Chapter 1

GLOBAL INCENTIVES FOR INTERNATIONAL PUBLIC GOODS:

Introduction and Overview

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As the world becomes more integrated through trade, financial flows, and the movement of people, a new set of public policy challenges arises.[1] National policy initiatives are necessary, but insufficient. Indeed, actions taken in the national interest can sometimes make matters worse from an international perspective. Globally coordinated efforts are needed to deal with such challenges as climate change, the AIDS epidemic, and financial crises. If these threats to global stability can induce global incentives to work collectively and cooperatively, they can be turned into opportunities. Humane and equitable globalization requires a shared vision of global prosperity. This shared vision makes possible international public goods (IPGs), which include the *rules* that apply across borders, the *institutions* that supervise and enforce these rules, and the *benefits* that accrue without distinctions between countries. The benefits accrue, for example, in the form of a cleaner environment, the lowered prevalence of disease, a more stable global financial system, and a reduced level of international conflict.

In a wide variety of circumstances, when countries act in their own self-interest, they also contribute to the provision of IPGs. Safe domestic financial systems, better public health, more research and development, and reduced emissions of greenhouse gases are all beneficial from both a domestic and international point of view. For this reason, the supply of IPGs will largely continue to depend on governments' willingness and ability to devote national resources to those domestic objectives that also contribute to international purposes and goals (see Cooper 2001; Kaul 2001).

This book, however, focuses on actions in the international arena that can help complement domestic efforts. The demand for IPGs has grown apace with globalization (see Kaul, Grunberg, and Stern 1999; Sandler 1997). Ferroni (chapter 6 in this volume) infers this growth in demand from the proliferation of regional trading arrangements that, he argues, reflects the need for more effective international rules. Soros (forthcoming), in reflecting on the promise and pitfalls of globalization, also maintains that currently public goods are undersupplied relative to private goods. He recommends more public resources: an amount equivalent to US$30 billion to be reserved annually to finance IPGs, of which more than US$5 billion a year could be spent on dealing with the AIDS epidemic (see also Sachs 2001).

Economic theory supports these assertions. The supply of public goods remains restricted, sometimes severely so, because households, businesses, and governments, acting in isolation, typically do not take into consideration the implications of their actions on others. This makes it difficult to put in place coordinating mechanisms—based on market or other prices—to pay for shared benefits. Markets do not have the ability to allocate sufficient resources to public goods, because private returns typically do not justify the investment in public goods. Further complicating matters, especially when public goods are viewed in an international context, people in different countries may value these shared benefits quite differently. At the same time, with the growing complexity of global interactions, the existing institutional framework is unable to consistently enforce beneficial action when markets prove insufficient.

Thus IPGs pose a policy challenge, because neither markets nor the existing constellation of institutions can effectively and consistently provide the cross-border rules or resources required. Hence the call for greater coordination that brings together official institutions with nongovernmental coalitions and other private parties. However, underlying the widespread agreement on the need for international coordination, two policy questions arise. The first overarching question refers to the institutions that could govern activities with cross-border consequences. In the absence of a global government, various alternatives are possible (Kindleberger 1986). At one extreme, a leader nation can set the agenda and back it up with resources, acting either in its own interests or motivated by broader global objectives. At the other extreme, informal, privately motivated coalitions can act in their areas of advocacy to promote the cause of coordination. In between these extremes, various intergovernmental agreements and official financing mechanisms can serve the coordination function.

The second, more specific, question arises in the context of these official arrangements. What, in particular, is the role of international financial institutions in promoting and financing IPGs? With demand for IPGs strong and rising and supply not following automatically, international organizations have been called on to step up their role, especially with respect to global and regional programs directed toward systemic stability and poverty alleviation (see, for example, International Financial Institutions Advisory Commission 2000; Kanbur, Sandler, and Morrison 1999; Kaul, Grunberg, and Stern 1999; Sachs 2000; Summers 2000). Thus international organizations are being pushed beyond their traditional country programs to tackle both regional and global cross-border issues. Even those critical of the present system of multilateral financial assistance, such as the International Financial Advisory Commission to the United States Congress (the Meltzer Commission), have called on the multilateral financial institutions and other official bilateral donors to do more for the provision of IPGs. Indeed, Kanbur (2001a,b) argues that IPGs could potentially reverse the decline of official assistance observed in the 1990s, although he notes that such financing of IPGs should be judged by what it does for the poor in low-income countries rather than by the criterion of whether it enhances global welfare.

Tying the IPGs agenda to the system of official development finance greatly narrows its focus, because those engaged in development finance cannot typically influence the industrial nations to make the decisions required to supply the full range of IPGs. Climate change is an example. While official donor agencies can finance some of the investment developing countries need to facilitate carbon trading, the basic rules and infrastructure required for carbon trading require a broader consensus.

Thus even though they are being called upon to play a larger role in the provision of IPGs, there is some question whether the official donor agencies will be effective in doing so. Their main clients have tended to be sovereign governments, and the traditional system of official finance is largely built around assistance to individual countries. While this has changed in recent years with more lending and grants to subsovereign governments, nongovernmental organizations, and the private sector, national governments continue to limit the ability to coordinate projects and programs across countries. IPG provision has tended to occur on an ad hoc basis, often in response to highly visible emergencies, such as the emergence of AIDS and the occurrence of financial crises that spill across borders.

The limitations of traditional development assistance are one reason for the growing influence of a variety of formally and informally organized coalitions. These, according to Reinicke (2001), are flexible networks that bring together governments, civil society, and the private sector with international bureaucracies acting principally as facilitators. Reinicke (2001, p. 44) suggests: "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."

Therefore solutions to the provision of IPGs need to be viewed in the context of the evolving structure of global governance. While leader nations may sometimes provide IPGs unilaterally (see chapter 3 in this volume; Sandler 2001), they are only likely to do so when it is in their self-interest. International organizations can play an important role, but the long-established limits on their activities remain, restricting their financing actions largely to individual countries. The growing demand for IPGs provides an opportunity to make the case for additional aid resources, but perhaps channeled in new ways. Working with various networks, international financial institutions will, therefore, sometimes act as convenors, bringing stakeholders together to decide on appropriate action, while at other times they will defer to those with greater expertise and legitimacy.

