Public Disclosure Authorized

Environment matters

AT THE WORLD BANK

17631

Public Disclosure Authorized

toward environmentally and socially sustainable development • Winter/Spring 1997

Education for girls has a catalytic effect on every dimension of development.... As the African proverb tells us: "If we educate a boy, we educate one person. If we educate a girl, we educate a family - and a whole nation."

James D. Wolfensohn,
World Bank President

Educating Students Around the World About the Environment

The World Bank's Economic Development Institute has launched the World Links for Development ("WorLD") Program to create on-line educational communities for secondary school students and teachers around the world. WorLD is working in partnership with the GLOBE Program, a distance environmental education program founded under the leadership of US Vice President Al Gore. Together, these complementary programs hope to advance world scientific knowledge and achieve their goals in building awareness about the environment and sustainable development.
See page 29.

Letter from Al Gore, Vice President of the United States

It has been five years since the Earth Summit at Rio. The great riches of human creativity were on full display there: a giant "tree of life" decorated with messages from children around the world; startlingly beautiful computer images of earth seen from space; spectacular sculptures, paintings, music, and graphics. The many parts of this human tableau seemed more alike than different: indigenous person and artist, scientist and child, tourist and diplomat. All seemed to recognize that we are all part of something larger, a family related intimately by commitments to each other's common future.

On this fifth anniversary, we are united by the knowledge that human activities are causing grave and perhaps irreparable damage to the global environment. The problem runs from local air and water pollution to destruction of the rain forests, global climate change and the diminished diversity of plant and animal species.

We have made some remarkable progress since Rio. We renegotiated the Biodiversity Treaty and Climate Convention, addressed population concerns at Cairo, and worked to vigorously enforce the Montreal Protocol. We are seeing that the ban on ozone depleting chemicals has begun to heal the fragile shield that protects us from ultraviolet radiation.

But those five years have also heightened new concerns. The new Global Biodiversity assessment reports that rates of species loss worldwide are 100-1,000 the normal rates of extinction and accelerating. And the Intergovernmental Panel on Climate Change reports a discernible human influence on the climate, and projects temperature changing faster than ecosystems can adapt.

Responding to these large scale problems requires bold new approaches. We must harness the planet's scientific and technological capabilities to develop sustainably. The link between energy use and environmental degradation must be broken. UNEP's first Global Environment Outlook report calls for an "Energy Decade" to promote alternative energy sources and improve energy efficiency. I would like to take this opportunity to challenge the World Bank Group to accelerate its efforts to promote and fund clean energy worldwide so that by early in the new millennium, a significant portion of their energy portfolio is renewable.

We must also pursue a more rigorous analysis of the challenges we face. The traditional economic system measures the value of things such as food, clothing and manufactured goods, but often understates or ignores the value of things more difficult to buy and sell: fresh water, clean air, the beauty of the mountains, the diversity of life and the quality of the world we leave to future generations. The World Bank has taken a great step forward by characterizing a nation's true wealth not only by the importance of industrial output, but also by the value of natural, social and human capital. I hope the Bank will continue to actively promote Green GDPs.

The Global Environment Facility is a promising development. It mobilized more than $2 billion for projects around the globe to tackle global environmental problems. The World Bank Group provides more than $25 billion in loans each year and fortunately its lending for environmental projects has climbed, as has lending for human resource development, population, poverty reduction, clean energy and forestry.

However, even the World Bank's resources are dwarfed by the demand for environmental goods and services globally, approximately $400 billion per year. And the market for energy efficiency and power generation is another several hundred billion dollars a year and growing. Those of us in government and international financial institutions need to help capital flow toward more sustainable solutions and develop incentives for private sector financing of environmental technologies. Policies that subsidize resource waste must be ended.

Five years ago, we achieved unity of purpose out of diversity at Rio. Everything we have learned since then should deepen our resolve to protect our home. Environmental protection is not a luxury, it is a necessity. We are all on spaceship Earth together.

Al Gore

contents

Letter from Vice President Al Gore 1

President's Letter 3

Overview: The Bank's Environment Community Takes Stock 4

Solving the Water Crisis Together: The Global Water Partnership 10
The new Global Water Partnership is the first-ever international attempt to coordinate efforts to solve water problems on a global scale.

Innovative Financial Instruments for Global Environmental Management 12
The World Bank Group is promoting a variety of innovative public and private financing mechanisms for the environment.

Getting the Public Involved: A Key to Environmental Solutions 14
By involving the public, we stand the best chance of achieving sustainable development.

Reflections 19
Anil Agarwal

The Aral Sea Disaster: Turning the Tide? 20
The international community is working together to find sustainable solutions to the survival of the Aral Sea.

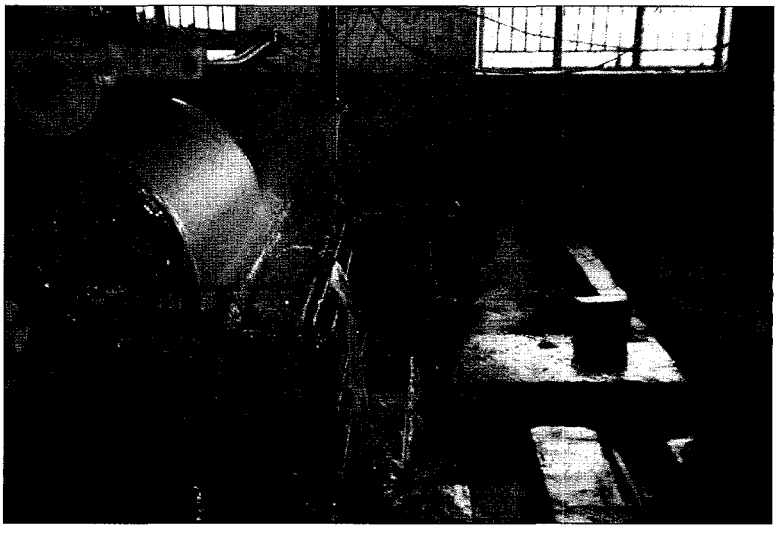
Russia's Special Initiative to Complete ODS Phase-Out 22
Russia, with help from the donor community, is phasing out ozone-depleting substances by the year 2000.

Building Global Markets to Reduce Climate Change 23
The World Bank and its partners are exploring ways to build global markets for offsetting and trading greenhouse gas emissions.

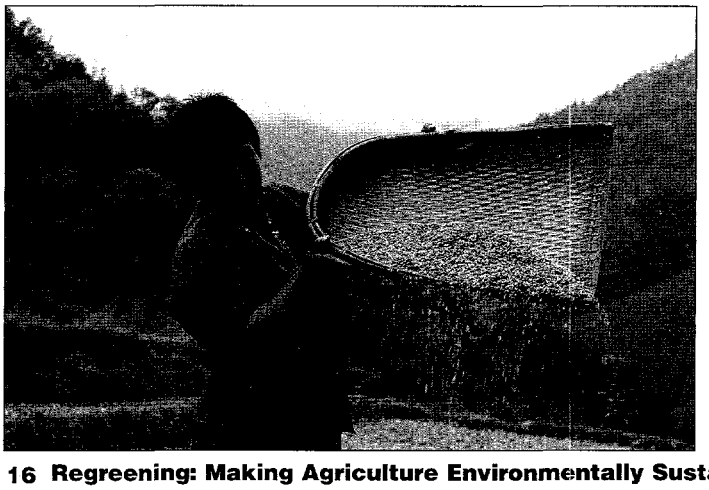
Reforming Subsidies: Now Is the Time to Act 24
Reducing subsidies for resources such as fossil fuels, fertilizers and pesticides for agriculture must become a key policy instrument.

Innovations in Environmental Policy: Progress Since Rio 26
This policy matrix classifies tools and best practices around the world in environmental management.

WINTER/SPRING 1997



6 Persuasion and Incentives: New Ways to Achieve a Cleaner World
The World Bank and its client countries are using new and innovative tools such as persuasion, social pressure and market forces to get polluters to clean up their act.



16 Regreening: Making Agriculture Environmentally Sustainable
The World Bank and its client countries are pursuing resource use and land management for sustainable agriculture in promising new ways: reversing soil decline, turning wastes into assets, using land quality indicators, and integrating biodiversity conservation into agriculture.

Five Years After Rio 27
Derek Osborn

At a Glance...
What's New at the Bank? 28
Scanning the Portfolio 30

Recent Publications 31

Mailing List 32

About the Covers:

Photographer: Curt Carnemark

Front Cover:
A salt miner at work in Irian Jaya, Indonesia

Environment Matters is a magazine of the World Bank Group produced three times a year by the Environment Department. Each fall features an annual report on the Bank's work in the environment, and a second volume containing a matrix of Bank Group projects with relevant environmental information. Visit us on the Bank's Environment Department Web page.

Managers of the World Bank Group's Environment Program

Environment Family Sector Board:
Chair: **Andrew Steer**
Africa: **Francois Falloux**
Europe & Central Asia: **Michele de Nevers**
Middle East & N. Africa: **Tony Garvey**
Latin America & the Carib.: **Constance Bernard**
E. Asia: **Jon Hitchings**
S. Asia: **Walter Vergara**

World Bank Environment Department:
Director: **Andrew Steer**
Sr. Science Advisor: **Robert Watson**
Sr. Environmental Advisor: **Ken Newcombe**
Senior Water Advisor: **John Briscoe**
Environmental Assessment Advisor: **Robert Goodland**

Land, Water & Natural Habitats, ENVLW
Chief: **Colin Rees**

Global Environment (including GEF and MP operations coordination) ENVGC
Chief: **Lars Videaus**

Social Policy, ENVSP
Chief: **Gloria Davis**

Pollution & Environmental Economics, ENVPE
-Technology and Pollution Policy
Chief: **Richard Ackermann**
-Indicators and Environmental Valuation
Chief: **John Dixon**

Environmental Law Unit, LEGEN:
David Freestone
Environmental Research, PRDEI:
Zmarak Shalizi, David Wheeler

Chiefs of Regional Units:
Asia: **Maritta Koch-Weser**
Africa: **Cynthia Cook**
Europe & Central Asia/
Middle East & N. Africa: **Anand Seth**
Latin America & the Carib.:**William Partridge**

International Finance Corporation Technical & Environment Department:
Director: **Andreas Raczynski**
Environment Division Manager: **Martyn Riddle**

Editor, Production & Circulation Manager: **Clare Fleming**
Associate Editor: **Diana Chung**
Design: **Bennet Akpa, Clare Fleming**
Advisor: **Louise Scura**

Publications Info: **202-458-8459**
General Inquiries: **202-473-3641**
Department Fax: **202-477-0565**
Web address:
http://www-esd.worldbank.org/html/esd/env/envmain.htm

Printed with soy ink on 100% recycled paper; Cover is 50% recycled and totally chlorine-free. Please recycle.

The World Bank Group
1818 H Street, N.W.
Washington, D.C. 20433

Letter from the President

Five years after the Rio Earth Summit is a good time to take stock of how far we have come in sustainable development.

Although awareness of environmental issues has increased, progress in putting environmentalism into practice around the globe has clearly not been what we had hoped. Investment in sustainable development has been inadequate or in some cases not cost effective. Targets under the Climate Change Convention for the year 2000 are unlikely to be met. Most important, we have not made nearly enough progress in improving the quality of life for the 3 billion people who still live on less than $2 a day.

We have, of course, seen some remarkable examples of dedication, innovation and success. We estimate that of the 100 countries which have now prepared national environmental strategies, about half are beginning to see progress on the ground. Some countries are experiencing changes that will become best practices for others to follow. Innovations range from Mexico's new Environment Law and Indonesia's new pollution policy to the halving of wasteful subsidies on energy consumption and expansion of the power of civil society in promoting sustainable development around the world.

In this issue of *Environment Matters*, we take a look at some of the successes the Bank's client countries have brought to the table since Rio and try to honestly assess the unfinished agenda. The Bank's own agenda for sustainability over the coming years will include investing in partnerships that work, mainstreaming environmental concerns into *all* of our lending, addressing the social and cultural dimensions of development, building and sharing knowledge and best practice, measuring progress differently through techniques like participatory poverty assessments and green national accounts, and channeling finance for sustainable development. The articles in this issue illustrate our work with our client countries in applying these goals.

I invite you to read this issue of *Environment Matters* as part of our continuing attempt to share information at the cutting edge of environmental practice and learn from one another, as we mark the five-year guiding post on the road from Rio.

James D. Wolfensohn

Five Years After Rio:

The World Bank's Environmental Professionals Take Stock

Since Rio, the World Bank environmental community has grown dramatically, with over 300 specialists devoted to environmental issues. This past January, all the environmental staff were formally linked in an 'Environment Family' (see page 28) under the Bank's new professional network structure. Now, five years beyond Rio, the Bank's environmental professionals are taking stock and planning for the future. The following statement by the Bank's Environment Family lays out six imperatives that will help guide our own work as we seek to support our clients in making development sustainable.

Mainstream Environmental Sustainability into All Development Programs

Since Rio, the Bank has sharply expanded its targeted support for environmental reforms in our client countries, with active environmental programs in 68 countries. The portfolio of (disbursing) loans for these programs now stands at nearly $12 billion. Such interventions–to reduce pollution, protect ecosystems and build capacity for environmental management in developing countries–are playing an important role in environmental reform. But as we focus on these targeted programs, we must also be sure that *all* Bank-financed programs are designed to ensure environmental and social sustainability.

We believe real progress is being made in our efforts to mainstream the environment across the board, but we're not satisfied yet. Along with other development agencies, we now need to work harder to incorporate environmental concerns into sectoral and even macroeconomic strategies in the same way that we have at the project level. We believe that sectoral and regional environmental assessments can yield high pay-offs.

M. IANNACCI

President James Wolfensohn addressing Bank staff.

On the positive side, a recent review of our experience with Environmental Assessment of Bank-supported projects showed strong improvement in technical quality and impact. Evidence shows that the kinds of investments supported by the Bank are, in most instances, much more sensitive to ecological concerns than those we supported a decade ago. But full mainstreaming is not yet complete. With this in mind we, along with our colleagues in the energy sector, are taking a tough look at our activities in energy and the environment. The Bank is also launching a major program to renew our work in rural development with a major emphasis on sustainability (*see Regreening, page 16*).

Invest in Partnerships that Work

One of the strengths of Agenda 21 was its insistence that all groups in society have a role to play in promoting sustainable development, and that by acting together the whole can be much more effective than the sum of its parts. In the Bank's environment work, we've begun to internalize this message. Partnerships are essential to our work on the environment; the majority of projects are now implemented with active NGO and community group involvement, and

we've been sharply expanding our joint programs with the private sector and other international agencies.

We believe there is still a huge untapped potential in working together in partnerships to bring about the transformations in corporate, consumer and official behavior needed to make development sustainable. Consider forest industries, for example. Why is it that there are so few examples of good environmental stewardship? It's because there is rarely the right combination of enlightened corporate behavior, appropriate government policy, adequate stakeholder consultation, strong NGO and scientific involvement to ensure independent certification of good practice, and adequate financing. The recently established Forest Market Transformation Initiative (described in *Environment Matters*, Fall 1996) is an example of an effort to bring precisely this set of actors together in a way that will help realize the competitive advantage that can underlie sound environmental and social corporate behavior. We expect to actively participate in this and other market transformation efforts in sectors such as renewable energy and marine products (*see Photovoltaic MTI, page 28*).

