WORLD BANK OPERATIONS EVALUATION DEPARTMENT

Global Public Policies and Programs: Implications for Financing and Evaluation

Proceedings from a World Bank Workshop

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2001
The World Bank
Washington, D.C.

www.worldbank.org/html.oed

Manufactured in the United States of America
First printing June 2001
1 2 3 4 04 03 02 01

ISBN 0–8213–4952–X

Library of Congress Cataloging-Publication Data

Global public policies and programs : implications for financing and evaluation / edited by Christopher D. Gerrard, Marco Ferroni, Ashoka Mody.
p.cm.
Includes bibliographical references.
ISBN 0–8213–4952–X
1. World Bank—Congresses. 2. International Monetary Fund—Congresses. 3. Economic assistance—Planning—Congresses. 4. Technical assistance—Planning—Congresses. 5. Environmental policy—International cooperation—Congresses. 6. Medical assistance—Planning—Congresses. 7. Educational assistance—Planning—Congresses. I. Gerrard, Christopher D., 1951– II. Ferroni, Marco A., 1948– III. Mody, Ashoka.

HG3881.5.W57 G55 2001
338.91—dc21

2001035187

This volume is based on a workshop that was organized by

UNDP Evaluation Office
World Bank Development Economics
World Bank Operations Evaluation
World Bank Resource Mobilization and Cofinancing

With financial support from
The Swiss Agency for Development and Cooperation

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Foreword

Robert Picciotto

The volatility of cross-border private capital flows, the uncertain fate of nations disconnected from the knowledge-based global economy, and the environmental stresses associated with current consumption patterns call for new approaches to the development assistance business.

A combination of market failure and limited institutional capacity to influence economic and social change across national borders underlies public discontent with aid. The time has come to reshape the development architecture to take account of the growing integration of the global economy.

It is now widely recognized that aid works better in countries that adopt fair, favorable, and predictable rules of the game for trade and investment. But the magic of the market has limits, especially for the poorest countries. The growing inequality and instability associated with globalization call for new development initiatives to help reduce poverty. Beyond supporting market-friendly reforms, aid strategies must be designed to overcome social and structural constraints to sustainable development.

A reconsideration of development assistance practices has become necessary to emulate changes that have already taken hold in the private and voluntary sectors. By now, globalization has revolutionized the behavior of private entrepreneurs and financiers in open economies. A far-reaching transformation is also under way in civil society, with the advent of global alliances of nongovernmental organizations. The emerging development assistance paradigm will be characterized by shared international development goals, improved coordination, harmonized practices, and reduced transaction costs.

The change process has just begun. Development assistance is still proffered largely through the funding of investment projects. These are not always selected to be consistent with the demanding requirements of poverty reduction strategies. Yet, unless projects are specifically designed to improve policies and/or build institutions, they are not justified for external funding given the imperatives of development effectiveness under the globalized development order.

The share of aid resources devoted to global policies and programs is still very small even though national economies are buffeted by global market trends, knowledge has overtaken capital as the main factor of production, and public policy specifically adapted to the integrated global economy has replaced public investment as the engine of growth.

As long as national governments held sway over the commanding heights of the economy, the development system was bound to be focused on project financing and country-based plans. But it is by now clear that the weakening of national public bureaucracies to make room for a burgeoning civil society—as well as far-flung multinational businesses—calls for fundamental adjustments in the modalities of development assistance.

To be sure, a large gap needs to be filled in the provision of national public goods. Aid flows are still far too small to trigger and sustain the reform of economic, social, and environmental policies in developing countries. But increasingly the new development paradigm will have to make room for support to global public policies and programs.

Critical development problems that cannot be handled at the country level alone are rising in intensity. As a result, businesslike partnerships will gradually supplant national projects as vehicles for development assistance. This is because the global aid business will necessitate the continued creation of informal development networks geared to the design and implementation of improved public policies and service delivery programs, conceived globally as well as locally.

Already, the priority of meeting a pent-up demand for global public goods has become a common plank of both the right and the left. Given the periodic financial and humanitarian crises instantly pictured on TV screens throughout the world, there is a shared perception of a commonality of interest between developed and developing countries with respect to not just the resolution of humanitarian disasters and global financial crises, but also their prevention.

Similarly, there is growing public awareness that global commons issues (ozone layer, climate change, biodiversity loss, and the like) require international cooperation. In the industrial democracies, the public is evincing growing impatience with massive, cross-border spillovers of such public bads as drug trafficking, air and water pollution, and infectious diseases. It is axiomatic that such problems cannot be solved without international cooperation.

Lack of harmonized policies and standards (for example, for accounting and auditing, labor practices, environmental protection, and intellectual property rights) prevent the emergence of a level playing field for trade and foreign direct investment. And there is a growing public consensus (solidified by the AIDS pandemic and the periodic famines that strike Sub-Saharan Africa) that the production of knowledge goods (such as agricultural and health research) would not meet the needs of the bulk of the world's population (that is, those living in developing countries) if left entirely to market forces.

These were the considerations that motivated the United Nations Development Programme and the World Bank to convene a workshop to discuss the dilemmas associated with the financing and evaluation of global policies and programs. Some of the leading thinkers and practitioners in these areas contributed to this workshop. Their papers in this volume address conceptual issues as well as the practical implementation problems of global public policies and programs.

The cases examined range broadly. They include efforts to craft commonly accepted standards for the design and operation of large dams. They address issues of global financial instability, explore the implications of intellectual property rights protection for developing countries, describe the promotion of international agricultural research, probe the implementation of international public health programs, and identify the dilemmas associated with the financing and evaluation of global public policies and programs.

Such programs have become center stage because of irreversible processes associated with globalization. Similar initiatives will dominate the development scene for years to come. I have every reason to believe that these proceedings will contribute significantly to dealing with these challenges that lie ahead.

Robert Picciotto
Director-General
Operations Evaluation

Acknowledgments

This volume is based on a workshop on global public policies and programs held in Washington, D.C., on July 11–12, 2000. This record has been assembled from transcripts of the recorded proceedings of the workshop as well as accompanying papers and powerpoint presentations that were provided by the 27 contributors to the workshop.

The publication of these edited proceedings has benefited from the contributions and support of many people, both in the planning and organization of the initial workshop and in the subsequent editing of the workshop materials.

The workshop was jointly organized by the United Nations Development Programme (UNDP) Evaluation Office and by three World Bank vice-presidencies: Development Economics (DEC), Operations Evaluation (OED), and Resource Mobilization and Co-financing (RMC). In addition to the three editors, the organizing committee for the workshop comprised Osvaldo Feinstein, Greg Ingram, Uma Lele, and Aristomene Varoudakis. Robert Picciotto, Motoo Kusakabe, Paul Hubbard, Khalid Malik, Nural Alam, and Inge Kaul also provided ongoing advice to the committee.

Jan Piercy (for the World Bank) and Khalid Malik (for UNDP) provided opening remarks on behalf of the two sponsoring organizations, which set the stage and challenged the participants. Manuel Conthe, Ian Johnson, Khalid Malik, Mamphela Ramphele, and Vinod Thomas kindly agreed to chair individual sessions of the workshop.

Marcia Bailey, Sarah Crow, Shukri Hayir, Aichin Jones, Pierre-Joseph Kingbo, Patrica Laverley, Maria Mar, Caroline McEuen, Diana Qualls, Kathy Strauss, Elaine Wylie, and Tom Yoon provided various kinds of technical

support, including preparing graphics, assembling participants' binders, registering participants, operating audiovisual and computer equipment, and tape recording. Special mention goes to Elaine Wylie for handling most of the administrative and financial aspects of the workshop, including hotel reservations, facilities, and travel arrangements.

Pat McNees did the lion's share of the editing of the recorded transcripts of the proceedings, while also drawing upon, as appropriate, the powerpoint presentations and written papers provided by the contributors. Elizabeth Campbell-Pagé and Caroline McEuen provided technical advice and support in the preparation and publication of the proceedings.

Last but not least, the Swiss Agency for Development and Cooperation has provided generous financial assistance both for the workshop itself and for the publication of these proceedings.

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Acronyms and Abbreviations

ABB	Asea Brown Boveri (a global engineering company with headquarters in Zurich)
AIDS	Acquired immunodeficiency syndrome
ANC	African National Congress
ARPA	Advanced Research Projects Agency (U.S.)
ARS	Agricultural Research Service (USDA)
AT&T	American Telephone & Telegraph
AZT	Zidovudine (medication for treating HIV/AIDS patients)
BIS	Bank for International Settlements
BP	British Petroleum
CAS	Country assistance strategy (World Bank)
CDC	Centers for Disease Control and Prevention (U.S.)
CDF	Comprehensive Development Framework (World Bank)
CDM	Clean Development Mechanism
CEA	Council of Economic Advisers (U.S.)
CERN	European Organization for Nuclear Research
CERs	Carbon emissions rights
CFCs	Chlorofluorocarbons
CG	Consultative group
CGIAR	Consultative Group on International Agricultural Research
CGAP	Consultative Group to Assist the Poorest (a microfinance program)
CIAT	Centro Internacional de Agricultura Tropical (International Center for Tropical Agriculture)
CIDA	Canadian International Development Agency

CIFOR	Center for International Forestry Research
CIMMYT	Centro Internacional de Mejoramiento de Maíz y Trigo (International Maize and Wheat Improvement Center)
CIP	Centro Internacional de la Papa (International Potato Center)
DALY	Disability-adjusted life-year
DDI	Didanosine (medication for treating HIV/AIDS patients)
DEC	Development Economics Vice-Presidency (World Bank)
DGF	Development Grant Facility (World Bank)
DNA	Deoxyribonucleic acid
DOD	Department of Defense (U.S.)
DOE	Department of Energy (U.S.)
ECOSOC	Economic and Social Council (United Nations)
EEZ	Exclusive economic zone
EIT	Energy-intensive
EMBRAPA	Brazilian Agricultural Research Corporation
EMRs	Exclusive marketing rights
EPI	Expanded Program on Immunization (WHO)
ERs	Emissions rights
ESMAP	Energy Sector Management Program
EST&P	Environmentally sound technologies and products
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FDA	Food and Drug Administration (U.S.)
FSAP	Financial Sector Assessment Program
GAVI	Global Alliance for Vaccine Initiatives
GCGF	Global Corporate Governance Forum
GCGP	Global Corporate Governance Program
GDLN	Global Distance Learning Network (World Bank)
GDN	Global Development Network
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gas
GMO	Genetically modified organism
GNP	Gross national product
GPG	Global public good
GPS	Global Positioning System
GURT	Genetic-use restriction technology
HIPC	Heavily indebted poor countries
HIV	Human immunodeficiency virus
HURiST	Human Rights Strengthening (United Nations)
IAVI	International AIDS Vaccine Initiative
IBPGR	International Board for Plant Genetic Resources

IBRD	International Bank for Reconstruction and Development
ICANN	Internet Corporation for Assigned Names and Numbers
ICARDA	International Centre for Agricultural Research in the Dry Areas
ICD-10	International Classification of Diseases, 10th edition (WHO)
ICDDR-B	International Centre for Diarrhea Disease Research in Bangladesh
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDRC	International Development Research Centre (Canada)
ICRAF	International Centre for Research in Agroforestry
IDA	International Development Association
IFC	International Finance Corporation
IFI	International financial institution
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
IMF	International Monetary Fund
INTELSAT	International Telecommunications Satellite
IPG	International public good
IPGRI/ INIBAP	International Plant Genetic Resources Institute/ International Network for the Improvement of Banana and Plantain
IPR	Intellectual property right
IRRI	International Rice Research Institute
IUCN	World Conservation Union
IWMI	International Water Management Institute
JI	Joint implementation
LANDSAT	U.S. satellite for making remotely sensed images of the Earth's land surface
LORAN	Long Range Radio Navigation
MELISSA	Managing the Environment Locally in Sub-Saharan Africa
MWTP	Marginal willingness to pay
NARI	National agricultural research institute
NARS	National agricultural research system
NASDAQ	National Association of Securities Dealers Automated Quotations (a U.S. stock exchange)
NATO	North Atlantic Treaty Organization
NIH	National Institutes of Health (U.S.)
NGO	Nongovernmental organization
NOAA	National Oceanic and Atmospheric Administration (U.S.)
NRC	National Research Council (U.S.)

NSF	National Science Foundation (U.S.)
ODA	Official development assistance
ODC	Overseas Development Council
OECD	Organisation for Economic Co-operation and Development
OED	Operations Evaluation Department (World Bank)
OIHP	Organisation Internationale d'Hygiène Publique (the forerunner of WHO)
ORT	Oral rehydration therapy
PCF	Prototype Carbon Fund
Ph.D.	Doctor of Philosophy
PPIAF	Public-Private Infrastructure Advisory Facility
PR	Public relations
RAFI	Rural Advancement Foundation International
R&D	Research and development
RMC	Resource Mobilization and Cofinancing (World Bank)
ROSC	Report on the Observance of Standards and Codes (IMF)
SDDS	Special Data Dissemination Standard (IMF)
SDR	Special Drawing Right (IMF)
SPAAR	Special Program for African Agricultural Research
SSATP	Sub-Saharan Africa Transport Program
TB	Tuberculosis
TDR	Special Programme for Research and Training in Tropical Diseases
TRIPS	Trade-Related Intellectual Property Rights (WTO)
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNICEF	United Nations Children's Fund
UNDP	United Nations Development Programme
UPOV	Union pour la Protection des Obtentions Végétales
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture
WARDA	West Africa Rice Development Association
WCD	World Commission on Dams
WDR	World Development Report (World Bank)
WHO	World Health Organization
WTO	World Trade Organization

The World Bank and Global Public Goods

Jan Piercy

In an address last week to the United Nations Economic and Social Council (ECOSOC) that sparked intense debate, U.S. Treasury Secretary Larry Summers spoke of 10 elements he felt must come together if we are to achieve "a new global consensus." One of these was better provision of global public goods. Without the public sector, Summers noted, there would have been no development of the Internet, no sequencing of the human genome, no eradication of major diseases. None of these advances could have been achieved in a purely national context, even in the United States, let alone in smaller, poorer countries. Global public goods must occupy a much more prominent place on our development agenda.

Secretary Summers observed that tangible successes such as those we have had with the Consultative Group on International Agricultural Research (CGIAR) are absolutely essential for reducing poverty and enhancing opportunities for growth. And, practically speaking, for people who sit as I do—representing the United States on the World Bank's Board and having to make the case with legislatures for providing continuing financing—documented successes such as CGIAR and CGAP (the Consultative Group to Assist the Poorest) help build the case for continuing investments and help counter the argument that development assistance is simply money down the drain. Sad to say, that negative image still prevails among some in the United States and the rest of the donor world.

The challenge of financing

"In the provision of public goods," Summers concluded, "financing is the crucial challenge. Everyone—governments, foundations, and international

institutions—wants to leverage the efforts of others, and no one wants to be leveraged." Acknowledging that the United States has no ready answers, Summers expressed the conviction that the multilateral development banks should review their current net income and pricing policies. He is also convinced that we must develop the vast undertapped potential for cooperation within public sectors as well as between the public and private sectors. With the U.S. Forbes 400 commanding more than $1 trillion in resources, the private sector is clearly a source to be reckoned with. Secretary Summers, with whom Jim Wolfensohn and I met yesterday (in part to discuss how to finance global public goods), was pleased to learn about today's meeting and thought UNDP and the Bank were absolutely on the right track in taking up these questions.

Closer to home, yesterday the Bank's Board Committee on Development Effectiveness met to review OED's study of the Bank's forestry strategy and Bank management's response to it. OED is noted for its independence and forthrightness, never hesitating to call things as it sees them. This is vital in evaluation. One conclusion OED drew was that the Bank needs to be proactive in raising concessional financing to meet global objectives on a large enough scale to make a difference.

We can look to the forestry sector to illustrate several issues we'll be discussing in this workshop. First of all, there is growing recognition of the critical role financing plays in the forestry sector. Being able to effectively finance interventions—which in global public goods are necessarily long term in nature—can often make the difference between whether an intervention has positive impacts on development or is disastrous. One issue the Bank is wrestling with, for example, is whether in the forestry sector the Bank should stick with an absolute ban on logging in tropical moist forests or—recognizing how much the poor depend on forests for their livelihood—consider selective interventions that allow us to protect the forests but at the same time provide livelihoods for the poor. Whether we can do this depends largely on whether we can provide the resources (1) to effectively monitor our adherence to our safeguard policies in such interventions and (2) to support alternative employment for people who live in the forests in a way that protects the environment yet provides revenue. Lacking adequate resources for this sector, the Bank and others have avoided controversial areas in which it is difficult to do things right. Many of the world's poor people, however, depend on us to do more.

The challenge of participatory evaluation

OED's work on the forestry sector also highlights the increasing importance of participatory approaches to evaluating development effectiveness. I am enthusiastic about such evaluation, partly because we need the evaluation

results to understand an intervention's impact and to make a case for financing, and partly because the kind of evaluation OED and its partners are currently undertaking is in itself developmental. The workshops held as part of the forestry sector review themselves created capacity, and extended networks and knowledge. Similar regional workshops are now under way for gender evaluation. With such double impact, I think we can make a very strong case for the resources we need to do this work.

But participatory evaluations present a challenge to all of you in the evaluation family. How do you preserve the detachment that has been considered essential to the independence and integrity of evaluation results when you are operating in ever more participatory ways? It is important to preserve an independent perspective in evaluations affecting the use of global public goods, about which there are such urgent agendas, and many doubts about the value of diverting resources into research that are urgently needed to attack global public goods problems themselves. I want to honor both the promise and the challenges of this new proactive evaluation, the process for which provides a beneficial impact even as the results of different kinds of intervention are being assessed.

Who should do what, when?

Most of the 90 or so global programs in which the Bank is now involved were started within the last five years. Like UNDP, other parts of the United Nations family, bilateral donors, and, thankfully, some parts of the private sector, we at the Bank are still asking, "How do we become effective at providing global public goods?" We know how to build roads. We know how to build a hospital. But how do we deal with tremendously interconnected problems such as water access and quality, or global warming, the magnitude of which threatens to overwhelm us? When it is hard to say which interventions are urgent because they all are, sequencing becomes important.

Part of what focuses the discussion is how fast this is all evolving. We haven't yet communicated this effectively to the community from which we must draw resources. Even the term "global public goods" is new, and making it a part of international consciousness will be a challenge. A recent Bank Board paper, "Addressing Global Dimensions in Development," begins to lay this out. Clearly, we must become more systematic about how we identify and inventory the global public goods that require our attention and then zero in on what the resource needs are, who should do what, in what sequence, how we should partner, and how we should specialize—so that we can clearly say we're leaving some things to others.

Let me be frank about the issue of financing. (This is a personal perspective.) Jim Wolfensohn has talked a good deal about "global public goods" and about partnership, and the Bank has begun to move in these areas. When the Bank enters an area, it attracts resources to the efforts it undertakes. The

policy dialogues it establishes may be controversial in some quarters, but they are well respected in others. As one person put it, however, the Bank has a way of taking up a lot of oxygen. On the Board, and I trust in management itself, we're beginning to wrestle with this question: Do we do X at the expense of other actors who may be less well known or less well established and resourced than we are, but who have more expertise in a particular area? Should we in the global community be deferring to and supporting certain organizations which have specialized mandates and are thus able to be more focused on certain tasks?

The World Health Organization is a good example here, I think. For a long time there was a sense that perhaps WHO's leadership may have been insufficient to meet the challenges it faced. During that period, many urged the Bank to do much more than it had done before in the health sector. Now that WHO has stronger leadership that is focused on identifying priorities, should we rebalance? Should we reduce what we do, not because it isn't urgent but because there's another player who has the mandate to address global health problems, and who is clearly competent to do so? I welcome your perspectives on these difficult questions. I welcome clear feedback about how other organizations see the Bank's role in addressing issues associated with global public goods.

The workshop agenda

Over the next two days we'll be discussing (1) definitional issues, (2) alternative ways of paying for global public goods, (3) whether we're using our resources efficiently and cost-effectively (for which the role of evaluation is central), (4) the comparative advantage of multilateral banks, United Nations agencies, and bilateral donors in providing global public goods, and (5) how we can find common ground for making decisions about global public goods when, unlike nations within their own jurisdictions, we do not have any internationally agreed-upon framework for coordinating our efforts or agreeing on priorities—indeed, in some quarters, I detect a fundamental distrust of global governance. The emergence of cooperative efforts in Europe is encouraging and I believe meetings like this will help us find a way to build that framework. One challenge will be balancing global efforts with efforts at the country and regional level.

This is a program development workshop, not a conference in which we simply listen to papers, add to our knowledge, and then return to our respective realms. For UNDP and the parts of the Bank associated with this workshop—DEC, RMC, and OED—this is a serious consultation. We've organized this workshop to get advice from you before we launch new research and evaluation programs with respect to global public goods, policies, and programs. After a keynote presentation this morning, there will be a panel

discussion on conceptual issues, new challenges, and emerging perspectives on how to define supply and demand for global public goods. This afternoon and tomorrow morning we will have four thematic sessions, on the environment, health, knowledge, and global financial stability. We hope in this process to exchange lessons and experience and explore their implications for the financing and evaluation of global public goods. Then tomorrow afternoon in two wrap-up sessions we will discuss (1) practical options for financing the provision of global public goods, and (2) a framework for evaluating global public policies and programs.

Grant financing for global public goods

In the last three years there has been a remarkable evolution in the Bank's thinking about how to finance global public goods. Various shareholders have been wrestling with the question, to what extent is it appropriate for the World Bank, which is primarily a lender, to move into financing on a grant basis? Three years ago, the Bank created a Development Grant Facility to bring together efforts in various parts of the Bank to provide grant financing. Tomorrow, the Committee on Development Effectiveness will be discussing the allocation for the Development Grant Facility for this year.

Sometimes we tend to define problems in terms of the solutions we understand or the instruments we have. For a long time, as the Bank moved increasingly into investments in human development, and protection of human and social capital, we tried to do it with loans, the Bank's main instrument. Former French Executive Director Marc Antoine Autheman used to contend that for IBRD borrowers, it didn't necessarily make sense to borrow for investments with a long-term payoff, such as education, because these might not generate economic returns within the loan payback horizon. Such investments, he contended, should be integral to a country's own budget financing. He said that if a case could be made for our intervention, we had to find a different basis for doing it.

Recognizing this, the Bank created the Development Grant Facility. I must be candid, however: the DGF is not yet well established, and within the Bank we continue to have quite a debate about the appropriateness and the criteria for Bank grant financing. One value of the Development Grant Facility is its requirement that programs financed through it are undertaken in partnership with other organizations. That is one of the criteria we look at in reviewing programs for potential DGF financing. Both Bank President Wolfensohn and U.S. Treasury Secretary Summers are keenly focused on the question of how to finance global public goods that we are convinced absolutely require global action—including the growing HIV/AIDS crisis.

Clearly, we must increase—even double—the size of the Development Grant Facility, and for global public goods we must learn how to do things on a grant basis. To do so, however, we must have a clearly prioritized and se-

quenced agenda, with a lot more clarity than now exists on what the responsibilities for action are within the global community, and how to evaluate outcomes. We need to know who should be doing what, and how to proceed. We look to the evaluation community for insight and early guidance on what is cost-effective, what is paying off, and where we should put those dollars—especially those grant dollars, which are very, very hard to come by.

Were he here today at this workshop, I think Larry Summers would concede that "global consensus" is part aspiration and part actuality. In coming together like this, however, I believe we can begin to build the necessary working consensus to proceed.

UNDP and Global Public Goods

Khalid Malik

While the subject of global public goods (GPGs) has been of interest to UNDP for some time, the forces of globalization and the concerns expressed as a result, particularly by developing countries, recently have given the topic much more importance and have highlighted the need for a coherent framework to analyze the key issues involved.

In 1999, with the publication of the book *Global Public Goods: International Cooperation in the 21st Century*,[1] UNDP tried to articulate some of the concepts involved in such a framework. The book points out that with their nonrivalry, nonexcludability, non-time-bound, and global attributes, GPGs are short of suppliers even though the need for them is greatly felt. Each country hopes that another will assume responsibility for its supply so that it can free-ride the benefits. The book identifies international cooperation as the means to deal with the undersupply of GPGs.

In UNDP, GPGs are increasingly becoming an important activity absorbing increasing proportions of the organization's resources. An indicator of this trend is the number of GPG evaluations undertaken, especially by UNDP, about 90 of them, mostly at the project level, over the 1995 to 2000 period. If present trends continue—which is likely, given the growing interest in a tighter alignment of national, regional, and global programs to the key goals of UNDP—the proportion of the organization's resources flowing to the provision of GPGs will continue to grow.

Global norms and standards

I would first like to mention the emerging global norms and standards arising from the UN conferences referred to in the UNDP book on GPG as a class-2 category of GPG human-made global commons. UNDP has a value in reducing the social costs of adherence/alignment by developing countries to these norms/agreements. In this respect, UNDP's value is directly derived from it being an intrinsic part of the United Nations, drawing upon its trust and neutrality. UNDP is active in three areas in particular: follow-up to the commitments made by governments at the United Nations Conference on Environment and Development in 1991; follow-up to the World Summit for Social Development (WSSD) in 1995; and follow-up to the Fourth World Conference on Women (FWCW) in 1995. Also, the area of human rights represents an increasingly important area of work of UNDP, witnessing a sharp growth over the past two or three years.

With regard to environment, humanity presently faces an unprecedented confluence of changes and challenges that intrinsically require a global response. Scientific evidence has demonstrated that human activities are degrading the planet's fundamental life-support systems: the biosphere, atmosphere, and hydrosphere. The symptoms, such as loss of biological diversity, climate change, and degradation of the oceans and international waters, threaten all nations and the well-being of future generations. UNDP efforts currently under way coordinate national, regional, and global responses through environmental control and protection programs, including through adherence to norms and principles such as those defined in the Climate Change Convention.

A similar approach is being used for the follow-up to the World Summit for Social Development. UNDP has championed the fight against poverty—indeed, this is the primary goal of the organization. In 1999, UNDP spent over 40 percent of its core resources directly on poverty eradication and supporting sustainable livelihoods. At the United Nations Millennium Summit of September 2000, world leaders endorsed a set of shared GPG objectives for the year 2015 that included halving the proportion of people living on less than $1 a day. To accomplish this goal, UNDP and the rest of the international community has been called upon to make available to governments and other national actors the knowledge of best practices they have gained through experience. UNDP is simultaneously working with developing country governments to promote good governance and create the necessary enabling environment for sound socioeconomic development—an essential prerequisite to achieving our goals for poverty reduction.

The norms resulting from the Beijing Women's Conference are well established and the need for collective action is amply documented. An assessment of the implementation of the Platform of Action, however, indicated that it

requires substantially enhanced support. There is still a long way to go to "mainstream" gender perspectives and assessments of gender impact in national laws, plans, and programs. Despite funding constraints, UNDP has initiated work on ensuring gender equality in the decision-making process at all levels and on promoting women's equal access to and control over economic and social assets, thereby fostering gender mainstreaming into development policies, processes, and programs to fully empower women, including in the exercise of human rights.

Human rights gets particular attention in UNDP through Human Rights Strengthening (HURIST), a program that seeks to integrate work on human rights with the goals of Sustainable Human Development. HURIST is expected to contribute to the international debate concerning major areas of relevance to human rights, particularly the economic and social effects of globalization. Thus, UNDP makes it a policy to integrate human rights in its work, and in this context, to uphold the United Nations concept of human rights as indivisible, inalienable, and universal, comprising economic, social, and cultural as well as civil and political rights. Human rights—HURIST—programs already under way as of September 2000 provide support to some 14 countries.

Participation in regional and global frameworks

A second category of GPGs in which UNDP is increasingly involved relates to the inclusion and participation of developing countries in regional and global frameworks. For example, together with UNCTAD, UNDP is increasingly being called upon to help developing countries to meet the accession requirements to the World Trade Organization (WTO). WTO has assumed a pivotal role in the global economy and is rapidly linking all the countries of the world to a comprehensive trade and economic framework. Developing countries are often disadvantaged in international economic negotiations with WTO. They are frequently not adequately prepared for negotiations and they rarely possess the expertise for substantive or legal discussions on accession terms favorable to them. Consequently, they turn to UNDP for neutral and objective assistance to facilitate their accession.

Shared problems

A third category of GPG demands on UNDP relates to solving problems that cross borders, such as HIV/AIDS. Despite all the efforts over the past two decades, HIV/AIDS has continued to spread at an alarming rate. To respond to the challenge, UNDP is facilitating exchanges of lessons, good practices, and experiences across countries of the globe.

Information technology and knowledge

A fourth GPG category is knowledge, which is a good example of a globally available resource that is currently underused in efforts to reduce poverty. The problem is that, although information and communications technology has helped to generate an unprecedented spread of knowledge in some parts of the world, it has also led to the creation of a vast new digital divide that has exacerbated the gap between the rich and the poor—the information haves and information have-nots. UNDP and the World Bank are jointly leading an exercise to find ways to shrink this divide. It is hoped that with modest international support, use of the new technologies will substantially enhance the sharing of knowledge and, with the right conditions, a more equal sharing of global opportunities. Some countries, India among them, are already beginning to take advantage of such technology to initiate new businesses, to receive training, and to become productive members of global information technology–driven markets.

Social cohesion

The fifth category refers to the area of social cohesion, which, it could be argued, is nation- or area-specific. Yet as is constantly demonstrated, local problems have a way of becoming regional and global concerns. The world at large has a vested interest in the stability of national societies and cultures. Participation and consensus building, when it promotes social cohesion and stability, emerges as another underproduced public good. There are clear, demonstrated advantages in broadening the institutional space for other actors, like NGOs and the private sector, who share an interest in the provision of GPGs. In the private sector, the interest in GPG activities is increasingly evident (for example, the Ted Turner and the Bill and Melinda Gates foundations). People depend on both private and public goods for their well-being and survival. The essentials—food, shelter, clothing, peace, security, law and order, public health, public education, and clean environment—go hand in hand. It is recognized that without an adequate provision of GPGs, markets can not function efficiently, preventing the production of many private goods. Similarly, NGOs are increasingly important in the supply of GPGs, an important reason why the United Nations involves them in all types of international conferences and regional exercises. Among other things, UNDP supports the institutional development of local and national NGOs in developing countries given their large role in the design and implementation of GPG initiatives at grassroots levels. Here again, it becomes an opportunity for aid agencies to go beyond traditional donor-recipient relationships in international cooperation and to identify and conduct international action based on global and regional GPG requirements, action which benefits the broader international community.

Conclusion

The scope and extent of UNDP involvement in GPGs is part of a growing body of experience that can be evaluated and assessed. From such experience, we can hope to gain an empirical perspective on GPG issues, and to identify lessons for policy action.

GPGs are a very powerful new argument for using grant transfers as a basis for international cooperation. Such transfers are urgently needed for the continuous and expanding supply of GPGs.

UNDP will continue to assist developing countries in recognizing their needs for particular global goods, and in placing those needs on the global policy agenda. Commitments toward funding the agenda—above and beyond meeting traditional overseas development assistance requirements—will be needed if we are to ensure a satisfactory supply of GPGs and, ultimately, a safe world for present and future generations.

Note

1. Inge Kaul, Isabelle Grunberg, and Marc A. Stern, eds. *Global Public Goods: International Cooperation for the 21st Century* (New York: Oxford University Press, 1999).

Part I

Keynote Address

Financing International Public Goods: A Historical Overview and New Challenges

Richard N. Cooper

The professional literature on the economics of public goods goes back more than a century but in its modern form starts with a classic article by Paul Samuelson, whose theory of pure public goods formalized and mathematized some ideas that had been around before. A pure public good has two attributes: *nonrivalry* (that is, my consumption of the good in no way reduces your ability to consume it) and *nonexcludability* (that is, no one in the relevant vicinity can be prevented from consuming the good). Those are strong conditions, and few pure public goods exist. *Knowledge* is one important class of pure public goods. If an important new idea, or knowledge of a dramatic event such as a visit to the moon, gets into the public domain, you and I can both consume it without reducing its consumption by others, and it is difficult to exclude people from access to it. With *clean air*, another pure public good, vicinity is relevant, but if a particular area has clean air, you and I can both breathe it and we can't be excluded from breathing it, short of serious coercion. As later examples will show, however, most things that we call public goods are not pure public goods.

At the other extreme are *private goods:* if I consume a good, nobody else can. Moreover, possession is excludable and it is possible to keep others from consuming it. There are many more pure private goods than pure public goods, but many private goods also have public aspects, which economists call *externalities*. I enjoy the view of my neighbor's flower garden, for example, or of the repainted trim on his house, which I experience as a positive externality (my view improves, among other things). Many goods with some public attributes can, at some cost, be excluded from consumers who are not willing to pay for them. In the real world, there is a vast territory between

pure private goods (of which there are many examples) and pure public goods (of which there are few). On the broad continuum between purely public and purely private goods, there are no sharp boundaries. The issue is often more quantitative than qualitative.

As important as the character of the good is the domain of its coverage. Truly global public goods are rare; purely local ones are much more common. To address only global public goods is too confining. An international organization should be concerned with transnational public goods, especially goods that serve more than two countries, so that coordinating their acquisition may be difficult.

Addressing the undersupply of public goods

Public goods, and goods with positive externalities, are characteristically undersupplied because purchasers do not reap the full social benefits from them. And public bads, or goods with negative externalities, are characteristically oversupplied. (While I'm going to talk about public goods, whatever I say about public goods can also be said about public bads such as environmental pollution, by, speaking algebraically, changing the sign from positive to negative.) Incidentally, goods may be undersupplied for reasons other than rivalry and excludability. A monopolist supplier, for example, can limit the supply because doing so raises his profits. Many kinds of institutional and market failure, having nothing to do with goods being public, may lead to the undersupply of important goods that may not be considered public in the classic economic sense.

Everyone should be in favor of a pure public good, but in the real world someone is usually going to oppose what you or I may regard as public goods. Human beings adapt to the absence of a public good. If lots of people are sick, an industry forms to look after sick people. The people who earn their livelihood looking after sick people are unlikely to be enthusiastic about preventive public health measures. Ferrymen will not be tremendously enthusiastic about bridges, which take away their livelihood. Some religious figures oppose secular education. And so on. In reality, we should expect that the people who will be required to pay for a public good, or who will lose something from its provision, are likely to object to it. As a matter of public policy, we should be less interested in public goods per se than in *the undersupply of goods with social value.* Generally we should be looking for investments that will produce higher-than-average social returns. Public goods are simply one important class of investments which may produce high social returns because of their public attributes.

If the incentive structure is such that not enough goods are available, some kind of collective action may be needed. Our interest should be in how much a public good is undersupplied and how important it is to human welfare.

These are the questions that we should be addressing at this workshop: Are important investments with high social payoffs and low social risk not being made? Should they be made? If so, who should take the initiative? And who should pay for them?

Public goods provided in the past

This workshop has emphasized four classes of public goods—environmental quality, public health, the generation and dissemination of knowledge, and global financial stability—all of which are unquestionably important. But the workshop organizers, perhaps reflecting a natural division of labor, chose to exclude other equally important goods that will be undersupplied without collective action. One such good is *peace and security from physical harm*, which in some respects is a prerequisite for enjoying the other public goods. You can say that is somebody else's department, but a workshop on global public goods should consider peace and security to be essential. One hundred years from now, the twentieth century—especially after 1950—will be noted for two things: explosive population growth and extraordinary economic growth. It is no coincidence that this has happened during the longest period of peace in Western Europe since the Roman Empire. Economists tend to take that kind of peace for granted, but the fact is, physical conflict can tremendously disrupt economic activity and social well-being.

Another powerful public good is a *legal system* in which people understand the rules, can make long-term contracts, and have a system for settling disputes. As Mancur Olson emphasized in his last book, without such a system, including a commercial code, intertemporal deals cannot be made—and modern economic development absolutely depends on intertemporal deals. If we can't make deals over time (I invest now and reap the rewards later), the scope for sensible possibilities is drastically reduced. Is this someone else's domain? I'm not sure. I suspect the most powerful benefit of China's membership in the World Trade Organization may fall under this heading. Over time, assuming things go well, WTO membership will give China a meaningful legal framework for the first time in its long history.

The public good that first came to mind when I was asked to talk about the history of global public goods was *infrastructure for transportation and communication.* We're talking now of global, not just local, issues. The classic public good, whose existence goes back to antiquity, is the *lighthouse,* guiding people at sea to safety. Recently, we have also been reminded of the importance of *measuring longitude* and the subsequent and closely related global *system for measuring time*—both relatively new phenomena. We learned how to measure longitude only in the eighteenth century and our global system of time dates back only to the 1880s. You had to have an accurate timepiece that could tolerate motion at sea to measure longi-

tude and developing such a timepiece took a long time. The man who figured out how to keep accurate time did so in response to a substantial prize offered by the British government because the British Navy and merchants were tremendously interested in finding a way not to get lost at sea. The solution to the problem of keeping accurate time helped resolve the ancient problem of long-distance navigation over open water, and once both pieces of knowledge were available, anyone who could buy an accurate timepiece could use them.

More recent examples include construction of the Suez Canal (which opened in 1869), and the much more ambitious Panama Canal (which opened in 1914), neither of which was literally a global public good but both of which facilitated the flow of goods, people, and ideas—important externalities affecting a substantial part of the globe. The Suez Canal, you will recall, was financed by private equity, by a company jointly owned by private parties in France and Egypt—although the British later bought out the Egyptian interest in the Canal—augmented by bond financing. The bonds were to be paid off by charging user fees, requiring selective exclusion.

The Panama Canal was financed exclusively by the U.S. government, after an earlier failure by a private French firm. The American government saw a strategic need to move its navy between oceans, and going around Cape Horn was the hard way to do that. So the Panama Canal was built with U.S. funding, with the interesting stipulation that fees for using the canal (which was open to everyone) could not be used to cover the costs of building the canal. The fees could cover only operating costs, plus a small royalty to Panama, plus a small reserve. In this case the entrepreneur, the U.S. government, decided quite consciously to bear the fixed capital costs and, in a sense, by so doing to subsidize international shipping.

Then the airplane came along and we needed navigational aids and guidance, such as LORAN, ground-based air traffic control, and, more recently, the Global Positioning System (GPS). GPS, which was important for military use, was also financed wholly by the U.S. government and is provided gratis to anyone anywhere in the world who can buy the little gizmo required to pick up its signals. It is, in fact, a pure public good. At some additional cost, it could easily have been encrypted and confined to use by the U.S. military and its allies, but a conscious decision was made not to encrypt it and to make it available to the global public (although it is possible to degrade the signal in time of military need).

The story of long-distance communication differs somewhat from the story of transportation. The telegraph was of tremendous interest to the burgeoning railroads, which for a fee, offered communication to others. The telephone was developed by a private U.S. company as a potential monopoly, with the incentives of a monopoly, but quickly became regulated so it would not be tempted to undersupply services to increase prof-

its. Other countries formed state-owned enterprises to handle telegraph and telephone. It's one of those paradoxes of human endeavor that an undersupply of telephone services can usually be found where state-owned enterprises are involved—enterprises that behave like monopolists, not necessarily in the fees they charge, but in their behavior regarding supply. There can be government and institutional failures as well as market failures.

Developing broadcast radio and television required allocating and regulating use of the radio-magnetic spectrum. Some countries created state enterprises to deal with interference issues, and again, where state enterprises were involved, there was often an undersupply of services. One thing to think about is that potential solutions to market failures often do not do what they were supposed to do.

The first commercial communication satellites were placed by a government-sponsored international consortium, INTELSAT, under a U.S. initiative, back in the 1960s. The Internet was created by a U.S. defense agency, ARPA, in the 1960s to compel U.S. universities under contract to use large, expensive computers more efficiently through time-sharing. The Defense Department didn't want to buy as many computers as the universities were demanding, so it created the Internet partly as a substitute for buying more computers. The rapid development of computers weakened that rationale, but once the network and protocols were established, far from atrophying, the Internet exploded, largely through private initiatives.

In general, goods with public attributes are provided when a single decisionmaker backed by adequate financing has a strong enough interest in providing them. Other beneficiaries will be free riders, except where user charges can be levied—as was the case with the two canals and with international air traffic control—making excludability possible (which it often but not always is). This general conclusion applies not only to transportation and communication but also to public health and knowledge generation and, with appropriate adaptation, to environmental issues and to financial stability.

Public goods in health

Let's take a quick look at public health, historically. Serious epidemiological work began in Britain and France following several cholera epidemics in the nineteenth century. The forerunner of the U.S. Public Health Service was created in 1878. Serious international collaboration—at first mainly the standardization of concepts and the exchange of information—started in 1907, with the establishment of the Organisation Internationale d'Hygiène Publique (OIHP), the forerunner of the World Health Organization. Puzzlement about how epidemic disease (especially, but not only, cholera) was generated and transmit-

ted prompted research, and national and international competitions were created, offering prize money to people who came up with useful ideas. The German Robert Koch won the prize for cholera in the 1880s, drawing on earlier work by the French scientist Louis Pasteur. (The source had actually been discovered 30 years earlier by an Italian scientist, Pacini, in a paper submitted for a well-advertised French prize and rejected as irrelevant, illustrating how critical timing often is to knowledge generation. We now know that his scientific discovery was correct—he even backed it with substantial detail, including a mathematical model of the small intestine—but it was rejected by the scientific community of the day. Only in the late twentieth century was Pacini honored—by putting his name at the end of the name for the microbe that causes cholera.)

For practical reasons, the U.S. Army was tremendously interested in the problem of yellow fever and, later, malaria. Walter Reed and his team, working for the U.S. Army, solved the practical problem of controlling yellow fever, and the U.S. Army, during World War II, made rapid advances in controlling malaria in certain key areas. British and French colonial administrations also took a great interest in controlling tropical disease. Britain, among other things, created the Ross Institute and Hospital for Tropical Diseases and the School of Oriental Medicine. After its founding in 1913, the Rockefeller Foundation took great and continuing interest in medical and agricultural research, especially in the tropics, supporting efforts that helped produce the green revolution by introducing new strains of rice and wheat.

Knowledge as a public good

The importance of knowledge is now—belatedly—widely recognized, which I take special satisfaction in, being in the knowledge-producing industry. Rich countries finance research through a variety of channels. The U.S. government, for example, finances research through the NSF, NIH, DOD, DOE, NOAA, and USDA, to identify only the major channels. Private firms engage in extensive applied research—AT&T in communications, DuPont in chemicals and plastics, Merck in pharmaceuticals, to name only a few examples from a very large class. Through patents, we confer temporary monopolies to encourage such research, and the race is on. Indeed, theoretically, applied research could transform an *undersupply* of knowledge into an oversupply, as firms race for first-mover advantage and patent control. My guess, however, based on empirical work that records continuing high rates of return to research, is that we have not yet reached a state of oversupply.

We should not forget the role of nongovernmental organizations (NGOs), and, especially in the United States, private foundations as sources of finance, and universities as loci of execution. From Andrew Carnegie in the late nineteenth century to Bill Gates in the late twentieth century, American philanthropy has remained alive and well. Total new charitable giving

amounted to $151 billion in 1997, or about 2 percent of GDP. Nearly half of that went to churches, but education, health, and the arts all got substantial private funding, as well as social services. To be tax-deductible, all philanthropy is required (by U.S. tax law) to improve public welfare, so in principle all of it is to some degree a public good. Private philanthropy for diverse purposes has also developed in Britain and Germany, but so far as I am aware has developed much less in other countries. If I am correct, it's worth asking why private philanthropy is well developed in a few countries but poorly developed in other countries that are equally well off economically.

I would argue that the professional rewards to successful research are now so high in the United States—through promotions, raises, prizes, awards, and other forms of recognition and social status—and so institutionalized, that *any* promising idea is likely to be pursued at least to the point where substantial funding is required for further development. Thousands of Ph.D. candidates are searching for ways to contribute to knowledge, because in principle such a contribution is required for a doctorate. Of course, research, like other human activities, is subject to both intellectual and political fads—right now I'd say cancer research and ideas for new dot.coms have the best chance of getting funding—and some research requires such substantial funding as to be beyond practical reach. Theoretical physicists tell us, for example, that they can't push beyond the "standard model" of high-energy physics without additional evidence. The kind of evidence needed requires very high energy collisions, which requires tremendous energies and very expensive machinery. The U.S. Congress has balked at putting up the billions of dollars required to build the needed facility. Europe moves forward on a less ambitious scale with CERN, a productive example of international collaboration in basic research. This "failure" to advance further knowledge in high-energy physics, and hence in the structure of matter, was a conscious decision, not the result of market failure; and it was rationally based on cost. Future advances in technology, or increases in wealth, may revive this particular line of research.

Environmental issues

As a category, "environmental issues" is too large to be operationally useful. But for many environmental issues, unconstrained public behavior leads to negative rather than positive externalities, so activities with negative environmental externalities get oversupplied. Collective action is required over some appropriate domain (not transnational in most cases), but funding is not generally needed—except when past damage needs to be undone or when certain actors must be bribed into compliance. The need to purchase compliance raises questions about whether an activity is a true "public good." It also creates an incentive structure that could encourage many potential parties to collective action to conceal their true preferences, with an eye to inducing others to offer

them rewards for cooperation. That in turn would lead to a further undersupply of the good in question (or an oversupply of the public bad). For most environmental externalities, the task is to discourage the offending behavior, which is best done through taxation, which has the great advantage of raising public revenue, thus easing the task of purchasing public goods or permitting the reduction of taxes (such as wage taxes) that discourage desirable behavior.

Potential sources of funding

Global public goods tend to be financed by governments (either directly, through purchases, or indirectly, through financial contributions to organizations such as WHO or the UNDP), through government guarantees that permit access to international capital markets (such as the World Bank), and through private philanthropy. Are there any prospects for developing fully *international* sources of finance for global public goods, especially for financing international or transborder public goods such as the environment? In principle, the answer is "yes." In practice, I'm afraid it is "no," because of the attitudes of governments and their publics toward taxes.

The International Monetary Fund (IMF) has been empowered to *create international money*, the SDR, but has done so only twice—in the late 1960s and the late 1970s—and with great reluctance, in the total amount of 21 billion SDRs (about $28 billion, at current exchange rates). A third allocation, doubling that amount, has in principle been agreed, but has not yet received the requisite parliamentary ratification. SDRs are created as central bank money to permit the nondeflationary growth of international reserves. SDRs are a *monetary* instrument. Various suggestions have been made over the years to create SDRs to purchase goods and services, to facilitate economic development. Those who, like me, have strongly opposed such suggestions, emphasize that the IMF's charter is to create such money only for very limited purposes—namely, international reserves—and some people don't accept it even for those purposes. This is pure money. It does not create real resources. Creating SDRs to purchase goods and services would be to confuse monetary policy with real expenditures—printing money to acquire real resources, rather than releasing those resources through taxation. It would work so long as SDRs were acceptable, but it would not be a good idea, and indeed would raise the required real resources either through the "inflation tax" or, more likely, by transferring seignorage from major national central banks to those acquiring and spending the SDRs, without being transparent about it. Parliaments quite properly are unlikely to agree to it.

