate to achieve a legitimate aim." While Denmark could require a deposit on all beverage containers, the Court reasoned that it could not require them to be reusable.

Even though it acknowledged that no actual restraint of trade had occurred, the Court concluded that:

There has to be a balancing of interests between the free movement of goods and environmental protection, even if in achieving the balance the high standard of the protection sought has to be reduced.

This case illustrates that when environmental laws are characterized as non-tariff barriers to trade, legitimate environmental programs can be relegated to second-class status and subordinated to trade objectives. Opponents of environmental regulation now have an important new tool to challenge environmental initiatives.

*The Lowest Common Denominator:* The U.S. government has proposed to

harmonize certain standards under GATT so that food safety standards governing pesticide residues and food additives would have to conform to international norms. Clearly, the development of international agreements around environmental standards is desirable. However, there are reasons to suspect that the intent of the proposals is to lower environmental standards to a common denominator.

First, harmonization proposals are being promoted by those who are often outspoken critics of efforts to strengthen food safety standards in the United States and Europe. For example, the U.S. Department of Agriculture is a *principle advocate for harmonization.*

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***If trade policies continue to be advanced without regard for their environmental consequences, the result will be agreements that inhibit or defeat much-needed progress on the environment.***

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The department describes harmonization as an answer to regulatory initiatives that it considers unjustified, including Europe's ban on bovine-growth hormone and California's rigorous pesticide initiatives.

Second, harmonization proposals would give the responsibility for setting food-safety and environmental standards to international scientific panels. Ethical and social considerations could be ignored, and the role of elected and democratic bodies, like the U.S. Congress, would be weakened.

Finally, and perhaps most telling, the proposed harmonized standards would operate as a ceiling but not as a floor for environmental regulation. To illustrate: Any country that established food-safety standards tougher than international norms, and applied those standards to imports as well as domestic products, would risk suffering retaliatory trade sanctions; on the other hand, a country that failed to live up to international standards might lose access to certain markets but would not be subject to GATT sanctions.

## **New Imperatives**

Recent developments in Eastern Europe and the plight of many countries in the Third World underscore the need to reconsider current trade policies and agreements and to hammer out new, equitable policies that promote sustainable patterns of development. GATT initiatives must be developed quickly to make environmental protection and sustainable resource management explicit and central themes of any new or renegotiated trade agreement.

It is not too late to inject these imperatives into current trade negotiations. While the details will need considerable work, several general principles can be identified:

- The right of all countries to determine, in good faith, their own environmental and resource policies free from the threat of trade sanctions
- The right of all countries to protect domestic producers from competition in which advantage is gained at the expense of the environment
- The need for international environmental standards to operate as a floor rather than as a ceiling: They should set a *minimum* level of environmental regulation that all must meet
- The need for a new approach to trade negotiations and dispute resolution that is more open, democratic, and accountable
- The imperative to thoroughly consider the environmental consequences of trade proposals before commitments are made to them.

If trade policies continue to be advanced without regard for their environmental consequences, the result will be agreements that inhibit or defeat much-needed progress on the environment. The task before us is to define the relationships between trade and the environment, and having done so, to develop trade agreements that will sustain our ecosystem, rather than destroy it. □

# Economic Aid and the Environment

by Robert Repetto

Protecting the world's atmosphere against further damage is in all nations' interest, but all nations simply do not have equal resources to deploy in this effort. Consider, for instance, that roughly one-third of the 59 parties to the Montreal Protocol on Substances that Deplete the Ozone Layer are developing countries—most of which are desperately short of capital.

The Montreal Protocol's budget incorporates a sliding scale so that developing countries can take part on an equal footing with industrialized nations: For instance, Singapore pays \$1,500 a year, but has the same membership rights as the United States, which pays \$300,000. Also, to help developing-country signatories meet their obligations under the regime, Protocol members are establishing a \$100-million fund, which would double to \$200 million if significant holdouts such as India and China should join.

So far, international efforts to control climate change have concentrated on clarifying scientific uncertainties. However, a handful of nations have made commitments to stabilizing or reducing their greenhouse-gas emissions. In mid-June 1990, West Germany became the first major industrialized nation to formally adopt a carbon-dioxide (CO<sub>2</sub>) reduction goal and a timetable: By 2005, West Germany aims to cut emissions to 25 percent below their 1987 level. The Netherlands plans to gradually stabilize CO<sub>2</sub> emissions so that its 1995 emissions do not exceed today's level; the United Kingdom has set an analogous goal for 2005. Japan announced in mid-June that it will stabilize greenhouse-gas emissions at the "lowest possible level" by 2000.

The forthcoming final report by the Intergovernmental Panel on Climate Change may provide firmer underpinnings for future international negotiations. But the point is that whatever the North finally does to reduce its impact on the atmosphere will be canceled out unless the South takes complementary actions. Developing

countries now account for 45 percent of annual greenhouse-gas emissions; their share will grow rapidly if economic and population forecasts are borne out—unless their technologies and use of resources are transformed drastically.

Clearly, it is in the North's interest to help the financially strapped countries of the South protect the global environment, just as it has been in the North's interest to promote economic development in the South. Moreover, the guiding principle here is mutual interest, not compensation. The reality is that developing countries are highly dependent on natural resources for employment, income, and exports. Over much of the developing world, the deterioration of the natural-resource base is already impeding development programs and causing much human suffering. The synthesis of environmental and economic imperatives popularly called "sustainable development" must become a reality, not just a slogan, if these

countries are to meet the growing challenges they face.

The North can promote this necessary transformation by providing the South access to new financing. There is an urgent need over the next decade for an added \$20 to \$50 billion per year to fund initiatives that will help developing countries help themselves—and help protect the global commons as well.

Where will this new money come from, and what mechanisms can facilitate its North-to-South flow? My colleagues and I at World Resources Institute tackled these questions last year in *Natural Endowments: Financing Resource Conservation for Development*, a report commissioned by the United Nations Development Programme. Happily, as discussed below, real-world applications are already in the offing for two of the basic mechanisms we explored: a "green" or "Ecovest" investment fund and a global environmental fund or "facility." In



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addition, we suggested bilateral debt forgiveness by industrial-country governments as a means for enlarging the scale of debt-for-nature swaps, and some movement on this front also seems possible.

### Ecovest

Developing countries have suffered inordinately from destructive investment schemes that yield quick profits to a wealthy few, while desolating the land and further impoverishing the many who are poor. But economic ventures that use natural resources without degrading them can protect the environment and yield attractive long-term profits to investors; local peoples and developing-country economies benefit at the same time.

To identify such investment opportunities and bring together local entrepreneurs, foreign technological inputs, and suitable financial packages, World Resources Institute proposed a

Ivan Ussach photo. Rainforest Alliance.



specialized investment banking intermediary, Ecovest. By combining venture-capitalist entrepreneurial skills with ecological wisdom, such an investment intermediary could prove that conservation pays—and can continue to pay for a long time to come. In addition, by catalyzing more private investment than it directly commands, it could have an impact disproportionate to its capital base.

The Ecovest idea is getting its first trial in Eastern Europe, where enormous pollution problems were revealed in the wake of the historic political events of the past year. Air- and water-borne pollutants from this part of the world drift into the Nordic countries. The Nordic Investment Bank has responded by creating an environmental investment fund, the Nordic Environmental Finance Corporation (NEFCO), which will begin making investments in Czechoslovakia, East Germany, Hungary, Poland, and the Soviet Union later this year.

NEFCO will back joint ventures between Nordic and Eastern European partners to create productive capabilities that will help these Eastern European countries solve their environmental problems. Needed equipment will be produced within each country, taking advantage of lower production costs in Eastern Europe. Since NEFCO is financing high-risk ventures, the Nordic governments are putting up its initial share capital of \$47 million. After a six-year probationary period, they will decide whether to make NEFCO permanent.

In addition, in July, the U.S. Overseas Private Investment Corporation (OPIC) launched another Ecovest variation: a \$100-million Environmental Investment Fund, privately owned and managed,

Funding mechanisms such as "debt-for-nature" swaps can provide developing countries with means to protect their resource base. Pictured is a rain forest on the Ivory Coast in Africa, an example of the resource treasures in the Third World.

that will invest in environmentally sustainable enterprises in the developing world and Eastern Europe. The fund's project menu—sustainable agriculture, forest management, ecotourism, renewable and alternative energy, and pollution prevention—makes it the first for-profit fund ever to deal with the "green" end of the environmental spectrum in developing countries, as opposed to "brown" issues such as pollution control and waste management. Besides being environmentally and economically profitable, qualified enterprises must have significant business ties with U.S. enterprises. OPIC expects to begin marketing limited partnerships to corporate investors in September 1990. The fund is slated to be fully capitalized by early 1991 and wholly invested in projects in the \$3- to \$5-million range by 1994.

Proving that sustainable development pays is critical if the Environmental Investment Fund is to inspire additional private-sector investment in the future. Therefore, OPIC plans to spend considerable sums on post-investment studies that evaluate how "green" the fund's projects are in terms of returns to investors as well as the environment.

### Debt-for-Nature Swaps

Typically, a debt-for-nature swap is an agreement between nongovernmental organizations (NGOs) and governments to buy part of a developing country's debt from commercial banks at deep discounts. These donors then exchange the debt they've bought for an agreed amount of the debtor country's local currency, often paid in bonds. The bonds can then be used to finance long-term conservation measures, typically undertaken by the debtor country's environmental NGOs. Since the idea was first proposed in 1984, debt-for-nature swaps have been carried out in Bolivia, Ecuador, Costa Rica, the Philippines, Zambia, and Madagascar. However, all these swaps have dealt with commercial bank debt (private debt)—not with debts owed to other countries (public debt) or to multilateral development banks.

So far, the largest impact has been in Costa Rica. In just two years, Costa Rica converted \$69 million (or nearly 5 percent of the debt it owes to foreign

commercial banks) into \$33 million in local currency bonds that are supporting parks and protected areas, public and private institution-building, and reforestation. A series of debt-for-nature swaps funded by \$10 million in private donations from American and European NGOs, plus the Swedish and Dutch governments, helped Costa Rica make this possible. The benefits to Costa Rica are threefold: First, its external debt has been reduced; second, the leverage of debt exchanges multiplying donated funds into local currency payments has attracted new money; finally, better parks and more reforestation are likely to bring benefits such as more tourist trade, better watershed protection for the hydroelectric system, and stronger institutional capability to carry out new environmental programs.

In some circumstances, swaps trading public debt for conservation programs could help developing countries meet environmental challenges. Already donor countries have realistically written off a good deal of the debt owed by African countries, mostly without conditionalities. The United States and other Northern governments should go one step further and convert an additional fraction of the poorest countries' public debt into local currency bonds along the lines of a debt-for-nature swap.

On June 27, 1990, President Bush announced the Enterprise for the Americas Initiative, a major trade, investment, and debt package that entails some moves in this direction. Under the debt-relief part of this plan, the Administration is proposing to write off substantial fractions of the \$7 billion that the most heavily indebted Latin American countries have borrowed at below-market rates from U.S. government agencies. To facilitate debt-for-nature swaps, the United States will also sell at discount rates part of the \$5 billion in market-rate loans owed by middle-income Latin American countries. The Administration's plan to let some countries pay interest on their debts to the United States in local currencies—and then use those payments to finance conservation programs—would be especially useful in aiding environmental progress in countries where the United States now has no bilateral assistance programs.

### **Global Environment Fund**

Early this year, the World Bank began discussing a Global Environment Fund along the lines suggested in *Natural Endowments*. In May, the Bank publicly proposed creating such a fund as a three-year pilot project that would lend from \$300 to \$400 million a year to support environmental projects in the developing world and Eastern Europe. World Bank donors would contribute the initial capital, and the fund would be managed cooperatively by the Bank, the United Nations Development Programme, and the United Nations Environment Programme.

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### ***Developing countries have suffered inordinately from destructive investment schemes that yield quick profits to a wealthy few ...***

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The Global Environment Fund would differ from existing World Bank programs in two important ways. First, so-called middle-income countries, such as Brazil or Poland, that have enormous environmental problems could borrow money from this new fund at low interest rates—rather than the rates the Bank usually charges them, which are nearly as high as those charged by commercial banks. Second, the new fund would support projects targeted at global environmental problems, unlike existing World Bank environmental investments, which tend to support national action plans to improve resource management and control local environmental degradation. Through such a fund, lending countries can share the costs of efforts in developing countries to mitigate global environmental problems. The Global Environment Fund's top priorities would include protecting the ozone layer, controlling greenhouse gases, and curbing deforestation and desertification; however, loans might also be available for cleaning up pollution in Eastern Europe and in regional seas and international rivers.

Unfortunately, the U.S. government has not yet endorsed the Global Environment Fund, saying instead that existing World Bank funds should be

reprogrammed. However, given the huge net capital outflows from the developing countries, these countries will not interpret an initiative that merely rearranges existing aid flows as genuine cost-sharing by the North. France and other European nations are willing to provide resources for the fund, but the plan is unlikely to get very far unless the United States also contributes.

The fund's chances of success also depend on its credibility in the eyes of developing countries, a judgment that will focus on "additionality." (Additionality, as the term suggests, is the extent to which these funds for global environmental protection are added to whatever assistance is already available.)

In mid-June, the Bush administration reversed its month-long opposition to the \$100-million international fund to help developing countries end their use of ozone-depleting chemicals. Similar enlightenment regarding the Global Environment Fund would go a long way toward restoring U.S. credibility as an environmental leader.

Although useful, the environmental funding mechanisms discussed above are not, in themselves, enough. A more far-reaching future initiative might, for example, extend the "bubble" or emissions-trading principle pioneered under the Clean Air Act to the global environment. In order to stabilize the greenhouse-gas content of the atmosphere, current emissions must be cut by over 50 percent. Faced with such stringent requirements, Northern sources might find it advantageous to finance abatement measures in the South. One U.S. energy company is already offsetting its CO<sub>2</sub> emissions by financing reforestation projects in Guatemala.

If the North, which presently generates most of the world's climate-altering emissions, comes to accept the necessity of substantial abatement, there will be strategic decisions to make. Countries of the North may well find that the most cost-effective way of reducing the greenhouse-gas burden is by financing investments in energy efficiency, reforestation, and clean technologies in the developing countries of the South. □

# The Challenge to International Law and Institutions

by Scott Hajost

The last two decades have witnessed a growing recognition that no part of the globe is immune from the environmental consequences of activities carried out elsewhere. This awareness has emphasized the need for nations to cooperate at the global, regional, and bilateral levels. To use a term coined by legal scholars and brought to popular attention by the Polish trade movement, there is a pressing need for international "solidarity" to preserve our forests, safeguard our oceans, and stabilize the Earth's atmosphere. However, reaching agreement on protecting the global commons is especially challenging because the benefits and the costs are difficult to define from the individual nation's point of view.

The international community has made impressive gains in meeting the challenge. Since the 1972 Stockholm Conference, an array of international agreements on environmental issues has been developed. The United Nations Environment Programme (UNEP) has led two major negotiations on ozone-layer depletion and one on hazardous-waste exports, and has served as a secretariat to these and numerous other international agreements.

A key outcome of the Conference was

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its "Stockholm Declaration," which defined a number of principles of international environmental law. The most significant and widely cited is Principle 21, which states that while countries have the right to develop, they have an obligation not to damage the environment outside their borders. This includes not only other countries, but the oceans and Antarctica. In the view of many scholars, this principle now represents customary international law; law established by the pronouncements and practices of states. Its application, however, to certain international problems is not clear cut. In the case of global warming, for example, it is not easy to delineate the impact of a specific country.

Critical events in which nations clearly perceive a common interest and require concerted international cooperation can lead to rapid developments in international law. Major oil spills in the 1960s and 1970s led the International Maritime Organization to reach agreements rapidly on oil-spill liability and on regulating oil discharges from ships. The Montreal Protocol was negotiated, entered into force, and amended in record time in response to scientific information on damage to the ozone layer by synthetic chemicals. The Basel Convention's conclusion was expedited by the discovery that hazardous waste and incinerator ash were being exported to a dumpsite in Nigeria. And in the

aftermath of the Chernobyl nuclear accident, the International Atomic Energy Agency rapidly concluded new treaties on notification and assistance. A key feature codified the responsibility of a state to notify others if there was risk of transboundary damage.

International agreements, however, are not an end in themselves. Adopting and signing an agreement are only the beginning. The true test is whether the parties carry out their obligations. This raises issues of verification and enforcement. Generally speaking, the more significant the obligations are, the more serious the attention paid to determining compliance. A number of tools have been developed, including reporting procedures, monitoring systems, and dispute-settlement mechanisms. They will be important in developing a treaty on climate change that will ensure the reliability of emissions data and compliance with agreed-upon controls.

There have been occasions in which nations have adopted non-binding guidelines, principles, or recommendations to control behavior. International lawyers call this soft law. A good example is the work of the Food and Agriculture Organization and UNEP in developing guidelines for trade in pesticides and industrial chemicals. Over time this soft law may evolve into customary law through practice, or it may be codified in new agreements. For hazardous waste exports, UNEP first

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Mother Goose & GRIMM



## International Agreements

### Marine Environment

*London Ocean Dumping Convention*, a direct outcome of the Stockholm Conference, regulates the disposal of wastes in the world's oceans. One unresolved issue is whether the oceans can be used for disposal of radioactive wastes, including decommissioned U.S. nuclear submarines.

*International Convention for the Prevention of Marine Pollution from Ships (MARPOL)* regulates the discharge of oil, chemicals, and garbage, including plastics, from ships. The convention will play an increasing role in the problem of marine debris, including debris in the Gulf of Mexico.

*United Nations Environment Programme's Regional Seas Program* is a broad marine-conservation treaty with supporting legal arrangements. It has sparked a series of regional agreements for the United States concerning such areas as the Gulf of Mexico, Caribbean, and South Pacific. These agreements are the only ones currently addressing the increasing problem of land-based pollution of the seas.

*1982 United Nations Convention on the Law of the Sea* is not in force. The United States objects to the convention's seabed-mining provision.

### Wildlife and Habitat

*1973 Convention on International Trade in Endangered Species (CITES)* regulates all international trade in endangered species. The protection of the African elephant through bans on ivory trade is a recent initiative.

*1971 Ramsar Convention on Wetlands* is an increasingly recognized vehicle for conserving wetlands worldwide.

### Atmosphere

*Vienna Convention on the Protection of the Ozone Layer* and its *Montreal Protocol* is a global effort on reducing ozone depletion. Parties to the protocol met in June 1990 to strengthen the controls on depleting substances and establish financial assistance for developing countries.

*Convention on Long-Range Transboundary Air Pollution* and its protocols controlling nitrogen-oxide and sulfur-dioxide emissions cover the United States and Europe.

### Hazardous-Waste Export

A global treaty on exports of hazardous waste was adopted in 1989 in Basel, Switzerland, but is not yet in force.

### Antarctica

*1959 Antarctic Treaty* and related instruments have sparked a substantial body of law. The 1988 agreement, not yet in effect, would regulate mineral exploitation. More recent proposals would turn Antarctica into a wilderness park and ban mineral activities.

### International Institutions

*United Nations Environment Programme (UNEP)*: See text.

*International Maritime Organization (IMO)* is set up to control marine pollution, primarily from ships, and serves MARPOL and the London Ocean Dumping Convention agreements.

*Food and Agriculture Organization (FAO)* deals with forestry, fisheries, and pesticide issues.

*Organization for Economic Cooperation and Development (OECD)* consists of the United States, Canada, Western Europe, Australia, New Zealand, and Japan. It is empowered to make binding decisions. Its primary successes have been in developing international environmental law.

*United Nations Economic Commission for Europe (ECE)* develops East-West treaties on environmental impact assessment and protection of watercourses.

*Multilateral Development Banks* include the *World Bank* and are crucial in protecting the environment through lending policies.

*World Conservation Union* is a combined governmental/nongovernmental institution that plays a significant role servicing agreements, including those on Earth's biological diversity.

developed guidelines, then a convention.

Ensuring the full participation of developing countries is critical to making international agreements work, and that raises the difficult issue of equity. If we are to succeed in protecting the world's forests, conserving biological diversity, and, probably most important of all, limiting global warming, we will have to be creative in transferring technology and in providing funding to developing countries. We will have to help educate them on the problems so that when they come to the negotiating table, they can participate effectively.

The problem of global warming, which cuts across issues critical to both developing and developed countries and which is scheduled for treaty negotiations in 1992, is the greatest challenge in front of us. If we are to face up to it, institutions will have to be strengthened and decision-making will have to be streamlined. Some have called for the creation of new authority for international institutions, authority that transcends traditional sovereign-nation decision-making. Procedures providing for rapid changes of agreement through technical annexes have moved us in this direction. The Montreal Protocol has taken us a step further by providing for certain decisions to be binding on a nation even if it does not approve of them—provisions similar to those in national legislation. We may see an expanded role for the World Court in settling environmental disputes.

While progress has certainly been made in those cases in which the scientific nature and the economic and technical implication of a problem have been conceded, in the case of global warming, where there is a lack of consensus, the way forward is slow. Lawyers and institutions can catalyze, but they cannot mandate what nations will accept.

The 1992 United Nations Conference on Environment and Development in Brazil will be a milepost for the international community and a benchmark for the future. International law and institutions will play a key role in mobilizing resources for a collective response to the threats to our planet as we enter the next century. □

# National Sovereignty and Environmental Imperatives: Two Views

by Fred Lee Smith, Jr.