Integrate Social and Cultural Dimensions

A key tenet at Rio was that social sustainability is equally important as—and often linked closely with—environmental sustainability. But the implications of this truth are still rarely worked out in public policy.

Last year President Wolfensohn requested that a task force prepare an action plan to incorporate social concerns into our activities across the board. This has recently been completed and approved by the Board of Directors. At the project level, social assessment will gradually become the norm just as in the case of environmental assessment. At the strategic level, the Social Development Family will address social capital issues in Country Assistance Strategies for a number of key countries. The Bank will also expand support for work in post-conflict situations, where social and institutional structures are severely weakened or destroyed. And, to help build and disseminate knowledge, the 1999 World Development Report will likely be devoted to social development.

Build and Share Knowledge

We recognize that we, like all professionals in this area, are on the steep part of the learning curve when it comes to environmental sustainability. The development path laid out in Agenda 21 was new, and with each passing year we all gain experience as to what works and what doesn't.

> Making development sustainable involves much more than simply ensuring that the environment is preserved. There are social, institutional and economic dimensions to sustainability that are not necessarily related to the environment. Nonetheless, it has been the environmental focus that has been a prime mover in encouraging a more holistic development model.
>
> *Caio Koch-Weser, World Bank Managing Director*

Some of the best innovations are still experimental and we must learn from these so that good practices can be replicated. The World Bank's project portfolio itself offers a remarkable living laboratory from which not only the Bank but others too can learn. But we recognize too that many of the best innovations come from outside and in particular from locally-led development efforts.

Too much knowledge rests in supply-driven reports and not enough in user-friendly systems available to decision-makers and practitioners. Recognizing this, the Bank will invest in creating a knowledge management system for development professionals. Building and maintaining the knowledge base on the environment will be an important task for the Environment Family.

Measure Progress Differently

To make progress toward sustainable development, we need better indicators to guide action and monitor progress. Reducing poverty rapidly in a manner that conserves ecosystems' productivity is the central goal of sustainable development. But we need to deepen our understanding and measurement of both poverty and ecology if we are to have a yardstick against which to measure progress.

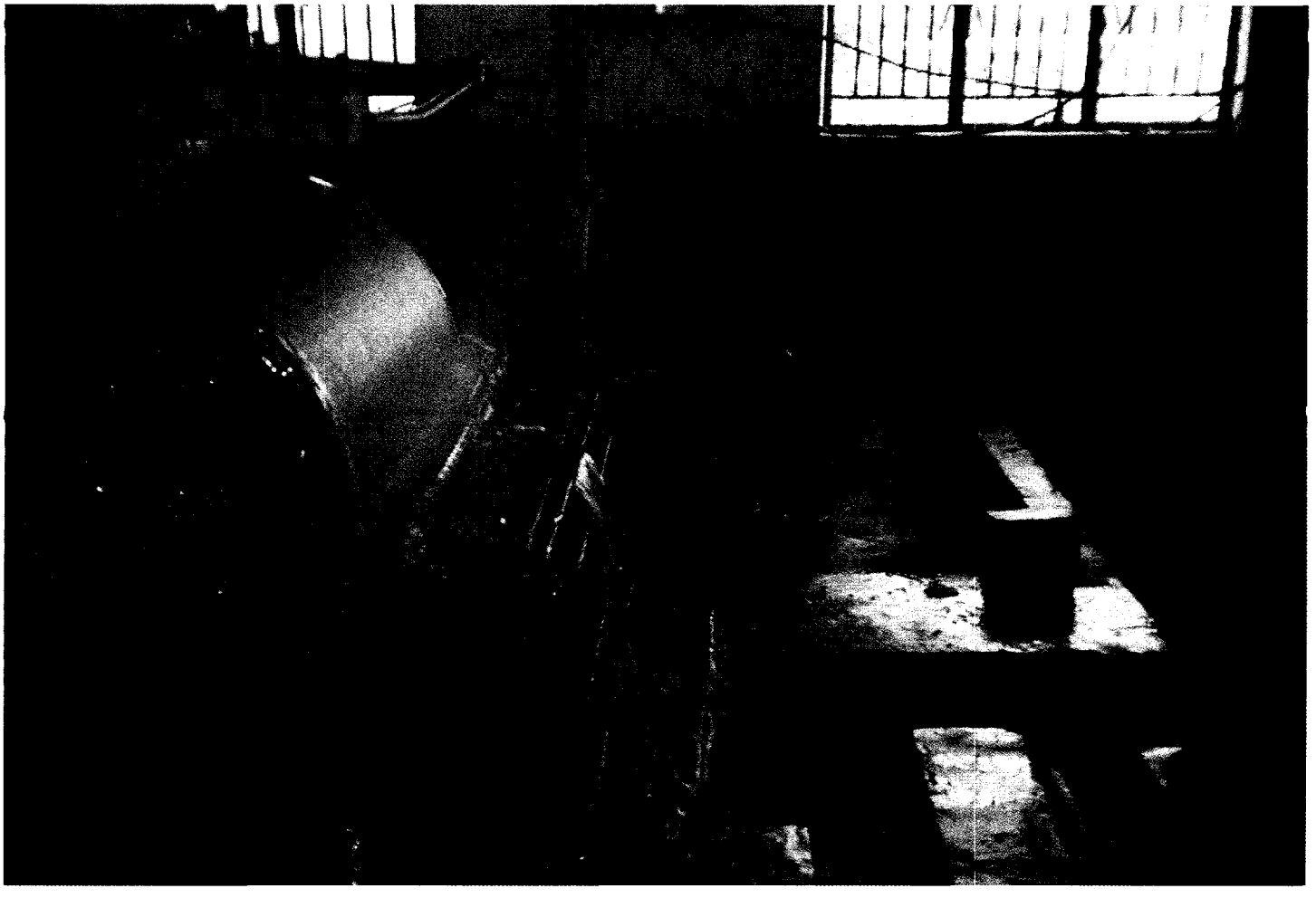
Integrating environmental concerns into development indicators is essential. More countries are seeking to incorporate environmental and social concerns into their national accounts. We believe we need to move vigorously to make this a normal practice. We need to progress on indicators of several different types: better indicators of the state of the environment and of related trends, better measures of the pressures affecting environmental conditions and trends, and better measures of the impacts of policy and other interventions.

Make Every Dollar Count

Funding for environmental programs remains inadequate. It is important that funding be raised: a strong replenishment of the Global Environment Facility this year is vital. Funds that are available must be allocated on the basis of cost-effectiveness and leverage. Setting priorities carefully and actively monitoring the impact of expenditures needs to be the hallmark of our work. And finally, our recent innovations in catalyzing private funding (*see Innovative Financial Instruments, page 12*) must be replicated

---

This article was written by Andrew Steer, Environment Department Director, in collaboration with the Environment Sector Board.



D. HANRAHAN

Persuasion & Incentives:

New Ways to Achieve a Cleaner World

Government regulation is not the *only* solution to pollution. There is now an expanding tool-kit of innovative and flexible incentives which can be used to get polluters to clean up their act.

While there is no substitute for meaningful regulatory frameworks and information about the environment, these new tools, which rely on persuasion, social pressure and market forces to help push for improved environmental performance, can often succeed where regulations can't.

The World Bank and its client countries are putting some of these tools to work with promising results, as demonstrated by the four described below.

Harnessing the Power of Public Opinion

Local communities and market forces can significantly influence polluting industries to comply with environmental regulations. In countries as different as China, Brazil, Mexico, and Indonesia, local communities are finding ways to force environmental norms on local polluters. Where formal regulations are present, communities use the political process to ensure tighter enforcement of regulations. Where formal regulations are absent or ineffective, community groups or nongovernmental organizations (NGOs) can use forms of "informal regulation." The agents of informal regulation can be local religious institutions, social organizations, community leaders, citizens' movements or politicians. For example, a community group can negotiate directly with a factory, by compelling it to respect social norms or by explicit or implicit threats of social or political sanctions if the factory fails to reduce damages caused by its emissions. Given the influence these community groups can have, it is important to get accurate environmental information to them so they may be more effective in their negotiations with polluters.

For companies sensitive about their reputations, public recognition of their good or bad environmental performance may translate into large gains or losses.

Commercial market forces can also be powerful. Evidence suggests that a firm's environmental reputation matters; when customers, suppliers and stockholders judge a firm's environmental performance, that firm's expected costs or revenues are affected. For companies sensitive about their reputations, public recognition of good or bad performance may translate into large expected gains or losses over time. This market pressure has resulted in a wide variety of Codes of Practice and other voluntary guidelines by companies or industrial associations, and NGOs and other groups are becoming more active in promoting the implementation of such commitments.

The World Bank Group is supporting a number of initiatives to bring together industries, local regulators and community groups to discuss local priorities and to improve those industries' environmental performance.

An example is Indonesia's PROPER program, which rates and publicly discloses factories' environmental performance (*see Box and Figures*). Armed with government-certified performance ratings like those provided by PROPER, environment agencies can reduce expensive legal enforcement procedures by

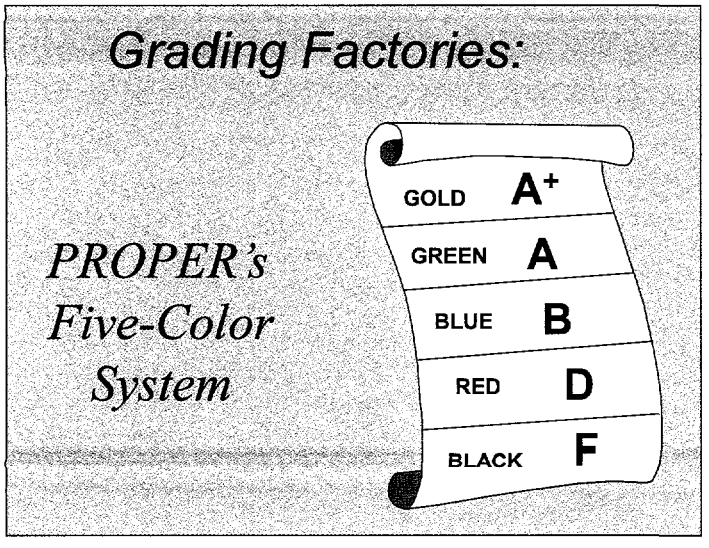
THE "PROPER" WAY TO PERSUADE

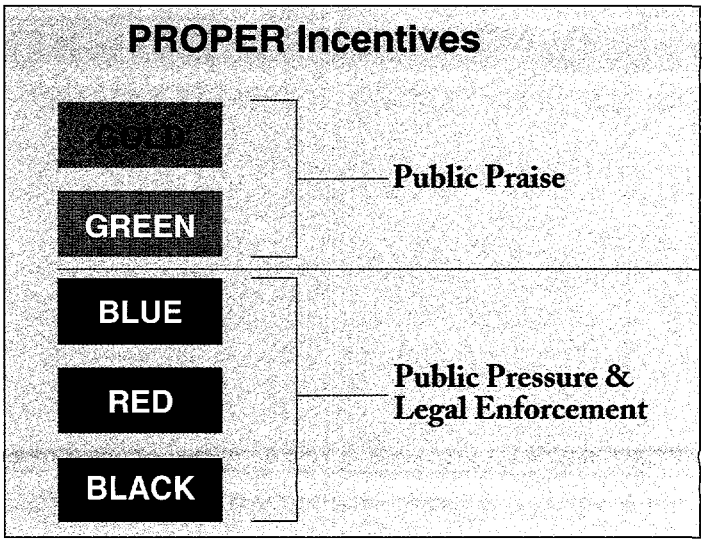
Several years ago, when the Government of Indonesia realized that it was facing the risk of severe pollution damage because regulatory enforcement was weak and manufacturing was growing at over 10% a year, it designed an innovative program for rating and publicly disclosing the environmental performance of Indonesian factories. The program was implemented in 1995 by a team at Indonesia's National Pollution Control Agency (BAPEDAL), with technical support from the World Bank. It is called PROPER PROKASIH. During the past year, BAPEDAL's PROPER PROKASIH team has successfully managed and expanded the program.

In PROPER, a factory is assigned a color rating based on the government's evaluation of its environmental performance. A Blue rating is given to factories who comply with national regulatory standards, Gold is reserved for world-class performers, and Black for factories which have made no attempt to control pollution and are causing serious damage. Intermediate ratings are Red, for factories that have some pollution control but fall short of compliance, and Green, for factories whose emissions control and housekeeping procedures significantly exceed those needed for compliance.

In PROPER's pilot phase, 187 plants were rated and in June 1995, when the program was officially launched, only the names of the five Green plants were publicly announced (no plants rated Gold). The 115 plants rated as Red and six plants rated as Black were privately notified and given until December 1995 to improve their performance. Before full disclosure in December, half the Black plants and 6% of the Red plants had made successful efforts to upgrade their status. By last September, 33 of the original 121 Black or Red Plants achieved Blue status and one achieved Green. Of the six plants originally rated Black, five had achieved better ratings and the sixth was brought to court by the local community. Five plants originally rated Red were reduced to Black status because of their refusal to work toward improved performance.

Inspired by PROPER, other countries have begun planning or implementing similar programs with World Bank assistance. In the Philippines, the ECOWATCH program is nearing first disclosure after six months of preparation (see page 30.) Colombia is also planning to begin a PROPER-type program this year.





bringing community and market pressure to bear on polluters. In the context of informal regulation, public disclosure can significantly empower local communities. PROPER also provides a novel application of 'incentive regulation' principles. Traditional regulation has been plagued by the fact that regulators need good data about firms' performance, but firms have clear incentives to withhold such information. The PROPER approach augments the regulators' information on firms by encouraging good performers to identify themselves.

Making Regulation More Flexible

The traditional approach to environmental regulation through permits, monitoring and enforcement has often been slow, contentious and costly. As a result, industrialized and developing countries alike are trying two new approaches to more effective pollution regulation.

The first is to more proactively prevent pollution, rather than focusing on treatment and clean-up. There will always be a need for regulation, quality standards and clearly defined limits on certain discharges, but this proactive approach shifts the emphasis to improvements in process and management to reduce the volumes of pollution generated.

The second approach is to establish a careful balance between central standards and locally negotiated environmental requirements. Uniform national standards have the advantage of being clear and equitable, requiring the same results from everyone (though usually not at the same cost). On the other hand, local regulatory bodies can set more efficient plant-specific requirements based on real costs and specific local environmental conditions. There is a growing acceptance of the need to build serious dialogue among all the stakeholders in areas where action is urgently needed—in some cases, this involves bringing in professional mediators.

These approaches are very new but are already leading to tangible results and the prospect of new opportunities. For example, a local government agency can request industries in a watershed to appoint a representative and agree among themselves how they will most efficiently meet ambient water quality standards; the government then holds the representative accountable. The benefits accrue to the industries in that they can negotiate among each other to reduce pollution in the most cost-effective manner, and to the government in that it requires less administrative effort to achieve a positive outcome.

These kinds of flexible approaches are reflected in the World Bank Group's *Pollution Prevention and Abatement Handbook*, to be sent out for public comment shortly. In summing up the lessons learned over several decades of dealing with pollution problems, the *Handbook*

ENERGY PRICING: LESSONS FROM A RUSSIA STUDY

A recent OECD/ Bank study on environmental implications of energy subsidies in Russia shows that air emissions are reduced more by increasing energy prices to unsubsidized levels than by increasing the level of pollution fees in the current system or by introducing a CO_2 tax. A complete phase-out of energy subsidies would decrease energy use and greenhouse gas emissions during 1990-2010 by about 14% compared to preserving subsidies at the high pre-reform (1990) level, and by 10% compared to maintaining "reduced" subsidies (at the 1994 level) and increasing pollution fees. The impact of high pollution charges is rather marginal by comparison (2% emission reduction). This impact is more profound for particulate and sulfur dioxide control, but still smaller than that of subsidies elimination.

