

Chapter 9 International Public Goods

9.1 The lives of the poor depend to an increasing degree on forces originating outside their borders. Progress in developing malaria and AIDS vaccines in developed countries can determine life and death chances for the poor in developing countries. Commodity price fluctuations generated on world markets can feed through to a cocoa farmer in Africa. Common standards set in international agreements can affect working conditions for the poorest in developing countries. Global warming can change the climate and increase the frequency of natural disasters that affect the poorest countries.

9.2 Last year's *World Development Report* detailed how globalization is changing the world—creating not only tremendous opportunities but also sometimes instability and unwelcome change.¹ These unwelcome disturbances usually do not discriminate between developing and developed countries. The collapse of a stock brokerage in Japan can now cause concern across the globe. Infectious diseases from one country can end up on the home shores of another far away, no matter how rich the country may be. High-tech crime syndicates operate around the globe with impunity.

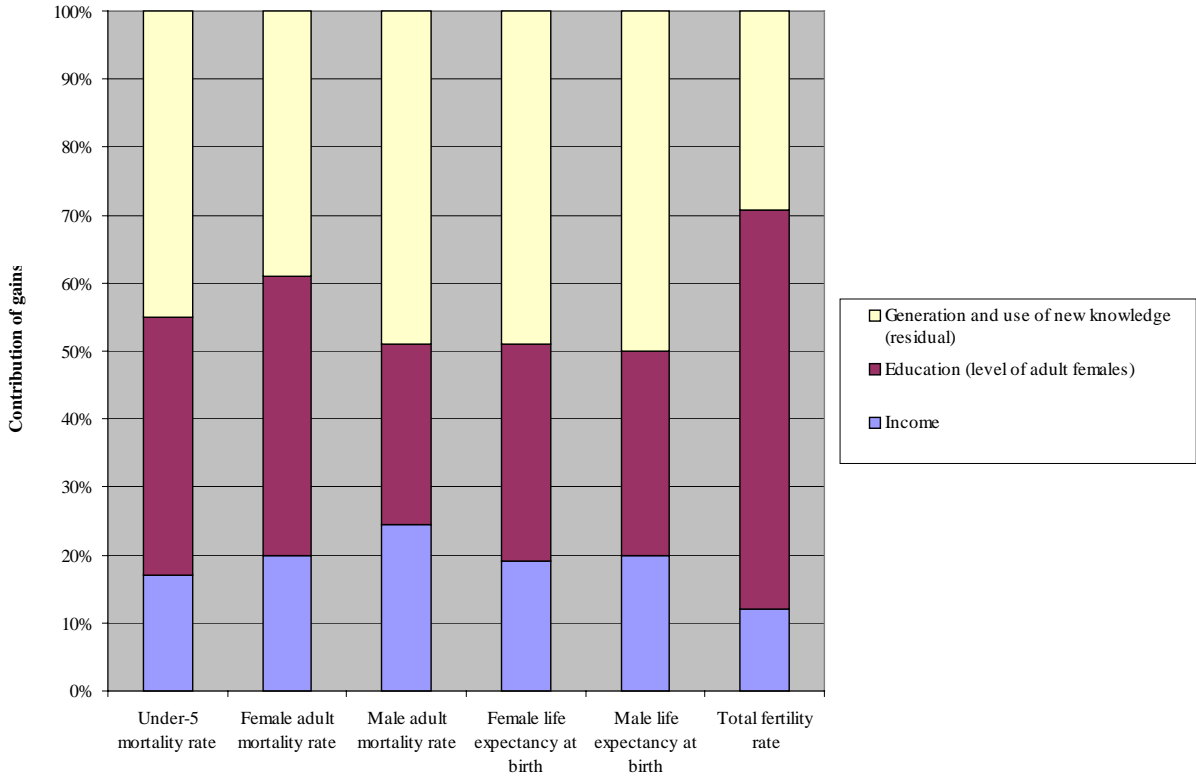
9.3 Solving these international problems requires international cooperation. More specifically, it requires the production of “international public goods”—commodities, services, or resources that have benefits that cross borders and therefore benefit entire regions or even the entire world. Examples include international economic stability, global health research, global or regional environmental improvement, and international security. These goods are important for every country. But they are essential for developing countries.

9.4 Take, for example, global health research. The 20th century saw enormous improvements in both wealth and global health indicators.² However, while improving health is highly correlated with improving *national* income, a larger amount of improvement can be explained by advances in *global* health research. Income and education explain, on average, only about half of the gains in mortality reduction between 1960 and 1990 (figure 9.1). The rest is likely to have been caused by the generation and use of new knowledge—an international public good.