The early federal experience with environmental protection in the United States repeatedly illustrated that, as a rule, the individual states had a built-in conflict of interest: They felt responsible for their citizens' health, but to compete with their neighbors in attracting industry and jobs, it seemed they were best served by a *laissez-faire* posture in environmental regulations. The solution was to impose the same federal standards on all, thereby eliminating the environmental element from the competition.

Now that the Earth faces global environmental problems, aren't the world's governments impaled on the horns of basically the same dilemma? To reach viable solutions, must national sovereignty and national security as such give way? Are international standards necessary—standards that apply equally to all nations?

EPA Journal asked two key observers of international economics and environmental issues to respond to the questions posed in the preceding two paragraphs. Their commentaries follow:

Concerns about the greenhouse effect, the ozone layer, the loss of biodiversity, and the tropical rain forests have led to calls for "globalizing" environmental policy. Just as the U.S. EPA was created to assume control of state and local environmental affairs, we now need a global environmental protection agency to protect Mother Earth, the argument goes. Only centralization, it appears, can eliminate the conflict of interest that forces nation-states to choose between environmental quality and economic growth.

However, before rushing to turn in our citizenship papers, we should consider what was sacrificed in federalizing U.S. environmental policy and whether global institutions are likely to advance global environmental

(Smith heads the Competitive Enterprise Institute, a pro-market public interest group. Jane S. Shaw, Senior Associate of the Political Economy Research Center, assisted in the preparation of this article.)

goals. First, consider the U.S. experience under federalized environmental policy.

Prior to federalization, the states, like nations today, varied widely in their interest in environmental issues and their economic ability to resolve them. More environmental quality (a "good thing") had to be traded off against more economic wealth (also a "good thing"). States that emphasized environmental quality to the detriment of economic growth could lose their tax base. The impact of their choices was felt clearly and directly.

Once EPA was formed, however, the pressure to make tradeoffs disappeared. People cannot simply move away from their country the way they can move from state to state. Federalization made it easier to spend more money, to mandate costly private expenditures on pollution controls, and to impose uniform standards across a very diverse nation. Whether this was something that the American people wanted is unclear. Indeed, whether federal policy has even advanced environmental goals is unclear. Urban air remains polluted; most of our waters are not much cleaner.

Federalization separated people from power by creating an additional layer of bureaucracy and making it harder to enlist people in the fight for a quality ecology. In principle, environmental policy is made only after "public participation." In reality, most people lack the time and interest to affect public policy, to become expert on such issues as whether efficient refrigerants should be banned or what the future of the Amazon basin should be. Those devoting the time to such pursuits are highly motivated, either because of economic interests or ideological commitment. Such groups are unlikely to represent the views of the public at

Wide World Photo.



Held in Stockholm in June 1972, the United Nations Conference on the Human Environment heralded a growing international perspective on environmental problems. The author is concerned about the possible "globalization" of environmental policy.

large; yet, in a politicized setting their voices are the ones most likely to prevail.

Federalization weakened the principle that polluters should bear all environmental damage costs. Politically well-connected polluters—older firms and city governments, for example—are treated far more leniently than oil, chemical, or other “pariah” polluters. Political status, rather than damage to the environment, becomes the metric for apportioning responsibility. Of course, this tendency makes a mockery of the major goal of centralization, uniform treatment of all polluters.

This politicization has caused EPA’s resources to be diverted to low-priority environmental goals such as eliminating asbestos in school buildings, even in the face of research suggesting that it would be safer to leave the asbestos in place, or cleaning up abandoned waste sites posing minimal risk. Politics has too often used new environmental arguments to justify old pork-barrel programs. EPA’s 1987 publication, *Unfinished Business*, documents the resulting misprioritization.

Moreover, federalization, in effect, closed down the states as environmental policy laboratories, discouraging the experimentation that by now would have yielded a wide range of less costly and less complex remedies. Also, EPA has become a monopoly supplier of information on environmental risks. Without state experimentation and without local sources of dissenting information, mistakes occur on a grand scale. An open and experimental program would have been far more valuable to the Third World.

Indeed, our current policies have little applicability to the rest of the world. U.S. environmental policies depend heavily on the expenditure of vast sums, the mobilization of armies of technicians, a civil service largely immune to bribery, and an independent citizen environmental movement. U.S. environmental policies are possible only because Americans are wealthy and reasonably well-educated and because

America retains a reasonably honest bureaucracy and a tradition of respecting minority viewpoints. These prerequisites are rare in much of the world.

Globalization is all too likely to follow the path we have seen with federalization. Narrow, vocal interests will hold sway, and the concerns of the organized environmental groups will probably prevail over those of Third Worlders. We are likely to emphasize

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***Economic central planning has failed. Why should we expect ecological central planning to do any better?***

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the eradication of trace pesticide levels rather than the improvement of basic diets and to be concerned with disposing of “hazardous” wastes rather than treating disease-carrying contaminated water. Globalization, like federalization, is likely to mean that environmental priorities will be set by the shrill rather than the serious.

Too, the lack of world government means that enforcement of global environmental polices will not be easy. International environmental agreements take the form of treaties, official promises by one government to another. History does not encourage us to expect such promises always to be honored. Indeed, the OPEC experience suggests that nations find it hard to enforce agreements even when they share common goals. A global warming treaty—given that warming will create widely varying costs and benefits among nations—would be far more complex to enforce. Moreover, America’s disastrous record of negotiating international agreements in such areas as trade and telephone service does not indicate that the United States will fare well under a global environmental regime.

This rush to globalize public policy is not new. Some years ago, a major push was made to erase poverty by global means. The Brandt report recommended that the developed countries transfer large quantities of wealth to the Third World; the obvious international

agencies—the World Bank, the International Monetary Fund, the United Nations—responded. These are also the agencies that supposedly will protect and enhance the global environment. Unfortunately, the track record of these agencies in the economic area provides little justification for optimism in the ecological sphere. Although these agencies spent vast sums to reduce global poverty, Third World conditions have improved little. Economic central planning has failed. Why should we expect ecological central planning to do any better?

Indeed, globalization may divert nations from taking appropriate local action, encouraging them to count on others to make the difficult decisions needed to solve their internal environmental problems. Only a nation can reform its own legal and economic policies to empower its people to protect its environment. Moreover, as anthropologist John Cordell in *A Sea of Small Boats* notes, many Third World countries have a rich tradition of “rational, often elegant and ingenious solutions” to natural resource management problems. Globalization may well ensure that these solutions are ignored.

Globalization sends us in the wrong direction. Like federalization, it makes it too easy for politicians to operate in a fantasy world, where costs are irrelevant, where technologies spring forth by legislative decree, and where ideology can triumph over economic and environmental reality. Before advancing this approach, globalization proponents should rethink the advice offered long ago by Rene DuBois that we think globally, but act locally! □

# ... Two Views

(Continued)

by Jessica Tuchman Mathews

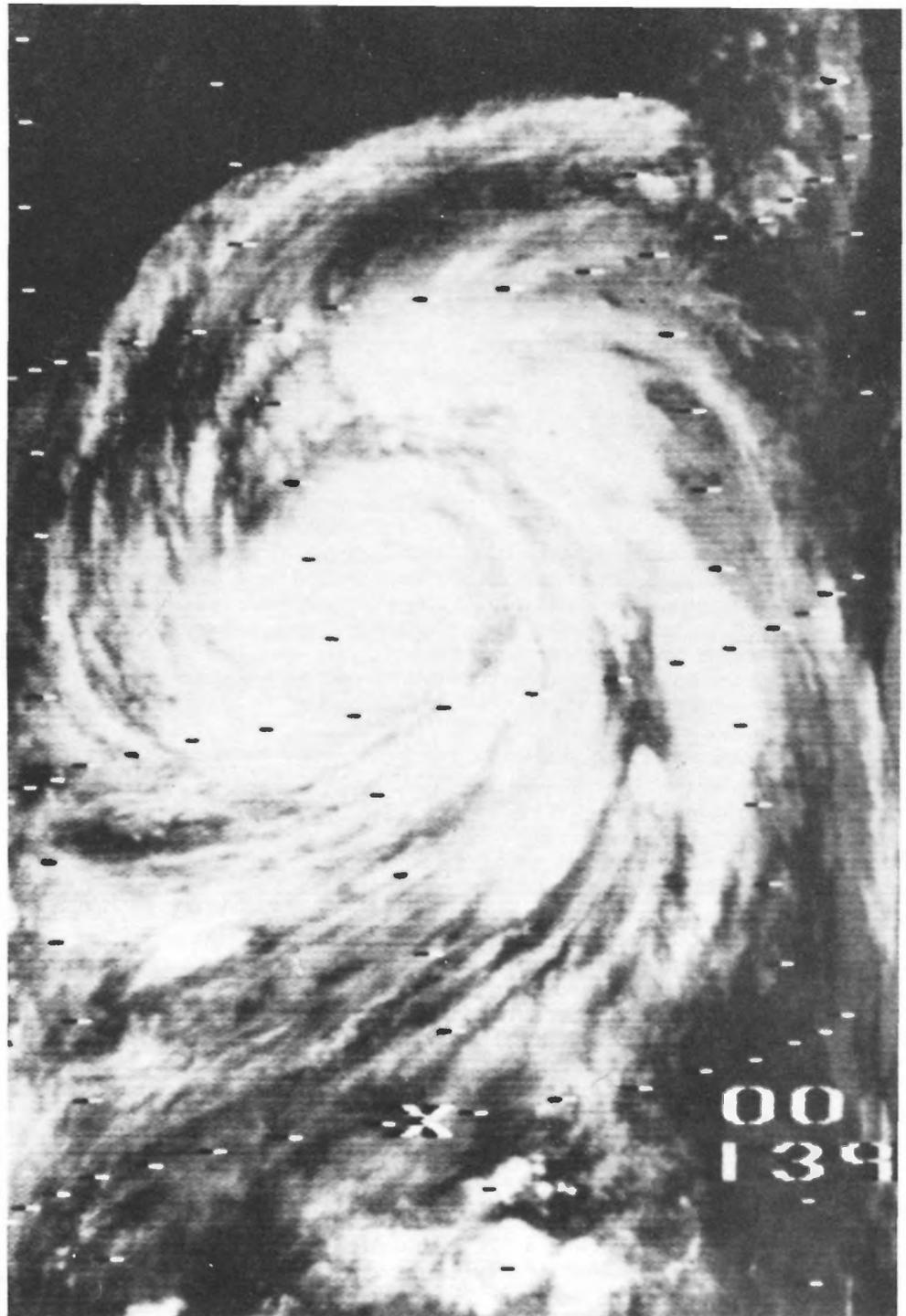
That individual American states were "best served by a *laissez-faire* posture in environmental regulations" is a flawed premise. States that welcomed polluting industries did indeed accrue short-term benefits in the shape of jobs and tax revenues. Over the longer term, however, these benefits were far outweighed by the costs of health care, productivity losses due to environmentally caused illness, and the cost of cleaning up polluted water and land. The tradeoff turned out to be a Faustian bargain.

One of the notable developments of the past decade or two has been the growing recognition that the same pattern holds true on an international scale. Countries differ widely in their commitment to environmental protection and in their readiness—and capacity—to spend governmental dollars on it. But in sharp contrast to the situation only a short while ago, no country now sees it as being in its national interest to attract international business or investment by becoming a so-called pollution haven.

While many countries lack the bureaucratic capacity, the political will, or the fiscal ability to strengthen weak environmental regulations, few see weakness in this area as a national asset. The tragic lessons of Bhopal and Cubatao, Brazil's "Valley of Death," have been well learned.

Bhopal has become a household word for industrial disaster, but Cubatao, a slow-motion industrial disaster brought on by extreme concentration of industries with lax or nonexistent pollution controls, is less well known. Cubatao was so polluted by industrial poisons during the 1970s and early 1980s that hundreds died and emergency evacuations became commonplace. Even without an accident or extreme concentration of industry in

(Dr. Mathews is Vice President of the World Resources Institute, a center for policy research on global resource and environmental issues, located in Washington, DC.)



Global warming may spawn increasingly violent weather, among other effects. The author argues that the imperatives of controlling humanity's impacts on the planet are changing traditional concepts of national security. Pictured is Typhoon June, near Guam, photographed by NASA's Nimbus System.

one place, the chronic and worsening environmental crisis in Eastern Europe stands as a stark warning of the long-term costs of industrializing without paying adequate attention to environmental protection.

That said, the calculus of determining national posture towards environmental regulation is evolving, in part because environmental imperatives are changing the concept of national sovereignty. The post-postwar era is still unnamed, but its defining characteristics are clear: multipolarity, replacing the bipolar U.S.-U.S.S.R. axis around which nations

used to array themselves; economic interdependence; and diverse invasions of national sovereignty.

Putting these trends together, it is likely that international problem-solving in the decades ahead will for the first time depend on collective management, not hegemony. And it is to precisely this form of governance that global environmental problems will yield.

Global environmental trends—loss of species, ozone depletion, deforestation on a scale that affects world climate, and accelerating buildup of greenhouse gases—all pose potentially serious

losses to national economies, defy solution by one or a few countries, and render geographic borders irrelevant. By definition, then, they pose a major challenge to national sovereignty.

In this the environmental trends are not alone. Many policies and practices once considered purely domestic matters now spill over into the international arena. The integration of the global economy—with its internationalization of markets, sources of supply, and capital—makes industry increasingly mobile, thereby undercutting governments' rights to tax and regulate.

In a very different domain, governments' treatment of their own citizens, which was once viewed as strictly a domestic matter, is now held to be within the realm of international law. The boundary-erasing effects of remote-sensing technologies and telecommunications developments are also evident, one consequence of which is the rising influence of a body of international public opinion.

The notion of what constitutes national security is also changing. In its original military sense, national security was a zero-sum concept: The more secure one nation became, the less secure grew another. (The distinction between offensive and defensive military expenditures never held up since one country's defensive buildup looks like preparation for war in the eyes of its enemy.) As the concept of national security broadened in the 1970s to include economic strength, the element of common security gained ground, as exemplified, for instance, by efforts to manage monetary policy cooperatively and to achieve free trade.

Environmental concerns shift the center of gravity still further toward common security. Global environmental degradation threatens nations' economic potential and thereby their internal political stability. But the potential fallout goes far beyond economics. Ozone depletion may put their citizens'

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***For both economic and environmental reasons, the notion of collective global security is slowly replacing that of individually defined national security.***

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health at risk because of increased ultraviolet radiation. The worst-case scenarios associated with global warming call into question some nations' very existence—the biggest national security threat of all.

Thus for both economic and environmental reasons, the notion of collective global security is slowly replacing that of individually defined national security. Nation states are not going to disappear, nor is world government in the offing. But nations are seeing irrefutable evidence that their future well-being rests increasingly on actions taken far from their shores, an insight that is putting an unprecedented premium on international cooperation.

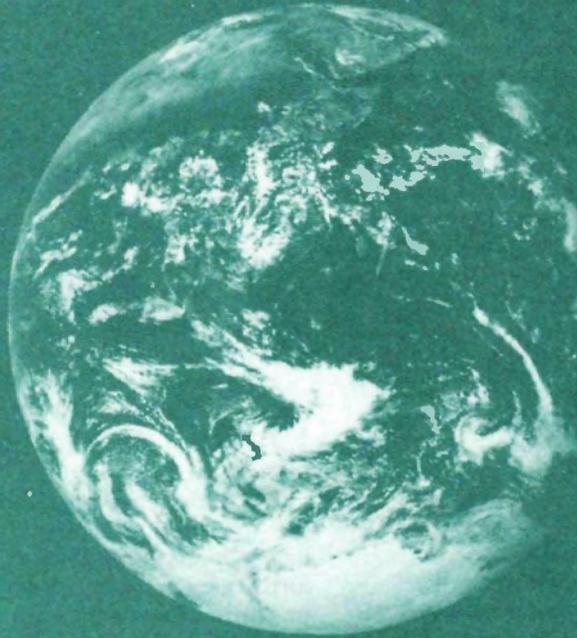
The idea that nations might gain from competing in the environmental realm, either by becoming pollution havens or by hoping to emerge as a "winner" from global climate change, has little support. Instead, nations are acting as though they believe that they have a strong mutual interest in cooperation, as demonstrated most spectacularly by the tightened chlorofluorocarbon and financing agreements under the Montreal treaty reached by 93 nations meeting in London in June 1990.

Turning this mutual interest into effective international environmental management remains a distant goal. The answer does not lie in a vain attempt to apply uniform environmental standards to a community of nations whose members differ by one hundredfold in per-capita income and have vastly different cultures, climates, religions, resources, and attitudes towards nature.

Instead, answers will be found only through institutional innovations as sweeping as those that inaugurated the postwar period we're now emerging from. The present international system was set up to preserve the status quo and to manage and contain conflict. The new system that will allow us to deal with the problems ahead must be designed to catalyze cooperation. Instead of the glacial pace required to negotiate treaties that set particular performance standards, we need fluid international processes that can respond quickly to changes in scientific understanding and that set all nations moving in the same direction at whatever pace is realistic for each nation's particular circumstances.

Scientific theories and economic, political, and environmental perturbations are all in a constant state of flux. Only a new institutional agility can keep international environmental governance closely attuned to these changing realities and ensure the best possible outcome. □

# A Forum: How Big is the Population Factor?



NASA photo.

Demographers estimate that at the current rate of growth, the world population will double in less than 40 years. Some experts are convinced that unless this population explosion is brought under control, efforts to come to grips with global environmental problems are bound to fail. Are they correct? Should programs like the United Nations Population Fund be revitalized and expanded? Or should the population factor not be considered in proposing solutions? EPA Journal posed these questions to six key observers in the population field. Their responses follow:

## Nafis Sadik



When Thomas Malthus observed at the close of the 18th century that population growth might threaten food supply, our current world population of 5.3 billion would have been literally unimaginable to him. Even 150 years later, it was hard for Paul Ehrlich and the other prophets of the "Population Bomb" to swallow; they thought that civilization would come to

an end first.

Yet here we are in 1990, ticking along at an extra 92 million a year and rising; expecting 6.25 billion people by the end of the century, 8.5 billion by 2025, and a total of maybe 10 or 11 billion by the time growth finally stops. Should we be worried?

The answer is: Yes, we should. The momentum of population growth is like that of a giant oil tanker, slow to develop, hard to turn, and very hard to stop. The reefs may be far ahead, but if you haven't already stopped the engines, you are going to run aground. The momentum of population is indeed slowing, but quite gradually. Birth rates are down in most parts of the world, but simple arithmetic means that annual additions will continue to rise until the end of the century, and only then start to decline. Population growth, according to the United Nations' most likely projection, will not halt altogether until about 2085.

Nearly all population

growth, about 96 percent of it, is in developing countries, and the largest additions are in the poorest countries. Potentially, these new arrivals are all contributors to the solution; but they need at least a 15-year supply of food, clothing, health care, and education before they can begin to fulfill their potential.

Already, most developing countries are hard pressed. Development strategies, however successful and sophisticated, cannot keep up with populations growing at 3 to 4 percent a year, as they are in most African countries. Zimbabwe is one of Africa's few success stories over the last decade, with vigorous development programs and considerable international assistance. Family planning programs have been very successful and growth rates are now poised to fall below 3 percent.

Although we may be able—theoretically—to supply everyone's needs from

the resources known to be available, the Earth is not merely a collection of resources, but a vast and complex life-support system. It has enormous built-in flexibility and capacity to absorb punishment, but it is showing signs of overload. Damage to the ozone layer, buildup of greenhouse gases and toxic wastes, and increasing acidification are all symptoms. Most of the burden of responsibility falls on the "rich billion" people in industrialized countries, but developing countries, the other 80 percent of the population, are doing their best to catch up.

Consider also the "bottom billion," the fifth of the world's population who live in deepest poverty. Their need is so desperate that they are forced into a ferocious assault on their environment simply to survive. The damage done by each individual is small, but the cumulative affects are enormous. Look at the equatorial rain forests, the eroding river basins, the filth and squalor of urban shanty towns: Can the Earth survive such a combination of poverty and destruction?

This concerns all of us. Clearly, development must continue—if only because poverty as well as wealth is wrecking the ecological balance. Equally, development cannot proceed on the basis of "business-as-usual." There has to be an all-out attack on the roots of poverty. There has to be a determined effort to find technologies which permit development without despoiling the environment. There also has to be an attack on rapid population growth.

Governments representing more than 90 percent of the population of developing countries are in favor of slower population growth, and they are acting to achieve it, according to the most recent survey by the United Nations. The international community supports them: Last year in Amsterdam, 79 countries called for a doubling of the funds going to population programs worldwide, to about \$9 billion.

If this seems like a huge amount of money, think of it as less than 1 percent of the global arms bill. If it still seems like a lot, consider what may happen if it isn't found.

(Sadik is the Executive Director of the United Nations Population Fund.)

## Ben J. Wattenberg



**D**ue to recent demographic trends in less developed countries, much of the argument about the "population explosion" has become moot. While fertility rates were climbing, or while those rates were

essentially at a high plateau, explosionists could cry disaster. Opponents, on the other hand, could maintain that whatever problems existed in those countries, be they economic or environmental, they were not primarily demographic in origin. Culture counts, we anti-explosionists said: It's what people do, not how many there are or how fast they reproduce, that makes an economy sound or sick, an environment healthy or polluted.