The study concludes that market-oriented economic reforms, by creating incentives for energy savings and accelerated technological innovation, are a fundamental condition for a long-term decline in air emissions. Removing energy subsidies is the most effective instrument for reducing carbon emissions and has a significant impact on emissions of other air pollutants. Market-based instruments (MBIs), such as emission fees or a carbon tax, can promote further emission reductions. However, the effect of these instruments may be diminished if appropriate macroeconomic and energy pricing policies don't exist.

reflects the move to a paradigm of sustainability in the phrase: *environmental management, not just pollution control.*

Applying Self-Regulatory Mechanisms

While these approaches can be effective, they can't stand alone. Frustration has grown as improved incentives and information have not improved performance as much as anticipated. As a result, there is a surge of interest in Environmental Management Systems (EMS—*see Box*). A good deal of interest has been focused on the development by the International Organization for Standardization (ISO) of standards for environmental management–the ISO14000 series. This series sets out the elements of a system which can be audited and certified, and provides a common basis for development and comparison of EMS. Any company can, and usually should, start with a simple EMS which reflects its character and sophistication. As the enterprise gains experience and upgrades its operations, it can then seek ISO14000 certification (or equivalent) to demonstrate that it has a high-quality EMS in place. In many cases, this issue of certification is critical or controversial and at the heart of the discussions of possible trade implications.

As awareness of the scope of ISO14000 spreads, industrializing countries are increasingly interested in the potential for environmental requirements to be used as implicit or explicit trade barriers. ISO14000 certification may eventually become a practical requirement for success in trading in a small number of sectors and markets, and may also be a useful marketing tool for companies to demonstrate their commitment to environmentally sound behavior.

On the other hand, there is now widespread discussion about whether the monitoring and reporting systems that a well-managed enterprise puts into place can substitute for some of the statutory inspections, audits and reports that may be required under government regulations. EMS certification is a very attractive approach, but there are a number of hurdles to clear before it can be used widely.

The Bank is supporting a pathfinding exercise in Mexico to develop and transfer ISO14000 approaches from large companies to their suppliers as part of a joint effort with government regulators. This joint effort will also examine how the new systems can dovetail with streamlining licensing systems. There are clear benefits all around in making such a partnership work. The findings hopefully will be transferable to other countries who have expressed interest.

Choosing Effective Market-Based Instruments

Financial incentives can be key to persuasion, and pollution charges (charges on emissions of pollutants or on products whose use or disposal causes pollution) are becoming an increasingly popular instrument for environmental policy. They are now widely applied in OECD countries and are a key pollution abatement instrument in most transition economies. They have also recently been introduced in developing countries, particularly in Latin America and East Asia.

Theoretically, the advantage of economic instruments over uniform command-and-control regulations is in greater flexibility and cost-effectiveness. But poorly designed pollution charge programs may not yield measurable economic and environmental benefits. The full potential of market-based instruments can be achieved only in the overall context of sound macroeconomic policies. "Environmentally perverse" subsidies and price distortions can often negate the improvements made possible by applying pollution charges.

"Walk Softly But Carry a Big Stick"

Relying on "punitive" approaches alone—big fines and occasional jail terms—has frequently been shown to be ineffective, especially where the legal system is weak or where there is a lack of resources and will to enforce consistently. Persuasive approaches can help make real progress in such situations. At the same time, however, environmental regulators must have a battery of tools at their disposal to address the wide range of pollution problems and local circumstances. The skill lies in selecting those tools that can be most effective under the given circumstances. Persuasion can achieve much, and building a social consensus around achieving key environmental objectives provides a good foundation for making even more progress. But there will always be some polluters who resist persuasion and incentives, and for these there must be a credible threat of real punishment. The old saying holds: "walk softly but carry a big stick."

WHAT IS AN ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)?

An environmental management system is a program of continuous environmental improvement: it follows a defined sequence of steps drawn from established project management practice and routinely applied in business management. In simple terms, these steps are:

- review the environmental consequences of the operations;
- define a set of policies and objectives for environmental performance;
- establish an action plan to achieve the objectives;
- monitor performance against these objectives;
- report the results appropriately; and
- review the system and outcomes, and strive for continuous improvement.

Not every system will present these steps in exactly the same way, but the basic principles are clear.

ISO14000 is an international standard outlining one such system as a common basis (the European EMAS is a similar standard and steps are underway to harmonize the two). Both ISO14000 and EMAS also identify those steps which can be audited and independently verified, providing a basis for certification.

This article was written by David Hanrahan with the staff of the Bank's Technology & Pollution Policy Unit and contributions from the Policy Research Department's Environment, Infrastructure and Agriculture Division.

Solving the Water Crisis Together:
The Global Water Partnership

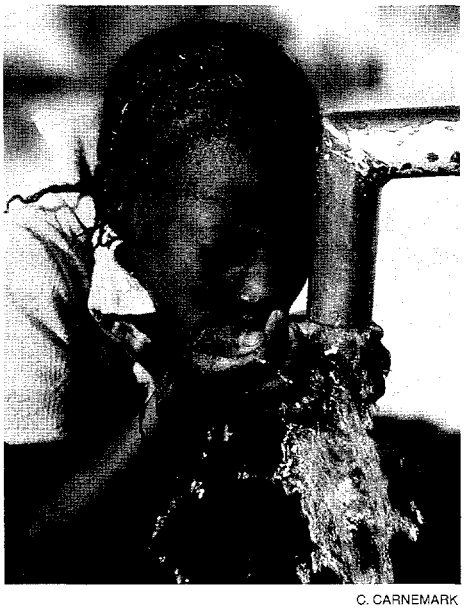
Around the world, over a billion people lack access to adequate supplies of water and close to two billion people suffer from the consequences of poor sanitation. Millions of people, especially children, die each year from contaminated water. In many areas, the lack of water, not land, will be the main constraint to agricultural production. The urban and industrial demand for water also competes with agricultural production needs, and adversely affects the rural poor and ecosystems as a consequence of increased water abstractions and discharges of wastewaters. ***Environment Matters*** *recently spoke with John Briscoe, the World Bank's Senior Water Advisor,[1] and Johann Holmberg, the Executive Secretary of the Global Water Partnership, about this new global group's efforts to create solutions to these problems. This article summarizes that dialogue.*

"The success of this venture ultimately depends on the participation of key actors at all levels. We must not fail: the well-being of humanity, indeed the planet, demands our cooperation."

Ismail Serageldin
World Bank
Vice President
Environmentally
Sustainable
Development

Global Water Partnership

Recognizing that water is critical to sustainable development, many aid organizations have tried to solve water problems by creating water-focused programs. But, with little coordination, these programs have frequently overlapped, competed or left serious issues unaddressed.



C. CARNEMARK

Last August, to solve this problem, a group of agencies founded the Global Water Partnership (GWP), the first-ever attempt to coordinate water solutions on a global scale. Membership in the group now includes national governments, multilateral banks, UN agencies, professional associations, the private sector and non-governmental organizations. Still in its formative stages, the GWP is moving to establish a conceptual framework for considering the various water sub-sectors' needs, then to prioritize them and suggest approaches for dealing with them.

How It Began

In December 1995, in an effort to rationalize the scattered array of water programs, 75 representatives from 56 agencies and governments around the world gathered in Stockholm at a first-of-its-kind Water Meeting. The Meeting, hosted by the Swedish International Development Agency (Sida), was organized by the World Bank and United Nations Development Programme, who have worked together extensively on water-related projects. Both organizations felt that progress had been unacceptably slow in translating principles articulated at the 1991 Dublin International Conference on Water & the Environment and reiterated in Rio, Habitat II, and elsewhere, including in the Bank's 1993 *Water Resources Management Policy Paper*. At an early stage the UN's Food & Agriculture Organization (FAO) expressed an interest in the idea of a partnership and made a financial contribution toward initiating it.

The meeting was chaired by Johann Holmberg, director of Sida's Department for Natural Resources and the Environment. "The participants were acutely aware of the international climate of declining aid resources and had little enthusiasm for new institutions," Mr. Holmberg said. "They stressed that membership in the GWP should be widely inclusive but must be matched by commitment, and that commitment includes contributing to the GWP's support. Even developing nations, however limited their resources, should expect to provide a level of support appropriate to their ability to pay."

An Economic Resource or a Human Right?

The matter of soliciting contributions underlines the kind of issues which have kept water from receiving the coordinated effort the GWP hopes to provide. For example, the question arises as to whether water is an economic resource which should be priced accordingly, or whether it is a basic human right.

To start answering such questions, the GWP has established a Steering Committee which acts on behalf of its full membership, and has appointed a 12-member Technical & Advisory Committee (TAC), to which all GWP members must contribute.

The TAC has already begun a global overview of the major water sub-sectors like health, agriculture, environment and industry. The participants also came to a clear consensus that the TAC needs to be rigorously non-political to guarantee the GWP's integrity. All the GWP members constitute the group's Consultative Group (CG), the GWP's highest policy-making body which will meet periodically, possibly once a year.

In each water sub-sector, the TAC has begun studying aid organizations' present efforts and is trying to identify ways in which these programs can be extended to cover areas presently overlooked.

S. VOLLERTHUN

Focusing on Regions

The water sub-sectors will be broken down along regional lines. "At the outset," Mr. Briscoe explained, "the GWP is directing its efforts to Africa and Asia, where need and donor interest is greatest, and where many aid organizations have close relationships with authorities." The GWP aims to set up a number of regional partnerships, while being careful not to overwhelm the regional organizations with whom they work, hoping, for instance, to eventually create a Southern Africa Technical Advisory Committee. This replication of the TAC on a sub-regional level will be able to advise governments and institutions on water issues, and coordinate the flow of consultants from Europe and America. The first regional meeting was held last November jointly with the Southern Africa Development Community (SADC) in Windhoek. The next TAC regional meeting will be hosted by the Asian Development Bank in Manila in June.

For now, the GWP will focus chiefly on those water issues that most immediately affect the people in developing nations. The GWP organizers have welcomed environmentalists with wider portfolios, such as water pollution in industrialized nations or the well-being of wildlife, and eventually hope to be in a position to address those issues as part of the group's mandate as well.

One of the Dublin principles acknowledges women's central role in providing, managing and safeguarding water. "The GWP has not as yet developed any approaches to explore ways in which women can be involved in solving water issues," Mr. Holmberg said, "but it will do so as it moves closer to supporting individual projects."

The Private Sector's Role

As the private sector becomes increasingly involved in water issues in industrialized nations, the GWP expects to draw on its expertise to find solutions to developing countries' problems. In the United Kingdom and especially in France, the private sector has developed methodologies that the GWP feels could be mobilized in less developed countries, such as the African Utilities Partnership, managed by the Union of African Water Distributors in Abidjan. The Utilities Partnership aims to improve water utilities' performance, ensure that the needs of the poor are addressed, and have water utilities pay increasing attention to sanitation issues.

Interestingly, at about the same time as the Stockholm Water Meeting, a separate group met in Montreal to organize the World Water Council (WWC). Initial concern that the GWP and the WWC might be too similar has been quickly allayed. The WWC has formed itself to be a deliberative group of eminent people looking at long-range, large-scale issues. By contrast, the GWP will be action-oriented, focusing on problems at hand.

"The WWC appears to be exactly the kind of big-picture forum on water issues from which the GWP can greatly benefit," stated Mr. Holmberg. "If they did not exist, we would have had to invent them."

[1] See page 28 on the Bank's Global Water Unit

This section focuses on building strategic alliances to generate new *knowledge and* avoid duplicating efforts in the Bank's environmental work.

This article was written for Environment Matters by freelance writer Steven Landrigan. John Briscoe is the World Bank's Senior Water Advisor and the Bank's representative to the Global Water Partnership. Questions about the Bank's partnership with the GWP or other water-related issues can be directed to (202) 473-5557.

Innovative Financial Instruments for Global Environmental Management

The task of effectively financing the management of the global environment is daunting. In developing countries, this task is particularly difficult because of the constraints that must be overcome to raise the hundreds of billions of dollars needed. Such constraints include the lack of long-term funding for recurrent costs of conservation, under-valued natural resource assets, little incentive for communities to initiate conservation programs, few alternatives for small- and medium-scale enterprises with environmental projects, the perceived high risks of investing in emerging environmental industries, and poorly developed markets for environmental technologies.

The Bank Group is using innovative financial instruments to address these constraints—instruments that have not previously been applied to the environment sector. The table provides a matrix of different instruments, the constraints they address, and the projects in which they are used. They include:

Securing Long-term Recurrent Cost Funding. Biodiversity conservation programs need guaranteed long-term funding of essential recurrent costs. But biodiversity conservation activities rarely generate net revenue; if they do, governments frequently allocate revenues to general budgetary support. The Bank Group is addressing this constraint by helping developing countries establish biodiversity *Trust Funds*. For example, the Bhutan Environmental Conservation project establishes a conservation trust for protected areas. With professional asset management, the initial trust capital is maintained in perpetuity, and recurrent conservation costs are funded from investment income. Some trust funds, like the Brazil Biodiversity Fund (with a sinking rather than a permanent fund), are designed to directly support community organizations and NGOs in implementing conservation activities.

Incentives for Community Participation. Integrated conservation and development programs depend on local participation to be effective. To stimulate community participation, the Madagascar Environmental Support project includes *Alternative Livelihood Grants (ALGs)*, which offset potential economic losses incurred by reducing income-generating activities that threaten valuable biodiversity resources. *NGO and Small Grant Funds* also engage communities by overcoming constraints imposed by highly centralized administration of environmentally sustainable development activities. The Philippines Conservation of Protected Areas Project demonstrates that, by channeling funds directly to NGOs or communities, local participation in conservation is guaranteed and implementation improved.

Adequately Valuing Natural Resource Assets. Undervalued natural areas typically generate resource rents which accrue in part to private interests through extractive uses and, less frequently, non-extractive activities. Through the Czech Republic Biodiversity project, the Czech government is trying to capture part of these rents by applying such *Economic Instruments* as: economy-wide policies that liberalize markets and reduce subsidies for environmentally damaging substances such as agrochemicals and fossil fuels; appropriate resource prices which at least recover the full market cost–if not social cost–of using natural resources; user fees linked to natural resource extraction; and taxes which "penalize" the use of environmentally harmful products. The revenues generated contribute to financing conservation activities that benefit the global environment.

Financing Small- and Medium-Scale Enterprise (SME) Environmental Projects. Because lenders and investors typically perceive SMEs as high risks, these enterprises have few affordable financing alternatives. This is especially true in developing countries and in a relatively new sector like the environment. The Bank Group's International Finance Corporation (IFC) is overcoming this constraint by *Channeling Concessional Funds through Financial Intermediaries* to SMEs, introducing a variety of environmental ventures (renewable energy, energy efficiency, sustainable forestry and agriculture, and ecotourism). The financial intermediaries (venture funds, NGOs) are attracted to the IFC programs because of their low-interest loans, credit enhancement (guarantees), co-financing, and technical assistance.