¹ World Bank 1999a.

² World Health Organization 1999a.

Figure 9.1 Sources of mortality reduction, 1960-90



Source: World Health Organization 1999a.

9.5 This is not an isolated example. In fact, international public goods have a rather illustrious recent history. The Green Revolution—one of the most important development advances of the century—came about as a result of international research on high-yielding seeds that were then distributed to farmers. The research was a product of institutes established around the world with the expressed purpose of producing advances that would relieve the world’s food problem. More recently, international cooperation in the campaign to fight river blindness in Africa has had an enormously beneficial impact on 11 countries (see box 9.1).

Box 9.1 Progress in controlling river blindness

The international effort to control river blindness (onchocerciasis) has been one of the most successful programs in the history of development assistance. A painful and debilitating disease caused by a parasitic worm, river blindness has been virtually eliminated in the 11 countries included in the Onchocerciasis Control Program (OCP). Before the program began, more than a million people were infected with the disease, suffering from itching, disfigurement, eye lesions, and blindness; 100,000 people were blind. When the program winds down in 2002, after a 28-year effort to eliminate the black flies that carry the parasite, 34 million people will be protected, 600,000 cases of blindness will have been prevented, and 5 million years of productive labor will have been saved.

Partners in the program have included African governments, local communities, international organizations, bilateral donors, the corporate sector, foundations, and nongovernmental organizations (NGOs). A key contributor has been the Merck Corporation, which has distributed the drug Ivermectin free of charge. While highly successful, the OCP has run into the problem of onchocerciasis in countries outside the program area, so the cross-border problem continues. In 1996, the African Program for Onchocerciasis Control was created, extending the effort to control onchocerciasis into the 19 remaining African countries where river blindness is endemic. Seventy development partners participate in the project.

Source: <http://www.worldbank.org/gper/>

9.6 Despite their importance, however, international public goods tend to be undersupplied. The reasons have to do with two characteristics that all “public goods” possess to varying degrees. First, many public goods, once produced, have benefits that are impossible to prevent everyone from enjoying. That is, they are “nonexcludable.” Second, many public goods are products that one person (or country) can use without affecting the ability of another person to use them. This quality is often referred to as “nonrival.” A *pure* public good, then, is a good like clean air: no one can prevent others from benefiting from it, and one person’s use of it does not take away from another’s. Because of these characteristics, private incentives to produce the good are likely to lead to less of the good than is socially optimal.

9.7 Not all public goods are completely nonexcludable and nonrival. In fact, public goods exhibit a wide range of nonexcludability and nonrivalry (see box 9.2). But because they exhibit these characteristics at all, the incentives for people or countries or companies to produce them are weak or absent. In many cases, without special arrangements, the price that potential producers would be able to charge will not reflect how much the goods cost to produce. Solving this dilemma of public goods has long been a role of national government, which must provide public goods such as rules and standards, infrastructure, institutions in the public service, property rights, and law and order. But with the increasing prevalence of international problems has come growing consensus that international public goods should be an increasing focus of international cooperation—and specifically international *development* cooperation.³

Box 9.2 A classification of public goods

Public goods can be categorized by their range of nonexcludability and nonrivalry. A good like clean air is a *pure* public good, because it is completely nonexcludable and nonrival. National defense is another example, as would be a system to protect the earth from an asteroid. But between pure public goods and *private* goods—which are completely rival and excludable—there is a wide range of goods that differ according to the “publicness” of their benefits.

Some goods are only partially nonrival or nonexcludable. An example of an *impure* public good is a natural resource of a country. Natural resources like forests tend to be nonexcludable in the absence of regulations—anyone can use them. However, the erosion of natural resources means that others will not be able to enjoy their benefits—that is, natural resources are rival goods. They are therefore not purely public goods.

Other goods exhibit the opposite characteristics: they are excludable but mostly nonrival. Examples include toll roads and access to the Internet. These are often called *club goods*, and users can be charged a fee to use the good. For instance, most international phone calls and television signals are conveyed using

³ Kaul, Grunberg, and Stern (1999a) and Kanbur and Sandler with Morrison (1999).

a communication satellite network known as INTELSAT. Nations and firms pay a fee to be a member of this private consortium and have access to the good.

These different types of goods require different policy responses, as discussed in the third section of this chapter.

9.8 In the past, they have not been. Although it is difficult to disaggregate aid flows into support of national or international public goods, a proxy is whether aid goes to national or regional projects. These data suggest that less than 10 percent of development assistance goes to regional public goods.⁴ Because of the importance of international public goods in development, this is too low.