But new fertility rates now coming in show that we're off the demographic plateau. Total fertility rates have either fallen dramatically, or are now falling, typically fairly rapidly, just about everywhere.

It's been about two decades since any major industrialized nation, including the United States, has had a total fertility rate at or above replacement-level (see box).

Although from much higher levels, Asian and Latin American total fertility rates have also been dropping for several decades. During the period 1960-65 to 1985-90, South Korea went from 5.4 to 2.0; Indonesia, from 5.4 to 3.3; India from 5.8 to 4.3; China, assisted by coercive government policy, from 5.4 to 2.0; Brazil from 6.1 to 3.5; and Mexico from 6.8 to 3.6.

Africa still has the highest rates, but Egypt has fallen from 7.1 to 4.8. A recent fertility survey in other African nations shows the beginnings of a serious decline even in Kenya, long seen as the intractable highest fertility country in the world.

### Demographic Terms and Definitions

**Demographic Transition** is the historical shift of birth and death rates from high to low levels in a population. The decline of mortality usually precedes the decline in fertility; thus rapid population growth typically occurs during the transition period.

**Population Momentum** is the tendency for population growth to continue beyond the juncture when replacement-level fertility (see below) is achieved. Periods of high fertility produce a relatively large number of people who must pass through childbearing age before a stationary population (or zero-population growth) is reached.

**Total Fertility Rate** is the average number of children that would be born alive to a woman during her lifetime if she follows

current age-specific patterns of childbearing. It represents the completed family size of the "typical" woman in a country.

**Replacement-Level Fertility** is the level of fertility at which couples have only enough children to replace themselves in the population. The total fertility rate is often used as an indicator of replacement-level fertility. Because not all children survive to reproductive ages, the replacement-level total fertility rate is generally considered to be 2.1 children per woman.

**Zero Population Growth** means a population in equilibrium, achieved when birth plus immigration approximately equals death plus emigration.

(Source: Population Reference Bureau, Population Handbook, 1988.)

Down, down, down. And fertility rates are clearly going to come down much, much further as modernization runs its course.

Which is why the argument is going to become sterile. Those of us who believe in supply-side demography (culture counts) never were against international family planning programs. Insofar as it is responsible for lower fertility rates, I applaud the effort. And insofar as rates are down because of economic growth and modernization, the explosionists should be applauding and should recant their snippy characterization of our position: "Capitalism is the Best Contraceptive." It may well be. The fact is both have been operating together, among families that have, in any event, been deciding on their own to lower their fertility.

However, the built-in demographic momentum of earlier high-fertility rates will produce an increase in the total population, probably doubling it by the middle of next century. Can this decline be speeded up? Perhaps. Let's do what can be done, but in a non-coercive way.

Since the increase in total population is already programmed into the deck of demographic momentum, we're going to have to live with it. If it's an environmental disaster, we'll have to cope until we reach, first, stability, and then reach what no one seems to mention, the likely reduction of human population toward the end of next century.

If population growth is not a key cause of environmental degradation, which is what I suspect and is the clear conclusion of a 1986 blue-ribbon National Academy of Science report, we will still want to do the best we can to let people control their fertility.

We will be helped by continuing economic modernization, hopefully accelerated due to the sweeping global victory of market economics. The economic boost provided by free-market philosophy may prove to be as important to lowering fertility as family planning, and perhaps more so. Are environmentalists prepared to support market incentives with the same vigor that supply-siders support contraceptive programs?

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(Wattenberg is a Senior Fellow at the American Enterprise Institute.)

### Herman E. Daly



Human impact on the environment is not simply the product of the impact of one person times the total number of people. All people and their impacts are not equal. Rich people use more matter and energy per capita than do poor, and thus one rich person is equivalent to many poor people in terms of load on the environment.

Apparently affluence, not poverty, is the big

environmental problem. Yet we hear a lot about the close connection between poverty and environmental degradation, and with reason. Poverty hurts the environment mainly because there are so many more poor people that their per-capita consumption adds up. In addition, the poor often are forced to live on—and overexploit—marginal land for immediate survival at the expense of the land's long-run productivity.

Fertility among the poor is also significantly higher than for the rich. Unless direct efforts are made to reduce population growth, there will be further degradation of the environment, increases in absolute poverty, and a widening gap in the distribution of income. And the theory of demographic transition, relied upon by many to provide the "automatic" solution to population growth, is a false hope.

Basically the demographic transition theory says that as poor people become rich they will adopt the lower fertility patterns of the rich. There is some truth to this, but it is of little relevance unless the poor are actually becoming richer. This is not happening due to rapid population growth among the poor which keeps labor in oversupply and wages low.

Even if it were true that the fertility of the poor would fall to the lower level of the rich as the poor began to consume more, there is still the question of the environmental impact of that much extra consumption. If the consumption of the average Indian has to rise to that of the average Swede for Indian fertility to fall to the Swedish level, then there is not much hope for saving the environment from total ruin. Transition enthusiasts forget that affluence is harder on the environment than poverty, other things being equal. Population control is essential—but we must

practice birth control for cars, airplanes, buildings, etc., as well as for people.

We must recognize that 10 billion lives are better than five billion lives—as long as they are not all lived simultaneously! We should strive to maximize the cumulative number of lives ever to be lived over time at a per-capita standard of resource consumption sufficient for a good life. But if we have too many people and too much consumption at any one time, we will erode the Earth's long-run carrying capacity and therefore reduce the population and standard of consumption in all future time periods. We will thus reduce the cumulative total of lives ever to be lived at a decent level of consumption.

In the long run, it is the neo-Malthusians who are pro-life, not the population and immigration boosters. And even in the short run, the consequence of population and immigration boosting is cheap labor and a lower standard of living for workers, who constitute the vast majority in every country.

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(Daly is a Senior Economist in the World Bank's Environment Department. The views expressed here are those of the author and should in no way be attributed to the World Bank.)

*Forum continued on next page.*

## Barry Commoner



Both historic and current population trends are explained by the process known as demographic transition. Briefly stated, rapid population growth is the natural response to a partial improvement in living standards, one that reduces the death rate without creating the level of economic security that motivates a comparable reduction in birth rate. After a time, the birth rate also begins to fall—if living standards become high enough to generate changes such as increased education, delayed marriage, and reduced infant mortality, all of which tend to reduce the overall birth rate.

This pattern has occurred universally in developed, industrialized countries and accounts for their nearly stable populations. It is currently occurring, although more slowly, in many developing countries.

The rapid population growth that is characteristic of developing countries is largely due to their lack of the economic resources needed to raise living standards to levels that enable the second,

population-stabilizing phase of the demographic transition to occur. Their predicament is the unresolved residue of the economic exploitation these countries endured during the period of colonialism, which initiated the first stage of the demographic transition but delayed the second.

Pressures on food supplies, resources, and the environment in developing countries would be reduced if birth rates were to decline faster than they presently are. Improvement in the standard of living, and a resultant decline in the birth rate, would be hastened if the rate of economic development could be accelerated. If development were based on ecologically sound technologies of production, increased impact on resources and the environment could be avoided.

These problems have a common solution: the elimination of poverty. Poverty is the reason for the failure thus far of developing countries to stabilize their populations. Poverty is the reason why their peoples are malnourished, sick, and hungry. Poverty is the reason why they experience such difficulty in applying the remedy: ecologically sound economic development. Poverty engenders poverty, holding the efforts of developing countries to overcome its tragic effects in a tight, nearly incapacitating embrace.

In effect, colonialism has determined the distribution of both the world's wealth and its human population, accumulating most of the wealth north of the equator and most of the people south of it. The only remedy, I am convinced, is to return some of the world's wealth to the countries whose resources and peoples have borne so much of the burden of producing it—the developing nations.

Such reparations ought to be paid not only in goods but, more usefully, in the means of producing them. And the productive processes should be those that correct both the environmental and economic defects of the technologies that have enveloped the global ecosphere in pollution.

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*(Dr. Commoner is Director of the Center for the Biology of Natural Systems at Queens College, City University of New York.)*

declining growth rates and aging populations. With the exception of Ireland, every nation in Western Europe has a birthrate below the replacement level. Europe's population is growing older as its workforce continually declines. The U.S. birthrate is also below replacement level and many sectors of the workforce rely on immigrant labor—legal or illegal.

In the developing nations, population growth rates have begun to decline and the problem of rapid population growth now exists in a small number of countries, mostly in sub-Saharan Africa and Western Asia. The increase in world growth rates from 1950 to 1970 was due primarily to a decrease in mortality, not to an explosion of births.

Concern about environmental problems was expressed at both the 1974 and 1984 United Nations World Population conferences. There is general agreement among population specialists and ecologists that environmental issues should always be considered in the context of socio-economic development. The solution to environmental problems requires more careful monitoring and control of economic and production strategies by the industrialized countries, since air and water pollution—such as acid rain and global warming—cross geographic boundaries. Industrialized countries also influence developing nations through their trade activities and importation of natural resources. Demographers and economists increasingly recognize that patterns of production, consumption, and economic activity, particularly in the least populated industrialized countries, have more to do with present ecological problems than population growth.

Two fundamental ethical principles should inform our strategies and guide our

## James T. McHugh



The doubling of world population in the next 40 years is a projection that is tenuous at best because most demographers refrain from projecting beyond 10 to 20 years. Nor is the doubling alone the critical issue. One has to consider a nation's natural resources, financial structure, workforce, and productivity in assessing the impact of population growth rates.

Looking at the global picture, one sees a variety of population situations. Most developed nations face the problem of seriously

efforts: the integrity of all creation and respect for human life and human dignity. We must come to understand that the goods of the Earth are part of the heritage of the entire human family.

Thus, there is an urgent need for a new solidarity among nations as a first step toward global protection of the environment. This calls for a strengthening of cooperation and peaceful relations among all nations and an end of hostility and the arms race.

It also includes a worldwide effort to correct the structural forms of poverty that exist throughout the world, especially in the poorer nations. And it requires the affluent nations to take a careful look at their lifestyles, particularly the demand for instant gratification and unlimited consumption.

It is not simply a matter of counting heads and proclaiming that there are too many people. Rather it is a matter of adjusting our lifestyles and global strategies to protect, enhance, and sustain human life as well as the global environment.

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*(McHugh is the Bishop of the Catholic Diocese of Camden, New Jersey, and has been a member of the Holy See Delegation at the 1974 and 1984 United Nations International Conference on Population.)*

## Dr. Karan Singh



Among the many factors that are causing environmental imbalance in the biosphere, the exponential rate of world population growth must be looked upon as one of the most significant. The entire developing world, in which I include Asia, Africa, and Latin America, is still showing a calamitous rate of population growth averaging well over 2 percent per year. The population of China is already nearing one billion, and India will be reaching that figure by the year 2000.

In the mid-1970s India experienced encouraging developments which resulted in the adoption of our National Population Policy by the Indian Parliament in April 1976. The policy set national goals for limiting population growth. Although the policy officially remains in effect, it has not been rigorously implemented over the last decade. Therefore the annual growth rate, which when I was Minister of Health and Family Planning I had projected should by now have fallen to 1.6 percent, is still over 2 percent. This

involves a staggering increase of over 15 million human beings every year, which equals the entire population of Australia, a country with two-and-one-half times the land mass of India.

Such massive growth in population involves increasing pressure on forests, resulting in widespread deforestation; rising demand for fossil fuel; unplanned and chaotic urbanization; enhanced transportation requirements; and many other factors that directly impinge upon the environment and deplete non-renewable resources.

I fully agree with the view that unless the population explosion in the developing world is brought under control, dealing with the global environment is somewhat like bailing water out of a sinking ship with a ladle. It is totally unrealistic to leave the population factor out of consideration in dealing with global environmental problems. As leader of the Indian delegation to the World Population Conference in Bucharest, Romania, in 1975, I said, "Development is the best contraceptive," a phrase that became widely quoted around the world. While that is certainly true, it is also true that over-population is potentially the worst pollutant.

Because India is a secular state, the National Population Policy did not have any particular religious orientation. Generally, it can be said that in comparison to some of the Semitic religions, Hinduism does not have a strong built-in hostility to family planning. However, the resistance to family planning by the Roman Catholics—who represent only a small fraction of India's population—and more importantly by the Muslims—who constitute a very sizeable minority—has contributed to a negative backlash to family-planning programs in India.

Humanity is now transforming into a global society, and in my view the United Nations Fund for Population Activities needs to be urgently expanded and energized if we are to make the transition smoothly. Otherwise, with the present imbalance in world population—growing larger every minute—we will find ourselves in a position where, while the threat of nuclear annihilation is steadily receding, the population bomb is inexorably ticking away with consequences that in the long run could be no less disastrous. □

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*(Singh is a former Ambassador to the United States from India.)*

# Water Resources: A Foreign-Policy Flash Point

by Joyce R. Starr

The U.S. State Department has estimated that there are presently at least 10 places in the world where war could erupt over dwindling shared water resources, the majority in the Middle East. As nation after nation around the world reaches its water resource limits, the potential for conflict between states—and even internal conflict within water-besieged states—will only intensify.

Water will be a paramount foreign-policy resource issue of the 1990s and beyond. With the world's population racing toward 12 to 14 billion people, our fragile, interdependent global ecosystem will barely be able to provide enough potable water, let alone food and space.

The problem is not an overall shortage of water, as water consumption for all uses is actually less than one-quarter of fresh water literally available. Instead, the challenge, according to the World Bank, is water availability at an acceptable cost in places where it is most needed and vastly improved water management for existing resources. Between 1985 and 2000, for example, urban areas around the world will absorb an additional 850 million people, pitting the David of existing water and sanitation services against the Goliath of demand.

Agriculture, industry, and human health will be the victims of our ignorance and inattention to the water crisis ahead. By the turn of the century, water will overshadow oil as the most revered and precious commodity.

(Dr. Starr is chairman of the Global Water Policy and Technology Summits and co-chairman of the U.S. Global Strategy Council. She has written extensively on water politics, including her well-known report on "U.S. Foreign Policy on Water Resources in the Middle East.")

The era of water geopolitics has dawned. But are we awake to the threat?

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***By the turn of the century, water will overshadow oil as the most revered and precious commodity.***

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In Africa alone, 250 million people, almost 40 percent of the population, will suffer or die from water-related problems by the year 2000. The United Nations Children's Fund (UNICEF) reports that currently 25,000 children worldwide are dying daily from hunger or disease caused by lack of water or contaminated water supplies.

Egypt's burgeoning population is expected to leap by 15 million within the coming decade to over 70 million, placing impossible strains on the Nile watershed and leading an Egyptian official to acknowledge that "Egypt's national security is dependent on water."

Experts predict that Jordan, Israel, the West Bank, and the Gaza Strip will deplete all renewable water sources by 1995, making water policies a key issue in any future peace process. The Gaza Strip, one of the most densely populated places in the world, is already a sewage time bomb waiting to explode. Turkey, Syria, and Iraq have been trading threats over the Euphrates.

Eastern Europe was benevolently endowed by nature with ample water resources. Yet, according to a recent issue of *Time* magazine, Poland's river water is so contaminated that almost 95 percent is unfit to drink and nearly all of Romania's rivers and 50 percent of those in Czechoslovakia are dangerously polluted. Moreover, Christian Taylor of the *London Financial Times* reported in July 1989 that the ecological catastrophe

of the Aral Sea region in Soviet central Asia was "worse than Chernobyl."

Soviet newspapers acknowledge that two-thirds of the people in the area suffer from hepatitis, typhoid, or throat cancer from water-related pollutants. With infant mortality skyrocketing and deformities a common occurrence, inhabitants call the Aral Sea the "salty sea of death."

Michael Rozengurt, a Russian-born and -educated oceanographer now residing in California, led the initial Soviet investigation on environmental damage to rivers and lakes throughout the Soviet Union. He has since testified before the U.S. Congress on the dangers of over-ambitious river diversion projects, arguing that "severe economic and environmental damage results from greater than 30-percent reductions in the natural flow."

Such figures may mean little to average American readers, until they learn that 98 percent of the San Joaquin River in California has been diverted to irrigate desert terrain. In addition, over half the water that once flowed into the San Francisco Bay-Delta estuary from the Great Central Valley watershed has been diverted elsewhere for farming, industrial, and urban use. Rozengurt believes that California's finest estuary could be on the verge of collapse. And California is certainly not the only state in the Union threatened by severe water shortages or water pollution.

Ironically, members of Congress from water-stressed states also tend to be the least interested in the global dimensions of the problem. Often I've been told by a senator or congressman from the South or West, "My constituents would never understand why I'm worrying about water in Africa or the Middle East when we have such severe water problems at home."

Crops won't grow when there is no water, but this farmer in the Sahel, sub-Saharan Africa, is practicing plowing so that his oxen will be ready when the rains come. A prolonged drought has brought distress to the area.

The U.S. government, through its many departments and agencies, has undertaken extensive technical assistance programs for water problems throughout the world. Projects for every conceivable purpose have been designed and implemented, including wastewater treatment plants, dams, feasibility studies, and training programs for regional experts. The quiet pool of dedicated water-related talent—all but hidden in the recesses of the U.S. government—would mark the United States as a leader in the global effort to respond to the emergency, if only there were the will to lead.

In 1987, M. Peter McPherson, then-administrator of the U.S. Agency for International Development, noted that the “development of water resources is a critical foreign policy issue for the United States.” McPherson was a lone environmental visionary on the American foreign-policy stage. Three years have passed, but his message on water has not yet caught the attention of those American men and women who have the political power to change the course of human events.

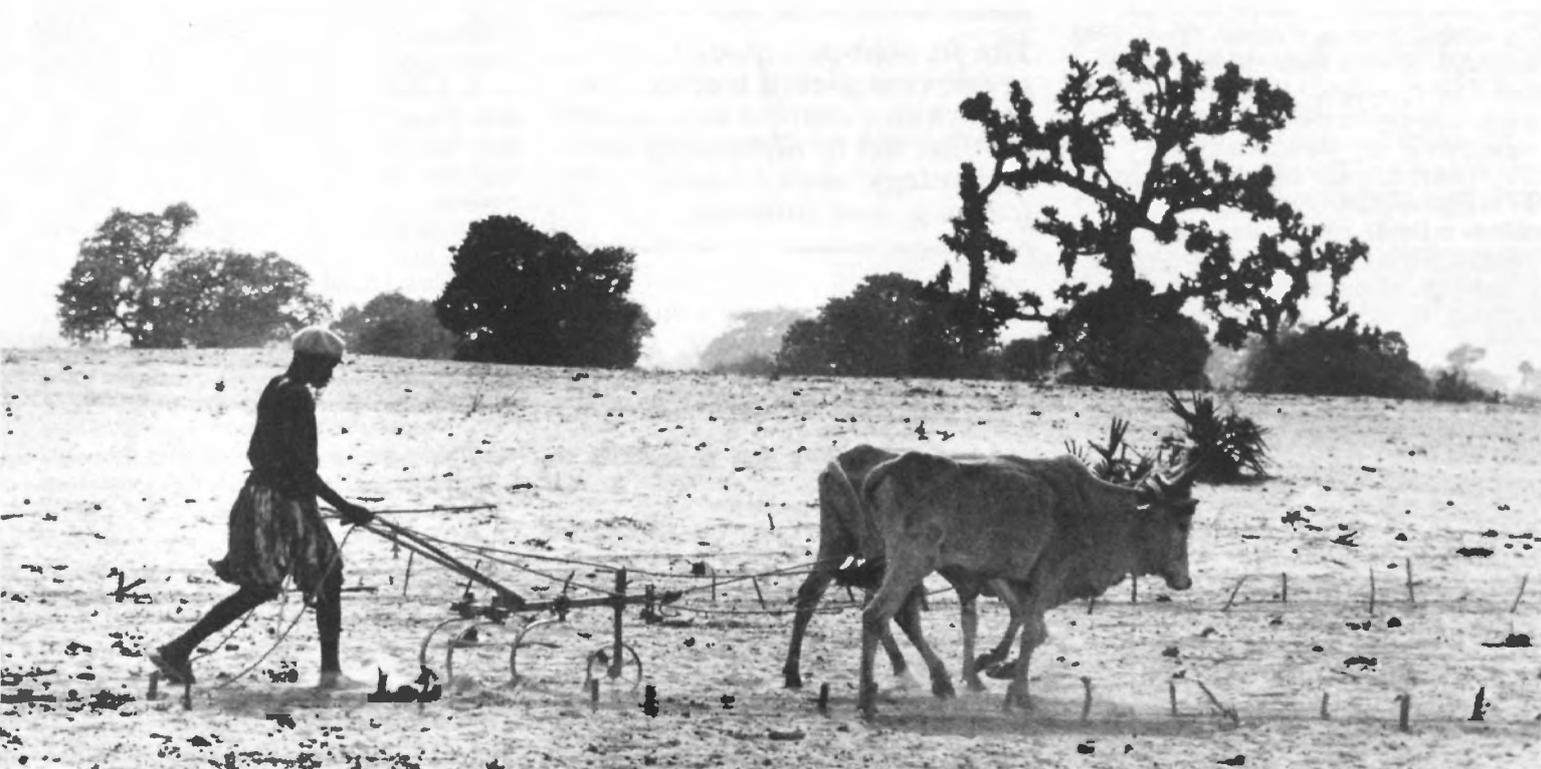
Despite well-intentioned efforts, federal departments rarely undertake comprehensive, anticipatory planning on water challenges abroad. American experts are in the vanguard in developing conflict-resolution techniques on water sharing. Yet no single agency has definitive responsibility, let alone an adequate, Congressionally authorized budget, to carve a foreign policy niche for water. Thus in place of a macro approach to the water dilemmas of Africa, the Middle East, Eastern Europe, or Latin America, the United States continues to rely on ad hoc responses.