Addressing Emerging Sector and Market Risks. Most professional and institutional investors are unfamiliar with environmental businesses in biodiversity or renewable energy and energy efficiency. Yet, many promising investments in these sectors are in developing countries that often do not have well-established businesses and capital markets infrastructure. The IFC is helping to address both the market and sector constraints by helping to create *Sector Invest-*

ment Funds for emerging markets. One example is a proposed fund to invest in biodiversity-linked projects in Latin America in the sustainable agriculture, forestry, and tourism sectors. Another example is a proposed renewable energy and energy efficiency (RE & EE) fund. The role of these sector investment funds is catalytic, encouraging follow-on investment by defining the investment opportunities, educating investors, and helping to channel new capital flows to the area.

Developing Markets for Environmental Technologies. In many developing countries, specific markets for environmentally sustainable products or technologies either do not exist, or face market barriers. *Market Transformation Initiatives (MTIs)*, which provide targeted financial incentives and consumer education in various segments of a given environmental industry, may mitigate the risks associated with investing in individual businesses and help reduce market barriers to accelerate the introduction of environmentally friendly technologies. The IFC is taking this approach using concessional funds in a number of environmentally sustainable industries: energy-efficient lighting, photovoltaic energy, and sustainable forestry. At the conclusion of these MTIs, the targeted industry segments and consumer demand should be developed enough to allow future market growth to occur on a sustainable basis without incentives. (*see PVMTI, page 28.*)

Looking Ahead

The Bank Group is committed to promoting a variety of innovative financial instruments in projects that yield global environmental benefits. Many initiatives have been introduced somewhat sporadically in the past few years, in part because of GEF pilot phase financial and technical support, which promoted greater (perceived) risk-taking than what the Bank Group might otherwise accept. To continue such initiatives, the challenge now is to closely monitor the implementation of the initial round of innovations and learn from successes and failures. This will enable the Bank Group to consolidate best practice in innovative financing for global environmental management, understand gaps that need to be filled, and develop a more strategic action plan for the future.

This article was prepared by Musa Asad, Financial Specialist in the Environment Department's Global Environment Unit, in consultation with the International Finance Corporation's Special Projects Unit. For more information, please call Musa Asad, (202) 473-4386.

CONSTRAINTS	Insecure Financing of Recurrent Costs	Disincentives to Community Participation: economic losses	Disincentives to Community Participation: centralized administration	Under-valuation of Natural Resource Assets	Scarce Finance for SME Environment Businesses	Emerging Sector and Market Risks	Inefficient or Non-existent Environment Markets
INNOVATIVE FINANCIAL INSTRUMENTS	Trust Funds	ALGs	NGO and Small Grant Funds	Economic Instruments	Financial Intermediary Programs	Investment Funds	Market Transforming Initiatives
SELECTED PROJECTS							
Bhutan Environmental Conservation	XX						
Biodiversity Fund for Latin America (IFC)						XX	
Brazil Biodiversity Fund							
China Gas Transmission and Distribution				XX			
Congo Wildlands Protection & Mgmt.		XX					
Czech Republic Biodiversity			XX	XX			
Ecuador Biodiversity	XX			XX			
Forestry MTI							XX
Hungary EE Co-financing Program (IFC)					XX		
India Alternate Energy					XX		
Madagascar Environmental Support		XX	XX				
Mexico Fund for Protected Areas	XX						
Mexico High Efficiency Lighting							XX
Philippines Conservation Protected Areas			XX				
Photovoltaic MTI (IFC)							XX
Poland Efficient Lighting Project (IFC)							XX
RE & EE Fund (IFC)						XX	
Slovak Republic Biodiversity	XX		XX				
SME Program (IFC)					XX		
Uganda BINP & MGNP	XX						

These projects are partially or fully funded by the Global Environment Facility. The implementing agency is the World Bank unless otherwise noted.

Getting the Public Involved:
A Key to Environmental Solutions

Broad public participation in policy development, combined with greater accountability, is essential to achieving sustainable development...individuals, groups and organizations need to know about and participate in environment and development decisions, particularly those which can affect their communities. **Agenda 21**

In countries all around the world, people have taken this statement to heart. Whether it's Mexico's new environment law, or recent declarations from Sofia or Santa Cruz, public participation is now recognized as essential to effective environmental policy-making.

How Public Involvement Can Work: Mexico's Radical Law Reform

Last November, the Mexican Congress passed a series of radical reforms in the General Law of Ecological Equilibrium and Environmental Protection which will have far-reaching implications for citizen involvement in all aspects of environmental decision-making and management.

Based on a year-long consultative process, which included intensive discussions with all levels of Mexican government and society, the new law reforms go far beyond previous initiatives and reflect a growing trend toward greater citizen participation throughout Latin America.

Following Rio's *Agenda 21* document, the new law reforms call for widespread social participation in environmental decision-making and activities by all actors, including state and municipal authorities, the scientific and academic communities, non-governmental organizations (NGOs), the private sector, workers, farmers, and indigenous communities.

The reforms' key elements are designed to create greater governmental accountability and transparency in the environmental area; transfer decision-making and management authority for many environmental activities to state and local governments; co-responsibility for environmental protection and management among government, the private sector and civil society; increased access for citizens to environmental information; and expansion of the fora for citizens to participate in environmental decision-making and management, especially in the Environmental Impact Assessment (EIA) process. This last point is particularly significant since, in the context of the North American Free Trade Agreement, the EIA process has become a subject of contention in Mexico.

Growing Public Involvement

Since the 1987 Brundtland Commission Report and the 1992 Earth Summit, the widespread promotion of public involvement in environmental decision-making has been looked on as an essential instrument in the quest for sustainable development. At last October's meeting of European Environment Ministers in Sofia, Bulgaria, for instance, major attention focused on the role improved environmental information-gathering, reporting and dissemination, and greater involvement of citizens in the public policy and environmental decision-making processes could play in implementing the Environment Programme for Europe. In the meeting's final declaration, the ministers approved a set of guidelines drafted by United Nations Economic Commission for Europe on Public Participation in Environmental Decision-making. The guidelines dealt with three themes: public access to environmental information, citizen participation in environmental decision-making (especially in EIAs), and administrative and judicial proceedings and remedies for citizens in the environment arena.

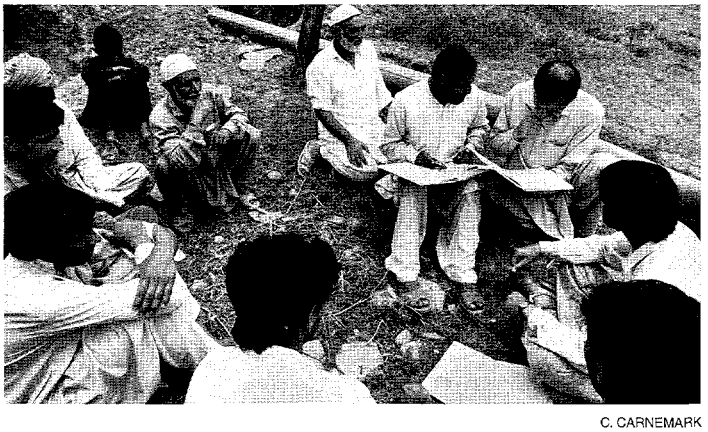
A strong emphasis on citizen involvement in environmental decision-making is also reflected in the work leading up to the Summit of the Americas on Sustainable Development held in Santa Cruz, Bolivia last December. To prepare for the Summit, a special Inter-American Seminar on Public Participation in Sustainable Development was held in Montevideo, Uruguay bringing together 120 governmental and non-governmental representatives from 27 countries. The Seminar produced an Inter-American Strategy for the Promotion of Citizen Participation, highlighting the need for measures to ensure the rights of citizens to participate in defining and implementing sustainable development policies, support for citizens' efforts to organize themselves and to participate effectively and responsibly in environmental decision-making, and strengthening government institutions to receive, manage and use citizen input.

Societal Instruments for Environmental Reform

Recently, environmental specialists have come to recognize that conventional command-and-control and market mechanisms alone cannot create the widespread behavioral and institutional changes necessary for sustainable development. Environmental policy analysts have come to focus greater attention on various types of societal instruments, such as public information and involvement strategies which, combined with the

more conventional instruments, can bring about environmental reform and modernization.

Taken together, these elements form a battery of social instruments which can contribute to overall environmental policy reform. They are proving particularly effective in the increasing number of countries that have chosen a democratic path to development or are undergoing democratic transition processes and wish to use public information and participation strategies as an instrument in the quest for sustainable development. Several governments, especially in Eastern and Central Europe and Latin America, have recently incorporated these societal instruments into their environmental policies and programs, especially as part of broader programs of legal and political reforms. Mexico's radical new law reform stands as a prime example.



C. CARNEMARK

World Bank Support

Social and environmental specialists in the World Bank are following these new experiments quite closely. Part of the reason for this is that the Bank's own policies, such as those dealing with Environmental Assessments (EAs) and National Environmental Action Plans (NEAPs) and those on Involuntary Resettlement and Indigenous Peoples, require consultation with affected communities and local NGOs. At the same time, the Bank recognizes that citizen involvement at all levels is fundamental to all forms of effective environmental protection, including those relating to urban pollution control and waste management.

The Bank and its client countries have learned that public involvement strategies need to be adapted to the specific political cultures and traditions of each region, country or locality. They also need to take into account each country's legal frameworks for participation (or lack thereof) and the evolution of civil society organizations that provide the wider public or political space in which public involvement activities take place.

The Bank is also recognizing that public involvement may take different forms depending on the types of environmental policy or program arena in which it occurs. For example, various forms of 'public hearings' are commonly used to elicit citizen views on development interventions as part of the EA process in a growing number of countries. For other types of exercises, such as the preparation of NEAPs or the environmental analysis of sectoral policies as in transport or energy, it may be more appropriate to establish 'citizen advisory panels' in order to elicit a range of views.

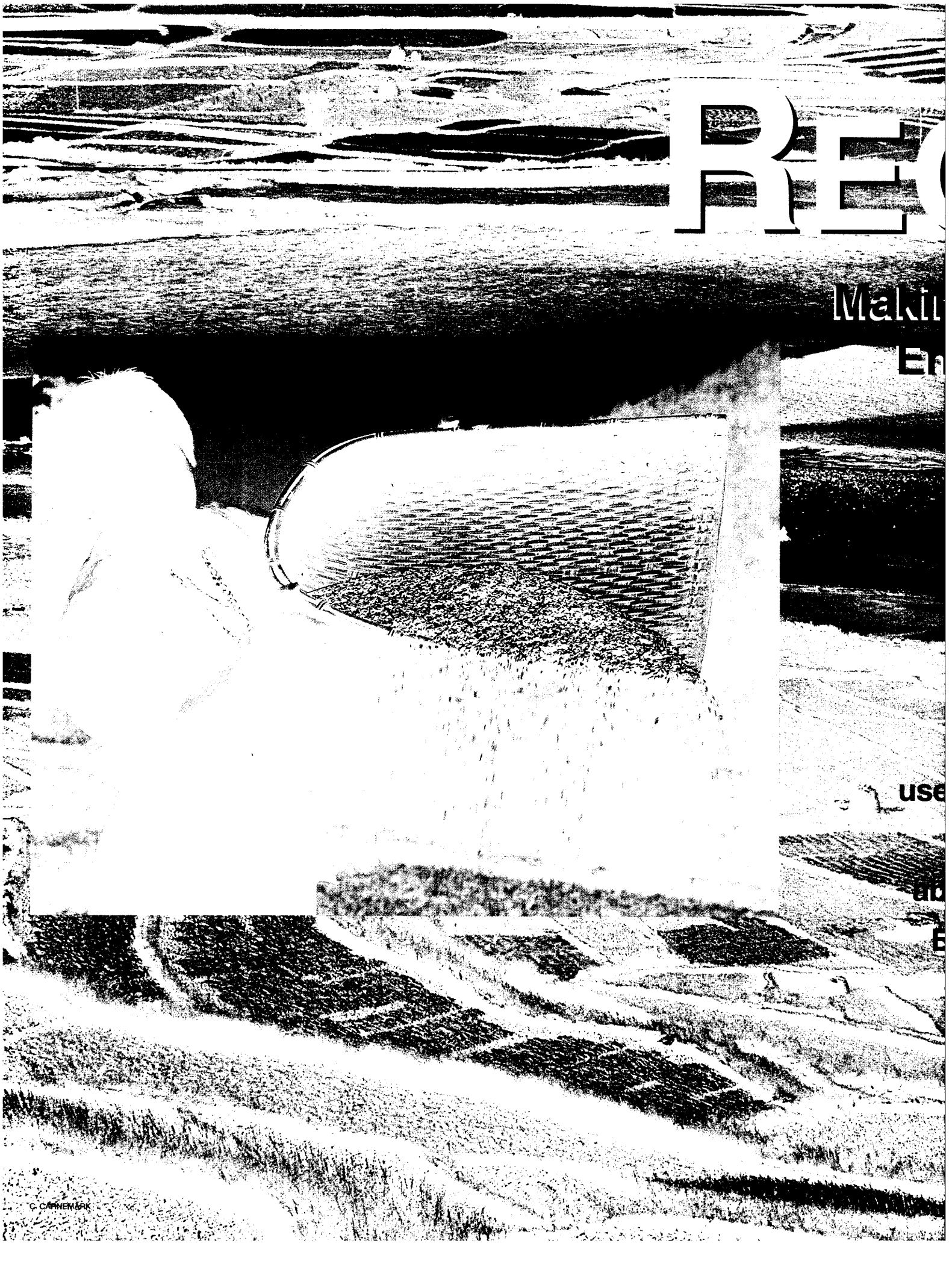
A Broad Range of Social Actors

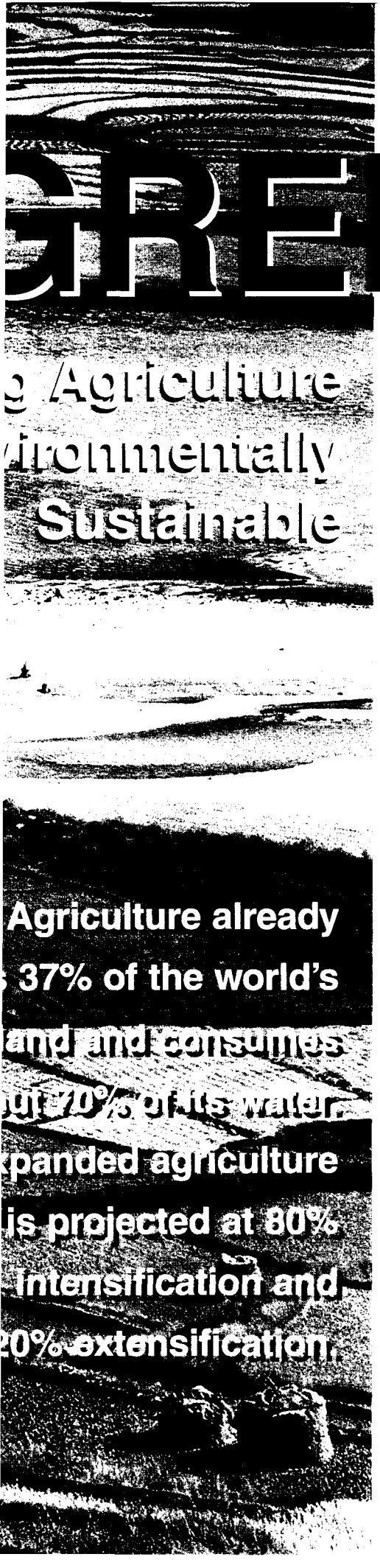
There are a large number of social actors besides national governments, international donor agencies and technical experts who are concerned about the social and environmental implications of development policies. These social actors include regional and local authorities, vulnerable groups or communities (displaced populations, refugees, indigenous peoples), international and domestic NGOs, parliamentarians, the media, the private sector, religious groups, women, youth, farmers and trade unions. Much of the recent work being done by social scientists at the Bank and elsewhere in 'stakeholder analysis' and 'social assessment' attempts to bring this growing number and diversity of social actors into the environmental and development decision-making process.