This book addresses the strategic and practical challenges of fostering the supply of IPGs, paying particular attention to the financing of these goods. Its premise is that a more structured system is needed for the governance and financing of IPGs. While recognizing that achieving that goal may take time, the book outlines a three-pronged approach, elements of which have been applied before, sometimes with considerable success, for example, in the control of river blindness and in agricultural research. However, the full strategy is required, we believe, to achieve sustainable and inclusive globalization. The three elements of our recommended approach are as follows:

- *Improving incentives for responsible action*. The provision of most IPGs—including those aimed at preserving the global environment and maintaining international financial stability—depends on the actions of a multitude of individuals, businesses, and governments, all of whom value these goods differently. Long-run sustainability and cost-effectiveness require aligning the incentives of countries and their citizens with the

global public interest through the use of standards, treaties, and regulatory mechanisms.

- *Integrating global and regional programs with country-based financing*. IPGs' significant potential contribution to development calls for coordination and synergy between national and transnational development efforts. Merely providing IPGs is not enough. The supporting infrastructure that enables poor countries to absorb and use these goods effectively is also needed. This places new demands on an already constrained pool of development financing. Ensuring the right level of, and balance between, locally focused efforts and IPGs is likely to require an increase in overall aid flows, as well as a commitment to high-quality programs.
- *Using public resources to leverage commercially motivated private money*. The only way to meet the large resource requirements is by leveraging scarce official funds and the funds charitable foundations make available with other resources. These funds should be used strategically to mobilize or "pull in" commercially motivated private financing. Good candidates for applying pull mechanisms are activities that offer the eventual prospect of a commercially-run business, for example, developing and distributing new drugs and vaccines, bridging the information technology gap between rich and poor countries, and increasing agricultural productivity in developing countries.

This chapter follows the structure of the book. It begins by reviewing the various concepts underlying the term public goods. It then discusses alternative governance structures and, especially, how new incentives could induce internationally responsible actions. Finally, it considers strategies for financing and the special role of international financial organizations.

DEFINING INTERNATIONAL PUBLIC GOODS

What exactly are IPGs? Given the recent popularity of this concept, there is a danger of the term being usurped for all manner of purposes, so that it loses both its analytical and practical significance. For example, poverty alleviation is sometimes described as an IPG. If that were so, almost all development activities would fall under the umbrella of IPGs, and the concept would have

lost its edge. At the other extreme, as contributions to this book show, pinpointing exactly what is a public good is often difficult. Few goods fall into the category of pure public goods. Most are "impure" or mixed, displaying the characteristics of both private and public goods. A practical judgment has typically to be made in operationalizing the concept, which leads to a small, but significant and growing, set of development activities (see World Bank 2001; chapter 5). Box 1.1 lists those goods that can be reasonably considered IPGs and concludes that, while it is not useful to regard poverty reduction itself as an IPG, the IPGs we do consider can play an important role in reducing poverty.

In addition, besides the obvious semantic problem that a public good is not always a tangible good, but the elimination of a "bad," an important characteristic of some of the most important public goods is that they take the form of rules and institutions rather than benefits that provide direct utility.

Nonrivalry and Nonexcludability

Morrissey, te Velde, and Hewitt discuss the concept of IPGs in chapter 2. Starting from Samuelson's classical definition of a public good, the authors reflect on the meaning of both "international" and "public." They define an IPG as a benefit providing utility that is, in principle, available on an international scale. While they point to many difficulties in all three terms, "international," "public," and "good," they work with the traditional definition: IPGs are nonrival and nonexcludable across international borders.

Nonrivalry is the easier problem. My consumption of a particular good does not reduce your consumption. Nonrivalry raises the challenge of determining the optimal quantity of a public good: some form of cost-benefit calculation is required to determine how much of a particular good should be provided.

Nonexcludability is the source of coordination and financing problems in the provision of public goods because of the incentive to free-ride. As all countries benefit, all should contribute to the cost of providing IPGs, but the problem of valuation and of differences in countries' ability to pay can complicate matters. Different countries may place different values on certain public goods, leading to differences in their motivation to contribute to the supply of the goods, while their incomes and other factors affect their ability to contribute. The variation in the ability to contribute gives rise to the need for international transfers in the production of public goods, bringing to the fore

Box 1.1. How Can IPGs Help Reduce Poverty?

IPGs could yield a high payoff in terms of poverty reduction by improving outcomes in certain policy domains that are particularly relevant to developing countries. This would improve the effectiveness of aid.

- *Health*. Infectious diseases severely disrupt economic life in many developing countries. They kill many adults during their productive years, and the dislocation of families to escape these scourges reduces investment in child development. Even when disease does not kill or threaten to kill, it often reduces economic activity well below its potential. For example, malaria continues to impose a high cost through lost workdays.
- *Environment*. Many tropical developing countries are more vulnerable to projected climate change than countries in the temperate zones. Global warming is likely to affect food production in the tropics adversely and may increase the range of tropical contagious diseases. Some low-lying developing countries, such as Bangladesh, are also likely to be disproportionately affected if sea levels rise, because they lack the resources and infrastructure to cope with the resulting floods.
- *Knowledge*. Modern information and communications technologies have greatly enhanced developing countries' ability to tap into the global knowledge pool. These technologies help improve people's access to services and resources, thereby empowering them and expanding their economic opportunities. For example, biotechnology has improved plant varieties and the genetic potential of livestock, allowing more flexible crop management and boosting productivity. This may accelerate the reduction of rural poverty, which has recently slowed in a number of countries with a large number of poor.
- *Peace and security*. Conflict triggers instability and social dislocation, hampering growth and undoing progress in poverty reduction. As Africa's experience demonstrates, civil wars and domestic unrest can easily spread, destabilizing entire regions and limiting countries' abilities to share in the benefits of expanding world trade, financial flows, and technological advances.
- *Financial stability*. Boom and bust economic cycles prevent countries from consolidating progress in poverty reduction, because it is the poorest who are the most vulnerable to these swings. For example, evidence from metropolitan areas in Brazil shows recent large swings in the poverty rate, which edged up in the wake of the emerging market financial crisis and has fallen again since late 1999 thanks to the resumption of growth.