Among other possible revenue sources from the financial sector, I'll mention three possibilities:

(1) *Sell some IMF gold.* IMF gold is an interesting historical artifact. Originally, members had to make 25 percent of their subscriptions to the IMF

in gold. The IMF owns 103 million ounces of gold, which has a market value of about $29 billion, but is carried on the IMF books at 3.62 billion SDRs (about $5 billion). In the early 1970s, I persuaded then Secretary of State Henry Kissinger that this might be a useful source of internationally available funding for internationally useful activities. We thought the IMF trust fund might help out important countries. The idea was that the IMF could sell gold to people who were willing to give up their resources to buy it, and an IMF trust fund could use the capital gains to fund international projects and help out member countries. The idea was a partial success, but the international community's response was abysmal. Limited sales were made in the 1970s, but only over the objections of many members. Member states (led by France) insisted that the released gold be returned to them rather than be used for internationally agreed-upon purposes. In the deal that was finally struck, half of the IMF gold allocated for these purposes was to be given back to members directly, not used for international purposes. The other half was sold on the market and did fund the IMF trust fund.

The issue of selling the IMF gold came up again in recent years in connection with financing debt relief for the highly indebted countries. But gold producers successfully blocked an actual sale of gold and, to end another sad and complicated story, no IMF gold will actually be sold. Through an accounting sleight of hand, some of the value of the IMF gold will be written up to something closer to market prices and the capital gains on the write-up will be used to help the highly indebted countries. But unlike the sale of gold to the private sector, this accounting trick generates no real resources and extracts no resources from the world public.

(2) *Impose a small Tobin tax.* The UNDP sponsored earlier work on the Tobin tax, a tax that initially focused on foreign exchange transactions. The concept has subsequently spread to include other financial transactions. The Tobin tax's ability to achieve its original purpose—to help stabilize financial markets—is highly doubtful. If it cannot be sold as an effective way to reduce financial volatility, the tax has no clear positive benefit except to provide revenue. (For a useful summary, see Michalos 1997; and Haq and others 1996.)

(3) *Draw on earnings of the World Bank and other development banks.* Net earnings of the IBRD were $2.0 billion in FY 2000 (up from $1.5 billion the preceding year), most of which are now devoted to technical assistance and other aid to developing countries. Equity arising from cumulative retained earnings is $19 billion. Other development banks have smaller amounts.

Other international resources

It has long since been forgotten, but in 1970 President Nixon made an extraordinary proposal: that all of the continental shelf beyond the territorial

seas (which then ranged from 3 to 12 miles from shore) should be held in trust for mankind as a whole, owned by the international community but managed by the coastal state. President Nixon proposed that production of *offshore oil* (beyond territorial seas) be managed by each coastal state on behalf of the international community, with royalties accruing to the international community. The international community's reaction to this proposal ranged from cool to outright hostile. The Indian ambassador to the United Nations suggested it was a plot by multinationals to control the world. It is a measure of the distrust that existed then, and I dare say still exists to some extent in the international community, that a proposal with such financially significant consequences could be rejected so summarily. Unfortunately, soon after Nixon's proposal, in the late 1970s, in the biggest "land grab" in the history of mankind, we extended national control of an "economic zone" to 200 miles out from shorelines, completely nationalizing this potential international resource. Coastal states acquired economic rights to a 200-mile-wide exclusive economic zone (EEZ), including the continental shelf, which amounted to roughly a quarter of the open oceans and seas. How much is that part of the continental shelf worth? We don't know. All we know is that its value will grow as technology makes ever deeper drilling economically possible. How much did the international community lose in potential royalties from offshore oil extraction? A 10 percent royalty would yield $6 billion annually, and growing, as capacity to exploit deep water oil improves. That's enough to finance both IDA and UNDP, with something left over.

Royalties from *seabed mining* are another potential source of finance. Countries that have ratified the Law of the Sea Treaty have accepted that the seabed is an international resource. The Treaty provides for the possibility that private miners might pay royalties for the right to mine the deep seabed. It is a complex regime but, under the 1994 revision, revenues (after deduction of administrative expenses) must be returned to the signatory parties. Deep seabed mining (mainly nickel, by value) is not likely to be economic for many years, if ever. The treaty also provides for royalties on production of oil and gas beyond the 200-mile boundary of the EEZ, a limit that may soon be breached, starting at 1 percent after seven years, rising annually to a maximum of 7 percent. Again, however, the revenues (after administrative expenses) must be returned to the signatory states, that is, they cannot be devoted to financing international public goods.

Antarctic mining in principle could also yield royalty revenue, but starting in the mid-1990s, Antarctica was closed to mining for 50 years.

Fisheries are a sad story of human mismanagement. We have overfished most of the world's fisheries and continue to do so. In principle, fisheries could also have been covered by the Nixon proposal, although he talked about the continental shelf rather than the waters over the continental shelf. But, this being an environmental issue in which the externalities are negative, each

successful catch increasing the costs to other fishermen, we need to heavily regulate or tax the fisheries in order to make optimal use of them. We have not done a good job at this, which is not just international failure. Under U.S. legislation (the 1976 Magnusson Act), fishermen in particular cannot be charged administrative expenses for managing fisheries to prevent overharvesting, much less taxes to discourage fishing. This policy is emulated the world over. Fishermen consider the idea of charging them to fish to be completely outrageous; fishing is hard and dangerous enough as it is, so that levying a charge on them would be adding insult to injury. But that is exactly what is required. If such a charge were to be levied, open-ocean fisheries—beyond territorial seas—would be a potential source of revenue. Most saltwater fisheries were covered by the creation of the EEZs. Only fishing beyond 200 nautical miles, mainly tuna by value, now represents a potential international revenue source. How much? I don't know. World fisheries harvests have recently been about 70 million metric tons. At $.40/lb, that represents a gross value of over $60 billion. If one-half of that was beyond territorial waters, a 10 percent royalty on fisheries (which is too low, but in a stable state that's what it might be) would yield about $3 billion annually.

Finally, my current candidate: *the carbon tax*. A carbon tax would produce much greater revenues than would the other potential international sources of revenue. I won't explore arguments for or against the controversial issue of global warming, but there's no doubt that taking it seriously means discouraging the burning of carbon, and the best way to do that is to impose a tax on carbon emissions. By one estimate, a tax on carbon emissions of $200/ton would yield $300 billion from the United States by 2050 (50 years from now), and $386 billion from the rest of the world, to achieve a targeted reduction from "business as usual" of 2 percent a year, yielding roughly a 25 percent reduction below 1990 emissions (see Cooper 2000). The U.S. Council of Economic Advisers has estimated that an extensive carbon emissions trading regime would lead to a price of $23/ton in 2020, which would yield $76 billion globally if the emissions permits were auctioned. In other words, with an international trading regime, the appropriate tax would come way down, but we are still talking about tens of billions of dollars a year coming out of an appropriate carbon tax. Could this be made available to the international community? Probably not. I think a carbon tax is the right way to go, but it will be an uphill fight no matter which way we go. In my view, by the way, Kyoto is dead; if we're going to make progress in this area, we need to take a new tack.

Environmental taxes have the great advantage of simultaneously discouraging activities that are excessive and raising revenues that can be used for other purposes. Getting international agreement on a carbon tax, if it is possible at all, will undoubtedly hinge heavily on national desires for the revenue such a tax would produce, at least in the early decades. One appeal of a carbon tax

is the revenue accruing to national sources. The one thing you can get every minister of finance in the world, except maybe the U.S. Treasury Secretary, to agree upon is the need for additional revenue. One way to reach international agreement on how to deal with negative environmental externalities is to install an appropriate revenue-generating policy, in the form of fees or taxes. Vito Tanzi (2000) has proposed creation of a World Tax Organization, originally to levy taxes, later more realistically to exchange information and provide a forum for coordinating taxes with international spillovers.

Let me close with a general remark about revenues. Today, as always, taxes go to the very core of politics, especially democratic politics. Parliaments derive their clout from their control of the tax system, and it will be a cold day in hell before national parliaments voluntarily give international bodies the power of taxation and hence the power to control spending. So I think the international community should get used to the idea that to finance global public goods they must rely on contributions from national governments; on philanthropy (whose development should be encouraged in more countries); and on some limited sources of funds such as earnings of the development banks (if shareholders can be persuaded to let the earnings be used for international purposes). As societies become more affluent, more funding will be available for specific activities with a high payoff that are presently underfunded. My advice is to spend less time thinking about imaginative new schemes for raising money and more time focusing not on grand concepts like global public goods but on taking advantage of concrete opportunities where social payoffs are demonstrably high and goods or services are seriously undersupplied.

References

Cooper, Richard N. 2000. "International Approaches to Global Climate Change." *World Bank Research Observer* (August).

———. 1998. "Towards a Real Global Warming Treaty." *Foreign Affairs,* March/April.

Haq, Mahbub, Inge Kaul, and Isabel Grunberg, eds. 1996. *The Tobin Tax: Coping with Financial Volatility.* New York: Oxford University Press.

Michalos, Alex C. 1997. *Good Taxes: The Case for Taxing Foreign Currency Exchange and Other Financial Transactions.* Toronto: Dundurn Press.

Olson, Mancur. 2000. *Power and Prosperity.* New York: Basic Books.

Samuelson, Paul A. 1954. "The Pure Theory of Public Expenditure." *Review of Economics and Statistics:* 387–89.

Tanzi, Vito. 2000. *Policies, Institutions, and the Dark Side of Economics.* Northampton, MA: Edward Elgar.

Floor Discussion

Khalid Malik, Chair

Khalid Malik, the chairperson of this session, thanked Cooper for providing a historical perspective, outlining a framework for examining global public goods issues, delivering a sobering and thought-provoking message about financing issues, and emphasizing the need to focus on concrete opportunities. He suggested that the group also consider issues of equity in their discussion of global public goods. In the example of the Suez Canal, for example, he was struck by what happened to the Egyptian interest when the British took over. He encouraged a collegial, informal dialogue throughout the workshop.

Barry Eichengreen noted how Cooper's presentation differed from his influential earlier writings on the provision of international public goods—a piece on health care in 1989 and a Brookings Institution book on global environmental issues in the mid-1990s—reflecting how things have changed over the years. First of all, 15 years ago discussions of international cooperation focused disproportionately on cooperation among governments. Now the discussion is much more about networks, foundations, NGOs, and partnering with the private sector, which is clearly a step forward. Second, Cooper had de-emphasized financing and encouraged the workshop not to concentrate on it. Invoking the Suez Canal as a case where the private sector provided financing was useful, because it makes us think about whether certain goods are truly public or international. Is the Suez Canal an international public good? Is it excludable? Is it nonrival in consumption? Arguably, neither attribute applies, so it's not surprising that the canal was financed initially by the private sector. Finally, Eichengreen emphasized the importance of international consensus in the provision of international public goods.

Apropos of the AIDS conference that was taking place in South Africa this week, he wondered if other preconditions for the provision of global public goods had not also come to the fore. Did this theme of intellectual consensus somehow resonate better when the topic was public health and infectious diseases—today, essentially AIDS—than in the case of other topics?

Michael Kremer commented on the attributes of nonrivalry and nonexcludability in Samuelson's definition of public goods. He noted that, even if a good were excludable, it would tend to be undersupplied unless a private provider could extract the full consumer surplus, which would require price discrimination. This is almost never the case. In fact, empirical estimates with respect to research and development suggest that the social rate of return to R&D products that can be patented, protected, and excluded is typically at least twice the private rate of return. That social rates of return like 50 percent are very common suggests that, from the social standpoint, there is a significant underprovision even of goods that are nonrival but excludable. This is not to deny that the problem may be even worse for goods that are not excludable. It is simply important to pay attention to the underprovision of goods that are in principle excludable but for which it is difficult to have perfect price discrimination.

Cooper responded that unless the term "global public goods" was just meant to be a new catch phrase in a community in which catch phrases were often important for presentational purposes, he would move away from the idea of global public goods and simply look for concrete activities where there was a huge undersupply and a very high social rate of return. Empirical work still suggests, for example, that despite huge incentives in the United States to invest in research, we still underinvest in the generation of new knowledge—in health care and in the environment—whatever you call these goods.

Dean Jamison said that the grant equivalent of development assistance in health is probably $3 billion to $4 billion a year, of which he guessed perhaps only 10 percent or so represented anything resembling a public good. Much of the development assistance was essentially a transfer of resources. Did this pattern hold for public goods generally?

Cooper replied that, if he understood the participant's point, he entirely agreed. Much of international spending is not for public goods at all; instead, it represents income transfers of one kind or another. So one potential source of funding for public and quasi-public goods might be to shift some of those transfer payments toward the production of public goods.

An unidentified participant, struck by the huge amount that could be raised by royalties from the continental shelf, asked if some kind of revenue-sharing—say, contributing 2 percent of national revenues to international uses—could still provide the financial resources which Cooper said would fund UNDP and IDA. Did Cooper think there was no possibility of revenue-sharing?

Cooper responded that climates of opinion can and generally do change over time. While nations with revenue surpluses were more likely to be willing to make contributions to international endeavors, the mechanism would likely remain national contributions to international endeavors rather than directly turning over even a fraction of a particular national revenue source to international organizations. Parliaments are simply extremely reluctant to give up control over spending, since this is a vital source of leverage that they have over the government's executive branch. Parliaments may even be generous in making contributions, but the mechanism would probably remain national contributions rather than a direct source of revenue.

Robert Picciotto, responding to Cooper's questioning whether "global public goods" was the right label, made the case for keeping the label. First, the whole development system is largely geared to country-level public goods rather than global public goods, which, in Cooper's definition, essentially evokes cross-border issues. The global level of public goods has been undersupplied more than the country level of public goods. On the other hand, the public sector has been extremely aggressive in moving toward global private goods. So the undersupply is occurring at the intersection of these two concepts—global and public—suggesting that the development system should be more focused on this than simply looking in theory about what is undersupplied. There are mechanisms such as monopoly, for example. And to the extent that technology or knowledge can transform pure public goods in the direction of privately supplied public or quasi-public goods, such as the Suez Canal, this would help solve the financing problem. This is what has happened in telecommunications, for example. Knowledge and technology can help, if the right institutions are created, which is one purpose of this workshop.

Rob van den Berg welcomed Cooper's economic perspective, but suggested that we might need to consider other kinds of perspectives as well in discussing international public goods. After all, it was once believed that the liberal economic model would prevail in the world, but history, as we have seen, went the other way. And throughout history we have seen the reemergence of local wars arising from ethnic strife, religious conflict, and other causes that are considered nonrational from the economic viewpoint.

Khalid Malik closed this session by thanking Richard Cooper for his thought-provoking presentation and the participants for their provocative questions. Indeed, he said, the whole purpose of this workshop was to provoke our thinking and to have a free and frank exchange of opinions on the subject of global public goods.

Part II

Panel Discussion

Six Reasons for a Global Public Goods Perspective on Development

Inge Kaul

I propose to define global public goods as goods that have significant qualities of publicness, whose benefits extend across countries and regions and perhaps even across time, affecting both current and future generations. As Richard Cooper pointed out, there are few pure public goods. Many goods have both private and public properties. Also, the privateness or publicness of a good's benefits or costs often does not reflect innate properties. In many instances, a good's qualities can be changed. They are not a given but a matter of policy choice. For example, some types of knowledge have significant public properties, which we have chosen to privatize—through patents. On the other hand, basic education has important private benefits—I benefit from my education and you benefit from yours. But because it also generates large positive externalities, many countries have made basic education a public good by design, universally accessible.

In my presentation today, I would like to highlight six points to explain why we in UNDP consider global public goods, GPGs, to be an important issue and to characterize how we define and approach global public goods. You may want to judge whether we three panelists are discussing alternatives to the global public goods approach or whether we are thinking along the same lines, which would, of course, be nice.

First, when discussing development, including GPG concerns, we in UNDP like to *start from the end*. We like to ask ourselves, "What do we really want to achieve in terms of development outcomes? What problem do we want to resolve?" Therefore, it is important for us to have a clear notion of goods, of the things and conditions to change and improve. In our experience, many actors express concern, worry, express more concern, and stop there—at being

concerned. Or we launch processes of deliberation and negotiations, or even, monitoring and review. But processes are a means, which should serve an end, produce outcomes, and lead to results. Hence, a notion of goods, private and public goods, is critical to our approach to development and to addressing the key challenges the international community is facing. But we must recognize that the properties of goods can be manipulated and that a choice, a political decision, is required. Hence, my first point: Let's start from the end. Let's be clear about the type of good or goods we want to solve a particular problem.

Second, UNDP takes a *human development perspective* on development. The well-being of people everywhere depends on both private and public goods. Yet we live in a world of differences and disparities, and therefore, our priorities differ. Some of us prefer a particular mix of private goods and public goods and, within the public goods, a particular mix of local, national, regional, and global public goods. Others, living under different circumstances, may prefer another mix. Financial stability, for example, may be important both for investors in Manhattan and for poor farmers in Indonesia who suffered heavily from the effects of excessive financial volatility during the Asian crisis of the late 1990s—but they may attach different preferences to financial stability. The issue may rank higher on the investors' list of preferences. Similarly, malaria control may be a higher priority for a farmer in the tropics and of lesser importance to the financial investor in Manhattan, who may, however, have some interest in malaria control mostly because she might have to travel to emerging markets.

If indeed different groups of people attach different preferences to public goods, including GPGs, it is important to ask, "Whose public goods are we talking about?" And it will also be important to explore whether all the relevant actors and stakeholders—rich and poor, North and South, business, civil society, or any population group—had a fair chance to participate in formulating the agenda for international development cooperation. At present, they often have not. The international trade regime is, arguably, more of a club good than a global public good. As we saw at Seattle, many protesters see the international financial architecture as it presently exists as a club good. The more civil society expresses social concerns, the more likely it will be that these concerns are actually being taken into account. A human development perspective on global public goods reminds us to pay attention to such issues as global fairness and participatory preparation of the agenda for international cooperation, lest we find those who have been excluded demonstrating in the streets and the global public good losing legitimacy.

Third, private goods—my glasses, say—need to be produced, for which many things must come together. Someone has to make the frame, someone has to put the glass in the frame, and so on. The literature on international relations and international issues often refers mostly to the political

aspects of providing public goods: fair agenda setting, for example, or the political economy of deciding what and how much to produce. Far less well developed is another interesting dimension: the production process of global public goods—what we actually have to do to reduce pollution, contain the HIV/AIDS epidemic, or control malaria, among other examples. Producing as apparently straightforward a global public good as controlling malaria is a highly complex process, involving a multitude of actors, action in several sectors and at several levels of development. For example, since pharmaceutical knowledge is largely private, we need to develop global incentives to motivate private pharmaceutical companies to produce effective medicines. Once the drug or vaccine exists, we have to think through the efforts needed to purchase the new drug, which may require something like a vaccine purchasing fund. Once the vaccine is purchased, it has to be delivered, which depends on a good, well-functioning national public health system. Some national capacity building may be needed, as well as a public information campaign to persuade people of the safety and utility of getting vaccinated or taking a drug. A large number of public and private goods and national and international activities must come together in a balanced way for the process to work. We cannot focus on only one or the other element. The example also demonstrates that aid effectiveness often depends on complementary international cooperation efforts, and that the effectiveness of GPG initiatives depends, in turn, on effective national development, including aid effectiveness.

Fourth, financing should follow, not lead, the endeavor. Goods can be produced in many ways; and each production alternative may entail different costs. So, we first have to clarify which goods to produce, what technology to follow, and how much to produce of each good before we can determine the cost implications. Of course, it is useful for decisionmakers to know how much money is available. But it is also important to prepare full and complete cost estimates. If we take the idea seriously that goods have indeed to be produced, then we should at least aim at knowing their full cost implications. I agree strongly with Richard Cooper that the main source of global public goods financing is at the national level.

Indeed, the concept and agenda of global public goods gives us a new way to look at national budgets. People in other countries may also benefit from them, but global public goods are essentially public goods that benefit us, in our daily lives. As a German citizen, I would like my health ministry in Germany to cooperate with various actors abroad to ensure my health through fostering a healthy global environment. The ministry should not spend all its resources nationally, except for a contribution to WHO's regular budget. Rather, it should be actively involved in fighting global public bads—diseases that may otherwise sweep into the country. (Parenthetically, let me mention that the strategy for producing goods is often very different from that for

controlling bads. Hence, if we concentrate too much on just controlling bads, we may never produce the goods that we really want and need.)

Therefore, I would suggest that we need to bring national sectoral ministries increasingly into the financing of global public goods. We should not just use development assistance funds for GPG purposes. Aid's unfinished agenda is to help poor countries achieve their proper national objectives. Yet an estimated 15 percent of aid money today already goes toward global housekeeping. In any case, the low level of aid money is deplorable. Hijacking a part of it for the purposes of global housekeeping makes the situation worse. The global public goods agenda calls for *additional* resources. I believe those resources should be found in the national budgets of the concerned sector ministries. Even if we need international incentives, such as a vaccine purchasing fund, my preference would be that this money should come not directly from "donors" (such as UNDP, the World Bank, or in this example, probably WHO) but via developing countries' national budgets. Developing countries, like industrial countries, must develop a two-track approach to national policy programming and budgeting. As we saw, GPG provision often requires efforts at all levels of development; and therefore, there need to be allocations for domestic expenditures and allocations for international cooperation.

Fifth, if we want to make a difference in producing and delivering global public goods, international organizations must expand their traditional sector perspectives and complement it with a stronger issue, or GPG focus. If we think of global *concerns* as global public *goods* to be produced, we will see that many endeavors should be time-bound in nature—that is, we can probably complete them within a certain period of time. There might not be a need for a permanent international organization to address the concerns. Therefore, I find Wolfgang Reinicke's concept of global public policy partnerships fascinating. Many global public goods activities could probably benefit from such a mechanism. International organizations (such as UNDP or the World Bank) could serve as issue managers and facilitators of these partnerships, if necessary, helping to bring together all the actors—business, governments, and local and global civil society. Global public policy partnerships seem to be a very flexible, participatory mechanism for complementing the more conventional national-level sector-development work of international organizations with the more vertical issue-oriented initiatives that GPGs require.

Sixth, we have to get used to the fact that global public goods are in the mutual interest of North and South, rich and poor. Hence, we must guard ourselves against approaching this new challenge in traditional ways. These may not fit. For example, some of the traditional aid concepts do not fit the GPG context. They may even be counterproductive. In the case of GPGs, there are typically no donors and recipients, but partners coming together to cooperate in the mutual interest of all. Often, it may not be easy to determine

whether and where the common interest lies. But the interaction between the negotiating parties is more of a bargain, maybe even a trade, rather than conventional aid. For example, if the international community were to request Brazil to make forest resources available for purposes of carbon sequestration, Brazil would provide an extremely valuable global development service to the world. We ought to have mechanisms for trading such services and valuing them properly. Perhaps we must introduce the correct property rights, and perhaps we must set up market-based mechanisms to be better able to determine the price, but we should pay the providing country a fair price—one that reflects opportunity costs, not just the direct costs of maintaining forests. But fairness is not just a matter of money. Partnership, too, can be an important incentive for international cooperation.

Global public goods are a reality. They exist. The turmoil and crises in today's world are often due to their underprovision. Progress toward sustainable human development will depend on a new approach to policymaking. The traditional divide between domestic and foreign affairs has become blurred. Therefore, international cooperation in support of global public goods must constitute an integral part of national policy-making. A growing number of public goods can no longer be achieved through domestic policy action alone. They require policymakers increasingly to reach across borders. And because of the growing openness of border problems, they have to be resolved decisively, lest they spill into countries and affect national and local development. It is for this reason that we think about today's global challenges not just in terms of "concerns," but more concretely in terms of goods—that is, things which need to be produced.

The Intersection of Development Assistance and International Public Goods

Ravi Kanbur

In the past decade, the literature on development assistance and the literature on global public goods have begun to intersect. Heightened attention to cross-border spillovers in a rapidly globalizing world has shifted the focus of discussion to externalities and global public goods. At the same time, conventional development assistance—transfers from richer to poorer countries—has come under more intense scrutiny as these transfers have declined. Not surprisingly, international externalities have been used as an argument for halting the decline of development assistance; some argue that international public goods have at least some claim on the "aid pot." At least in the popular imagination, and now even in the strategic programming of aid agencies, the two sets of issues have begun to meld.

The analytical literature on the intersection between these two domains is much less well developed and may be somewhat underplayed in this workshop. I shall discuss three perspectives on the relationship between global public goods and development assistance that need to be investigated fully. One starts at the public goods framework and examines the implications for development assistance. The other two start with insights from the literature on development assistance and add public goods considerations.

Development assistance as compensation mechanisms

The analytical literature on global public goods basically applies the classic economic theory of public goods in an international context, treating each country as a unique agent. The central concern is with efficiency—whether or not the "Samuelson conditions" are met. The natural framework for char-

acterizing the nonintervention situation is "private contributions to public goods": Each country is seen as contributing to an international public good to advance its own objectives, given what everyone else is contributing. This leads to a free-rider problem and an inefficient outcome: an undersupply of the public good.

Typically the solution is for countries to agree to some form of coordinated outcome. All the usual problems of monitoring and enforcement exist and must be discussed. One problem is that changing from the uncoordinated to the coordinated outcome may produce gainers and losers. Although the gainers' gains outweigh the losers' losses in the coordinated outcome—another way of saying that this outcome is more efficient—this is cold comfort to the losers unless they are paid compensation. Compensating transfers from potential gainers to potential losers may be necessary to sustain the efficient outcome—the cooperative or coordinated equilibrium. If these transfers are from richer to poorer countries, then "development assistance" may become a natural part of the strategy. It is often argued in the popular literature, for example, that developing countries should be "compensated" for agreeing to regimes of labor or environmental standards, which may convey global benefits by putting a floor on the race to the bottom but may also have immediate negative effects on the poorest countries.

Public goods justifying conventional aid

In the literature on conventional development assistance, the basic structure involves a donor and a recipient (usually official entities). The donor (the richer country) makes a transfer to the recipient (the poorer country) to advance its own objectives. These objectives may be direct benefits to the donor (such as geopolitical support) or altruism (such as reducing poverty in the recipient country). One major strand in the theoretical literature deals with whether a transfer from rich to poor can, seemingly paradoxically, make the rich better off as well. Another strand focuses on the agency problem: The outcomes which the donor values (say, poverty alleviation in the recipient country) depend on the transfer but also on actions by the recipient over which the donor has no control. If the objective functions of the donor and the recipient differ (for example, if the donor is assumed to care more about poverty alleviation in the recipient country than the recipient government itself does), then the agency problem can be alleviated by conditioning transfers on actions by the recipient. But in the vast theoretical and empirical literature on the subject, conditionality is observed to fail in many situations.

This is the familiar framework of conventional development assistance. Adding cross-border externalities and global public goods leads to two distinct perspectives. One argues that the case for conventional development assistance is now stronger, the other that global public goods provide a ve-

hicle for transfers that go beyond the conventional country-to-country transfers of resources.

The case for conventional development assistance is now stronger, it is often argued, because poverty in recipient countries will have direct spillover consequences—such as the spread of infectious diseases or illegal migration—for the donor countries. Thus, whatever the earlier arguments for transfers, spillover considerations can only make them stronger. Analytically, this extension is not difficult in principle, because it simply adds a new component to the donor's objective function. But three observations are in order. First, the old agency problems remain—the transfer still has to actually result in poverty reduction in the recipient country for the added impact on the donor's objective to be felt. Second, while anecdotes of spillovers make for good press, they may not be quantitatively significant. Third, for some, relying on the direct benefits from transfers (rather than altruistic benefits) is not a morally permissible justification for transfers in the first place.

Public goods as alternative vehicles for aid transfers

The third perspective—global public goods as alternative vehicles for effecting transfers from rich to poor countries—has received much attention lately. The output of basic research on tropical diseases or on tropical agriculture, for example, is an international public good that primarily benefits poor countries. So spending resources on such research, and ensuring that the results are available to poor countries, is one way to improve well-being in poor countries without necessarily making conventional transfers to the recipient government. In other words, global public goods can be viewed as an alternative instrument for making transfers from rich to poor. Are they more effective instruments than conventional transfers? It depends quite intricately on the nature of the public good and who is most effective at producing it—the donor or the recipient. And while making transfers through global public goods produced in the donor country may not present the same sovereign-country agency problem as conventional transfers and associated conditionalities, it can present another kind of agency problem—a recent example being the relationship between the donor countries' government and private sector in the proposed setting up of vaccine purchase funds.

To conclude, the intersecting literature on development assistance and international public goods produces three distinct perspectives: (1) development assistance as part of the compensation mechanisms needed to sustain agreements that correct the undersupply of international public goods, (2) international public goods and externalities as strengthening the case for more conventional development assistance, and (3) international public goods as providing alternative vehicles for effecting transfers from rich to poor countries. One finds all three perspectives in the popular literature.

All three should be closely examined to develop the framework for analyzing how development assistance and international public goods impinge on each other, but I think the most fruitful type of research and analysis will be found in the third area.

Walking the Talk: Global Public Policy in Action

Wolfgang Reinicke

My presentation has to do with action-oriented, practical experience from existing programs that try to provide global public goods. Many of you supported the work of the Global Public Policy Project which I directed over the last nine months. The project report, *Critical Choices*,[1] is based on more than 20 case studies we prepared on global public policy networks. These networks are essentially trisectoral alliances among governments, civil society, and the private sector, with international organizations participating in some form. In highlighting our findings about how these networks work and where we think the debate on global public policy and global public goods will be going, I can only scratch the surface. I will touch on three topics: the properties and functions of global public policy networks, the management principles of these networks, and the key challenges for advancing the global public policy agenda.

The networks' properties and functions

Global public policy networks *internalize the changing global environment*, especially the basic value of deeper integration of the world economy. They neither oppose globalization nor try to bring it to a standstill; instead, they go with the flow—but try to influence the flow's direction. Taking advantage of technological innovation and political and economic liberalization, they take on globalization as it is—with all the challenges, positive and negative, it generates.

Networks *bring together and make the most of diverse groups and complementary resources.* Knowledge is the most important resource, of course, and actors from different sectors bring different forms of knowledge to the table.

Some bring factual or scientific knowledge; others bring knowledge about power, politics, and decisionmaking; still others bring knowledge about how different groups of actors view each other or how to bring about compromise on hotly contested issues.

As a result—and this is the important part—networks *address transnational issues that no single group can resolve by itself.* In many ways globalization has changed power relationships. Neither multinational corporations nor civil society can be ignored in global public policymaking.

Networks do not exist to be a homogenizing force. They rely on participants retaining their distinct characteristics. NGOs are not supposed to turn into profit centers, or vice versa, and private companies are not expected to become charities. Sociologist Mark Granovetter describes these networks as having the *"strength of weak ties."*[2] What makes these networks dynamic is their built-in learning function, which allows them to adapt rapidly to changing circumstances and to embrace or deal with other networks.

Functions which networks perform

Based on our review of 20 networks, we consider six of their functions to be critical. First, these networks *help place issues on the global agenda.* The landmines movement is a classic example of how transnational advocacy networks work; another is Jubilee 2000. Advocacy networks do not need to be trisectoral—neither the landmines movement nor Jubilee 2000 were—but advocacy networks often prepare the ground for the emergence of multisectoral networks.

Second, the networks *facilitate the negotiation and setting of global standards.* For this the participation of all three sectors is critical. One good example is the World Commission on Dams—a truly trisectoral effort to formulate sustainable standards for the building of large dams—which was born out of a stalemate. The report due to be published in November 2000 by the commission will be a demonstration of how well these networks can function and survive as key instruments for setting the agenda on global governance.[3]

Third, networks *serve as mechanisms for producing and disseminating critical knowledge.* The prime example of this key function is the Consultative Group on International Agricultural Research (CGIAR), which has been able to scale up existing knowledge and disseminate it throughout the world. Another good example is the sharing of best practices in microlending networks.

Fourth, networks *create markets where they are lacking and deepen them where they do not or cannot fulfill their potential.* This key function should not come as a surprise. Historically, new markets have always required institutional and political support. So it should not be surprising that existing or new global markets also require an adequate institutional or political embedding. Sometimes, left to their own devices, markets do not fulfill their potential of producing the desired goods and networks can help to close this

gap. The prime example here, of course, is the Global Alliance on Vaccines and Immunization, a trisectoral effort to develop vaccines against diseases such as malaria.

Fifth, networks *can serve as mechanisms for innovative implementation.* They do not always have to cover the entire policymaking cycle. Some networks focus simply on the implementation of global public policy. With the Global Environment Facility, for example, there was a traditional intergovernmental treaty and negotiation, only after which the implementation was delegated to the Global Environment Facility.

Sixth, networks *create trust and help close the participation gap.* Networks put a premium on transparent, inclusive processes, through which they build trust and create global social capital, creating new venues of participation that help to close the participation gap. Not closing the participation gap—not addressing the democratic deficit, as it were—leads to demonstrations such as we've seen recently in Seattle and here at the World Bank. This sixth, overarching function links together all the other functions which networks perform.

Management principles of networks

The openness, transparency, and flexibility we've talked about come at a price. Networks are very difficult to set up and manage. Building them takes a lot of time and tremendous resources, as the experience of the World Commission on Dams demonstrates. So they are by no means an easy solution to problems of global governance. And clearly, the closer you come to the traditional domain of sovereign security issues, the more problems you will have with greater participation by civil society and the private sector. Today networks have begun to play an increasingly important role in addressing human rights issues, for example—a highly contentious area with many governments.

In our study of 20 networks, we identified several key management principles: you can probably identify many more just from reading the report.

Getting the network up and running requires both personal and institutional leadership. You need a champion for a network to succeed. Partnerships and hierarchies are important, but if you do not have somebody to initiate the network, provide a vision, bring people together around this common vision, and move things forward, you will not succeed in creating and running a network. At the same time, such personal leadership will only take you so far. The network doesn't work if one leader tries to capture and dominate the network and does not give others access to it. You need to maintain a careful balance between institutional and individual leadership.

Again, the World Commission on Dams provides an interesting example. Initially the Bank and IUCN provided leadership but as soon as IUCN and the Bank were able to get critical players around the table, they moved into the background, if you will, leading from behind—still supporting it, financially and otherwise, but

letting the other players run the show, because ultimately it was those players who had to come up with workable solutions. The World Bank and the U.N. can help create the right environment, they can help developing countries that might not otherwise have access to these networks, but otherwise, once the process has been launched, they can and should step into the shadows.

Balancing adequate consultation with delivery is the key to success. This is a difficult one. How can a network avoid the risk of deteriorating into a mere talking shop, as so often happens? How can you move from the initial phase of deliberations and conflict intervention into delivering tangible results? You can create milestones, you can set yourself a time limit, and you can focus on the issues. You can also focus on starting with easy winners—as the Global Water Partnership did. Don't start with the most difficult issue. Pick one about which there is relatively little conflict, just to have a success, and allow the participants who don't trust each other initially to think, "Maybe I can work with those guys." Be very careful which kinds of issues you select when you start the network going.

Maintaining "structured informality" prevents over-institutionalization and an obsession with process instead of results. How can network managers ensure that a network stays open for all stakeholders? Trisectoral funding is critical for keeping the network open to all stakeholders. Make sure all participants have resources they can bring to the table or those with the most resources will claim power, including the most say in decisionmaking. To keep the network from becoming rigid and sclerotic, network managers must be wary about overformalizing things. They should not worry that things seem a little messy or chaotic; it is precisely this messiness and openness that creates results and will allow the network to work successfully.

Being inclusive (both local/global and North/South) is imperative for a network to be legitimate and sustainable. Most networks have very few participants, both locally and from developing countries. Unless these conditions change dramatically, the networks will fail when it comes time for implementation. If local participants don't participate—if they don't help initiate and hence "own" or buy into the norms or standards (or whatever) to be implemented nationally and locally, those norms or standards won't have legitimacy and won't be honored. Of course, institution building and capacity building require resources, which makes this fourth principle one of the biggest challenges of building networks.

Where do we go from here?

I propose a three-track strategy for advancing global public policymaking:

(1) *Consolidate and strengthen existing networks,* focusing on implementation and learning processes. Many of these networks are very shaky; government and international organizations would do well to support them.

(2) *Support the establishment of implementation networks* to shore up existing international conventions or traditionally negotiated intergovernmental treaties (for example, those associated with global climate change) where implementation is lagging, by forming key partnerships between the public, private, and civil society sectors.

(3) *Carefully nurture new networks* where they are needed and can be launched. Where a stalemate emerges on the resolution of certain issues—for example, those associated with genetic engineering—a network might be especially useful.

Obviously, for networks to be successful, all players must make major organizational adjustments. While the World Bank and the U.N. have been successful in participating in these networks as social entrepreneurs, knowledge managers, and financiers, they must clearly adjust their structures internally. More important, there must be institutional change and adjustment at the national level—with more cross-ministry perspectives to better anchor global public policies in national governance.

Finally, let me return to a theme others have already mentioned. We should hesitate to put too much emphasis on the public goods aspect of global governance because doing so might preclude many issues being brought to the global agenda and exposed to an open public debate. In most societies, the spectrum of public goods goes far beyond what a classic economic definition of joint consumption and nonexcludability would capture. It is far more important for the members of each society to determine—in a transparent, democratic process—what is and is not in the public interest.

Moreover, how you provide these public goods—the production function Inge Kaul mentioned—is also an open question. There are many different ways to do so. We believe the kinds of public policy networks we studied are a hopeful avenue precisely because they create a fertile environment in which people can get together, determine what is and what is not in the global public interest, and then move on to deliver global public goods at the transnational level.

Notes

1. Reinicke, Wolfgang H., Francis Deng, Jan Martin Witte, and Thorsten Benner, *Critical Choices. The United Nations, Networks, and the Future of Global Governance* (Ottawa: IDRC Publishers, 2000). Also available on the project's website at www.globalpublicpolicy.net/.

2. Granovetter, Mark, "The Strength of Weak Ties." *American Journal of Sociology* (May, 1973).

3. World Commission on Dams, *Dams and Development: A New Framework for Decision-Making* (London: Earthscan, 2000). See also www.dams.org/.

Floor Discussion

Greg Ingram, Chair

Greg Ingram, opening the floor discussion, highlighted one theme that cuts across all three presentations—the heterogeneity of public goods, of the people who value them, and of approaches one might take to producing and financing them. Some might use networks and some might not, and so forth. He invited participants to address some of the issues that the three panelists had touched on, including social capital, cooperation, incentives, and fairness.

Frans Leeuw said the results of much research showed social exclusion from policy networks. Hence, where does it bring us if there is an increased level of public participation in local and regional networks, on the one hand, but exclusion from global policy networks (and hence knowledge transfer) on the other hand? Second, what empirical knowledge (or best practices) could the three speakers share about the micromanagement of global policy networks?

Wolfgang Reinicke responded that he was not an expert on social capital, but, as he understood it, the empirical research has been much disputed. People nowadays are engaged in many different kinds of social activities. He emphasized that networks are not about social engineering and social control. While it is important for people to have access to these networks, whether they choose to participate is up to them. His point was that in developing countries few people currently have access to them because they do not have such infrastructure as the Internet. If people in developed societies, who can access the Internet, prefer not to engage in network activities, it's not up to the networks to make participation more attractive. What's important is that the networks be transparent about membership, policies, financing, and so on—so people can join if they want to and that

support be provided for people who want to participate but lack the access or resources needed to do so.

Inge Kaul responded that she was certainly not interested in micromanagement. Her main point was that we have to keep the total picture in mind so that we aren't tempted to think that solving a problem might be easier with an international intervention when a national intervention would be more effective, because the process is difficult. In looking at the total picture, we might recognize that an international policy effort cannot succeed without corresponding national endeavors, but she was certainly not recommending detailed micromanagement of the process.

Herbert M'Cleod asked Kanbur for clarification. Was Kanbur suggesting that development assistance was only about transfers from the rich to the poor? Although this was largely true, those exploring partnerships have learned that in certain areas partners create knowledge together, so it was not just a matter of transfers from the rich to the poor. If you extend the point, to say that global public goods increase the instruments for this transfer from the rich to the poor, the implication would be that global public goods involve only issues or areas that deal with the rich and the poor and not laterally among the rich or the poor. In his view, issues such as emissions that destroy the ozone layer are more about relationships among the rich than about those between the rich and the poor.

Ravi Kanbur agreed, saying that, in the literature on public goods, externalities, spillovers, and so on, there was not generally a distinction between who was rich and who was poor; there was simply a failure in coordination. Then the question becomes, in what different ways can the coordination failure be resolved? Much of our focus is now on how to resolve that coordination problem among a group of actors. To the extent that transfers enter the picture, they do so almost as a side issue—literally as side payments—in terms of the theoretical literature. On the other hand, we cannot forget the many issues associated with transfers from the rich to the poor. We should be exploring the intersection between global public goods and transfers instead of saying, "This other thing is more congenial to look at, given aid fatigue and the failure of traditional transfers from rich to poor."

Robert Picciotto saw both an apparent coherence in, and tensions among, the three presentations. He chose to highlight the tensions, because in many ways the three presentations were, remarkably, at different poles. The public goods question has a coordination dimension (how we get objective functions to fit together) and a financing dimension. Inge Kaul said that we should start with politics, with collective action, with the objective functions, and things would fall into place after that. But is starting with politics really the right strategy? If you start with politics and encounter gridlock, you may get stuck there. Ravi Kanbur basically said that the most productive thing was to start with a decision to transfer resources; then you have already solved

the financing problem. But one of the reasons why we are here is because we have difficulty solving the financing problem ahead of time. Which is why Picciotto found Reinicke's approach of global public policy networks to be perhaps the most promising. Reinicke was basically saying, regarding the production function, let's be pragmatic and let's see how it evolves. This approach may resolve both collective action and funding problems in some cases. The question is, in which cases?

Ravi Kanbur responded that he saw a fair amount of confusion in the literature—even in the same article people talk about two or three different things. He was simply trying to classify in his own mind what those three types of things were. As he said, one set of issues involved coordination (which often gets mixed up with the other two); a second set of issues was global public goods in some sense strengthening the argument for making more conventional transfers; and the third set of issues was that things like basic R&D into malaria vaccine research may give us the almost perfect vehicle for making those transfers. People often put all three types of issues into the same bag; he was simply trying to unpack them. Maybe all three sets of issues were present in some cases, perhaps even quite often. But even so, let's be clear which component of the argument we are talking about.

Inge Kaul responded that she thought Reinicke's public policy partnerships also started from the political end in the sense that some networks get started out of frustration with the official political process, make their own politics, decide that an issue is important, and then take pragmatic action. In the same way, we could rethink the official political process. Today we have more actors so we need more political forums. But in the official political process, we should perhaps, as Scott Barrett has often suggested, do much more of what happened in connection with the Montreal Protocol: take an issue like ozone depletion that is ripe for action out of the bigger debate. There are many political debates, such as the review of the social summit that occurred at the recent Copenhagen Plus Five, in which in one breath governments want to reduce unemployment, eradicate poverty, and foster social integration, which will never work. On many issues we could suggest that governments take them out of the political debate and ask a global public policy partnership to take them on for further action. She did not see how, in the long run, we could ensure action, especially funding, without first having the political consensus. Picciotto and Kaul appeared to disagree about how large or small a piece of the puzzle politics was.

Wolfgang Reinicke responded that, although they did some conceptual work at the beginning of their study, the beauty of what they found was that networks were already happening. People are already out there and engaged in global networks, and so they decided to do something simple and practical: watch how people do it. Some networks respond to apparent policy failures. The landmines network grew out of the failure of a treaty on con-

ventional arms, when a group picked out that issue and went after it. It is crucial to keep your mind open to learn from both the failures and successes of existing networks.

Another interesting thing, said **Reinicke**, would be to see if Kanbur's theoretical perspective actually fits the practice. Can we see that bifurcation or trifurcation in these networks?

Commenting (to laughter) that this panel was something of a beauty contest, **Kaul** said that she didn't understand why Reinicke didn't like the term "global public goods." Most of his global public policy partnerships center around a global public goods issue, such as overarmament or the environment. The networks do not emerge for no good reason. They all have a focus.

Of course, they all have a focus, **Reinicke** said. But do we, as international organizations, go out there and say, "These five areas are global public goods"? Or do we engage in processes by which people can determine things for themselves? We are putting the cart before the horse if we say, "Here are X goods that we hereby declare to be in the global public interest, and the rest are not. Take it or leave it." This is not how public policy works nationally and this does not allow for a changing environment. We must find ways to adapt to this constantly changing process through which people define what is and is not in the global public interest. We must also be flexible about how we provide public goods. There are 15 different ways to deal with gasoline emissions from cars, and the cross-Atlantic debate about them is often heated. How do we go about resolving different views about dealing with gasoline emissions? It can't just be the World Bank and the U.N. saying, "Here is one approach. Take it or leave it." People won't buy this.

Robert Beaglehole, taking up a point that Reinicke had made in his presentation, asked how could one determine whether or not there was a need for a new world health network? His concern was that health networks were often established for particular diseases, public health *bads*, when we should be finding ways to promote health *goods*, especially public health generally. Basic networks on diseases do not get at the broad underlying determinants of good health, the public good.

Wolfgang Reinicke responded that practical experience shows that you often combine the two. Once you deliver on specific issues, this opens up the door to debate broader issues. With labor standards, for example, you focus on a specific issue such as child labor in order to initiate debates about the broader issues of social justice and labor standards. And in focusing on a specific issue such as child labor, you show donors, or those to whom you are accountable, that you can deliver concrete results and avoid being accused of being a mere debating society. While you have to address the overarching issues eventually, one can start by combining the two.

Ashoka Mody noted that Kanbur, in developing his taxonomy, had expressed a clear preference for the third approach—global public goods as

an alternative vehicle for effecting transfers from rich to poor countries. He asked Kanbur to clarify: Was this third approach analytically preferable or developmentally preferable? Is Kanbur's argument that, now that we have a broader set of instruments, we can do things better than we were able to do them before? Mody presented two reasons why the case for the third approach was not an easy one to make. First, it does not address the delivery problem of somehow making incentives stronger on the recipient side to deal with the issue of development effectiveness. Second, focusing on specific issues that are easier to address might be a distraction from other, more difficult development goals, leading one to forget about the broader agenda of resource transfers.

Ravi Kanbur said that the third area was in a sense the least explored analytically, relative to the other two, although things were happening in this area. As for the balance between conventional development assistance and development assistance for global public goods, he thought that Mody raised a good set of issues, which he (Kanbur) used to discuss with Robert Picciotto. Kanbur had felt in the past that these discussions of global public goods, to the extent that these distracted from discussions of conventional development assistance, were a boon for people at the World Bank. There they were being beaten over the head about structural adjustment and, you might say, along came this shiny new train of global public goods and they leapt onto it. Striking the right balance between the two was obviously very important. The point he was trying to make, by means of the analytical literature, was that that balance depended on the specifics of the global public good being discussed. To follow through on the example of basic R&D, one could make a good case for shifting the marginal dollar from conventional transfers to basic R&D. You could argue that you wouldn't have the conventional agency problems that you get with conventional transfers. There are other agency problems, of course, such as how you get the private sector and the donor country to do the things you want, but not the cross-sovereign agency problem. So striking the right balance is important. One probably could not derive any general results on this yet, but there are perhaps already some specific cases to analyze.