In the end, public involvement is part of a broader social learning process whereby individuals and institutions can create the conditions for sustainable development. By investing in this social learning process, we stand the best chance of achieving some of the broader goals first espoused in the Brundtland Commissions' Report and at Rio. Mexico's reform shows firsthand the practical results of such a process.

This section focuses on efforts to increase participatory approaches, enhance public involvement, and integrate the social and environmental dimensions of development into decision-making.

This article was written by Sandy Davis, Principal Sociologist in the Bank's Social Policy and Resettlement Division. Copies of the full paper from which this was drawn can be obtained from Mr. Davis at (202) 473-3413, fax (202) 522-3247, sdavis2@worldbank.org.


RE
Makin
En
use
ab
E
© CARNEMARK



GREENING:

To be sure that there's enough food to feed the world into the next century, experts say, we must almost double the amount of food we produce today. To do this, we must get more yield out of the same land area (intensification) and grow crops in new areas (extensification). Most of this expansion is projected to be in Sub-Saharan Africa, Latin America and the Caribbean, much of it overlapping with forests, wetlands or other critical ecosystems. This two-fold expansion of agriculture, more than any other single human activity, threatens to degrade the soil, destroy natural habitats, and cause serious pollution. Unless farmers can grow crops in an environmentally sustainable way, terrestrial ecosystems and indeed agricultural production systems themselves are in serious jeopardy.[1]

We must look for ways to 'regreen' agriculture. This is no small challenge. Indeed, it calls for us to literally transform agriculture as we know it.

Since Rio, the Bank has worked with its client countries to regreen agriculture. Its loans to client countries, for 216 agriculture projects worldwide at more than $16.8 million, include actions to improve small farmers' conditions, promote investment in technology, and enhance resource use efficiency. But given the immensity of the challenge, much more needs to be done. The Bank and its client countries are pursuing sustainable resource use and land management to create sustainable agriculture in a number of promising new ways, including:

Reversing Soil Decline

The quality of soil is key to land's capacity to support intensified growth of crops. Soil can be degraded by erosion, a shortened fallow period, overgrazing and deforestation.

In much of the developing world, especially Sub-Saharan Africa, degraded soil severely limits food security for poor farmers. Unfortunately, many farmers don't have enough income or land security to farm sustainably; forced to repeatedly exploit their land, their production level is marginal at best. But when they have the opportunity, developing countries' farmers demonstrate that they can increase their net returns through environmentally friendly farming, such as crop rotations, integrated pest management and appropriate use of livestock. These changes reduce their costs for fuel and farm chemicals, equipment wear and tear, and off-farm environmental degradation, and they can actually produce above-average yields with improved net income.

Kenyan and Chinese farmers have brought abandoned or degraded soil back to life through soil conservation measures. In 1979, innovative farmers in Parana, Brazil formed the Clube de Minhoca (Earthworm Club) to rehabilitate poor soil, one of the first soil clubs to promote integrated soil management in Brazil. Later, the Bank started support for land management projects in four Brazilian states, in which local farmers, extension workers, agribusiness and local authorities all became involved, helping farmers adopt reduced tillage techniques, intercrop legumes and food crops, use vegetative contours, and work with reforestation.

Recently the Bank joined with other groups to launch an international consortium called the Soil Fertility Initiative, to disseminate appropriate technologies for organic and inorganic fertilizers, erosion control and water management, and economic valuation of soil fertility benefits.

Turning Wastes into Assets

The 1990 Bank/UNDP Waste Management and Resource Recovery Program

identified a number of technologies as the most promising for developing countries, including:

Recycling Municipal Solid Waste and Composting: Processors of raw materials are finding new ways to reuse discarded products made from metals, glass, plastics and paper. But large quantities of organic materials also pollute rivers and lakes or end up in landfills. Rather than allowing this pollution, or paying for discarding these wastes, they can be composted. Compost improves soil moisture retention and increases biological activity, resulting in more efficient absorption of nitrogen and phosphorus by crop plants.

Re-using Wastewater: The same principle applies to used wastewater. Rather than paying for secondary or tertiary treatment, the water can be used for irrigation or aquaculture. When the cost of these alternative approaches is calculated into the decision-making process and the total costs to the community considered (for health, pollution, landfill and/or incinerator costs, and the like), it becomes apparent that such approaches make a lot of sense.

With this in mind, the Bank sponsored a seminar on *Recycling Waste for Agriculture: The Rural-Urban Connection* as part of last September's annual Conference on Environmentally Sustainable Development. Many of the 150 agriculture, health, and urban specialists from around the world who attended described successful waste recycling programs, including both large-scale and individual farm-scale examples: composting in Egypt and Senegal; use of municipal solid waste in North America and China; reclamation of wastewater for agriculture, industry and groundwater recharge in India, the Middle East and Chile; and use of treated effluents on fish farms in Peru.

Using Indicators of Land Quality

Over the next decades, getting the right balance of intensification and extensification will be a critical but difficult challenge, requiring careful and strategic planning for agricultural expansion. To accurately assess, monitor and evaluate changes in the quality of land resources, planners must have access to good land quality indicators, such as nutrient balance and the ratio of cultivated land to cultivable land. Unfortunately, few such indicators exist today.

To help address this problem, the Bank, United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), Food & Agriculture Organization (FAO) and the Consultative Group for International Agricultural Research (CGIAR) have joined together to launch a Land Quality Indicators (LQIs) program. The program provides a framework for national and sub-national land management information

ED COURRIER, Rodale Institute

systems, preventive maintenance, and integrated socio-economic and biophysical information on sustainable land management strategies.

The LQI program is developing a set of indicators for the condition of land, including the combined resources of soil, water, vegetation and terrain. It provides information on the state of and pressures on these resources, and what people are doing about them.

The Bank and FAO are also developing LQIs for four countries to be selected from Ghana, Côte d'Ivoire, Kenya, Malawi, Mali, Kenya and Uganda, and conducting a case study as part of the Tunisia Natural Resources Management project to develop a decentralized information system on the environment.

Integrating Biodiversity Conservation into Agriculture

Expanding and intensifying agriculture contributes significantly to habitat loss, impairment of ecological integrity, and world-wide threats to biodiversity. But agricultural landscapes often provide the biodiversity on which production depends, in the form, for instance, of genetic information for new crop varieties, crop pollination, soil fertility enhanced by micro-organisms, and pest control by insects and other wildlife. Conserving biodiversity offers an important way to enhance agricultural production and achieve sustainable development at the same time.

In light of this, the Bank has begun work with its client countries to incorporate biodiversity conservation into national and local environmental planning. Last year, the Bank's *Mainstreaming Biodiversity Conservation in Agricultural Development* paper[2] created a framework for examining agricultural activities and policies' effect on biodiversity.

Bank-supported country studies applying the framework and developing good practice in the agriculture and forest sectors include Nepal's Land Resources Management Study, the Congo Basin's Sustainable Forestry Management and Biodiversity Conservation Sector Strategy Study, Vietnam's Sustainable Agriculture Study and Ethiopia's Sources of Agricultural Growth Study.

---

[1] For more detailed discussion of food security, production and access, see *Food Security for the World*, November, 1996. For the Bank's plan of action for rural development, see *Rural Development: Putting the Pieces in Place*, November 1996. Both documents by the Bank's Agriculture & Natural Resources Department, fax (202) 522-3307.

[2] *Mainstreaming Biodiversity in Agricultural Development: Toward Good Practice.* World Bank Environment Department Paper No. 42. October 1996.

This article was written by a team from the Bank's environment and agriculture sectors led by Colin Rees, Division Chief, Land, Water and Natural Habitats. (202) 458-2715. Ed Courrier's original sketch was provided by Rodale Institute.

Rebuilding Natural Capital

ANIL AGARWAL
Director, Centre for Science and Environment, New Delhi, India

If there is anything that India's environmental movement has been able to show in the last two decades, it is that good village-level environmental management—what I would call 'village ecosystem management'—can greatly improve the local economy of the poor. Millions of poor villagers in degraded lands face uncertain food production, increased vulnerability to natural climate variations, male outmigration, heavy female work burden and continuing poverty. This chain of events can be broken by rebuilding local natural capital.

In the village of Sukhomajri, nestled in the denuded sub-Himalayan hills, rains can wash away as much as 900 tonnes per hectare of topsoil per year. In 1979, a massive drought swept across India: rains failed and agricultural production dropped. Sukhomajri was badly hit. The villagers would normally take only one monsoon crop a year, but this year they were not even going to get that. Into this desolate landscape stepped P. R. Mishra, a soil conservationist who, to get the villagers to stop grazing their animals in the degraded watershed, had helped them build a small earthen dam across the village's stream. The villagers, desperate this year for the dammed water, appealed to him to help them make channels to convey the water to their fields. Mishra told them first that if they did not stop grazing their cattle in the watershed, their own dam would silt up very fast and they would not have this water when the next drought hit. The villagers agreed to take care of the watershed. This small water harvesting gave birth to a pioneering village-based natural resource management system which has since inspired many Indian environmentalists and village workers.

Today, the village has several water harvesting structures. It regularly takes three crops a year. From a food-importing village, it has become food-exporting. And with grass increasing and trees regenerating in the watershed, it now has so much fodder that the villagers have given up their goats for high-yielding buffaloes and sell thousands of dollars of milk to neighbouring towns. With a small investment in a few earthen dams and a self-managed natural resource base, the village economy improved dramatically and mud houses have given way to brick houses. Today, a rich forest of valuable native species has come up in the watershed. Once the villagers get government permission to harvest these trees, they can earn at least $300,000 a year on a sustainable basis. And a small-scale industry of wood products could fetch even more. Says economist Gopal Kadekodi at New Delhi's Institute of Economic Growth, "the rate of return from this project cannot be matched even by the corporate sector."

Several such outstanding examples in India show that we can put a floor to poverty by regenerating natural capital. Of course, programmes to help villagers revive their natural capital will have to be supported by national policies with appropriate changes in property rights, institutional development and financial mechanisms.

Combating Poverty was clearly identified in Agenda 21, but little has actually taken place since then. It is sad that the issue which affects the poor so intensely has remained neglected—by the North and the South. The Northern leadership had gone to Rio largely focusing on global issues like climate change, biodiversity conservation and sustainable forest management. The interface of poverty and natural resource management received little attention at Rio in 1992—the Southern leadership too did not push the concern adequately. One can only hope that this interface, which could turn environmental management in the developing world into a real mass movement, will not get neglected again in Rio and New York.

The Aral Sea Disaster:
Turning the Tide?

The Aral Sea was once the world's fourth largest lake. It is called a sea because of its size, but "sea" is in fact a misnomer; the Aral Sea is a lake which once had slightly brackish water. It lies in Central Asia, partly in Uzbekistan, partly in Kazakstan, and is fed by the Amu Darya and Syr Darya rivers. It has no outlet, and for millennia there was an equilibrium between inflow and evaporation. Then, in the 1920s, the former Soviet Union decided to turn Central Asia into a major cotton producing area, using the river waters to vastly expand irrigation in the abundant drylands upstream from the Aral Sea. Massive irrigation schemes were constructed and the region turned into a major producer of cotton, or "White Gold." But at a price....

J. POST

Irrigation and Its Price

In the 1960s, deprived of most of the inflowing water, the Aral Sea started to shrink. The shoreline retreated and the harbors of the fishing villages of Muynak and Aralsk fell dry. Today one can still see a fleet of ships stuck in the sand, the sea's shore having withdrawn to over 60 km away. But the most devastating effect has been the salt concentrated in the ever-shrinking water body. In the mid-1980s, the salt rose to the concentration of seawater, and today the Sea is approaching hypersalinity. The once-abundant fish, birds and other organisms have disappeared, and the Sea is now nearly dead.

About 3.5 million people living near the Sea suffer from shortages of clean water, and people living along its shores have lost their fishing grounds. Water fowl using the West Asian flyway, including several rare and endangered species, have lost a major staging ground and source of food on their migration route. A subspecies of fish unique to the Aral Sea has become extinct.

Living conditions in this "disaster zone" are dismal, although it is difficult to determine which problems can be attributed to the Sea's desiccation and which are caused by the poverty that followed. What is certain is that respiratory diseases, cancer, tuberculosis, hepatitis, intestinal disorders and infant mortality, among other health problems, have risen to disturbing levels.

World Attention

The Soviet Union asked for help from the United Nations Environment Programme (UNEP), which launched a study by an international group of experts to analyze the crisis. The working group's 1992 report, issued by UNEP and the Soviet Union's successor governments, sounded the alarm. The international community decided to see what could be done. Study of the problem was sobering, as it became apparent there was no easy way to remedy decades of cumulative loss. The difference between the amount of water needed to restore the Aral Sea to a healthy ecosystem and the amount of water that could be devoted to the Sea even under the most optimistic water-use scenarios was too large to be a realistic option. Hope for restoring the Aral Sea was abandoned. But there appeared to be many possibilities for smaller remedies, and so the Aral Sea Basin Program (ASBP) was born.

The ASBP is managed and coordinated by the Interstate Council for the Aral Sea (ICAS), representing the participating countries (Kazakstan, Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan). Many donors contribute to the ASBP, and a special World Bank unit assists ICAS.

The ASBP's first phase included 19 projects in eight thematic areas. The following examples illustrate the range of issues tackled by the program.

Water and Salt Management

Work is underway to establish a regional framework for water and salt management. Formerly, Moscow dealt with transboundary water issues; but now the five new independent states must agree among themselves. There are conflicts of interest, for example, between the mountain states which would like to release water to generate hydro-electricity in winter, as they have limited fossil fuels to burn for energy, and the downstream states which need this water for irrigation during the growing season. Cooperation among the states has been surprisingly good so far, but they must codify existing understandings to ensure the full force of international law.

Salt management, another international issue, may be the most pressing challenge to the Basin's agriculture. About a third of the irrigated lands are losing productivity because of salinization, and millions of hectares will be out of production soon if the trend continues. In addition, salt levels in the

J. POST

major rivers are rising, jeopardizing their use for other purposes like drinking water. Salinization has occurred because, after years of applying water to land without sufficient drainage, the water table rose so that the irrigation water now forms an unbroken column with salty ground water through capillary action in the soil. The water evaporates at the surface, "sucking up" more water from the subsoil. As the water travels up, salt from the subsoil dissolves in it and is deposited at the surface where the water evaporates. Methods to deal with this problem are now being investigated.

Wetland Restoration

When it became clear that the Aral Sea could not be fully restored, another strategy was adopted, which posed the question, "If there is not enough water to rescue the whole Sea, is it possible to rescue parts of the Sea, or to rehabilitate some ecosystems on the Sea's perimeter?" By such measures, the detrimental effects of the Sea's destruction would at least partly be mitigated.

This seems to be possible. In the north, near the mouth of the Syr Darya River, a former bay of the Sea can probably be closed off and the river water conveyed through it to flush out its salt into the Aral Sea, re-creating a large fresh or brackish water lake. In the south a plan has been designed to restore a wetland belt between the Sea and the agricultural hinterland in the Amu Darya River delta. This wetland belt would provide many benefits such as preventing the delta from drying out, creating opportunities for fishing, grazing, liquorice production, muskrat trapping (fur) and providing habitat for water birds. These measures would also allow Uzbekistan to designate its first site under the Ramsar Convention for the conservation of habitat of critical importance to migratory birds.