The United Nations declared the 1980s as the International Drinking Water Supply and Sanitation Decade. Together with the World Bank, United Nations organizations—notably the United Nations Development Programme, UNICEF, the United Nations Environment Programme, the World Health Organization, and the United Nations Center for Human Settlements (HABITAT)—have made a resolute effort to slow the ticking clock. But neither the World Bank, nor any of

the major United Nations bodies has the effective political mandate or charter to negotiate water controversies between nations or to dictate appropriate water management within. Instead, the most concerned international players find themselves walking a political tightrope leagues above the seas and rivers, with little expectation of a net.

Yet there is hope. The International Drinking Water Supply and Sanitation Decade may not have reached the all-encompassing goals of its founders, but water supply installations service 700 million new users and 350 million persons have sanitary facilities that didn't in 1981. The World Bank and three multilateral regional banks—the African Development Bank, Asian Development Bank, and Inter-American Development Bank—have already marched to the front lines by providing major contributions to water-related sectors. The burden borne by women as the water-carriers of the world is finally being acknowledged as an injustice having dire consequences for the economic well-being of women, children, and men. A wealth of

*AID photo*





Marriner photo. Greenpeace.

Not just water supplies, but access to water that is clean enough to meet drinking and other needs will be a major foreign-policy issue in the 1990s. This woman is doing laundry in a mercury-polluted stream near Thor Chemical, Cato Ridge, South Africa.

experiences on the social, institutional, human resources, and technical aspects of planning and programming are now at our disposal.

Moreover, a global initiative to galvanize the highest-level political leadership within water-resource regions to face their common water future—the Global Water Policy and Technology Summits—was launched in June 1990 under the auspices of the U.S. Global Strategy Council. The inaugural African Water Summit was hosted by President Mubarak of Egypt in his capacity as the chairman of the Organization of African Unity and co-sponsored by the Egyptian Ministry of Foreign Affairs. Over 40 African nations actively participated in a dialogue for action. The African Water Declaration resulting from the event recognized that through a compact for cooperation, African water and land resources are potentially capable of sustaining several times the present population.

As chairman of the Summit Initiative, I am pleased to convey that President Ozal of Turkey has agreed to hold the Middle East Water Summit, and plans are already under way for a special program for Eastern Europe emphasizing the critical need for major financial investment in a peaceful war against water pollution.

Moreover, on September 10, 1990, the United Nations will hold a four-day Global Consultation on water, hosted by the Government of India, to recommend strategies for the future, which in turn will be presented to the Secretary-General.

If the visibility of water as a foreign-policy issue is increasing, the

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***The foreign-policy tools for preserving global waters and preventing conflict must merge the fine art of diplomacy with technology, management, training, and financing ....***

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technological horizons are even more encouraging. For example, Mr. Robert Bisson, president of BCI-Geonetics, and Dr. Farouk El-Baz, director of the Center for Remote Sensing at Boston University, recently presented a state-of-the-art model for ground-water detection to a major international conference on desertification. Dr. El-Baz stated, "This very practical use of space-age remote sensing techniques ... creates a major new opportunity for economic development in water-restricted areas of the world, especially in the Middle East and arid Africa."

Breakthroughs in lowering the energy costs of presently expensive

desalination technology could turn salt water and brackish water into drinkable water for millions of people around the world. Advanced water-reuse technologies will mean the recycling of precious supplies, while vastly improved pollution-control, water-treatment, and waste-disposal processes will help safeguard existing resources. Plant breeding and high value crops also hold tremendous potential.

The foreign-policy tools for preserving global waters and preventing conflict must merge the fine art of diplomacy with technology, management, training, and financing—in sum, a holistic approach to integrated resource management and sustainability. According to John Kalbermatten, a water expert instrumental in the promotion of the Water Decade, the real unsung heroes in bringing water and sanitation to the poor have been non-governmental organizations. It is time that the governments of the world follow their lead. □

# Business and the Environment

by Kristine L. Hall

Environmental issues have taken on an increasingly international and sometimes global character in recent years. One result is that business, particularly those corporations that do business in a number of countries, will be increasingly involved in decisions on courses of action concerning global environmental issues both within the business community and for society at large.

Transnational corporations can, along with other institutions, help define and resolve the environmental problems that face us. In fact, it is clear that the complicated environmental issues confronting society cannot be successfully resolved without a high degree of business involvement and cooperative effort.

The most obvious form of business involvement is through development of products for the marketplace that help define or solve environmental problems. The past decade has witnessed a phenomenal growth in business opportunities that address environmental protection in the United States and other countries. As more countries tighten environmental requirements, business opportunities also grow and international competition is fostered.

Equipment that removes pollutants from air and water, biotechnology that renders toxic pollutants harmless, consulting services that offer specialized approaches, and computers that do everything from collecting environmental data for complex models to helping industry better manage its processes for environmental compliance: All these are growth areas that business is pursuing on an international basis.

To serve the needs of business and government, IBM has, for example, undertaken a number of relevant research and development projects, including the development of air- and water-pollution models, ocean-current and climate models, oil-spill models, and sand-storm studies. In 1989, the company announced a \$16 million investment in its Scientific Center in

Bergen, Norway, to make it the international focus of the company's research in the environmental area. The Bergen center covers all major fields of environmental science and emphasizes the development of transferable software tools and the acquisition of technical competence and skills on environmental issues.

Business can also play a major role by insuring that its activity takes place with as small a footprint as possible consistent with producing quality products in a competitive manner. Many major multinational corporations have explicit environmental policies and stringent internal guidelines in place that are applied on a worldwide basis.

IBM's environmental policy, for example, was first formalized in 1971. It commits company management and manufacturing worldwide to:

- Meet or exceed all applicable regulations on the environment at all locations
- Set our own standards where no relevant government regulations exist
- Use non-polluting and energy-efficient technologies wherever possible in designing products and processes
- Help governments and other industries develop solutions to environmental problems wherever our knowledge and experience would be useful.

To implement this policy, the company has a series of comprehensive internal guidelines that are usually more stringent than local regulatory requirements. In effect, all manufacturing facilities, regardless of whether they are located in Argentina or the United States, are required to meet the same stringent requirements designed to protect the environment.

For example, chemicals used in every plant are controlled through a central database of information on each chemical and its approved uses. Chemicals that have not been characterized for the database may not be used for production.

When chemicals are stored on IBM property, storage facilities must meet stringent containment requirements, requiring accessibility to facilitate inspections and testing. Likewise, distribution of chemicals on-site is carefully controlled to prevent leaks, discharges, and emissions.

Product managers are required to complete an internal environmental impact assessment prior to any significant change in product or manufacturing process. This allows us to identify, early on, any environmental, work-place health and safety, and energy issues for resolution before they become problems.

Hazardous waste is handled according to a hierarchy that was in effect long before it became part of the U.S. Resource Conservation and Recovery Act. This hierarchy applies worldwide and does not allow plants to send waste

IBM photo.

Businesses are reorienting their production processes with the environment in mind. Here, at IBM's disk-drive manufacturing facility in San Jose, California, an engineer inspects a new aqueous cleaning system which has replaced CFC-113 cleaners.



(Hall is a manager of Health, Safety, and Environment at IBM.)

off-site for treatment or disposal unless the waste vendor can meet certain environmental requirements.

Approval of waste vendors is done centrally. In a few countries, this has created a dilemma, since no off-site hazardous waste facilities there meet our requirements. In those cases, we store waste in specially designed facilities until environmentally acceptable vendors can be found.

This waste hierarchy emphasizes that source reduction is the highest priority of all, followed by recycling. Through much hard work at the plant level, the company has reduced its generation of hazardous waste by 30 percent worldwide between 1985 and 1989. In addition, on a worldwide basis, we recycle about 87 percent of our production waste, 75 percent of it on-site.

Chlorofluorocarbons have been a major source of concern for the electronics industry in general. CFC-113 has been widely used because it is nontoxic, nonflammable, and has unique cleaning qualities that have generated large demand in the past decade. IBM has established a goal of ending CFC use by the end of 1993. This will entail considerable expense, since CFCs are used in hundreds of product lines. There is no single, drop-in solution. Hundreds of solutions will have to be engineered.

IBM has reduced its worldwide consumption of CFCs by 35 percent in the last three years and is well on its way to meeting its 1993 goal of total elimination. In addition, our plants have been advised not to use methyl chloroform (also suspected of causing ozone depletion, although at a much reduced rate) and have begun the research necessary to find replacements for this chemical as well.

In addition to making sure appropriate internal programs are in place, business can also make a large contribution to protecting the environment through working externally. By supporting well thought-out international environmental initiatives, communicating effective approaches, sharing successful management techniques, and making available appropriate technological solutions to governments and industry in other countries, industry, particularly major multinational companies, can play a very valuable role.

As environmental requirements continue to grow more stringent and apply more broadly, it is in the interest

of the business community to take an increasingly international approach to specific environmental issues. International approaches to transnational environmental problems will help insure that no one country's industry bears a disproportionate share of the burden of addressing an international issue. For this reason, the business community has recently supported the Basel Convention on Control of Transborder Movement of Hazardous Waste and the Montreal Protocol on Control of Ozone-Depleting Substances.

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***Many major multinational corporations have explicit environmental policies and stringent internal guidelines in place that are applied on a worldwide basis.***

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Increased international approaches, however, have inherent difficulties for developing countries in which local industry may not have the resources available to address environmental controls. Thus an important issue of the 1990s is making technical environmental knowledge available to industry in developing countries.

Industry, particularly multinational companies, has the largest reservoir of technical and management know-how to solve complicated environmental problems. Making that knowledge available to industry in other parts of the world is not, however, a simple matter. Although much attention has focused on the issue of "technology transfer," practical approaches remain few in number.

In most instances, environmental management skills are much more important than simply adding on a piece of equipment at the end of a pipe. Transferring these skills to industry in countries that do not have a tradition of efficient production management is a time-consuming process where results are hard to measure. In addition, decisions about what information is proprietary and what technology is appropriate to transfer to industry in countries without the infrastructure of highly developed countries are sometimes very difficult.

There are no easy answers for the many case-by-case determinations that will have to be made over the coming years. Much more cooperative dialogue is necessary before efforts aimed at

technology transfer on a major scale can be undertaken on an effective basis.

Nonetheless, industry is already actively sharing its knowledge and experience, both as individual companies and through specific organizations that have been set up to foster and improve environmental management skills in industry and to transfer environmental technology and know-how. Specifically, these organizations are the World Environment Center in New York, the International Environmental Bureau, a specialized division of the International Chamber of Commerce in Geneva, and the Global Environmental Management Initiative, recently established by industry in the United States.

In 1988 IBM donated \$6.5 million worth of equipment to the Global Resource Information Database (GRID), a United Nations Environmental Programme project that converts geographic and environmental data into map form. IBM donated data-processing equipment and software to installations in Geneva and Nairobi, and 15 smaller machines to African countries to link into the GRID system.

GRID's unique strength is the capacity to examine the interactions between different environmental databases, such as data about geography, geology, vegetation, population, etc. By overlaying these databases, GRID can be used, for example, to locate areas within a region with specific soil, climate, and vegetation within major population centers. GRID can also be used to investigate changes in geographic areas as a result of changed climate conditions, such as the greenhouse effect.

National governments, international bodies, institutions, and universities can create databases to help them understand what is happening or what may happen in any region or country for which basic data are available. Increasingly, GRID is becoming an important tool for economic development in developing countries.

If we are to solve the serious environmental issues confronting us, new efforts must be made to involve all relevant parties—business, government, academia, and nongovernmental organizations—in constructive dialogue. Industry plays a critical role, both in bringing resources to bear in defining issues and problems, and in contributing its knowledge and experience to the solution of those problems. □

# Third World Grievances

by Shridath S. Ramphal



Michael McRee photo.

(Sir Shridath S. Ramphal, currently Chancellor of the Universities of Guyana, Warwick (Britain), and the West Indies and Chairman of the West Indian Commission, was a member of the World Commission on Environment and Development. From 1975 to 1990 he was Secretary-General of the Commonwealth, the association of 50 independent countries previously administered by Britain. He is a former Foreign and Justice Minister of Guyana.)

In Kenya, which has one of the world's fastest growing populations, subsistence is a day-to-day effort. Food is often scarce for these children, their parents, and six other siblings, especially when baboons and warthogs from the nearby game park raid the garden.

As the collective experience of industrialized as well as still-developing countries shows, when nations seek to harness new technology and industry in order to grow rapidly, stresses and conflicts are created. Among such stresses are those that affect the environment.

Rapid development can, and often does, create irreversible damage through pollution and the over-use of scarce resources. But poverty and underdevelopment are also gross, or even grosser, pollutants. Not only the excesses of wealth creation but the extremities of stagnant poverty endanger our global environment. How to escape the horns of this particular dilemma is already one of the great issues of the age.

There is some basis at least for hope, if not for optimism. Environmental causes now receive political attention to a degree well beyond our expectations two years ago. In Western Europe, the survival of governments can actually turn on their treatment of "green" issues. In Eastern Europe, the acknowledgment of past environmental neglect and the need for remedy are central to *glasnost* and *perestroika*; indeed, Mr. Gorbachev has shown characteristic foresight in proposing that environmental cooperation should be one of the main planks of the emerging new international political order.

Throughout Latin America, Africa, and Asia, environmental issues are becoming politically sensitive and command priority attention. And after a long, frustrating period in which multilateralism was in retreat, the environment has provided the trigger for a major burst of activity, much of it led by the United Nations Environment Programme (UNEP). This activity includes formulating international principles and rules governing such matters as ozone depletion, the dumping of hazardous waste, species preservation, and climate change. All this is to the good, but it is not yet good enough.

I must share with you some reservations about the way in which this "greening" of the international agenda is taking place. Much of the driving force for change is coming from

the affluent countries. That is welcome, but perspectives can become skewed as a result. Unlike most of humanity, people in rich countries have achieved high living standards, have stable population levels, and can contemplate with equanimity some reduction in material welfare in order to create a cleaner, quieter, and generally more aesthetically pleasing environment. To them, the concept of sustainable development seems not only desirable but attainable.

At its best, the new environmentalism has produced a genuinely uplifting moral philosophy whose concern for the natural world is allied to deep respect for the claims of all humanity and of future generations. The political "greens" are a force for good, recalling us to these eternal values. But like all new religions—and some old ones—the new environmentalism is throwing up its own breed of fundamentalists who are narrow, intolerant, and extreme: people who seem to believe that natural resources should not be used at all to sustain and improve conditions of human life.

Such people seem to want the people of the developing world to revert to a kind of primeval, aboriginal state, in which they can be stopped from cutting down trees, growing cash crops, living in cities, putting up factories, building roads, and obtaining electricity for cooking and lighting. That is a parody, of course, but it is how some of the environmental evangelism is coming across.

It is not difficult to see why environmental questions are often perceived quite differently in developed and developing countries. The Western world passed through a period of remarkable and largely unexpected economic success in the 1980s, reinforcing its existing prosperity. This prosperity created many undesirable environmental side effects, but it has also created the resources to provide an antidote to most of them. In the more environmentally aware countries, there are already measurable results in cleaner air and rivers and reduced pollution.

This, however, contrasts sharply with the position of large numbers of developing countries where poverty actually has increased and there is little short-term prospect of any amelioration. It is estimated, for example, that in 21 out of 35 low-income developing countries, the overall daily calorie supply per capita was lower in 1985 than in 1965. Almost half of 115 developing countries have experienced falling per capita staple food consumption this decade. Significant numbers of African countries are reporting falling life expectancy, rising infant mortality—and famine. For hundreds of millions of people, life has

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***Ecology and economy are inseparable. Lip service has been given to this proposition; but it is clear that it is still not widely understood.***

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long been a struggle for bare survival; in the 1980s, their numbers greatly increased. Many fail to survive; the World Food Council estimates that there were 14 million unnecessary child deaths from hunger and disease in the first half of the decade. Where the priority for individuals is managing to survive, where for governments it is not much different—with issues like debt and adjustment to overwhelming growth—"sustainable development" will inevitably be seen as a very distant goal.

Developed and developing countries come to the environmental crisis—which is a common crisis—out of such vastly different economic experiences and with such vastly different capacities that the crisis itself is in danger of being perceived differently—with potentially serious consequences for North/South relations. The current arguments over tropical forests, and over environmental conditionality—the setting of environmental conditions for flows of international finance including foreign aid—are symptoms of this. If these divisions were to widen, it would be extremely difficult to achieve harmonious solutions to global

environmental problems.

For this reason, I believe we have to take a fresh and urgent look at the link between environment and development and at how it can properly be addressed in international relations. The truth is that mass poverty in the world is not merely unacceptable and unnecessary but that, in environmental terms, it is both exacerbated by and contributes to environmental stress. Ecology and economy are inseparable. Lip service has been given to this proposition; but it is clear that it is still not widely understood.

The clamor by non-governmental organizations in industrialized countries to try to stop deforestation by banning trade in tropical hardwood is a case in point. Clearly, there is some serious over-exploitation by commercial loggers and, equally clearly, forestry industries have to be made subject to economic disciplines leading to sustainable use; but to concentrate attention on this issue detracts from a more serious problem in most countries: forests retreating in the face of growing numbers of poor people looking for land for crops and grazing and for firewood—processes that will continue or even accelerate if the trade ceases. But, of course, the former involves the relatively easy task of lecturing developing countries; the latter involves alleviating poverty through facilitating development.

Western governments know that such lectures are not the answer. But since, by and large they are not ready to provide the alternative answers in concrete terms, they might even go along with the polemics—and, of course, in doing so, make matters worse.

If the environmental crisis is to be tackled effectively, the development dimension has to be grasped in a purposeful manner, and if this is to happen, there will have to be major changes in basic approaches of both developed and developing countries. For the moment, in industrial countries, the environmental issue is a populist platform. In fact, the measures that governments—all governments—will have to introduce to achieve



AID photo.

“sustainable development” could be anything but popular. The “polluter-pays” principle, now being advocated as the guiding principle for economic policy, almost certainly means, in practice, higher prices to be paid by consumers—rich and poor alike. Much higher prices for energy are one obvious example. But if the United States cannot muster the political courage to stop the environmental damage caused by cheap gasoline (or, for that matter, by the cutting down of the temperate rain forest of Alaska), it is not difficult to understand why governments in more politically fragile societies also fail to act.

Another area of difficulty is agriculture. It has now been abundantly demonstrated that the protection and subsidization of farming in rich countries—particularly in the European Community and Japan—have contributed to the overuse of environmentally damaging inputs, as well as the distortion of world trade. By contrast, developing country governments have often neglected agriculture to subsidize the cities, damaging the rural environment by neglect.

A change of direction will require governments to stand firm against powerful pressure groups: the farmers of the North; the urban masses of the

South. The implication may well be that in the transition to saner world agriculture, food prices should rise. Governments will have the awesome task of persuading their people that, in this and other ways, sustainable development offers no easy options and may be very painful. In fact, at present, many developing-country governments are being forced—through conditions attached to financial assistance—to inflict this pain; but in the developed world, where per-capita consumption of energy, food, and other resources is very much higher, “green” rhetoric is not being matched by real action.

Meanwhile, however, developing countries cannot let the default of the rich encourage them to default as well on some politically forbidding long-term issues critical to their survival—like reducing population growth where it is outstripping the availability of fertile land and economic resources. The success of countries such as Japan and others in Southeast Asia points to the crucial importance of progress in this area. It may involve confronting deeply held religious beliefs and traditional prejudices about the role of women. Some governments—Zimbabwe is one—have set a courageous example, but let no one underestimate the difficulties. These changes could be

difficult enough but are in turn being superimposed on big changes in economic policy to reflect the importance of sound finance, market instruments, the private sector, and the primacy of the agricultural sector. Developing-country governments need sensitive encouragement and practical help.

At present, with “development” virtually off the agenda of the rich, the poor can be forgiven for believing that too much is being asked of them; if they cannot expect some results—at least in terms of reduced poverty—they will be tempted not to persist. For results, they do need help. The examples that are widely cited of successful reforms—Ghana in Africa, Bolivia in Latin America—relied heavily on external assistance.

For many developing countries, external debt is an often insupportable burden, and recent relief measures for both middle-income and low-income debtors, while welcome, barely scratch the surface of the problem. Protectionism remains a serious problem for countries trying to diversify from resource-based exports. Capital flows to developing countries are restricted. All these factors contribute to poverty and increase the difficulty in

these countries of attending to long-term environmental issues.

Unless the developed world is willing to do much more to alleviate these burdens of poverty, many developing countries will not get beyond their current hand-to-mouth existence, let alone to the point of giving due weight to long-term "sustainable development." For Western industrial countries, this is a crucial time that could easily be wasted basking in a warm glow of smug complacency because the rest of the world now wishes to follow their political and economic example.

Fortunately, there are signs that some member countries of the Organization for Economic Cooperation and Development realize the dangers. The trouble is, however, that to the extent that the growing environmental sensitivity of the North is in fact spilling over into North-South relations, it is often taking the form of stringent "environmental" conditions attached to aid. Some of this is genuinely well-intentioned, is designed to produce better projects, and—when associated with generous aid flows—is accepted by most developing countries. But there is a growing stridency and self-righteousness in some of the attempts to influence policy. These attitudes are particularly invidious when they come from countries where wasteful lifestyles and massive pollution have already contributed to serious depletion of the world's ecological capital. "Don't do as I do: Just do as I say" is how some of this comes across.