In response to a question inaudible on the tape, **Ravi Kanbur** responded that he, Todd Sandler (who was also present at the workshop), and Kevin Morrison had written an ODC policy essay, at the end of which this was actually one of the five questions: when you get into certain types of externalities, a genuine transfer becomes problematic. People say that if, by giving the conventional transfer, you reduce poverty, which reduces infectious diseases, which benefits you, you shouldn't really call this aid—it's really trade, or something else. With some issues, one cannot separate out the genuine transfer so cleanly when one gets these spillover effects. If, to the literature on conventional transfers with conditionalities, one adds spillovers and ex-

ternalities, what new things would we be able to say? We might stay confused a while longer because by definition this sort of separation is almost no longer possible in the real world. That was one of the questions which Sandler, Kanbur, and Morrison had raised.

Inge Kaul said that she was reminded, in these situations, of A. K. Sen's remark that it is better to be vaguely right than precisely wrong. To aim at the distinction has actually helped some donors increase their allocations for international cooperation, she said. The Danes have allocated 0.5 percent of their GNP for global environmental purposes. Once you have the perspective, you find a way here and there. It may not always be easy, but it helps.

Rob van den Berg continued this discussion with a question about the role of evaluation. If there is no consensus on the concept or the perspective, what can we evaluate and what do we expect from evaluation? Should we look into the question of global versus national perspectives? Do we want to look into the question of public versus private funding, or do we want to look into the goods? It's no problem if we want to evaluate the goods, but where in the evaluation would we add to the debate on the public or the global aspect of this whole issue. And how do the three presentations help us in that regard? If the confusion persists, should we perhaps wait some more time before we start evaluating?

Inge Kaul responded that her intention was to help one evaluate very precisely. In terms of political process and agenda setting, one question we can clearly ask is this: Are the global public goods pro-poor or pro-rich? Who benefits in what way? And if we find that we only have the rich man's agenda before us, we could also ask if everybody has had a chance to participate in the political decisionmaking, whether through a formal process, national democracy, global public policy network, or whatever. With respect to the production function, you can also ask precise questions. For example, are all the elements in place or are we wasting our money producing vaccines that we will never be able to deliver through the health service? This is a start. We can make a longer list of such questions later.

In closing, **Greg Ingram** repeated something which Wolfgang Reinicke had said: "Watch what they do." Uma Lele is leading an OED evaluation over the next two years with respect to the Bank's involvement in global public policies and programs, and in the next few months should be better able to answer the question about evaluation. Similarly, Inge Kaul is working on another book, and Ashoka Mody is grappling with the issue of financing. So we can be observers, if not participant observers, in these activities.

Part III

Environmental Issues

A Water-Secure World

Ismail Serageldin

It's a privilege to be here on my first day as a retiree. How could I refuse a request from my former boss and mentor, Bob Picciotto, whose emphasis on quality, impact, and what happens on the ground (as opposed to reports) was an important part of my own development. Today I will address the issue of a water-secure world—international public goods and the future of water.

Why would water be a public good, if public goods are nonexcludable and nonrival? After all, although we depend on water, if you drink that glass of water, I can't. But clearly, some aspects of water are linked to public goods. Just as public education is a public good for all citizens, so is protecting the quality of water for all people (as opposed to only those who can pay for bottled water)—this being one of the examples Adam Smith offered when he spoke of the provision of public goods in *The Wealth of Nations.* Moreover, the ecosystem's dependence on water is almost absolute; without water, there is practically no life. And the responsibility for maintaining the hydrological cycle transcends national boundaries. We are all responsible for it. The long-term environmental benefits of wetlands are not easily understood, but we are discovering their importance as we try to undo damage in the U.S. Everglades and elsewhere.

The vision described in the report of the World Commission on Water was the result of an exercise in which hundreds of organizations and some 15,000 people participated. This culminated in a meeting in The Hague on March 17–22, 2000. Of the 5,772 people attending from 158 countries, I'm proud to say that 28 percent were women—quite an achievement in a field dominated by middle-aged engineers. On top of that, of the 145 countries

represented at a ministerial conference, 113 of the delegations were headed by actual ministers.

Some sobering figures

Water, especially fresh water, is a fairly precious resource. Fresh water—as distinguished from salt water—represents less than 2.5 percent of the water on the planet, about two-thirds of which is locked in glaciers and ice caps. Of the third that is not, two-thirds is lost to evapotranspiration—that is, evaporation going straight up and transpiration through plants that is not capturable as surface runoff. That leaves only about 40,000 cubic kilometers potentially available to people—of which 20 percent is in areas too remote for people to reach (which is not to suggest that people should colonize that remaining wilderness). Of the remaining 80 percent, three-quarters is not readily usable because it comes at the wrong time and in the wrong place—such as floods in monsoon seasons—and brings lots of damage. Thus, the total water available sustainably for all of humanity is about 12,500 cubic kilometers.

And water use is rising. In the 20th century, the world's population grew threefold and water use grew sixfold—although 1 billion people have no access to safe drinking water and close to 3 billion have no appropriate sanitation—and ecosystems are severely strained. Against that background, the Commission found that current practices are unsustainable and *unjust* and must be changed.

More sobering figures: In the last 100 years, half of the world's wetlands have been lost to development. Underground water is being mined at unsustainable rates and 10 percent of world food production, especially grain production, now depends on withdrawing groundwater faster than water tables can be recharged. When water tables drop like that, you can dig deeper and deeper wells and find barely any water at the bottom. And when you've mined that water, life in that community is no longer sustainable. Unsustainable practices are often not visible. Pumps elevate groundwater, which is used for irrigation, and when the water table drops too far or salt water intrudes, you get desertification. Who suffers the enormous impact of desertification? Invariably, the poor.

In addition to problems with the quantity of water, we have problems with water quality. Water pollution is making water unusable for drinking and other purposes, largely through urban concentrations, industrial point pollution, and the leaching of agricultural chemicals. Freshwater fish species are going extinct at five times the rate of marine fish species. Fish kills—most recently from mining and cyanide—occur largely because of pollution, not overfishing. We take it for granted that refuse dumped into waterways will be carried away. By not internalizing the social and environmental costs of pollution, we are destroying a precious resource.

How water is wasted

How are the waters being wasted? Irrigation uses enormous amounts of water, inefficiently. It takes at least 2,000 to 4,000 tons of water to produce a ton of rice. It takes roughly a thousand tons of water, most of it used inefficiently, to produce a ton of wheat.

Many cities have inefficient public utilities. Water losses—treated water that is unmetered or doesn't reach consumers—are between 40 and 55 percent, although a well-run utility such as Singapore's loses only 8 percent. The poor get rationed out of access to the piped water system, do not have access to water and sanitation, and live in miserable conditions. Lower water utility prices are strenuously defended in their name, but the poor actually end up buying poor quality water from water vendors, paying 10 to 20 times the unit price that the middle class and the rich pay for the water which is piped to their homes. This is not merely unfair; it's perverse. And women bear the brunt of this inequity, expending enormous amounts of energy meeting household water needs.

In our judgment, waste and shortages are the result of inappropriate pricing. So are lack of innovation and the failure to involve the private sector. I will talk more about this strong finding because people tend to have different views about water issues. The degree of cost-recovery in water utilities constrains private sector investment. Telecoms make a big profit, so they never have a problem attracting private investors; the government can establish auctions, bids, and so on. While gas and power profits vary from country to country, you can get some private investors. But revenues from water tariffs average about 25 percent of costs. That is so far below cost recovery that the private sector today is at best involved in only 5 to 6 percent of urban water services around the world, and even less in the agricultural sector. In fact, some of the giants in the water business, such as Vivendi of France, are getting out of it. They would rather go into telecoms than stay in this difficult sector. That's the bad news. But there are some sustainable solutions.

Sustainable solutions

One solution is getting "more crop per drop," a slogan David Seckler of IWMI first used in connection with irrigation. Mexico has had good experience with *user management of irrigation systems,* in which the farmers themselves, through a farmers' cooperative, monitor water use. Not only is the allocation of water more equitable because they know each other, but they also maintain and fix the facilities as they go along, so that pipes do not fall into disrepair. This system has now spread to Turkey and to Andhra Pradesh in India.

Another solution is *community action for water and sanitation,* examples of which we have seen in Brazil (Condominial) and in Karachi (Orangi).

Although the Orangi district is called a district or a neighborhood, it contains 650,000 people, so this is not a small experiment. What this experiment has shown is that people are willing to invest enormously not only to get water for their plots but for simple sanitary facilities. To get the wastewater out of their neighborhoods, they covered 35 percent of the cost with their own labor. What's interesting is that this reversed conventional priorities for dealing with water treatment. The standard engineer would have said, "First you build the plant, then you build the trunk lines, then you build the primary connectors, then the secondary, tertiary, and so on—and then you connect the homes." The families started by investing first in their homes, then they took the project out to the neighborhood block, from there to the district, then to the edge of the district, and finally they connected to the main sewerage processing plant. This way they got something as they went along. Their priorities were different.

Similar things are happening in rural areas. The Grameen Bank financed a $15 million-a-year microlending program for poor women with no interest subsidy, and not only did it succeed but they have a 98 percent repayment rate. People are willing to pay for good water quality.

So what is the problem? If you get the prices right, is everything resolved? But here the public good comes in—the gloomy arithmetic of water. Globally, agriculture consumes about two-thirds of total water withdrawals. And most of the population growth in this century will be in developing countries, where we expect agriculture to continue withdrawing between 80 and 90 percent of the water. With population pressure increasing, by our analysis 17 percent more water will be needed for agriculture by 2025 and 40 percent more for human consumption. And that 17 percent figure for agriculture is based on the extremely conservative assumption that irrigation would provide only 40 percent of the total, although in the last burst of activity, the green revolution, it provided about 80 percent of the total. This also assumes there will be no increase in per capita consumption of calories, which we hope will increase. Add to those assumptions the assumption that efficiency of water use in irrigation would rise from its current very poor level, about 35 percent, to the river basin level of 70 percent everywhere in the world, and you would still need 17 percent more water.

These demand figures are not feasible if we are to protect the basic ecosystems on which we all depend. What does that mean? We could capture a lot more of that floodwater by building more dams, but this raises a whole other set of issues, which John will be addressing in his talk on the Dams Commission. Or we could accept a lot more rainfed agriculture, but then what's going to happen to the forests, to the ecosystems, to the habitats, and to the species? We have a big problem on our hands. If the solution is business as usual, we'll have unsustainable practices and the poor will not be served. Agricultural expansion in rainfed areas will create enormous prob-

lems, and the conflicting claims to water will create tensions and possible strife.

Against that background, we've come up with some recommendations, one or two of which are controversial. In a water-secure world, to use an analogy with food security, every human being would have access to safe drinking water, appropriate sanitation, and adequate food and energy at reasonable cost—and water to meet these basic needs would be provided equitably and in harmony with nature. But if water security is the goal, we must change the way we manage water.

Integrated water management at the catchment level

First, we must move to a holistic approach, relying on integrated water resource management to replace our current fragmented approach to water management. Integrated water management is best done at the basin or catchment area level. Essentially, in every country there are at least 6 and sometimes as many as 20 agencies involved in water management. Water used for irrigation is managed separately from water for municipal use, water for industry (both input and output), water for hydropower, and water for environmental protection. It's all the same water but most of the time the agencies in charge don't talk to each other and often make contradictory decisions. We must resolve problems associated with fragmentation by use.

We also need to deal with the fragmentation across sovereign boundaries—fragmentation by sovereign administrative unit. About 262 rivers are shared by two or more countries, and 40 percent of the world's population lives on such shared rivers. Of course, these boundaries are meaningless in nature. Countries in a catchment area must learn to collaborate. Even within a national boundary such as India or the United States, states' administrative boundaries do not conform to river basin catchment areas. States, too, must learn to collaborate. Water management really requires several kinds of public-private partnerships to accommodate market concerns, sovereign-state concerns, and regional and global concerns.

Participatory decisionmaking

Second, a mechanism must be put in place to involve all sectors of society in decisionmaking. Civil society has to be involved both in educating the public and in giving voice to their concerns. In Orangi, by giving voice to the community, they were able to reduce costs by 75 percent yet provide first-class facilities for 650,000 people, by getting the people—not a central third party—to set priorities. Collaboration and participation must be backed up by scientific knowledge, of course, including how to deal with technical issues, such as the problem of arsenic that is emerging in Bangladesh. You need

to involve and rely on the village but you also need structures such as the World Commission on Water for getting technical advice.

Cost pricing plus subsidies for the poor

The most controversial part of the commission's recommendations was to move toward full-cost pricing of water services, with targeted subsidies for the poor. This requires a major change, but we insisted on linking the two because of the market's failure to accommodate the needs of the poor. We believe full-cost pricing of water services will reduce waste, increase accountability, encourage private sector involvement, and possibly help mobilize large private sums, releasing scarce public funds for other essential tasks, such as education and health. The amounts can be quite significant. We know the poor are willing to pay for water, but public funds will still be needed. Transparent, targeted subsidies for the poorest will be needed—subsidies for the people, not for the utility or service provider. The idea is to initiate a multiplier effect for scarce public funds by reducing the size of that part of the water equation which cannot be tackled by the private sector, and to promote the innovation and public goods research we feel is badly needed. So community action such as we have seen in Orangi, and in projects carried out by Lyonnaise, Vivendi, and others is going to be needed, as well as national concessions.

"Do you recognize water as a human right?" people ask me. Of course I do. Without food and water, people die. But how much do humans actually need? My friend, Peter Gleick, says that the average basic daily need is roughly 50 liters per person: 10 liters for cooking, 5 for drinking, 15 for bathing, and maybe 20 for sanitation-related activities. But add in the water needed to produce the food you cook and eat and the daily total is closer to 2,700 liters per person. It takes a liter of water to produce a calorie, on average, so 2,700 calories calls for 2,700 liters of water, although it varies, depending on the diet. In the United States, because of the beef content of the diet, it takes 5,500 liters per person daily to produce 3,800 calories; in the Sahel, in Africa, it takes only 983 liters to produce about 2,000 calories. But the world average is 2,700 liters per person to produce 2,700 calories, or roughly a liter per calorie per person per day. That's how important agriculture is in dealing with this water equation.

If water is a human right, should the government provide everyone with a minimum amount of safe water and other services for free? Does the government provide everyone with free food, that other basic human right without which there can be no life? No. Farmers in the private sector grow, process, and distribute food and get paid for it. We try to support those who cannot afford food with food stamps, income transfers, solidarity programs, and community action programs, but we do not destroy the agricultural production

and distribution system on which society depends. The former Soviet Union tried to provide free food for its citizens, destroyed its agriculture, had massive shortages, and failed to meet its citizens' needs. That's a sobering lesson on why we need rational water pricing to attract the private sector.

Water innovation fund

We also recommended a water innovation fund to foster innovation and technology, to provide seed capital—or venture capital—to nourish innovative approaches, evaluate best practices, and prepare projects for start-up. This should be done globally, in our judgment.

User-pay and polluter-pay policies

All that being said, since governments are key actors, we will need political will. Governments must think beyond their national boundaries, recognize water's regional and global aspects, pay as much attention to the poorest citizens as to powerful lobbies, encourage participation from the lowest level possible, and deal with the problems of pollution. Unless user-pay and polluter-pay principles are introduced, these changes will not take place.

Governments are responsible for protecting the environment for future generations, which requires a direct investment in public goods. But governments also have an educational task: encouraging behavioral change. Rather than see water as a private good from whose use others are excluded, governments need to collaborate with others to safeguard the systems on which water depends. And collaboration is required from the lowest level to the highest level.

Major changes in policy will require massive investments. By the commission's estimates, we need to go from annual average investments in water of $70 billion to $80 billion a year to roughly $180 billion. Such an enormous increase will not come about without community action and the involvement of the private sector.

Our challenge is to act as responsible stewards of the earth. Since the meeting in The Hague, the Global Water Partnership has been developing a framework for action to help guide investments, large and small, that promote sustainable agriculture, provide food security for teeming cities, protect the environment, and ensure that people and children find safe water at the faucet.

Floor Discussion

Robert Picciotto, Chair

Robert Picciotto, the chairperson of this session, commented that global public policy was like the weather: Everybody talks about it, but no one does anything about it. But, as we have heard, Ismail is clearly an exception to this rule. While inviting questions from the floor, he thanked Ismail for his presentation, especially since yesterday had been his last day at the World Bank. As of today, he was a free man; the workshop was therefore doubly grateful that he had agreed to give this luncheon presentation today.

In response to a question inaudible on the tape, **Serageldin** said that the environmental movement was his model for the political movement required for change in the water sector. Maurice Strong, who was Secretary-General for both the 1972 and 1992 Earth Summits, told Serageldin that only three heads of state and government attended the first summit; at the second summit, 20 years later, 114 heads of state and government attended. Whether they came out of conviction or because they felt it was politically expedient to do so did not matter. What was important was that in 1972 the environment was seen as an issue only for the beads and sandals crowd; it became a mainstream political issue largely because intellectuals, civil society, and the media took it up, educated the world, and said, "This is not acceptable." Water is just beginning to become an issue. The point of the event in The Hague was not to have another technical meeting—we've had many of those—but to galvanize groups from all segments of society to say, "This is not acceptable. You have to change." We had 5,770 people register and pay to go to The Hague. We need more campaigns of that kind.

In Tamil Nadu, India, close to the sea, the water table is dropping. If it keeps dropping, reducing hydrological pressure, there will be saltwater in-

trusion, the water will be unusable for drinking or agriculture, and of course the land will be unusable for agriculture. California's Imperial Valley has drawn down water so fast that today they are treating wastewater and reinjecting it to maintain the aquifer's hydrological pressure. India and Tamil Nadu will never be able to afford that kind of solution. They have no choice but to avoid the problem.

Because groundwater is not visible, you have to galvanize public opinion around the problem. In Andhra Pradesh, in India, Chief Minister Chandrababu Naidu got re-elected by saying, "I am not going to promise cheaper electricity." The user-pay, polluter-pay principle will not be enforced unless rising political consciousness makes it necessary either for politicians to believe in the issue or to feel compelled to act on public opinion. This is why civil society must be involved on a large scale. You need education, you need behavioral change, and you need a political movement. Unless you galvanize communities to take on a much larger part of the responsibility, there is no way to increase spending on water from $70 or $80 billion a year to $180 billion a year—the level of investment needed to achieve the objective of a water-secure world by 2025 or beyond.

John Briscoe said that, a month earlier, he had met with a group of farmers in Haryana (India) that had been looking at implementation of the water policy paper. These farmers had just been to Andhra Pradesh to learn what was happening with the farmers there. The people in Andhra were much poorer than the farmers in Haryana but they paid ten times more for water services. We asked if they could pay that much and they said, with the official from the irrigation department sitting there, "We're not paying for it because you are not accountable to us. If you will be accountable to us, we will pay it happily." We asked if they thought that, although Mr. Naidu had taken this on as a political issue, if everything might go back to square one once he goes and somebody else replaces him. The farmers' answer was fascinating. They said, "When we asked our colleagues in Andhra Pradesh about that, they said that when a new chief minister comes, they would not allow him to provide free water in the future." Thus, after so many years of unfulfillable promises, the community has actually started demanding payment and accountability. There's a lot we can talk about in terms of how the Bank should get involved at the grassroots and community level, but you are starting to see things happening. **Serageldin** said, still far too few.

Chris Gerrard said he understood the report of the World Commission on Dams was a consensus report. He assumed the recommendation about the full-cost pricing of water was a consensus recommendation. What was the key to reaching that consensus?

Serageldin replied that the 25 members of the commission were all eminent people, including former President Mikhail Gorbachev, former Prime Minister Carlsson of Sweden, former President Masire of Botswana, Vice

President Kazibwe of Uganda, Bob McNamara, Maurice Strong, and Mohamed T. El-Ashry. And every single person on the commission signed off on the report. Serageldin drafted it. While it was a short report, it was the commission's report. They negotiated the language in every paragraph. They agreed at the beginning that they would seek consensus among themselves as individuals but would make no effort to seek consensus with governments or other stakeholders. They had launched a process and everybody else—there are many different groups—could now produce their own vision. Literally hundreds of documents were distributed in The Hague and there would be many more.

As a group of eminent people, the commission owed it to the world to give their judgment. And on the issue of pricing, they all agreed that there was no way to get significant changes from the current wastage if water continued to be free. On that point, they had lots of support from the environmentalists on the commission. With the bar charts the way they were, there was no way that they would get investment from the private sector, who would put their money somewhere else. Jerôme Monod and others from the private sector strongly supported that view, but the current system is also unjust from the viewpoint of the poor. What the poor pay water vendors ranges from 2 to 100 times as much as the official price of piped water—that, or they pay in the poor health which they and their children experience from drinking polluted water. So we decided to bite the bullet and recommend full-cost pricing, continued Serageldin. We did not say in the report what full-cost pricing means. Clearly it includes the cost of infrastructure and operational maintenance, and some members of the commission would like to stop there. Other members, and he is one of them, insist it should include the social and environmental cost as well.

Serageldin said he tries not to argue too much on that point, drawing an analogy with someone wanting to take a train to the West Coast from Washington D.C. One person will say that the train should go as far as Texas; others will say it should go to Colorado, or stop in Texas, or go all the way to California. Meanwhile, we're still here in the station on the East Coast. Why not start moving in the direction of raising the prices and then worry about where to set the limit on full-cost pricing? It reminded him of the many arguments the Bank has had on the long-term marginal cost pricing of electricity. You say to people, I don't really care whether it's going to be exactly 332 times or 328 times the current tariff. We'll start with a 100 percent increase and maybe get another 200 percent increase later on, but we're still well short of that, so let's not argue too precisely.

The commission reached a consensus that nothing would happen without *conservation, equity, and investment,* all of which were required. They were attacked by some NGOs, who argued about the human right to water.

We asked if water was so different from food and pointed out that they accepted food pricing, to preserve the agricultural production system, with the poor being subsidized directly. Why should water be different? Subsidize the poor people.

Rob van den Berg congratulated Serageldin, the Commission, and the Global Water Conference for putting the issue of water pricing on the map. He thought Serageldin was right: You need to put the issue on the agenda before you can start dealing with it, especially with public policies and programs. But the timeframe also has to be taken into account. A department in the Dutch Ministry of Foreign Affairs has done an evaluation of Dutch support for institutional development in the water sector. This was put on the international agenda decades ago, when there was an international consensus that the institutional aspects of water management were important. Their evaluators learned that it took about five years for that international consensus to be translated into national policies, since national governments grappling with the problem didn't know how to translate the international consensus to their own specific situation. Then it took another five years for those national policies to be put into action and in fact it was too early to judge whether the implementation was successful and going in the right direction. So this time gap is important. **Serageldin** agreed.

Robert Picciotto asked if any technological solutions might help in the transition toward a full-cost pricing approach.

Serageldin responded that this was widely debated, because irrigation uses so much water. They think that the enormous potential to increase water-use efficiency will also come through pricing. In Egypt, for example, the water in the valley called the old lands is technically provided for free. The net result is that farmers overuse water so much that certain parts of the prime valley land are waterlogged. In the so-called new lands, which are reclaimed desert, water is priced, and everybody there has adopted irrigation systems that use water incredibly efficiently. More important, they have also changed their crop patterns. As an Egyptian, Serageldin finds it ludicrous that Egypt should produce wheat, for which they have no comparative advantage against the plains of the American Midwest. With so little land per capita, enormous labor-to-land ratios, and a climate that requires irrigation year-round, Egypt should be producing and exporting high-value crops, from cut flowers to fruits and vegetables, and importing its wheat. It makes no sense for Egypt to produce wheat, but not doing so will require tough political decisions. Pricing tends to force people to take a hard look at crop patterns, and changing crop patterns can enormously change water requirements.

Biotechnologists are engineering plants that are not only more drought-resistant and drought-tolerant, but are especially important in poor areas in Africa that are not irrigated and depend heavily on rainfall. Scientists are changing the metabolism of plants, shortening the time the plants need to

grow so they can get an extra crop, or increasing their salt tolerance so that they can use brine water—M. S. Swaminathan is now doing research to understand the salt absorption mechanism in mangroves. Potentially you can change plants' growth patterns in different locations so you will have less evapotranspiration, but get the same amount of crops—as Dave Seckler put it, so you get "more crop per drop." But without the change in incentives that comes from changing the pricing policy, a technology fix will do no good—you won't move people to adopt an appropriate technology even if it exists. The example he gave from Egypt is true all over the Middle East. Why should anybody trouble themselves to be out of pocket if water is free? It would be insane.

One problem is that technologies appropriate for the South are not a primary interest of the private sector in the North, which controls most biotechnology investments. You might get some attention to such traits as drought tolerance in Europe (more than in Canada and the United States), but there would be no attempt to deal with plants' resistance to salt and salt water. When acidic soil-resistant maize from CIMMYT is produced, people ask if it can be used in the United States. And it cannot, because that particular plant doesn't grow north of the 30th parallel, which barely captures the bottom of Florida. What grows in the United States is not necessarily suitable for India or the Sahel, so we will need investments that see this as public goods research. This is where the CGIAR, in the able hands of Ian Johnson, can play a major role.

Robert Picciotto closed the session by thanking Ismail Serageldin once again for giving his presentation today. The time Serageldin had given us had been very precious.

The Prototype Carbon Fund: Mobilizing Private and Public Resources to Combat Climate Change

Ken Newcombe

Much of the material I am referring to is on the website www.prototypecarbonfund.org/. The most important thing about this new sovereign commodity of greenhouse gas emissions reduction—sometimes called carbon offsets—is that it doesn't matter where in the world the actions to reduce emissions take place. Wherever it is, these have the same impact on climate, which is extremely fortuitous in terms of the global market in emissions reductions we're trying to stimulate.

The industrialized countries have collectively committed themselves to reducing their greenhouse gas emissions by 5.2 percent below 1990 levels between 2008 and 2012. They can do that through trade under flexible mechanisms. The interest of the Prototype Carbon Fund (PCF) and the Bank is in project-based ways of generating emissions reductions. You may be skeptical about whether the Kyoto Protocol will ever get ratified, but a protocol will be ratified sometime and any actions taken now will likely be grandfathered into it. In many ways, the protocol is already being implemented by the private sector through corporate commitments to reduce greenhouse gas emissions within their businesses, and by a growing number of financial intermediaries investing in or trading carbon offsets in anticipation of the domestic trading regimes in the OECD. And most domestic regimes, including those in the European Union, will go forward to some extent. So debate and uncertainty about the international regulatory framework should not concern us in terms of preparing for the market development.

What is going on is that more and more of the major corporations that are in carbon-intensive businesses are seeing this change as inexorable. Politics may slow it down, but it will occur and it will have a major impact on their

business. At the last annual shareholders meeting of BP Amoco, 12 percent of the shareholders voted for BP to get out of oil production. That sent them a signal about how sensitive these environmental and sustainable development issues are for their consuming public. And a major corporation in Australia saw its share value drop 20 to 30 percent on the Sydney stock exchange because Greenpeace pointed out that they failed to mention the potentially enormous cost of offsetting the large carbon emissions intrinsic to their business development. Clearly, most big companies are aware that if they are carbon-intensive, they must think strategically to mitigate the risk of climate change. Like it or not, they have to take the issue seriously.

Formal market drivers

The formal market driver is the OECD countries' obligations to reduce their greenhouse gas emissions by on average 5.2 percent below 1990 by the end of the accounting period of 2008–2012. The impetus for investment and trade in emissions reductions with Bank client countries is that the OECD will miss its agreed Kyoto Protocol emissions reductions obligations by 20–30 percent in terms of actions taken within their own economies and will have to trade under the protocol's flexible mechanisms of Joint Implementation (Article 6), the Clean Development Mechanism (Article 12), and Emissions Rights trading (Article 17) to make up the difference. This means that if the Kyoto Protocol is ratified and the current commitment period of 2008–2012 is retained, perhaps half a billion to 700 million tons of carbon a year will have to be offset through trade on average in each year in this period. Analysts speculate that the market-clearing price globally, in a perfect world, is in the range of $20–50 per ton of carbon (t/C). Technically, the developing countries alone can meet this volume of demand for less than $20/t/C. On the other hand, the short-run marginal cost of supply in the already energy-efficient and hydro-power or nuclear-dominated economies of Japan, Norway, and Sweden, for example, is already above $40/t/C. Obviously, we must be careful in adopting global model estimates of prices and volumes as given. We tend to discount the trade volumes substantially, given that carbon finance by itself is no magic bullet for the capacity constraints and investment risks for foreign investment in developing countries. However, a trade volume of the order of $10 billion a year in emissions rights and project-based emissions reductions is feasible if the protocol provides an enabling regulatory environment for private investment. Given that carbon finance will comprise 10 to 20 percent of total project financing, this carbon trade volume implies a substantial boost in investment in cleaner technologies, and in climate and environment-friendly infrastructure for our client countries.

What are the key problems? While developing countries have the technical capacity to produce this volume of emissions reductions, their gov-

ernments and private sectors have only limited capacity to facilitate the trade. They have opportunities for meeting the demand but there are enormous constraints on their delivering it in this timeframe. And unfortunately the EU is inclined to a cap on the proportion of an OECD country's emissions reductions obligations that can be met through trade under flexible mechanisms, with the intention to force the U.S. and others to take hard decisions on their energy policies. I think that it's naive to believe that the developing countries have the market capacity to deliver any significant volume of low-cost, project-based emissions reductions to the OECD in this timeframe.

Very few countries may benefit from this trade. It could easily resemble the highly skewed distribution of foreign direct investment flows to the developing countries. On the face of it, China and India will be the main beneficiaries, with Russia and Ukraine potentially large beneficiaries if they can build market confidence. I am constantly surprised by our clients' inability to define or articulate their own self-interest in the convention process. Key negotiations are coming to closure, but they are ill equipped to defend their interests. The most striking example of this is that land use and forest cover—or the potential to invest in carbon sinks as a means of achieving emissions reductions—represent the only significant opportunity for most of the poorer, more agrarian economies to benefit from the Clean Development Mechanisms (CDM). But most appear silent on the issue because they have such limited capacity to analyze and assess the potential benefits to their agro-ecosystems, their degraded landscapes, and the livelihoods of the rural poor of prospective private carbon investment flows.

What is the basis of the Bank's involvement? Basically CDM-driven, project-based investment to achieve emissions reductions is the single most powerful incentive ever for clean technology transfer, if this could be made to work. Without the benefit of trade, especially through these flexibility mechanisms, the cost of compliance for countries, and companies within OECD countries, will be so high that it's unlikely they will want or be able to do anything at that scale. And, of course, climate change will be progressive and aggressive, and our poorer country clients will suffer substantially.

This trade would be dominated by private capital. It's inconceivable that there could be a sufficient scale of overseas development assistance to mitigate climate change. Remember, we are talking not only about the carbon offset investment component, but about another four or five times this amount in total project finance, because at the lower end of anticipated carbon prices, carbon finance is only a modest slice of the investment capital required to support more climate-friendly infrastructure.

The key concern for most stakeholders is the environmental credibility of traded emissions reductions. Selling greenhouse gas emissions reductions must mean that the supposed climate benefit is real. And if the climate can-

not be shown to benefit from the emissions reductions trade, pretty soon the trade will collapse under the weight of criticism. What reasonable, affordable transactions and processes could achieve environmental credibility while creating this new sovereign commodity of greenhouse gas emissions reductions? Is there a happy convergence between the transaction costs that assure one of the environmental integrity of the product, yet pose manageable transaction costs on investment and trade? These are the fundamental questions facing the Prototype Carbon Fund.

Purposes of the Prototype Carbon Fund

The purposes of the Prototype Carbon Fund are the following:

(1) To demonstrate how trade through the Clean Development Mechanism and Joint Implementation can contribute to sustainable development.

(2) To provide "learning by doing" experience for parties to the Kyoto Protocol, the private sector, and other stakeholders on key issues (such as defining and validating baselines).

(3) To build confidence that the trade can benefit both sellers and buyers.

The second purpose above is a particularly sensitive one for a global public good product in the Bank, because the regulatory framework for the Kyoto Protocol doesn't yet exist. We have in some sense been granted the legitimacy of testing the application of the protocol through rules that are still being negotiated. Often in the process of developing a product, we were accused of "getting ahead of the convention." After two years of discussing the trade-off between a learning-by-doing service to negotiators and other stakeholders on the one hand, and possibly being seen to pre-empt the negotiations on the other, the Board and most stakeholders agreed that the "learning-by-doing" function was unique, potentially enormously valuable, and that we should proceed. Our challenge is to sustain the confidence of those who concluded that this was a valuable role for the Bank and to avoid becoming in the eyes of many, a de facto "negotiator." This is a difficult challenge given the power of the knowledge and experience we are gaining about what works and what won't in the protocol negotiations text as we move through the first emissions reductions purchases.

Ultimately, this trade won't happen unless both sides feel that it works for them. We hope that the PCF will demonstrate how this trade is profitable in and of itself, that developing and transition economies can capture important resource rents through the trade—understanding the very substantial difference in the marginal costs of abatement between developed and developing countries—and finally that private investment flows to support the trade can contribute to sustainable development and improve the quality of life of low-income groups.

The Prototype Carbon Fund value chain

The Prototype Carbon Fund (PCF) is constructed like a closed-end mutual fund, which takes share capital from governments and from companies. Funds are pooled by the World Bank using a trust fund vehicle and placed in perhaps 25 or 30 projects around the world. In return, the subscribers receive high quality certified emissions reductions and, the hope is, valuable knowledge of the product and the market. Shareholders don't get a financial return. However, they are hoping that the cost of emissions reductions through the PCF is considerably lower than the short- to medium-run cost of supply within their own carbon-intensive businesses, or that they can sell their carbon offsets in the secondary market at a profit.

In sum, we are placing shareholder funds about equally between both project-based flexible mechanisms—Joint Implementation and the Clean Development Mechanism—and distributing our carbon purchases as widely as possible across climate-friendly, renewable energy and energy-efficient technologies and regions of the world. We produce two products. One is precise: *certified emissions reductions* with a target price outcome average across the portfolio at Fund liquidation in 2013 of about $20 a ton of carbon. We feel this is doable based on our experience with Global Environment Facility (GEF) and other climate-change mitigation investments over the past decade. The cost of carbon going in should be less than $10–12/t/C to provide room to hedge project risk and provide incentives for the project sponsor.

The other, perhaps more interesting product is *knowledge—learning by doing.* Stakeholders such as NGOs, the private sector, and host countries for these carbon purchase transactions stand to learn a good deal through the experience of transacting carbon purchases and maintaining the project-based carbon asset over time in line with the Kyoto Protocol's requirements. For example, in verifying and certifying emissions reductions, transferring them to national and central registries and fund subscribers. And, most important, in being able to create a high-value asset up-front by establishing a credible baseline of what would have happened without the project, and defend this baseline through a process of independent validation. How do we establish the baseline? This business is very much about what would have happened under "business as usual." All the way down this value chain we're trying to put in place procedures that allow independent arbiters of high professional standing in the private sector to say, "Yes, we agree with your assumptions about what would have happened under 'business as usual' and therefore how many emissions reductions you could claim over the life of the project if you financed a renewable energy technology instead of a fossil fuel one, or you switched from a higher to a lower carbon modern fuel source for your process." This is where environmental credibility comes in: one wants to be confident that emissions reductions certified really mean that the atmospheric or climate-change mitigation benefit materializes.

The Prototype Carbon Fund's core group of stakeholders

Currently 17 corporations and 6 public entities are investing in the fund. Public entities subscribe $10 million and companies $5 million. Subscribed capital is $145 million. Why are they interested? It is intriguing for us to work with these companies and to understand how they are viewing the product, and how they're equipping themselves to cope with the impending obligation to reduce emissions or to take advantage of the emerging market opportunity. Whether it's packaging carbon-neutral oil or coal for the Japanese market, factoring carbon finance into their developing country investments to increase profitability, or simply figuring out how to generate emissions reductions efficiently inside their own business, the PCF association provides a rich learning experience.

Of course, the potential host countries are the key parties to these transactions. We have a mechanism for bringing them into the PCF learning-by-doing process beyond the individual deal they may authorize. In the business structure of the PCF, there is a Host Country Committee with advisory functions, and it meets whenever the Fund participants meet and often in joint session with participants to review the practical lessons arising from specific projects and implications for the ongoing negotiations and fine-tuning of the regulatory framework. There will eventually be 25 to 30 members of the Host Country Committee comprised of countries hosting PCF projects and those which have signed a Memorandum of Understanding that they will contribute in this capacity to the PCF's implementation.

Technical advisers

PCF draws formally on NGOs, researchers, and private sector business associations, North and South, to review and comment on its business processes and methods for carbon asset creation and management, and portfolio development. NGOs are partly self-selecting from the global Climate Action Network, as well as from a North-South Kyoto Protocol research network.

Prototype Carbon Fund: Current Subscribers ($145 million)

Governments (6):
Canada, Finland, Japan (through Japan Bank for International Cooperation), Netherlands, Norway, Sweden

Private Sector (17):
BP-Amoco, Chubu Electric, Chugoku Electric, Deutsche Bank, Electrabel, Fortum, Gaz de France, Kyushu Electric, Mitsui, Mitsubishi, NorskHydro–Norway, RaboBank, RWE–Germany, Shikoku Electric, Statoil–Norway, Tohoku Electric, Tokyo Electric Power

To enhance the learning value of the PCF, beginning in January 2001, members of the Host Country Committee, Technical Advisory Committee and Participants in the PCF will be taking up visiting fellowships to work in the PCF Fund Management Unit for periods of several weeks to several months at a time. Host Country Committee and Technical Advisory Committee members will be supported by funding from the parallel PCF+ facility,[1] whereas PCF participants support their own costs. Both will work on a specific task agreed with the PCF as well as contribute to the regular work of the team.

The Prototype Carbon Fund's portfolio and investment phase

PCF's capital is to be fully contracted in emissions reductions purchase agreements associated with specific projects by the middle of 2003. This means that almost all the projects that will achieve these emissions reductions will have been identified by mid-2002 to ensure adequate time remains to finalize project preparation and contract negotiations by the time the investment phase closes in July 2003.

PCF's portfolio development strategy is to diversify financing across regions and highly replicable technologies, emphasizing carbon purchases from renewable energy and energy-efficiency projects, while making room for fuel-switching projects in the modern sector which are likely to be the "core market" of the CDM. Already, deal flow is heavy compared with PCF's financial capacity, and third-party private sector projects with no underlying IFC or World Bank financing dominate deal flow.

Every day in the PCF brings new insights on how carbon finance can contribute to sustainable development, and how much synergy is created through making a market out of this global externality of climate change and addressing local environmental and social issues.

The PCF experience to date suggests that the Bank is uniquely placed to convene stakeholders and mobilize capital to explore this potent development interface in an emerging global public goods marketplace.

Note

1. PCF+ is a program of research on improved methods to create and manage the emissions reduction asset, and for training and outreach for PCF purposes. Supported by the investment income of Finnish, Canadian, and Swedish PCF Participant Holding Trusts for PCF subscription paid largely in advance, it provides about $1 million per year for these purposes. It is a source of support for a World Bank Institute/PCF Climate Change Training Coordinator and workshops for other national and regional stakeholders alongside PCF prenegotiations workshops in host countries.

Discussion: The Carbon Fund in the Bigger Picture

Scott Barrett

It is nice to see someone actually doing something about these problems rather than, like me, just talking about them. I am going to talk about them now from the perspective not only of climate change, but of global public goods generally.

First, there is no question that climate change is a global public good. But what is the Carbon Fund going to do about the problem? Let's try to get some perspective on it. A certain amount of money is being put into it, but what are we actually getting in return? It's helpful to think about the Carbon Fund in terms of some different benchmarks. For the Carbon Fund the two benchmarks are (1) no cooperation at all—everyone behaves unilaterally, looking after themselves, not doing anything consciously or deliberately to help others—and (2) full cooperation, in which you're trying to do something that will benefit everyone. Ravi Kanbur was discussing the latter benchmark. If you start bringing issues like altruism into the story when you're discussing a problem of cooperation, you define the problem away by assumption. There is no problem if we're all altruistic but, sadly, we are not.

How do you interpret these two benchmarks? We are pretty good at solving for full cooperation, the ideal outcome. William Nordhaus at Yale University, for example, has worked out a ballpark calculation of a full cooperative outcome for the whole world—exactly what we should do about climate change. You can do that kind of thing for full cooperation, but what's the nature of the outcome if we don't cooperate fully and just look after ourselves? In economics you can write down a model, get a clear result, and feel satisfied, but the real world is messy and difficult to get a handle on. But here's a way to think about this noncooperative outcome. When I teach

it to my students, I have them play a card game. I give them a black card and a red card and ask them to hand one card back to me. They get a payoff, but the payoff depends on which card they hand back to me and which cards all the other students hand back to me. The red card is a public good, and if you provide the public good, everyone in the room benefits, but you pay a cost. Usually, we assume that the cost is big enough that everyone wants to hold on to his red card; that is, no one supplies the public good. This is the prisoners' dilemma game. When I perform this experiment in the classroom, however, I always find that some people supply the public good.

How do you frame this problem? Instead of asking the students to hand back a card without anyone knowing which card they handed back—that's why I give them two cards, so no one can tell which card a student handed back—suppose it were public knowledge what each student did? I know that my behavior would be altered by this public disclosure, and I'm sure the same will be true for others. It's a bit like this: When people can make eye contact with one another, they behave differently than when they can't. What I am saying is this: While William Nordhaus can tell us what full cooperation is, we're not really sure what the other benchmark of noncooperation is. I think the Carbon Fund is, in a sense, trying to help us find this noncooperation solution—by which I mean it is not achieving full cooperation. To achieve full cooperation for a problem such as climate change, you must have an international agreement in which countries basically pledge to supply the ideal amount. But that agreement has to be backed up. It has to be supported in such a way that it is in the interest of all the different countries actually to supply this amount. The Kyoto Protocol does not do that.

This morning, we heard Richard Cooper say that Kyoto is dead. Well, yes, it probably is dead, because it is not really built to deal with this problem the way it should be dealt with. There's nothing wrong with Kyoto in terms of its overall target. The 5.2 percent reduction by the industrialized countries, it turns out, is broadly about right. You may disagree and that's fine; I don't have a strong view about it. But broadly, based on what we know about benefit-cost analysis for climate change, that's roughly right. So the agreement is basically aiming for the right target. The problem is that it doesn't contain the mechanisms needed to support this kind of outcome in a world in which, unfortunately, we care about our national interests more than the collective good.

The basic approach of this negotiation was to focus on targets and timetables, something that the NGOs were pushing. That was a big mistake, in my view. Instead of negotiating targets and timetables and then asking how do you encourage participation and enforce compliance, you should start the other way around. Start by asking what you know you can make countries do and, within that set of possibilities, choose the one that is best. This is not the approach that was taken.

To make this clear, let's compare air pollution agreements. The 1985 Helsinki Protocol on Sulfur Emissions (the Sulfur Protocol) required a 30 percent cut in emissions. It is widely believed that this agreement achieved nothing in the sense that all the countries which have done what they said they were going to do would have done it anyway. Roughly two-thirds of the parties to this treaty have overcomplied by a factor of three. Basically, countries figured out what they were going to do on their own anyway, and then negotiated those targets. Not a single mechanism in that treaty makes anyone do anything. There is no mention of compliance in the treaty. (Compliance is mentioned in Kyoto but nothing is done about it.) As for financing global public goods, there are no side payments in the Sulfur Protocol either.

The Montreal Protocol on the ozone layer, negotiated in 1987, sets a target and timetable just as the Sulfur Protocol does, but it also contains the mechanisms you need to get you toward full cooperation. It addresses both the compliance problem and the participation problem, in what I consider to be an ingenious way. As explained in my talk to this workshop, it does so mainly by threatening to restrict trade between parties and nonparties—a threat that is apparently credible.

Kyoto also has targets and timetables but, unlike the Sulfur Protocol, it set targets that are tight—that are actually biting, as Ken pointed out. But it doesn't contain the mechanisms needed to support the whole treaty, as does the Montreal Protocol. Now this is all very negative and I am not saying that I know how to write a better treaty on climate. I don't. But I do think it's important that we ask the right questions. I don't think the Kyoto negotiators did.

Basically, I see this Carbon Fund, especially the learning by doing it promotes—people meeting, discussing, deciding what to do about the problem—as helping to determine this noncooperative outcome. It is actually making things better. It's not getting us to where we'd like to go—there's still a huge gap—but it's a helpful institution in defining where we're going if we don't get a successful Kyoto. So it has utility even without a terrific agreement.

What I worry about with respect to the Carbon Fund is the problem Ken knows very well: How do you know what has actually been achieved? By definition, you can only observe the world you live in, where a transaction takes place; you don't know what would have happened without that transaction. But you need to have some sense of what would have happened otherwise, especially if one party to the transaction is not subject to any constraint on emissions—and one that can be enforced by the world community. I'd like to know how you know this—or, more important, what would be the costs of trying to figure it out. My guess is that the transactions costs of convincing people that something is really being achieved are substantial.

What happens when countries fail to cooperate? It's not as if nothing will be done. Something is going to be done. With climate change, as with sul-

fur, some emissions reductions will take place. With climate change, as with acid rain, people are also going to start adapting. People are going to start taking actions that will limit the damage. And this gets you right back to economic development because adaptation is a local issue. It's something that firms and individuals have automatic incentives to deal with. And where these incentives are missing, countries have incentives to supply the local public good of adaptation. These are local public goods issues. My favorite example, having recently moved from London, is the Thames barrier, which is a local public good, ready to prevent, in a sense, a rise in the sea level from harming London. Such local public goods are, I think, very relevant for the World Bank. Mitigating global climate change is a global public good. Adapting to climate change is a local (or intranational) public good. If the world screws up on the global public goods side, countries can still reduce this damage by doing a better job on the adaptation side. And here the Bank can play an important role. In many ways, it is wrong for the developing countries to have to pay for adaptation themselves. They didn't cause the climate to change, the industrialized countries did.

The World Commission on Dams: Lessons Learned About Setting Global Standards

John Briscoe

In talking about the World Commission on Dams, I'm going to give some tentative—and I emphasize tentative—personal reflections on some of the lessons we've learned about setting a global standard. Ismail's talk earlier today was almost an introduction to why there is a World Commission on Dams. The 45,000 dams that have been built have provided enormous benefits—including hydroelectricity, irrigation, water supply, and flood control—but at a great cost, of which we are more aware now than we were before: the annual displacement of millions of people as well as environmental impacts ranging from the drying up of rivers to the disappearance of the Aral Sea and half of the world's wetlands. For example, we saw on a recent trip to India that the Yamuna Barage had a nice fish ladder, but no water on either side. Moreover, benefits, broadly defined, have been inequitable, especially from hydropower, with most of the benefits going to urban areas. Few of them went to rural areas, which nevertheless bore the costs. So dams have become highly controversial. This very day, for example, the *New York Times* reported on the Western China Project as a "North-South struggle over aid." Developing countries are pulling one way and the United States and the industrialized countries are pulling another. With dams we see again and again that existing mechanisms cannot resolve the resulting problems.