9.9 This chapter explores the prospect for providing international public goods central for development. It argues that some of the biggest challenges facing poor countries could be alleviated through the provision of international public goods—but that poor countries' lack of resources provides little ability or incentive for them to participate in the provision of many of these goods. This, it is argued, should be of concern to both developed and developing countries. The chapter also explores policy options for overcoming these obstacles, including the use of development assistance, as well as the institutional implications of these options.

International public goods and the poor

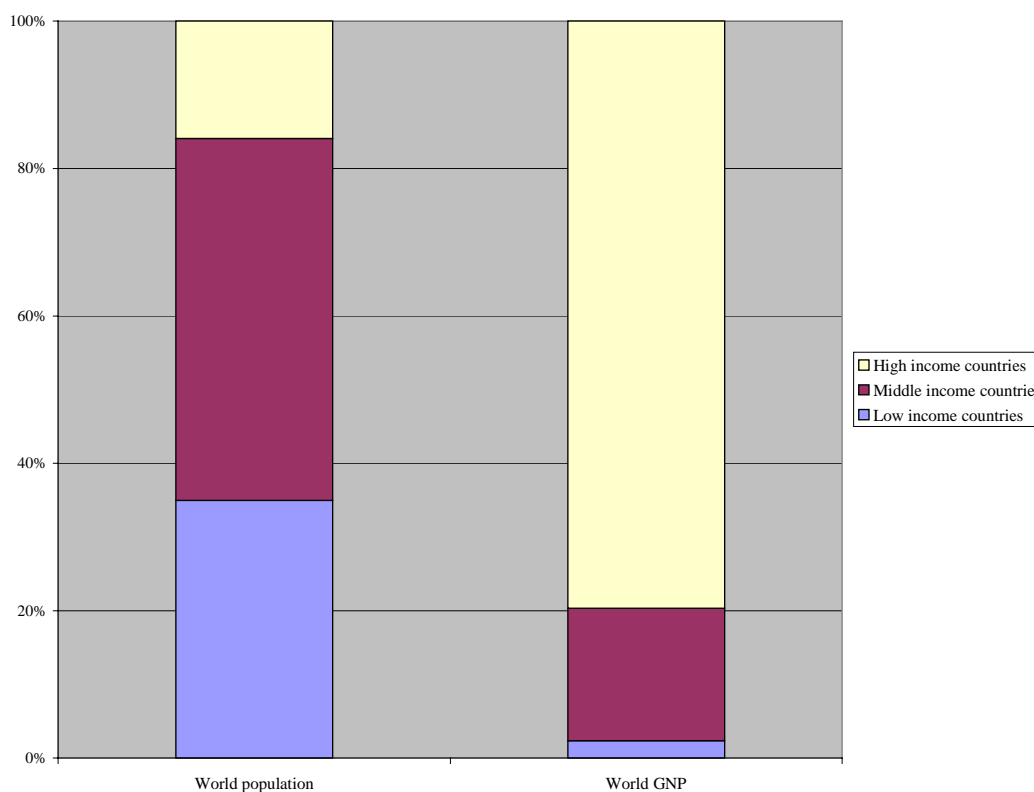
9.10 As mentioned above, one of the keys to the enormous rise in health indicators over the 20th century has been the generation and use of new knowledge. Both of these elements—generation and use—are critical for the provision of international public goods. But for any good to be generated, and used, two things must be in place. All relevant countries must have the incentive to contribute to the good's production. And all relevant countries must have the capability.

9.11 The economic inequality between nations that has arisen over the 20th century takes on particular importance in this context, because wealth is likely to influence—if not determine—a country's incentive and ability to contribute. In 1820 the average income of the richest country was 3 times that of the poorest country. It was 11 times larger by 1913, 35 by 1950, 44 by 1973, and 72 by 1992.⁵ Current shares of world GNP, even accounting for purchasing power parity, reflect the enormous disparity (figure 9.2). Understanding how this inequality—and the lack of resources by poor countries—affects the provision of international public goods is essential to creating policies and institutions that lead to the successful production of these goods.

⁴ Cook and Sachs 1999.

⁵ Maddison 1995.

Figure 9.2 Shares of world GNP show large inequality (1997 GNP measured in purchasing power parity)



Source: World Bank 1999c.