Although a number of global and regional endeavors to create IPGs entail considerable investment costs, others do not. For example, the chief input into the creation and promulgation of rules and standards to safeguard financial stability is negotiations, not capital. Such policy initiatives may therefore have even higher financial payoffs in terms of poverty reduction.

Source: World Bank (2001).

a new role for official development assistance (ODA) or foreign aid (multilateral and bilateral).

In chapter 3 Barrett discusses how coordination problems are resolved in local communities and within nations. In essence, the solution lies in a clearer definition of property rights, which then create private incentives to cooperate. In his classic contribution, Coase (1990) reviews the history of lighthouses in the United Kingdom and concludes that property rights were reasonably well defined and permitted a system of user fees (principally, a fixed entry fee) that funded lighthouses without extensive state intervention. However, Barrett argues that such a definition of property rights becomes progressively less useful as the spatial domain expands to include an increasing number of nations.

Morrissey, te Velde, and Hewitt reflect on another interesting definitional issue: what is the difference between externalities and public goods? In a recent contribution, Kanbur (2001b) uses both terms in the title of his paper, but then uses them synonymously in the text. The term externality refers to the consequences my actions may have for others for which they receive no financial compensation. We believe that the term cross-border externality is perhaps more descriptive of a problem that requires international attention, and that the term public good, with its more subtle connotations, is less easy to handle both analytically and operationally. But perhaps this ship has sailed. Morrissey, te Velde, and Hewitt, arguing through examples, conclude that while the problem originates, in the first instance, through externalities, the solution takes on the character of a public good. Thus when nations pollute, that has consequences for other nations for which they are not compensated. The polluted environment then becomes a public bad that requires public action.

Based on these considerations, Morrissey, te Velde, and Hewitt offer a classification of public goods. In the spirit of World Bank (2001), they conclude that several categories of public expenditures that relate to the environment, health, peacekeeping, knowledge generation and diffusion, and international governance are most closely related to public goods. They then classify the public goods into two categories: those that principally have national benefits and those that have international benefits.

Rules and Institutions

Rules and institutions are themselves public goods, and are key to the provision of IPGs. Indeed, they often better meet the criteria for nonrivalry and

nonexcludability than do direct benefits arising, for example, from a cleaner environment and more research and development. Nonrivalry applies clearly to standards and with minor qualification to institutions. Nonexcludability, as always, is more problematic. Standards can be proprietary and institutions can close their doors to some would-be participants. Standards are seldom uncontroversial. A key problem with setting standards is that standard setting assumes knowledge of and consensus on a variety of matters. For example, economists disagree about the design of an efficient bankruptcy law and about whether fixed or flexible exchange rates are superior. Even the new guidelines for capital adequacy, which have key regulatory implications, invite controversy. However, a variety of standards and institutions have open accessibility.

Barrett, in chapter 3, considers the role of standards in helping achieve coordination in relation to achieving a cleaner environment. The role of financial standards is discussed in World Bank (2001), which also summarizes some of the growing literature on that subject. Sandler, in chapter 4, describes several international public institutions with varying degrees of accessibility that provide, for example, peacekeeping, communications, and development finance services.

Technology for Public Goods Production

The discussion above has focused on the nature of benefits and costs associated with IPGs. However, a cost-benefit analysis for their provision also requires knowledge of their production technology.

In this context it is useful to consider three types of IPGs, which Sandler discusses in detail in chapter 4 and are summarized here in table 1.1. Best shot goods, which depend on focused technical expertise and benefit from economies of scale, are organized for production and delivery in a centralized location or in a closely networked manner. Traditionally, such goods have been supplied through the so-called "push" model, with the public sector sponsoring the enterprise and assuming the full financial risk.

"Pull" measures operate by recognizing that the public sector continues to bear some of the responsibility for financing public goods even as it seeks to harness the private sector's flexibility and entrepreneurship. This is achieved by shifting some of the risk of product development to the private sector. Pull measures are not, however, conventional subsidies, but are more like contingent contracts. Payment is due only if services are delivered.

Table 1.1. Production Technologies of Public Goods: Institutional Implications

Supply technology	*Examples*	*Institutional implications*
Best shot: the most concerted effort determines the public good level	• Finding a cure for AIDS • Neutralizing a pest • Engineering the next green revolution	Incentives in the form of "prizes," or assured compensation, shift the risk of product development to the private sector. Requires complex public-private partnerships and supporting regulations.
Summation: the (weighted) sum of individual contributions determines the public good level	• Curbing air pollution • Reducing global warming • Cataloging species	Cannot typically rely on voluntary action at the national level. International treaties can create the property (trading) rights needed for provision of the public good, but also requires systems of taxes and penalties that limit the free-rider problem.
Weakest link: the smallest effort determines the public good level	• Containing river blindness • Limiting the spread of insurrections • Achieving international financial stability	Capacity building required in poor countries. Partnerships among various participants can circumvent collective action problems. Incentives are critical to limit moral hazard (cheating) that puts others at risk.

Source: Adapted from chapter 4 in this volume.

In contrast, summation and weakest link goods, which depend on the actions and contributions of widely dispersed individuals, are not generally suitable for either the push or the pull approach. Instead, such goods require a wide set of global partnerships. Official agencies essentially play a catalytic role, and the pragmatic mobilization of global coalitions through informal partnerships, standards, and treaties becomes more prominent.

INCENTIVES FOR RESPONSIBLE ACTION

When global outcomes result from the uncoordinated actions of many individuals, institutions, and governments, the unintended consequences can sometimes be financially serious, but additional financial resources do not always

help achieve the needed coordination. Coordinated action requires incentives, not just for the sake of efficiency, but also for inclusiveness. Establishing incentives for governments, nongovernmental entities, the business sector, and individuals to act in the global interest lies at the core of providing IPGs. Measures to contain global warming and maintain financial stability and the international trade regime are some of the most prominent examples where international coordination is critical.

The policy goal is to establish rules of the game that promote efficiency, transparency, and equity in access. To that end, the global community uses a variety of devices, including standards, treaties, and supporting regulations. This section first follows Barrett's arguments in chapter 3 to highlight the constraints on effective coordination through these mechanisms. However, it then goes on to suggest where the possibilities for coordination may lie. It follows Barrett in exploring the idea of a "tipping" balance. When a sufficient number of parties agree to a course of action, then the balance can quickly shift from a lack of cooperation to a cooperative outcome. To this end, this section explores the current constraints underlying the Kyoto Protocol on global warming and concludes that a learning process is ongoing, which could achieve coordinated outcomes in the future. Similarly, the recent emergence of a variety of global coalitions in the form of advocacy and action groups could also help achieve a critical level of cooperation.