How the World Commission on Dams came into being

The World Commission on Dams (the WCD) was formed because there was no forum for trying to reach a consensus on how to ensure that the "good dams" were built quickly and efficienctly, and that the "bad dams"

were not built. Bob Picciotto, who is sitting here, played an important role in getting the WCD started. After an OED review of the impact of World Bank lending for large dams, Bob wisely pulled together a coalition of the IUCN and the Bank to convene a meeting in April 1999 of 35 stakeholders from NGOs, the private sector, funding agencies, and indigenous people—ostensibly to review the OED report. Predictably, the report was dead on arrival because of its Bank-related authorship. The content didn't matter: the Bank was not a credible interpreter of events. What came out of this meeting is a story in and of itself—a story of careful facilitation. The consensus was that the world needed an independent body with moral authority to do three things: first, review the development effectiveness of large dams; second, assess alternatives for developing energy and water resources; and third (and most important), try to develop internationally acceptable criteria and guidelines for the planning, construction, operation, and decommissioning of dams.

We discussed not only "what" to do but "how" to do it. The consensus, appropriately, was that this should be an open, transparent, independent, inclusive, and consensus-driven approach, accessible to all stakeholders. The IUCN and the Bank were charged with bringing this commission into being with a 10-person "reference group," representing various stakeholders. Bob happily passed that over to me and others. I don't know how many years I aged in the next year.

Our first critical step in forming this commission was to get a chair. The chair we selected was Professor Kader Asmal, South Africa's Minister of Water at the time. Kader Asmal is a politician whose close association with Nelson Mandela brought legitimacy to this choice. He is a lawyer with a distinguished history in human rights activism, which added enormously to his credibility. That he had played a key role in South Africa's transition was important, and as Minister of Water he had handled the Lesotho Highlands Water Project, a celebrated case of multiple requests to the Inspection Panel. In my view, if Kader Asmal had not agreed to be chair, we would have had no commission. There was no second choice—nobody else on whom everybody could agree—a vulnerability that is rather frightening.

Next we held an important discussion about commissioners. Should we have a commission like Ismail Serageldin's World Commission on Water, with notable people in an independent capacity, or should this commission be people who clearly represented involved interest groups? Without a good deal of careful thought, we leaned toward the second option: respected individuals who were associated with interest groups. We then spent a year trying to put this commission together. Kader was absolutely critical in this process. Once he was appointed, he very much took charge. He was the source of moral authority that kept contending forces at the

table, which neither the Bank nor the World Conservation Union could have done, in my view. Kader saw the big picture and kept the process going. In the midst of all this, when discussions were hot and heavy, an election was held in South Africa and Kader became the fourth most popularly elected politician in the ANC. The sense of personal political legitimacy he received from that democratic process was tremendously important; he felt a deep sense of entitlement in pushing forward through a difficult and contentious process, which came close to breaking down many times. A South-South solidarity developed—in this case between South Africa and Narmada[1]—which changed the normal dynamic (in which the noisiest groups from the North often disrupted the process).

We eventually got a commission representing a wide range of views. The commission secretariat was located, importantly, in South Africa—not in Washington, Geneva, or New York. Financial contributions came from a wide range of donors—something like 50 donors—from government agencies (40 percent), multilateral agencies (6 percent), the private sector (27 percent), and NGOs and foundations (24 percent).

Where things stand

The work program has been ambitious: All of the different stakeholders have participated in developing a knowledge base. Substantial regional consultations and stakeholder meetings have allowed all of the interested parties to have their say. The commission has also convened a World Commission on Dams forum, including all of the groups who were involved initially—about 70 people—against whom they have constantly checked the commission's progress.

Has the commission operated with complete transparency? Yes and no. The gathering of data was all open, transparent, and participatory. And there is a commitment that the secretariat will produce three "synthesis papers" (on development effectiveness, alternatives, and criteria) which will be subject to wide peer review. But at the end of the day the commissioners will have to review all of this work (and especially the three synthesis papers) and come to their own conclusions.

Last weekend the commission met in Cape Town, where all of the commissioners worked on the first draft of their final report. That's where things stand right now. The report is due in August.

Lessons learned

From this experience I have learned several things about setting global standards on issues that are hotly contested. First, *there must be demand for solving a problem*. You cannot get people to spend an enormous amount of time

on a vaguely defined issue. It has to be a problem that really bothers them in order to make them want to go into that meeting room. Once that happened, of course, the problem was not really dams. A whole set of general issues, including sustainable development and water and energy resource management, got addressed through our specific focus on dams. That gave us an enormous advantage.

Second, and for me the most important, *the people driving the process should be the people who have to live with its consequences.* That Kader is a minister in a country where he has to pay attention to development, the environment, and so on was tremendously important. He also has relations with others in developing countries, who expect him to represent their interests in the process. As World Bank President James Wolfensohn said when he met with Kader Asmal and some of the commissioners—"the real test of the report will be whether the governments of developing countries accept the recommendations of the Commission." Having a minister from a developing country as the chair greatly increases the chances of this happening. You also need people like Medha Patkar who has spent her life campaigning for the rights of resettled people on the Narmada, and like Goran Lindahl who is CEO of ABB, the world's biggest supplier of engineering equipment.[2] These people had no interest in attending a seminar; they came because they had real interests at stake.

A critical, related issue here is the degree to which it is the commissioners and not the secretariat (which is not nearly as balanced as the commission) plays the dominant role—the familiar "principal-agent" problem. As with all else, time will tell!

Third, *moral leadership really matters*, and so, in my view, does political leadership. This is not a technocratic issue. Both the sense of legitimacy Kader brought to this process and his skills as a politician were vital to the process. His experience managing "impossible transitions" was helpful in forging consensus and keeping his eye on the ball. Before the forum meeting began, for example, Ahmed Kathrada took all of the people from the forum to Robben Island, where Mandela and he had been imprisoned for 27 years. Kader had a clear purpose in having the group go there. He wanted to remind people of what really mattered, that there was more at stake than their own personal interest. He wanted them to remember that this had been done before. I'm South African and can say that 10 years ago none of us thought what happened in South Africa would happen. Kader has been heavily involved in that, and it was interesting watching him use that experience to bring people back to the table when fissures began to appear in the process.

Fourth, *the World Bank plays a different role at different times.* In stage one, we used the convening power of OED and the Bank to get the commission launched. During stage two, the Bank supported the commission as it worked toward a consensus, but rigorously respected the commission's independence. (In the view of some, we have been too "hands-off" in the

process—only time will tell whether this is true.) Depending on whether or not the recommendations pass "the Wolfensohn test" (namely, will our borrowers want to implement its recommendations and will private financers and developers be willing to engage in what has become a costly and risky business), the Bank will probably play an active supporting role in stage three—dissemination. And during stage four—implementation—the Bank will also, again depending on the commission's findings, play a strong role in demonstration.

Fifth, *don't count your chickens before they hatch.* This has been an extraordinarily successful process, and none of us thought, a few years ago, that we would get as far as we have. But the commissioners have not yet come to agreement; this is not yet a done deal. And if they do come to agreement, what does that mean? We still have to hope that the report is both implementable and implemented. Will there be a consensus in the broader community? We hope so. The final test, of course, will be if we can do a better job out in the real world, which was the whole purpose of the commission. Can the 45,000 existing dams be operated better? Can we ensure that good new dams are designed, built, and operated appropriately? Will the many dams that should never have been built get screened out? And finally, will developing countries find the right balance? It isn't simple. Dams provide huge benefits of hydropower, irrigation, and flood protection, which are desperately needed in many of our borrowing countries, but there are large social and environmental costs. The test is whether the World Commission on Dams will lead to people living a better life.

Notes

1. A dam on the Narmada river in India became such a cause célèbre with environmentalists that the Bank pulled out of its investments there and a commission was appointed. Narmada has become a symbol for concerns about the resettlement of indigenous people.

2. Regrettably, since the launch of the commission, ABB decided to get out of the hydro business, raising questions about the degree to which the interests of developers would be represented on the commission.

Floor Discussion

Ian Johnson, Chair

Ian Johnson, the chairperson of this session, summarized the two presentations as studies in how to shape and create a global market for carbon and global standards for dams. Both had to be done in partnership. The two presentations were also concerned with how to measure outcomes and success, which means a good deal is expected of evaluation. He then invited **Jed Shilling** to give the first response to these two presentations.

Jed Shilling said that the two presentations demonstrated some interesting properties of public goods, especially those in relation to the environment. In his view, the Global Carbon Fund is truly a global public good, whereas the issues addressed by the Dams Commission are either local or transboundary public goods for which we are trying to find common standards that can be applied around the world. Returning to Richard Cooper's earlier definition of public goods, he agreed that the standard economic ideas about public goods were changing. Goods used to be simple things such as spears, bows and arrows, and food you could trade; they tended to be private in nature, although they were often shared. As economies have become more complex, goods have also become more complex and more goods have taken on the nature of services—sometimes the kind of service for which you don't see results, or, in fact, the so-called "good" is the avoidance of an undesirable result. For example, we pay a lot these days for security services in the hope that some potential harm will never materialize. We don't have a good counterfactual, but we're convinced that something bad didn't happen because of what we did.

Much of what we're talking about in connection with the environment is making sure something bad doesn't happen because of what we do—the pub-

lic bads Richard Cooper discussed. But this requires extending our concept of goods to something that is not only not tangible, but not even produced. Economic models are designed to deal with tangible goods and services that are produced and consumed. In the cases before us, we're talking about the "nonproduction" of something not good so that people do not have to "consume" it involuntarily—the nonproduction of carbon, the nonproduction of pollution, the nonproduction of dams' negative impacts, and so on. This represents a major intellectual leap to the concept of the nonproduction of something as a "good." Once properly constructed, it allows us to use market mechanisms to regulate the production or nonproduction of a particular good or bad through trading permits, through emission reduction credits, and the like. Some people would then say, fine, let the market do its thing and we can step back. But we haven't obviated the need for public intervention; instead, we've created the necessity for a complex set of public interventions in order to manage these markets in nongoods.

With the Carbon Fund, it's clear we first have to create the demand. There is no market demand out there for the nonproduction of carbon. Only by negotiating a treaty and imposing some limits can we produce demand, as with the U.S. pollution reduction regimes in which limits are established on total production, and people can trade permits on emitting sulfur dioxide and other things so as to reduce production to the target level by the most cost-effective means. After creating a market and creating demand for the goods, we have to set some standards. What constitutes the nonproduction of this pollutant? We have to set up a regulatory authority to verify and validate that something doesn't happen—a pollutant doesn't get produced or is produced at acceptable levels. Then we have to manage the market structure. Once we have this whole superstructure in place, markets can work just fine. But we need to recognize that, throughout these cases, which are good examples of public goods, a tremendous amount of public governance activity lies behind the markets working—many cooperative structures, and even the peace and security that allow us to deal effectively with global or local public goods. Ultimately, we want to translate what are now public goods (or bads) into marketable entities with standards that can be regulated internationally. But these public goods are very high on the food chain of governance in the sense that we need a whole set of other complementary public goods to establish the markets for them.

That may not be true of everything we categorize as a public good, but it does demonstrate the importance of the interlocking governance structures and networks which we have to have in place in order to manage public goods through market or regulatory mechanisms. A tremendous amount of work has to take place to define, validate, and regulate what we're talking about in regard to this set of public goods. The lessons we learn from these two examples apply much more broadly to the environment and beyond.

Robert Picciotto said that the debate on large dams was about restoring the functioning of the markets in the face of an enormous public outcry, which led the World Bank to set up a safeguard policy framework designed to make the system work better. Then the real debate became whether, even if this regulatory framework were implemented, would it be acceptable to environmentalists? In this OED report, out of roughly 50 dams, there were no social, economic, or environmental problems with perhaps 10 dams, another 10 dams were dogs, and between those two extremes there were about 30 in the middle. The question is, if we had implemented our safeguard policies properly on these—and in fact we had for the majority of them—would they have been socially, economically, and environmentally acceptable? The environmentalists very much challenged OED's tentative conclusions. The fact is, even if we enforced our safeguard policies successfully, people do not necessarily accept the results as legitimate.

John Briscoe agreed with Picciotto. The process the World Commission on Dams went through may end up producing the same words the Bank did but it has a legitimacy about it that the Bank's work did not. Picciotto responded, "Let's just hope that the dead will rise." Briscoe replied, "Exactly."

An unidentified participant observed that the Bank is an increasingly irrelevant financier of much of this infrastructure. What we're seeing is $140 to $150 billion worth of foreign direct investment, much of it going into infrastructure. At this point the largest dam, the Three Gorges in China, is being financed with foreign direct investment, involving export credit agencies. The ultimate question, said the participant, is which makes sense: voluntary global standards or a global regulatory system? How can you encourage adding social and environmental responsibility to the $150 billion or $192 billion in foreign direct investment? That is a big challenge. The Bank has challenges meeting its own standards, but so does foreign direct investment, which is where the global public good lies at the end of the day.

Another participant added that when we talk about the private operators in this business, it's not as if there are many of them. The urban water business has been dominated by two or three companies and one of them looks ready to get out. Ironically, Goran Lindahl, a representative from the private sector on the Dams Commission, got out of the business. ABB has also exited the business: too costly, too many problems. True, there is a lot of money around, but if we make standards too transaction-cost-intensive, we'll have a problem. Private money is looking for investments that are less of a headache. If they exit, if we lose their $60 billion, we are back to relying on government budgets again.

Ian Johnson said that we must become more creative about using different kinds of instruments to provide incentives to reduce long-term risk. If we're indeed lowering the public risk with more socially and environmentally responsible investments, we should be looking at how companies can

get breaks on insurance—how can we use insurance and guarantee instruments and export credit agencies.

Ken Newcombe said that the transaction costs in this business are key, and then explained what is the Clean Development Mechanism and why there are transaction costs. In the practically nonstop final two days of negotiations in Kyoto in December 1997, the negotiators agreed on a thing called the Clean Development Mechanism, designed to provide flexibility, to include developing countries, and to make technology transfer possible. More important, it was hoped that, because of dramatically lower costs for reducing greenhouse gas emissions in the developing countries, where existing technology is less efficient than in industrialized countries, the cost of compliance would be lower there. It would be easier for the industrialized countries to comply if they could invest in emissions reductions in the developing countries, in exchange for which the developing countries could postpone establishing caps of their own. So developing countries don't have caps, although their eventually having caps is probably going to be a condition for U.S. ratification.

The problem is, if companies like BP Amoco, Exxon-Mobil, or Ford—or a U.S. power plant owner (which is already happening)—put carbon financing money into an emissions reduction project in a developing country, how will anyone be able to compare what happens next with what would have happened if it had been "business as usual." How do you compare results from that project with the baseline, the counterfactual, if you don't have caps at the global level? That's where the transactions costs come in. The set of credible processes, which the convention has begun to discuss using, validates the baseline with an independent professional judgment by credible parties who say that, yes, we agree with your assumptions that "business as usual" would have looked like that. The Clean Development Mechanism provides an extraordinary opportunity but also the extraordinary challenge to somehow validate and certify the counterfactual and then to certify the outcomes against it. Our challenge, in a nutshell, is to minimize and streamline the procedures for validating the baseline and to allow firms to certify against it, while maintaining environmental credibility about the outcome.

We've done this once and are halfway through the process in quite a few projects and we don't find the transactions costs enormous. The project we did in Latvia, for example, was to validate the business-as-usual baseline for sanitary landfills (landfills capped below and above to stop leachate). We put money in and tapped methane out of these landfills with fairly fancy recycling technology for the leachate inside the envelope and generated power from it. Without our money, that project wouldn't have happened because it wouldn't have been affordable. It cost $70,000 to have the baseline established, presented to an external validator—in this case, Det Norsk Veritas—on a competitive basis, with a detailed monitoring and verification protocol that tells you how to measure against the counterfactual in terms of what social and local envi-

ronmental benefits flow from this project. All this was done and we got a certificate of validation for this project for $70,000. It took three and a half to four months, because it was the first time around. We can do it better next time. But it's interesting that you raised this issue because it's true: you can't do this for a $100,000 project or even a $2 million project. In my view, the bare minimum we can do it for is a $3 million project. And our developing country clients do not have a lot of 1,000-megawatt coal-fired power plants that are easy to upgrade. Far more common are projects somewhere between a few kilowatts and 10 or 15 megawatts.

One possible solution to this problem is to say, with a certain discount factor but a high degree of certainty, if you invest in photovoltaics, you get credit for a certain period of time. We should set up standards and indices and rules of thumb, so that we can cut the transaction costs substantially, but we should also try to avoid creating perverse impacts at the margin. I certainly wouldn't want to do away with the baseline validation because a certain oil company, which is no longer purporting to be an investor in the Carbon Fund, wants to claim 100 million tons of carbon annually for a substantial gas pipeline development from one of our clients, when this is already highly profitable and it's going to go ahead anyway. But they are saying that they should get the benefit from it because it is climate-friendly. In other words, if you build a windpower or hydropower project that's climate-friendly, you should not be able to claim emissions reductions. Such kinds of perversities would undermine the market dramatically.

The sales were in the order of 20 million tons last year in the United States. Globally it's larger, but not much larger. I now know of major power plant operators who cannot operate without a license from their government, which includes offsets of all or part of their emissions reductions. By 2005, there will be domestic regimes in place, whether the protocol is ratified or not, in Europe, in the Nordic countries. How much these will bite will in the end be a competitive issue and a matter of public choice. It is extraordinary to me how willing the publics in some of these European—especially Scandinavian—countries are to pay for their contribution to solving this problem.

The overall market is growing and literally dozens of companies have made binding commitments and are going through all sorts of fancy arms-length processes to have people effectively certify that they have done this. BP, Shell, DuPont, and the global cement industry, among others, all have standards. So this is happening.

I would like to comment on the Montreal Protocol because I had the pleasure of managing the investment operations of the Montreal Protocol, which was channeling money to developing countries so that they could be compliant for a good part of the 1990s. It was clear to Dow, DuPont, and others that it would be cost-effective for them to comply, and they knew there would be a growing market through this multilateral fund that would ac-

tually finance goods and services effectively coming from them. So they had practically implemented the protocol before the multilateral fund got under way. However, you have to ask questions about the success of the other 10 percent—namely, the obligation of developing countries to phase out ozone-depleting substances under the Montreal Protocol. While this seemed small enough, their economies (especially China and India) are growing rapidly. It is not necessarily under control, and some of the issues around this aspect of the Montreal Protocol are overlooked when it comes to saying it is a success.

Finally, on the Kyoto Protocol, there is no way that U.S. coal producers, some car companies, and one of the oil companies will give up lobbying Congress because they really do believe that the protocol is going to affect them strategically. They are probably even more rooted in this approach because they see some of their competitors taking advantage of being greener, which is creating a tension. There are good economic and political reasons why they don't want to comply. One of our second closing candidates used to be two separate car companies (you can guess which). The two parts of the company are fighting about whether to join PCF because to do so would be to admit that climate change exists.

Scott Barrett responded to an inaudible question that there is nothing a teacher wants to hear less than "I didn't understand a word of what you were saying." He said maybe one reason why he was hard to understand was that the problem is complex and he was oversimplifying. What he said was important, however, so let him have another go at it. He found the card game metaphor extremely useful. It's easier to follow once you've actually played the game, but the way in which the card game is set up, full cooperation—what everyone in the world should do about climate change—is absolutely clear to everyone. They all know they should hand in their red card. What happens if they don't? That depends. Every time he plays the game, he gets a slightly different answer. The one result which he gets every time, no matter who plays, is that *not everyone hands in the red card.* And that tells us that public goods are a problem. But at the end of the game he asks the students to do one more thing: vote on a referendum question: "Do you want the government to confiscate everyone's red card, in which case you will all collectively be as well off as possible?" It is amazing how many people vote no, but every time he does this—and he's played this game at least 30 times—at least a simple majority always votes yes. He confiscates everyone's red card—that's taxation—and provides the public good, which of course is what our governments do. One of the main roles of domestic governments is to confiscate our money and provide public goods. This happens in the classroom time and time again.

But in the world of international relations, Barrett continued, we don't have a government to confiscate red cards, so we have to develop a decentralized mechanism that works as well, and if it doesn't, we have to improve it. Notwithstanding Ken's comment—and Barrett thinks he is correct about

this 10 percent business—the Montreal Protocol has basically changed the nature of the game. It has created a credible punishment for countries that (1) don't participate or (2) don't comply. Now, because the punishment in this treaty is credible and severe, no one will actually deviate. It's like when you have a good contract, you never go to court. That is what has held the treaty together. The question is, how can the world do this for climate change and Barrett didn't know that answer. Kyoto doesn't do it and it's not obvious to Barrett how it could. The basic problem is that the decision made in Kyoto (and before that in Berlin and Toronto) to focus on targets and timetables has tied our hands from the very beginning.

With respect to the Montreal Protocol, Barrett said, there are two very different problems. Barrett's contribution to the UNDP volume on global public goods compares the two issues and the two treaties. (Richard Benedict's book, *Ozone Diplomacy,* is an informative and insightful account of the Montreal negotiations.[1]) The Montreal Protocol basically redirects incentives in a terrific way, so that once enough countries are in the agreement, everyone wants to come in, when there is pretty good assurance that compliance will take place. The companies believed a market would be available. But the market was only going to be available if the governments intervened. What you have is feedback between the behavior of the government and the behavior of the companies (whose investment in R&D was needed to come up with the substitutes). The governments wanted to require that chlorofluorocarbons be eliminated only if the cost of doing so wasn't too great, but the cost depended on the innovations undertaken by industry—and industry doesn't want to innovate unless it believes the market will be there. So you really had another game going on. Only because Montreal was able to turn this and everything else around was there this satisfactory outcome. But the circumstances that allowed that to happen don't exist for climate change, which is why climate change is such a problem and why Kyoto, which is modeled on Montreal, was a mistake. Climate change is a different problem than ozone depletion; it requires a different kind of solution.

Ken Newcombe, acknowledging that he hadn't answered the question, said that the PCF is a very small fund. It doesn't purport to be a substitute for the Clean Development Mechanism or any other mechanism. It is simply big enough, he thinks, to demonstrate how you might go about real-world transactions. There are many other games in town. One of the exciting things we're doing now as a team, said Newcombe, is trying to team up with other funds and banks with similar aspirations—regional banks such as the European Bank for Reconstruction and Development, for example—to leverage our knowledge through their own investments, which could be substantial.

Ian Johnson said, in closing, one lesson from the discussion was that in thinking about global public goods we should keep our eye on the prize—and understand what the prize is. It is easy to become so absorbed in programs that

we don't stop to think what we're trying to do. With carbon, we seem to be discovering that we cannot make development more sustainable by a business-as-usual, country-by-country strategy, but that we might be able to tap the enormous potential of creative technology transfer and the fact that today it costs about $10 a ton at the margin in developing countries to abate carbon compared to perhaps $100 a ton in developed countries. If there were a market, we wouldn't have a problem. Since we don't have a market, we have to consider if there are technology and financial gains to be made by creating conditions, however imperfect, that encourage developing countries to get something for that differential in the cost of abatement. If there were a way to find a bridge, industrial countries could also gain by reducing their costs of emissions reduction. Is there a role for the Bank and the United Nations Development Programme as honest, good-faith brokers in this search for bridges?

As for large dams, many suppliers are getting out of this business because it's too risky. Can we address this problem also, not country by country but through technology or standards, voluntary or otherwise?

Risk is inherent in all of this. The Prototype Carbon Fund is a risky venture for us, but just look at the upside. Can we push buttons anywhere that encourage the kinds of trades that might encourage the regulatory system to develop? People say that Kyoto has failed. It hasn't failed; it has triggered responses. Look how regulatory functions develop in this country. We didn't sit around and wait until we had a perfect regulatory framework. The point is to create the enabling environment to get people to move on regulation and then codify it. We may never have a fully functioning Kyoto Protocol, but we might have a quite wellfunctioning market for carbon. We cannot discount this outcome. The question is, is there a public good in trying to promote these ideas early on and keep them on the table? The two examples do demonstrate that we are not talking about country-by-country programming. We are talking about doing business in fundamentally different ways. One way, and it's risky, is to try to create and shape a global market that could provide tremendous benefits to developing countries, in both technology and funding. Another way is to try to create and shape voluntary or involuntary global standards—voluntary in the first phase and then perhaps regulated. This too is high-risk and, as John said, might fail. But the business of country-by-country development aid, country programming, and the country as the sole organizing principle will also be dead on arrival. We have to stay the course on these global public goods if we are going to make a difference, and global environmental issues are especially needful of a very different approach.

Note

1. Richard Benedict, *Ozone Diplomacy: New Directions in Safeguarding the Planet* (Cambridge, Mass.: Harvard University Press).

Part IV

Health Issues

Creating Markets for New Vaccines

Michael Kremer

Malaria, tuberculosis, and the strains of HIV common in Africa kill roughly 5 million people a year, and 95 percent of these cases are in developing countries.[1] Vaccines are in many ways the best hope for a radical, sustainable reduction in deaths. But there is very little research on these diseases, largely because potential vaccine developers fear that they would not be able to sell enough vaccine at a high enough price to recoup their research expenditures. Not only do these diseases primarily affect poor countries, but both the market for vaccines and the market for vaccine research are subject to severe market failures. Due to these market failures, the social value of vaccines is much greater than the private value that would be obtained by a vaccine developer.

There are two broad ways to increase research and development on vaccines: One is for governments or international organizations to subsidize or directly fund the research and development (R&D). The other is to promise that if a vaccine is developed it will be purchased. In other words, the first approach is to *subsidize the research;* the second is to *commit to paying for the output: a usable vaccine.* To some degree, both approaches are needed. However, there is a radical imbalance between the approaches right now, and we need much more privately funded R&D.

Failures in the market for vaccines

The dilemma institutionalized into the current system is that on the one hand, we need high prices to create R&D incentives, and on the other, we need low prices to give poor people access to the vaccines and drugs they need.

By committing in advance to paying for vaccines, and making it available to those who need it, we could break this logjam.

Vaccines are underconsumed for several reasons. First, individuals have little incentive to take into account the public health benefits to others of their own vaccination. Second, those vaccinated are usually children, who cannot contract to pay for the vaccinations themselves. Third, consumers are more willing to pay for treatment than prevention. Many poor consumers are illiterate and place little credence in official pronouncements about a vaccine's benefits: they prefer to wait and see what it does for their neighbors. But the benefits of vaccines, unlike medicines, take time to be revealed.

Failures in the market for vaccine research

Distortions in the market for vaccine research are even greater than those for vaccines themselves. Research on malaria, tuberculosis, and African forms of HIV is a global public good. A key distortion in the market for vaccine research is that R&D on vaccines benefits the whole world. If a vaccine were developed, it would be of benefit to many different countries. But the vaccine developer could capture only a small portion of the vaccine's benefits. No single country has an incentive to encourage investment in the vaccine by unilaterally offering to pay higher prices. In fact, most vaccines sold in developing countries are priced at pennies per dose, a tiny fraction of their social value. Poor countries typically do not purchase the more expensive on-patent vaccines. Moreover, once vaccine developers have invested in developing vaccines, governments are tempted to use their powers as regulators, major purchasers, and arbiters of intellectual property rights to force prices down to levels that cover manufacturing costs but not research costs. As a result, there is very little research on tropical diseases right now.

Vaccine research is also subject to what economists call a "time consistency" problem. Vaccine research is very expensive, but once vaccines have been invented, they can usually be manufactured at low cost. Once a vaccine has been developed—say, for sale on the U.S. market—a small country like Uganda has little incentive to pay high prices for it. If Uganda is thinking rationally about its self-interest on an issue important to its people, it won't provide much intellectual property rights protection and it will try to get the vaccine as cheaply as possible. From a single country's viewpoint, that makes perfect sense. Once vaccines are developed, the government is in a strong bargaining position. Governments are the main purchasers of vaccines, and they are unlikely to have brand loyalty. Governments typically purchase vaccines and distribute them either free or cheaply to the population, so they have every incentive to get as low a price as possible. Anticipating that, vaccine developers are unlikely to invest in the first place. Unfortunately, if all countries ignore intellectual property rights and insist on low prices, we'll continue to get expensive

drugs for diseases such as hypertension, but we won't get drugs to deal with tropical diseases that affect poor people in small African countries.

Of 1,233 drugs licensed worldwide between 1975 and 1987, 13 were for tropical diseases. Of these, two were modifications of existing drugs, two were developed by the U.S. military, and five were more or less by-products of veterinary research. Only four were developed by commercial pharmaceutical firms.

The gap between the social value of vaccines and their value to private developers is likely immense. The standard way to assess a health intervention's cost-effectiveness is its cost per disability-adjusted life-year (DALY) saved. Health interventions in poor countries are often considered cost-effective if they cost less than $100 per DALY saved. (By contrast, health interventions in the United States are considered cost-effective at 500 to 1,000 times that amount: $50,000 to $100,000 per year of life saved.) The World Health Organization recently estimated that malaria costs 39.3 million DALYs per year. Crude calculations suggest that a malaria vaccine would be cost-effective (relative to other developing country health programs) at $41 per person immunized.

What is a vaccine worth to a private developer? It's hard to give a quantitative estimate, but the developing country market for childhood vaccines is about $200 million a year, one-tenth the amount at which a malaria vaccine would be highly cost-effective. The combined cost of the six vaccines in the standard Expanded Program on Immunization (EPI) package is about 50 cents. Each EPI vaccine sells for pennies per dose, rather than the $40 per dose at which a malaria vaccine would be cost-effective. The gap between the $41 at which a vaccine would be cost-effective and the less than $2 per dose which the historical record suggests a vaccine developer would be likely to get for a vaccine implies firms will pass up socially valuable research opportunities.

The gap between the private return to R&D and the price at which vaccines would be cost-effective even in poor countries suggests that vaccine R&D is undersupplied even relative to poorer countries' very low purchasing power.

The scientific prospects for vaccines for these diseases are hard to predict. It may easily be 10 years before vaccines are available, but there is reason to be optimistic. We cannot be sure that there's a malaria vaccine around the corner, and, if there are no scientific prospects for one, we shouldn't be pursuing it. If there were scientific prospects for a vaccine, it would be socially worth spending billions of dollars to develop it, given the value of the vaccine. But private actors have no reason to invest if they are going to earn less than a tenth, maybe a twentieth, of the vaccine's social value.

Committing to purchase vaccines

The literature on vaccine research distinguishes between *"push"* and *"pull"* programs. Push programs provide funding for research through mechanisms

such as grants for academic research, public equity investments in vaccine development, R&D tax credits, or work in government laboratories. Push programs are particularly well suited for supporting basic research. Pull programs, on the other hand, increase rewards for vaccine development by, for example, promising to purchase a vaccine if it is developed.

The option of encouraging research on vaccines by committing to purchase vaccines and make them available to poor countries is attractive for a number of reasons. First, promising to buy a vaccine if one were developed would help interest biotech or pharmaceutical firms in developing the vaccine. Second, if such a vaccine were developed, it could be distributed at affordable cost to the people who need it. Third, with this approach nothing would be spent unless the vaccine was actually developed. It is up to each individual firm to decide whether or not it's worth risking time spent on R&D, given that society as a whole has decided to make it available at a reasonable purchase price. Large public purchases could potentially enlarge the market for vaccines, benefiting both vaccine producers and the public at large. Because vaccines typically have very high R&D costs, monopoly pricing would exacerbate their underconsumption. However, since manufacturing additional doses of vaccine is typically cheap, large government purchases can make both vaccine producers and the general public better off than they would be under monopoly pricing to individuals.

One problem with the push approach is that researchers working on a particular line of research have an interest in exaggerating the promise of their own lines of research in order to get their next grant. Scientific administrators may have trouble deciding which diseases are worth working on and which vaccine approaches are worth pursuing. Scientific commission after commission has underestimated the time and cost necessary to produce vaccines. This leaves politicians in an uncomfortable position. U.S. public opinion polls tell us the public doesn't support aid because they think it's wasted and not really doing anything; if they knew that the aid was being used effectively, they might support it. Pull programs provide a guarantee that funds will only be spent to provide an effective vaccine.

If the pharmaceutical firms and the biotech firms get paid only if they develop the vaccine, then they have strong incentives to focus on developing the vaccine. Paying only if the vaccine gets developed helps get people focused. There are great advantages to letting individual firms make the decisions about which projects to pursue or whether it is possible to pursue vaccines at all. If you're a researcher applying for grants, you always want to say, "My approach is going to succeed," whereas if you're committing your own money, you have reasons to be more careful. The advantage of the commitment to purchase is that nothing is spent unless there is an actual vaccine.

Potential sponsors of pull programs to increase R&D

There are three main potential sponsors for encouraging vaccine research: governments of industrialized countries, private foundations, and institutions such as the World Bank.

Industrialized countries could be to encourage research through either *tax credits* or a *vaccine purchase commitment*. The U.S. administration budget proposal for this year includes $1 billion in tax credits—which means every dollar of sales of vaccines that qualify (for AIDS, malaria, and the like) would be matched by a dollar of tax credits. That greatly increases the incentive for pharmaceutical firms to develop these vaccines. It also would tend to exert downward pressure on prices by strengthening the bargaining position of purchasers such as UNICEF. When they negotiate a price, they know that if Merck develops a vaccine, Merck is going to get a tax credit only if they actually sell it to UNICEF.

A second approach is for *private foundations* to create a vaccine purchase commitment. The largest foundation in this area, the Gates Foundation, has $22 billion in assets. U.S. law requires that they spend 5 percent of that every year on grants. They could use that 5 percent to support programs to get existing vaccines into the field and to support other initiatives to fight HIV (for example, encouraging the use of condoms). They could use the fact that they have $22 billion in assets to make a very credible commitment to purchasing a malaria vaccine, should a private pharmaceutical firm develop one.

The third actor could be the *World Bank*, which I'll discuss only briefly. (A policy brief I did through the Brookings Institution discusses some of these issues.) In an interview with the *Financial Times*, Wolfensohn said that the Bank plans to create a *$1 billion fund* to purchase specific vaccines if and when they are developed. That is a wonderful idea, because it creates incentives for developing vaccines. I understand there is a possibility that this proposal will be weakened or abandoned, which would be a real tragedy. Obviously, these diseases represent critical development problems. While as a lending institution the World Bank can't do much about them directly, the Bank could encourage the market for developing vaccines.

Important factors for a vaccine purchase commitment

Pharmaceutical firms need a credible commitment to purchase. Pharmaceutical firms assume it will take 10 years to develop the vaccine, and that after developing it they will need 10 years to recoup their R&D cost. Even if we increase purchases of existing products, potential developers may not believe that vaccine markets 15 or 20 years from now will justify the R&D expenditures now. Political winds shift, and donors' interest change. There is no reason for firms to assume the political commitment will still be there in the absence of a specific, credible commitment. Once vaccines are available, every

country will bargain to get them at the lowest price possible. To keep the prices sufficient to increase incentives to develop the vaccine will require outside concessional assistance. For example, IDA funds could be used. They would have to be additional to any other IDA funds the country feels it is going to get. This is difficult for the Bank for a number of reasons. First, the Bank has an understandable problem with earmarking funds; it's difficult for a bureaucracy to say what it's going to do 10 years from now, and doing so could set a bad precedent. We have to find ways to do so that would not set a bad precedent, because the commitment to encourage the investment in R&D is intellectually justified.

The vaccines must be cost-effective. To preserve flexibility, cost-effectiveness criteria could be built into the purchase commitment.

A vaccine purchase commitment will be highly focused on poverty, Africa, and the poorest parts of the world. There is no conflict between poverty alleviation and global public goods in the case of this global public good. At less than $10 per year of life saved, it would be an extremely cost-effective health investment. And if the vaccine research fails, if no vaccine is developed, nothing is spent. This is why it is such a good idea. Yes, there are many bureaucratic and political obstacles to implementing the idea, but it is really worth making an effort to find a way around them.

It is important to reassure people that this initiative will not conflict with current priorities. Obviously, until we have an AIDS vaccine, for example, we need to focus on prevention (condoms, sex education, and so on). The sponsor of a vaccine purchase commitment could spend currently available funds in whatever way it thinks is best, but it commits to buying a vaccine once it is developed. This commitment to actually buy the vaccines is essential.

There are many complicated issues involved with how to purchase the vaccines. I've discussed these issues in a separate design paper, but don't have time to discuss them here. You have to set up eligibility rules, for example. When does a vaccine qualify? Should countries provide some copayments? Should the countries that receive vaccines make copayments? What happens if multiple vaccines are developed? Some procedures must be developed to address that problem. How should vaccines be priced? The issues are complicated, but there are ways to address them.

Conclusion

Private incentives for research on vaccines for malaria, tuberculosis, and strains of HIV common in Africa are limited by the fact that the commercial value of vaccines is likely to be a small fraction of the social value of new vaccines. Under current institutions, potential vaccine developers have incentives to ignore socially valuable research opportunities. Moreover, if vaccines

were developed, access to them would be limited if they were sold at monopoly prices.

Commitments to purchase vaccines and to make them available to developing countries for modest copayments could both provide incentives to develop vaccines and ensure that vaccines reach those who need them. Taxpayers would pay only if the vaccine were developed.

Note

1. See M. Kremer, Creating Markets for New Vaccines. Part I, "Rationale" and Part II, "Design Issues." NBER Working Paper 7716 (Cambridge, Mass.: National Bureau of Economic Research, 2000).

WHO, Global Public Goods, and Health Research and Development

Dean Jamison[1]

Let me begin with a few remarks by way of background. I came to my interest in health research and development (R&D) indirectly. The subject was not of personal interest, never having taken a biology course, but I had the chance to lead the World Bank's World Development Report team on investing in health in 1993. Larry Summers, my boss most of that time, left for the U.S. Treasury before the Report was complete, and Michael Bruno replaced him. Michael asked me to brief him on where I thought we were and what messages the WDR93[2] would send. I observed that Larry and I had agreed on three messages at the outset, which had, with some modification, remained with us throughout the year. What Michael wanted to know, however, was what surprises we had come up with—findings we hadn't expected. The answer was simple. Although improvements in income and education, particularly education, had contributed to changes in health during the century, I had become convinced that the spectacularly important changes in health status—such as declines in mortality rates by a factor of two or more over 30 or 40 years, often in the context of only modest (or no) changes in income—had probably resulted from new knowledge. Sometimes this knowledge allowed development of new technologies, new drugs or new vaccines, and sometimes it was knowledge that changed people's behavior (around smoking and heart disease, for example), or knowledge that changed public sector policies, for example with respect to tobacco taxation.

In other words, new knowledge from R&D drove changes in health in the twentieth century. New knowledge generation was both critically important and, we concluded in WDR93, underappreciated and underfinanced. The world has invested far more in a vibrant agricultural R&D system—through

the Consultative Group on International Agricultural Research (CGIAR) and a large circle of collaborating institutions—than we have invested in health sector R&D.[3]

In partial response to this conclusion—and to work that several philanthropic foundations were doing which suggested an actual withdrawal of funding, especially for research on tropical infectious diseases—the World Health Organization (WHO) asked me to chair a committee to review the state of health R&D. Which institutions were addressing what topics? What successes had been achieved? What failures? What directions should be taken next? And what should the priorities be, to the extent that the committee could determine that? The WHO committee's 1996 report argued that R&D expenditure was perhaps the most important international public good, certainly, in health. Since international public goods by their nature need to be addressed by international collective action, the report further argued that the comparative advantage of development assistance clearly lay in financing international public goods.

Why we should continue supporting health R&D

Before I describe what emerged from the WHO report, let me comment on how specific products, processes, and technical achievements have been important to the health sector's dramatic success in reducing morbidity and mortality.

Health R&D has a record of both success and failure, which is inherent in any risky enterprise. Everyone knows the story of the smallpox eradication campaign, but not everyone recognizes the central role that continued heavy investment in *operational research* and in *new product development* played in the ultimate success of the eradication campaign. The bifurcated needle, the switch from mass immunization to a search and containment strategy that focused immunization in the highest priority areas—these were dramatic changes in the way the program was implemented. Smallpox would never have been eradicated without that *applied research*. (The expanded immunization program, although it has achieved major successes in immunization coverage, has not continued with these relatively research-oriented activities.)

Processes—clinical and public health algorithms—have also contributed significantly to health advances. Oral re-hydration therapy (ORT), for example, is a process, not a product—a process *The Lancet* has called the most significant advance in clinical medicine in half a century. Hyperbole, no doubt, but ORT has certainly been a significant advance.

We have also had success with *institutional development*. Institutions such as the International Center for Diarrhea Disease Research in Bangladesh (ICDDR-B) have been enormously productive over many decades, with de-

velopment of ORT and many other contributions. The Tropical Disease Research (TDR) program, which the Bank cosponsors with WHO and the United Nations Development Programme (UNDP), is another good example of a program that has yielded a large harvest of scientific products, and a real but more modest harvest of products and implementation procedures to deal with major tropical diseases. TDR has also made important contributions to the development of scientific institutions in the countries where it works. Again, there are successes mixed with some failures.

These successes, and the potential for more such successes, are good reasons for sticking with this category of public goods. And the technology for conducting R&D itself is changing in ways that are almost sure to make R&D enterprise more productive. Examples include such general research 'technologies' as computing and the Internet, and such health-specific ones as use of PCR and combinational chemistry.

Conflicts between control and research

That said, there remain what seem to me to be continued, often genuinely bitter, fights between the *research community* and the *control community*. As something of an outsider I remained puzzled by this tension. Every dollar that goes into a laboratory's or scientist's operations is often viewed as a dollar taken out of control efforts. In the view of the control people, if you take $100 out of the tuberculosis control effort, you lose a life, so that you pay for research with lives. Depending on budgetary allocation mechanisms, that can be a real enough perspective, but it feeds a certain level of resistance and disarray that has kept the health community and its research activities from having anything like the success the agricultural community has had in developing the CGIAR. The agricultural and environmental communities have gotten behind their programs more effectively than we have. As a result, our aggregate effort has been rather modest. I won't go through the numbers, since they are in the WHO reports, but the small amount we spend on health R&D for problems of the poor contrasts fairly sharply not only with R&D for health problems of the high-income countries (which is not surprising), but also with R&D for such areas as agriculture.

WHO's recommendations

The main comments of the WHO committee about both substantive directions and processes are important for us to bear in mind as we think about strengthening the R&D side of health investments. Two of their central suggestions about process and commitment have to do with a *strong lack of focus* (getting back, in a sense, to Michael Kremer's comments about the need for incentives that focus researchers on the product) and with *inadequate*

mechanisms for engaging the power of the private sector in new product development. The committee also observed that we need to get basic epidemiology straight, to develop and test clinical and public health algorithms, and to disseminate those that are successful. Much of our health R&D is rather implicit and very implementation-oriented in character, involving several types of problems that have received little attention for developing countries: cardiovascular disease, mental disease, many injuries, and—still, surprisingly—such highly visible problems as AIDS. The capacity for operational research on AIDS in Africa is extraordinarily limited, and it would not take much money or technical effort to change that.

Implications of WHO's recommendations

What does all this mean for what development assistance and what the development assistance community does? This morning Inge Kaul and Ravi Kanbur commented on a tension between support for the routine provision of services, which is often important for the poor, and health R&D. That tension mirrors the tension between the disease control community and the disease research community as well as the tension between investment in health R&D and investment in other international public goods.

If the vast majority of the $4 or $5 billion of development assistance in health is essentially spent on the provision of fairly routine services, there is a strong argument for switching *much of it to much more focused R&D investments* than we have had in the past and *to transborder efforts at disease control*—successors to the effort to eradicate smallpox. Perhaps this argument overpolarizes things, given the nature of the R&D problems we face, but we clearly need these products. Michael mentioned one kind of approach, of finding ways to get the private sector involved, say, in malaria vaccine development now with the promise of some kind of public reimbursement later. Programs of this sort claim high priority. So, too, does more operational research.

How do you use the cheap but effective drugs we now have for most of the major mental illnesses, and which constitute almost as much of the disease burden as, if not more than, the three big killers (malaria, tuberculosis, and HIV) Michael mentioned in low- and middle-income countries? How do you design the clinical algorithms and test how well they work? That requires hard research in the settings where the research results will be used. I think *the central focus of country-oriented development assistance should be to transfer, evaluate, and adapt technology.* Aid funds should go to the control efforts of country institutions or programs that are willing to invest in learning what works. They should be designed in ways that draw much more heavily on the evaluation skills we have but don't often use. There would be a *much more systematic effort to learn from what we're doing.* In that

sense, implementation efforts in one country, with modest additional investment, could become much more important international resources and could facilitate a much more rapid transfer of learning. This could be viewed as finding a health sector mechanism to mimic aspects of foreign direct investment for transfer of technology.

Focusing on a few big conditions

This has one central implication for how the Bank and WHO do their business. Both institutions operate with increasingly limited staff time and resources, at least in operations. If we are spending a lot of our program money on lots of different routine things, we simply forego any opportunity to learn systematically what does and doesn't work and how to do things better. The only way that we can really take advantage of the use of operational aid—as opposed to money going into new vaccines and drug development—*is to focus much more tightly on a few big conditions.* And both the Bank and my own institution, WHO, have an extraordinary incapacity to focus. The Bank likens its many unrelated project components to Christmas tree ornaments, and I think Christmas comes more often in the year now than it did when I was on the Bank staff. This proliferation of multiple component (or sectorwide projects) which we have no real competence to manage or implement means nothing much happens except a little money gets transferred. If both institutions focused on a very few important things, we might get more done. The Bill and Melinda Gates Foundation provides an instructive example.

Notes

1. This document is a transcript of informal remarks. At the time of delivery the speaker was Director, Economic Advisory Service, World Health Organization.

2. World Bank, *World Development Report 1993: Investing in Health* (New York: Oxford University Press, 1993).

3. See World Health Organization, *Investing in Health R & D,* WHO/TDR 96-1 (Geneva, 1996). For a more general discussion of international collective action in health (beyond public goods) see Jamison, Frenk, and Knaul "International Collective Action in Health," in *The Lancet,* Volume 351, February 14, 1998.

Floor Discussion

Mamphela Ramphele, Chair

Mamphela Ramphele, the chairperson of this session, said that Michael Kremer and Dean Jamison have forced us to think more creatively about public-private partnerships in the development and sustenance of global public goods. But they also raised a whole range of subsidiary issues. She was especially interested in linking what Michael Kremer asked about the World Bank's role with what Dean Jamison suggested about the need for a better interface between control and research efforts, because if it's new knowledge that has improved well-being and control over disease patterns and disease burden, we really need to get that one right. She wasn't sure we had thought this through carefully enough.

Geoffrey Lamb said that, having responsibility for concessional financing such as the International Development Association (IDA) and the Heavily Indebted Poor Countries (HIPC) debt relief initiative, he spoke from the financing and institutional side of things, with no expertise in health. In terms of the push-pull framework that Michael had laid out, the Bank's comparative advantage lay on the pull side, while leaving to others investments, certainly in "R" and probably also in "D." The Bank shares Michael's concern about the tradeoff between the broad attack on primary health and disease problems—which governments and societies want and donors expect to see—and a sharply focused attack on market failures having to do with public goods or institutional failures that are especially evident in the case of vaccines. There they were on common ground.