Incentives for producing international public goods

9.12 Whether a country has an incentive to cooperate in producing an international public good might depend on a number of factors, possibly including cultural differences, regional considerations, or even a desire to be seen as a cooperative member of the global community.⁶ However, because of the tradeoffs involved in any decision, willingness to contribute financially to a particular good is likely to be strongly influenced by a country's stage of development.⁷ Poor countries, for instance, would benefit as much as rich countries from environmental treaties that reduce pollution. However, international agreements on the environment need to be weighed carefully against the slowdown such agreements might cause in economic growth and poverty reduction—poor countries' highest priorities. The United Nations Framework Convention on Climate Change and the Convention on Biological Diversity (both agreed to at the 1992 Rio Earth Summit) specifically recognize that some costs may be too much for developing countries in light of other priorities.⁸ Developed countries, whose

⁶ Kaul, Grunberg, and Stern 1999b.

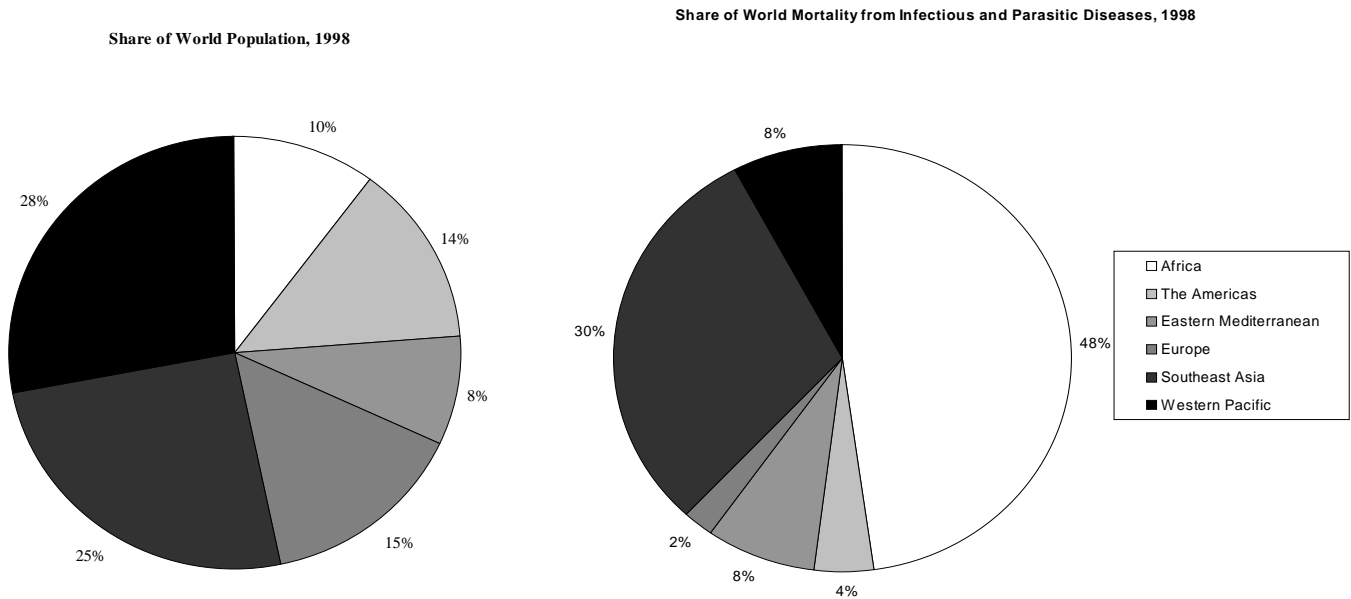
⁷ Rao 1999.

⁸ Imber 1996; Porter, Clemençon, Ofosu-Amaah, and Philips 1998.

tradeoffs may not be as severe, may see things differently. This same divergence of interests appears in many international debates, including the protection of intellectual property rights and labor standards.

9.13 Incentives to produce goods can also be affected by inequality in other ways. Some international problems are particularly disastrous for poor countries as opposed to rich ones. These include, for example, infectious and parasitic diseases (figure 9.3). However, because of developing countries' lack of resources, very little research is done on these problems, by developing countries themselves or developed countries. Developing countries account for only about 4 percent of world research and development expenditures.⁹ And governments and companies in developed countries do not do research on many developing country health problems, because of concern that the payoffs for any remedies (which can cost hundreds of millions of dollars to create) will be too low.

Figure 9.3 Susceptibility to infectious and parasitic diseases is largely concentrated in the poorest countries



Source: World Health Organization 1999b.