Environmental conditionality is actually slowing down aid flows at a time when many countries are desperate for liquidity. Conditions are often capricious. For example, countries are being urged to switch away from fossil and nuclear fuels, then hydro-power projects are opposed on environmental grounds. Underlying the technical issues is a political concern by developing countries that, without increasing their overall concessional resource flows, developed countries are increasing their control over key areas of developing-country policy. The World Commission on Environment and Development has specifically warned that increased flows must accompany any increased emphasis on environment conditions. The danger of ignoring that warning is the risk of a backlash against environmentalism in general.

It is vital to deal with these issues in a proper spirit of cooperation. As weaker members of the international community, most developing countries have much to gain from global, rather than national, approaches to pollution and resource management. At the same time, their cooperation is indispensable if amicable international agreements are to be reached. This applies especially to management of the global commons (the oceans, the atmosphere, space, and Antarctica) and to international trade (as

with toxic waste disposal and trade in threatened species and tropical timber). The current interest in strengthening legal statutes and international cooperation is to be welcomed, as is the higher status and profile being given to UNEP. But it must proceed in a way that keeps the development dimension at the center of attention. Thus, if there is to be satisfactory global environmental management, it must be equitable and must address the causes of problems—including poverty and inequality—as well as the symptoms.

## Developing Nations: Four Environmental Profiles

Countries such as the Philippines, Egypt, Mexico, and Kenya suffer from massive environmental degradation and have rapidly growing populations besides. Except for Kenya, these are so-called middle-income countries, and all have made real gains in the decades since World War II. But in the 1980s those gains were eroded by explosive population growth, urban pollution, deforestation, soil degradation, and declining water and energy supplies.

- Mexico presents a complicated foreign-policy challenge for the United States, for the two countries share long-standing cultural and economic ties. Mexico, the United States' third-largest trading partner, bought \$25 billion worth of our exported goods in 1989. We buy half of its petroleum exports, and 40 percent of our winter fruits and vegetables are from Mexico. Our 2,000-mile permeable border and the pressure of nearly a million workers joining the Mexican labor force each year emphasize that it's in our own national interest to help Mexico solve its environmental and economic problems.

Concern in Mexico is rising, as illustrated by President Salinas's major address on World Environment Day in

*(Dr. Brown is Senior Associate at the World Resources Institute and editor of In the U.S. Interest: Resources, Growth, and Security in the Developing World, which includes case studies of the four countries discussed here.)*

June and the nationwide planting of five million trees, but the continuing problems are daunting. Mexico City, home to nearly a quarter of the country's population, is the largest city in the world and one of the most environmentally damaged. It suffers from horrific air and water pollution, thanks to a heavy concentration of industry and a motor vehicle fleet that has grown six times as fast as the population has over the past 40 years. Throughout the country, nearly a million acres of forest are lost each year and desertification proceeds apace. Forty percent of rural Mexicans are malnourished, and basic food grains must be imported. Real wages fell at least 20 percent in the 1980s as oil prices dropped and debt payments consumed half of export earnings. Restless and rebellious, the voters of Mexico in 1988 seriously challenged the ruling party for the first time in 60 years.

- Egypt may be poor in natural resources—only 4 percent of its land is arable, its water supplies are uncertain, and its known oil reserve could be exhausted in 15 years—but it is rich in human resources. Its chief asset is a resilient, industrious, and educated people, three million of whom work overseas and send part of their wages home, thereby fueling an informal economy that belies official statistics. Population doubled between 1952 and 1980, but economic growth kept pace and the progressive social policies that Egypt adopted allowed it to avoid the extremes of wealth and poverty found in many developing countries.

The environment is a rapidly evolving subject. Just a few years ago, climate change was not seen, as it is now, as a central issue. Major new subjects, and threats, are emerging over the horizon—acid fog, pollution by particulates, algae blooms, and the hazards of biotechnology and genetic engineering. There is a danger that a mixture of despair, boredom, and confusion could come to paralyze policymakers faced by demands for action on a multitude of subjects that are barely understood.

We therefore have to keep the fundamentals clearly in focus: Environment is not an afterthought, but central to good economic policy; rapid but "green" growth is feasible and necessary; overcoming poverty is a global not just a developing-country responsibility; an endangered environment demands truly international, not nationalistic, thinking and action. Only through such readjustments in thinking can sustainable development pass from aspiration to reality. □

by Janet Welsh Brown

But in the 1980s, oil prices collapsed and debt payments rose, putting Egypt in a financial bind at the same time that the balance between population and resources began to shift. Soil and water degradation plague both rural and urban areas. Damming the Nile at Aswan allowed regulated irrigation that greatly increased food production in the short term, but also led to the waterlogging and salinization that now affect perhaps one third of Egypt's arable land. Some irrigated land, once lush and green, is now salt-encrusted, and food production is off by an estimated 10 percent.

The cities, where nearly half the population lives, don't have adequate water or sanitation systems, and urban air is dirty. At current growth rates, Egypt's population of 50 million will double by 2012. Will the country's limited and already severely strained resource base be able to support twice as many people? No development scenario yet proposed can keep up with such rapidly growing population pressure on land and water resources. Environmental degradation and population rarely surface in discussions of Egypt's security, but their uncontrolled growth threatens the economic prospects and political stability of the United States' key Arab ally.

● Kenya, the East African country most important to the United States, is in many ways the most promising state in sub-Saharan Africa. It has met various economic, political, and ethnic challenges and has survived the 1980s'

droughts without loss of life. But Kenya's economy is hostage to many factors beyond its control: the vagaries of the world coffee and tea markets, the fads and fears of European tourists, the price of imported oil, and the weather. With one of the world's highest fertility rates—eight children per woman during the early 1980s—Kenya doubled its population from 8 million to 16 million between 1960 and 1980. And if present increases continue, the population is expected to reach 40 million by the end of the century and 80 million by 2020 or so.

Meanwhile, Kenya's arable land—20 percent of the total land area—is losing productivity at an alarming rate. Thanks to soil erosion caused by deforestation and other land-use changes, crop yields in some areas are expected to fall 50 to 75 percent by 2000. Although only 3 percent of Kenya is forested, fuelwood provides 74 percent of the country's energy. The government is pushing tree planting, but this burgeoning fuelwood crisis demands much more agroforestry training and higher energy-efficiency gains than are presently in the pipeline. Water is also a problem, both for urban areas straining to absorb rural migrants and urban babies and for subsistence farmers in the country's vast semiarid regions. Since Kenya is East Africa's leading market economy, its management of these natural-resource problems will have repercussions far beyond its borders.

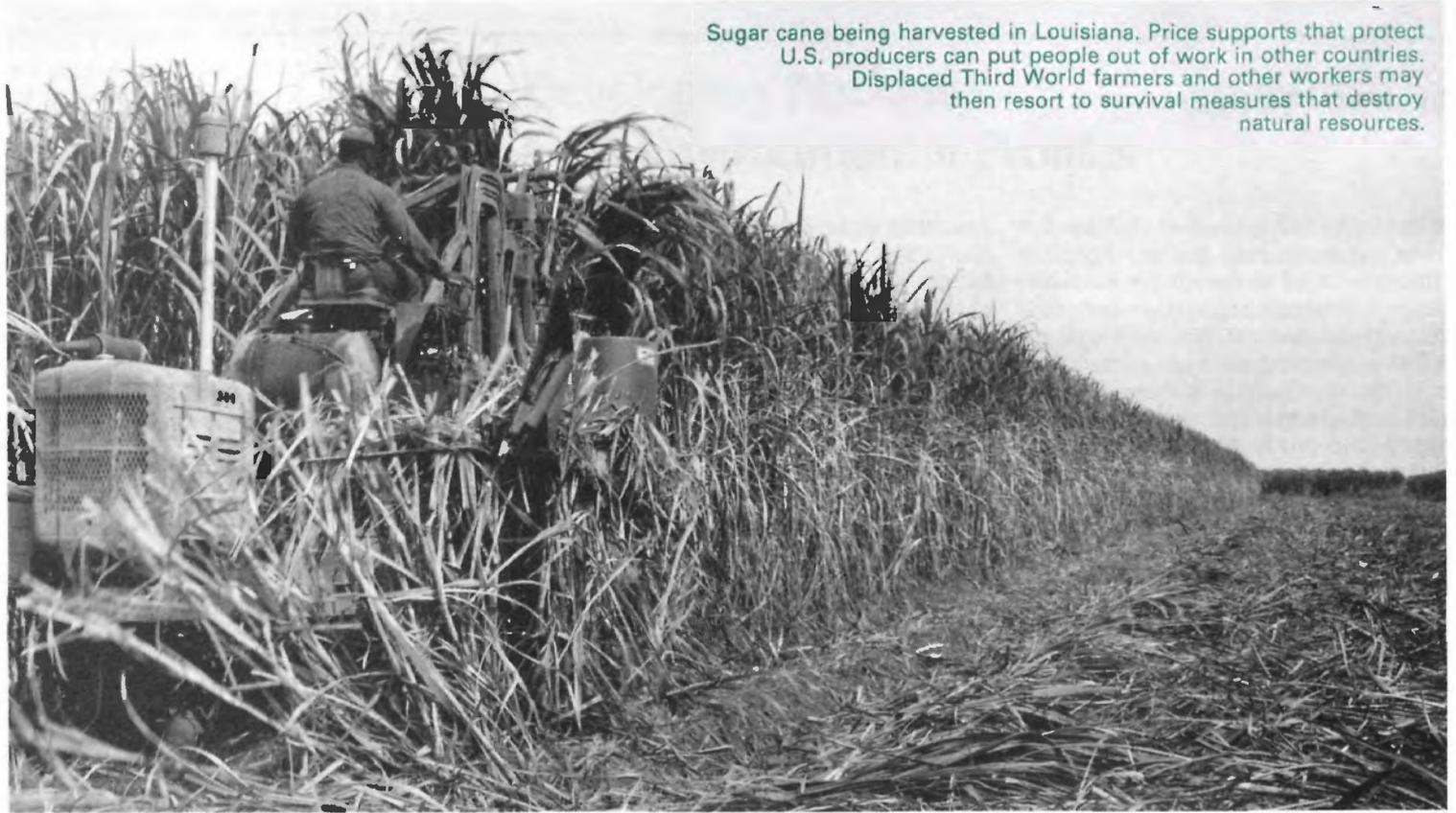
● The U.S. interest in the Philippines—maintaining U.S. bases there and nurturing democracy—is

compromised by destruction of the nation's resource base and strong population pressures. "If we have a revolution in this country," a Philippine official once said, "it will start in the uplands." His logic is impeccable, for the uplands—where up to one quarter of the population now lives—bear the brunt of the country's environmental problems. The Philippine population more than tripled between 1948 and 1988, from 19 million to 63 million.

A small group of wealthy families owns most of the good cropland, so throngs of impoverished, landless migrants push into the uplands, where they clear steep, forested slopes to raise food for their families. Heavy rains of the twice-yearly monsoons rush down the denuded slopes and carry off topsoil that silts streams, damages hydroelectric plants, and spoils fish-spawning grounds—a particular disaster for a people whose main protein source is fish. Commercial logging, much of it illegal, also contributes to deforestation. Logging so wasteful and corrupt that it can only be described as rapacious was a hallmark of the Marcos government. But destruction of mangrove forests, dynamiting of coral reefs, and overfishing are still commonplace in spite of environmental laws. So far, improving resource management and curbing population growth can't be counted among the Aquino Government's priorities.

# Unintended Consequences

By Al Binger



Sugar cane being harvested in Louisiana. Price supports that protect U.S. producers can put people out of work in other countries. Displaced Third World farmers and other workers may then resort to survival measures that destroy natural resources.

J. M. Cross photo. USDA.

The next time you buy that pound of sugar, chocolate, or cookies, or that ice cream cone or soft drink, you will pay an artificially high price. You will also contribute, indirectly, to environmental degradation, poverty, and the cultivation of illegal crops like coca and marijuana in developing countries in Latin America, the Caribbean, and Southeast Asia.

*(Dr. Binger is President of Biomass Users' Network, a not-for-profit international organization of developing countries that focuses on ways to manage renewable resources to advance economic, social, and ecological goals.)*

The reason for high sugar prices: U.S. price supports and the "no-cost" provision of the 1985 Farm Bill. The connection with environmental degradation and drug production in developing countries: continued decline in employment and income as the centuries-old sugar industry collapses, forcing increasing numbers of workers into subsistence livelihoods.

In the United States, as in a number of other industrialized countries, subsidies in the form of price supports are intended to protect domestic sugar producers from fluctuations in international markets. The no-cost provision of the U.S. Farm Bill is equally well-intended: It authorizes quotas on sugar and other imports in

order to avoid domestic surpluses and the costs the government would incur by buying and storing surplus harvests.

The problem is that these policies were developed based on purely domestic considerations, with little or no consideration of foreign-policy implications. These same policies now represent a major obstacle to global free trade and environmental protection.

In the mid-1970s, before these policies were in place, the United States imported around 6 million tons of sugar annually. In 1989, one sixth of this amount, less than a million tons, was imported. At the same time, subsidized prices encouraged farmers in member nations of the European Community (EC) to increase their production of

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sugar. Consequently, the EC has gone from being a sugar importer to a major exporter in 10 years.

The result of these trends and other factors has been a severe contraction in the world market for sugar and highly unstable sugar prices, with devastating effects on developing countries where sugar production has been an economic cornerstone. In many of these countries, sugar has not been just a crop, readily interchangeable with other crops, but the foundation of an industry that produced staple products including processed sugar and molasses. Until the late 1970s, the sugar industry provided a livelihood for an estimated 50 million people in developing countries.

In the last three years, world prices for sugar have fluctuated between 4 and 13 cents per pound (U.S. currency). These fluctuations have not affected producers in the United States or the EC because price supports have kept sugar prices in these countries in the range of 18 to 23 cents per pound.

The real impact has been felt in sugar-producing developing countries, most of which have significantly reduced their production in order to cut their losses. In the vast majority of cases, sugar production has not been successfully replaced by any comparable new agricultural-industrial activity. The net effect: a severe negative impact on the quality of rural life and the environment.

Most displaced field and industry workers, unable to find other employment, have few alternatives: slash-and-burn subsistence farming; migration to urban centers in search of employment; or illegal crops like coca and marijuana, which are more lucrative than legal crops. A new wave of subsistence farmers has accelerated the destruction of forested areas in developing countries, particularly in Latin America, the Caribbean, and Southeast Asia. In Negros Occidental in the Philippines (the largest

sugar-producing region in that country), forested areas have declined by about 60 percent since the downturn of sugar prices in the early 1980s.

Agricultural subsidies for sugar and other crops in the EC, the United States, and Japan amount to more than \$240 billion a year—a figure equivalent to almost 10 percent of developing countries' economies. In this era of heightened concern for the environment, it is time to reconsider these policies in light of their detrimental consequences.

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***Until the late 1970s, the sugar industry provided a livelihood for an estimated 50 million people in developing countries.***

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Moreover, there is a readily available "win-win" solution to the sugar-industry problem: The answer is not an abrupt end to subsidies in industrialized countries, but rather a scenario in which financial and technological means are provided to help developing countries diversify the products they can derive from sugarcane.

Proven technologies are now available to accomplish this. It is possible to produce more than 30 products ranging from paper to chemicals and bio-degradable plastics, from building materials to energy, using various processing technologies for sugarcane. For example, sugarcane-based energy production (electricity and ethanol) has tremendous potential for developing countries. It makes sense given their dependence on imported petroleum and problems of availability. And the environmental payoffs are indisputable. In the face of global climate change and the need to reduce emissions of greenhouse gases such as carbon dioxide (CO<sub>2</sub>), energy derived from

sugarcane represents a readily deployable option with no net release of CO<sub>2</sub>.

These many environmentally and economically beneficial uses of sugarcane are easily within reach with modest amounts of capital investment. Just one percent of the amount industrialized countries will spend on agricultural subsidies over the next five years (approximately \$12.5 billion) would be required to carry out the diversification of the sugar industry of developing countries. If these funds were redirected for this purpose, a dying industry could be transformed into an engine for rural economic development and global environmental protection.

From the perspective of industrialized countries, such an approach offers the advantage of significantly reducing the need of developing countries to export sugar, even if their production levels increased substantially. This would lead to more market stability and, therefore, a reduced need for price supports for domestic producers at the expense of taxpayers. Equally important, this approach represents a mechanism for weaning producers from addiction to subsidies with minimal pain.

During most of the past decade, multilateral financial institutions such as the World Bank, as well as some bilateral donors, have attempted to help sugar-producing developing countries bury their failing centuries-old sugar industries. This has taken the form of structural-adjustment and crop-diversification loans. In most cases, the results have been dismal failures. Clearly the time has come for new thinking and new approaches based on the larger picture and not just the pieces. After all, the environment knows no boundaries. □

# Hazardous Waste Exports: Changes in Sight

by Wendy Grieder

The trans-frontier movement of waste is a subject that has been receiving increased attention over the past six years. Americans have been fascinated by the tales of the *Islip Garbage Barge* roaming the high seas looking for a home for its cargo. They have followed the *Khian Sea* from Philadelphia to Singapore, with stops between and changes in name, searching for a place to dispose of its load of incinerator ash.

Nevertheless, stories in the press to the contrary, EPA has little concrete evidence that large-scale "dumping" of wastes is taking place. The Agency works closely with the Department of State, the Customs Service, and law enforcement agencies to detect illegal shipments of waste across our borders. There have been a few isolated cases of dumping; however, by and large, waste exporters comply with U.S.

notice-and-consent regulations which require the formal consent of the receiving country before waste can be shipped.

To be sure, interest in exporting waste remains high. Each day EPA receives inquiries, some with bizarre aspects. One company wants to send west coast garbage to the Marshall Islands to build atolls. Another proposes to send incinerator ash to Guatemala to build roads. And still another would like to send sewage sludge from an east coast city to Tibet for agricultural purposes. In the past, the Agency has received a number of proposals to send barrels of hazardous wastes to some of the poorest countries in Africa, which are tempted by the income it would generate for them. However, in all these cases the shipments were rejected when the United States sent notice about the proposed exports.

Most hazardous-waste exports from the United States go to Canada and Mexico under bilateral agreements. In 1989, the United States generated 275 million tons of hazardous waste. Of that, only 150,000 tons was exported, with more than 80 percent going to Canada for both disposal and recycling. Most other exports go to Mexico for recycling or to countries in Western

Europe for the reclamation of materials such as gold and platinum. Small amounts go to Brazil, Japan, and South Africa.

As the impact of the Resource Conservation and Recovery Act (RCRA) regulations is felt, hazardous-waste generators in the United States look for disposal facilities in other countries that are either cheaper or more readily available: For example, most U.S. generators who export to Canada are located near the border; proximity reduces transport risks and the consequent liability costs.

The RCRA regulations prohibit the export of hazardous waste unless EPA is notified in advance of the intent to export and the receiving country provides prior written consent. EPA will forward the consent to the exporter, and a copy must accompany each shipment. The regulations apply only to waste classified as hazardous by EPA. At the present time, they do not cover household waste or municipal incinerator ash.

In response to continuing public and Congressional concern about several highly publicized proposals to export waste to developing countries, President Bush announced in March 1989 that he would seek legislative authority to ban the export of hazardous waste except where there was a bilateral agreement with the receiving country. This agreement would be negotiated to assure the environmentally sound management

of the waste in the receiving country.

Also in March 1989, negotiations were concluded on the Basel Convention on the Transboundary Movement of Waste, sponsored by the United Nations Environment Programme. Fifty-four countries have become signatories, including the United States. The Convention provides for limiting transboundary movements of wastes among parties, setting up notice and consent procedures for international shipments, and it defines illegal traffic and the responsibilities of the parties involved. The Convention also allows countries to enter into separate, bilateral agreements. EPA has developed legislation that would implement the Basel Convention and extend our current export regulations to household waste and municipal incinerator ash.

The accelerated interest in exporting hazardous waste is illustrated by the increase in the notices of intent received by EPA. In 1980, the Agency received 12 notices; in 1989, 554; and to date, the number for 1990 is 441. Until there are better ways to reduce the generation of hazardous waste, such as more recycling and waste minimization, the interest will continue to rise.

The task is to strengthen the regulations in such a way as not to hinder legitimate exports in the waste trade, but still to protect those countries that do not have the capability of safely managing waste. □

Although progress is being made, illegal international traffic in hazardous waste has not yet been eliminated. Between 1987 and 1988, almost 4,000 tons of toxic waste from Italy were illegally dumped in Nigeria. Following the Nigerian government's discovery of the contraband, it was loaded onto the *Karin B.* and another ship for removal.



Gremo photo. Greenpeace.

(Grieder is a hazardous waste specialist in EPA's Office of International Activities.)

# Making a Difference with Solar Ovens

by William F. Lankford

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*Firewood to meet villagers' everyday cooking needs is increasingly a scarce and expensive commodity.*

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There was a small crash outside, but in the rural villages of Guatemala the noise level is generally high, and the sound was ignored. Jan finished a lunch that had been cooked in her solar oven and went out to cover it up—only to discover a huge pig just finishing off the flavorful fiber-glass insulation from the oven door. Poor pig, poor family that owned the pig if it died, but the door could be repaired, and this was only a minor setback in ongoing efforts to promote solar cooking in Central America.