But in the world of the possible, given constraints on the Bank's resources and on borrower countries' programs and absorptive capacity, the Bank's thinking (in brief) has moved somewhat from a pure focus on the fund as a

pot of gold at the end of the drug company's rainbow to a broader concept of market assurance, saying, "Here is a large, credible, sustained engagement through highly concessional resources in the field of health and communicable disease control." While it would fail a test of purity and is in some sense a second-best approach, it represents what's possible between donors and the world of implementation. Chris Lovelace and others could speak on this topic.

In that connection, Lamb was struck by a powerful (and to him new) message toward the end of Dean's presentation. Lamb sensed that his colleagues in health were trying to move the Bank toward wide-ranging support for health—toward the position that no health problem, especially no primary health problem, is alien to us, and that there is no issue we will not address. This is probably a mistake if we want to have a major impact on the diseases that are disastrous to poor people. Lamb was struck by the importance of Dean's notion of focusing on a few big things and really rethinking implementation strategies and coming up with the kinds of technological innovations the smallpox eradication campaign came up with in its later stages.

Finally, for everyone's information, Lamb said that about a month earlier, the Bank had enthusiastically endorsed the notion that IDA alone, let alone IBRD, should commit at least $1 billion over the next two to three years in a ramped-up effort to fight communicable diseases. Karel van Kesteren, an IDA Deputy who was attending this workshop, could provide more details, but Lamb thought that with some of the work the Bank had done subsequently, including the big HIV/AIDS program in Sub-Saharan Africa and the IBRD work on TB in Russia, the Bank's aggregate lending and commitment to combating communicable diseases would be even greater than $1 billion. IDA alone, for the fiscal year that had started a week earlier, was looking at roughly $700 million in lending in health. Lamb had seen recognition of such signals in discussions with pharmaceutical companies and public policy people involved in health in Durban the week before. When you add to the Bank Group such donors as Gates, bilaterals, WHO, UNAIDS, and so on, you see a changed situation. He didn't know what it would take to address the need to show a credible, long-term commitment and change investment behavior to correct the 90/10 imbalance between looking after rich people with cardiac arrest (the caricature) and looking after poor people in danger of contracting AIDS. They had explored only a bit the idea of the purchase fund, which was an interesting possibility. The problem they came up against over and over was the sizable opportunity cost of long-term commitments in a world of constrained resources, where the Bank has to gouge money out of Karel and his fellow governments. In moving on communicable diseases, they have to consider the purchase not just of the vaccine but of the whole delivery system—the several dollars in system costs it takes to get a 14 cent vaccine into a kid's arm. That's where their emphasis currently is.

Susan Stout said that, as a public health specialist at the Bank and as an evaluator, she had the unfortunate job not only of being last speaker in an interesting group, but also of emphasizing bad news. She hoped the audience would resume a more enthusiastic tone when she finished. Michael had drawn their attention to the obvious point that incentives matter, whether you're a private sector R&D firm, or a small village that needs to know what to do to voice demand for more effective health services. She and her coauthor, Tim Johnston, in their recent evaluation of the Bank's work in the health sector concluded that the Bank is frequently naive about incentive issues—a concept that has only recently filtered into thinking about international health.[1] In fact, she had originally proposed the subtitle "public goods, private goods, and *feel goods*," because in the health sector we want people to be less poor and to feel better, so we often ignore such core issues as incentives and their influence on provider and consumer behavior.

Michael's point about push and pull mechanisms was useful. What made Stout anxious, given people's general historical reactions to foreign assistance, was the degree to which a large private pharmaceutical firm would *trust* a long-term commitment and the Bank's presence in the health sector enough to justify their long-term investments in particular vaccines. She was also wary of the tendency for policymakers to treat vaccines as "silver bullets"—hoping unrealistically for easy solutions to complex problems. Investing in a malaria, TB, or AIDS vaccine might be smart but, as Dean implied, having the right technology is far less than half the battle. We know how to promote the use of iron tablets to address widespread anemia, for example, yet anemia continues to persist despite the simplicity of the technology required to address it—there are many similar examples in the health sector. There may be problems producing new technologies such as AIDS vaccines, but producing the technology does not end the problem. There is still the problem of making sure the technology is delivered. This is why Stout strongly agreed with Jamison's call for a systematic, structured approach to *operational research*—which Stout would classify as a form of evaluation—as an especially high priority in the health sector. Stout thought the focus in health should especially be on the delivery of goods and services. The political, institutional, and technological issues that surround delivery vary greatly by country. Stout therefore considered it wise global public policy to extend networked research capacities to evaluation and to learning by doing. Doing so will also correct for a tendency to see a tradeoff between global public goods investments and those designed to improve conditions at the country level.

At this point she didn't think there was a clear process for agreeing on what few big things to focus on, either within the World Bank or in the international health world as a whole. But as time passes and the differentials in health status and burden of disease across income and ethnic groups become more obvious, tensions over how the global health policy agenda is set are likely to become more intense. A global effort to stimulate networks

and sharing of information on "what works" in the health sector could be a healthy antidote to these concerns.

As for the bad news, from OED's recent review of the Bank's experience in the health sector, it is evident that the Bank's health projects usually intend to do the "right thing" on operational research and on building better monitoring and evaluation capacity: all of 224 loans that OED reviewed had some form of evaluation research or monitoring capacity as a part of the project design. But only about a third of them had much success getting that capacity implemented.

Which brought up incentives again. It is very important to link *operational research* or *evaluative research—learning by doing*—to the allocation of resources. In Johnston and Stout's analysis, people didn't tend to develop operational (or evaluative) research or good monitoring if money wasn't hooked to it—if a specific budget was not affected either by continuing poor performance or by remarkably greater needs. Agencies will not, evidently, do operational research and evaluation work unless there is some reason to do so—unless there are consequences and/or benefits to changes in performance. Most health sector agencies find that their budgets are not, in fact, related to trends in performance, and underinvestment in operational research and learning is therefore not surprising. We have missed an opportunity to build alliances with the people in the development community who are concerned about building evaluation and learning capacity, said Stout. We need to build a bridge between those of us who are interested in R&D and those who are interested in building capacity. Stout would have changed the title of a recent paper, "Building Capacity through Results," to "Tapping Capacity." We tend to forget that knowledge and ideas about how to do things more effectively already exist, and so do the skills to do them. One point of a learning-by-doing strategy is to tap that capacity rather than build it anew. Countries are not empty sets.

It is also important for us to remember that difficult choices are involved in focusing on a few big things or balancing the tradeoff between broad-scale efforts to improve health sector performance as a whole and particular vertical choices. We need to ask ourselves, what incentives and accountability mechanisms operate in the donor agencies themselves, especially at the World Bank, among those working in health. Why after 30 years of major investments in this sector is there so little evaluative capacity in our borrower countries? There's something about incentives in our own business that we need to be more open about.

Building on the need for focus, **Mamphela Ramphele** said that Susan has asked an important question: By what process do we arrive at a consensus about priorities? It's all very well to talk about push and pull and incentives, but how do we build trust, especially when trust in global institutions is at an all-time low? How do we talk about global public goods when there is

a crisis in credibility with the global institutions trying to do so? She opened the floor for discussion

Chris Gerrard commented on all the support the Bank has given to agricultural research. An implicit assumption in Michael's presentation was that if you provide pull, there will be private investment. Gerrard questioned this assumption. He could imagine a small research company with a good idea investing a lot of resources, failing, and then going bankrupt. If you set up a fund that offered a payoff on the other side, could an insurance firm like Lloyds of London also enter this market and provide insurance for a company to invest in what the fund supported? In other words, a fund or a precommitment might also solve the insurance problem. He had no idea and didn't know if there was already an insurance market for research ventures.

Michael Kremer, in response to Gerrard, suggested that the downside of stronger incentives for developing a vaccine was the greater risk. In a public sector R&D lab, salaries get paid whether or not they come up with a vaccine, but a private firm can go bankrupt. If change has occurred, it has come through better capital markets, not insurance markets. Better capital markets have allowed a greater spread of this risk, although the market is still far from perfect. The rise of venture capital has allowed people to spread their wealth, putting only a small part of it in any given project.

Kremer, in response to Geoff Lamb, completely agreed with the importance of a broader commitment to fighting communicable diseases generally. To him that commitment complements the commitment to purchase vaccines. There isn't really a tradeoff between the two; in fact, there isn't an opportunity cost. He was *not* saying that it was best to put this money aside rather than buy the hepatitis B vaccine or have programs to get condoms out to the public. It is vital that we buy that hepatitis B vaccine and get condoms out to the public, not just because people are dying right now from these diseases, but also to demonstrate the sustained, long-term commitment that is so important to pharmaceutical firms. In addition to spending more on the techniques that are already available, we need to credibly promise that if a malaria or AIDS vaccine is developed, we will purchase it. Making that promise now doesn't require reducing current spending. Promising to increase current lending on these important items is completely compatible with promising to purchase a vaccine if it is developed. For example, future vaccine purchases could be financed entirely out of IDA reflow money.

If that second promise is missing, issues of trust will indeed be (literally) deadly to vaccine development, because it takes 10 years for pharmaceutical companies to make the vaccine and then another 10 years to make their money. At the moment, newspapers write about AIDS every day, politicians are interested, development money is coming in, and the IDA deputies endorse support for dealing with the problem. Fifteen years from now, who knows what will be happening? The pharmaceutical firms may not believe

the money to buy the vaccine will be there 15 years from now unless two equally important things happen: First, we demonstrate the commitment now by buying the hepatitis B vaccine and building the infrastructure to supply it where it is needed, and second, we make an explicit commitment that, 15 years from now, an AIDS vaccine will be purchased.

Robert Beaglehole thanked Jamison for putting on the table the issue of noncommunicable diseases, which are now and will remain the leading cause of death in the world until the year 2020. We know what to do in relatively wealthy environments, but applying existing knowledge about both the treatment and prevention of noncommunicable diseases in the poorer parts of the world raises lots of issues. Beaglehole's question had to do with the few big things. Although he was relatively new at WHO, he had the impression that WHO has clear priorities on the control of tobacco and malaria. He wondered what people thought the few big things should be. What were the big issues, what resources should be devoted to them, or what should be the connection between WHO's and the Bank's priorities in the health field?

Rob van den Berg also favored vaccine initiatives, but drew attention to the fact that this seminar was not only about public goods but also about public policies. And health issues should be looked at from the perspective not only of the medical establishment but also of public health policy. We know that such factors as education, nutrition, and safe water were either as important, or even more important, to the good health of the poor as the medical establishment was. One could say that the AIDS crisis in Africa is partly a cross-border failure in communication. We have failed to get the message across to the people not just in one country but all over certain regions. Van den Berg said his group was starting an evaluation of Dutch support to public health policies. Since they wanted to do this from the perspective of the recipients, especially the poor, they felt it was essential to include such nonmedical factors as education, communication, nutrition, and so on. He asked if the panel felt this should be part of global public policy or left for national governments to handle.

Chris Lovelace said he thought much of the discussion showed that the problem was not quite as gloomy as Susan had painted it. It seemed to him the technical issues were real but not great. There were, for sure, some political issues. But opportunities also existed to support sensible push policies and create a whole environment for moving forward, whether the Bank leads or follows. One of the first steps was to establish credibility.

Altogether, overseas development assistance in health is only $5 billion a year, which is a relatively trifling amount. If you don't use it well, it doesn't matter how much there is, and there's a strong case for better evaluation of both Bank activities and those of others. The opportunity exists to vamp up that amount credibly in the short and long run, but to do so you have to start demonstrating some progress. The kinds of things the IDA

deputies committed the Bank to in Lisbon and the kinds of credit commitments Callisto Madavo [2] committed the Bank to in Africa provide the bedrock for moving forward. If we're credible today, if we begin to introduce today's relatively new vaccines effectively, if we begin to do something to improve on the 40-percent basic immunization rates in half the African countries today, yes, the international community is going to be there.

Then if we can—and here Lovelace agreed with Michael—begin at very low risk to build some sort of pull credibility, whether it's the guarantees Michael wrote about or something else, it seems to me we might have a more optimistic equation to look forward to in the 21st century. If the international community as a whole can demonstrate some progress in the next year or two, and can set the stage, then when we go back to deal with the very real political issues associated with establishing long-term pull mechanisms, there will be much more sympathy for them. Right now, the politics works against that because we don't have a good enough track record of development effectiveness in the health sector to convince people that the pull mechanism makes sense.

Tim Johnston, who had worked with Susan Stout on the evaluation of the Bank's health work, said he saw a qualitative difference between issues having to do with vaccine development and those having to do with evaluation and operational research about effective reform of health systems. There is not an obvious market for evaluation; for instance, they were giving their study away for free. He asked the panel to reflect on some of the different types of institutional setups and incentive issues which they face—and to comment especially on an internal budget allocation dilemma within the Bank: how to allocate money between central sector units that have more of a knowledge function and country departments that are often more focused on lending.

Dean Jamison responded first to Robert Beaglehole and Susan Stout about the relative ease of *talking* about a focus in setting priorities; the rub comes when you try to do it. In his tenure as a World Bank manager, he had once tried setting priorities, and his managers told him that he had somehow missed the message; this was not what they wanted him to do. The mistake had been to allocate 90 percent of his division's resources to health at the expense of continued efforts in nutrition and population. That is a problem we will all continue to face; it will not be easy. But on health priorities, in a sense, the answers are not hard. The international Classification of Diseases, 10th edition (ICD-10) lists all the diseases in two thick volumes.[3] On that list are only a few major items. Tobacco and AIDS are the two biggest (and growing) epidemics of the next 20 years, and they are more or less equal in size. Then come vaccine-preventable diseases, diarrheal disease, pneumonia, tuberculosis, and probably maternal death and stillbirths. If we are not doing a very good job on these prob-

lems in whatever we are doing—developing health systems, implementing categorical disease control programs, or doing research—then we aren't doing a very good job. And I think we are not doing a very good job on those things. Which takes us back to comments from the Netherlands and elsewhere about commitments to action and learning, if I understood these comments correctly.

What is a global public good and what is a country-specific investment program? If we choose our country-specific investment programs right and systematically ensure that we're learning from those experiences, this potential tension becomes attenuated. The potential exists to create international public goods through local action.

Geoffrey Lamb had both good news and bad news on some of the issues that had been raised. The good news was that when he had begun to get interested in the AIDS vaccine issue three years earlier—he confessed his prior ignorance—there were very, very few candidate vaccines moving forward with any credibility, speed, or energy. But he had heard in Durban the previous week that something like seven candidate AIDS vaccines would be going into humans within the next year to 18 months. This was happening partly because of the wide awareness of the severity of the disease and partly because of credibility building—simply, the thinking and the discussion that has gone into finding financing and solutions. Trust, long-term credibility, and commitment are important, but one can see a public and private market response already.

The sad news is that there is no silver bullet. The reality, even if we get there, is that the first HIV/AIDS vaccines would be only 50 to 60 percent effective and might not cover all forms of the disease. What do you do then? Whom do you give it to? What does that do to the rest of your anti-AIDS strategy? What public policy dilemmas do you then have to grapple with, at whatever price for the vaccine, and with what sorts of tradeoffs? The public good and vaccine dimensions are terribly important to all the work on health, but it would be wrong to think that you build credibility and then you walk free.

Susan Stout thanked Geoff Lamb for emphasizing a message that can't be strongly enough reinforced, that the risks of a silver bullet approach are huge when you have the kind of political pressure that has built up around AIDS. As a former smoker, she found it interesting that tobacco was the other leader on Dean's list. One of the things technocrats working in this field must remember is to keep drawing attention to what we can learn. We can never get around the political process of an agenda building around a particular disease, such as AIDS or, down the line, around tobacco or tuberculosis. The trick, whenever one of these categorical diseases reaches the top of the agenda, is to use it to build other core functions as well.

Returning to the point about noncommunicable diseases, Stout said that the piece of the tobacco control and AIDS issues that most eluded us was

the problem of changing the way people think and behave. And this is not a problem of delivering particular technologies, at least not until we have an AIDS vaccine. Solving this problem requires understanding how you change people's thinking and behavior, whether it's how policymakers think about whether to purchase or produce AIDS vaccines or it's how the midwife thinks about her patient. Understanding how to measure change in ideas is a major challenge.

Michael Kremer said that, in relation to the silver bullet issue, it was important to remember that we're going to need a broad approach. The current situation with existing vaccines is an illustration of this need. Right now, 3 million lives are saved each year by existing vaccines, but those vaccines do not reach everybody and need to be made more broadly available, which requires more infrastructure, consideration of behavioral issues, and so on. To fight disease, we need to expand the use of existing vaccines and of other techniques, such as behavioral change. This expansion is very important for building credibility. Equally important for credibility in the long run is making a commitment that, if vaccines are developed, they will be purchased. If an AIDS vaccine were developed, it would save millions of lives even if vaccine coverage rates were unchanged. We need to move on both fronts. The advantage of the pull approach is that because no funds are spent until and unless a vaccine is developed, there is no conflict between moving on both fronts at once. We can spend what we need to spend right now without compromising the R&D effort.

Mamphela Ramphele challenged the panel to respond to the question about why the issue of control and research arises in health but not in agriculture.

Dean Jamison admitted that he usually ducks questions he can't answer well. He speculated that in agriculture most spending on production is private spending by farmers, large or small, who think of it as ultimately adding to their tool kit, with no conflict about taking away from them now. If you're running control programs, the costs are individual deaths and the purchases are made by the public sector. So it's a matter of whether the budgets are all in one place, and they are both closer to being all in one place around health issues while at the same time being more highly dispersed.

Ramphele said she had returned to this question because in her own country, South Africa, they have a problem. Their president steadfastly refuses to do certain things because he says that until he totally eliminates X, Y, Z, and poverty, he is not going to move on dealing with the AIDS issue. So this is not a theoretical question but a serious policy question. We must remind ourselves that this is not only about public goods but also about public policy. How do we, as a global community, respond to that kind of domestic political response? To what extent does a global response to that kind of statement by a politician look appropriate or inappropriate? In a sense we have broken the barrier between private goods and public goods. Are we

prepared to break the barrier in terms of public policy, when a particular political leader's behavior does not contribute to good public policy? What response from the global community would be regarded as appropriate in this case? With this question, she closed the discussion and thanked the four panelists.

Notes

1. Timothy Johnston and Susan Stout, *Investing in Health: Development Effectiveness in the Health, Nutrition, and Population Sector* (Washington, D.C.: World Bank, OED, 1999).

2. The Bank's Regional Vice-President for Africa.

3. WHO, *International Classification of Diseases,* 10th edition (Geneva, 1995).

Part V

Knowledge Issues

Lessons from the CGIAR: A Perspective from the South

Francisco J. B. Reifschneider

We have discussed initiatives that are one, two, and three years old. The CGIAR, which is over 25 years old, is a mature system, so we bring to the discussion a tremendous amount of information as well as lessons learned. Sponsored by the World Bank, the Food and Agriculture Organizatin (FAO), and the United Nations Development Programme (UNDP), the Consultative Group on International Agricultural Research (CGIAR) has 16 international agricultural and natural resource research centers, several committees (such as finance, technical advisory, non-governmental organizations) and a consultative council—a subset of the larger CGIAR group, which was founded a couple of years ago. Between 1972 and 1999 we used roughly $5 billion in resources—$328 million for 1999 alone.

Sources of support

The top twelve contributors in 1999 were (in descending order) the World Bank, Japan, the United States, Switzerland, Germany, Denmark, the United Kingdom, Canada, the Netherlands, Sweden, Norway, and Australia. A speaker said participation must be time-bound, but we do not specify the boundaries. The World Bank has been a supporter for over 25 years. The developing countries' contribution has been limited; there is obviously room for improvement there. We need more resources from traditional donors (our major investors) and we need to increase the contribution from developing countries, in cash and in kind—however, we often fail to acknowledge the tremendous in-kind contributions of developing countries. We are explor-

ing the possibility of tapping the new wealth—philanthropy—which may pose interesting challenges for the system as a whole.

CGIAR's mission

CGIAR's mission, which has evolved over the years, is to achieve sustainable food security and reduce poverty in developing countries through scientific research and research-related activities. When we began, research and technology were at the heart of our mission; in the year 2000 we are emphasizing food security and poverty reduction through scientific research and research-related activities. Has this been an evolving mission or an interpretation of donors' wishes? Poverty reduction is important to all of us, especially in countries such as mine (Brazil), but one tremendous challenge we face is *technological poverty*. Illustrating an article by Jeffrey Sachs in *The Economist* not too long ago was a map showing which countries contained technological innovators, which contained technological adapters, and which were technologically excluded. They showed part of Brazil as technologically excluded, which is relatively accurate. And countries that are not technological innovators or adopters still have a long way to go in the management of intellectual property rights. This is not simple. Who will invest in science and technology for and especially in the developing countries? Brazil has been discussing such investments with the private sector, including multinationals, and the kind of reaction it gets is, basically, "If the risk is high, I prefer not to invest"—and risk is certainly multifaceted.

The CGIAR-supported centers, which are autonomous, are managed by boards of trustees. With autonomous centers there is always the question of setting up a more centralized body in order to develop more coherent intercenter strategies and procedures. Here are some of the centers in the CGIAR:

Center	Location	Year joined CGIAR	Number of years operating before joining CGIAR
CIAT	Colombia	1971	4
CIMMYT	Mexico	1971	5
IRRI	Philippines	1971	11
IITA	Nigeria	1971	4
ICRISAT	India	1972	0
IPGRI	Italy	1974	0
CIFOR	Indonesia	1992	0

Some of the centers had already been operating for a few years before joining the CGIAR. IRRI, for example, had 11 years of experience before joining the CGIAR. This meant that, in addition to adopting similar procedures, we had the challenge of making the culture of existing organizations compatible.

Global *output* has included germplasm (which Dr. Shands will discuss), training, different methodologies, policies, and linkages. The CG's capacity to intermediate South-South linkages is extremely valuable. The system has been frequently *reviewed,* with internal reviews, external reviews, and three system-wide reviews. One of the last reviews was by OED. Stakeholder participation in evaluation has been limited.

Governance and other issues

We have several governance issues: the complexity of the multicommittee system; the fact that CG is still pretty much North-centered; questions about partnership, stakeholders' participation, and so on; and donors following separate agendas. The fact that the membership from the South is expanding brings new and interesting tensions to the CG, which, in due time, will allow it to become even more responsive to the needs of the South. All of this has required an extremely strong and substantive chairmanship to keep the system producing an excellent set of outputs. Of several major changes over the years, three could be highlighted:

- In the last 20 to 30 years we have seen the *emergence of major, strong national agricultural research systems* (NARS), such as in Brazil, China, and India—which reflects an increasing capacity in the South to generate national and international goods.
- *Intellectual property legislation*—which is being addressed by another speaker—has certainly made life more difficult for biological researchers in all countries. Harnessing the potential of new technologies such as biotechnology—for example, the work associated with the elaboration of genetic maps, functional genomics, gene transfers, etc.—is the kind of work a lawyer and a biologist must do together, to ensure that the legal protection of the different elements (vectors, etc.) are duly respected. Tremendous investments are required since we need both biological and legal expertise to harvest the complex benefits of the genome age.
- The most important change has been the *speed of change,* which presents a tremendous challenge to us all.

We have been talking about cooperation, or working together for a *common* purpose or benefit. Is the South comfortable with some of the work countries are doing together? In the CGIAR, there are pretty much different perceptions of what is going on—donors versus recipients, North versus South, the rich versus the poor. And although the CGIAR has adequate forums for discussion, we still often hear, "If we are paying the bill, we will decide what

is supposed to be done." Who is the client in all this? It should also be noted that for some of the exporting countries, like my own, the question of incentives and subsidies (versus the true free market) in the agricultural sector of the developed world directly affects our agricultural research and technological development. For some countries, cooperation via fair markets could have a larger role in development than traditional technological development.

The CGIAR's participation in the science and technology market has been very interesting. A publication by a scientific council in the U.K. stated, "If you produce the right goods at the right time and promote them well, they have every chance of success in the political marketplace." It is true that the boundaries between the technocracy and political decisionmakers will continue to decrease. Indeed, the relevance of what is done is linked to the proper identification of the problem and to the production of the right output, followed by a clear market strategy to get the outputs to the proper clients. The CGIAR still has many opportunities to fine-tune the market strategies it requires to get the outputs out.

It should be stressed that the CGIAR as a consultative group supporting international research centers has been producing highly valuable goods for the developing world, and still has a major role to play. The CGIAR is still extremely important and needed. That's a completely different question from who pays the bill and how the bill is paid.

Improving the CGIAR

I'd like to present some ideas for reflection—some adjustments we might need to make in the centers, including slight adjustments in the managerial model.

First of all, who is the client? The client is no longer the national research institute, as it was perhaps before, but different players in the national agricultural research systems, including farmers' associations, the universities, and so on. The CGIAR generates good science. In that capacity, it can find and has found solutions to key problems, but it is not and should not be seen as a direct alleviator of poverty. How do we reconcile the donors' perception that they are financing actions to alleviate poverty with the South's perception of CGIAR's mission, which is to solve agricultural problems through the best science and technology? We are and should be generating global (and in some cases regional) public goods, and above all we should be producing the best science and technology.

From a Southern perspective, the CGIAR's mission is to find solutions to problems of poverty not through poverty alleviation programs but through the best science and technology. But the science and technology business is a business like any other business, and sometimes this is forgotten. Not only do we have to produce goods for specific clients, but we have to manage the process efficiently, which means, among other things,

resolving problems in our distribution network. A recent publication by one of the CGIAR-supported centers stated that, although they had generated germplasm of high quality, which the poor could advantageously use, the new maize products had not reached some of the subsistence farmers because of bottlenecks in the distribution network. We need a clear policy framework in which to discuss questions of intellectual property, germplasm deployment, nonexclusivity, and protecting producers' rights (non-GMO, seed multiplication of non-genetically modified organisms). And of course we also need to promote the product.

We need results-based evaluation and above all we need to improve accountability. We need staff training, especially to change attitudes, so that different actors in the system recognize the importance of finding the best way to manage the production of global public goods. We have to talk about the impact of science and technology. To use CGIAR outputs efficiently, we have to link them to different development projects and to the World Bank and other development and financing agencies. This is a learning-by-doing process in which we are making mistakes and, hopefully, learning as fast as we can.

The success of the CGIAR can provide us with lessons for the future generation of public goods. Some of these lessons are:

- Structures for generating public goods need to be light, flexible, and capable of rapid adjustment.
- Networking is essential so we should use all of the human resources and infrastructure that are available. We do not have to build huge physical structures, as we have done in the past.
- We hope for balanced stakeholder participation, but whether we achieve it depends partly on financing.
- To improve links to distributor and communication chains, perhaps we should stop thinking about *donors* and *recipients* and think instead of *investors* who want benefits—mostly social—from the products we are generating.
- We need to develop central strategies and coherent procedures.
- We need an evaluation scheme that measures the efficiency, effectiveness, and impacts of our science and technology projects. How do our clients—NARS, distributors, and communicators—assess what is being generated? Are projects financially sustainable? We need benchmarking, to facilitate inter- and intracenter comparisons as to allow countries to make adequate decisions when deciding where and how much to invest.

In recent years, Southern participation in the CGIAR has been much stronger, which is perhaps why I was asked to talk to you. This is a tribute to Ismail Serageldin, who insisted that several developing countries, including my own, be stakeholders, be investors. The world as viewed from the South is very different from the perspective from the North.

Knowledge and Global Public Goods: Implications of the WTO' s TRIPS Agreement

Jayashree Watal

I would like to thank the organizers who invited me for forcing me to think about the link between Trade-Related Intellectual Property Rights (TRIPS) and knowledge as a global public good. There are two themes to my presentation.

First, the TRIPS agreement has unambiguously strengthened the protection of intellectual property rights, but there are ways within the TRIPS agreement both:

(1) *To reduce to some extent the social costs of complying with it.*
(2) *To improve the benefits developing countries could get from implementing it.*

International governmental organizations such as the World Bank and the United Nations Development Programme (UNDP) need to reiterate these messages to the developing world, because these perspectives are not widely accepted. The debate on the subject is so polarized that people appear to be either for it or against it; there seems to be no gray area in between.

Second, new and emerging intellectual property issues, some of which existed before TRIPS, have gained prominence in the media since TRIPS was signed and need to be resolved in a more coherent, coordinated way than has been seen before. The Bank and the UNDP can help conceptualize and finance *mechanisms for the global governance of technology*.

Knowledge as an impure public good

Our keynote speaker yesterday morning said knowledge was an example of a pure public good. I think that it is an impure public good. Knowledge is

nonrival in consumption, but some forms of it are partially or wholly excludable by several means. One means of excluding others from sharing or using knowledge is intellectual property rights (IPRs), the most important of which is patents.

The issue of whether a global knowledge commons is nonexcludable raises an interesting point about equity. The global knowledge commons—folklore, traditional knowledge, and so on—are funds of knowledge open to everybody. So far nobody can be excluded from them. Issues of equity arise when intellectual property rights can be used to exclude people from some sources of knowledge but not others. Several legal solutions to the protection of folklore and traditional knowledge are under discussion, but very little has so far been done because each solution presents problems.

The purposes of intellectual property rights

People tend to think of all intellectual property rights as the same but there are two different kinds. One kind—patents, copyrights, and so on—is used to *encourage innovation and creativity*. *Patents and copyrights,* for example, give their owners more market power for a period of time but are *limited* in scope, subject matter, and duration in time. Only some of these are relevant for our purposes. Copyright-protected entertainment products and patent-protected business strategies can in some sense be viewed as knowledge and in other senses not. On the other hand, copyrighted books and patented technologies are clearly included in the stock of knowledge.

The other kind of intellectual property right (IPR)—which includes *trademarks*—is intended to prevent unfair competition and the *deception of consumers.* Trademarks provide limited rights, but are usually *unlimited* in time. A trademark is forever, subject to renewal, if it has to be registered. But trademarks, or other distinctive signs such as geographical indications, are about distinguishing the goods and services of one enterprise (such as Kodak) or one region (such as Champagne) from others and to prevent the deception of consumers with false labels. Trademarks are irrelevant to the topic of knowledge as a global public good. Using the word “Kodak” or “Champagne” does not use or spread knowledge.

The TRIPS agreement’s implications for proprietary knowledge

Proprietary knowledge is knowledge which someone owns. The first important thing about the TRIPS agreement is that countries which decide to sign the agreement cannot exclude certain sectors or products from patent protection. In particular, you cannot exclude medicines, food, microorganisms—three categories of products that developing countries typically excluded from

protection before TRIPS. There are limited exclusions to this obligation. For example, countries can exclude plants and animals from patent protection; countries can exclude methods of medical treatment; and countries can exclude scientific principles, business methods, and discoveries. The term "discovery" is used here as distinct from the term "invention" as the former is a product found in nature with no addition to knowledge by man, whereas the latter involves technical intervention made by man. This distinction is not clearly spelled out in the TRIPS agreement, but can be deduced by reading between the lines and by knowing what the patent laws were before TRIPS, what was on the negotiating table, and what was finally allowed.

The way the TRIPS agreement describes these obligations allows considerable leeway on the most controversial subjects: *plants, genes, and biodiversity*. The TRIPS agreement says countries can exclude plants from patent protection but, at a minimum, they have to provide an *effective, sui generis* system of protection. "Sui generis" means "one of its own kind," and "effective" is subject to interpretation. So a number of countries have come out with solutions on how to implement this obligation that allows considerable flexibility. Some follow the international convention UPOV (Union pour la Protection des Obtentions Végétales) in its 1978 version, others in its stronger 1991 version.

The sources of inequities

The inequities in global public policymaking lie here: on the one hand, the international community has decided to impose this agreement that strengthens intellectual property protection. But it has not imposed on an international level the kinds of rules or structures for regulating monopolies or anticompetitive practices that are typical in a country such as the United States (most recently in the Microsoft case). Developing countries are not obligated to have such regulatory structures on their own and most of them do not—or if they do, these are not effective. So there is inequity in the regulation of monopolies and anticompetitive practices.

Also, what can be excluded from intellectual property protection has implications for the interests of developing countries—for economic development in these countries in general and for health, poverty reduction, and other aspects of welfare in particular. What is protected and excluded also has implications for agricultural development, which has gotten extremely complicated. Nobody knows where things will go in terms of agricultural biotechnological products, but equitable solutions that will be good for everyone have not been fully discussed in the context of the TRIPS agreement.

Finally, there is the issue of the fair and equitable sharing of the benefits from the commercialization of traditional knowledge and bioresources—which TRIPS doesn't even mention. Thorny legal issues are involved, and it is un-

clear what solutions are available or enforceable, but clearly some solution must be found for this clear inequity.

Exceptions to patent rights

The TRIPS agreement strengthens patent protection, which clearly benefits the owners of patent rights. A patent lasts 20 years from the date of filing, under Article 33 of the agreement, so the patent owner has a limited monopoly for 20 years. But Article 30 provides for *exceptions to patent rights* during the term of the patent. One of the main exceptions is for regulatory approval of generic drugs. Before a patent for drugs expires, the testing and regulatory approvals to market the generic product can be obtained so that production can begin once the patent expires. This exception was upheld in a recent WTO dispute.

More important, especially to the debate about AIDS, is *compulsory licensing.* With compulsory (or nonvoluntary) licensing, state authorities or a court can grant licenses even if the patent owner doesn't want to do so. It doesn't always work, because, when trade secrets are also involved, the licensee might need the cooperation of the right holder to actually manufacture the patented product or process. But it works particularly well for a product such as pharmaceuticals for which, once the product is out, reverse engineering is easy. A skilled chemist can figure out the drug's exact composition and manufacture its bioequivalent product. In addition to compulsory licensing, there is government use of products for *public noncommercial purposes.*

Another exception is *parallel trade,* which is the import of the proprietary product from a country in which the patent owner is charging a lower price. In other words, if the patent owner charges a higher price in Market A than in Market B, the country in Market A can import that product from Market B. It is important to make a distinction between parallel imports and parallel exports. A country like India has an interest in allowing parallel imports if a product is cheaper elsewhere in the world, but not allowing parallel exports, which could lead to lowered availability and possibly higher prices within the country. Even from the patent owner's perspective, parallel exports may be detrimental since the ability to effectively price, discriminate would mean higher global profits.

Policy issues and political economy

Certain policy practices, which were not written into the TRIPS agreement, were on the negotiating table and have not been constrained in any way, such as price controls (especially in the pharmaceuticals sector), reimbursement policies, monopsony buying, and so on. These could do a lot to address some of the issues that have recently become prominent. Much more

work needs to be done on the economic implications of these policy instruments. It is not clear that it is in the interest of every type of developing country to make maximum use of these policy instruments. In some countries the use of such policy instruments could hurt domestic innovators who are just learning to play the patent game.

And it is not just what the TRIPS agreement says but what countries can actually do under it which is quite another story, affected mainly by questions of political economy. For example, although the agreement clearly says that countries can use compulsory licensing, there has been a good deal of political and trade pressure not to do so. Both South Africa and Thailand were actually targeted under Section 301 of the U.S. trade law in recent years and these two important cases have not been resolved very satisfactorily. In the South African case, the legislation intended to allow measures for the production of generic products or import of original products is till pending before domestic courts. In Thailand, the originator company of an important HIV/AIDS drug agreed to reduce prices, thus leaving the effectiveness of compulsory licensing untested, although it is important to note that it was the very threat of such licenses that led to the price reduction.

The implications for other global public goods

Many post-TRIPS issues have implications for other global public goods. For example, TRIPS has implications both for the *generation of* pharmaceuticals, which Michael Kremer discussed, and for *affordable access* to them. It has similar implications for environmentally sound technologies and products (or EST&Ps, often called merely environmentally sound technologies). TRIPS also has implications for nutrition—consider vitamin A rice, for example. There are several patented technologies involved in the production of this rice, and, in a post-TRIPS world, where patents have to be respected, some countries may be unable to pay the consequent higher prices. Fortunately, in this case the several right holders have forsaken their rights. It is unclear what the solution would be if in future there is a similar nutritionally important crop innovation.

Technical standards can in a sense be defined as a global public good. Whether you think of them as a means or an end, it us useful to have licensing and proprietary standards that are applicable across an industry. But issues arise from having technologies that are part of a standard. For instance, if certain EST&Ps become the environmental standard to reduce carbon emissions and the international community resolves to introduce these world over, how do nonowners of these technologies get access to them? How can we have standards and at the same time provide optimal incentives for supplier technologies that improve global public goods and

encourage their widespread dissemination? There are no easy answers to this question.

Balancing the interests of rights owners and the global public

How do we ensure equitable access for all and at the same time allow a reasonable return for creators and innovators? Different solutions have been proposed. One is the *voluntary forsaking of intellectual property rights,* which we have seen with open-source software (the Linux model, as opposed to such proprietary software as Microsoft) and with the Human Genome Project, in which a consortium actually decided to forsake intellectual property rights even though they could have taken patents on their product or with the vitamin A rice.

Another solution is what I call "*increasing the stakes,*" best illustrated by e-commerce patents in the United States. Jeff Bezos said all he needed was a three-year period for his one-click patent for Amazon.com/ and that the TRIPS agreement stood in the way of such an arrangement. If the United States were to reduce the e-commerce patent term to three years, it would be violating the TRIPS agreement. This is the kind of paradox that the international community needs to resolve.

Another solution is *protection technologies, or technological protections,* which affect the enforcement of intellectual property rights. Take the case (in the music industry) of MP3 and Napster versus copyright and digital security. Or the case of genetic-use restriction technologies (GURTs) in plants versus plant patents. Here the "terminator" technology ensures the nonreproduction of proprietary seeds, which is a stronger protection than the legal rights over plant patents. Even if plant patents weren't granted, could we come to such a stage of technological protection?

In terms of equity, who will be the winners and losers when new genetic therapies and telemedicine are developed? How will we ensure that global public goods are disseminated widely? In global governance of technology, will we follow the Internet Corporation for Assigned Names and Numbers (ICANN) solution used for resolving disputes between domain names and trademarks in what is really a private sector initiative, or will we follow what the Academies of Sciences did recently on genetically modified organisms? Will governance be handled by such informal structures, or do we want more formal structures for making decisions about these issues?

What role should the World Bank and UNDP play?

Certain things could be done through country programs. First, we can propose to develop effective national and regional policy coordination mechanisms to deal with issues involving new technologies, intellectual property

rights, and international negotiations about these issues. Not enough is going on within countries to bring together different ministries and other stakeholders to coordinate responses in these new areas.

As we have suggested to the UNDP, as part of a project on intellectual property rights in Africa, there could also be projects to reduce the social costs of compliance with TRIPS and to increase the social benefits from intellectual property, particularly in the area of copyright and geographical indications (for example, Darjeeling tea or Basmati rice).

The Bank and UNDP can get involved with financing the acquisition of important proprietary technologies, because even with the most lax forms of intellectual property protection, there are some public goods one cannot disseminate except by purchasing and distributing them—for example, vaccines, essential medicines, environmentally sound technologies, and important crops.

Developing countries also need help developing the physical and human infrastructure essential for absorbing information about new technologies, including infrastructure to provide access to scientific and technological information through libraries and the Internet. The United States National Research Council's proposed project on the dissemination of scientific and technological information is a good starting point.

One objective could be financing the generation and adaptation of appropriate R&D targeted to the needs of developing countries or financing research (by developing countries and others) for developing country interests. Financing could also encourage inventors from developing countries in acquiring, maintaining, marketing, and defending intellectual property rights in developed country markets and to help developing countries improve their domestic portfolios of intellectual property rights.

There needs to be a way to evaluate new technologies and intellectual property policies for poor countries all over the world, in relation to new developments such as genetic engineering, genetically modified organisms, and genetic-use restriction technologies in plants. Are we going to leave to NGOs such as Rural Advancement Foundation International the responsibility for telling us the implications of these new developments or can these subjects be dealt with in a more objective way? The World Bank and the UNDP have an important role to play, which they are not playing at the moment. Peter Drahos, an Australian lawyer and philosopher, suggested one interesting possibility: The World Bank or, say, a Bank subsidiary, could set up an institution that would create an institutionalized marketplace to bring together buyers and sellers of traditional knowledge and bioresources. That institution would be an intermediary, garnering trust and acting as broker, bypassing thorny legal solutions, because you never get anywhere going the legal route. I think this is one of the best ideas that has come along in the last few years of debate on this subject.

Finally, we have to somehow prepare developing countries for effective participation in global discussions and negotiations on these subjects.

The CGIAR at a Crossroads?

Henry Shands

Like Jayashree Watal, I also had to think outside the box for the topics we're discussing today. Some of my ideas were shaped by an effort I did for the Consultative Group on International Agricultural Research (CGIAR) in 1993. We looked at the CGIAR's genetic resources program and considered developing a system-wide genetic resources program. We did a comprehensive survey and found the countries' responses thought-provoking. Countries indicated that they had many needs in structuring and developing a genetic resources program. Most lacked an infrastructure, many lacked scientific expertise, and most were interested in having the CGIAR guide them in establishing a national genetic resources program. Many would have liked the CGIAR to take a coordinating role in the region or subregion. While the Stripe Panel made this recommendation, the CGIAR, with its falling budgets, was unable to act on this recommendation. Although my comments have therefore been shaped by others, particularly from the developing world, the views which I express about the genetic resources program are my own. I don't claim that they are the views of the U.S. government, the U.S. Department of Agriculture, or U.S. Agency for International Development, because we probably differ significantly on some points. I probably also differ considerably from how the Northern donor nations might approach this subject.

CGIAR's contributions to global public goods

The CGIAR has made a tremendous contribution to global public goods through activities that supported:

- Crop varieties that enabled the Green Revolution.

- New technologies associated with crops, forestry, and aquatic and livestock production management.
- The collection and conservation of plant genetic resources (with IBPGR and now IPGRI in Rome collecting and conserving materials from developing countries and keeping them in CGIAR gene banks and in Northern gene banks).
- Agroforestry genetic resources collection and management.
- Aquatic genetic resources management.

Changes over the years

Under the early plan, when the Rockefeller Foundation and the Ford Foundation were funding CIMMYT's and IRRI's efforts to increase crop productivity through breeding and management, the five-year plan was to train national scientists to do the work and then to get out of the business. But breeding programs don't take just five years, and success has a way of keeping things going. The donors had a love affair with the successes of the green revolution varieties and with the programs' competence and accountability. Then new global issues became important to them. The CGIAR rapidly expanded the number of centers and activities. The research work being done was often leveraged by special project funding and—in a slight case of mission creep—the missions changed. With the sudden financial retraction that occurred in the early to mid-1990s, the centers contracted in size. We are now suffering the impact of that downsizing.

Plant genetic resources as global public goods

Which plant genetic resources are global public goods? There are large collections of genes in farmer varieties (landraces) and wild crop relatives for 9 major crops, 14 lesser crops, and a lot of forages, mostly from developing countries. Genes from over 600,000 varieties are being held for future crop improvement—for yield, for disease and insect resistance, for abiotic stress tolerance, and so forth. Still, genetic erosion continues, and we need to collect more in areas where there is stress from development or population growth.

The 12 CGIAR centers with plant genetic resources[1]—all located in developing countries—serve as curators for these global collections. They have in-trust agreements with the Food and Agriculture Organization (FAO) to shelter these genetic resources under a U.N. organization, but the effort is greatly underfunded. A continuing tragedy of the commons is that everybody owns something collectively so that no one has the incentive individually to invest in further development. The original research mission was to improve strains of the world's important crops, train the scientists, and then have the scientists work in their own countries improving crop production,

with a link to a CGIAR center. After testing and development in developing countries, the incentives for development trailed off in many countries because the CGIAR varieties were so strong that the countries couldn't compete. Many of them disengaged their research programs on those crops and became a testing program, heavily dependent on the CG.

Issues noted earlier

As Francisco Reifschneider noted, the CGIAR was Northern-centered. USAID and the Canadian International Development Agency (CIDA) both produced fairly significant papers on how the CGIAR crops benefited them, so that the U.S. and Canadian legislatures would vote to invest more in the international research system. Donors often follow their own agendas and leverage mission changes.[2] However, to give both Canada and the United States credit, they have concentrated on funding core programs rather than special projects. It depends on the country how they leveraged center programs.

The CG's expanding membership has brought increasing conflict. Biotechnology issues are complex not only because genetically modified organisms are an issue globally but because FAO and others are still debating how—internationally—to handle such issues as the protection of intellectual property rights and the ownership of genetic resources. Rights to landraces and varieties collected from developing countries are sometimes being assumed by Northern biotechnology companies and multinational firms, who claim protection of their intellectual property rights. Meanwhile, the developing countries ask, "Where did that material come from?" This conflict must be dealt with. IPR lawyers I spoke to at the American Seed Trade Convention two weeks ago said that it is a real problem for them to know how to deal with all 16 autonomous centers. Because the centers are autonomous; their efforts are not coordinated. It might help to have a coordinated central office handle intellectual property rights and technology transfers, linked to the centers but speaking with one voice for the CG. There is a similar problem in the United States where the private sector is troubled by having to negotiate intellectual property rights for collections in 50 different state university systems.

Keeping up with change

The CGIAR struggles to keep abreast of new developments, but can it stay competitive with such a rapid rate of change in biotechnology—a field dominated by the private sector? Yesterday's science may be out of date overnight. Just keeping up with molecular biology is difficult and extremely expensive and the CGIAR is not in a position to do so, either through post-docs or by hiring new scientists. Agriculture—both as an industry and in intellectual property rights—is increasingly privatized, and the private sector has

carved out most productive areas in all countries. That marginalizes the CGIAR varieties and efforts in marginal areas in countries that can't deal any better than the CGIAR with the problem of keeping up with changes. I think Francisco Reifschneider's presentation showed the Bank contributing $50 million a year to the CGIAR, which is roughly 13 to 15 percent of the total budget ($328 million). Some donors are noted for late or problem payments, and the Bank's role in bailouts has ultimately enabled short funding of the system.

Requirements for finished or unfinished products are mixed, and depend on how developed a country is. A few advanced developing countries would like the CGIAR centers to release more unfinished, wide-breeding crosses so that their programs can use a broader range of genetic materials in improvement work. Most countries, however, want prescreened and nearly finished lines so that they can do final field testing and then move selections straight to the farmers. Providing the latest technology in these cases is difficult when there are proprietary technologies involved, since the centers will have to negotiate the use of these technologies on a country-by-country basis with the owners of the technologies. It may not be possible to have the same releases in adjacent countries when the owners reserve sales rights in select markets. This will complicate managing releases by the centers unless they can get broad agreements on the intellectual property that will enable the centers not to be restricted in the testing and release of new genetic material. That is currently difficult since many companies have not fully determined where their intellectual property protection interests may lie geographically.

What can we do?

The Bank can continue investing to meet CGIAR's needs, after it reviews CGIAR's relevance and impact, or it can decide to change and limit the CGIAR—increasing support in some areas and decreasing it in others—but demanding accountability on specific Bank products. A transition period is probably needed to reprioritize activities.