Immediate Impact Project

In 1995, a visit by World Bank President James Wolfensohn to the disaster zone drew attention to the fact that the tens of millions of dollars pledged to rescue the Sea and the millions already spent on studies had not had an observable effect on the plight of the people who live there. An Immediate Impact Project was prepared to alleviate the suffering of people in the disaster zone. About $1 million was spent in the first tranche by mid-1996 to buy water tankers, fishing nets and ambulances for the people of the disaster zone, help provide clean water and fishing opportunities in the deltas, and provide health care for people living near the Sea. A second tranche being implemented now is expected to finance a range of activities including repair of hospitals, schools, kindergartens and orphanages, and help for the neediest families through productive assets (farm animals), winter clothing and subsidies to kindergartens.

J. POST

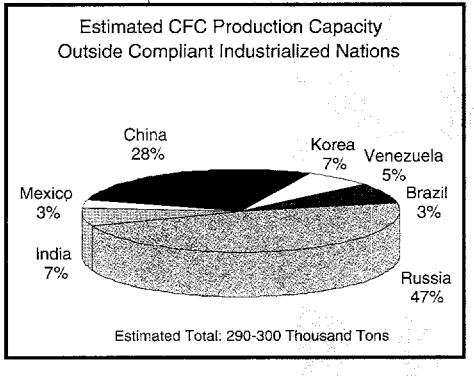
This section focuses on freshwater, coastal and marine resource *management*, integrating an ecological dimension into water resource management from the upper watershed to the coastal zone.

This article was prepared by Peter Whitford, Manager, and Lucy Hancock, Consultant, the Bank's Aral Basin Program office, and Jan Post and Steve Lintner, Senior Environmental Specialists in the Environment Department's Land, Water, and Natural Habitats Division. For further information, please call Peter Whitford (202) 473-2504.

Russian Federation:

Special Initiative to Complete ODS Phase-Out

In December 1991, the Russian Federation committed itself to continuing its membership in the Montreal Protocol on Substances that Deplete the Ozone Layer. But because of challenges it has faced in making the transition to a market economy, Russia has not yet been able to comply with the Protocol's requirement that industrialized countries complete their phase-out of production and use of ozone depleting substances (ODS) by the end of 1995. The Government of Russia has now developed an alternative plan to achieve complete phase-out by 2000—a major step forward for protecting the ozone layer in this tenth-anniversary year of the Montreal Protocol.



Recognizing the global importance of Russia's effort, the World Bank is supporting a special initiative to help the country meet its goal. This initiative, which will "clean up" both the production and the consumption sectors, will achieve what is probably the most cost-effective large-scale ODS phase-out in the world.

In early 1996, with the Bank's help, the seven Russian chlorofluorocarbon (CFC) producers developed comprehensive business plans outlining the CFC production shutdown schedule and replacement activities. A strategy is now in place for completing production closure for the majority of companies by 1998, with final phase-out completed in 2000. *All seven producers have now agreed formally to close down their CFC production.* This will mean closure of over 140,000 tons per year of production capacity, or about 80% of the installed Russian CFC-production capacity. With this commitment in hand, the way is cleared for joint enterprises with western chemical companies and new potential for development of chemical business in the region.

The Production Sector

Russia's economic crisis, while creating difficulties in achieving last year's phase-out deadline, has had the unexpected result of dramatically reducing the production and consumption of ODS throughout the Russian Federation. Today, Russia's national consumption is less than half what is was in 1990. Its actual production has also dropped–to approximately 40,000 MT–but its installed productive capacity remains high and represents *almost half the world's CFC production capacity.*

Dealing with both actual and potential CFC production in Russia is crucial. Without Russia's compliance, China and other producers are likely to question the true global commitment to the phase-out and continue producing. This could have disastrous results for the future.

In the fall of 1996, illegal CFCs were estimated to be worth $300 million a year.[1] In the United States, smuggled CFCs may be supplying as much as 30% of the market. The black market trade in North America and Europe means higher enforcement costs and lower revenues for governments and undermines the investment private industry has made in alternatives. In developing countries, the continued availability of cheap CFCs undermines the Montreal Protocol investments and creates a disincentive to move to alternatives. This effect is already being seen in Latin America, where the motivation to phase out CFCs is falling along with their prices.

Russia's initiative will work in concert with a $60 million Bank-GEF umbrella project to complete phase-out in the ODS-consumption sectors, focussing on enterprises in the fire protection, solvents and non-insulating foams sectors.

Support from Donors

The Bank has been active in developing donor support for providing compensation packages to ODS-producing enterprises for an accelerated program of production phase-out. A number of countries have already expressed a strong interest in supporting the initiative. The United States has taken a lead role, offering a substantial commitment of $6 million (given full donor commitment from other countries). Austria, Norway, Denmark, the United Kingdom and the European Union were early supporters offering additional funding. Currently, Finland, Sweden, Germany, Japan and Canada have the funding under active review and strongly support the initiative. In the Russian Federation, both the government and the enterprises have made significant commitments to the effort to ensure its success.

This article was prepared by Ellen Tynan, Operations Analyst in the Bank's Montreal Protocol Unit, (202) 473-8201, fax (202) 522-3256.

[1] Pearce, Fred. "Smart Smugglers Outwit the CFC Cops," New Scientist, 26 October 1996 (Vol. 152; No. 2053).

Building Global Markets
To Reduce Climate Change

There is increasing scientific evidence that greenhouse gas emissions from fossil fuels, industry and land degradation contribute to climate change. If current emissions continue, temperatures may increase by 1–3.5° Celsius and sea levels may rise 15–95 centimeters by 2100. While emissions are primarily from industrialized countries, developing countries will face the consequences on human settlement, health and livelihoods.

The World Bank is exploring innovative ways to help efficiently achieve the goals of the United Nations Framework Convention on Climate Change (UNFCCC) and in a manner that promotes economic development among the Bank's client countries. One such way could be the building of global markets for offsetting and trading greenhouse gas emissions.

The Basis for Carbon Markets

A strengthened international agreement expected by the end of 1997 could commit industrialized countries to reduce current emissions by 10–20% by 2010 or 2020.

The UNFCCC provides for the possibility of "joint implementation" of commitments between countries. If this option is pursued, a company in one country may meet emission requirements through investments in another country. It would do so in countries where reduction costs are lower. The global environmental effects would be the same. The resulting benefits could be shared between the investor and the host country. Such a mechanism would lower the costs of reducing global emissions substantially, and it would promote more ambitious global climate policies.

Large Potential Markets

Two factors drive the potential global market for emission trades: the level of emission reduction commitments and the costs of emission reductions in different regions. The Norwegian research institution ECON has recently completed a study of the market perspectives for 2020. Even under moderate commitments, the global market for carbon, the major greenhouse gas, may involve $30 billion–$40 billion. Stronger commitments would result in substantially larger trading volumes.

Many Benefits for the Bank's Client Countries

The main flow of trades will take place between industrialized countries and developing countries or countries with economies in transition. Abatement costs in industrialized countries may be in the range of $50–$100 for a ton of carbon, whereas abatement options in developing countries can be pursued for a fraction of this.

Carbon trading will create tens of billions of dollars of income for developing countries. By linking these funds to other investments, they may leverage investment flows to host countries that are several times larger.

All greenhouse gas offset investments must be compatible with and supportive of host country development priorities, and contribute to capacity building and technological development. By facilitating investments in more efficient technologies, emission trades will promote broader environmental and economic efficiency.

The Bank Contributes to Exploring and Realizing the Potential Benefits

In 1996, the Bank and the Government of Norway initiated a three-year program to explore greenhouse gas markets. During the pilot phase, the main priority is maximizing learning about the possible mechanisms for carbon deals.

Pilot projects form the basis for exploring how different mechanisms can contribute to the interests of the Bank's client countries and to promoting the objectives of the UNFCCC. The Bank will work to ensure a level playing field for negotiations between host countries and investors. The projects will also explore solutions to analytical and methodological issues and to increasing private sector participation in carbon deals.

To reduce transaction costs and ensure quality, these pilot projects will be linked to regular Bank and IFC projects. The Bank recently reached agreement on a new pilot project in Burkina Faso, the first AIJ (Activities Implemented Jointly) pilot project in Africa. During 1997, more pilot projects will be initiated in Asia and Eastern Europe.

This section focuses on the Bank's work in fostering global warming *solutions through* energy efficiency, demand side management and renewable technologies, and its role in carrying out the GEF and Montreal Protocol work.

This article was prepared by Eivind Tandberg, AIJ Program Adviser, in the Environment Department's Climate Change Unit (ENVGC), (202) 473-9746, fax (202) 522-3256.

Reforming Subsidies:
Now Is the Time To Act

Economic development's sustainability is imperiled, not only by what governments are not doing—taxing pollution emissions, for instance—but also by what they are doing: subsidizing activities and inputs that are destructive to the enterprise of building sustainable societies.

Last September's World Bank/Earth Council seminar, *Subsidies and Sustainability: Seeking Win-Win Policy Reforms* was opened by Maurice Strong, Chairman of the Earth Council, Senior Adviser to the World Bank President and Rio Earth Summit Secretary, was chaired by the late Emile van Lennep, State Minister, The Netherlands, and was attended by over 30 leading experts on subsidy reform.

Subsidy Reform: Findings by the Earth Council and World Bank

Last September, at a workshop to discuss reforming government policies on subsidies, experts concluded:

J. DIXON

- While there may be 'good' subsidies in principle, in practice most are wasteful of scarce fiscal resources, miss their intended targets (the poor, for example), and have the undesirable effect of stifling innovation and limiting competitiveness.
- Given the fiscal constraints governments face, the political climate for reducing subsidies has probably never been better. But the political obstacles to removing subsidies should not be underestimated.
- In reforming subsidies, it is important to make the message clear and get the analysis right, especially if the target audience is the Ministry of Finance.
- The first practical step should be targeting financial subsidies.
- The OECD countries account for roughly two-thirds of the subsidies with environmental consequences, with the remainder in developing countries.
- Recent Bank analysis suggests that financial subsidies are declining in developing countries, largely as a result of the liberalization of markets.

Seminar participants also concluded that subsidy reduction must be prominent among the policy instruments for achieving sustainable development.

Multilateral development institutions should use their privilege of policy dialogue with governments to urge immediate subsidy reform. But to achieve subsidy reform, political commitment may be the scarcest resource of all. Politicians must be convinced that reducing subsidies will bring the greatest good to the greatest number.

Participants made some suggestions to policymakers interested in reform:

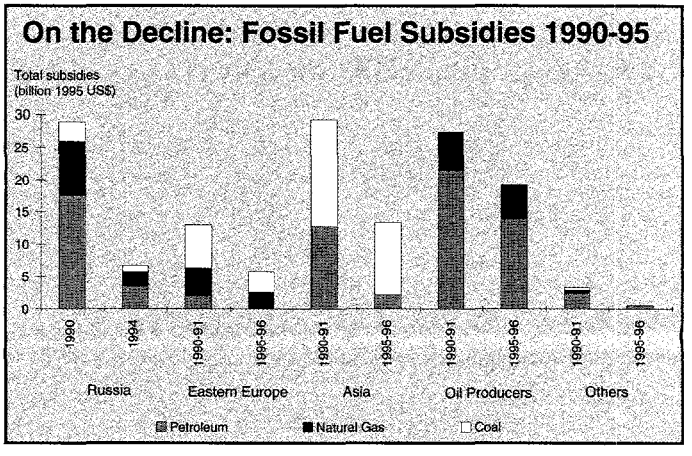
- *Be opportunistic.* For example, the liberalization of the economies in transition provided an excellent opportunity to reform subsidies. Fiscal or environmental crises might provide another.
- *Privatize.* Privatization may provide another opening for subsidy reform.
- *Recognize that vested interests in the subsidy realm may lead to unpalatable policy choices.* For instance, phasing out price supports and replacing them with lump-sum payments may be the only practical way to begin to limit the harm done by agricultural subsidies.
- *Introduce subsidy removal subtly.* For example, threaten a tax hike to meet some fiscal shortfall, then offer to reduce a subsidy instead of introducing the tax.
- *Compensate the poor.* Where the poor have benefited from the subsidy, use part of the revenue gained from the subsidy removal to offset any real income loss.
- *Build a constituency for reform.* If more people knew where their tax dollars went, there would be greater political support for subsidy reform.

Fossil Fuel Subsidies

Recently, researchers at the Bank have begun to quantify the prevalence and trends of subsidies on fossil fuels and other productive inputs. Looking at 20 developing countries that account for 77% of the world's total energy consumption outside the developed world, they have found that in the early 1990s unit energy subsidies as a proportion of the unsubsidized price were as high as 40-50% in Eastern Europe, Russia, and among the oil producers.[1] Subsidy rates in Asia were close to 33%. The past five years, however, have seen significant decreases in the magnitude of energy subsidies in almost all regions (*Figure*).

The analysis of movements in subsidy rates—subsidy as a proportion of the unsubsidized price—is often

more illuminating than total subsidies, since a decline in the latter may well be due to lower consumption levels. A number of countries undergoing economic transition have made substantial moves to reduce (although not yet eliminate) subsidy rates. This is true for most countries in Eastern Europe and the Former Soviet Union. In China, subsidy rates have fallen from 42% to 20%, and in India from 25% to 19%. The main oil-producing countries in the sample substantially increased real prices for petroleum products. Prices have more than doubled in Iran and almost tripled in Saudi Arabia, for example. Despite these reductions, subsidy rates among oil producers remain high compared to other countries.



Subsidies on Agricultural Inputs

Subsidies for agro-chemicals, mainly pesticides and fertilizers, have also been reduced in recent years. In Indonesia in the early 1980s, for example, pesticide subsidies of up to 85% were integral to government efforts to boost agricultural production. By the late 1980s, however, the threats to public health from pesticide pollution caused a drastic policy change: many pesticides were banned and integrated pest management was adopted. Pesticide subsidies were eliminated by 1989. This produced a triple dividend: reducing risks to biodiversity and health while maintaining rice production levels.

Fertilizer subsidies have been used by governments to induce farmers to increase yields. Agricultural intensification can be good for the environment, reducing pressures on ecologically sensitive lands; and correct fertilizer application restores soil nutrients. But excessive use leads to runoff into waterways, polluted drinking water and eutrophication. Many countries have struggled to find the right balance in encouraging fertilizer use. Since the mid-1980s, Bangladesh decreased subsidies from $56 million to $19 million, Indonesia from $732 million to $333 million, Pakistan from $178 million to $33 million, and the Philippines from $48 million to zero. While environmental considerations played a role, often it was the burden on the Treasury that was the prime motivation for these reductions.

WHAT ARE SUBSIDIES?

Subsidies can take many forms, but all result in lower prices in the marketplace, through explicit subsidies for consumer products or through subsidies to inputs that lower production costs. **Price subsidies** are the prevalent direct subsidy, common for energy, water and agricultural inputs. **Tax credits** and **preferential borrowing rates** both lower production costs, leading to higher investment in the targeted sectors and artificially low product prices. **Inadequate cost recovery** for infrastructure, such as irrigation or electric power, is another common form of subsidy that leads to wasteful resource use.