The Constraints to International Coordination

Cooperation in the supply of IPGs—on a global or regional scale—is often expressed in an international treaty or agreement, supported by the required institutions, for example, a treaty secretariat and, possibly, arrangements for side payments. Treaties can set rules of the game in a way that is more binding than standards, but with a few important exceptions, such as fisheries treaties and the Montreal Protocol for Ozone Reduction, they have been difficult to accomplish. Regulatory oversight of global activities has succeeded in some areas, such as air traffic control, but has been more contentious in others, such as international antitrust and competition policy.

Barrett, in chapter 3, identifies why international cooperation is difficult, using the concepts of game theory. He argues that international treaties are extremely difficult to enforce, because they almost always allow a country to opt out. He then asks if trade linkages, which are based on reciprocal relations,

can be used to enforce treaties and is pessimistic on this score. Instead of the "stick" of trade sanctions, the "carrot" of financial compensation may sometimes work, but again, Barrett is not optimistic.

A country's interests in influencing the supply of global and regional public goods depends on what other countries are doing, therefore treaty design must take this strategic interdependence into account. Barrett explores many of the implications that flow from this observation. For example, where strategic interdependence exists, negative and positive feedback is possible. With negative feedback, as one country increases its supply of the public good, others have an incentive to reduce their supply. In contrast, with positive feedback, some may have an incentive to increase their supply.

Barrett notes that a supranational government backed by the power to tax could remedy the mismatch of demand for and supply of IPGs, but because no such entity exists, the commitment of public and private resources to IPGs requires the coordination of efforts across national borders, a process that is often slow and difficult to enforce. Barrett notes also that successful treaties have typically depended upon the interests of a single nation or a few nations for whom the obligations under the treaty were beneficial, almost no matter how the other countries chose to proceed. He cites the Montreal Protocol for Ozone Layer Depletion as an example where the strong U.S. interest created the necessary condition for the treaty to be established.

On a more hopeful note, Barrett's analysis shows that in the presence of positive feedback coupled with a threshold effect, a tipping point may exist, such that with the agreement of a critical mass of nations, the incentives to join the treaty are increased for the nonparticipating nations. The global system of trading rules achieved under successive rounds of multilateral negotiations is an example. Starting principally with a small group of industrial nations, over time an increasingly larger group of countries has become party to the obligations under these rules. Moreover, even though the system embodies a set of reciprocal obligations, and hence the possibility of reciprocal sanctions, countries have increasingly come to accept something close to an economist's ideal: the merits of unilateral trade liberalization.

The Kyoto Protocol: The First Stage of a Learning Curve?

Even though disastrous consequences resulting from global warming are low-probability events, their costs, if they transpired, could be catastrophically high,

and would also be disproportionately borne by the poor. Therefore, pursuant to the precautionary principle, the global community has a strong interest in mitigating these risks, and despite the controversies that have arisen, progress to date demonstrates that the coordination of incentives can be achieved in an evolutionary way. Currently the main approach to reducing global warming, embodied in the 1997 Kyoto Protocol, establishes quantitative limits by country on its emission of the greenhouse gases responsible for warming: signatories to the protocol are required to reduce their greenhouse gas emissions at least 5 percent by 2008–12. While many elements of the protocol are subject to criticism, it is a necessary step toward a global governance system for managing the risks of global warming. The many experiments currently under way could create the necessary basis for a substantive agreement.

A special feature of the Kyoto Protocol is its Clean Development Mechanism, which provides for the possibility of international trade in emission rights. Such trade would contribute to efficiency in reducing emissions, and could also transfer significant resources from industrial to developing countries. If trading rights function effectively, the marginal cost of eliminating a ton of carbon emissions could fall from US$200 to US$23 (Cooper 2000). However, some consider the protocol as a whole to be both inefficient and unworkable (Cooper 2000; Nordhaus and Boyer 1998; chapter 3 in this volume).

Despite the provision for trading, however, Nordhaus and Boyer (1998) conclude that the approach is inefficient, because the benchmark emission reductions set for different countries are arbitrary and will not lead to a globally optimal mix of reductions. Moreover, about two-thirds of the costs would fall on the United States, which because of the macroeconomic implications is unlikely to support the protocol. Others criticize the Kyoto Protocol for being difficult to monitor (Cooper 2000) and for its weak treaty. However, despite its weaknesses, new ideas and practices are emerging from experience with the negotiation of the Kyoto Protocol, which could lead to a more acceptable and workable system.

The immediate prospects of international trade in pollution rights under the Clean Development Mechanism are not bright, but the idea's eventual promise makes this an important experiment. Under the mechanism, industrial countries that have committed to reduce their greenhouse gas emissions could purchase rights to emit greenhouse gases from activities in developing countries that hold emission rights. Emission rights trading is intended to ensure that emissions reductions occur where they are cheapest to implement.

The Kyoto Protocol is unclear about exactly how such reductions would be measured and certified. This is a crucial impediment. However, if the mechanism could be made to work, the resulting resource transfers to developing countries could be US$5 billion to US$10 billion a year (Black and others 2000). The major beneficiaries would be China, India, and Russia, but other countries would also benefit.[2] For Colombia, sales of pollution permits could raise revenues equal to those from exports of bananas or cut flowers (Black and others 2000). Collateral benefits in the form of higher rural wages, higher employment, greater technology transfers, and reduced air and water pollution could add to the development impact (Austin and Faeth 2000; Black and others 2000). The Prototype Carbon Fund, a private-public partnership sponsored by the World Bank, aims to facilitate emissions rights transactions between private investors and host countries (see Newcombe 2001 for details). By monitoring emissions reduction, verification, and certification, the fund could help build trust between the parties from an early stage. Such trust is necessary for sound development of the market. The fund also expects to attract additional public and private resources and promote the transfer of environmentally safe technologies. The Prototype Carbon Fund is an example of networks that could help increase coordination across national borders.