That transition could start with a product demand survey *by* developing countries *for* developing countries. In identifying who needs what (in terms of national capacity and investment), the survey should try to identify what "we" (the developing countries) need, not what "they" or "it" need (with the Bank interpreting their needs for them). Many developing countries don't take ownership of CGIAR goods simply because they have little say in what those goods are, which is another tragedy of the commons. There are also input issues. The Rural Development Department is studying the way countries aren't accepting certain seeds, fertilizers, and other goods because of country bureaucracy or nontariff trade barriers.

There might also be a product demand survey for Bank needs, to study Gobal Environment Facility (GEF) activities and contracts as well as the activities of other global goods programs.

Another possibility to consider is privatizing the CGIAR with shareholders and a board of directors from developing countries, with Bank and donor support for high-priority global programs, and with developing country investment for continuing programs and networks. As yesterday's speakers observed, some networks have done a successful job of bringing together, say, wheat breeders, maize breeders, and coconut breeders, but not all countries have enough money to support having their breeders attend network meetings, where a great deal of technology transfer goes on.

Other possibilities include a nonfungible trust fund for sustainability projects; in-trust collections (which are unlikely to be sustainable but which are important for the level of public goods); various kinds of management programs (for example, for the development and management of crops, forestry, or aquatic breeding); environmental and participatory breeding programs; and so on.

IFPRI, Future Harvest, and others are working on an initiative for a proposed *Future Harvest Genebank Trust*. It might be more efficient to centralize efforts rather than support 11 different CGIAR genebanks, with their 6-million-plus accessions. They estimate that a trust fund of $200 million would generate roughly $10 million a year. I think this amount is inadequate. To generate the $20 million to $25 million a year needed to manage those collections, they would need a trust of $500 million. Would such a genebank give the CGIAR collections international legitimacy? Or would it seem like a self-serving initiative from the North? I don't know.

Criteria for evaluating Bank programs

What criteria will the Bank use to evaluate programs? First, who benefits from a technology transfer? In national projects, is the private sector helping the country? That's significant. What about marginal areas? Are the farming poor left out of the picture? Will the technology being transferred have an impact on farmers and agriculture? How will intellectual property issues affect farmers and agriculture?

National programs really need institution building because they often simply lack capacity. Will a program help with that? Will it help breeders in developing countries participate in international network activities on an equal basis? Global public policy networks are important for gene deployment, but may have issues to deal with. If you're going to use the same gene for stem rust resistance in Argentina and in northern Canada, will you have a rust issue going right up both hemispheres? Is bioterrorism possible? Can one race's resistance be knocked out by one gene that someone inserts in the organism?

The Bank needs a participatory index at both the policy and practice levels. In terms of private sector equity, are exchanges of germplasm and technology fair in terms of intellectual property? What extension activities is the private sector providing? The private sector can do a lot, when the national government doesn't have much of an extension program, to help farmers share benefits and to help improve the market structure.

Finally, the Bank should ask: Are we a step closer to getting the country on its feet and getting the bilaterals and the Bank out of the business? And if not, why not?

Notes

1. CIAT, CIFOR, CIMMYT, CIP, ICARDA, ICRAF, ICRISAT, IITA, ILRI, IPGRI (INIBAP), IRRI, and WARDA.

2. Donors provide money to advance their program interests without due respect to the center's mission. Centers were often obliged to take the money as a result of "how do you refuse?" despite the fact that it stretched some activities on a tangent to the focus of the center. It often went toward related but not strict CGIAR mission focus.

Reforming the Intellectual Property Rights System

Carlos Correa

The dilemma economists face in dealing with intellectual property rights issues is, on the one hand, how to protect innovations and incentives for investment, and, on the other, how to promote the diffusion of information and ideas so that more people can benefit from the use of inventions and other works. Several exceptions to intellectual property rights, such as parallel imports and the experimentation exception under patent laws, limit rights conferred on rights owners. But in the last 20 years, protection of intellectual property rights (IPRs) has increased dramatically, creating problems for those who want to use and improve on protected innovations.

Why protection has expanded

Why has protection of these rights expanded? First, the criteria for the examination of patent applications (novelty, inventive step, and industrial applicability) are loosely applied in many cases. This is true even for such major patent offices as the U.S. Patent Office.

Second, applications are examined superficially. According to one study on the examination procedures of the U.S. Patent Office, in roughly half of all patents granted, only prior patents were considered in assessing an invention's patentability; other documents, books, and journals—or an invention's prior use—were not considered in deciding whether to grant the patent.

Third, the dividing line between a discovery and an invention is not at all clear, particularly in the field of biotechnological developments.

Last year, the U.S. Patent Office granted 160,000 patents. In the past, patented inventions usually represented significant advances on the state of

the art, but many inventions today are just minor developments or marginal improvements. Patents are being granted for such trivial or frivolous items as this (showing pictures) combined camouflage and decoy device (a hat resembling the bird you want to hunt); this mouth appliance for assisting in weight control (plastic stickers you put on the mouth that allow you to breathe and talk but not to eat); this "animal hat apparatus and method" (a hat that keeps four-legged animals cool on hot days). The inventive step is difficult to find in these inventions, which are hardly revolutionary. The problem with a system that permits such inventions to be patented is that the same low standards may be applied to inventions in other fields, including biotechnology and pharmaceuticals.

Patents in biotechnology and pharmaceuticals

With biological inventions, for example, the dividing line between discovery and invention is very narrow today. In plant biotechnology, you can get a patent in many jurisdictions in connection with DNA sequences that call for certain proteins, or for plasmids and transmission vectors. In the United States, for instance, it is possible to get a patent on seeds, plant cells, plant varieties, and plant hybrids. With genes and other biological materials, the magic word has been "*isolation.*" A natural substance which has been isolated (or purified) may be eligible for protection. On March 12, 2000, President Clinton and Prime Minister Tony Blair announced that patents would not be granted on human genes in the United States and United Kingdom. But two days later the U.S. Patent Office issued a press release reassuring the pharmaceutical and biotechnology industries that patents would continue to be granted on genes. Indeed, a number of genes have already been patented, including one gene that is considered to cause breast cancer. This kind of protection could be a serious barrier to the medical use of genes in diagnostic tests and gene therapy.

Similar problems arise with pharmaceuticals. Though the new chemical entities actually developed each year are only a few, thousands of patents are granted each year for variants of existing products (such as polimorphs, isomers, compositions) as well as for new uses and for manufacturing processes.

Many patents in this field actually *discourage innovation or genuine competition.* A U.S. federal laboratory, for example, developed a product called diadosine (ddl), which is used to treat HIV-related disease, and an exclusive license was granted to Bristol-Myers Squibb. The patent has expired but Bristol-Myers Squibb was granted a formulation patent for a very noninventive composition that combines this drug with an antacid. The patent was granted in countries such as Thailand, which allowed Bristol-Myers to maintain a monopoly on the product and to prevent the Thai government from producing a cheaper product for patients in Thailand. Similarly, when AZT—

which was developed in the 1960s—was found to be useful in the treatment of HIV-related infections, a new patent was granted not for the product but for the product's *new use,* which again permitted the pharmaceutical company to maintain a monopoly on its use—and to keep its price high.

The patent system is not working the way it should. The original purpose of the patent system was to promote and reward genuine inventiveness and inventions, not to support the monopolization of a large body of knowledge that should be in the public domain. Let me finally share with you a statement from the United Nations Development Programme *Human Development Report* which I think accurately reflects the current situation: "The relentless march of intellectual property rights needs to be stopped and questioned. Developments in the new technologies are running far ahead of the ethical, legal, regulatory, and policy frameworks needed to govern their use. More understanding is needed—in every country—of the economic and social consequences of the Trade-Related Intellectual Property Rights (TRIPS) agreement. Many people have started to question the relationship between knowledge ownership and innovation. Alternative approaches to innovation, based on sharing, open access, and communal innovation, are flourishing, disproving the claim that innovation necessarily requires patents."[1]

Note

1. UNDP, *Human Development Report 1999* (New York, p. 73).

Floor Discussion

Vinod Thomas, Chair

Vinod Thomas, the chairperson of this session, thanked the speakers for their presentations on two different aspects of knowledge as a global public good: the Consultative Group on International Agricultural Research (CGIAR) and related network experiences on the whole question of knowledge for development, and the World Trade Organization- (WTO) related obligations on intellectual property rights which directly impinge on the creation and dissemination of knowledge. In inviting questions from the floor, he hoped that everyone clearly saw the logic of the two segments, and how they were related.

An unidentified participant said that the United Nations Development Programme's (UNDP) call to rethink where we are going with respect to intellectual property rights had come at the right moment. He predicted there would be a backlash against the move toward private ownership of common knowledge, which he compared with what had happened in land ownership. Indigenous people all over the world now claim that they often signed away their land rights in the past without truly understanding the consequences. Similarly, he felt that the general public was now signing rights to public knowledge over to private companies without fully understanding the consequences. He could imagine a lawyer writing to tell someone that they could not use the word "welcome," because it was owned by the Welcome Foundation. In the Netherlands some intellectuals have awakened to this problem and are asking, "What are we going to do? At some point we'll be asked by lawyers not to use certain words in our novels because companies commercially own the words." The current rich debate on intellectual property rights has been completely captured by small, powerful, special interest groups and commercial lobbyists, and the general public does not understand what is happening.

Another participant said that what drives some bilateral donors' agendas is an investment's impact on poverty reduction. She was afraid that involving the private sector would mean that the focus on poverty reduction would be lost, especially if it interfered with the profit motive. She raised a note of caution about the story of the consultative group (CG) system. Those of us on the donor side who are still connected to poverty reduction shouldn't think that negotiating public-private partnerships was going to be easy when issuing patents and making money became part of the picture, and not just providing public goods.

Barry Eichengreen said that, although he found anomalies in how the U.S. Patent Office operated striking, it was not clear to him that a weakening of intellectual property rights would make the developing countries better off, since it would almost certainly slow down innovation.

Jed Shilling said that an interesting article the week before in the *Wall Street Journal* had reported that the pharmaceutical industry was not generating new patents or reformulations of old patents, but was shifting far more of its resources away from research into the marketing of products made from existing patents. This raised an interesting question. In theory, intellectual property rights protect the rights of the individual. How many patents are granted to corporations and how many to individuals? A corporation is a public creation, and there has been much discussion of the corporate responsibility to act responsibly. He wondered if the issue of the proper use of intellectual property rights should be addressed.

Anders Agerskov said it might be worthwhile to revisit the reason for having intellectual property rights—fostering innovation, encouraging new ideas, and so on—and bringing the CG centers in alignment with those reasons. To him, it was not a question of yes or no, but what kinds of property rights they should have. He solicited the panel's ideas about how to be more innovative in granting intellectual property rights and the limited (in time) monopoly that comes with them.

Jaime de Melo asked if granting intellectual property rights to encourage innovation was truly in the interests of poor countries, most of whom would not have the means to buy the products of that innovation.

Vinod Thomas asked the panel to address the questions about how intellectual property rights affect both knowledge and equity—whose property are the rights protecting, and who benefits—before returning to issues associated with the CG.

Jayashree Watal responded that Eichengreen's comment that weakening intellectual property rights would slow the rate of innovation was linked to the subsequent question about the kinds of innovations the rights were going to encourage and whether these innovations would be in the best interest of developing countries. A recent paper by Jean O. Lanjouw and and Iain Cockburn[1]—available on the MBR Web site—asked exactly that question about the pharmaceutical sector, with a focus on India. Would

the strengthening of intellectual property rights, which the TRIPS agreement makes obligatory, actually lead to more appropriate R&D in India? The answer, based on surveys and interviews, was not very clear. It could be that it was too early to tell because the agreement had not yet been implemented, but Watal's own feeling was that it would not lead to more appropriate R&D in India. Even Indian companies investing in pharmaceutical R&D were looking at products for the global market. A product with a limited market in terms of purchasing power—a product needed by a large number of people who live in very poor areas—would not get researched. She thought that the most creative solutions to the problem of the underprovision of a global public good had been brought out in the Sachs-Kremer proposals. She did not think strengthening property rights by itself would necessarily lead to more appropriate R&D or even to more innovation. And economists Richard Nelson of Columbia and Suzanne Scotcher of Berkeley had shown how strengthening intellectual property rights could actually block further innovation.

Carlos Correa agreed with Jayashree Watal that strengthening intellectual property rights in developing countries would not automatically lead to more innovation, especially in countries that did not have strong scientific and technological infrastructure. Nothing magical could lead these countries to improve their innovative performance just because of stronger intellectual property protection. Strengthening certain kinds of intellectual property rights would benefit mainly Northern companies that would be able to exploit exclusive rights to innovations in developing countries.

As for whether patents go to the individual inventor or the corporation, most patents are granted to corporations, not individuals. The individual inventor—a romantic image—does not exist anymore in economic terms. He had read that in the United States, for instance, of the 160,000 patents granted the year before, half had gone to 200 U.S. corporations. So the system is used and controlled by corporations, especially big corporations, and the main beneficiaries are those corporations and the lawyers—because the amount of litigation is extraordinary. In plant biotechnology, for example, almost every significant patent had been challenged in court. He was baffled by all this litigation, even though he was also a lawyer, and he thought society and consumers were paying a high price for this expansion of intellectual property rights.

He agreed that the answer to the problem was not yes or no, black or white. The problem was, what kind of rights are granted, what scope of protection was permitted, and whether the area of knowledge being privatized was reasonable in terms of society's goals.

Barry Eichengreen observed that no one had commented on the country composition of the CG program and, as an outsider, he found the list of countries involved—Colombia, Côte d'Ivoire, India, Italy, Kenya, the Netherlands, the Philippines, Mexico, Nigeria, Peru, Sri Lanka, Syria—unexpected (he hated

to say "peculiar") to someone unfamiliar with the system. Maybe this reflected the history and the politics of the program, or some other rationale that was not immediately apparent.

Henry Shands explained that there is a difference between which countries are members of the CGIAR and where the centers are located. There are about 55 member countries altogether, including 30-something Northern countries, fewer Southern countries, and two private foundations—he didn't remember the exact mix. He was not totally familiar with the history of why the centers were located in certain countries. Obviously, the first two centers in the Philippines and Mexico, which were associated with the early programs of the Rockefeller and Ford Foundations (Robert Chandler and Norm Borlaug), were grandfathered in, if you will. The others were selected on the basis of various factors such as transportation, whether they were a center of biological diversity for crop material or the environment, whether the country wanted to give them an international status, and whether the country offered the CGIAR an opportunity to confer that status. The only center he was close to was the IPGRI center in Rome, which had split off from the FAO parent organization. Four countries had offered to host that center, and it became a bit of a dogfight before the final decision was made. The one that has been an anomaly, of course, has been the Asian Vegetable Research and Development Center in Taiwan, China, which got involved in the international politics about recognizing China and Taiwan, China. It is not an international agricultural research center in the same sense as the others but deals with Asian vegetables. Some centers consolidated for the sake of administrative efficiency: ILRI in Ethiopia, which was concerned mainly with forage, consolidated with Nairobi, Kenya, which was involved in animal disease research; and INIBAP, a small operation in Montpelier, France, concerned with bananas and plantains, merged with IPGRI in Rome.

Francisco Reifschneider responded that basically the CGIAR was open to all countries. There was no limit and no previous determination that countries A, B, or C would benefit from any activities. However, the minimum financial contribution expected—half a million dollars a year—was itself a barrier. Increasing that amount to $1 million had been proposed but strongly opposed because this might exclude even more countries if the increase were approved. Often, although a country is named as the participant, it is actually an institution participating on behalf of a specific country, and the institution uses its own budget. That this is an institutional contribution and not a national contribution clearly indicates how important the system is to these specific national institutes.

With respect to the question about science and poverty reduction, Reifschneider responded that poverty elimination, more than poverty reduction, remains a main target—no question about it. The question is how to use, as efficiently as possible, the limited resources we have for different proj-

ects. In several programs, donors have imposed the use of costly researchers, who end up working directly with a very small group of farmers. This is certainly not the most efficient way to use limited CGIAr resources, yet we see this more and more often. And we are not using the national institutions or systems, NGOs, universities, farmers' associations, and so on to multiply as effectively as possible the impact of a CGIAR effort. In some cases, there is the risk of the CGIAR taking over very localized actions. This is highly inefficient in a system that exists, after all, to generate global public goods.

Vinod Thomas, in closing, thanked the panelists and reminded participants that this had been the third of four thematic sessions at the workshop on environment, health, knowledge, and global financial stability. He thought that this session on knowledge issues had been extremely valuable in its own right and as a basis for the two concluding sessions this afternoon, on the implications for the financing and the evaluation of global public goods.

Notes

1. Jean O. Lanjouw and Iain Cockburn, "Do Patents Matter? Empirical Evidence after GATT," *National Bureau of Economic Research,* Working Paper Series no. 7495 (Washington, D.C., 2000).

Part VI

Economic and Financial Governance

Global Financial Stability: Recent Achievements and Ongoing Challenges

Morris Goldstein

The international financial architecture is essentially the institutions, policies, and practices associated with financial-crisis prevention and management. I'm going to talk about two issues associated with the topic: (1) the implementation of international financial standards and (2) currency regimes in emerging economies.

Implementing international financial standards

International financial standards have become the rage in the past few years. We now have international standards for, inter alia, banking supervision, cross-border listing of securities, data disclosure, monetary and fiscal transparency, and corporate governance, and we are moving toward international accounting standards. We have them in large part because the track record on financial crises has been so bad in the past decade or so. Weak national banking systems and poor banking supervision were central to the Asian financial crisis; some of those crisis countries now face enormous fiscal costs—from 10 to 60 percent of GDP—for bank recapitalization. The spillover effects of crises in even seemingly small countries, such as Thailand, can be fairly substantial. The "ground-zero" crisis country has sometimes acted as a "wake-up call" for investors to look at similar vulnerabilities in other countries.

Why can't countries come up with their own standards? They could. But there is a consensus that such standards are more credible if they've been accepted and blessed by a large group of countries and experts.

Assume that international financial standards are a good thing. How do we get countries to implement and enforce them? Standards are being pro-

moted through three types of incentive channels: the expected market payoff, lending conditions of the Bretton Woods institutions, and the risk weights in the revised Basel capital accord.

Expected market payoff

If market participants can tell who is (and who is not) complying with standards, countries that comply ought to benefit from a lower market cost of borrowing. That could be a sizable incentive even if compliance were voluntary. While countries could certify their own compliance with standards, this would not be viewed as objective, and so typically they ask international financial institutions (IFIs) or somebody else to certify compliance.

Sometimes the list of compliers and noncompliers is published. On the International Monetary Fund (IMF) Web site, for example, under the Special Data Dissemination Standard, the IMF lists countries it regards as complying with this data standard. But there are potential problems with such public disclosure. Countries might worry, for example, that, if you name the noncomplying countries, you might start a run and precipitate a crisis. That has been the typical rap against the IFIs doing so, although recently the IFIs seem to have overcome their reservations in some areas. The Financial Stability Forum, for example, has named the offshore financial centers with lax supervision, and other official groups (the OECD and the Financial Action Task Force) have published the lists of tax evaders and money launderers, so we are pointing the finger of public shame at countries more than we used to. It is unclear whether we should move beyond publicly saying that there is noncompliance in certain countries to saying that, based on our financial sector assessments, we think that there is systemic risk.

One problem is, how do you judge compliance when standards have many components? The international banking standard, for example, has 25 principles. Do you take the average? Do you judge compliance by just a few of the most important principles? Do you judge each principle separately? And suppose a country that did meet the standard no longer does? Do you now indicate publicly that it has been downgraded? What political problems or pressures would there be not to do so?

Some think it would be better if the private credit-rating agencies judged compliance, rather than governments or IFIs (which have governments as their members). So far, at least, the credit-rating agencies have been reluctant to do so. There are also questions about who should do the compliance evaluation, especially in areas where the IMF and the World Bank lack the requisite expertise, and about how you would bring evalutions in different areas together. A clearinghouse of some sort makes sense but would require considerable interagency cooperation. A group like the G-20 or the G-7 would have to announce that they want all compliance reviews in one place, saying, “IMF, we want to publish these compliance reviews as an appendix to your Article IV

report. OECD, submit your evaluation on corporate governance. World Bank and Bank for International Settlements do your evaluations and send them to the IMF in time for publication of the IMF report." This would require more coordination than I think would come together voluntarily.

Bretton Woods institutions' lending policies

A second channel for encouraging the adoption of international standards would operate much the way a private insurance company does, giving you a better insurance deal if you install a smoke detector or exercise regularly. The Bretton Woods institutions would give countries that comply with standards either lower interest rates or greater access to their loans. Not too much has been done along these lines. Supposedly, in the case of the Fund's new credit line—the so-called contingency credit line—compliance with standards is one factor considered for eligibility. But this is so far moot, since no country has yet agreed to draw on the contingency credit line yet.

Risk weights in the revised Basel capital accord

The Basel capital accord is an agreement which specifies the minimum capital requirement commercial banks must hold against various kinds of assets, including loans to various countries. It has been proposed in the revision of the existing agreement that loans to countries that implement the standards would get a preferred risk weight. This revision, however, is still up in the air, so we don't know precisely how substantive this incentive will be.

Currency regimes

In discussions of crisis vulnerability and currency regimes for emerging economies, one issue that comes up is G-3 currency regimes. Some experts, including Paul Volcker and Fred Bergsten, say it is impossible to make currency regimes for developing countries more stable until you have more stability in the key currencies (the dollar, the euro, and the yen). In their view, such stability is an international public good. I don't think we're going to see a single currency for the G-3 or fixed exchange rates à la Bretton Woods, or even G-3 target zones—at least not in the next 10 years. I don't see Mr. Greenspan, Mr. Duisenberg, or Mr. Hayami raising domestic interest rates in a recession or lowering them in an inflationary boom for the sake of keeping the exchange rate within an agreed-upon currency zone. Nor is there persuasive evidence that, if the Fed, the European Central Bank, and the Bank of Japan had done so over the past 30 years, we would have gotten better bottom-line growth and inflation performance than we've achieved with the policy they followed. We are not going to see a single G-3 currency or fixed exchange rates and, as former D.C. Mayor Marion Barry put it, "I think those who think otherwise have to get over it."

As for emerging economies, the consensus seems to be that these economies should avoid adjustable peg, or "soft peg," currency regimes in favor of managed floating rates—perhaps with an inflation target à la Brazil—or, in special cases, currency boards or dollarization. Why counsel against adjustable pegs? Because history suggests they blow up. How many of the larger emerging economies with open capital markets have been able to maintain fixed exchange rates for five years or longer? Only two—Argentina and Hong Kong. There's a very difficult exit problem which is really a political problem (Barry Eichengreen and others have written about it). If the exchange rate is overvalued only a bit and there is not much market pressure, there is little incentive to change it. If you suggest to the minister that it be changed before there's a crisis, he will ask if you are trying to create a crisis and tell you to go away. By the time it is greatly overvalued with a lot of market pressure, it is too late. We saw this happen in the exchange rate mechanism in 1992–93, in Mexico in 1994–95, in Asia in 1997, in Russia in 1998, and in Brazil in 1999. There is no easy way to get around it.

Another problem is defending those fixed rates with high interest rates (once your reserves are run down). You can't keep interest rates sky-high for long if you have a weak banking system, are in a recession, have high debt/equity ratios in the corporate sector, or have a floating-rate government debt with a big fiscal deficit. The speculators know these factors make the fixed rate vulnerable, so these regimes are not very viable. You get greater viability if you go to a managed floating rate, perhaps with an inflation target that doesn't present a one-way bet. Brazil's performance in this regard is encouraging.

What countries say they're doing and what they are actually doing is not always the same. Many countries say they are floating, but if you examine their behavior you will find that they are intervening in currency markets or moving interest rates a lot to influence the exchange rate. Why is there what Guillermo Calvo and Carmen Reinhart describe as a widespread fear of floating in emerging economies? One reason is that if you lower the interest rate "just temporarily" because you're in a recession, market participants may think you're "off to the races," with high inflation just around the corner. A second, and more serious factor in emerging economies is large dollar-denominated liabilities by banks and corporations. If you combine this large currency mismatch with a sizable depreciation, you get a lot of insolvent banks and/or corporations—à la Asia—which is very costly. Once you have the mismatch problem, you're kind of stuck. With public sector borrowing, you can deal with the problem by internalizing the externalities. You don't borrow as much in foreign currency and you try to reduce the debt's maturity. But it's a tougher nut to crack in the private sector, where you have the problem that either borrowers think they will be bailed out if there is a depreciation, or everybody does it because it's cheaper and everyone else is doing it.

Much of what happens on choice of currency regimes will hinge on what happens in Brazil and Argentina. You want monetary policy independence not for fine-tuning but for gross-tuning. If you're in a recession and you can't use monetary policy, you have a problem. As Argentina is discovering, all it can do (given its currency board) is tighten fiscal policy in a recession. If Argentina ultimately blows up, I think the case for dollarization will be weakened. Conversely, if Brazil—which has made a good start, with growth doing well and inflation under control—were to blow up, the case for dollarization would be strengthened.

Promoting Financial Stability as a Global Public Good

Barry Eichengreen

Morris Goldstein didn't touch explicitly on the case for financial stability as a global (or at least an international) public good, so let me do just that. In a world of contagious crises and systemic risk, global economic and financial stability can be placed at risk by events in particular countries. Hence, institutional arrangements affecting, among other things, prudential supervision and the conduct of monetary-cum-exchange-rate policies are of critical interest not just to the initiating country but also to the rest of the world. I count myself among those who believe that financial contagion across borders is an important phenomenon and that systemic stability is something to be worried about. Countries don't experience crises only because they follow bad domestic policies that can be corrected at home; as innocent bystanders, they can also suffer collateral damage from financial instability abroad. Global initiatives to influence national practices can be justified as a way of internalizing these externalities.

Promulgating international standards

That is the argument behind the effort spearheaded by the International Monetary Fund—and involving the World Bank, the Financial Stability Forum in Basel, and the United Nations, among others—to encourage industrial and developing countries to *upgrade their financial practices and institutions.* The *focus* of these efforts, as Morris mentioned, is to upgrade institutional arrangements in such areas as data dissemination; fiscal, monetary, and financial policy transparency; the regulation and supervision of banking; the regulation of securities and insurance markets; and auditing, accounting, bankruptcy,

and corporate governance practices. The *mechanism* is the promulgation of *international standards* defining minimally acceptable practice in these areas, which all countries active on international financial markets must meet, together with efforts to encourage compliance using a combination of multilateral surveillance, peer pressure, and market discipline.

Why have international efforts not been geared instead toward more heavy-handed regulation? One answer is that the suppression of global markets is politically and, in our high-tech world, technically infeasible. In addition, more far-reaching, centralized global initiatives would subject countries to one-size-fits-all advice (what Thomas Friedman calls "the golden straitjacket"), denying them the opportunity to design regulatory institutions tailored to their own distinctive cultural, economic, and legal traditions. This is where the case for standards comes in.[1] Standards define criteria to be met by all countries active on international financial markets but permit those countries to satisfy the criteria for minimally acceptable practice in different ways. They offer a way of reconciling the common imperatives created by widespread participation in international markets with the diversity of national socioeconomic systems and structures. And to the extent that the perceived arbitrariness and capriciousness of the IMF's structural interventions explain the backlash which these have provoked, the promulgation of standards will ensure the existence of objective criteria to which the multilaterals can refer when they demand structural reforms.

Objections to international standards

Approaching this issue globally and through the promulgation of standards is, at the end of the day, probably superior to the alternatives. But there are some troubling objections to the approach. Neither the IMF nor the official community as a whole possesses the resources necessary to design and monitor compliance with detailed international standards in all relevant areas. In its early country Reports on the Observance of Standards and Codes (ROSCs), the Fund relied heavily on countries' self-evaluations, a practice that is not easily reconciled with the objective of shining the harsh light of transparency on national practice. For the IMF to carry out this function satisfactorily would require a significant increase in staff and a radical change in expertise, neither of which is likely in the foreseeable future.

Moreover, reservations have been voiced about how much can realistically be accomplished through the promulgation of standards. There is widespread disagreement about the definition of acceptable standards—witness the dispute between the U.S. and Europe over accounting standards, or the wide variation in provisions of bankruptcy and insolvency codes among the advanced industrial countries. There is a danger that an international standard broad enough to encompass these variations will tend toward a lowest common denomina-

tor. And by defining the minimum acceptable threshold, standards might weaken the incentive for countries to do better. What will prevent governments from taking steps to meet the letter of the requirement without satisfying its spirit?

Perhaps the most fundamental problem is with the notion that appropriate institutional arrangements for financial stability can be identified at the global level. This assumes a knowledge of the operation of these institutions that in actual practice does not exist. The problem is not only the limited human resources of the Bretton Woods institutions but also the limitations of economic science in its current state. We economists disagree among ourselves about the design of an efficient bankruptcy law, for example, about whether additional data disclosure is stabilizing or destabilizing, and about the relative merits of fixed or flexible exchange rates. It is not just that we are a cantankerous lot; rather, these disagreements are a reflection of the state of knowledge in the discipline. Casual observation confirms a continued diversity of institutional arrangements among the high-income countries themselves, and opinion about the merits of these competing institutions has oscillated over time. We used to think bank-based financial systems like those of Japan and Europe were more stable and conducive to growth than market-based systems; you don't hear that opinion much any more. Are fixed or flexible exchange rates better? Most professional economists would have given you quite different answers to such questions 10 or 20 years ago than today. If we cannot agree among ourselves, how can the international community be confident that a global initiative to change national institutions and practices in a particular fashion will make the world a safer financial place?

Sticking with national initiatives

Drawing an analogy from evolutionary biology, there is an argument for a continuing diversity of national practice on the grounds that this will encourage the survival of the "species" best adapted to a globalized environment.[2] According to this argument, the burden of reform should remain at the national level. If one buys this, then one must accept that there is no single blueprint for how countries should identify and implement desirable national arrangements. If no single mode of governance is optimal, the implication is that there is not much more to say. The national approach amounts to crossing one's fingers and hoping for the best.

Compromising with regional initiatives

Some contributors to this literature have suggested regional initiatives as a way of squaring the circle. Regional initiatives are a compromise between national and global approaches; in principle they can combine the best elements of both. If you think financial contagion is limited in scope—and there

is considerable evidence that the destabilizing effects of currency crises are felt disproportionately in the region where they originate[3]—and that the repercussions tend to die out with distance, then there is an argument for addressing these problems at the regional, and not the global, level. Policies and institutions (including exchange rate policies) could be coordinated regionally, yet diversity in national practices and policies could be preserved.

That those arguments have gained considerable currency in Asia since the region's 1997–98 financial crisis reflects the perception that the advice offered and conditionality imposed by the international financial institutions were inadequately tailored to the particulars of the Asian model and the Asian crisis. The proposal in 1998 for an Asian Monetary Fund reflected the desire to build a regional financial institution tailored to Asia's special needs. More recently, the Chiang Mai initiative to expand swap lines (credit lines) among participating Asian countries and to expand the list of participating countries to include such big countries as China and Korea—tabled by the Japanese government at the Asian Development Bank meetings last May—can be seen as trying to address regional financial pressures on terms better suited to Asia's distinctive social, economic, and financial system. Discussions of the case for establishing a common basket peg for Asian countries[4] are seen as responding to the dilemma of having to choose between a hard peg and a floating exchange rate. Morris described the record of fragility of pegged but adjustable exchange rates in a world of high capital mobility and liquid capital markets. There is the feeling that through strength in numbers, Asian countries can skirt this Hobson's choice by agreeing to a collective peg and supporting one another in its maintenance. This regional approach to institution building has worked in Europe, where it has promoted cooperation, encouraged the harmonization of policies and institutions, and created a zone of monetary and financial stability. If it has succeeded in Europe, is there any reason why it should not be pursued in other regions, including Asia?

The European model

I am skeptical about how much progress can be made at the regional level. Special historical circumstances have allowed European countries to effectively manage the challenges of globalization at the regional level.[5] European monetary unification was the culmination of a process, spanning nearly half a century, of strengthening regional economic, monetary, and political ties. Its origins go back to the Treaty of Rome, which established the European Economic Community and viewed the exchange rates of member countries as a matter of common concern. The Commission of the European Communities drew up a plan for monetary union in 1962. In 1970 the Werner Committee recommended completing that transition within a decade (a timetable that was disrupted by the collapse of the Bretton

Woods system and the generalized financial turbulence that followed). From the "snake in the tunnel" in 1972 to the Maastricht Treaty in 1991, mechanisms for limiting exchange rate variability were the vehicle for the pursuit of economic and monetary integration.

In an important sense, the origins of European monetary integration go back even further than this. A long-lived strand of integrationist thought in Europe has led politicians and their public to contemplate compromises of national sovereignty more readily than their counterparts elsewhere in the world. The Pan-European Union, founded in 1923, lobbied for a European federation, attracting the support of, among others, Konrad Adenauer and Georges Pompidou. Even earlier, in the mid-19th century, European intellectuals such as Victor Hugo were advancing the case for a United States of Europe. Before him, William Penn proposed a European parliament; Jeremy Bentham, a European assembly; Jean-Jacques Rousseau, a European federation; Henri Saint-Simon, a European monarchy. One could go on, but this is enough to make the point. Many generations before the signing of the Maastricht Treaty and the advent of the euro, a powerful strand of European integrationist thought already existed.

The lesson drawn after World War II was that nationalism and the struggle for industrial resources had caused three bloody wars in less than a century. This geopolitical logic, not only advanced within Europe but also argued and financed by the United States, lent momentum to the process. Underlying it were two powerful European dynamics: for commercial integration and for political integration. Europe's first great postwar project was its customs union, to which currency instability posed an ever-present threat. But continuously present behind the scenes has been the desire on the part of the founding members of the European Community for political integration, to be achieved by building a single market whose need for governance would encourage the development of Europe-wide political institutions.

Asian reality

In Asia, the motivation for monetary cooperation is different. There is little desire for a regional trade arrangement—much of Asia's trade is with Europe and the United States—and regional preferences would threaten to antagonize such powerful political bodies as the U.S. Congress, thus jeopardizing Asian market access. So the role of outside powers, especially the United States, in promoting or discouraging regional trade preferences in Asia turns post–World War II European experience on its head.

Moreover, in Asia there is no desire for political integration, given the split between Malaysia and Singapore in the 1960s, conflicts between Indonesia and Malaysia, and the Vietnam War. Rather, the impetus for monetary cooperation reflects the desire to create a zone of financial stability. The fear

created by the 1997–98 crisis is that small currencies and large financial markets are incompatible. Asian central banks, left to their own devices, lack the resources to cope with global financial flows and even with the position-taking ability of a few highly leveraged institutions. Unilateral floats and unilateral pegs are subject, in this view, to speculative manipulation. The solution, in this view, is the pooling of reserves designed to marshal enough resources for the authorities to counter speculative pressures and, ideally, maintain the stability of intra-Asian rates. Whether this desire, unaccompanied by European-style commercial and political integration, proves strong enough to support regional cooperation, only time will tell.

Complementary initiatives

Perhaps it is appropriate to view regional and global initiatives as complements rather than substitutes. In the same way that regional and global trade-liberalization initiatives have proceeded in tandem without regional initiatives robbing global initiatives of all force, perhaps standard setting and other means of providing the international public good of financial stability can also proceed on two tracks simultaneously. To the extent that there is "local knowledge" at the regional level, regional initiatives can build upon it, but those regional initiatives need to be embedded in a larger architecture compatible with the various regional designs. Asia and the West, for example, might opt for different approaches to the problem of corporate governance, but the particular way in which each region approaches the problem should have to be compatible with a more general global standard for corporate control and shareholder rights. This design may be appealing in theory but it is not obvious how to implement it in practice. Doing so is likely to be a time-consuming, intellectually demanding task.

Notes

1. Here I draw on my discussion of standards in Eichengreen (1999a), chapter 2.
2. Rodrik (2000) makes this point eloquently.
3. See Glick and Rose 1999.
4. Williamson 1999.
5. This argument is made at more length in Eichengreen and Bayoumi (1999), from which the present discussion is drawn.

References

Eichengreen, Barry. 1999a. *Toward a New International Financial Architecture: A Practical Post-Asia Agenda.* Washington, D.C.: Institute for International Economics.

———. 1999b. "Is Asia an Optimum Currency Area? Can It Become One?" In Stefan Collignon, Jean Pisani-Ferry, and Yung-Chul Park, eds., *Exchange Rate Policies in Emerging Asian Economies.* London: Routledge, pp. 347–67.

Friedman, Thomas. 1999. *The Lexus and the Olive Tree.* New York: Farrar, Straus, Giroux.

Glick, Reuven, and Andrew Rose. 1999. "Contagion and Trade: Why Are Currency Crises Regional?" *Journal of International Economics* 18:603–17.

Rodrik, Dani. 2000. "Institutions for High Quality Growth: What They Are and How to Acquire Them." NBER Working Paper no. 7540. National Bureau of Economic Research, Cambridge, Mass.

Williamson, John. 1999. "The Case for a Common Basket Peg for East Asian Currencies." In Stefan Collignon, Jean Pisani-Ferry, and Yung-Chul Park, eds., *Exchange Rate Policies in Emerging Asian Economies.* London: Routledge, pp. 327–33.

Renovating the World's Financial Architecture

Matthew Fisher

Let me highlight three of the lessons from the Asian and other crises that have led to a pronounced shift in the work agendas of the International Monetary Fund (IMF), the World Bank, and the international community generally. First, to the extent that that specific crises were foreseen, their severity—in terms of the loss in GDP, the cost of cleaning up the banking systems, and the sheer misery and disruption it caused in the lives of people in those countries—was much greater than anticipated. Second, the contagion effects—the tendency for a crisis in one country to be transmitted to others—were much more powerful than anticipated and operated through channels that were not fully understood at the time. Finally, despite considerable efforts, there seems to be no prospect whatsoever of developing painless ways to resolve these crises once they've become full-blown. The message that came out of Seattle, and more recently France, only reinforces the lessons that if we do not come to grips with the instabilities in the system and reduce the frequency and severity of these crises, we will lose many of the benefits of globalization.

Secretary Rubin coined the term "new financial architecture" to describe efforts to reduce our vulnerability to crises and to develop better techniques for resolving them. I'm not sure architecture is the appropriate image; I don't think we're looking at fundamental changes. It's more a matter, say, of changing the wallpaper, or the way in which the door handles work. But, in terms of crisis prevention, it may be worth looking at, first, how governments can improve their policies and operations and, second, how to improve the general environment for private sector decisionmaking. Doing so is increasingly the focus of the IMF's annual check-ups on the health of its 183 member countries.

Reducing vulnerability to financial crises

With governments, policies—especially macroeconomic, exchange rate, and debt management policies—are key. Clearly, if the shortcomings in Asian prudential supervision of financial systems had been addressed early enough, the crisis might have been avoided. Two things are being done with respect to improving our ability to assess countries' vulnerability to crises, which is another essential step toward managing vulnerability.

Macro prudential indicators

First, considerable work is under way in the IMF, the Bank, and elsewhere to develop a group of macro prudential indicators that we hope will not only serve as an early-warning system for imminent crisis, but also as flashing yellow lights (for policymakers and the private sector) when vulnerabilities begin, so people can take preemptive action when situations become unsustainable.

Financial sector assessment program

Second, work on financial systems is intensifying. The IMF and the Bank are cooperating closely on the Financial Sector Assessment Program (FSAP), an experimental effort to carry out comprehensive, cross-disciplinary assessments of countries' financial systems, including the adequacy of legal and institutional arrangements, the supervisory regime, banks, and nonbank financial institutions such as security firms and insurance companies. To cover that diverse a range of issues, the program draws on expertise from other institutions and member governments.

We expect pilot FSAP assessments for 12 countries to be completed this year; another 24 to be undertaken in 2001. The joint FSAP assessments will provide a basis for special IMF and Bank assessments. They will feed into the IMF's assessments of financial sector stability, which focus on risks to macroeconomic stability stemming from the financial sector—which in turn feed into policy advice in Article IV consultations, IMF technical assistance, and, as appropriate, the design of adjustment programs. The Bank will use FSAP assessments in country assistance strategy papers, technical assistance efforts, and sectoral lending operations.

Pushing transparency to facilitate private sector decisionmaking

To improve the private sector's ability to assess and manage risk and make decisions, we are trying to improve the efficiency of capital markets by making available timely, reliable, and internationally comparable data on economic policies, as well as quantitative indicators for both sovereigns and nonsovereigns. In the case of sovereigns, this entails the timely publication of inter-

nationally comparable data on macroeconomic aggregates, including for the real sector, the fiscal accounts, and the financial system, as well as the publication of policy assessments. In the case of nonsovereigns, we are encouraging countries to adopt accounting standards so as to facilitate the international comparability of companies, and to require the regular and timely publication of balance sheets and related information. This is all part of the push for greater transparency.

Publications

The obvious place to start improving transparency is at home. The IMF is becoming more transparent in its operations (albeit starting from a poor base). We have embarked on a program of publishing policy papers (so that people can understand IMF policies), letters of intent (for IMF-supported adjustment programs), summaries of most of our board discussions, and, under an experimental pilot program, Article IV surveillance reports (only with the prior consent of the member concerned). A review of this pilot program later this year is expected with respect to two questions: Does the prospect of publication reduce the reports' candor and usefulness? And, more generally, does increased transparency undermine the IMF's role as a confidential adviser to governments? These are genuinely difficult questions. If transparency detracts from other objectives, one must weigh if it is really the right way to go.

Standards

As part of the push for transparency, we are engaged in a major exercise to promote the dissemination of (and adherence to) standards covering a wide range of issues considered critical to the efficient operation of financial markets. Some of these, such as the IMF's Special Data Dissemination Standard (SDDS), are very close to the IMF's core activities. There is also a code of conduct on fiscal transparency, to ensure that the presentation of fiscal accounts facilitates analysis for both individual countries and cross-country comparisons—by emphasizing the consolidation of extra-budgetary accounts, for example.

Many of the standards important for capital markets are outside the IMF's core expertise. The Basel capital standard, which was developed by G-10 central banks, is now being revised. But many standards—including those for auditing, accounting, and bankruptcy—are generally outside the expertise of the official international community. In cases where working with the private sector is key, we have encouraged countries to adopt the standards of specific private sector organizations that have established standards, because the private sector has the expertise both to develop standards and to assess compliance with them.

But let me add to what Barry Eichengreen said about the difficulty of coming up with global standards in an area such as bankruptcy, where people have

both technical and political disagreements about appropriate standards. People have different technical judgments about the best way to organize a bankruptcy standard, for example. In the United States and some other jurisdictions, the Chapter 11 framework is believed to be the best way to go for an insolvent company, but bankruptcy professionals do not agree among themselves that this is the optimal way to arrange things. People also have political differences. When a bankrupt enterprise has many different unsecured creditors, most countries can agree that the government is at the top of the hierarchy and back taxes tend to get high priority. But who is second in line? France gives heavy weight to settling workers' claims for overdue wages, but workers are much further down the hierarchy in the United States. With such fundamentally different political judgments, you're never going to get agreement on a rigid international standard.

Now, in light of the number and complexity of the standards, clearly an effort must be made to take stock of individual countries' adherence to these standards. This is becoming a significant activity for the IMF. Because of the need to mobilize expert resources for assessments for various standards and the time taken to prepare each one, assessments are being prepared in a phased manner. The IMF has also begun a pilot program of Reports on the Observance of Standards and Codes (ROSCs), under which reports are prepared on a standard-by-standard, country-by-country basis, with the member initiating the process. The reports provide background information for policy discussions with our members and guide our technical assistance efforts. Using this modular approach means that we will never have a complete, up-to-date snapshot at any one time, but this does spread the assessment workload among IMF staff, national authorities, and other institutions.

Some countries that prepare a report on standards and codes do not want to have it published. I am not alone in thinking ROSCs should be published, but when some people in a country want an ROSC, but others are unwilling to have it published under any circumstances, the political compromise sometimes crafted is to have the ROSC done but not publish it. Sometimes when these issues are hotly contended it is worth moving forward anyway—making the information available in the official community, even if you can't get agreement on publication. Clearly, the system as a whole benefits if international standards are widely observed, but countries adopting standards should understand that their ability to borrow from international capital markets improves only if they adhere to standards in a transparent way.

Floor Discussion

Manuel Conthe, Chair

Manuel Conthe, commenting on Matthew Fisher's final remark, said it was his impression that it might be counterproductive to cast objectives in terms of externalities, interdependence, international standards, and public goods. We might be doing countries a disservice by undercutting their own case for undertaking reform. With the environment, for example, the typical public good would be global warming, and developing countries might well ask why they should restrict their emissions of carbon dioxide if doing so is going to benefit other countries. This is why China and other countries are so reluctant to embrace the Kyoto convention. And problems with health care and vaccines are generally taken seriously only when they entail systemic risks. So to the extent that AIDS is confined to Sub-Saharan Africa, 14 million Africans can die and industrial countries won't pay much attention.

Similarly, financial stability is considered a public good because a crisis erupting in one country may spread to others through contagion or collateral damage. There is also a prisoner's dilemma: To the extent that one jurisdiction becomes a tax haven for money launderers or tax evaders, it undercuts other countries' capacity to raise revenue. But if we are doing financial sector assessments, we should do them for both emerging and industrial economies because contagion works both ways. Yes, the crisis in Thailand in 1997 spread throughout the world. But the crisis in Europe in 1992 came after German unification in 1990 and after the Bundesbank raised interest rates. And it was not by chance that Mexico's first crisis (in 1982) took place a few years after Paul Volcker raised interest rates to combat the inflation created by Carter's economic policy, and that Mexico's second cri-

sis (in December 1994) took place eight months after the Federal Reserve raised interest rates again, for domestic reasons.

We should convince emerging economies to make their financial systems more resilient because it is in their own interest, because banking crises are extremely expensive, and because they create poverty and other sorts of fallout—and not to contribute to an abstract international public good of stability, which is an important but probably not the main reason for them to change.

Rohinton Medhora asked to what extent a currency bloc's lender-of-last-resort function could be financed. There are self-financed deposit insurance schemes and other ways of handling this function. He also asked if standards and transparency were really the way to go. It struck him that they were a necessary but not a sufficient condition to get where we wanted to go. If we had nothing but standards and transparency, how would we deal with the issue of countries deemed too big to fail? An earlier speaker had discussed the moral hazard of a country not doing something about infectious diseases within its borders because it knew that if it didn't, assistance might be forthcoming. This happens in finance, too. What would be the best-case scenario if indeed we applied wallpaper (such as standards and transparency) rather than changing the financial architecture?

Morris Goldstein agreed that the "too big to fail" problem was a serious one. The moral hazard was that if private creditors believed they would be bailed out when they made mistakes, they would not monitor carefully. Moral hazard might not explain the Asian crisis, which was probably the result of unbridled optimism, but an extensive explicit and implicit network of guarantees cushions the downside risk and affects lenders' and borrowers' behavior. An agreement seems to be emerging from ongoing discussions that the IMF will in the future lend at a higher interest rate and will require shorter repayment periods—more as a short-term lender of last resort to deal with liquidity crises. The IMF wants to avoid cases like the Philippines where a country is involved with the IMF for 20 years, with one loan after another.