This incident offers an apt metaphor for the kind of social factors that can complicate the introduction of solar cooking in impoverished areas of developing countries such as Guatemala, Costa Rica, and Nicaragua. The obvious question is, Why are solar ovens being promoted in these seemingly improbable places? And why is a *Norteamericano* like me involved in these efforts?

Some of the reasons have to do with local subsistence economics. Firewood to meet villagers' everyday cooking needs is increasingly a scarce and expensive commodity. In many areas of Guatemala, for example, the Indians must depend on local landowners to allow them to cut firewood on private lands. Not all landowners are sympathetic, and some are actively hostile to trespassers.

In addition, there are compelling health and environmental arguments for solar cooking in the developing countries of Central America, where the equatorial sun is a ready resource (notwithstanding those few days when the sunshine does not break through the

clouds). Solar ovens do not produce wood smoke, a source of indoor and outdoor air pollution that has the potential to cause retinal damage and respiratory diseases. And from a broader environmental perspective, solar ovens are advantageous for the simple reason that they afford an alternative to widespread reliance on firewood as fuel for cooking. As in many areas of the world, deforestation is a very real environmental problem in Central

## Cooking with Cardboard

East of the capital of Guatemala, there is a long, almost totally deforested valley around the towns of El Progreso and Zacapa. There, Professor Robert Metcalf of the California State University, Sacramento, working with the local Foster Parents Plan, has introduced several hundred cardboard solar box cookers. While the cardboard models are cheap and easy to build, they are, of course, susceptible to unexpected rain. However, in the present near-desert conditions there, that is hardly a worry. The clear air and relatively high elevation provide such intense sunshine that these simple cookers work beautifully.

To date, the success of this program is mixed. While some families are avid solar cookers, others have been discouraged by obstacles such as finding a secure, sunny place for the oven, or the uncertainty of whether the day will remain sunny enough to complete cooking. Lack of understanding of the principles of operating the oven is also sometimes a problem. All of these things are under study.

America, with consequences that may be implicated with climate change: the now-famous greenhouse effect.

The physics of solar ovens is really quite simple. The oven I am working with is basically a wooden box. There are no electrical connections, no chemicals, no fire.

With the right materials and a little instruction, anyone can build a solar oven. The main components consist of a box with glass at the top to let in the sunshine and a black metal plate at the bottom to absorb the sunlight and turn it into heat. If the sides and bottom are well-insulated, the oven will easily reach temperatures above 300 degrees Fahrenheit. To ensure good insulation, certain details of construction, such as a double versus single pane of glass, can be important.

Solar ovens work because the glass is transparent to the visible sunlight coming in, but opaque to the infrared radiation given off by the light-absorbent black metal plate.

Currently, there are a number of efforts to establish the practice of solar cooking in Central America, and there is an active thermal solar research program in the Physics Department of the National University of Costa Rica. My work is part of a resurgent interest in the idea.

Some 20 years ago, the Rockefeller Foundation funded an ambitious program in Mexico to introduce a reflector-type solar cooker. The program was not successful, however; likewise a number of early solar oven projects failed to take hold. Initially, there were some technical problems. For instance, the particular kind of solar ovens used in Mexico produced a high-temperature hot plate, but users found them unstable in the wind and inconvenient to use. People had to stand in the hot sun to cook, avoid the bright reflection, and frequently move the cookers to track the sun.

More important, this early program suffered the flaw that has characterized

*(Dr. Lankford is a professor of physics at George Mason University in Fairfax, Virginia, and at the National Autonomous University of Nicaragua.)*



Lankford photo.

Solar ovens free users from their traditional dependence on scarce firewood and from exposure to wood smoke. Cooked at temperatures that can exceed 300 degrees Fahrenheit, the food is hot and tasty.

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*As in many areas of the world,  
deforestation is a very real  
environmental problem in  
Central America . . . .*

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so many U.S. aid efforts: a lack of understanding of the social factors involved. In this case, the cookers were presented as outright gifts, unsolicited by the prospective users; as a result, the ovens were not valued and not used. The failure of this and similar early programs left solar cooking with a negative image that more recent efforts have had to work to overcome.

There is little doubt that the solar box cooker, as presently designed, performs as it should. Instead, the real challenge is to change long-standing indigenous habits of cooking with firewood: to bring solar cooking into the daily ritual of Central American families. In this respect, we have learned a lot from the programs that have foundered in the past.

In India, an estimated 80,000 solar box cookers have been purchased by Indian citizens to date, with a 50-percent government subsidy. In Guatemala and Nicaragua, there are current efforts to establish solar cooking by selling the ovens, rather than providing them gratis.

However, among the really poor majority of Central Americans, purchasing a solar oven is seldom a possibility. People who have enough money to buy an oven can usually buy a gas stove and use subsidized propane gas. Thus, a basic premise of the work I am involved in is to have the users build their own ovens. In this way, potential users contribute their own manual labor, while the necessary tools and materials are provided. I believe this kind of subsidy will prove to be more effective than outright or even partial gifts.

I first became involved with solar ovens in 1987 while a visiting professor of physics at the National Autonomous University of Nicaragua in Managua. A

first-year project with five students studying the efficiency of the oven, brought home the fact that solar ovens really do work under the intense Managua sunshine. The first model we built benefitted from a consultation with thermal researchers at the National University of Costa Rica.

Our solar-oven project attracted increasing attention, and the university continues to give the project as much support as resources allow. However, at first I wondered if my Nicaraguan students' enthusiasm for their solar efficiency study was due more to the great variety of food we cooked than their interest in the physics of the device. One day we even cooked a great pizza. The question was whether their excitement would carry over to their parents, who bear the constant burden of providing food for their families.

The following year, with some assistance from my students, I began working with solar ovens off-campus in an effort to teach villagers to build their own solar ovens—first in Nicaragua and then in other Central American countries. Nicaragua turned out to be a receptive initial project site. It is a country looking for new solutions to old problems, searching for pragmatic approaches that hold promise to help its vast majority of impoverished citizens.

Basically, the whole process goes like this. First a respected person is found in a village or neighborhood, and that person forms a local organizing group of people who either like the idea of building their own solar ovens and/or trust the initial contact person. A cooking demonstration is arranged in which they prepare and cook their own food, and as the "expert," I give an illustrated talk to explain how the ovens and the project work. Usually about 20 to 40 people attend. Those who are interested in participating in a construction workshop sign up.

By the time the necessary organizing meetings are over and actual construction begins, the group is typically down to about a dozen people. They spend several weeks to several months working during evenings and weekends after their regular jobs. When the ovens are finished, the proud new owners take them home to keep. This is when the real test comes—whether the ovens will be put to use on a daily basis—and this is where we are concentrating our efforts.

The initial enthusiasm is encouraging. Certainly many people are anxious to build their own solar ovens, and their dedication builds as the work proceeds. While the work is going on, the model oven can be used to experiment with cooking various foods—at least until the model must be moved to the next project. As with anything new, experience is needed to get the cooking details right. How much water should be added to new rice? To old rice? How much more cooking time is needed for last year's beans as compared to the current harvest?

The U.S. Fulbright Commission has awarded me a six-month research grant to do a follow-up study and an evaluation of solar-oven use in Central America. The results should be available in late 1990. If the results are as positive as early data indicate, the next step will be to solicit funding to enlarge the project. Several funding agencies have expressed interest. Because an essential part of the project is local involvement, growth will not be rapid. However, as is so often heard here: "poco a poco" or "little by little," solutions will be found.

And the pig that ate the fiber glass in Guatemala? It's doing fine. Perhaps that is an encouraging sign. □

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# Eastern Europe: Restoring a Damaged Environment

by Richard A. Liroff

*Whole sectors of industry are producing things in which no one is interested, while things we need are in short supply . . . Our outdated economy is squandering energy . . . We have laid waste to our soil and the rivers and the forests our forefathers bequeathed us, and we have the worst environment in all of Europe today.*

—Václav Havel, President of  
Czechoslovakia

President Havel's assessment of his nation's economic and environmental ills applies broadly across Eastern Europe. The Iron Curtain has been lifted to reveal truly appalling environmental conditions. Eastern Europe has been savaged by economic-development policies indifferent to the carrying capacity of its ecosystems and to the health and well-being of its citizens. The East's central planners have demonstrated they can be as environmentally callous and cavalier as the worst private-sector managers in market-oriented economies.

The United States, together with Western Europe, is supporting the economic and political transition of Eastern Europe. The United States should offer a balanced, integrated program of environmental and economic assistance that fosters full restoration of a healthy environment in Eastern Europe. Such a program would help reduce the region's contribution to global warming and encourage use of both American technologies and innovative approaches to pollution prevention.

## The Environmental Challenge

The German Democratic Republic (GDR), Czechoslovakia, and Poland are among the world's largest emitters of sulfur dioxide (SO<sub>2</sub>). Moreover, in Europe, as elsewhere in the world, air pollution does not respect political boundaries. The Eastern European states export from 59 percent to 74 percent of their SO<sub>2</sub> emissions. According to monitoring data, however, of the total amount of SO<sub>2</sub> deposited in these nations, 36 to 59 percent originates outside their borders.

*(Liroff directs the Eastern Europe Environment Program at World Wildlife Fund and The Conservation Foundation. Previously affiliated, these groups were formally merged in 1990 to form a private, non-profit conservation organization involved in research and environmental protection.)*

The forests of western Czechoslovakia, southwestern Poland, and the southern GDR have been devastated. Budapest, Prague, Krakow, and other major cities routinely have air-pollution readings well above existing health standards.

Drinking-water supplies throughout Eastern Europe are heavily contaminated. Vast reaches of the Vistula River in Poland, which drains much of the country, are classified as unfit for use even by industry. The Baltic and Black Sea coasts are badly degraded by domestic sewage, agricultural run-off, and heavy metals and organic pollutants from industry. Water quality problems are both domestic and transboundary; domestic progress in combating pollution has been slow, and multilateral cooperation negligible.

The soil, too, is polluted. Industrial discharges have contaminated soils and domestic food supplies. In the Upper Silesia region of Poland, for example, lead, zinc, cadmium, and mercury levels in samples of garden produce are 30 to 70 percent higher than World Health Organization norms.

Eastern Europe's mines and industries yield prodigious amounts of solid and hazardous waste. Waste generators in Hungary reportedly dispose of over 500,000 tons of hazardous waste annually in illegal landfills. In addition, substantial amounts of hazardous waste have been shipped east from Western nations. The GDR has reported importing one million tons of waste annually, but Greenpeace contends that the amount of imports has been disguised and is really five times greater. Few safeguards have been developed to assure appropriate management of these wastes.

The devastation of the environment is revealed through effects on human health and welfare. In especially contaminated areas, statistics and anecdotal evidence show dramatically elevated rates of respiratory disease,

reproductive and developmental problems, and shortened life spans. These areas include Poland's officially designated ecological disaster areas, the coal-burning and industrial areas of Czechoslovakia and the GDR, and industrial centers in Romania and Bulgaria. Upper Silesia, one of Poland's ecological disaster areas, has circulatory and respiratory disease rates that are, respectively, 15 and 47 percent higher than national norms.

Human populations have been removed from some contaminated areas, and in other areas people have been offered economic incentives to remain. For example, in Bitterfeld, GDR, labeled by *Der Spiegel* as "the dirtiest city in Europe," wages are comparatively high

to attract workers to the area. Also residents are given extra money to buy vegetables, to compensate for the loss of contaminated home-grown produce.

### Economic and Political Roots of the Problem

Eastern Europe's heavy industries are inefficient, requiring larger inputs of energy and raw materials than counterpart industries in Western Europe. On average, Eastern European economies use about twice as much energy and water per unit of Gross Domestic Product as do West European economies. Little has been spent on pollution control, and there is virtually no domestic pollution-control industry.

Countries have been unwilling to spend scarce hard currency on Western pollution-control technology.

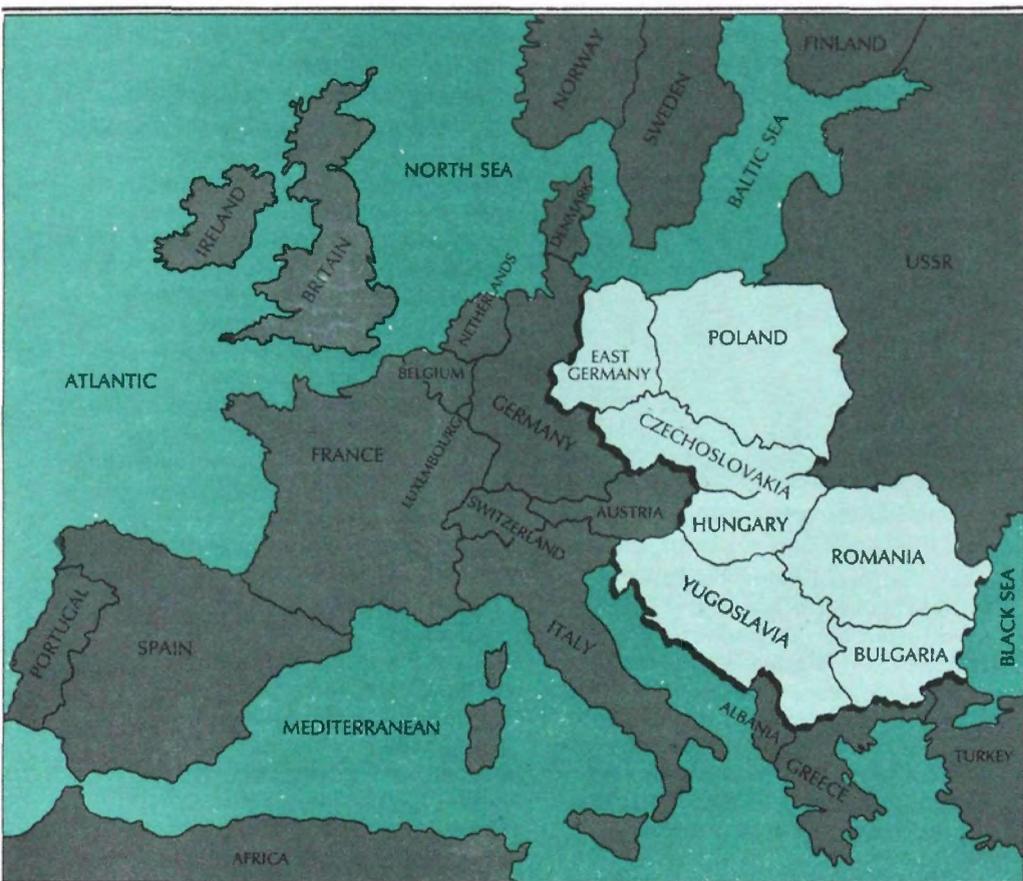
Eastern European societies have not been "societies of law" in the Western sense. Even when strong environmental laws have been enacted in these nations, they have had little impact, because decision-makers have not been held accountable for enforcing them. Watchdog nongovernmental organizations (NGOs) have rarely been tolerated.

The environment has had very low priority in planning. Heavy subsidies for inefficient industries and the lack of real pricing of goods have undercut any meaningful role for fines, penalties, and other economic tools in environmental protection. For example, Poland levies fines on polluters, but they constitute a very small percentage of clean-up costs. Until a few years ago, fines were negotiated away in talks between the environment ministry and other ministries.

Discharge fees in other Eastern European nations have had similarly small impact. State environmental functionaries generally have had little success policing state industrial enterprises. The fox has been guarding the chicken coop.

### Guidelines for U.S. Programs

The principal U.S. programs to assist Eastern Europe in its economic, political, and environmental transition are authorized by Congress in the Support for Eastern European Democracy (SEED) Act of 1989. The U.S. Agency for International Development, EPA, the Department of Energy, the Peace Corps, and the Overseas Private Investment Corporation, among others, are authorized to launch multimillion



dollar assistance programs in Poland and Hungary.

SEED's environmental programs include a regional environmental center in Budapest, Hungary, a report to be prepared by EPA on environmental problems and priorities in Hungary and Poland, and clean-coal retrofitting, air-monitoring, drinking-water, and wastewater projects for Krakow, Poland. Reflecting the rapid pace of change in Eastern Europe, Congress is considering new legislation, SEED II, that will expand programs to other Eastern European nations and authorize U.S. participation in a new multilateral development bank for Eastern Europe.

The United States should observe the following guidelines as it expands its program in Eastern Europe:

- **Emphasize energy efficiency.** Many of Eastern Europe's environmental problems stem from mining and burning poor-quality brown coal. Slowing or reducing energy demand can reduce stress on the environment in a significant, cost-effective way. As Eastern European governments restructure their economies and eliminate subsidies for energy, they will encourage energy efficiency. If the United States and other Western nations transfer efficient technologies, they will hasten this process.

- **Stress pollution prevention.** The United States should encourage Eastern European governments to promote process changes in manufacturing rather than "end-of-the-pipe" approaches to pollution control. The United States is only just now focusing on process changes in domestic environmental

policy, after having emphasized end-of-the-pipe solutions for more than 20 years. Because Eastern Europe is starting fresh with environmental policies, it can be a fertile testing ground for pollution-prevention approaches.

- **Promote Cost-Effective Technologies.** The U.S. government should also encourage Eastern European governments to develop cost-effective solutions to pollution problems at existing sources. Competing vendors of pollution-control technology have already descended upon Eastern Europe, hoping to sell the new governments technologies that can remove nearly all the pollutants from waste streams—but often only at a very high cost in money or energy per unit of pollutant removed.

For existing sources, it might be better to promote broad use of alternative

technologies that, pound for pound of pollutants, would cost less to operate. More cleanup of existing sources might thus be achieved at less cost. All new sources should be required to meet the most stringent Western standards.

- **Build Self-Reliance by Strengthening Education and Institutions.** Eastern Europe boasts a well-educated population and a rich tradition of scientific innovation. Unfortunately, in recent years, it has been cut off from the latest developments in environmental science and technology. The United States should invest in the development and upgrading of environmental curricula, the training of officials at all levels of government, and the education of a new cadre of industrial managers.

Both ministries and enterprises will need assistance in taking an integrated approach to management that incorporates economics, technology, and



Budapest Conference Center

The Budapest Center, originating with President Bush, was established by the governments of Hungary, the United States, and Austria as well as those of the European Community. Housed in a 200-year-old silk mill in the old section of Buda, the Center's central mission is to help citizens, non-government organizations, the

private sector, and government agencies in Central and Eastern Europe address problems threatening sustained economic growth in the region. Initially, it will focus on health, energy efficiency, and pollution prevention.

A key start-up project is an air-pollution monitoring network EPA is running in Krakow, Poland. EPA officials will also help upgrade that city's drinking water and wastewater treatment facilities.

In addition, EPA scientists, particularly in the Office of Research and Development, are collaborating with their East European counterparts under science-and-technology cooperation agreements with Poland, Yugoslavia, and Hungary.



Wide World photo.

Smoke belches from the stacks of an East German power plant that uses high-sulfur brown coal. This fuel, commonly used in Eastern Europe, causes high sulfur-dioxide emissions.

administration. A landmark World Bank-funded program for Poland is a strategic example here. The Bank is funding the staffing and training of a new planning and investment unit in the Environment Ministry, the creation of a new regional regime for managing watersheds, and the development of environmental auditing for state-owned industries.

As part of its institutional investment, the United States should promote innovative economic approaches to environmental management. Domestically, it has relied heavily on "command-and-control" approaches to reduce discharges. These have been supplemented on a small scale with such economic incentives as the trading of air-emission privileges. Eastern European officials have expressed considerable interest in economic incentives, recognizing that these may yield environmental gains more efficiently than traditional regulatory

approaches. They should be encouraged to combine such incentives with integrated approaches to reducing discharges to air, land, and water.

The investment in people should include the NGO community. Environmental awareness and organizing have grown dramatically in Eastern Europe, and nascent environmental organizations have been key players in the region's democratization. But environmental organizations suffer from lack of information and resources. In many cases, they lack the most basic supplies and equipment needed to carry out their activities. They need technical information, and they could benefit from training in organizing programs and reaching out to the public more effectively.

The United States should stress the urgent need for informing and involving the public as Eastern European countries revise their environmental programs. In Eastern Europe, until recently, environmental data have been treated as state secrets, and environmental dissent has been suppressed. The United States should push hard for freedom of information and involvement.

- **Encourage Environmentally Sound Investments.** The United States and its Western European allies should press an environmental agenda on the new, \$12-billion European Bank for Reconstruction and Development. The United States holds a 10-percent share, the European Community nations just over 50 percent. The bank, which will be investing in both the public and private sector in Eastern Europe, is the first multilateral development bank whose charter requires promotion of "environmentally sound" development. But that mandate must be acted upon. Priority should be given to clean, efficient technologies and to ensuring that new investments are scrutinized for their environmental soundness.

The European Community nations are pushing for an environmental code of ethics for Western investors in Eastern Europe, and the United States should join in this effort. Occidental Petroleum, a U.S. corporation, provides a promising

example in this regard: As a matter of corporate policy, the new facilities built in foreign lands must meet U.S. or local environmental standards, whichever are more strict.

The United States, together with other Western nations, should encourage development of a pollution-control industry in the East to serve both Eastern and Western markets. Strong U.S. support for strict enforcement of laws by new environmental administrators in Eastern Europe will

further foster home-grown pollution-control industries.