Networks for Fostering Coalitions

In the absence of a central authority to ensure coordination, can informal coalitions of stakeholders serve a constructive function? The spontaneous growth of global coalitions that can be observed today is a favorable development. These networks of nongovernmental and governmental actors carry some of the burden of building constituencies for coordinated action. Multilateral organizations can play a critical convening function and a role as catalysts and supporters of coalitions to provide IPGs.

Reinicke (2001, p. 43) states that these trilateral alliances among governments, civil society, and the private sector serve to "internalize the changing global environment, especially the basic value of deeper integration of the world economy." By bringing together complementary strengths, they help "address transnational issues that no single group can resolve itself." However, as Picciotto (1995) has emphasized, global networks are effective when their organization reflects the characteristics of the public good in question.

Alliances have been used extensively in the corporate world, where they serve two functions: reducing transactions costs and fostering a learning process (see Mody 1993). In a corporate environment, as in global public policy, transaction costs occur when markets lack sufficient information, and hence dysfunctional actions on the part of the various actors involved are possible. In principle, when the incentives to share complementary information can be created, an alliance can reduce information gaps, but the main gains are unlikely to lie in a one-shot sharing of information. Alliances' ability to achieve coordination is likely to occur principally when they can experiment with innovative approaches. The learning processes that unfold as a result can help identify, and even create, conditions under which cooperation becomes more attractive to the various parties. Balanced against these benefits are the obvious costs that arise if alliances generate restricted clubs. In the corporate world, this leads to concerns about the creation and exercise of market power. In the policy world, the concern lies with the creation of rules and institutions that serve to exclude rather than include.

Policy networks can serve several functions. They can, for example, advocate special causes, but they can go further and help negotiate and set global standards (Reinicke 2001). An example that illustrates the potential for networks is the World Commission on Dams. The commission was charged with the sensitive task of proposing standards that could meet multiple objectives: furthering economic growth, protecting the environment, and ensuring a fair deal to those who are displaced or otherwise hurt by the construction of the dam. The commission brought together political and economic leaders from across the globe. Multilateral institutions such as the World Bank worked mainly to facilitate the process. In the event, the progress achieved was perhaps limited and the challenges remain; however, as with the Kyoto Protocol, such efforts are early steps in confronting complex tradeoffs.

INTEGRATING COUNTRY-BASED FINANCING AND GLOBAL AND REGIONAL PROGRAMS

The financing of IPGs raises a series of questions. What do we know about the trends in the financing of IPGs? Are these trends largely beneficial, or are there underlying risks against which policymakers need to be vigilant? Looking ahead, is a centralized pool of funding to finance IPGs something to think about? What types of financing arrangements would make the most effective use of

scarce public resources? What should the role of international financial institutions be in furthering the financing of IPGs?

International Development Assistance for IPGs

The provision of IPGs calls for policies and financing at various jurisdictional levels ranging from the local to the global. At this time, we simply do not know how much aggregate funding occurs for IPGs. We do have a somewhat better idea about a narrower question: the extent of official financing by multilateral and bilateral donors that directly or indirectly facilitates the creation of IPGs in developing countries (see World Bank 2001, chapter 4). Such financing does not, of course, include the financing of IPGs undertaken in the industrial countries. Thus, for example, the annual budget of the U.S. Environmental Protection Agency is about US$10 billion dollars, much of which potentially provides an IPG; all ODA directed toward environmental IPGs is about one-tenth of the U.S. Environmental Protection Agency's budget. However, official financing also omits the IPGs financed by developing countries without international assistance and expenditures incurred by multilateral agencies but not financed by the conventional aid budget. Thus, for example, funding of United Nations peacekeeping forces is not reflected in official financing statistics, which therefore show a smaller amount devoted to matters related to safeguarding of peace than is the case in reality (see World Bank 2001).

Yet despite these limitations, trends in the official financing of IPGs are important not only because of the implications for the effectiveness of such financing, but also because these trends are likely to reflect broader global priorities.

Core and Complementary Activities

In the empirical discussion that follows, an important distinction in made between core and complementary activities. Core activities aim to produce IPGs. These activities include global and regional programs, as well as activities that are focused in one country, but whose benefits spill over to others. Examples of multicountry programs include carrying out international agricultural research; creating incentives to achieve breakthroughs in medical technology; and holding negotiations to develop rules and standards, such as the bank solvency proposals the Basle committee of financial regulators advanced in early 2001. An example of a country-focused activity with positive spillovers is an effective

epidemiological policy to combat a disease in one country that also reduces neighboring countries' exposure to that disease.

By contrast, complementary activities prepare countries to consume the IPGs that core activities make available, while at the same time creating valuable national public goods. Traditional country-based financial flows to support domestic policy, institutional reform, and investment in infrastructure are primarily motivated by the benefits expected within the country, but these flows and the national public goods they help create may also enhance the country's ability to absorb the benefits of IPGs. For example, a country cannot use international agricultural research goods effectively in the absence of adequate domestic agricultural services and incentives. Thus core and complementary activities interact. For the best results, they must go hand in hand.

Trends in International Resource Transfers for IPGs

International resource transfers for core activities amount to about US$5 billion a year (table 1.2). Sources with a global or regional mandate provide US$3 billion a year, typically as grants—private charitable foundations contribute about $1 billion and the rest is channeled by official donors through a variety of trust funds. In addition, country-based concessional aid (grants and loans with a grant component of more than 25 percent, commonly referred to simply as "aid" and more formally as ODA) finances transfers in the amount of US$2 billion for those national public goods that, like peacekeeping, also have cross-border implications.

Table 1.2. Sources of Funding for IPGs and Complementary Activities, Annual Averages, 1995–99
(US$ billions)

	Global and regional funding		*Country-based financing*		
Category	*Foundations*	*Trust funds*	*Concessional*	*Non-concessional*	*Total*
IPGs ("core" goods)	1	2	2	0	5
Complementary goods	0	0	8	3	11
Total	1	2	10	3	16

Source: World Bank (2001) based on The Foundation Center (1997, 2001); Development Assistance Committee of the Organisation for Economic Co-operation and Development data.