Much less progress has been made with respect to the *reform of bank deposit insurance* and international rescue packages. Deposit insurance for banks may sound like an arcane subject, but bailouts of both small depositors and large uninsured creditors tend to happen more at the national level than the international level. And there is no system in place to limit bank deposit insurance in the right way.

As for *international rescue packages,* one of the principal recommendations in the report from the Council on Foreign Relations was to try to find a way to cut down the size of rescue packages when the crisis is clearly not systemic. The IMF's normal lending limits are 100 to 300 percent of quota. For crises during the last few years, the rescue was 500 to 700 percent of quota—and for Korea it was 1,900 percent of quota. We have to find a way

to reduce that size; otherwise, there's too much money bailing out short-term debtholders and defending overvalued fixed exchange rates. This area of the financial architecture is not well developed. Both the IMF and the U.S. Treasury want to preserve an area of discretion so that there will be enough money to restore confidence, among other things.

Barry Eichengreen said there was a real perception—certainly on Capitol Hill, at least—that the "too big to fail" problem was serious and affected the behavior of investors, in particular. It's not that governments follow riskier policies because they think they're going to be bailed out by the IMF. It's the perception that investors lend without regard for the risks of their actions because they're confident that they can get their money out of the crisis country, courtesy of an official rescue package. This interferes with the efficient operation of international capital markets and requires reform.

Matthew Fisher emphasized that standards and transparency are not synonymous. The argument for establishing standards for improving the supervision of financial institutions—or for strengthening corporate governance through new mechanisms for shareholders to verify that corporate managers are following sensible policies—is to improve institutional arrangements and financial markets, and thereby to make the world a safer financial place. Establishing standards is a broad way to bring that about, and goes well beyond improving transparency.

Fisher said it was useful to look at the "too big to fail" issue from the perspective of both the country and the creditor. What would you say if you were advising the minister of finance of a country that was too big to fail? Mexico in 1994–95 was apparently too big to fail and a vast bailout package protected the creditors, but then the country went into a recession and lost 7 percent of GDP. It may have been too big to fail in that it didn't default on its external debt, but that enormous domestic cost was worth avoiding, however the external creditors dealt with it. If 7 percent of GDP doesn't grab a minister's attention, Fisher didn't know what would.

As for creditors, if you hold long-term claims (such as long-term bonds or equities), it doesn't matter whether other investors are being bailed out. You can suffer enormous short-term losses in the secondary market value of your claims, and that really matters if you are judged weekly on your performance as a investment fund manager. If you have short-term claims, you may think that you are fleet of foot and can get out, but Korea's experience was that, in ill-defined circumstances, eventually the G-10 may be willing to lean on its banks and have a concerted rollover followed by a restructuring. In such circumstances, your original short-term claim may have been exchanged for a medium-term bond, and you may wonder whether the bond is going to be paid. Ecuador demonstrates that, in circumstances in which it is not possible to reach understandings on policies that warrant financial support from the IMF, the international community is willing to allow bond

defaults. Fisher agreed with Barry about the need for collective action clauses to facilitate that.

There is also some ambiguity about who is too big to fail. There was a widespread perception that Russia was too big to fail—maybe not financially but because it was too nuclear—but that didn't save it when August 1998 rolled around.

Barry Eichengreen said, in response to a question inaudible on the tape, that incentives could be provided to encourage investors to behave in ways that are both personally rational and collectively desirable. It may help to strengthen market discipline rather than substitute something for it, which is why we have touched on the importance of encouraging transparency. Transparency is supposed to make financial markets operate more efficiently, enhance market discipline, and allow efficient market-based solutions to these problems.

None of us touched on the nitty-gritty of how standard setting works. The International Accounting Standards Committee, the Private Sector Committee, the International Bar Association, and a host of other NGOs are deeply involved in the design, definition, and promulgation of these standards. The multilaterals are grappling with how (1) to best coordinate these efforts to identify desirable standards and encourage countries to work with NGOs to adopt them, and (2) to coordinate their own monitoring and sanctioning activities with those of the private sector—in this case, the financial markets. On the IMF's Web site, click on "Standards" to pull up a spreadsheet of what the NGOs are doing, what the IMF is doing, what the coordination effort is. It's worth studying as a good case study of how to organize private-public sector collaboration in the provision of global public goods generally.

Matthew Fisher wanted to make it clear that, although he saw some problems with standards, he strongly supported them and saw them as an area of real progress in improving the world's financial architecture. He also didn't want to exaggerate areas in which he saw ignorance and substantial cross-country differences. When you cut away from the jargon of the 25 principles in the international banking standard, for example, the standard is pretty basic, which is why they were able to get agreement on it. It says, basically, if you are granting a license to open a bank, don't give it to somebody who has no experience or who looks like a crook; try to have legitimate accounting standards, not loan classifications that don't mean anything; don't lend too much money to your family and relatives to run businesses; and if you set up a supervisory agency, make sure that it is fairly independent and has some money and legal authority. The standard allows a country a fair amount of scope as to whether the system is bank-dominated or securities-oriented.

He also thought there had been progress on participation. A good deal was now being handled in two groups, the G-7 and the G-20. The Group

of 20 includes the industrial countries, the larger emerging economies, and the Financial Stability Forum (dominated by industrial countries, although emerging economies now play a much bigger role). Much of the work had shifted out of the G-7, which is more exclusively larger industrial country groups, because the G-7 realized it wasn't going to get anywhere unless the countries whose behavior it wanted to change felt they were part of the process and felt some ownership of the issues. They also recognized that economic power is increasingly financial power. Although the United States clearly has the most influence, the days are passing when things can be decided exclusively by the largest countries.

Manuel Conthe, in closing, agreed about participation. The notion that one could dictate from Washington what standards to adopt and expect countries to jump was pure fantasy. To get buy-in, it was critical to have participation across a wide range of countries and NGOs and across different segments of society. The accounting profession has to buy in to the accounting standard and similarly with bankruptcy. His one concern about standards and transparency, to which he too was fully committed, was how markets would react to them. The fact is, all the information one needed to predict the Thai crisis was available publicly; the BIS had published it. An irrational exuberance led Thailand to think that it didn't really matter that the numbers were so large. Similarly, in current arguments about NASDAQ or the stock market, depending on what people think, you will hear either that the market is heavily overvalued and due for a crash or that we are in a new paradigm and the market is fully justified. Some even say the market is undervalued. People have different takes on numbers that are clearly out of line with what has been considered stable in the past. He didn't know how to resolve that problem.

Part VII

Implications for Financing Global Public Goods

Financing Global and International Public Goods

Todd Sandler

Some of the benefits from *global public goods* (GPGs)—resulting from efforts to curb global warming, to reduce emissions of ozone-depleting chlorofluorocarbons (CFCs), or to preserve earth's biodiversity, for example—disperse worldwide. Benefits from *international public goods* (IPGs) spill over national borders but not globally. Some IPGs are associated with activities involving, for example, health, security, culture, infrastructure, discovery, financial stability, foreign aid, the environment, and research and development. Most international organizations have recently come to recognize the growing importance to their missions of international public goods (IPGs). But how can the provision of such goods be financed? Should the world community rely on voluntary national efforts? Should it engineer a collective response? Or should it combine collective and voluntary national financing? The answers to these questions hinge partly on the nature of the public good and the extent to which its benefits are nonrival and nonexcludable. It may help to review some basic principles, financing possibilities for each of five basic kinds of GPGs (as defined by the nature of their benefits), and how some supranational structures finance their IPGs in practice.

Principles of taxation for financing public goods

When the voluntary or private provision of public goods is inadequate, the public sector may become involved with two related activities: providing public goods and redistributing income to satisfy ethical norms of fairness. How a public good is provided has clear distributional consequences; indeed, changing an income distribution may itself be a public good. Two principles of

taxation guide the national financing of public goods: the *benefit principle* and *ability to pay*.

Benefit principle

Under this principle, public goods are financed by recipients of the good's benefits, through their marginal willingness to pay (MWTP) or the value of their marginal benefit from consuming the good. If all consumers contribute their marginal willingness to pay, and if the sum collected equals the marginal cost of providing the public good, the optimal level of *pure public good* is provided, since social benefits match marginal social costs. If you can apply the benefit principle, you will get perfect efficiency, where people buy the public good up to the point where they don't want any more, and where marginal willingness to pay is equal to the price. But the benefit principle may be impractical for *pure* public goods, since benefits are nonrival and nonexcludable and agents will not willingly reveal their MWTP. In a public goods world, with incomplete information, people can strategize—can claim that a good is worth less to them than it is, or worth nothing whatsoever. The provider's failure to exclude nonpayers and to monitor use makes it exceedingly difficult to tie charges for pure public goods to the consumers' MWTP. If asked, consumers would be expected to understate their benefit to minimize their payment for a pure public good. Consumers can acquire a private good, on the other hand, only by paying its market price. Agents purchase a private good until their MWTP, which is captured by the demand curve, equals the good's price. The price for private goods provided competitively equals marginal cost, so individuals automatically satisfy the benefit principle through their purchases.

Ability-to-pay principle

Another way to finance a public good is to base the agents' financial burden for the good on their *ability to pay* (in terms of their income or wealth). Under an ability-to-pay scheme, you need not ascertain the agents' MWTP schedules. Forget about what kind of good they are getting or whether they are getting it: you just look at whether they can afford to pay for it. The relationship between ability to pay and assigned burdens is calculated according to one of two basic *notions of fairness:* horizontal equity or vertical equity. With *horizontal equity,* equals are treated as equals. People with the same income or wealth carry the same burdens for the public good. Under the U.S. tax system, the so-called marriage penalty is a clear violation of horizontal equity. With *vertical equity*, the burden for providing a public good rises with an agent's ability to pay, so agents who can afford to finance proportionately more of the public good through taxes or assigned assessments are expected to do so—on the principle (the diminishing marginal utility of income) that a dollar taken from a richer agent has less of an impact than a dollar taken from a poorer agent. Progressive income tax, where the rich are taxed a greater percentage

than the poor, is an example of vertical equity. So are dues to learned societies (to finance the shared public goods of journals and society infrastructure) that are graduated based on income. Some supranational structures also rely on vertical equity in ability-to-pay financing arrangements.

Financing possibilities for various kinds of public goods

Various taxonomies for public goods reflect the purposes and properties of the goods being studied. The five categories of global public goods shown in table 1 reflect the degrees to which the goods are pure public goods (nonrival and nonexcludable)—which sheds light on how the goods should be financed. A similar table could be constructed for each type of IPG (whose spillover range is not global). If the good's benefits are both nonrival and nonexcludable, the good is a pure public good. A good's benefits are nonrival when one agent's consumption or use of the good does not detract in the least from the consumption opportunities still available to other agents from the same unit of the good. Reducing emissions of CFCs, for example, helps stem depletion of the ozone layer, which benefits all nations. If the provider of a public good *cannot* keep an agent from receiving the good's benefits, its benefits are nonexcludable; the provider cannot keep a *nonpayer* from taking advantage of the good's benefit. This inability limits users' incentives to finance the good's provision. Nations engaged in reducing emissions of CFCs cannot deny other nations from benefiting from the result. Improving the protective ozone shield is a purely public global good. So are reducing emissions of greenhouse gases (to prevent global warming), limiting the spread of contagious diseases such as AIDS, and producing (and sharing) basic research findings.

Financing pure public goods

It is most difficult to get financing for pure public goods (table 1, row 1). In a best-case scenario, a leader nation derives enough benefits from a good to justify financing its provision even if it bears all the costs for doing so—as the United States does in underwriting of the Centers for Disease Control (CDC). Lacking such a leader nation, the global community must find an alternative. Currently, we have no international public finance system through which to collect taxes (on, say, internationally traded items) earmarked to finance global public goods. The alternative has to be some sort of collective action through a supranational structure such as the United Nations, with members charged according to some ability-to-pay measure.

Neutrality is a concern with pure public goods; you don't want collective provision or financing of public goods crowding out voluntary national provision. Efforts to augment national voluntary provision with collective provision of public goods *will fail if voluntary contributors are made to fund collective efforts.* If the collective provider gets its money from those who

Table 1. Financing Possibilities for Five Types of Global Public Goods

Type of public good	Examples	Financing possibilities	Remarks
Pure public	• Curbing global warming • Conducting basic research • Limiting spread of disease • Augmenting ozone shield	Must rely on global scheme based on either a benefit principle or an ability-to-pay charge. Financing coordinated by either a supra national organization or some international taxation arrangement. A leader nation might provide financing if it gets enough net benefits.	Neutrality is a concern: collective contributions may crowd out voluntary contributions. Partial cooperation brings free riding, so an enforcement mechanism is needed.
Impurely public with some rivalry but no exclusion	• Managing ocean fisheries • Controlling pests • Curbing organized crime • Alleviating acid rain	Must rely on a supranational organization or an international taxation arrangement. Rivalry may motivate more independent behavior than purely public goods do.	More private incentives to contribute. Rivalry lessens concerns.
Impurely public with some exclusion	• Missile defense system • Disaster relief aid • Extension services • Information dissemination	Exclusion promotes voluntary financing and clublike structures. An entrepreneurial or leader nation may come forward to market the goods.	Exclusion is not complete, so arrangements may remain suboptimal.
Club good	• Transnational parks • INTELSAT • Remote-sensing services • Canals, waterways	Charge each use according to the crowding that results and exclude nonpayers. Toll per use is equal to marginal crowding costs so as to internalize the congestion externality. Tolls paid on total visits reflect differences in tastes; nations pay more if they visit more often.	Can result in an efficient outcome. Limited transaction costs. Full financing depends on scale economies, the form of congestion functions, and other considerations.
Joint products	• Poverty alleviation • Tropical forests • Peacekeeping • Defense	As nation-specific private benefits and club good benefits become more prevalent among joint products, markets and club arrangements can be used to finance the good more efficiently. As the share of private benefits increases, payments can be increasingly based on benefits received.	Ratio of excludable to total benefits is the essential consideration. As ratio approaches unity, markets and clubs work perfectly.

Table 2. Financing Arrangements for Some Supranational Institutions

Institution	Description of institution	Financial arrangement
INTELSAT	An external communication satellite network with consortium of member countries and firms. Satellites positioned in geostationary space provide global communication.	Operates as a club with charges to members based on tolls, taking account of congestion. A member's total tolls reflect member's total utilization.
U.N. peacekeeping	Since 1975, countries have been assessed shares to support each operation. Voting privilege in the General Assembly can be suspended for nonpayers if assessments are too far in arrears.	Countries are categorized according to ability to pay (horizontal and vertical equity) and benefit principle (four categories). Considerations of vertical equity dominate (much more than in U.N. itself).
United Nations	The United Nations provides a host of global and international public goods through its regular membership fees and members' voluntary contributions.	Financing is based on ability to pay and U.N. status,with strong emphasis on vertical equity (but much less than for U.N. peacekeeping). Peacekeeping assessments more important than vertical equity. Voluntary contributions are small part of funding.
NATO	This successful, loose 50-year alliance, established in 1949, has grown from 12 allies to 19. Under Article 5, an attack on one ally will be viewed as an attack on all allies. NATO's mission, which has changed many times, now involves crisis management and nonproliferation of weapons of mass destruction.	Most of allies' defense spending is autonomous; only 0.5% is common spending to maintain infrastructure, NATO civil structure, and NATO military command. High proportion of nation-specific (excludable) benefits.
World Health Organization	The mission of the World Health Organization, which is part of the United Nations, is to maintain world health.	Based on regular U.N. budget assessments and thus ability to pay.
Environmental treaties	Agreements to curb various pollutants including chloroflurocarbons (CFCs), nitrogen oxides, sulfur, and greenhouse gases.	Montreal Protocol on CFCs relies on a multilateral fund, with contributions based on ability to pay. Most treaties depend on members financing their their own cutbacks, based on the benefit principle.

were voluntarily providing the good, they will cut back on their voluntary giving. This is no way to fix the problem, unless the collective-action institution can get around neutrality by going to noncontributors.

Partial cooperation is another problem. What do you do if some countries come on board to finance collective action but others do not? Noncooperators can partly or wholly offset the increased contributions by deliberately contributing less in response to cooperation-induced increases. An enforcement mechanism may be required, and then you have the problem of how to finance such a mechanism.

Financing impure public goods with some rivalry but no exclusion

Global public goods whose benefits are either partially nonrival or partially excludable (that is, excludable at a cost) are *impurely public* (see table 1). Impure public goods that display some rivalry, but produce nonexcludable benefits include ocean fisheries, in which property rights may be difficult to protect or are owned in common, but benefits have a strong element of rivalry. There is rivalry because more fishing by one party may limit the catch of others through crowding. Controlling pests, curbing organized crime, and alleviating acid rain are rival as efforts by one individual affect benefits available for others, but benefits such as an improved environment or a more secure society are nonexcludable. Without excludability, this class of goods may at times be difficult to finance through voluntary actions, so action is required either through a supranational organization or some kind of international tax arrangement. But rivalry limits neutrality and in some cases may provide private inducements to promote contributions. For example, if a nation's efforts to control sulfur emissions mainly curtail acid rain over its own territory, some voluntary action can be expected because of a spatial rivalry (that is, every ton of emissions dropped on it cannot fall elsewhere).

Financing impure public goods with some exclusion

The prognosis for financing is better for the other three types of global public goods, because benefits are either excludable or private and nation-specific. The provision of impure global public goods with some excludable benefits—for example, a missile defense system, disaster relief aid, extension services, and information dissemination—can be withheld from nonpayers (see table 1). Whether a country is protected by a missile defense system or receives extension services hinges on its willingness to pay for these benefits. Exclusion promotes voluntary financing and clublike structures where use can be monitored and the user can be charged a fee. Where exclusion is not complete, the results may remain suboptimal. It may be difficult to limit information dissemination, for example—to control whether one buyer can freely pass along the information it acquires to a nonpayer. And even with missile defenses, protection may not be denied to a nonpayer when collateral damage for the provider

results. (For example, a missile attack on Canada will harm U.S. interests given U.S. proximity to Canada, so that any U.S. missile system would have to aim at incoming missiles to Canada.) An ideal club arrangement charges a toll to internalize the crowding externality associated with rivalry, but this third type of global public good, for which there may be no rivalry, presents a problem. One nation's possession of information need not be rival for another nation if the information can be provided easily whenever needed.

Financing club goods

Club goods hold the most promise for self-financing without coercion or an elaborate structure. If exclusion costs are small enough to allow usage rates to be monitored and *toll* or user fees to be charged, the users can form a club and provide themselves with the shared good. Nonmembers are excluded from benefits and members pay a toll for each use or visit. The toll internalizes the crowding externality, and resources are directed to their most valued use. A member visits the club and pays the user fee only when its resulting gain is at least as great as the toll payable for each visit. Transnational parks—such as pristine rain forests worldwide and the Great Barrier Reef off the coast of Queensland, Australia—are one example of club goods. Even national parks qualify as transnational because of their international visitors. Toll schemes used for these parks finance land acquisition, park infrastructure, and park maintenance. INTELSAT, a private consortium of member nations and firms, operates as a club to share a communication satellite network in geo-stationary orbit that carries most international phone calls and television transmissions (see table 2). Data from remote-sensing satellites—such as LANDSAT for surveying—are sold to users in a clublike arrangement based on individual demands for surveys. Canals and waterways such as the Suez Canal and the St. Lawrence Seaway also permit exclusion and monitoring.

Clubs are clever in that the mechanism forces you to reveal the truth: If your tastes differ, members with a stronger preference for the club good will visit more often and pay more in total tolls, automatically revealing their preferences. With *club pricing, members are charged according to their marginal willingness to pay for benefits.* The proper functioning of clubs requires an inexpensive-to-operate exclusion device and crowding or rivalry in consumption that requires internalizing. If the club is not large enough to accommodate all nations, clubs can be replicated so every nation can find itself in the right size of club.[1] Clubs provide an institutional alternative to elaborate supranational structures or taxing authorities (to which nations who cherish their sovereignty are loathe to agree). Clubs are relatively simple structures that require little more than an exclusion mechanism and a tollbooth to economize on transaction costs. Using taxes to finance global public goods severs the link between who receives a good's benefits and who finances them, resulting in allocative inefficiency. Through toll charges, clubs maintain the connection between benefits and financing, be-

cause only members willing to pay the toll will use the facilities, and only to the point where willingness to pay equals the toll.

Will club devices fully finance themselves? That depends on congestion, production, and competition. It depends on the form of the crowding function—whether the crowding function is homogeneous of degree zero in provision and utilization, so that a doubling of use and facility size leaves crowding unchanged. It depends on whether competitive conditions prevail and whether production of the club good is *not under increasing returns to scale.* The intricacies of self-financing have yet to be analyzed.

Financing joint products

The fifth category (table 1, bottom row) consists of joint products, for which activities yield two or more outputs that may vary in degree of publicness. Joint products may be purely public, impurely public, or private. When nation-specific private benefits and club good benefits become more prevalent in joint products, market and club arrangements can be applied to finance the activity. If benefits are only nation-specific, the recipient nation has a clear incentive to reveal its maximum willingness to pay through payments for the good. Nation-specific benefits, which may be private among nations but public within the recipient nation, serve a privatizing influence, not unlike the establishment of property rights. Now suppose a public activity produces both a nation-specific private benefit and a pure global public good benefit. If jointly produced outputs are complementary, so that nations desire to consume them together, then markets can sell the activity as a benefit package, using proceeds from the private good component to finance the joint activity. If club outputs are prevalent, tolls can be charged. What determines the financing of joint products is the *ratio of excludable (nation-specific and club) benefits to total benefits.* As this ratio approaches unity, so that all benefits are excludable, markets and clubs can be used to finance the activity without elaborate and costly supranational structures. The closer the ratio is to unity, the more relevant is the benefit principle of financing.

Poverty alleviation, tropical forests, peacekeeping, and defense are examples of global joint-product public goods. Poverty reduction in the form of foreign aid can provide donor-specific benefits, if the aid is tied or conditional, and any poverty this aid relieves yields a global public good to all richer countries concerned about the well-being of those less fortunate. Preservation of the rain forests generates the purely public global benefits of carbon sequestration and preservation of biodiversity as well as such local and regional benefits as erosion control and local effects on climate, watersheds, and sites for ecotourism—which should help motivate local and regional preservation efforts. Peacekeeping provides nation-specific benefits as well as greater global political security and reduced human suffering. Nations near areas of conflict may be affected by migration and other

collateral effects. Defense among allies provides pure public benefits (deterring an attack) and nation-specific benefits (curbing domestic terrorism or maintaining colonial control).

Other factors to consider

The following are some other factors that may need to be considered in the financing of particular global public goods.

- To what extent does a benefit exhibit spatial spillovers? To what extent is there subsidiarity, in which the decisionmaking group's jurisdiction matches the region of spillovers. Subsidiarity—which promotes efficient allocations and limits transaction costs—is an important principle for promoting the provision of international public goods involving health, foreign aid, peacekeeping (security), and environmental concerns.
- Within the class of pure public goods, goods may be further categorized according to how contributions add to the total—the so-called aggregation technology (for example, weakest-link, best-shot, summation, weighted sum). The various alternatives can influence agents' incentives to contribute toward financing the IPG. With best-shot technologies, for example, a leader nation must emerge; with weakest-link technologies, all contributors must match one another's contributions.
- Sometimes there will be enough demand for an international public good that a rich country will provide it for poor countries—especially for weakest-link public goods, where the smallest contribution determines the level of the good for all nations. Other considerations include comparative advantage and the underlying technology of aggregation.

Note

1. Clubs involve at least two allocative choices (which must be made simultaneously): level of provision and size of membership. The choice of the toll fixes the membership size (Sandler and Tschirhart 1997).

References

Bruce, Neil. 1998. *Public Finance and the American Economy.* Reading, MA: Addison-Wesley.

Buchholz, Wolfgang, Christian Haslbeck, and Todd Sandler. 1998. "When Does Partial Cooperation Pay?" *Finanzarchiv* 55(1): 1–20.

Cornes, Richard, and Todd Sandler. 1996. *The Theory of Externalities, Public Goods, and Club Goods,* 2nd ed. Cambridge, U.K.: Cambridge University Press.

DeSerpa, Allan C. 1978. "Congestion, Pollution, and Impure Public Goods." *Public Finance* 33(1–2): 68–83.

Heckathorn, Douglas D. 1989. "Collective Action and the Second-Order Free-Rider Problem." *Rationality and Society* 1(1): 78–100.

Kanbur, Ravi, and Todd Sandler with Kevin Morrison. 1999. *The Future of Development Assistance: Common Pools and International Public Goods.* Overseas Development Council Policy Essay no. 25. Washington, D.C.

Kaul, Inge, Isabelle Grunberg, and Marc A. Stern, eds. 1999. *Global Public Goods: International Cooperation in the 21st Century*. Washington, D.C.: Overseas Development Council.

Murdoch, James C., Todd Sandler, and Keith Sargent. 1997. "A Tale of Two Collectives: Sulphur versus Nitrogen Oxides Emission Reduction in Europe." *Economica* 64(2): 281–301.

Oakland, William. 1972. "Congestion, Public Goods and Welfare." *Journal of Public Economics* 1(3–4): 339–57.

Sandler, Todd. 1999. "Intergenerational Public Goods: Strategies, Efficiency, and Institutions." In Inge Kaul, Isabelle Grunberg, and Marc A. Stern, eds., *Global Public Goods: International Cooperation in the 21st Century*. New York: Oxford University Press.

———. 1998. "Global and Regional Public Goods: A Prognosis for Collective Action." *Fiscal Studies* 19(3): 221–47.

———. 1997. *Global Challenges: An Approach to Environmental, Political, and Economic Problems.* Cambridge, U.K.: Cambridge University Press.

———. 1977. "Impurity of Defense: An Application to the Economics of Alliances." *KYKLOS* 30(3): 443–60.

Sandler, Todd, and John T. Tschirhart. 1997. "Club Theory: Thirty Years Later." *Public Choice* 93(3–4): 335–55.

Warr, Peter G. 1983. "The Private Provision of a Public Good Is Independent of the Distribution of Income." *Economics Letters* 13(2): 207–11.

Financing Global Public Goods

Scott Barrett

How do we know if an international treaty such as the Helsinki Protocol is good or not? How do we know if it delivers anything? To understand the problems associated with financing global public goods, it helps to develop a structured imagination and to think about these issues in the abstract.

Why transnational public goods are special

Transnational public goods differ from local or intranational public goods in one crucial respect: There is no world government with the means and authority to supply public goods directly (after taxing the global citizenry) or indirectly (by enforcing an agreement among countries to supply public goods). Transnational public goods must instead be supplied by the anarchic, horizontal system of international governance. This makes all the difference.

A key problem with supplying public goods of any kind is in determining the value that people place on these goods. If you don't know this value, you won't know how much of the public good to supply. You can ask people how much they would be willing to pay for a good but this approach is vulnerable to strategic manipulation.

With international public goods, there is an additional problem. Even if you knew the social value of the public good, it may be impossible to get the good supplied because of the incentives to free-ride. Overcoming this handicap is the greatest challenge to the supply of international public goods.

Recent research has shown that local free-riding is often less severe than the theory of collective action assumes, raising the hope that the same might be true at the international level. Ostrom (1990), for example, has shown

that local communities are sometimes able to overcome or short-circuit free-rider incentives in managing common property resources. But the circumstances crucial to this success are different at the international level.

First, the local community must be able to deter entry by outsiders, but for international supply problems, deterrence of this kind is infeasible by definition (when a transnational public good is supplied by one state, other countries cannot be excluded from benefiting). Second, although these studies show that common property resources can be effectively managed without the strong, visible hand of government intervention, the central government may still play an important, if subtle, indirect role. The central government legally circumscribes the activities of organizations such as cooperatives (through antitrust laws, for example); it assigns property rights, even if to communities rather than individuals; and it can always intervene if local community management fails. This last observation is more important than first appearances might suggest. Game theory has taught us that a player need only have the *potential* to act to dramatically affect the outcomes that can be supported as equilibria (which is why the theory of deterrence is deeply profound). In a word, the main challenge in providing transnational public goods is sovereignty.

Some public goods are a bigger problem for supply than others

Imagine a situation in which the supply of a public good—say, protection of the ozone layer—is determined by the collective effort. The amount of protection available to every country depends on the sum of the protection levels undertaken by all countries. For simplicity, assume that supply at the state level is binary: The good is either supplied or it isn't; ozone-destroying chemicals are either prohibited or they are not. What happens in this situation depends very much on local benefits and local costs of provision. If the benefit to country A of A's own supply exceeds the cost of supply, plainly, country A has every incentive to supply the good unilaterally. If the same is true for every country, a first best outcome will be supported and provision will not be a problem. This situation roughly characterized some countries' protection of the ozone layer in a preliminary stage of the international cooperation effort (as argued in Barrett 1990). But suppose the benefit to *all* countries of country A's supply is less than the cost of supply. If this were true for every country, global welfare would be maximized if no country supplied the good. We may be better off doing without some public goods. Just because a good is public, doesn't mean that it should be supplied.

Of course, the situation we are mainly interested in is the one that falls in between these two extremes: one in which the benefit to *all* countries of having country A supply the good exceeds A's cost, but one in which the benefit to A falls short of A's cost. This is a prisoner's dilemma.

The supply of public goods needn't have this aggregation characteristic; there are still other variations (see, for example, Sandler 1997). The point is that some public goods present more challenges than others. Some transnational public goods will be provided even if countries don't cooperate. Some shouldn't be provided even if cooperation is easy to sustain. I focus on the prisoner's dilemma because it poses the greatest challenge to the international system.

Some features of the prisoner's dilemma are more important than others. For example, playing Defect is a dominant strategy of this classic game—by which I mean that it is in every player's interests to play Defect, no matter what the other players do. This situation is unusual. More often, what one player wants to do will depend on what the others do. It is easy to modify the game to eliminate dominant strategies, and it is easy to let provision be a continuous variable. The essential feature of the one-shot prisoner's dilemma is that the full cooperative outcome—the outcome that maximizes the aggregate payoff—cannot be supported as an equilibrium. And the outcome that is supported as an equilibrium is inefficient. The problem of international cooperation is how to improve on the equilibrium that would result if countries adopted only unilateral policies. Ideally, cooperation will sustain the full cooperative outcome, but this may not always be possible.

Overcoming the prisoners' dilemma

In the equilibrium of the one-shot prisoners' dilemma, every player fails to cooperate. If the game were repeated indefinitely, however, and if every player were patient enough, the players' failure to supply the public good might still be an equilibrium, but so would every other feasible outcome, including full provision. The theory of repeated games begs the question of whether the supply of transnational public goods really is a problem. I have argued elsewhere, however, that the notion of an equilibrium that underlies the folk theorems is ill suited to problems of international cooperation (Barrett 1994). The provision of transnational public goods is a cooperative effort. Individual rationality is crucial to an equilibrium because of sovereignty (countries are free to participate or not, as they please), but collective rationality is also important. If a country chooses not to participate, the other countries will consider their situation collectively, not just individually. In particular, they will punish the deviant state only if doing so makes them better off, collectively and not just individually.

Collective rationality gives precision to our predictions about cooperation. Under certain plausible assumptions, it yields a unique equilibrium. It also limits cooperation. The success of international agreements depends especially on the nature of the problem: the number of players and the players' payoffs (both functional specification and parameter values). Cooperation

is much easier when the public good is regional. All else being equal, global public goods are the hardest to supply. To deter any country from failing to supply the public good, the other countries must threaten to punish a deviant for failing to supply it. But when they punish a deviant by reducing *their* provision of the public good, the other countries harm themselves—which, from the collective perspective, makes the threat to punish incredible. The more countries involved, the greater the collective cost of enforcement—and the less credible the threat to enforce.

This approach provides a sharp prediction. If we weaken the rationality assumption a little, we lose some of this sharpness, but we gain something else. It becomes possible for countries to negotiate different kinds of treaties. In particular, they might negotiate a "narrow but deep" treaty—an agreement in which every signatory supplies a lot of the public good but in which participation is thereby limited. Or they might negotiate a "broad but shallow" treaty—in which every country participates but each signatory supplies only a small quantity of the public good. Sovereignty implies that it may not be possible to sustain a first best outcome every time, especially with global public goods, so we should think about what is *possible* rather than what is ideal.

Financing as redistribution

What role do financial transfers play in the supply of transnational public goods? It is best to think of this question from two perspectives: financing as a means of redistribution and financing as a strategic device.

Consider, first, financing as redistribution. If countries are asymmetric, financial transfers may be needed to ensure that every country benefits from participating in a treaty (compared with the alternative: having no treaty at all). Mäler (1989), for example, has shown that the full cooperative outcome for the European acid rain game would make the United Kingdom worse off than the noncooperative outcome. To get the United Kingdom to join, the countries that benefit the most from acid rain controls would have to compensate the United Kingdom. for the costs of undertaking extensive abatement.

But things are not so simple; it is not obvious that the noncooperative outcome is the most compelling alternative to full cooperation. The noncooperative outcome assumes that the United Kingdom has the legal right to pollute as it pleases, but international law says states also have a responsibility not to harm others. Unfortunately, customary law does not clearly allocate rights. It tells us that the United Kingdom can't pollute as it pleases but it doesn't tell us how much the United Kingdom can pollute. This is something that must be negotiated. This world is very different from what Coase (1960) imagined and cannot be relied upon to yield an efficient outcome. In a negotiation in which a third party (a central government, in Coase's article) cannot

assign rights, the downwind countries (which are eager for a quick resolution) are at a disadvantage. But the upwind countries benefit from delay.

Actually, in the acid rain example, side payments have never been paid, at least not between Western European countries. So the system of treaties governing long-range air pollution in Europe have probably improved little on the noncooperative outcome.[1] But side payments *have* been paid in some cases—an important example in Western Europe being the Rhine Chlorides Agreement, in which countries both upstream and downstream paid France to reduce salt emissions at a potash mine. This agreement has hardly been a great success. It took a long time to negotiate, the emission reductions were delayed, a less effective control technology was eventually adopted, and economic circumstances eventually favored closure of the mine anyway. In both the acid rain and Rhine agreements, negotiations seemed only to steer countries from a situation in which nothing was done to one supporting noncooperation only. Part of the problem was that it isn't enough for financial transfers to make every country better off than they would be under no agreement. Instead, every country must be better off being a signatory than being a nonsignatory. If one country chooses not to participate, the alternative isn't noncooperation, but partial cooperation. This matters. Side payments of the kind discussed above do not materially promote cooperation because they do not alter the free-rider problem. Money transfers are a zero-sum game: For every signatory that gains, at least one other signatory must lose, and since participation in a treaty is voluntary (this being the most important expression of sovereignty), the loser can withdraw or not sign the agreement in the first place. Every time you pay someone to come in, you increase the incentive for someone else (who is making the payment) to leave, so all you are doing is rearranging who's there. You aren't actually achieving anything.

Financing as strategy

Can financial transfers help sustain cooperation? Carraro and Siniscalco (1993) show that they can under some circumstances. Suppose that signatories to a treaty can commit to being signatories and have an incentive to pay other countries to join, to increase provision of the public good. The problem is, countries cannot commit to being signatories. International law allows countries to participate (or not) in international agreements, as they please, but every treaty that I've seen has a provision allowing withdrawal from the treaty (typically, with advance notice). Carraro and Siniscalco assume in their model that countries are symmetric, but countries are highly asymmetric. In the Rhine Chlorides Agreement, for example, it was cost-effective to reduce emissions at one location (France). The problem was how to share the total cost. The cost-sharing formula for this treaty recognized that France, Germany, and

Switzerland were upstream of the pollution, and only the Netherlands was downstream—and suffering from the pollution. The Dutch took a lot of action at home to end the pollution; the upstream states prevaricated and delayed. Ultimately an agreement was reached but it seems to have had little effect. The potash mine was eventually closed for reasons having nothing to do with the treaty that was negotiated.

If countries are strongly asymmetric, financial transfers can sustain more cooperation (Barrett 2000a), especially when some (low-benefit) countries would never be better off supplying a public good, either on their own or as part of a collective effort. But I suppose also that some high-benefit countries would cooperate, fully or partially, and would also be willing to pay the low-benefit countries to supply the public good. And the low-benefit countries would be willing to supply the good, if compensated enough. Strong asymmetry allows the rules of the game to be rewritten. The cooperation problem changes from one in which the high-benefit countries cooperate to provide the public good directly to one in which the high-benefit countries cooperate to pay the low-benefit countries to supply the public good. In equilibrium, the number of high-benefit signatories increases, and every low-benefit country also joins, in contrast with the game without financial transfers. The number of high-benefit signatories increases because contributing to the public good fund essentially ratchets up the cooperation problem. The high-benefit countries make a take-it-or-leave-it offer to the low-benefit countries, each such country getting the minimum payment needed to make its accession individually rational. This offer is always accepted.

Side payments alone do not assist cooperation; they only change the identities of the signatories. But strong asymmetry means the low-benefit countries are committed to being nonsignatories to an agreement not offering side payments. This commitment is different from the kind assumed by Carraro and Sinsicalco. The low-benefit countries do not *choose* to be committed to not signing; they simply *are* committed. Schelling (1960) has emphasized the significance of this distinction. This model helps understand perhaps the most important example of financing a global public good: the financial mechanism of the Montreal Protocol. In this model, the Montreal Fund emerges as an equilibrium. The "rich" countries offer the "poor" a transfer equal to the incremental costs of their compliance, an offer that every "poor" country accepts. It may seem unfair that the "rich" should compensate only for incremental costs, which should worry us for more than moral reasons. Experiments with the ultimatum game show that people often reject this kind of offer. However, the Montreal model explains that the reason for the asymmetry in bargaining is that the "rich" countries cooperate in supplying the public good whereas the "poor" do not cooperate in denying the rich access to their potentially providing it. At the same time, the bargaining game played here is not the same as the ultimatum game. The equilibrium of the side payments

game is "fair" provided every low-benefit country receives some positive benefit from the public good, because the offer of side payments creates a wedge between the marginal and total benefit of accession. Each low-benefit country is indifferent about joining or not joining, taking as given the choices made by all the other low-benefit countries. But each low-benefit country gains in net terms because every low-benefit country accepts the offer. Indeed, in the example, the offer of side payments actually improves the welfare of the low-benefit countries more than that of the high-benefit countries. What happens here is that the gain gets ratcheted up and the cooperation problem becomes how the rich countries can cooperate to put money into a pot to pay the poor countries to join the treaty to provide the public good.

Conclusion: Negotiators and development officials should think strategically

Although side payments emerge as an equilibrium in the game just studied, we get to this situation only after recognizing that strong asymmetry can change the rules of the game. There is nothing inevitable about this equilibrium. To get to it, the players have to be clever enough to see that side payments could be used to exploit this situation. On their own, side payments make little difference, but if the players recognize that the low-benefit countries are essentially committed to remaining outside the agreement, then strategy can transform the game. Here side payments are simply a means to an end. The lesson is not that you should use side payments when there is asymmetry. The lesson is that you should think how the game can be restructured to support greater cooperation. The usual view is that treaty negotiators need to find some kind of formula acceptable to enough countries. The view expressed here is different: Negotiators need to think strategically about how they can restructure their game.

The same is true of development officials, who are conditioned to thinking of development policy in a vertical, top-down way. In the international arena, we don't have that kind of authority. For global public goods, we need to think more horizontally. We need to see that a game is being played, and that by putting ourselves in the shoes of all the players, we can imagine how they will respond to different structures. The focus should be more on institution building than on policy.

This is one great feature of the Montreal Protocol but not the only one. Because then you have to ask the question, "How is this treaty being supported? How do you deter free riding within this agreement? What's so special about that?" The mechanism used to reduce free riding is the trade sanction or the threat to restrict trade with nonparties—with noncooperators. Under this treaty, the parties are not allowed to trade with nonparties, products that might have been made using CFCs.

Game Theory and the Provision of Global Public Goods

To understand what makes global public goods a special problem, consider the following card game. Suppose I give each of you two cards, one red and one black. The payoff you get depends on how many red cards are handed to me. I ask you to hand one card back, without anyone else knowing which card is handed back. If you keep your red card, you get $5; you also get $1 for every red card anyone hands in. There are about 50 people in the room. If no one hands in a red card (noncooperation), each of us gets $5. If everyone hands in the red card (full cooperation), we each get $50. That's the basic problem, but suppose we change the numbers. Suppose you get $10 for every red card handed in, and only $5 if you keep your red card. You are all probably going to hand in your red card because it's in your own personal interest to do that. Todd Sandler pointed out that a leader might provide the public good on his own; but if the numbers fall right you can have everyone provide the public good.

Here's another example: If we each get 5 cents for every red card handed in, collectively we are better off if no one hands their red card in. We're actually better off if the public good is not provided. Our concern should really be with the $5/$1 story, where we are all better off if everyone hands in their red card but where none of us does so. Of course, there will often be some people who will hand in their red card regardless. In the international arena, we identify the Swedes with taking this kind of stance. If we were all Swedish, there might not be a global public goods problem. The reality is that the vast majority of countries are more interested in their own national interests than the common good. So: How do we get around this problem?

Let's play a slightly different game of cards. Suppose we talk about this problem and decide collectively that we'd be better off if we all hand in our red cards. Suppose further that, after having this discussion, 49 of us do as we promised and only one (non-Swede) doesn't. The rest of us are hurt, so what do we do? We each lose a dollar, so the group as a whole loses $49 because one person didn't cooperate. What kind of punishment can we use to deter that behavior? The way I've set this game up, the only thing we can do is not to hand in our red cards. Suppose we say to the deviant, "If you don't hand in your red card, we won't hand in ours." This threat might work if the deviant believed that you would behave in this way. The problem is that the threat is not credible. We hurt *ourselves* by not handing our red cards, not just the one person who refuses to cooperate. Even though we're upset, we can do no better than to cooperate, given that one player has decided not to cooperate. If two people refused to turn in their red cards, we have exactly the same problem. The 48 of us who cooperate cannot make the threat to punish the two deviants credible. Continuing this way, I think you will see that punishing noncooperation is only credible if the group of cooperating players is small enough. But that means that cooperative treaties will typically be incomplete. Some countries will be in and some will be out.

There is still another way to look at the problem. I could have given everyone lots of red cards, representing almost a continuum of choices about supplying the public good, rather than a binary (yes or no) choice. We might then have an agreement in which we're all in but we all keep a few red cards in our pockets. That agreement is in many ways a better characterization of the way the world works. We actually agree to do something but we may not achieve as much as we'd like to.

How do the financial payments come into this? Sticking with the card game, suppose that six of us reach some kind of agreement, and we ask ourselves, should we bring someone else in? Each of us puts up a little money—say, 75 cents each—so we have enough money to bribe someone else to accept the agreement. Everyone is better off, the new party because she gets 75 cents, and the six original cooperating players because we each gain $1 by having an extra country join. This is where side payments can seem to help—until you think hard about it. Because once you've set up the agreement to offer side payments, there's an incentive for one of the original six cooperating players to pull out. Remember, under the rules of international law, you can withdraw from a treaty or anticipate in advance that this might happen. The problem with side payments, in the Rhine case and in every international agreement I've seen that includes side payments or transfers, is that the countries are different: you are not all getting the same number of red cards, or a red card is worth something different to you than to someone else, or the value to you of handing in a red card is different from the value to someone else of handing in a red card. That, too, is the world in which we live. Side payments may be necessary to bring another player into the agreement, but transfers are a zero-sum game. Every time someone else gains, I lose, if I'm making the payment. And every time you pay someone to come in, you increase the incentive for someone else (who is making the payment) to leave. You are rearranging who's there, but you're not really achieving anything.

The Montreal Protocol shows how we can do better. It is a great exception to this otherwise fairly sad story. In the Montreal Protocol, as Todd mentioned, the rich countries pay the poor to join the treaty, and the poor countries are no worse off for being in than they would be being out. Whether that's equitable is another story, which we can return to if we have time. What's going on here? This is a public goods game *par excellence,* but it is different from the ones we have looked at before. In 1987, the assumption was that it was not in the interests of the poor countries to do anything (or very much) about the ozone problem; this was something the rich countries would gain most from participating in, for lots of reasons—skin color, geographic location, not to mention income, and so on. Montreal recognized that the poor countries were, in a sense, committed to being outside an agreement that didn't offer to pay them anything. They're committed not because they've chosen to be committed, but because it literally isn't in their interests to join the

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Game Theory and the Provision of Global Public Goods (continued)

treaty, unless they're paid to do so. That distinction is fundamental. What happens then is that the game gets changed—it gets ratcheted up. And the cooperation problem is no longer how all of the rich countries can reduce their emissions to supply the public good, but how the rich countries can cooperate to put money into a pot to pay the poor countries to join the treaty to provide the public good. With the vaccine story we heard yesterday, there was a pot of money and the question was how to make credible the promise to pay the pharmaceutical company that develops the vaccine. With the Montreal Protocol, you get the credibility from the fact that the poor countries really are better off staying outside. You transform the game by exploiting this asymmetry.

Side payments allow you to take advantage of the situation but they don't do the job for you. They are a strategic device you use to transform the structure of the relationship between the parties. This is one great feature of the Montreal Protocol but not the only one. Because then you have to ask the question, "How is this treaty being supported? How do you deter free riding within this agreement? What's so special about that?" The mechanism used to reduce free riding is the trade sanction or the threat to restrict trade with nonparties—with noncooperators. Under this treaty, the parties are not allowed to trade with nonparties, products that might have been made using CFCs.

How does this work as a game? Suppose the treaty you have negotiated and drafted says you have to hand in your red card and there will be a trade restriction with nonparties. Two of you want to hand in your red cards but the rest of you don't. If you join, you lose twice: once because only two of you are handing in your red card, so you each gain only $2, whereas otherwise you would have each had $5; and on top of that you can't trade with the other 48 people in the room. So you definitely do not want to join. But suppose instead that 49 of us are cooperating, and you're the last person, and you're trying to figure out whether to cooperate or not. If you don't cooperate, and free-ride as before, you gain $4—but now you can't trade with the rest of the room. If the loss or gain from trade is greater than $4, you're going to join. Provided you have enough players in the treaty to reach a tipping point, everyone will want to come in. Adding the device of the trade restriction transforms the cooperation game into a coordination game. Once you identify and reach a minimum participation threshold, everyone wants to be in. And virtually every country has joined the Montreal Protocol—the only nonparties being countries like Iraq and Rwanda, countries that either are pariahs or that have ineffective domestic governments. Everyone else is doing as much as they can to provide the public good. And what's holding the whole thing together, I think, is the threat of trade restrictions. If the threat is credible, the restrictions don't need to be imposed. The combination of the two strategic mechanisms—the carrot (the side payments) and the stick (the credible threat of trade restrictions)—makes everything work. The lesson this holds for people in the development community is to think strategically to get agreement on providing global public goods.

Note

1. See, for example, Murdoch, Sandler, and Sargent (1997).

References

Barrett, S. 2000a (forthcoming). "International Cooperation for Sale." *European Economic Review*.

———. 2000b. "Consensus Treaties." Paul H. Nitze School of Advanced International Studies. Johns Hopkins University, Washington, D.C.