Unfinished Business

Because the process of subsidy reform is a recent one, it is too early to detect significant reductions in environmental damages. But studies of energy use after the 1970s oil shock indicate that the effect of a change in prices on energy efficiency, though not immediate, is likely to be substantial. Energy use per unit of output fell by 38% in OECD countries between 1971 and 1988. For developing countries, in the long run, energy demand is likely to fall by half a percentage point for each percentage point price rise.

Subsidy reform is not just a developing country issue. Agricultural subsidies in the OECD countries are damaging the environment. Any broad-based international effort to reform subsidies must target OECD countries as well.

Removal of subsidies is just the first step. For products like fossil fuels and pesticides, where the environmental effects of their use are substantial, reform must extend beyond eliminating subsidies to imposing changes that reflect the full environmental and social costs of consumption. In this way, users will be given the right incentives to bring private behavior into line with social goals.

[1] Egypt, Indonesia, Iran, Mexico, Nigeria, Saudi Arabia, and Venezuela.

This section focuses on environmental information at two levels: understanding projects' environmental dimensions and monitoring their performance; and observing a nation's management of its environment. It also explores economic analysis tools to link physical environmental effects to economic impacts.

This article was prepared by Kirk Hamilton and Aru Kunte, Environmental Economists in the Environment Department's Indicators and Environmental Evaluation Unit. For further information, please contact Unit Chief John Dixon at (202) 473-8594, fax (202) 477-0968.

Innovations in Environmental Policy:

Progress Since Rio

For the Earth Summit's fifth anniversary, the World Bank has prepared *Five Years After Rio: Innovations in Environmental Policy*[1]. At the heart of this paper is a policy matrix designed to distill and organize a very rich and diverse set of best practices in environmental management.

The matrix classifies innovative environmental management tools that enable countries to get some of the financial resources they need to achieve sustainable development. The tools are classified under the four broad categories as shown in the table below.

THE POLICY MATRIX

Using Markets	Creating Markets	Regulations	Engaging the Public
Subsidy reduction	Property rights/ decentralization	Standards	Public participation
Environmental taxes	Tradable permits/rights	Bans	Consultation
User fees	International offset systems	Permits/ quotas	Information disclosure
Deposit-refund systems			Informal negotiation
Targeted subsidies			Community pressure
			NGO involvement

While different countries have tried very different approaches to similar environmental management problems, some general lessons have emerged from this review:

Financial Sustainability. Despite the rhetoric of Rio, it is clear that there will be few if any additional resources to fund environmental improvements. Therefore, new policies must be financially sustainable to create effective change. There are many examples of policies that do generate financial resources, such as user fees and environmental taxes. The most successful policy initiatives are those that both generate revenues and recognize the fiscal constraints of governments.

Administrative Sustainability. There are often major administrative constraints to implementing new policies or procedures. Since the environment is a relatively new concern, few countries have well-established environmental management bureaucracies. Consequently, policies that do not require elaborate and expensive administrative support have a better chance of success. Building capacity for improved environmental management is an important, but longer-term process.

Engaging the Public. Since governments rarely lead in the cause of environmental reform—but more often respond to public pressure—the role of an informed and involved citizenry is crucial. Engaging the public, both to inform them about the costs of environmental degradation or pollution, and to involve them as advocates for reform, is facilitated by open exchange of information, and more open societies. Some of the most polluted places on earth were in parts of Eastern Europe and the former Soviet Union where environmental protests and debates were not tolerated. Without the combination of an informed, and involved public, and a committed government, the best laws and legislation are likely to have little impact.

Seeking Policy Integration. One of the lessons from Rio is that the environment and economic development are inextricably linked.

For example, economic liberalization can exacerbate environmental problems. Increased access to international markets can put pressure on natural resources where property rights and resource pricing regimes are inadequate, leading to excessive exploitation. And, to the extent that liberalization leads to growth in production and incomes, this may lead to pollution emissions. The bottom line, of course, is for countries to ensure that policy reforms of the sort highlighted in the Policy Matrix are established to work in conjunction with the process of economic liberalization.

These lessons in the *Five Years After Rio* show there is great potential for environmental reform, but tempered with the reality that money is scarce and that major institutional issues need to be addressed.

[1] See back cover for reference.

This article was prepared by John Dixon and Kirk Hamilton of the Environment Department's Pollution and Environmental Economics Division.

Five Years After Rio:
What have we done and where are we going?

Personal reflections

by Derek Osborn, Chairman, European Environment Agency, Copenhagen, and co-chairman of the intersessional meeting of the Commission on Sustainable Development (CSD).

Sustainable development remains our central and essential goal. We must have development to relieve poverty and to give all people everywhere a decent chance in life. But we must develop in such a way that we do not damage our own environment and the quality of life of our own and succeeding generations.

The enormous Agenda 21 which we negotiated at Rio spelt out a comprehensive programme of action for all sectors of civil society to achieve a sustainable pattern of development throughout the world.
Five years later, that programme remains robust.

C. CARNEMARK

But we need to find more effective ways of implementing it properly, and to re-energize all parts of the world community in this task.

Many ideas and proposals will be brought forward from the environmental agenda. Stronger action will be demanded on climate change and on air pollution. Pollution of the oceans and the catastrophic decline in some fish stocks will be emphasized. Growing problems about shortage of fresh water in many parts of the world and contamination of some supplies are gaining increasing attention. How to manage the world's forests sustainably is a major piece of unfinished business from the Rio agenda. New instruments will be proposed. Many other ideas will be canvassed.

The development agenda will come equally to the fore. In some developing countries the means of securing sustainable growth loom larger as an immediate political priority than longer-term environmental protection. How countries can use international trade and private investment, and how to mobilize international support through adequately funded and well-directed aid programmes will be prime concerns here.

Governments have made some progress since Rio. We shall need to consider how to support and encourage this progress with ideas such as peer group review and indicators. The CSD itself and other parts of the international machinery may need to be reshaped to support national progress better.

Sustainable development is not a matter for governments alone. The Local Agenda 21 which has been driven forward by local governments throughout the world has made remarkable headway in many cities of the world. Progressive sectors of the business community have made their own contribution through such programmes as ISO 14001 and Responsible Care. Financial institutions are gradually finding ways to integrate the environment and sustainability into their programmes. NGOs are helping to transform communities on the ground as well as lobbying effectively for change at national and international levels.

Everyone associated with this year's meetings has a keen determination to make real progress. The world expects and deserves no less.

At a glance...

The Photovoltaic Market Transformation Initiative

The Global Environment Facility (GEF) and the International Finance Corporation have introduced the Photovoltaic Market Transformation Initiative (PVMTI), which will support competitively solicited, private-sector photovoltaic projects in India, Kenya, and Morocco. The GEF Council gave initial approval for the project last October. PVMTI will use $30 million in GEF funds to help reduce obstacles to market development and attract additional investment for new and expanded activities.

New Environmentally and Socially Sustainable Development (ESSD) Network

In an effort to better serve its client countries, the Bank has just launched four "networks" in Environmentally & Socially Sustainable Development; Human Development; Finance, Private Sector & Infrastructure; and Poverty Reduction & Economic Management. These networks bring together communities of staff from related sectors. The ESSD Network is a group of several hundred staff from across the Bank in the agriculture, rural development, natural resources, environment and social development sectors.

These networks are designed to empower staff to achieve greater excellence in their work and the services they provide by replacing the old, compartmentalized way of working with one that emphasizes and rewards cooperation and collaboration. Key to this is shared strategy. By developing shared strategies and ensuring that resources are efficiently deployed across the networks, staff will be able to draw on the experience and expertise of their colleagues.

The ESSD Network is divided into the Environment, Social Development, and Rural families. Each of these families will be coordinated by a Sector Board made up of members selected from across the Bank. The Boards will formulate strategies, organize knowledge management, supply innovative learning opportunities, support professional excellence, and organize partnerships with other institutions. (*See Overview, page 4.*)

World Bank Launches New Global Water Unit

The Global Water Unit (GWU), part of the new ESSD network, brings together Bank staff working on water-related issues. Water issues are dealt with in a number of sectors—hydropower issues in energy and mining, irrigation and drainage in the rural sector and water and sanitation in infrastructure. The GWU will coordinate these sectors to better meet the needs of client countries in this critical area. John Briscoe, the Bank's senior water advisor and head of the GWU, is also the Bank's representative to the international Global Water Partnership. (*See page 10*)

Vision to Action in Agriculture

The Bank has developed an action plan to revitalize the rural world. As part of this plan, two new initiatives are underway. The first is a two-day training course entitled "Sustainable Intensification of Agriculture Production Systems." This course will describe sustainable intensification of two important production systems–integrated crop-livestock systems in the Sahel and irrigated rice-wheat systems in India–and suggest ways for task managers to promote sustainable intensification in World Bank activities. The second initiative is a newsletter intended to raise awareness on sustainable intensification, to seek out and share successful examples of sustainable intensification, and for agriculturists and task managers to share experiences. (*also see footnote, page 18.*)

Alternative Energy Support Exceeds $1 Billion in Asia

World Bank/GEF support for renewable energy and energy efficiency in the Asia regions has reached nearly $1.2 billion. This funding is projected through 1999.

The Bank's Asia Alternative Energy Unit (ASTAE) has helped catalyze this shift to more environmentally sustainable energy options. The staff of ASTAE, in partnership with other Bank staff and client countries, follow three key principles: mainstreaming alternative energy at all levels of the decision-making process; strengthening institutional capacity to identify, assess and implement proven, cost-effective alternative energy options; and fostering public-private sector partnerships. Such activities are expected to avoid an estimated 1.9 GW of fossil fuel-based electricity generating capacity.

Epcot and the Bank Join Hands to Build Awareness About Sustainable Agriculture

For the second year in a row, the Bank is joining the Disney Epcot Center in a powerful interactive exhibit called *Gardening For Food Around the World*, an awareness-building undertaking which is part of Epcot's growing sustainable agriculture education program. The April-June exhibit at Epcot invites visitors to enter into the worlds of Asia, Africa and Latin America through 'villages' to discover the regions' food crops and the challenges and opportunities the regions' citizens face for sustainable agriculture. This year also includes an exhibit by Rodale Institute on new ideas in American agriculture. With real crops growing in fields, 'communicators' from each region acting as hosts and tour guides, and interactive exhibits like an oil press and water pump, the exhibit is designed to keep visitors entertained while they learn.

Educating Students Around the World About the Environment

As part of the Bank's commitment to awareness building about the environment, its Economic Development Institute recently launched the World Links for Development ("the WorLD") program to create online educational communities for secondary school students and teachers around the world. Students in developing countries will be linked by Internet and the World Wide Web with their peers in industrialized countries for collaborative distance learning.

WorLD is working closely with GLOBE, a distance environmental education program founded under the leadership of US Vice President Al Gore and funded through the National Oceanic and Atmospheric Administration, National Aeronautic and Space Administration and the National Science Foundation. In each country where the WorLD program connects schools, WorLD will provide training and in some cases equipment to schools to participate in GLOBE. These schools will then become part of GLOBE's International network of more than 2,000 schools in over 40 countries.

For more information on WorLD, call Sam Carlson, program manager, (202) 473-7561, fax (202) 676-096.

Lead Phase-Out Success Stories

Argentina, Austria, Bermuda, Brazil, Canada, Colombia, Costa Rica, Denmark, El Salvador, Finland, Guatemala, Honduras, Japan, Nicaragua, Slovak Republic, Sweden, Thailand, and the United States all phased out lead from gasoline by the end of 1996.

A joint program is underway on national lead phase-out plans in Latin America and the Caribbean. Partners include the Bank, the Pan-American Health Organization, Organization of American States, United States Environmental Protection Agency and Department of Energy, Inter-American Development Bank, and Natural Resources Defense Council. As part of the program, the Bank organized a workshop in Santiago de Chile last September, in which many key government officials participated and expressed their strong commitment to the lead phase-out initiative.

The UN Economic Commission for Europe has established a Task Force on Phase-Out of Lead in Gasoline under the leadership of the Governments of Denmark and Bulgaria, building on the results of the Bank's lead phase-ut work. Bank staff actively participate in the task force and its steering committee. The task force's key objectives are to strengthen political commitment and address policy and technical issues to accelerate lead phase-out in Europe.

A Bank study on the feasibility and costs of phasing out lead from gasoline contributed to awareness-raising in Romania. The Government of Romania made a commitment to reduce the lead content of gasoline as covenant of a road project prepared by the Bank.

Institutional Strengthening

The Mediterranean Environmental Technical Assistance Program (METAP) has established a Regional Facility at Cairo, **Egypt** to help Mediterranean countries build their project portfolios. The Facility consists of a Project Preparation Unit (PPU), to be jointly financed by the World Bank and the European Investment Bank, and a Capacity Building Unit (CBU), to be financed by UNDP Capacity 21 Europe. The PPU will help sector ministries and organizations identify and prepare environmental projects consistent with METAP priority themes: arresting and preventing pollution in "hot spots" and integrated water resources management. The CBU will finance and help implement capacity building activities at the regional and national levels.

Pollution Management

The **Philippines'** Department of Environment and Natural Resources (DENR) is introducing a public disclosure program called EcoWatch modeled on Indonesia's PROPER program (*page 6*). Ecowatch will soon have its first disclosure of factory performance ratings. The program started on a high note last year when President Ramos publicly introduced EcoWatch along with the leaders of around 20 Philippines Business Associations. The Associations signed an agreement with DENR to support EcoWatch by providing information for program development and encouraging participation by members.

CleaNet, a business center for cleaner production, has just been established in **Sri Lanka** under the Bank's Private Finance Development Project to help private manufacturers practice pollution prevention. *CleaNet* will provide clearinghouse and information brokering, networking and training, facilitate waste minimization audits, and eventually promote waste exchange among enterprises.

Under an innovative cooperative scheme in **India**, the Bank has now financed 30 common wastewater treatment plants. The units are designed to serve 4,000 mostly small-scale operators while taking advantage of economies of scale in treatment and recycling. Five plants are now under operation.

The Bank is helping **India** appraise a state-of-the-art recycling plant that uses lignite as fuel. The plant will have a cycle efficiency of nearly 67%, will recycle ash, hot water and steam, and will exceed the emission standards of the EU in the year 2000.

The Bank has just approved support for the research, development and commercialization of clean coal combustion technologies in **China**. China is anticipated to contribute the greatest share of emissions from coal power plants by early next century. Development of systems and devices to reduce these emissions is central to this initiative.

In **India**, the first biopesticide plant is slated to start operations this March, under a Bank-supported program for cleaner technologies. The plant's products will displace synthetic pesticides used in agriculture.

Partnerships

A Bank grant to the **Philippines** for a Demand Side Management (DSM) regulatory framework on energy policy was completed 10 months ahead of schedule due to a 'twinning' arrangement between the Philippines Energy Regulatory Board and the Oregon Public Utility Commission. A *Collaborative Process* was adapted to Philippines conditions to produce a successful conclusion. Other energy agencies in the Philippines plan to use the same process to bring the NGO community to the table for dialogue on important privatization issues.

Natural Resource Management

The Bank has just begun an initiative whereby teams in the Bank's Africa and Asia regions will look at using Common Property Resource Management (CPR) in their respective regions. This initiative stems from the Common Property Resource Management Network (CPRNET), formed in 1995 by Bank staff interested in Common Property Resource Management.

CPR management represents a broader and more holistic approach to poverty alleviation and sustainable development, complementing existing emphasis on private property by enabling a more culturally sensitive approach to project preparation and implementation. For more information contact Lars Soeftestad, (202) 473-8263.