An additional US$11 billion a year is spent on complementary activities that fund domestic mechanisms and the infrastructure that allow countries to absorb the benefits of these IPGs. Thus, for example, funding is needed to build domestic public health infrastructure so that countries can benefit from such IPGs as drugs and vaccines to control infectious diseases; and environmental education, training, and administrative capacity are needed at the local level to complement international agreements to reduce pollution. These complementary activities are funded in large part by concessional funds (US$8 billion), and in part by nonconcessional lending from multilateral financial institutions (US$3 billion).

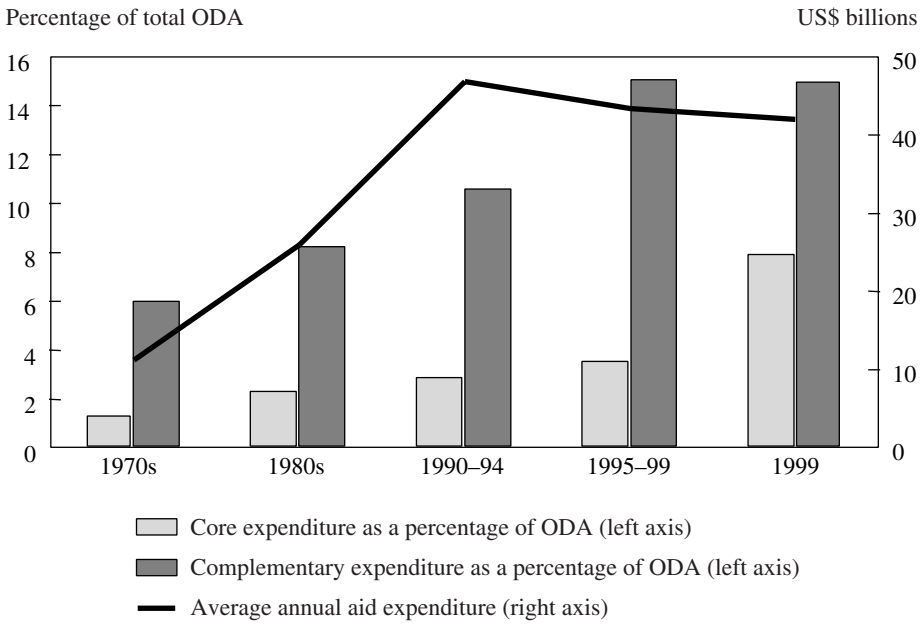
The Role of Aid: Official Development Assistance

Although philanthropic assistance is important and likely to grow (World Bank 2001), as is nonconcessional official assistance, the bulk of funding comes through concessional assistance or ODA. In the second half of the 1990s ODA contributed about US$2 billion a year toward core IPG spending. As a fraction of total ODA, spending on IPGs rose from about 1.5 percent in the 1970s to 3.5 percent in the late 1990s (figure 1.1). In 1999 core spending reached nearly 8 percent of ODA, largely reflecting increased expenditure for peacekeeping operations. Funding for health, the environment, and peacekeeping has grown significantly, while that for knowledge generation and dissemination has stagnated.

A far more significant part of ODA—estimated at about US$8 billion a year in the late 1990s—is channeled to complementary expenditure. This component rose from about 6 percent of all ODA in the 1970s to more than 15 percent in the late 1990s. These expenditures have been relatively resilient in the face of declining aid flows since the mid-1990s. They are particularly important in the health domain, where the control of infectious diseases requires significant supporting infrastructure.

In chapter 5, te Velde, Morrissey, and Hewitt present a detailed analysis of spending by official donors on IPGs. The authors classify public goods into five "sectors": environment, health, knowledge, governance, and conflict prevention or security. Building on the analysis of World Bank (2001), they prefer to divide public goods into international and domestic categories. While these match the core and complementary distinctions to a significant extent—both in levels and trends—as the authors explain, some differences are apparent. These authors also examine the behavior of specific donors with regard to the financing of IPGs and find a generally rising trend.

Figure 1.1. Share of Development Assistance Allocated to IPGs, 1970–99



Source: World Bank staff estimates.

Te Velde, Morrissey, and Hewitt also ask if the increasing share of resources that have been directed to the provision of IPGs has come at the expense of other forms of aid. Until the early 1990s, while expenditures on IPGs grew, so apparently did expenditures on all other aid. However, the continued increase in spending on IPGs in the 1990s took place in an environment of declining overall aid, implying that IPG spending is displacing other expenditures. They conclude, however, that spending on national public goods in the five sectors they consider also grew in the 1990s. Thus IPGs and national public goods grew, while other traditional forms of aid declined.

Regional Public Goods

In chapter 6 Ferroni examines the financing of regional public goods. His analysis agrees with Barrett's that regional public goods may be easier to supply than global public goods. All else being equal, the incentives to free-ride increase

with the number of countries that must supply a public good. Given the growth in the number of regional trade agreements during the past decade, Ferroni infers that the demand for regional public goods is rising. The pursuit of commercial integration gradually leads to cooperation in policy domains beyond trade, including infrastructure (an area of cross-border cooperation not addressed here or in chapter 5), finance, public health, environmental codes and standards, and other areas. However, he notes that joint action by countries in a region is neither straightforward nor easy, despite the growing interest in regional integration worldwide.

Ferroni focuses on the role of the multilateral development banks in supplying and financing regional public goods. He argues that these institutions are increasingly engaged in working with their borrowing member governments to supply regional public goods and analyzes how the banks' lending and nonlending operations are financing regional public goods. With reference to the core versus complementary distinction, he clarifies the types of public goods-related activities that can be funded by means of loans, specifies those instances where the less abundant resource of grants is appropriate, and outlines some of the pitfalls that can accompany grant financing.

Can—and Should—Additional Official Resources Be Devoted to IPGs?

While no estimate exists for the resources required for IPGs, the presumption often is that significant additional resources could be effectively used. For example, the United Nations Special Session on HIV/AIDS concluded: "An overall annual expenditure target of US$7–10 billion in low- and middle-income countries must be reached to mount a comprehensive and successful response to HIV/AIDS. The shortage of resources to fight tuberculosis and malaria stands at about US$2 billion a year" (see http://www.un.org/ga/aids/ungassfactsheets/html/ fsfund_en.htm). Clearly these sums are large not only in relation to official resource transfers for IPGs, but also in relation to the overall aid flows to developing countries.