### **The Imperative for Sustainable Development**

Development strategies in Eastern Europe have failed in terms of both economics and the environment. Much of Eastern Europe is a wasteland. Tens and perhaps hundreds of billions of dollars will be required to restore and protect the environment.

One frequently hears the question, "Will the East Europeans be willing to pay for cleanup?" This question assumes a tradeoff between economic well-being and a sound environment. Trade-offs and hard choices undoubtedly will be necessary, but they should not be overstated. An enormous economic price already is being paid for environmental degradation. Poland's present pollution damage will cost the country an estimated 10 to 20 percent of its Gross Domestic Product.

## **Environmental Conditions in Eastern Europe**

### **Poland**

Mining and burning of coal lie at the root of many of Poland's environmental problems. It is the world's fourth largest producer of coal and seventh largest emitter of SO<sub>2</sub>. Coal supplies 78 percent of the country's domestic energy needs. Coal-mining operations discharge 7,000 tons per day of salts into the headwaters of Poland's two major rivers, the Oder and the Vistula. Mines and industries produce large amounts of solid and hazardous waste, and severe pollution of land and water by heavy metals is reported.

Between the late 1960s and early 1980s, Poland's water quality deteriorated dramatically. The proportion of rivers classified as suitable for municipal water supply dropped from 33 percent to 6 percent, while the proportion so polluted as to be unfit even for industrial use rose from 23 percent to 38 percent. About 60 percent of the Vistula is unsuitable for industrial use.

The government has designated 27 "areas of ecological hazard," encompassing 11 percent of the country's area and just over a third of its population. Five of these are "areas of ecological disaster." The five include Gdansk on the Baltic Coast, the copper-mining and -refining region of Legnica-Glogow in west central Poland, and the contiguous, industrially impacted areas of Upper Silesia, Krakow, and Rybnik in southwestern Poland.

### **Bulgaria**

Bulgaria, less industrialized and less dependent on coal for its energy, does not have as pervasive an air-pollution problem as other East European countries. But it does have "hot spots" of industrial pollution. Health statistics have only

recently been released. Bulgarians living near industrial complexes have markedly higher instances of numerous diseases and, in some cases, body tissue levels of heavy metals two to four times standards set by the World Health Organization.

The widespread harvesting of trees, the heavy contamination of air, water, and soil from industrial pollutants and agricultural chemicals, and other harmful practices have affected plants and animals as well. Forty percent of the country's bird species, 25 percent of its mammals, reptiles, and amphibians, and 20 percent of its plant species have been designated by the Bulgarian Academy of Sciences as endangered or rare.

Bulgaria's coastal resort trade is threatened by continuing decline in the quality of the Black Sea. The Danube River, which forms part of the boundary between Bulgaria and Romania, drains the agricultural, industrial, and municipal waste of eight highly industrialized countries into the sea.

Under the stress of these discharges, and as a consequence of reduced inflows of fresh water from rivers that have been dammed for energy and irrigation, the depth of the oxygen-rich upper fresh-water layer of the Black Sea has diminished. The U.S.S.R, Romania, and Turkey, all of whom also have coasts on the Black Sea, share in the problem.

### **Czechoslovakia**

Czechoslovakia, dependent on brown coal for 60 percent of its domestic energy, is the sixth largest emitter of SO<sub>2</sub> in the world. Northern Bohemia bears the brunt of the impacts of coalmining and burning. Government studies leaked several years ago indicated that life expectancy in northern Bohemia is several years lower than the average for the balance of the

country, and rates of infant mortality, childhood illness, and respiratory illness are markedly higher. Those willing to work in the area for 10 or more years receive cash bonuses; skeptics among the citizenry label the funds "burial money." As in the German Democratic Republic, large swaths of forest are devastated by air pollution.

Czechoslovakia, like other East European nations, is reassessing the role of nuclear power in meeting its energy demands. The Chernobyl accident raised public concern throughout Eastern Europe about the safety of nuclear power, but at the time the effect of public opinion on government policies was limited. In January 1990, the government announced it was suspending plans to construct two nuclear reactors in Temelin, in southern Bohemia near the Austrian border. However, two others are scheduled to go on line there in 1992.

Prague, Czechoslovakia's capital, suffers from severe air-pollution problems, especially in winter. The pollution stems from auto emissions, household burning of coal, and factories. Prague's factories generate 11 percent of Czechoslovakia's industrial output. Prague's city planners cannot account for about 80 percent of the estimated 40,000 tons of hazardous waste produced in the city each year.

### **German Democratic Republic**

The German Democratic Republic (GDR) is the richest nation in Eastern Europe, as measured in terms of Gross National Product per capita. But this conventional measure of economic well-being fails to capture fully the toll the GDR's industrial machine is taking on human health and the environment.

The GDR depends on brown coal for 70 percent of its domestic energy demand. It is one of the largest emitters of SO<sub>2</sub> in the

Currently, many of the worst polluters may be the most inefficient operations. And as subsidies for energy are eliminated, market prices introduced, and other adjustments made, many facilities will become uncompetitive and shut down. The environment will benefit. Moreover, steps taken to make remaining operations more efficient by reducing resource consumption and making other process changes will yield additional environmental benefits.

Political forecasts about Eastern

Europe have been notoriously wide of the mark in the last few years. But it is reasonable to believe that in heavily affected regions where forests are dying, babies are born prematurely, children are retarded, men and women are dying young, and the search for clean air takes people to distant areas, people will be willing to endure temporary unemployment and other economic dislocations for the promise of an economically and environmentally sustainable future. □

world. Recently released data on air-pollution levels—previously kept secret—reveal that in such centers of heavy industry as Leipzig, Halle, and Bitterfeld, average annual levels of SO<sub>2</sub> in the air are five times the U.S. standard, and average annual levels of particulate are 13 times the U.S. standard.

The impact of pollutants on human health is readily visible. In the Pirna area near Dresden, children have unusually high rates of neurological and motor-development problems. Near the coal-processing facility of Espenhain, 50 percent of the children have respiratory ailments, and 33 percent suffer from eczema.

The GDR is the most industrialized nation in Eastern Europe but, by one estimate, as much as 60 to 70 percent of its chemical industry could be forced to shut down if it were subject to West German environmental standards. Much of the industry might be uneconomical to operate anyway. One chemical plant near Bitterfeld discharges 44 pounds of mercury into the Saale River each day, 10 times as much as the yearly discharges of mercury by the major BASF chemical facility in West Germany.

The GDR has been a major dumping ground for West German domestic and industrial wastes. West Germany is now being reunited with its wastes and will need to address this legacy.

### Hungary

Oil and gas satisfy 60 percent of Hungary's energy demands, yet air pollution is a serious problem. It is especially pronounced in Budapest; automobile emissions are a major culprit.

Water pollution is a priority concern. Most of Hungary's water enters the nation in degraded condition from its neighbors. (This includes the Danube, which enters

Hungary after passing through West Germany, Austria, and Czechoslovakia.) Ground-water contamination from overuse of agricultural chemicals in Hungary poses a risk to public health. Water in hundreds of villages and towns is unfit to drink. Lake Balaton has been the focus of a major clean-up effort; much progress has been made in eliminating the phosphorus that contributed to the lake's decline.

The proposed Nagymoros Dam on the Danube River has been the most prominent Hungarian environmental issue in recent years. The dam, whose construction is nearly complete, is the lower portion of a larger hydroelectric project that will affect about 200 kilometers of the Danube. An upper dam is being built at Gabčíkovo in Czechoslovakia. After having ignored several years of public outcry and scientists' forecasts that the project would disrupt the ground-water system supplying Budapest's drinking water, the Hungarian government recently agreed to abandon the dam. The final outcome remains to be seen.

### Romania

Relatively little is known about environmental conditions in Romania because of the Ceausescu regime's veil of secrecy over environmental data.

Romania is much less dependent on coal for its energy than other East European nations. It relies on imports from the Soviet Union and domestic oil and gas for 64 percent of its energy needs.

The Danube Delta is Romania's most noteworthy ecological feature. One of the largest reedbeds in the world, and home to more than 160 breeding species of birds, the delta is a major stopping point for birds migrating between Europe, the Mediterranean, the Middle East, and Africa. In the late 1960s and early 1970s,

hundreds of thousands to over a million ducks were counted in the region during the winters. The Delta has been damaged by draining and diking, a product of Ceausescu's promotion of irrigated agriculture and construction of a shipping channel.

Pollution is greatest in five heavily industrialized regions. There is serious contamination of air, water, and soil by heavy metals. Characterizing the impact of two factories in the town of Copsa Mica, a *New York Times* reporter has written, "For about 15 miles around, every growing thing in this once-gentle valley looks as if it has been dipped in ink."

### Yugoslavia

Yugoslavia's environmental problems have not drawn as much attention in the West as those of other East European nations.

As they enter Yugoslavia, the Danube and other rivers are substantially degraded, a result of upstream industrial, municipal, and agricultural discharges. Yugoslavia's largest internal river, the Sava, flows through the greatest industrial concentration in the country. The Sava is categorized as suitable only for irrigation and industrial uses or as requiring special treatment prior to any use.

Northern Yugoslavia is more industrialized than the south, thereby producing greater pollution, but concern about industrial discharges is found throughout the country. Yugoslavia's forests are subject to lower levels of SO<sub>2</sub> deposition than forests in the German Democratic Republic, Czechoslovakia, and Poland. Consequently, they have not experienced the substantial damage found in these other nations, but there is concern that levels of SO<sub>2</sub> may increase in the future.

# Saving the Arctic: Challenge to Eight Nations

by Oran R. Young

**C**elebrated far and wide as one of the last great pristine areas on Earth, the Arctic has recently entered the era of burgeoning threats to the natural environment with a vengeance.

Some of these threats are Arctic-specific, arising from the postwar increase in the extraction, processing, and shipment of raw materials. Oil-and-gas development over the last 20 years in the Soviet Arctic has destroyed an estimated six million hectares of reindeer pasture in northwestern Siberia's Yamal-Nenets Autonomous District. Sulfur emissions from the mining complexes of the Kola Peninsula, immediately east of northern Finland, are twice the emissions of all of Finland.

Closer to home, the oil fields at Prudhoe Bay in Alaska are estimated to produce annual emissions of nitrogen oxides, a key source of photochemical smog, that equal or surpass those from the entire Washington, DC, metropolitan area. The Exxon Valdez oil spill, at over 10 million gallons the worst ever to occur within the jurisdiction of the United States, is directly attributable to the extraction of oil at Prudhoe Bay. The James Bay hydroelectric complex in northern Quebec, Canada, has already inundated thousands of square kilometers of wildlife habitat; it will engulf considerably more over the next several decades if current plans for additional development go forward.

Other threats to the Arctic originate far beyond its southern limits. They are intensified by natural conditions: a combination of air and water currents of the Northern Hemisphere and

environmental conditions prevailing in the Arctic itself.

Air currents deliver carbon, sulfur, and other pollutants from Eurasia to the Arctic Basin; the low level of precipitation in the Arctic ensures that these pollutants remain in the atmosphere for considerable periods of time. This gives rise to Arctic haze, which casts a pall over large segments each winter and spring and rivals the annual mean level of photochemical smog over Los Angeles, California. Similar dynamics are at work with respect to the movement of carbon dioxide, chlorofluorocarbons, and other greenhouse gases from the mid-latitudes to the Arctic.

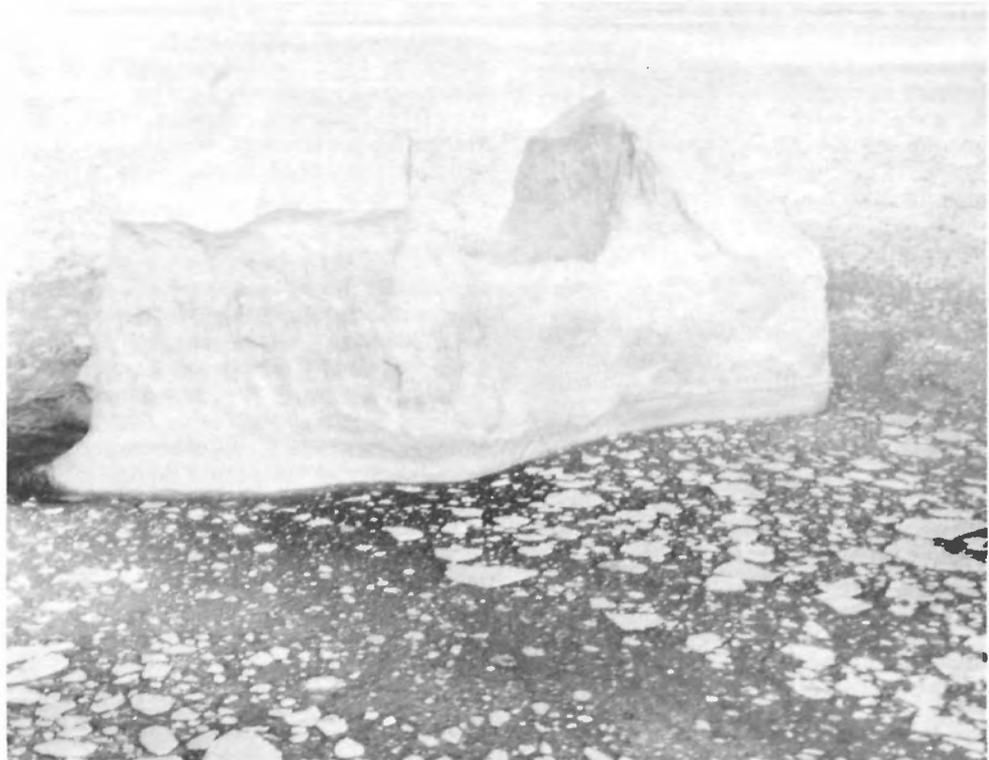
Water currents also function as conveyor belts to bring pollutants from

distant sources. For some time, observers have noted unusually high levels of toxic substances in seals and polar bears. Such substances soon make their way to the top of the food chain; mercury, for example, is found in mother's milk in many parts of the Arctic.

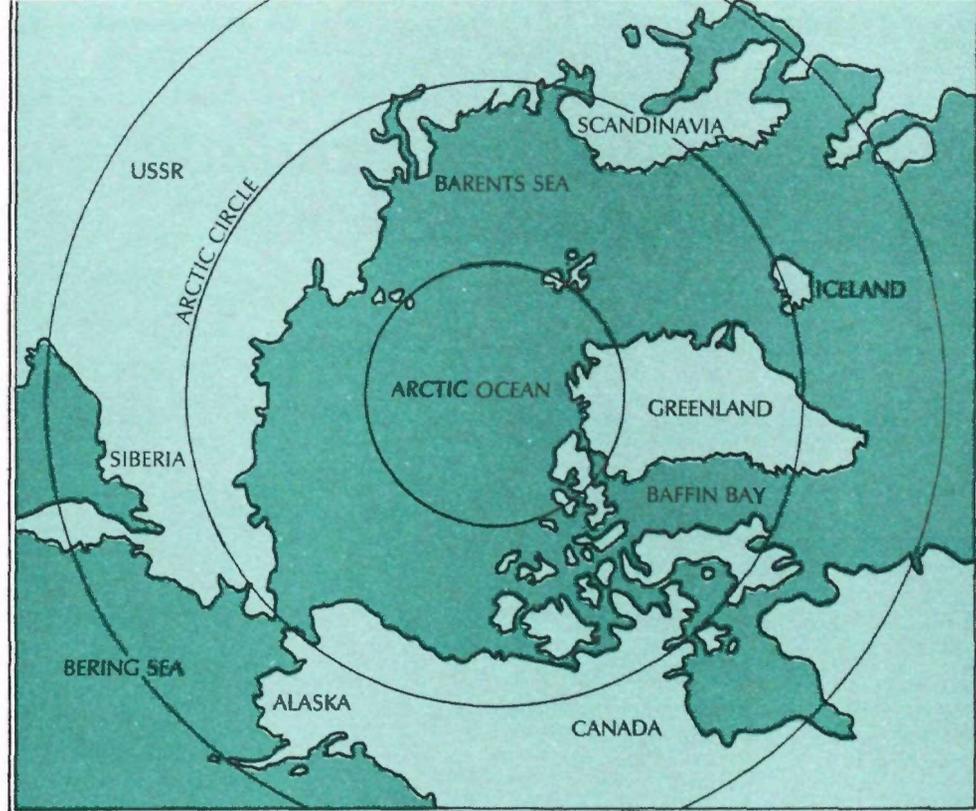
The Arctic, as a distinctive region, also plays a significant role in the overall dynamics of the Earth. Nowhere is this more apparent than in the region's connection with the prospect of global warming. Most global circulation models project temperature increases in the Arctic twice those expected in the mid-latitudes. While the driving forces behind this occurrence lie outside the Arctic, resultant changes in the region may well impact the mid-latitudes profoundly.

International cooperation will be required to protect the Arctic environment. Pictured is a scene in the far North—an iceberg off Greenland estimated to be 200 feet high.

*U.S. Coast Guard photo.*



*(Dr. Young is director of the Institute of Arctic Studies at Dartmouth College. He also serves as a member of the Polar Research Board of the Natural Academy of Sciences and as co-chair of the nongovernmental Working Group on Arctic International Relations.)*



The melting of sea ice will lower the albedo or reflective power of the Arctic Basin, in turn lowering the Earth's ability to reflect solar radiation. This will enhance the greenhouse effect, thereby raising the Earth's temperature. Higher temperatures may release large quantities of carbon and methane by melting Arctic permafrost and destabilizing Arctic clathrates. (Clathrates are chemically interwoven deposits of methane, ice, and water ice on the sea bottom.) The retreat of Arctic glaciers and the melting of the Greenland icecap may contribute substantially to a worldwide rise in sea levels.

What is more, scientists today are documenting the crucial role that the Arctic and its elements—ocean, ice, and atmosphere—play in determining weather patterns throughout the Northern Hemisphere. These relationships reinforce the rising interest in the role of the Arctic in global climate change.

Taken together, these threats lend a sense of urgency to the search for international measures to protect the Arctic's environment. To be sure, some of the problems can be traced to activities taking place within the jurisdictions of individual states. There is no denying the severity of the environmental problems arising in the Kola Peninsula, the Yamal Peninsula, and other parts of the Soviet Arctic.

Nonetheless, it would be a mistake to overemphasize jurisdictional boundaries in considering ways to come to grips with the growing threats to the natural environment of the Arctic. The problems are circumpolar in scale. No single jurisdiction's actions will stop the threats.

In the face of these environmental threats, the initiation of a multilateral process aimed at reaching international agreement on measures to protect the Arctic's environment is a welcome development. At the invitation of the government of Finland, representatives

of the eight Arctic states—Canada, Denmark/Greenland, Finland, Iceland, Norway, the Soviet Union, Sweden, and the United States—met in Rovaniemi, Finland, during September 1989 to explore options for advancing international cooperation.

The process launched at Rovaniemi is continuing. A second consultative meeting, attended by about 80 representatives from the Arctic states, took place in Yellowknife, Canada, during April 1990. A third is now planned for January 1991 in Sweden to conclude preparations for a ministerial meeting at Rovaniemi in the spring of 1991.

Numerous complex issues and hard choices have yet to be faced and resolved. How should the legitimate interests of non-state actors, like organizations representing the interests of the Arctic's aboriginal peoples, be taken into account in devising protective measures for the Arctic environment? Is the model of an initial framework convention followed by a series of protocols, as used in the recent agreements for the protection of stratospheric ozone, suitable for the Arctic?

The questions continue. How can the parties deal effectively with threats, like Arctic haze, that originate in industrial processes centered far beyond the Arctic region? To what extent is it desirable to link environmental issues with other matters, like scientific research, economic development, commerce, and

the rights of indigenous peoples, in negotiating the terms of a regional environmental regime for the Arctic? Is there a role for a standing conference on the Arctic environment, either in working out the terms of protocols dealing with substantive issues or in overseeing the implementation of specific measures to protect the Arctic's environment?

Achieving cooperation in dealing with the environmental threats to the Arctic will be hard. The difficulties of collective action that affect all international efforts are joined, in the case of the Arctic, by a number of complexities relating to identifying the participants and reaching consensus on the nature of what can be done. However, the process initiated at Rovaniemi has built up a considerable head of steam, and there is a palpable sense that the Arctic states are not willing to walk away from this process empty-handed.

What is critical at this juncture is for the ministers, who are expected to gather in Rovaniemi sometime in 1991, to exercise the political will needed to make full use of the opportunities handed to them. The reward for doing so will be an achievement of lasting value—the protection of the Arctic's environment. It may also yield a set of multilateral cooperative agreements that can serve as a model for achieving effective international cooperation to cope with environmental threats in other regions of the world. □

# The European Community: An Environmental Force

by Nigel Haigh and Konrad von Moltke

In the 1970s, Europeans frequently looked across the Atlantic to the United States for inspiration when developing their own environmental policies. They may not have adopted all they saw, but at least they looked.

In the 1990s, Americans may find themselves looking increasingly to Europe, and to the European Community (EC) in particular, in conjunction with the growing internationalization of the environmental agenda. Certainly the EC has come of age as an international actor. Less than 10 years ago, the United States was questioning whether the EC could sign the Vienna Convention on Protection of the Stratospheric Ozone Layer as an independent entity. Today the need to deal with the EC as a unit is an indisputable reality, not only on trade and agricultural policy issues but also in many environmental matters.