* A sampling of recent Bank initiatives. For more details on the Bank's full environmental project portfolio, request the full project matrix (202) 458-8459 (voice mail).

Setting Conservation Priorities in Irian Jaya

In early January Conservation International hosted an important meeting in Irian Jaya with financial and other support from the World Bank, and the Japanese and US governments. Irian Jaya is the largest province in Indonesia with some of the most extensive rain forest outside the Amazon basin. It is also the least developed province but a wide range of developments are being planned, most of which would have significant implications for biodiversity conservation. The meeting brought together leading biodiversity specialists, planners from the provincial government, sociologists, NGOs, and tribal leaders. Throughout the meeting Conservation International staff produced and modified maps to identify priority areas for conservation, as the participants moved toward a consensus. The objective now is to work with the Governor's Office to help translate the conclusions into development decisions.

A Selection of Recent Bank Group Environmental Publications*

General

Rural Development: Putting the Pieces in Place. World Bank Agriculture & Natural Resources Department. November 1996. Fax (202) 522-3307.

The World Bank and the Environment: Environment Matters at the World Bank. World Bank Annual Review on the Environment. December 1996.**

Biodiversity and Natural Habitats

Accounting for Natural Resources in Ecuador: Contrasting Methodologies, Conflicting Results. Environment Department Paper No. 41, September 1996. Pollution and Environmental Economics (ENVPE), Fax (202) 477-0968.

Freshwater Biodiversity in Asia, With Special Reference to Fish. Maurice Kottelat. World Bank Technical Paper No. 343, September 1996.**

Mainstreaming Biodiversity in Agricultural Development: Toward Good Practice. Environment Department Paper No. 42, October 1996. Global Environment Division (ENVGC), Fax (202) 522-3256.

Water Resources Management

Guidelines for Integrated Coastal Zone Management. Jan Post and Carl Lundin. Environmentally Sustainable Development Studies and Monographs Series No. 9, September 1996.**

Economic Analysis of Indonesian Coral Reefs. Herman Cesar. Environment Department Work in Progress, December 1996. Fax (202) 477-0968.

Africa: A Framework for Integrated Coastal Zone Management. Marea Hatziolos, Carl Lundin, and Anders Alm, October 1996. Land, Water, and Natural Habitats Division (ENVLW), Fax (202) 477-0568.

African Water Resources: Challenges and Opportunities for Sustainable Development. Narendra P. Sharma, Torbjorn Damhaug, Edeltraut Gilgan-Hunt, David Grey, Valentina Okaru, and Daniel Rothberg. World Bank Technical Paper No. 331.**

Fostering Riparian Cooperation in International River Basins: The World Bank at Its Best in Development Diplomacy. Syed Kirmani and Guy Le Moigne. World Bank Technical Paper No. 335.*

Monitoring and Evaluation Guidelines for the World Bank-GEF International Waters Portfolio. Environment Department Paper No. 37, October 1996. Global Environment Division (ENVGC), Fax (202) 522-3256.

New Evaluation Procedures for a New Generation of Water-Related Projects. Ronald Cummings, Ariel Dinar, and Douglas C. Olson. World Bank Technical Paper No. 349, December 1996.**

Pollution Management

Air Pollution from Motor Vehicles: Standards and Technologies for Controlling Emissions. Asif Faiz, Christopher S. Weaver, and Michael Walsh, with contributions by Surhid Gautam and Lit-Mian Chan, January 1997.**

Effective Pollution Charges: Lessons of Worldwide Experience. Dissemination Note 50, December 1996. Pollution and Environmental Economics (ENVPE), Fax (202) 522-3247.

The Price of Dirty Water: Pollution Costs in Sebou Basin. Environment Department Paper No. 38, July 1996. Pollution and Environmental Economics (ENVPE), Fax (202) 477-0968.

Phasing Out Lead from Gasoline: Worldwide Experience and Policy Implications. Environment Department Paper No. 40, August 1996. Magda Lovei. Pollution and Environmental Economics (ENVPE), Fax (202) 477-0968.

Livable Cities for the 21st Century. Directions in Development Series, October 1996.**

Social Perspectives

African Involuntary Population Resettlement in a Global Context. Environment Department Paper No. 45, February 1997. Social Policy and Resettlement (ENVSP), Fax (202) 522-3247.

Hydropower Dams and Social Impacts: A Sociological Perspective. Environment Department Paper No. 44, January 1997. Social Policy and Resettlement (ENVSP), Fax (202) 522-3247.

Participation in Practice: The Experience of the World Bank and Other Stakeholders. Jennifer Rietbergen-McCracken. World Bank Discussion Paper 333, December 1996.**

Social Assessment in World Bank and GEF Funded Biodiversity Conservation Projects. Environment Department Paper No. 43, October 1996. Social Policy and Resettlement (ENVSP), Fax (202) 522-3247.

Environmental Management

Green National Accounts: Policy Users and Empirical Experience. Kirk Hamilton and Ernst Lutz. Environment Department Paper No. 39, July 1996. Pollution and Environmental Economics (ENVPE), Fax (202) 477-0968.

Environmental Management and Institutions in OECD Countries: Lessons from Experience. Environment Department Paper No. 46, February 1997. Pollution and Environmental Economics (ENVPE), Fax (202) 477-0968.

The Experience of the World Bank in the Legal, Institutional and Financial Aspects of Regional Environment Programs: Potential Applications of Lessons Learned for the ROPME and PERSGA Programs, August 1996. Land, Water, and Natural Habitats Division (ENVLW), Fax (202) 477-0568.

---

* See other selected publications on the back covers. For a full listing of the Bank's current environmental publications, send or fax the enclosed mailing list form, call (202) 458-8459 (voice mail), or look us up on the Web at http://www-esd.worldbank.org/html/esd/env/envmain.htm.

** Order from the World Bank Publications Order Line (202) 473-1155. E-mail: Books@worldbank.org., Fax (202) 522-2627.

Mailing List

Please add or update my information on your mailing list as follows:

Name_____

Title _____

Office Telephone _____

Fax Number _____

Organization_____

Address _____

City/State/Postal Code_____

Country_____

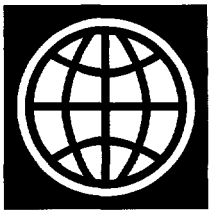
Email Address _____

My work: (Check only one)

- ❑ International or regional organization
- ❑ Government agency or ministry
- ❑ Nongovernmental organization
- ❑ Research institution or library
- ❑ School/University
- ❑ Private sector
- ❑ Consultant
- ❑ Student
- ❑ News media
- ❑ Other

My area(s) of interest: (Check all that apply)

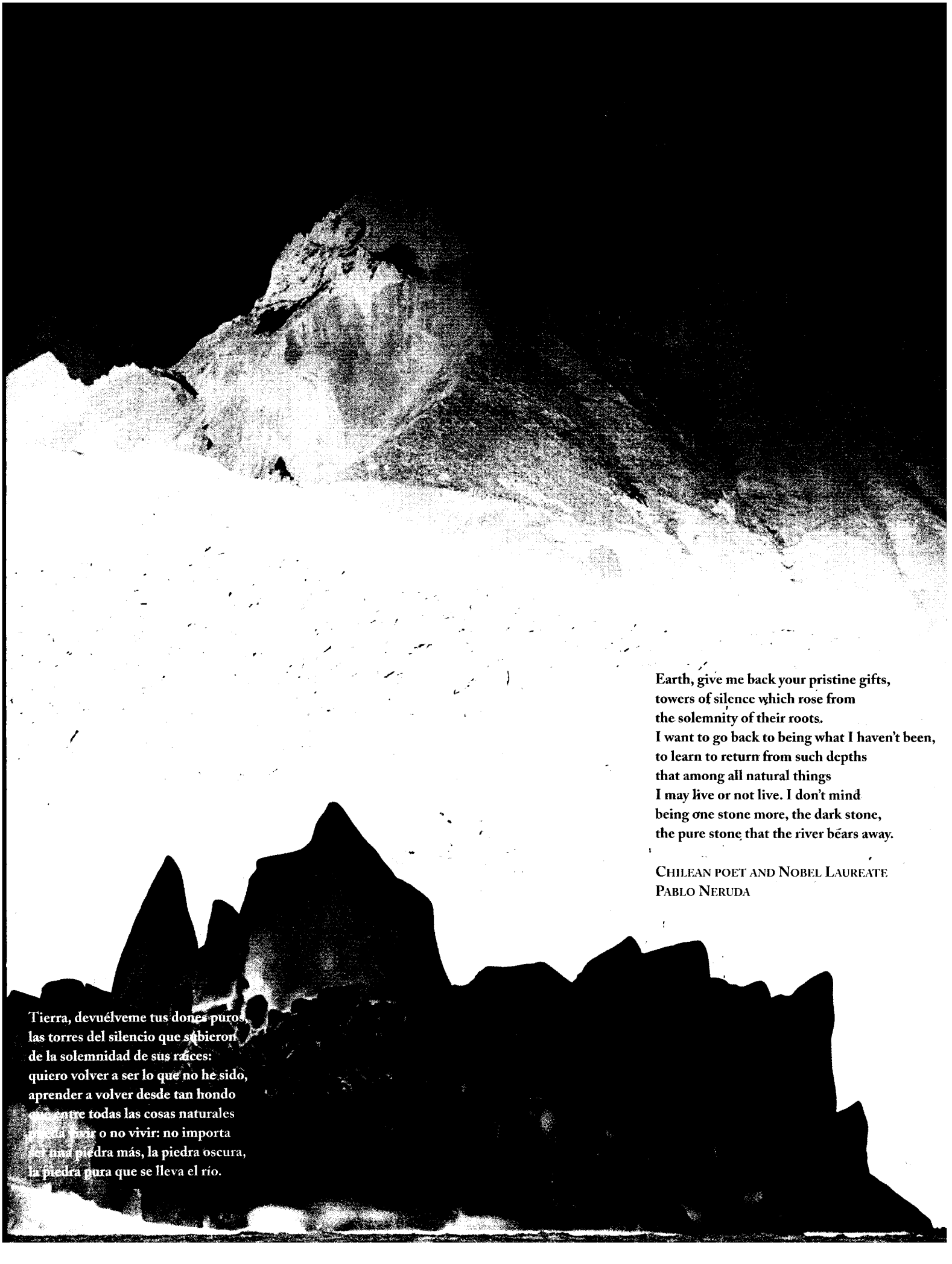
- ❑ Pollution Management/Technology
- ❑ Water Resource Management
- ❑ Natural Habitats/Biodiversity
- ❑ Climate Change/Ozone
- ❑ Social Perspectives
- ❑ Environmental Indicators/Information Systems
- ❑ Environmental Economics & Policy
- ❑ Private Sector & Finance
- ❑ Sustainable Development in general
- ❑ Other



Mail or fax to:
Environment Department Publications
The World Bank
1818 H Street, N.W., Room S-5057
Washington, DC 20433 U.S.A.
Fax: 202-477-0565; Phone 202-458-8459 (voice mail)
http:/www-esd.worldbank.org/ESD/ENV
Email: environment@worldbank.org

To order the full environmental project matrix or other Environment Department publications, refer to our publications list and / or list those you would like to receive using the order form below. To order more than 5, please contact the Environment Department publications office directly.

Title	Series	No.	Author	Date

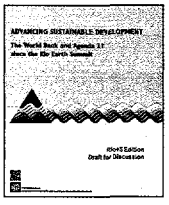


Earth, give me back your pristine gifts,
towers of silence which rose from
the solemnity of their roots.
I want to go back to being what I haven't been,
to learn to return from such depths
that among all natural things
I may live or not live. I don't mind
being one stone more, the dark stone,
the pure stone that the river bears away.

CHILEAN POET AND NOBEL LAUREATE
PABLO NERUDA

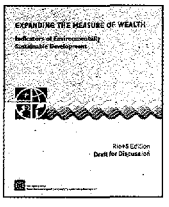
Tierra, devuélveme tus dones puros,
las torres del silencio que subieron
de la solemnidad de sus raíces:
quiero volver a ser lo que no he sido,
aprender a volver desde tan hondo
que entre todas las cosas naturales
pueda vivir o no vivir: no importa
ser una piedra más, la piedra oscura,
la piedra pura que se lleva el río.

new publications



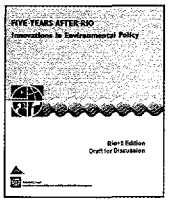
Advancing Sustainable Development: The World Bank and Agenda 21 Since the Rio Earth Summit**

In this publication, the World Bank takes a look back at its work with its client countries in the five years since Rio, summarizing its response to the relevant chapters of Agenda 21, spelling out progress, lessons learned, and the emerging challenges the world faces in making development sustainable.



Expanding the Measure of Wealth: Indicators of Environmentally Sustainable Development**

National wealth consists of more than machinery, bricks and mortar. Natural resources are an important source of wealth in the developing world, while human resources are the largest share of wealth in all countries. How wealth is managed, whether genuine rates of saving are positive, and the pace of subsidy reforms are all highlighted in this new publication.

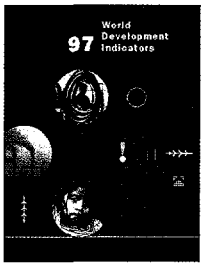


Five Years After Rio: Innovations in Environmental Policy**

The 1992 Earth Summit set an ambitious agenda for policy reform. Through a 'policy matrix' and selected case studies this publication describes proven winners and new approaches to managing the environment and natural resources under four headings: using markets, creating markets, regulation and engaging the public.

Decentralization and Biodiversity Conservation: A World Bank Symposium.*

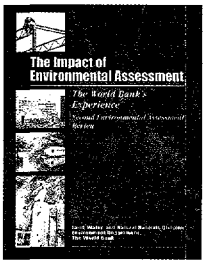
Ernst Lutz and Julian Caldecott, editors. Symposium Series, December 1996.
Conservation of biological diversity is important for sustainable development, and decentralization is a key aspect of good governance. This book looks at whether decentralization promotes conservation and if so, under what conditions. Local and international experts present case studies from experiences in Colombia, Costa Rica, India, Indonesia, Kenya, Nepal, Nigeria, the Philippines, Russia, and Zimbabwe. $40.00



The New World Development Indicators 1997 Introduces Environmental Measures*

The World Bank's *World Development Indicators 1997* (WDI) provides a broad view of the world economy, the people who live and work in it, the environment, and the structural transformation of developing and high-income economies. This year, the WDI includes a new expanded environment section, with statistics on land use and deforestation, protected areas and biodiversity, freshwater use, energy use and emissions, pollution, and national environmental strategies and participation in international treaties.

WDI is also available on CD-ROM for Windows. Its database covers 500 indicators for nearly 150 countries, from 1960 to 1995, where data are available. It offers mapping and charting on the fly, and includes Excel files for all the tables from the book, as well as the explanatory text.



The Impact of Environmental Assessment

The Bank's EA experience has expanded significantly, encompassing a broad array of countries, environmental settings, sectors and project types. This review reveals remarkable improvements in a number of areas and remaining shortcomings. Detailed recommendations for improving the EA process are provided in an action plan. The growing experience with a variety of projects makes this review more than an assessment of performance; it also makes it a "good practice" paper, providing useful insights and guidance to anyone involved in EA work. To order, call (202) 458-2715, Fax (202) 477-0568.

* Order through the World Bank Publications Order Line (202) 473-1155. E-mail: Books@worldbank.org, Fax (202) 522-2627.
** Order through the Environment Department (202) 458-8459, Fax (202) 477-0565.