In the case of other IPGs, the demand for additional resources is more controversial. For example, with respect to global warming, Schelling (1997) argues that the benefits will largely accrue to future generations, who will also be richer, and who should, therefore, bear the cost. Thus scarce resources should

be used to finance current more pressing needs. In chapter 4 Sandler urges caution in the enthusiasm for expanded financing of IPGs. He notes that the examples of pure public goods are few, and that institutional arrangements can often be achieved to create "club" goods, which can then generate revenues necessary for the financing of such goods.

Kanbur (2001a) believes that IPGs help justify more aid. To him, global demand for more IPGs justifies additional aid, though such additional aid may best finance traditional (in our terminology, complementary) expenditures, such as health delivery systems. He notes, however, that in some instances shifting existing aid expenditures to the industrial countries for the provision of core public goods may be desirable. Thus research and development (R&D) in relation to certain knowledge products may be most efficiently conducted in industrial countries.

Cooper (2001, p. 22) cautions that even if the case for significantly stepped-up resources could be made, the prospects for doing so are not good. Reviewing the evidence for proposals to create an international pool of resources that could be used for financing IPGs, he notes that either the proposals were not based on sound principles, or the amounts involved were small, or, most important, the political consensus to implement the proposals simply did not exist. In practice, he concludes, the answer to the question: "Are there any prospects for developing fully *international* sources of finance for global public goods?" is no, because of "the attitude of governments and their public towards taxes."

The problem of added resources may ultimately be solved in unconventional ways. Lancaster (2000) argues that political support does exist in the United States for devoting more resources to global problems, but that these resources are being channeled in new ways that reflect the objectives of either directly dealing with the poor or mediating aid through the private sector. The U.S. tax credit for development of an AIDS vaccine is an example of funds made available, but not transferred through traditional channels. Tax incentives for charitable giving similarly enlarge the resource envelope. These and other shifts imply that in the aid business, it will not be business as usual.

Thus both the rationale and prospects for a general enhancement of resources for IPGs remain clouded. For this reason, while the importance of ensuring adequate funding for specific purposes, such as dealing with HIV/AIDS, cannot be minimized—and, indeed, scarce available resources should be used to their maximum potential—the continuing emphasis must be on generating incentives at the local level for activities that contribute to IPGs.

Leveraging Official and Philanthropic Resources

Private foundation and official resources are scarce, and the claims on their use are many. Leveraging these resources can expand the envelope of funds available to provide IPGs. The goal of such leveraging is to attract commercially-oriented resources, but because of the financial risks involved in the provision of such goods, private funding may not be forthcoming. Pull mechanisms operate not by subsidizing activities in the traditional manner, but by assuring sales contingent on the successful development of the public good in question. Such leveraging is most likely in the development of vaccines and new agricultural technology, but possibly also in narrowing the digital divide. In these contexts a key technological development is often required that, in turn, implies the deployment of significant dedicated resources. By offering the "prize" of an assured minimal market, the private sector can sometimes be motivated to devote its own resources to the risky development phase. The chronometer to solve the longitude problem and the means to control cholera were both the results of prize competitions (Cooper 2001). Pull mechanisms through contingent contracts can be both effective and efficient, because they pay for the output of research (the public good itself), not for the inputs (Kremer 2000).

The push approach has traditionally been used for best shot public goods that require a high degree of technical expertise and where high fixed costs of production are associated with significant technical and market risks (see table 1.1). Knowledge and knowledge infrastructure are best shot public goods, of which the Internet is an example. The U.S. Department of Defense and its Advanced Research Projects Agency created the Internet. Its use exploded through private initiative once the network and its protocols had been established, and could be greatly enhanced through an initial push on portals and navigation standards for developing country communities. Such a push could not only fund early fixed costs, but could also generate demonstration effects that subsequently pull in new private initiatives.

Because the incidence of HIV/AIDS is highest in many developing countries with a low ability to pay, the incentives to invest in R&D are weak, as the developer may not be able to directly recoup the costs.[3] Low purchasing power and low childhood immunization rates create the presumption on the part of pharmaceutical companies that the market for an AIDS vaccine in developing countries would not be large enough to warrant the investment. Even though the cost of all four basic childhood vaccines is less than US$1 per child, coverage

remains low in the poorest countries, and an AIDS vaccine is likely to be much more expensive.

Recent push mechanisms for vaccines have operated through networks of governmental and nongovernmental organizations, with representation from the private sector. The Medicines for Malaria Venture, the International AIDS Vaccine Initiative, and similar networks draw funds from private foundations and official trust funds to finance vaccine and drug development (for details, see World Bank 2001).

Other pull approaches are under consideration. Under a U.S. government proposal, every US$1 of vaccine sales would be matched by a US$1 tax credit.[4] Setting up an HIV vaccine purchase fund financed by donors and developing countries would also signal the commitment to pay for a vaccine and would stimulate private sector research. A replenishing fund has been proposed using International Development Association (IDA) resources and other multilateral concessional funds (Ainsworth and others 1999). Providing contingent loans and guarantees to developing countries to purchase a vaccine that would meet donors' standards is another option to stimulate private sector R&D. By creating a greater likelihood of vaccine use, traditional country-based programs can also pull the development of vaccines.

Some major uncertainties surround global pull initiatives, however. Is the international community willing to lock in large amounts of capital for a long time if this means reducing the availability of resources for other development priorities? Will the promise of funds be credible enough to bring about the necessary research effort? Will the processes for evaluating whether countries qualify to receive such funds be simple enough to minimize disputes? These uncertainties reveal why country-specific development assistance and policy dialogue should continue.[5] Indeed, by building the infrastructure needed to deliver vaccines and provide supporting medical and sanitation services, such country programs may exert the strongest pull on vaccine development.

The New Challenges for International Organizations

International organizations have been central to the provision of public goods through their resources, their knowledge transfers, and their global negotiations and rule making (Kapur 2000). They also generate information; lower the cost of transactions; encourage members to think about a common future; create

links across issues; and create and diffuse ideas, norms, and expectations (Martin and Simmons 1998; Ruggie 1992). In addition, they negotiate and manage rules for conditionality, sanctions, and even the use of direct force (as in the case of the North Atlantic Treaty Organization). International organizations are themselves IPGs (see chapter 4 in this volume).