The EC is something of a puzzle to many people in Europe; thus it is hardly surprising that people outside Europe often find it difficult understand. The EC fits no existing model of international relations. It is not a federal national state—a kind of United States of Europe—although there are plenty who think it should become one. Nor is it just another international organization like the Organization for Economic Cooperation and Development or the United Nations Environment Programme, within which countries collaborate without giving up important elements of sovereignty.

On issues where the EC has enacted legislation—for example customs duties, agricultural policy, and many aspects of

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Roland de Bruin photo, Netherlands Board of Tourism.

environmental management—it has the authority to represent all 12 member states in external relations. This can get complicated since some international treaties cover some matters on which the EC has passed legislation and other issues on which it has not.

For example, in recent negotiations to tighten the Montreal Protocol on Substances that Deplete the Stratospheric Ozone Layer, the EC was the undisputed representative of the member states when deciding which substances to include and how vigorously to control them. But it was unclear whether the EC as a whole—or its individual member states—would participate in the new fund to help less developed countries comply with the requirements of the protocol.

The EC has long puzzled the United States, which appears torn between the advantages of a strong “Europe” which can commit 12 countries at one stroke and the disadvantages of having to

Low-lying Holland, a member of the European Community, is already worried about sea-level rise from global warming. The Delta Works is a major dyke system currently being built.

negotiate with this strong entity rather than with its much weaker constituent parts. A unified European entity is welcome for the strength of the Western alliance, but it inevitably reduces the relative importance of the United States within that alliance.

A case study in this ambivalence occurred in 1988. Just before the Montreal Protocol entered into force, the U.S. negotiator criticized the EC for insisting on joint ratification by its member states—which entailed the risk of holding up the rest of the world in protecting the ozone layer. It was well known that a number of member states were ready to ratify and that these individual ratifications could suffice to bring the protocol into force.

As it turned out, the member states did ratify collectively and in time. The U.S. negotiator had not anticipated the advantages of joint action, nor the contributions of the EC in making the protocol successful. Just a few months

later, the EC forced the pace in dealing with stratospheric ozone depletion by calling for rapid phase-out of all controlled chlorofluorocarbons (CFCs).

How did the EC get so deeply involved in environmental affairs that it is now an important international negotiator? Its original goal was to create closer relations among member states by establishing a "common market." (See box.) Unity through economic development was very much an idea of the 1950s and 60s. Prosperity has helped ease tensions between traditional antagonists, but the EC has certainly not yet replaced the sovereign instincts of its member states. Indeed, often the most effective way to influence EC decisions is to work with the member states individually.

As the economic reforms of the EC began to take hold, the costs of economic growth without regard for the environment became increasingly apparent. It also became apparent that separate initiatives by individual member states to adopt environmental standards might be futile and might even conflict with the free-market goals of the EC. Differing standards could distort competition in some industries. Thus in 1972 a decision was made to launch an "environmental action programme" for the EC.

The economic technocrats who shape EC decisions did not exactly welcome this new venture with open arms. In fact, the first decade of EC environmental policy was eked out in a minefield of economic interests. For example, the original decisions on the control of CFCs were shaped to avoid any real impact on the industries concerned.

It is little short of a miracle that the "Cinderella" of EC environmental policies managed to survive, presumably because growing public pressure was forcing member states to act. From inauspicious beginnings, environmental policy has now become one of the mainstays of the EC, recently



institutionalized in the same set of amendments to the European Economic Community (EEC) Treaties which designated 1992 as the date for removal of all barriers to trade.

Over the years EC environmental legislation has proliferated: More than 200 directives and regulations cover most aspects of environmental management, sometimes in great detail. These legal instruments differ widely in their significance. Some involve relatively small matters while others are comparable in importance to federal legislation in the United States. Some of the more important EC environmental legislation is highlighted below:

- The "Sixth Amendment," adopted in 1979, regulates the labeling and packaging of chemicals as well as testing requirements for new chemicals before they are marketed. It established a notification scheme which allows manufacturers to market new chemicals anywhere in the EC after notifying public authorities in one country only.
- The "Seveso Directive," adopted in 1982, was a response to a major accident, an explosion in a chemical factory, in Italy in 1976. Due to this directive, long before the Bhopal disaster, the European chemical industry was accustomed to preparing safety reports and on-site and off-site emergency plans, and the public was being informed of the correct procedures to follow in the event of an accident.
- A 1985 directive established an environmental assessment procedure for major public and private projects in all EC countries. Stimulated by the U.S. experience with the National Environmental Policy Act (NEPA), the European directive ended up being very different from NEPA because it had to be integrated with the advanced systems for land-use planning which were already in place in most European countries.
- The acid rain directive (1988) requires emissions of sulfur dioxide from existing large power stations to be reduced overall by 58 percent by the year 2003 from a 1980 baseline; however, different reductions are allocated to different countries. This agreement was reached after long and painful negotiations because the fuel supplies and the economic and geographical circumstances of the member states were so different. Thus the EC, an international body, was able to resolve its own inter-regional disputes on acid rain much more quickly than the United States.
- Over the years, a number of instruments have been adopted which effectively made the EC the key negotiator on the control of CFCs. The original decisions were merely symbolic in some respects, but they did define the controlling philosophy which ultimately was incorporated in the Montreal Protocol: limitation of overall

production and use rather than regulation of individual applications.

Arguably the international negotiating logjam on stratospheric ozone depletion was finally broken in 1986 when first U.S. environmental organizations and then industry were pried loose from the U.S. government's negotiating position and embraced the EC approach.

It is important to keep in mind that in areas where the EC has passed

legislation, it acquires external authority and thereby becomes an important negotiating partner for other countries. Moreover, EC environmental legislation is now so extensive that it is impossible to understand fully the national legislation of any member state without an understanding of the framework of EC law within which the national laws must fit. The member states with comparatively weak environmental

records, such as Greece, Spain, and Portugal, are now building their policies in concert with the EC framework. But even the more enthusiastic countries such as Germany, the Netherlands, and Denmark, have had their environmental policies improved by EC legislation.

The EC has become a force to reckon with on environmental and other issues. Member states deal with each other on a day-to-day basis in evolving environmental policies. The solutions they develop reflect the constraints of international cooperation, but these solutions are often more advanced than can be achieved in other international negotiations. Moreover, much like the United States, once EC countries reach consensus among themselves, they are unlikely to change their stance under external pressure. It is therefore essential for the United States to follow EC legislation closely and to seek input while influence is possible.

The reality of EC environmental policy has added a new dimension to U.S. foreign environmental policy. EC decision-making is complex and difficult to influence from the outside. EC decisions, once reached, are very difficult to change through the traditional means of bilateral diplomacy with member states. The experience of stratospheric ozone depletion may prove instructive.

The United States did much of the underlying research and took the first steps to act on the problem. But in recent years, the EC has emerged as the leader on the issue. It is not inconceivable that this pattern may be repeated on other international environmental issues ranging from tropical deforestation to global warming. □

Note: A book by Nigel Haigh entitled *EEC Environmental Policy and Britain* is available for \$40 from The Conservation Foundation, P.O. Box 4866, Hampden Post Office, Baltimore, Maryland 21211; telephone (301) 338-6998.

## The European Community in Profile

The European Community (EC) was founded in 1957 through the Treaty of Rome. It comprises the European Coal and Steel Community, the European Economic Community, and the European Atomic Energy Community.

The six original EC parties were France, the Federal Republic of Germany, Italy, Belgium, the Netherlands, and Luxembourg. The United Kingdom, Denmark, and Ireland joined in 1973; Greece acceded in 1981 and Portugal and Spain in 1986. Thus the EC presently consists of 12 member nations. Several other nations have applied to join.

The EC has four main institutions:

- The *European Parliament* is a directly elected body with a given number of seats for each member nation, depending on the size of its population. The Parliament is not primarily a legislative body. However, proposed legislation cannot be adopted by the Council (see below) unless the Parliament has given an opinion on the proposal.
- The *Commission* consists of 17 individuals appointed by the governments of member states (one or two from each member state). Together with the Council, the

Commission comprises the EC's legislature. The power to propose legislation lies solely with the Commission, but only the Council may adopt it.

- The *Council*, which is composed of one minister from each member state, is empowered to enact legislation for the EC. (Once legislation is adopted, member states are responsible for implementing the law.)
- The *Court of Justice* is the judicial body of the EC. The Court decides cases referred to it by the Commission. For example, such cases would include instances in which the Commission believes member states have not fully implemented EC legislation.

The principle task of the EC, as defined in the Treaty of Rome, is to create closer relations among the member states by establishing a common market. The Single European Act of 1987 refined this mandate to require, by the end of 1992, the creation of an internal market comprising an "area without internal frontiers in which the free movement of goods, person, services, and capital is ensured." The 1987 treaty also delineated various common policies in areas including transport, agriculture, and the environment.

# Strategies for Change; Reasons for Hope

by Maurice Strong



Mike Brisson photo.

(Strong will chair the U.N. environmental conference in 1992.)

Clean air for the world will be one major topic under discussion at the 1992 United Nations Conference on Environment and Development.

The 1972 United Nations Conference on the Human Environment in Stockholm, Sweden, put the environment on the agenda of the world community. The goal of the 1992 Conference on Environment and Development in Brazil is to place the environment squarely at the center of economic decision-making, so that we can balance our economic aspirations against our environmental imperatives. While the recent explosion of environmental concern provided the impetus for the 1992 Conference, realistically it is only within the processes of economic development that most actions to deal with environmental concerns can be taken successfully.

The idea that the environment and development are related is not new. Indeed, the concept was articulated persuasively as early as the seminal meeting of experts and policymakers at Founex, near Geneva, Switzerland, in 1971. That meeting provided the intellectual basis for the Stockholm Conference. It also paved the way for the participation of developing countries in the Conference. Prime Minister Indira Gandhi of India made the point dramatically at Stockholm when she pointed to poverty itself as the principal source of pollution in developing countries.

When the United Nations Environment Programme was established following the Stockholm Conference, it became a strong advocate of the environment-development link. Nevertheless, by 1983, when the United Nations General Assembly established the World Commission on Environment and Development to take a new look at the issue in the perspective of 2000 and beyond, there had been very little recognition of the relationship in national decisionmaking.

The Brundtland Commission rejected "no growth" as a goal for the world community, but made it clear that no growth would be the inevitable result of continuing on the path of environmentally destructive development. It called for a transition to sustainable development, particularly in developing countries, to meet the need for growth. The recommendations contained in its report, *Our Common Future*, provide a basis for the issues to be addressed at the 1992 Conference.

The 1992 Conference, or ECO '92 as it is already being called, will deal with a broad range of issues bearing on the transition to sustainable development. These include climate change, transboundary air pollution,

management of waste, protection and management of land resources, conservation of biological diversity, protection of the oceans and coastal areas, and the quality and supply of freshwater resources. Cutting across these will be the financial and technological requirements of developing countries for joining in global cooperative actions and the institutional changes needed to foster cooperation.

Cooperation can only be based on common interests. At the Stockholm Conference, developing countries were deeply concerned that their overriding need to alleviate poverty might be prejudiced by the growing preoccupation of the industrialized countries with environmental problems. Some said they would welcome pollution if it was a necessary accompaniment to the economic growth they urgently required.

Since Stockholm, air and water pollution and the cancerous spread of urban blight have added cities like Mexico City, Cairo, Sao Paulo, and Manila to the list of the world's most polluted environments. Shortages of supply and rising tides of toxic substances have been added to loss of soil, forest cover, and whole species of plant and animal life to produce a new generation of risks to the health of peoples in developing countries. As fragile economies struggle to accommodate growing populations, the vicious circle of poverty drives millions of people to undermine the very resources on which their survival depends.

In Western industrialized countries and in Japan, the environment has become deeply entrenched as one of the central concerns of the public. This has led to vigorous action and some notable progress in attacking local environmental problems. The new openness of the Soviet Union and its allies in eastern and central Europe has revealed widespread environmental degradation in those countries. At the same time, there has been a growing focus on such major global risks as climate change, ozone depletion, and the deterioration of biological and genetic resources.

ECO '92 will focus on the concrete steps we must take to effect a transition to sustainability in our economic life. The industrialized countries must clearly take the lead in this transition. It will be no easy task. Inertia is as powerful a force in human affairs as it is in the physical world. Although the transition to sustainable development

ultimately will produce more opportunities than will continuing along the "business-as-usual" pathway, the changes themselves will be disruptive. There will be strong resistance from those most immediately threatened.

The transition must derive primarily from incentives rather than regulatory measures. Market forces can be a powerful ally in providing the incentives. It would be fully consistent with market-economy principles that environmental costs be met by incorporating them into the products which give rise to them. Such a change would amount to nothing less than an

"eco-industrial" revolution, one that would create a whole new generation of economic opportunity.

The substantial reductions by Western Europe and Japan in the materials and energy used in industrial production illustrate that environmental measures can be integrated into economic growth and vitality. Japan uses only about half as much energy per unit of production as does the United States, giving it a competitive advantage of five percent in the United States market. Further, waste management and pollution control are now among the leading growth industries in industrialized countries.

## Upcoming Events by Jonathan Elkind

Reflecting the heightened importance of environmental issues, the next 12 months will bring a number of major international events that relate directly and indirectly to the environment. Following are some of the highlights of the upcoming year:

### • Fourth Plenary Session of the Intergovernmental Panel on Climate Change (IPCC)

August 27-30, Singsvall, Sweden

The United Nations-sponsored IPCC, the major international body investigating climate change, will prepare a summary report reflecting its final assessment of the scientific issues, socio-economic impacts, and response strategies that the panel has been developing. The panel will also discuss the scope of its future work.

### • Opening of the Regional Environmental Center

September 6, Budapest, Hungary

This independent center will be visible evidence of the political changes of the last year. First proposed by President George Bush and jointly sponsored by the United States, the European Community, and the Hungarian government, the center will focus on environmental health effects, pollution prevention, and energy efficiency in a region plagued by the effects of heavy

*(Elkind is a policy analyst with the President's Council on Environmental Quality.)*

industrialization. It will support the development of independent environmental institutions throughout Eastern and Central Europe.

### • Montreal Protocol on Substances that Deplete the Ozone Layer—Meeting of the Executive Committee of the Parties

September 21, Montreal, Canada

Discussions will center on implementing the Financial Mechanism. The Financial Mechanism will help developing nations with the cost of introducing new technologies or industrial processes which do not use ozone layer-threatening substances.

### • World Bank/International Monetary Fund Annual Meetings

September 25-27, Washington DC

World Bank officials and participating nations will address the question of creating an environment-focused "Green Fund"—officially called the Global Environmental Facility—as well as the environmental impacts the Bank's regular lending activities have on such issues as energy efficiency, conservation, and tropical-forest preservation. Some nations, including the United States, have been urging the Bank to assess environmental impact as a routine part of its lending process.

### • Second World Climate Conference

October 29-November 7, Geneva, Switzerland

Making such changes in our economic life requires as much industrial as it does political statesmanship. It is encouraging to see the interest industrial leaders have shown in contributing to preparations for ECO '92.

Changes within industrialized economies must be accompanied by new relationships with developing countries that will enable the latter to become full and equal partners in ensuring global security. One of the principal challenges to the 1992 Conference will be to find a way to substantially increase the flow of

resources to these countries, as well as to provide them access to environmentally sound technologies.

One principal product of the conference will be an agenda for action by the world community for the remainder of this decade and the beginning of the 21st century—"Agenda 21." In addition, the Conference will spur the negotiation of conventions in such key areas as climate change and bio-diversity. However, these actions will be meaningful only to the extent that they are accompanied by commitment to the financial resources,

technologies, and institutional mechanisms needed to carry them out.

No one conference can fully resolve issues of such fundamental importance and complexity. However, ECO '92 must produce a fundamental shift in our economic attitudes, and establish the foundations for a cooperative global alliance if we are to ensure that the planet remains a secure home for human and other forms of life. The road to Brazil will be a difficult and crowded, but it offers the most promising and hopeful pathway to "Our Common Future." □

Meeting only two months after the IPCC Plenary Session (see above), delegates to this United Nations-sponsored conference will review the World Climate Research Program, the recent IPCC report, and the need for adopting a climate framework convention.

● **Antarctic Treaty Meeting**

Late November, Santiago, Chile

Parties to the treaty will meet to discuss measures for Antarctic environmental protection and specifically the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA).

Some member nations have expressed concern about whether CRAMRA will be used to promote minerals development in Antarctica or whether it will provide effective international control of minerals development.

● **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)—Meeting of the Standing Committee**

November 19-23, Perth, Australia

The Standing Committee, which is comprised of representatives of convention parties from each continent, will meet during a time of growing global awareness of the importance of biological diversity. The meeting also comes at the end of a period of instability in the management and operations of CITES.

● **International Union for the Conservation of Nature and Natural Resources (IUCN)—General Assembly Meeting**

November 28-December 5, Perth, Australia

As the principal forum bringing together most major environmental non-governmental organizations (NGOs), this meeting will focus on discussing plans for a possible international treaty on biological diversity. It will also be an opportunity for the NGOs to review and critique their government's preparations for the 1992 UNEP meeting.

● **General Agreement on Tariffs and Trade (GATT)—Ministerial Meeting**

December 3-7, Brussels, Belgium

Although the GATT process has not been considered "environmental" in the past, current renewal negotiations for this major international trade agreement have incorporated the environmental implications of agricultural trade policy, natural-resource trade policy, import-export quota restrictions, and other issues.

● **Organization for Economic Cooperation and Development (OECD) Environment Ministerial Meeting**

January 30-31, 1991, Paris, France

This traditionally economic organization, which grew out of the post-World War II Marshall

Plan, has recently turned its attention in part to integration of economic and environmental concerns. By elaborating concepts of sustainable economic development, member states aim to develop an environmental agenda for the 1990s and produce documents which will be of assistance to the UNEP 1992 Conference.

● **Framework Convention on Global Climate—First Negotiating Session**

February, 1991, United States

At July's economic summit meeting in Houston, the United States and the other G-7 nations agreed to complete a Climate Framework Convention by 1992. The Bush Administration has repeatedly proposed that the first negotiating session for the convention take place in the United States, although the specific location and date of such a session have not yet been finalized.

● **Negotiation Meeting on a World Forestry Convention**

(To be arranged)

The G-7 Summit meeting generated a declaration calling for the negotiation of a world forestry convention. The aims of the convention would be curbing deforestation, protecting biological diversity, stimulating positive forestry actions, and addressing threats to the world's temperate and tropical forests.

# Appointments



Judge **Daniel M. Head** is one of the Agency's new Administrative Law Judges.

Previously Judge Head was an administrative law judge at the Department of Transportation, the Federal Energy Regulatory Commission, and the Federal Communications Commission. In addition, he served for over four years as board chairman on licensing boards for various nuclear power plants.

Judge Head served as a trial attorney with the Pollution Control Section of the Department of Justice and performed civil trial work in private practice for almost eight years. He earned his bachelor's degree from the Georgetown University in 1956 and his law degree from the Georgetown University Law Center in 1962.



**Frank Covington** is the Director of EPA's National Enforcement Investigations Center (NEIC), located in Denver, Colorado.

Before joining the NEIC, Covington served as Deputy Regional Administrator of Region 5, headquartered in Chicago, Illinois. He has been with EPA since its creation, serving in various executive positions in Region 9, which is headquartered in San Francisco, California.

Covington began his federal career with the Federal Water Pollution Control Administration. Before that he was Director of State Planning in Iowa and worked in California at state and local government positions. He earned his bachelor's degree from San Francisco State University in 1958 and a master's degree in business administration from Golden Gate University in 1962.



The new Deputy Regional Administrator for Region 5, headquartered in Chicago, Illinois, is **Ralph R. "Dick" Bauer**.

Bauer spent the past year at Indiana University's School of Public and Environmental Affairs as a visiting scholar under a government exchange program. Most of his career, however, was spent with the Agency's Region 10, headquartered in Seattle, Washington. Since 1971, he has held various executive positions there, including that of Deputy Regional Administrator.

Bauer served in the U.S. Army in the early 1960s, before joining the Federal Water Pollution Control Administration in 1966. He earned his bachelor's degree from the University of Southern California in 1960 and a master's of public administration from the University of Washington in 1981. He has been awarded the Agency's Bronze and Silver Medals.



**Dr. Walter W. Kovalick, Jr.**, is the Director of EPA's Technology Innovation Office.

For the previous five years, Dr. Kovalick was the Deputy Director of the Superfund program. From 1978 to 1984, he directed a staff office in the Office of Toxic Substances. He joined the Agency in 1970, working extensively with the states on the Clean Air Act implementation plans.

Dr. Kovalick earned his bachelor of science degree in industrial engineering and management science from Northwestern University and his master's in business administration from Harvard Business School. He holds a Ph.D. in public administration from Virginia Tech. He is a member of the American Society for Public Administration, the Institute for Industrial Engineers, the Association of Public Policy and Management, and the Academy of Management. □



David Hughes photo Bruce Coleman

Efforts to protect the African elephant recently resulted in a ban against international trade in ivory from the animal's tusks. Shown is an elephant in the Etosha Preserve in Namibia. See story on page 15.

Back Cover: Market in Malang, Indonesia. How Third World countries can attain higher living standards without degrading the local and global environment has become a major international issue. Photo by Chuck O'Rear for Woodfin Camp. See story on page 39.