———. 1999. "A Theory of Full International Cooperation." *Journal of Theoretical Politics* 11(4): 519–41.

———. 1994. "Self-Enforcing International Environmental Agreements." *Oxford Economic Paper* 46: 878–94.

———. 1990. "The Problem of Global Environmental Protection." *Oxford Review of Economic Policy* 6: 68–79.

Carraro, C., and D. Siniscalco. 1993. "Strategies for the International Protection of the Environment." *Journal of Public Economics* 52: 309–28.

Coase, R. H. 1960. "The Problem of Social Cost." *Journal of Law and Economics* 3: 1–44.

Mäler, K.G. 1989. "The Acid Rain Game." In H. Folmer and E. van Ierland, eds., *Valuation Methods and Policy Making in Environmental Economics.* Amsterdam: Elsevier.

Murdoch, J. D., T. Sandler, and K. Sargent. 1997. "A Tale of Two Collectives: Sulphur versus Nitrogen Oxides Emission Reduction in Europe." *Economica* 64: 281–301.

Ostrom, E. 1998. "A Behavioral Approach to the Rational Choice Theory of Collective Action." Presidential Address. American Political Science Association. 1997. *American Political Science Review* 92: 1-22.

———. 1990. *Governing the Commons.* Cambridge, U.K.: Cambridge University Press.

Sandler, T. 1997. *Global Challenges: An Approach to Environmental, Political, and Economic Problems.* Cambridge, U.K.: Cambridge University Press.

Schelling, T. C. 1960. *The Strategy of Conflict.* Cambridge, MA.: Harvard University Press.

Global Public Goods and Official Development Assistance

Karel van Kesteren

These days have been enormously informative. We are on a steep learning curve, especially with things that have gone awfully wrong. As a humble civil servant and practitioner of international business, I am going to look at this subject from a practical perspective: what works, what doesn't, how we can make institutions work better, and how we can raise more money for things that should be done.

International taxation or national contributions?

Using international taxation to finance international public goods is not a real issue; you could ask countries for a national contribution instead. The reason is that obtaining national governments' political commitment to foregoing part of their potential income and channeling it to the international level amounts to the same thing. It's a national contribution, even if it's called international taxation. What we want is not a certain source of income, but enough money in predictable flows. The question is, how best to get this?

Pure aid or international public goods?

More basic is international public goods' relevance to daily decisionmaking about funding for international actions. Yesterday Inge Kaul told us that international public goods should be financed by specialized ministries if goods were largely in a country's own interests—in contrast with pure aid, including humanitarian aid, which should be financed out of aid budgets. It seems a useful distinction on the face of it, but many arguments for "pure aid" over-

lap with arguments about international public goods. For example, the eradication of mass poverty is often described as an international public good because it addresses the causes of a lot of trouble, the consequences of which are felt also in developed countries. So I don't see that the distinction really brings us forward. Another paper sees international public goods as more in the technical area of specialized ministries. In practical terms, that's merely confusing and doesn't take the notion forward.

Richard Gardner, in "Nickel and Diming Foreign Policy" (*Foreign Affairs*, July/August 2000), argues for increasing the U.S. foreign aid budget with arguments similar to our arguments here about international public goods. He says the presidential candidates should argue (with Congress) that national security requires more international action because it's more efficient and effective than doing it within U.S. boundaries or not spending money on it at all. So once again, aid and national interests are seen as closely interlinked, it is difficult if not impossible to draw the line between the two.

Nevertheless, I see merit to Inge Kaul's proposal to distinguish, within aid budgets, between spending on international public goods and aid in the narrow sense of the word (the most concrete example being food and blankets handed out to refugees). It might be informative to have a closer look at what, in our international affairs budgets, goes to international public goods and what goes to aid. We might conclude that we should shift the balance a bit, but I see no immediate relevance for the daily practice of foreign aid.

Official development assistance or international public goods?

Official development assistance (ODA), which is more important in Europe than in the United States, has not been mentioned much here. As defined by the Organisation for International Co-operation and Deveopment (OECD), ODA is basically a unilateral transfer (for which you get nothing in return) of concessional resources from rich countries to poor countries for the poor countries' social and economic advancement. In the Netherlands, for example, we have a budget for ODA from which we can finance only things that are official development assistance by OECD standards. Our foreign affairs budget is 1.1 percent of gross national product, of which 0.8 percent goes for official development assistance and 0.3 percent for such purposes as assistance to Central European countries that do not officially qualify as ODA by OECD standards. If you feed the notion of international public goods into the notion of ODA, you have two options. On the one hand, you could say that with an international public good, we have a self-interest and so it is not pure aid any more—it is no longer transfers from which you get nothing in return—so it should not be financed out of ODA. In this case, many useful things, such as research on tropical diseases, will no longer

be financed because national budgets have no provision for non-ODA financing. On the other hand, you could say, "Why not finance something for developing countries even if benefits accrue to yourself?" But when you say that explicitly, you open the door to financing all kinds of other stuff in your own interests out of ODA budgets, so that in the end nothing is left for pure aid. Either option leads you down a dead-end road, which is why we should be careful in the Northern European context about introducing the notion of international public goods into discussions about aid.

There is another danger as well. Once you decide that it might be more effective to provide a public good such as research on tropical diseases in your own country, institutions will immediately line up at the aid ministry door and say, "That's me. Please give me the money." You open yourself up to powerful pressure groups, and the flow of resources to developing countries will diminish. So I suggest we back away from the public goods discussion and, as practitioners of international affairs, ask simply, "What should be done that isn't being done about such issues as air pollution, ozone depletion, and destruction of the environment? What incentives can we create that will make good things happen and bad things stop? What can we do about free riding?"

The basic problem is that right now we have no central world institution to manage the financing of such activities. Eventually I think such an institution will come into being. We developed a supranational government in Europe; 40 percent of all Dutch laws now stem from Brussels. Globally, an international criminal court will come into being, which was unimaginable 40 years ago and is at odds with traditional notions of national sovereignty. Publishing lists of money launderers is only a step away from sanctions to bring them into line. So supranational authority is growing and will continue doing so. But at this moment, globally we rely on the existing multilateral system, which doesn't function as it should because, some people say, there is a disconnect between international institutions and international realities.

I think the option of network alliances which Wolfgang Reinicke discussed yesterday is useful, because you draw into the international system developed in 1945 new stakeholders from the private sector and civil society. These may be, in their respective home countries, a voice pushing their governments to put up money for whatever cause they are working for, be it vaccines or something else. So, by expanding this concept of networks, we could among other things increase pressure within states to come up with additional money for internationally desirable activities. Our government is very interested in supporting the development of such networks. The problem, of course, is the delicate balance within these networks, which makes it difficult to decide whom to support. (I'm sure that after the meeting 10 people will say, "I am the institution with the comparative advantage.") I see some merit in

trying to develop an international mechanism (in the U.N. or elsewhere) to become a clearinghouse of information about networks and to help those providing financial support for networks know what to do, in a way that doesn't destroy the networks' delicate internal balance.

Floor Discussion

Marco Ferroni, Chair

Marco Ferroni, the chairperson for this session, opened the discussion by pointing out that the prognosis for the provision and financing of international public goods varies with their nature and that it is particularly important to understand differences with respect to the degree of "publicness" of public goods. At least four characteristics affect "publicness" and the motivation and ability of different players to pay for an international public good: the spatial reach of the externalities engendered, the degree of excludability in consumption, the degree of rivalry, and the manner in which individual contributions add up to the total supply of the international public good. The issue of reach is perhaps the easiest to understand—a country unaffected by a particular problem such as a regionally confined disease may not be interested in contributing toward the eradication of the affliction. The issues of rivalry and excludability were discussed in detail by Todd Sandler and do not call for further elaboration. But the question of the aggregation technology deserves greater attention, particularly from the point of view of drawing in the private sector and finding the right balance between public sector "push" and private sector "pull" in the creation of solutions to transnational development challenges. The greatest scope for participation by the private sector exists when you have "best-shot" goods, for example, knowledge-intensive endeavors such as the development of medical drugs and vaccines, as discussed during the session on health issues. The challenge in these cases is to come up with the right kinds of incentives. In contrast, "summation" and "weakest link" goods, where the overall level of provision depends on the contributions of widely dispersed actors, may be less likely to lend themselves to a combination of "push" and "pull," depending instead on far-reaching global partnerships.

Jaime de Melo asked about the role of political economy in the analysis of global public goods. Whom did those making decisions at the country level represent—industry, labor, urban, rural?

Todd Sandler responded that Jaime was absolutely right. He hadn't had time in his brief presentation to discuss the different shades of collective action.

Scott Barrett agreed that political economy was obviously an important consideration, but he didn't feel bad about leaving it out. First, political economy issues pervade everything, domestic and international, and he wanted to focus on what was special about international issues. And, second, having shown that cooperation was difficult apart from considerations of political economy, clearly, adding such considerations would only make it more difficult.

Chris Gerrard, picking up a point made by Michael Kremer yesterday, asked Todd Sandler to what extent clubs were efficient providers of nonrival, but excludable goods. Kremer had implied that a club could only be efficient if it were a perfectly discriminating monopolist. Second, even in the case of private goods, was it not necessary to have well-defined property rights and enforceable contracts in order to ensure efficiency? While we had this for private goods like wheat, we did not have this for goods like knowledge. Wasn't the difficulty of establishing well-defined property rights and enforceable contracts for knowledge a large part of what we had been talking about in the health and agriculture sessions yesterday afternoon and this morning? Third, Gerrard asked Scott Barrett to clarify the implications of his analysis for the World Bank. While many people viewed the Bank as being in the business of making side payments (transfers), Barrett seemed to be saying that the Bank should not be in the business of making side payments.

Todd Sandler responded to the question about clubs, saying that whether or not clubs were efficient depended on the form of the congestion function and other considerations. In the paper itself, he had assumed perfect competition. With respect to the question about knowledge, he had classified basic research as a pure public good, which highlighted the absence of property rights, the inability to exclude, and perhaps the absence of rivalry as well.

Scott Barrett responded to the question about side payments. The lesson was not that the Bank shouldn't make side payments. The lesson was that you should ask, "What is the real problem here and how can side payments help resolve it?" If you were just to negotiate a Montreal-like treaty, any dummy could figure out that you would need side payments for that problem. If you included only side payments and didn't think about how to restructure the problem, you wouldn't achieve nearly as much. That's why strategic thinking is so important. Side payments are still useful instruments but the way you use them is different when you see the horizontal story.

An unidentified participant brought up the issue of trade sanctions and the Montreal protocol. To his mind, this was the most effective instrument for providing that global public good. China and India were promised a certain sum of money at the London Summit in 1990, and the Montreal protocol contained a clause that there "shall" be a transfer of technology. Four companies in India were producing ozone-depleting substances because they had bought cheaply a technology that was being phased out. They were producing CFCs and were exporting 75 percent of their production abroad, because they could not get the substitute technologies at any price. They were eased out of all of their markets and have now completely shut down production. A country, namely India, that had no great interest in providing this global public good had gotten dragged into an agreement with certain promises and didn't get the money it wanted because it was given to China instead. You can see why the environmental groups are saying we must have trade sanctions because that's the hammer that hits the nail on the head.

Susanna Moorehead supported the previous participant's point, emphasizing that global public goods in the wrong hands could be just another way of detracting from efforts at poverty reduction. The question is, if we're spending increasing amounts of money on all these public goods, what are we spending less money on? It also struck her that two very different kinds of public goods were being discussed. Something like an AIDS vaccine might be a public good once it's produced, but it needn't be financed as such. You need substantial investment to produce a vaccinelike good and to set up distribution chains and so forth, but that's completely different from an effort that needs to be sustained over time, such as the reduction of CFC emissions. Maybe we should separate "one-shot" projects that may or may not require complicated financing from other much broader commitments to collaboration, of which financing is only a small part.

Todd Sandler agreed that this point about long- versus short-term commitments was subtle and interesting. A more detailed table would have to deal with those issues. He agreed that the resource commitments would be quite different.

Scott Barrett reinforced Sandler's point, saying that the two speakers' points were quite consistent. Different problems require different solutions. He'd picked a simple card game as a way of illustrating how financing global public goods is such a difficult problem. He could easily focus on problems that were easier to remedy. Even within a particular card game, the details would differ, which was important. That there is no one-size-fits-all solution to providing global public goods may sound obvious, but the people who negotiated the Kyoto Protocol did not understand it.

Barrett said he would not state that trade sanctions should be used, as a general rule, for providing public goods or for doing anything else. He had found one situation in which a trade sanction was helpful, especially because

it had never been used, so you could have your cake and eat it, too, both providing the public good and having a free trade regime. But you might not always get that. The strategic question was, why was that trade sanction somehow more credible than other kinds of punishment you could come up with? The answer to that question was not obvious, but he thought he knew what was going on. If you wanted to punish a party who didn't cooperate but would hurt yourself in the bargain, then you wouldn't bother with it. But under the Montreal agreement, when a country got out of the treaty, you could have substantial "leakage": production and resources could migrate toward that country (as finance migrates to the Bahamas). Barrett didn't mean that particular companies would pick up and go, but through this change in comparative trade advantage, ozone-depleting production would progressively shift toward nonsignatory countries. That would harm the countries trying to do something about ozone depletion, which is why they would use trade sanctions for punishment. This would not always work. It's another of those counterintuitive results that trade leakage is harmful in a unilateral situation, but helpful in a multilateral situation, if you think strategically.

An unidentified participant felt that a distinction should be made between institutional arrangements for (1) purely public goods where a trade is possible because you can identify the people with whom you will do the horse trading (who will be hurt or will benefit immediately from the good), and (2) public goods with a primarily intergenerational benefit.

Todd Sandler responded that the point was well taken, but he'd done four papers on intergenerational public goods, and wanted to present something different in this workshop.

Inge Kaul had a similar comment. Referring to Sandler's Table 1, she wondered if the type of benefit from the good was the right entry point for discussing financing issues, because there were so many different dimensions to the problem. In the first row, for example, the case of pure public goods, what about basic research and international cooperation? If someone like Barry Eichengreen, sitting all by himself, thinks hard and produces new insights, that's a public good, but it is probably financed by a university or a national tax plan. Financing may have to be different for developing a vaccine, however, which involves proprietary knowledge; we may have to compensate for the privatization of the public good. As Richard Cooper had said we could introduce national taxation again. Or, if we can reach an agreement on the distribution of intellectual property rights, then we would not need public financing, for then the market would work and private financing would come in. We need to understand the nature of the various goods in order to get the financing right.

Kathryn Imboden brought up a concrete case to highlight the potential and the challenges of global public goods initiatives. A multidonor consortium in support of microfinance, the Consultative Group to Assist the Poorest

(CGAP) is a 27-member policy advisory group with an outside body of experienced practitioners. Its efficient, high-performing Secretariat is housed at the World Bank. Increasingly CGAP functions as a service center to summarize knowledge and provide support, training, and technical advice to donors, to microfinance institutions, and to the microfinance industry generally (including governments, regulatory agencies, private donor-partners, and so on). Because this small group of people performs efficiently, this public good clearly benefits both donor agencies and the aid community, with ripple effects beyond. Among funding issues probably endemic to such initiatives, CGAP has had problems bringing in private foundations because of rigidity within member donor agencies. We have to convince the Nordics it won't be too North American, to convince the French it won't be too Anglo, and so on. It's tough. It takes quite a bit of urging, and doesn't happen naturally. Funding is also a challenge, since CGAP must conform to the rules of its main funder, the Bank's Development Grant Facility. More important, to make CGAP more multidonor and multilateral, it needs more funding, which is proving difficult. If a global or an international initiative is not housed within an international organization or part of one of its programs or, on the other hand, if it is not part of a bilateral program with a country focus, it is difficult to fund. We need to reflect on how this issue has come up in the last couple of days in terms of benefits, efficiency, and so on, and try to spring the necessary funding from our aid budgets.

Todd Sandler thought Kathryn was espousing the joint products case; it was not so difficult when it was country-specific. **Marco Ferroni** added that in the case of CGAP the international public good probably lay in the framework and the good practice it crystallized rather than in actual income benefits at the national level. Another participant wondered if we might not be aggravating some of the traditional problems with aid effectiveness in spreading ourselves a bit thin. CGAP is a useful device and a good-performing example, but if we were to generalize it as a mode of a delivery, we might be in danger of going in the wrong direction in other cases. Someone else thought financing a global program from trust funds might not necessarily always be the best solution.

Khalid Malik welcomed the practical realities which Karel had expressed, and said that instruments which transform into trust funds put a lot of pressure on U.N.-type programs and units, especially. ODA has been stagnant, U.N. agencies are experiencing financial pressure, and, with the funding problems associated with certain governments' arrangements, we are seeing a distinct shift toward topic-specific programs. He asked for comments.

Marc Stern returned to the technical questions raised earlier. First, how do you know if you have reached an efficient level of provision of a public good? How do you know if a public good is underprovided? How many police are enough police? How much ozone protection is enough ozone pro-

tection? And how much basic research is enough basic research? You could answer this in economic or political terms. Second, on the question of side payments, is the cooperation agenda set by those who have enough resources to make something happen? Do any models offer hope to countries without cash resources? What about topics or areas (such as agriculture and health R&D) where those without resources want different things or benefit from different things from those who have resources?

Todd Sandler responded that all he was trying to say about basic research was that it was not likely to be optimal—not that we would not get any basic research. We would have meetings whether we planned for meetings or not. Whether we would have enough meetings is the question.

Osvaldo Feinstein suggested that, with sources of funding, it might be useful to think in terms of dealing with public bads in the context of globalization—for example, curbing organized crime. The national state is partly able to deal with these issues, but at the same time a product security industry is emerging. As an alternative to ODA funds, we ought to consider tapping sources in the private sector—not philanthropy but those suffering from the existence of a public bad or the lack of a public good.

Todd Sandler said he thought it was essential to consider global public goods not as a substitute for aid in the traditional sense, but as a way to mobilize more aid. What turns U.S. people on is a feeling that something they're doing will help them. He knew that was selfish. But if you asked yourself, "Why did I give a dime to this bum and not someone else?" the answer would usually be that this person looked a little more helpless and hopeless, and giving them a dime appealed to your sense of altruism, so you got something out of it. To say that it's not aid if you don't get something out of it means there is no such thing as aid, so we might as well all go home and never return. Aid always produces private benefits. To say aid is a global public good is a motivator when you are trying to mobilize collective action. To point out that a huge nation is not doing its share is a way to get them to do their share.

Scott Barrett thought some people might have the wrong impression of what a global public good is. A global public good is not something we all like that isn't provided enough, such as a network. The *idea* of a Grameen Bank, now that is a public good—once the idea is out there, my use of it doesn't diminish anyone else's use of the idea. The idea of a network is interesting but it is not a public good, even though we talk about network externalities that lead to unappetizing decentralized solutions. With a network, there will be situations in which the more others are doing something, the more I want to do something. So if someone else joins the network, the network expands a bit, which makes all the other members of the network better off. That's an important phenomenon. Yesterday I heard someone say that education is a public good. I don't know. Education certainly has a network externality aspect. I have a Ph.D. in economics and am much

more productive when I come to the World Bank because, like it or not, there are a lot of people with Ph.D.s in economics here. I can talk easily and freely, using all the jargon that I want; everyone knows what I'm saying, and I'm much more productive. But it's not a public good. (They told me it's a negative externality for all the noneconomists and that's certainly true.)

Barrett continued that Marc Stern asked two good and clear questions. How do you know if you have enough of a public good? Basically, if you want to know how much is enough climate change, call Bill Nordhaus at Yale University and he'll tell you. When I put prices on the card game—$5 is the cost and $1 x N is the aggregate benefit (since the problem is symmetrical)—this is simply benefit-cost analysis. You use the same kinds of tools as you would normally. Marc also asked, suppose the poor want a public good provided and it's not provided; how can you get it provided? In a way, the problem often is that these things aren't public enough. That's another one of these bizarre, counterintuitive twists, but think about it. If the strains of AIDS common in Africa were as prevalent in North America, the richer countries would make more effort to help. In a sense, the more the contagion, the greater the incentives for the richer countries to act in a way that is also helpful to the poor. When something like an endemic disease is isolated, you must really count on altruism or whatever you want to call it, as Ravi Kanbur observed yesterday.

Karel van Kesteren stressed that, although he didn't say it in his speech, his preference was that all countries would devote 0.7 percent of their national income to ODA. Then we would have $60 billion extra from the U.S. alone and perhaps the same amount from the other donors, and we could make some progress. But that is not the case. And the result is not only that U.N. agencies are underfunded, but also that the agencies are bilateralized: agencies tend to get less money for core budgets and more money for specific purposes. This and the limited vision in aid agencies create a lot of problems. Perhaps it's time that even aid agencies catch up with the modern world in thinking strategically and globally, rather than sticking with all those little projects we've been working on for the last 40 years. Mustering enough support and money to provide international public goods is of course a question of politics. You need political support in parliaments; you need voters' support, which requires political leadership, grassroots support, and constituencies. This is why he mentioned the network concept. What he was saying is not underpinned by theories, scientific evidence, or red and black cards. As a vehicle, the network concept has the advantage of not only existing, but also of having its roots in various national societies. If we can give up these underfunded, bilateralized systems, perhaps we can broaden the constituencies for action within national societies. Then, under pressure from these constituencies, spending patterns for internal purposes could shift gradually to the international arena, where the money can be spent much more effectively for the common good of all of us.

Marco Ferroni, in concluding, thanked the panelists and said that the workshop, and this panel, had succeeded in highlighting the need for systematic work on two aspects in particular, that is, the issue of financing and coalition building for the provision of international public goods, and the question of how national activities interact with and complement supranational activities that aim to address problems that spill across borders.

Part VIII

Implications for Evaluating Global Public Policies and Programs

Evaluating Global Public Policies and Programs

Michael Scriven

Let me start with this point: evaluation is a public good because it is something we can convey to others, we do not have to charge them for it, and they don't have to compete to get it. And we can demonstrate that, done well, evaluation pays off—adding great value by increasing the payoff from an activity via improving it, and/or reducing its cost, and increasing accountability—which is why our associations are committed to it. (That this is sometimes bad news for some people is a separate issue.) Three candidates for making evaluation *more* of a public good are empowerment evaluation, joint evaluation, and cooperative evaluation.

With *empowerment evaluation,* we teach people how to evaluate and they do the evaluation. Teaching people in a country or region how to do evaluation is a useful form of empowerment and will pay off, usually in the short term, more certainly in the long term. But empowering people working on a project to evaluate their own project *instead of* using external evaluators—a popular version of empowerment evaluation—has limitations both in terms of the validity of the resulting evaluation and because self-evaluations lack credibility.

With *joint evaluation,* which people at the recent conference on evaluation and poverty rightly advocated, more than one investor agency contributes to the evaluation. This is much stronger than single-agency evaluation and often leads to further good joint ventures in funding and evaluation.

I prefer *cooperative evaluation,* which combines (but is both more and less than) empowerment evaluation and joint evaluation. In this version, external evaluation by a donor representative must be combined with internal evaluations by people with adequate training in evaluation. At the Poverty Symposium,

one often heard, "Don't parachute somebody in to do an external evaluation." Well, also don't e-mail someone on the receiving end of the funding saying, "Be sure to attach an evaluation at the end of your report on how you spent our money." Instead, do both. Retain credibility, if you can; use reasonably consistent standards, to make comparisons possible, and a transfer of learning and insights in both directions. That combination is hard to beat.

Making evaluation more productive

The Bank and the Operations Evaluation Department (OED) have put a good deal of effort into making evaluation more productive, providing useful publications on the subject. As a good evaluator of public goods, you should have in your bag six or seven useful tricks, which you probably did not learn earning your Ph.D. as a social scientist or economist. For example, you need to know the following:

- How to handle "mission creep," or "goal drift," which social scientists often don't know how to deal with. It's not always a fault; often enough, avoiding it is the fault.
- How to detect side effects, which is a neat trick because there is an infinite number of possible side effects and they are often at least as important as the main effect, or lack thereof.
- How to synthesize results—which is a difficult task. With most programs, you develop a matrix to show a program's strengths and failures along 10 to 22 dimensions of merit or failure. How do you add them up? When a number of projects are competing for refunding and you can refund only some of them, you need ways to rank them for *overall merit*. That's a tough task methodologically, and you need to learn how to do it well in evaluation.

Well, that's the technical dimension. There is also the resource dimension and the political dimension. After a great deal of thought, the American Evaluation Association held a meeting (funded by Kellogg) to explore the possibility of international cooperation between national evaluation associations. That year, 2000, there were nine countries from which to invite participants; this year there will be 31, partly because Africa is coming online on a large scale. These are very good associations of (by and large) experienced, highly professional evaluators, which gives us an interesting and valuable locally expert force. Tying our efforts at overseas evaluations to respectable local organizations can make the evaluation—as well as the local organization—not only better but also more credible and acceptable. The first two days of that meeting were spent entirely on (forgive me, my European friends) fighting the Europeans' paranoia about this being a way to impose American standards on everybody else, although they could not find a word to that effect in anything we had distributed, because we were extremely sen-

sitive from the first conception onwards, about the need to avoid this. Finally they cooled down, some good business got done, and I don't think the problem will be as serious in the future—but it reminds us that we must be attentive to such concerns.

Making private goods public by intervention

Some private goods can be made public by intervention. The Human Genome Project is the current big bad wolf, in that respect. The World Bank is not used to becoming interventionary before things get under way, but in cases like this it would be several hundred times more cost-effective if they had been, rather than trying to fix things up later. It's scandalous to classify genes as a private good—and imagine what it would be like to try to reverse the patentability of genes once it is established. Perhaps it's still possible—especially with the coming change of government—for us to get changes in interpretation, to convert that private good into a public good. In our repertoire of models of possible activities in the development world, we ought in some cases to consider preventive intervention, rather than curative intervention.

Ethics as a public good

Ethics is a public good. Nevertheless, it would not be a sound public relations move for the Bank to decide to take ethics to developing countries; the Bank is already in enough trouble—that could be its terminal move. But if anything is a public good, ethics is. We have to take some version of it with us, not for them, to developing countries and we have to make it as transparent as we can. Our distinguished contributors from economics, public policy, jurisprudence, and various areas of applied social science are dancing on the edge of ethics all the time. To a large extent we are all practicing applied ethics when we work for the World Bank. A large element of most of our disciplines and most solutions to practical problems are applied ethics. Consider what people have said at this workshop—about how unacceptable it is that 30 percent of the world is living on less than one U.S. dollar a day, about inclusion being one of the payoffs we want to see happening, about certain methods of distribution leading to unacceptable cruelties. These are ethical comments and, throughout, we're talking about working within an ethical framework. What are our ethical assumptions? At a minimum, that *people have equal rights*, except in certain circumstances where they reduce their own rights—for example, people rightfully imprisoned, dictators and aggressors, don't have the same rights as those who are innocent; children under two don't have the same rights as adults, and so on—exceptions that are justified by appeal to the general principle. I think we should be more explicit about the fact that we're practicing some perfectly respectable prin-

ciples of applied ethics and that equal rights is one of them. Equal rights is an ethical principle that rises above the specific variations in ethical principles found in various religions, so no one can complain that we are imposing our values and violating their religious principles. You have to look twice to see this, for example, with respect to women in Islam, but Koran scholars do claim this and provide a plausible justification.

Ethics has its foundation in applied social science including jurisprudence. We can argue for this, starting as follows. Law is a public good, but law enforcement is substantially ineffective and expensive. If we could internalize the values built into law, we would eliminate the problems of the police being (1) corruptible, (2) expensive, and (3) not always present. Internalized (democratic) law (another name for a large part of ethics) has the status of a public good—a social law plus extras: lower expenses and fewer inefficiencies. Turning to another line of thought, with the same conclusion: the solution to the prisoners' dilemma (mentioned in connection with financial crises) is easy if you presolve it. To do so, the prisoners make commitments in advance (which they honor and enforce via peer pressure and training) to value each other's welfare. That model of socially valuing others is called ethics. So the prisoners' dilemma is solved by partial altruism—limited to one's criminal friends, of course, as is common in ethical systems. A third line of thought: decision theory generates a theorem—roughly, that *given the same sequence of events, altruistic societies always survive better than rational egoist societies.* Fourth, there's a parallel for altruism in evolutionary biology—the famous altruism gene discussion, and curiously enough the Poverty Symposium recommended we move toward a development approach based on evolutionary biology rather than one based on simple scientific models. Social science's resistance to value-based systems is under pressure from many directions. I think we must face up to that and spell out in our evaluations that our goal, in some sense, is *the greatest good for the most people.*

Participatory or Bottom-up Evaluations: Preventing Global Public Goods from Becoming Club Goods

Frans Leeuw

Participatory (or bottom-up) evaluations can prevent the production of global public goods from becoming the production of club goods. It is true, as our keynote speaker said, of the CGIAR, "We have been doing a lot of reviews." But the ultimate beneficiary, at the grassroots level, has not played a prominent role in these evaluations. Tremendous processes are available to engage people's participation in evaluation, in networks, and in interactive policymaking, but they are affected by seller selection processes. People who are bureaucratically competent—who can speak the language of bureaucracy—are much quicker than others to get involved in traditional bottom-up evaluations. And that is a problem in participatory evaluations, where you get what sociologists call the "Matthew effect," in which the rich get richer and the poor get poorer.

One solution to the problem is adequate social mapping. Before you specify which people to include in networks or evaluation activities, try to find out with whom they interact and whether or not the same people are always participating in these activities. In a study I did for the World Bank on the anticorruption initiative, we mapped how many people were participating in various workshops and detected something of a Matthew effect, in the sense that certain people repeatedly participate in these workshops.

Checking out assumptions

More attention should be paid to our underlying assumptions about behavioral mechanisms believed to be important in producing global public goods. Over the last two days, I've heard about 50 such assumptions. We are probably better at recognizing assumptions than we were 20 years ago, but if behav-

ior modification is what we are striving for, we have to examine these assumptions. I'll mention just a few that I have noticed:

- Realizing a few quick wins in the production of global public goods will help us realize more quick wins in other fields.
- Networks must be somewhat chaotic or they won't work. They also have to be transparent.
- National ministries are not very well adapted to creating the institutional conditions that help effectively produce global public goods.
- Leadership is important; credibility is, too.

That last assumption is especially important. Part of the nitty-gritty work of evaluation is pinning down which assumptions we have about behavior and figuring out if they are informative or have empirical support. Let me share with you one example: One of the CGIAR centers did a study about how to encourage innovation in poverty reduction. A number of implicit assumptions—about innovation diffusion and about psychological windfall profits appearing to be in the hands of the people who had something to do with major innovations—were wrong and started the wrong chain of activities. How do we find that out? How can we systematically reconstruct and assess these assumptions—which, by the way, easily fit the six anchor points Inge Kaul considered relevant for evaluation. If you look for a more instrumental approach to her six anchor points, you also open up what I sometimes call the "candy box" of behavioral mechanisms we all have on our minds, which can be relevant to evaluations of the production of global public goods.

Frameworks for evaluating networks and collaborative arrangements

I'd like to say a few words about evaluating partnering and partnerships, networks, and collaborative arrangements (including public-private partnerships, consortium-based government collaborations, and CGIAR-type collaborations). What issues are involved in evaluating collaborative arrangements? With Canadian colleagues John Mayne and Tom Wileman, I've been looking at several case studies of collaborative arrangements around the world to learn which mechanisms work and what evaluators and auditors should do to learn if partnerships and collaborative arrangements are working. Clearly, networks are everywhere. From these case studies we identified two frameworks for analyzing how these arrangements work: one traditional (tick-and-flick) approach and another far more in-depth analysis.

A traditional (tick-and-flick) framework

To learn if networks are working or not, and leading to intended effects (not just to unintended side effects), ask questions such as these:

- Are objectives being met?
- Is the collaborative arrangement the best way to meet objectives?
- Are public service values being maintained?
- Are mechanisms in place to hear and address citizen complaints?
- Are there effective mechanisms for public consultations and feedback?

To evaluate arrangements for accountability, ask these questions:

- Are objectives, expected level of performance and results, and operating conditions clear and agreed to?
- Are each partner's roles, responsibilities, and authority clear?
- Do partners' expectations match their capacity?
- Is there a well-defined management structure?
- Can performance be measured and credibly reported to each partner, Parliament, and the public?
- Has adequate provision been made for monitoring, review, program evaluation, and audit?
- Are adequate procedures in place to deal with nonperformance?

To evaluate increases in transparency, ask these questions:

- Have the information needs of those affected been recognized?
- Is enough appropriate information being disclosed to Parliament and the public?

The traditional (don't-know-better) approach is to unpack and analyze how these characteristics of partnership arrangements are being dealt with.

Variables for explaining the success or failure of networks or collaborative arrangements

Examining the pattern of interactions requires painstaking social bookkeeping—about who is dealing with whom, which partners have which level of available resources, and so on. Among the several cases we studied, we learned that if one partner is big and important (an institution such as the World Bank) and the others are small grassroots institutions, you can predict that certain things may go wrong in a partnering arrangement. To find out what is actually going on and whether or not partnership arrangements are working, you must look at certain elements:

- The network's social capital. (Who is dealing with whom? Which deals are being negotiated? What is going on to change reputations?)
- Partners' different goals and expectations about output. (There may have to be tradeoffs, which can lead to mission drift.)
- The mix of partner organizations. (Are different organizations living up to their own and each other's perceptions?)
- The pattern of interactions.
- The level of available resources.
- The structure of the partnering organization.

- Human resource management issues. (Human resources management within the different partner organizations can greatly affect outcomes and side effects in the partnering arrangements.)
- The stability of the partnering arrangement.
- The degree to which agreements are formalized. (The auditors ask, "Have you written down all of the agreements, goals, activities, and instruments you are working on?")

You have to have answers to all of these questions or you can end up with statements about the effectiveness of partnering arrangements that may not be empirically validated.

Important Questions for Evaluation

Greg Ingram

I've been considering the implications of the workshop discussions for the evaluation of global public goods. The principal underlying dilemma of public goods is that people have no incentive to reveal their demand for a public good or what they are willing to pay for it. But the further we get from a pure public good, the more information we have about demand and willingness to pay. This is good news because most interesting real world cases are not pure public goods.

Dick Cooper said, "Remember, there are other kinds of failures besides public good failures." Many of his examples involved infrastructure, and some of the more striking failures in relation to infrastructure don't involve public goods at all. The telephone system in the Philippines, for example—which was one of the worst-performing systems in the world—was private for 50 years. You can't explain away how badly it undersupplied telephone services by saying it was a monopoly; it was worse than that. There are many ways to do things badly that have little to do with public goods. So if you have a problem, I think the first key evaluation question should be, as Dick emphasized, *"Is this a public good failure or not?"* It might not be.

Dick also said—almost as a throwaway line—"Don't pay attention to this public goods business. Go for the low-hanging fruit. Go to the places where stuff is undersupplied. Be opportunistic." That turns out to be very difficult. The second key evaluation question is the one someone asked in the last session: *"How do we know what is the efficient level of supply for public goods?"* One turns to benefit-cost analysis to find the answer, but the answers often have a tremendous range of uncertainty. I spent a year managing a study of automobile pollution controls in the early 1970s,

for the National Academy of Sciences, and our cost and benefit estimates were X and Y, plus or minus 50 percent or more. So identifying the efficient level of supply—in other words, identifying cases where public goods are undersupplied—is not always easy.

Another strong message from this workshop came through clearly in the last session: *This stuff we call public goods is tremendously heterogeneous,* and in the evaluation business, heterogeneity matters a lot. *You must have your problem properly categorized or you're likely to come up with the wrong evaluative answer.*

Inge Kaul talked about production-side and demand-side issues, partnerships, and so on. Ravi Kanbur linked global public goods to aid, and Ravi and Todd Sandler made important distinctions between the weak-link public good, the summation public good, the best-shot public good, and so on. Knowing which public good you're looking at is critical to evaluation, so the taxonomy—whether the case at hand is a public good, club good, toll good, common pool good, or private good with externalities—strikes me as really important. We glided over that yesterday, but it came back into focus a bit more clearly today.

Yesterday Wolfgang Reinecke talked about networks as an instrument to help with some public goods dilemmas. How might networks be helpful? Let me offer an analogy. Charles Tiebout, a public finance economist, hypothesized that households would move to communities that offered public service levels that they wanted to consume. In so doing, the households would have to reveal their willingness to pay for the local services. The "Tiebout hypothesis" underlies much analysis of the demand for local public goods. Reinecke's networks may be useful in the same way as local communities. If individuals have to join a "club" or a network to consume a public good or service, this could be used to establish their willingness to pay for the service and to help us determine what the right level of supply of the service should be. Reinecke's networks could help to resolve a key dilemma of mixed public goods and provide an avenue for evaluation.

Ken Newcombe offered a different approach based on his interpretation of behavior observed among energy firms who are actively engaged in reducing emissions associated with global warming. Although the Kyoto treaty is unlikely to be made effective, firms participating in this area are driven by the risk that there will be a substitute agreement or convention. They want to generate a record of responsibility, so that self-regulation becomes a viable alternative. Newcombe characterized the activities of these firms as "insurance." This type of behavior can also reveal "demand" and be studied by evaluators.

In the knowledge area, we were presented with an interesting possible contradiction. For vaccines, it was argued that the private market lacks the in-

centive to develop certain drugs (vaccines against rare diseases) and that such research should receive a public subsidy. In agriculture, too, the argument that certain research should be subsidized underlies the Consultative Group on International Agricultural Research (CGIAR). Yet today, the bulk of agricultural research has moved from (subsidized) public institutions to private firms. Do these patterns reflect public goods issues, or do they represent enhanced intellectual property rights (in agricultural research) and a lack of effective demand (for certain vaccines)? The effectiveness of intellectual property rights is emerging as a basic issue in an area which was formerly was replete with public goods propositions.

Further to the CGIAR, Henry Shands raised a number of evaluation issues that are very pertinent:

- Who benefits from technology transfer?
- What institutions work best at effecting such transfer?
- How does one engage in participation in this area?
- How can we get innovations into the field? and
- When can the Bank exit?

Let me end my comments by returning to Jan Piercy's opening remarks about evaluation being developmental. She said that good evaluation does three things: First, it provides evidence about *what works and what doesn't work*, which in the case of international assistance, is particularly important. Second, it tells us something about *priorities*—that is, if well done, it might tell us something about what things are in short supply and hence what we should be focusing on. And third, if we are really lucky, it will tell us something about *the best roles for different actors to play*. Let us hope that in the evaluation of global public goods, we are both skillful and lucky.

Floor Discussion

Robert Picciotto, Chair

Robert Picciotto, the chairperson of this session, said that it was fitting to conclude the workshop with this session on evaluation, since evaluators like to have the last word, and, as a result, often end up speaking only to themselves. Yesterday, Rob van den Berg had opined that there was a conceptual confusion about the role of evaluation in global public goods, and Inge Kaul had reminded us of A. K. Sen's remark that it is better to be vaguely right than precisely wrong. The three panelists had helped clarify the confusion and had begun charting a road for the evaluation of global public policies and programs. Picciotto invited questions from the floor.

Henry Shands asked Frans Leeuw, "Do we have a clear idea of what the objective of evaluation is?" He wasn't sure exactly what people were looking for and thought people were generally looking for very different things.

Frans Leeuw thought the question about what to do if you didn't know what your goods were was interesting. The point was completely well taken. In the case of networks, it's often a process of arriving jointly at a concept of goods that differs from what individual participants had in mind when they first participated in the network. He had three things to say. First, everybody has to decide that the process can happen. Second, you have to check the good's reality not only as auditors record it, but as it is perceived, and as men and women define it: through its consequences—here the Thomas theory, originally developed in the early part of the last century, comes to mind. If men define situations as real, they are real in their consequences. Third, if you are not sure what end you want to achieve, make it clear that not every objective can be realized.

With reference to Greg Ingram's comments, Leeuw thought one interesting difference between the pharmaceutical industry and the CGIAR was that the pharmaceutical industry was a profit-making, private-sector industry that used intellectual property as much to protect molecules as to generate research—and the CGIAR couldn't do this in the public sector. Maybe the costs are lower for CGIAR kinds of research than for some of the pharmaceutical research, but it seemed to Frans that the two models, starting from different sides, produced very different results. The lessons might be: Be very selective; and consider not providing public goods forever, if it means public funding forever.

An unidentified participant said that the pharmaceutical industry sees the market for many of these vaccines as too small: one shot in the arm and it's over for that company. But agricultural patents are used year after year after year, so a single patent has a very large multiplier effect.

Greg Ingram responded that it might be a demand issue, but what struck him was what Michael Kremer was saying, "These companies have a problem. They can't protect their intellectual property rights." The private sector's incursion into agricultural research is supposedly driven by two things: We have clarified that intellectual property rights are enforceable, and science has become less labor- and land-intensive and more capital-intensive. You can spin theories, but both of those things have happened. Ingram was struck by how both sides used intellectual property rights.

Marco Ferroni said that Frans Leeuw in his first slide had talked about preventing global public goods from becoming club goods. The participant didn't understand this because, from the viewpoint of financing, that would be desirable. **Leeuw** said his point about club goods or public goods was a little bit of a joke—a bad joke—to make the point that saying you were opening networks up to everybody was like saying you were opening Congress up to everybody. You might say everyone in the real public could participate in the network production of a good, but in fact only a certain club was involved. His comparison had been noneconomical.

Marco Ferroni also said that Michael Scriven had described ethics as internalized law. It struck him that ethics was much bigger than law, which is merely the expression of the legislative status quo.

Michael Scriven replied, yes, of course, ethics is in some sense superior to law and goes deeper, but there is a great deal of overlap. Property rights are implicit in both "thou shalt not steal" and "thou shalt not kill," for example. Scriven was simply saying that, although ethics includes attitudes and law does not, getting people to accept the ethical values on which law is built would reduce the extent to which we need to police the law, so that we could get the benefits of law plus lower costs. Nobody ever has any trouble justifying law; we happily say it's an example of a public good. Ethics is nothing more than an extension of internalized law, yet we balk, unless we're

brought up as utilitarians, at the idea that it's just a functional arrangement. The Carbon Fund and the Vaccine Development Fund are simply extensions of the ultimate social contract.

In evaluating partnerships, Scriven continued, one needs to distinguish between evaluating the apparatus of the partnership (things like getting the goals and the contracts straight) and evaluating the work of the partnership (which can be much more box-oriented). For example, you don't need to know what the goals were in order to evaluate what was achieved; you only need know what the affected populations needed.

An unidentified participant liked the presentations very much and liked Michael Scriven's "applied ethics," a crucial element missing from earlier discussions of public goods. He liked the assumptions Frans put on the table, but both of them were methodologies for evaluation and didn't tell us exactly on what to base our objections. Where do we say, "This is all right" or "this is insufficient"? We have two grounds for making value judgments. A scientific standard may be the basis for a value judgment (this is the taxonomy Greg Ingram was referring to), so you say, "This is going in the right direction" or "is up to analytical standards," or whatever. But at the present time, the economics is not fully developed and so further analytical work is needed. Another possibility is social or community standards—standards we agree about, for example, the standards the World Commission on Dams is working on—with judgments based on an international consensus. Perhaps the global public policy networks can deliver the same kind of goods in other areas. The participant hoped so because, without scientific and community standards, he didn't see enough basis for evaluations or value judgments.

Anders Agerskov agreed that ethics was important. Often we simply say a product addresses a need without saying what values or behaviors we want to change or without discussing the social fabric in which the product's beneficiaries exist. We have been looking at various (heterogeneous) ways of producing global public goods—typically through partnerships (except for the Development Economics Vice Presidency, which does a lot of research), said Agerskov. Typically, partnerships involve a few rich international or national institutions on the supply side, and capacity building bypasses many developing countries.

An unidentified participant said he didn't see much evaluation work comparing two programs and saying, "Money would have been better spent had a million dollars been put into that." Rather, it struck him as valuable for someone to be able to say, explicitly, "We want to know whether to shift X million dollars from this pot to this pot. Can you as evaluators tell us whether this would be a good or a bad thing to do?" If $5 billion has been spent on the CGIAR in the last 20 years, can evaluators even begin to think about answering the question, "Would that money have been better spent on higher education projects?"

Michael Scriven responded that, with the proper funding, they could evaluate the alternatives; after all, we all begin with some clear commitments to the relative importance of different needs, for example, to the need for drinking water over video games. However, when you have such a "double-handed" evaluation you've doubled the difficulty, and when you have a range of options you must work on the whole range of options. So it is a good question, and we must always try for it, but before you start the evaluation, you must establish which of the questions the client wants, or needs, answered. Many clients will wait until the final report has been turned in and then spring the question, "Should we have spent the first $2 million on something else?" It's a good question, but that's a bit late—and can't be answered unless you redo the evaluation.

Frans Leeuw replied that it was a legitimate, commonsensical question, and often the only question decisionmakers face, so evaluators must be able to handle it. But there is no free lunch. You can't say that this money would have been better spent over there unless you've done the sensitivity analysis on expenditures over there—a large slice of an evaluation (not a whole one, but a large slice of it). If it can be answered, it must be answered, if the resources are there to do it—but resources are often a problem. A lot of studies had been done about basic education, suggesting that 10 or 15 years of basic education did indeed lead to something, but these studies had little or nothing to do with evaluation. Leeuw agreed with the participant up to a point, differing in this: Even if we cannot do this evaluation empirically, we can compare the "quality" of the underlying theories, saying, "The CGIAR approach consists of the following 12 mechanisms and the following five or six (probably unintended) side effects, and we can reconstruct the same kinds of arguments about basic education or higher education or gender, but it would be an intellectual comparison, not an empirical comparison."

Greg Ingram said that the question was the same question we ask in relation to public expenditure reviews, for which the first question to ask is, "Should we spend on education or agriculture or transport?" It is very difficult, even when you are looking across the sectors, to make good judgments, except to identify the obvious white elephants and the obviously powerful projects that you know you want to continue. Relative evaluations of projects on the margin are difficult, but you have to face this problem in the first step, before you can wrestle with other issues.

Michael Scriven said that an economist would be even more reluctant than an evaluator to deal with such a question. But a study by John Hattie showed that educational researchers were not so nervous. Hattie's clever study asks this question: "I've got extra money in the budget for schools in California. What should I spend it on: reducing costs, adding computers, adding paraprofessionals, etc.?" Hattie looked at 25 such items, had enough studies to do evaluations on them, and got specific answers. Some answers were sur-

prising, so it is a good subject, relevant to our discussion, but of course doing it across a universe of options is a little daunting.

Robert Picciotto brought the workshop to a close, saying that their work was only beginning, and that it would be a long journey, but that they would get it done faster if they did it together. He thanked the following people for organizing the workshop: Khalid Malik, partner and friend; Nurul Alam, Marco Ferroni, Ashoka Mody, Aristomene Varoudakis, Greg Ingram, Osvaldo Feinstein, Uma Lele, and Chris Gerrard (without whom the event could not have happened), helped by Elaine Wylie, Diana Qualls, Marcia Bailey, Pierre-Joseph Kingbo, Sarah Crow, Maria Mar, and Tom Yoon. Having failed to end the program at 5 p.m., as promised, Picciotto scratched his closing comments.

Annex

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