Thus international organizations are critical to the three-pronged approach to IPGs advocated in this chapter: in their catalytic role in convening stakeholders and providing platforms for international joint action, as conduits for funding investments (both for the core and complementary activities) that their clients undertake, and in the creation of the frameworks to leverage public resources with private funds. However, significant challenges lie ahead. In light of the foregoing discussion, it is not clear that international organizations will be able to deploy more resources unless a significant change occurs in the international aid environment. Linked to the question of more aid is the ability of all donors to use their funds more efficiently, a challenge that does not go away with the move from traditional expenditures toward IPGs. At the same time, to function effectively themselves, international organizations need to better coordinate with each other, observing the principle of subsidiarity. They could also achieve greater effectiveness by deploying innovative financial instruments; however, we would caution against the search for more finely-tuned financial instruments unless set in the context of genuine project opportunities.

Making larger aid budgets available to international organizations and to all donors could significantly boost priority areas, such as vaccines and drugs for diseases that disproportionately affect the poor. However, additional spending on a significant scale risks damaging existing country programs and complementary expenditures. While more funds may be available, they may not be routed through the traditional international organizations. At the same time, the concern also exists about how efficiently aid resources are used. Both more funds and new incentive frameworks for effective aid deployment are needed, as are improved mechanisms for aid coordination (World Bank 2001, chapter 4). The IPGs agenda opens up new, and heretofore little explored, dimensions of aid coordination that relate to timing, balance, and synergy between core and complementary activities.

International organizations must be willing to observe the principle of subsidiarity: allowing the most effective organization in any given initiative to take the lead. They must partner with others to establish priorities, set standards, and use demonstration projects to create knowledge for action. The

discussion of such coalition-based governance and the meaning of subsidiarity in this context is still at an early stage. It will need to evolve in the context of an appropriate, yet still to be identified, framework for achieving effective policymaking in a decentralized stakeholder setting. By operating in a network-based system of governance, international organizations will influence political decisionmaking to advance global interests.

Ferroni, in chapter 6, is cautious about the proposal for differentially pricing loans for IPGs, because that does not expand the envelope of resources. In theory, differential pricing would permit fine-tuning of subsidies for different kinds of IPGs, but it could also be difficult to administer, with administration likely becoming a politically charged exercise.

In the absence of differential pricing, loans will need to be combined with grant funding in appropriate combinations to foster the production of some public goods that spill across borders. This is already being done in the form of hybrid financial products that combine concessional or nonconcessional lending (depending on the type of borrower) and grant-based co-financing. The question is where will the full measure of needed grant funding come from? Possible answers include bilateral donors and transfers financed by increased charges on ordinary capital loans extended by the multilateral development banks. Neither of these options looks promising today. The financing of IPGs requiring public funding beyond current levels is therefore likely to depend on ad hoc arrangements for some time.

CONCLUSIONS

The already difficult task of providing IPGs is embedded in the even more complex evolution of global governance structures accompanying the process of globalization. National governments, international organizations, and the new networks that join these traditional sources of authority with civil society and the private sector will guide the provision of IPGs. The incentives for the generation and delivery of IPGs—reflected in international standards, regulations, and treaties—should ideally be set by the principles of economic efficiency and equity; however, it is the broader governance process that determines which incentives are put in place. Many economists believe, for example, that carbon taxation is superior to the quantitative emission limits proposed under the Kyoto Protocol. However, the political ability to implement such taxation

does not exist at the present time. As such, the most fruitful approach is likely to be one that is not committed to a single course of action. Rather, multiple experiments in local and global contexts are likely to help illuminate what will work in practice.

The challenges of financing IPGs arise from the features that distinguish public goods from private ones, and also because of differences in the national and international taxation environments. National governments, either directly, or indirectly through their contributions to international organizations, are the principal sources of finance for IPGs. Much has been written about the scope for truly international sources of funding for public goods: the Tobin tax, the carbon tax, International Monetary Fund gold, and so on. In practice, and for many reasons (some of which are controversial), this scope is currently limited. Thus the supply of IPGs will largely continue to depend on governments' willingness and ability to devote national resources under their control to international purposes and goals. Significant contributions from charitable organizations augment official resources, and both must increasingly be leveraged by commercially motivated private money for some IPGs and for private goods and services that generate desirable cross-border externalities.

The multilateral financial institutions have come to recognize the growing importance of IPGs to their mission. This places new challenges before them, given that they have traditionally operated on a country-by-country basis. However, the pursuit of development and poverty reduction calls for policies and interventions at levels ranging from the local to the global. Thus even though the country focus continues to be important, it must be complemented by regional and global problem solving to counter undesirable cross-border spillovers and create a better environment for shared opportunities and growth. The multilateral organizations are uniquely placed to foster synergy and complementarity between country-level and transnationally focused action.

NOTES

1. This chapter draws on the authors' contributions to World Bank (2001, chapter 5). The authors would like to thank Christopher Gerrard, Ravi Kanbur, Robert Picciotto, and Todd Sandler for their comments on the chapter.

2. Other estimates predict much larger financial flows between countries, either as counterparts of permit transactions or as compensatory side payments (OECD 1999). Moderate abatement strategies would generate annual flows of about US$50 billion (in 1995 dollars), whereas more ambitious abatement paths could generate as much as US$150 billion to US$200 billion annually.

3. Total R&D expenditure on HIV vaccines was only about US$300 million in 1999, compared with an estimated US$2 billion spent annually on research for AIDS treatment and targeted to industrial country markets (Ainsworth and others 2000).

4. Unlike conventional tax credits that match R&D dollars spent, this credit would be available only when sales have been achieved. Qualifying vaccines would include those that prevent diseases causing at least 1 million deaths every year and would require regulatory approval (see Kremer 2000).

5. About 30 percent of IDA operations in health, nutrition, and population (which, on average, accounted for 15 percent of IDA investment lending in 1998–99) were directed at family and reproductive health, especially increasing immunizations and providing information on good health practices. IDA is the largest financier of tuberculosis control efforts in developing countries, with major operations in China and India. IDA is also a cofounder of the Global Initiative to Roll Back Malaria, launched in 1998 with the aim of halving deaths from malaria by 2010.

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