9.14 The reasons for this gap come down to market incentives. Pharmaceutical companies in developed countries—by far the most advanced in the world—do not believe that there is a suitable market for vaccines for diseases found mainly in developing countries. The countries that need the vaccines are poor and so are unable to pay for them. And the donor governments and international organizations that end up paying for the vaccines are essentially monopolistic buyers, so they often insist on low prices that cover production costs but not research costs. The result is a dearth of

⁹ World Bank 1999c. These expenditures include but are not limited to health research.

research on the health problems of most of the world. The World Health Organization estimates that only 10 percent of the \$50-60 billion spent worldwide each year on health research is directed toward diseases that afflict 90 percent of the world's population.¹⁰

9.15 Inequality, then, can strongly influence the incentives to generate an international public good. The perceived costs and benefits of contributing to an international public good can vary widely according to whether a country is rich or poor. And yet it is the balance between these costs and benefits—and the incentives that result—that will largely determine the degree of cooperation that can be sustained in the international system.¹¹

Ability to pay

9.16 Even if the proper incentives are in place to generate the international public good, many developing countries will not be able to pay for its use. As box 9.2 explained, many international public goods can be excluded from users and are therefore given a price. For example, once a vaccine is produced, the knowledge of how to produce the vaccine can be a public good if it is made freely available. However, the production and distribution of the vaccine will cost money. Consider the case of hepatitis B. Despite an effective vaccine, the disease continues to kill about 92,000 people a year, and chronic hepatitis B contributes to another 700,000 deaths through cirrhosis and liver cancer.¹² Without vaccination, the problem will continue. About 350 million people in the world are chronically infected hepatitis B carriers and can transmit the disease for many years before developing and dying from cirrhosis or liver cancer.

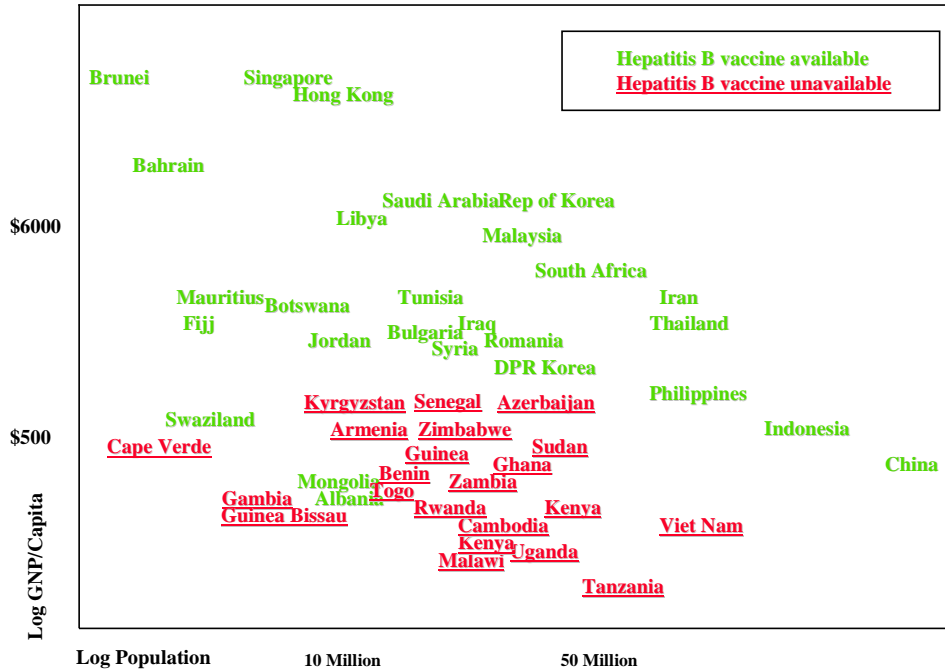
9.17 Why are people not being vaccinated for this disease? Because some countries cannot afford the vaccine. Analysis of a set of countries that all have strong health delivery systems (covering at least 70 percent of their population) and a high need for the vaccine (because of the number of people carrying the disease in their country) shows that GNP per capita is a primary determinant of whether a country introduces the vaccine (figure 9.4).

¹⁰ World Health Organization 1999a.

¹¹ Barrett Forthcoming.

¹² World Health Organization 1999b.

Figure 9.4 How wealth determines availability of vaccines



Note: All countries have strong health delivery systems (as measured by coverage rates of at least 70 percent) and high rates of hepatitis B.

Source: World Bank.

9.18 Another example is access to improvements in agricultural technology. As with the Green Revolution, advances in agricultural technology can continue to have substantial impacts in poor countries because of the high percentage of people who live in rural areas. Rural poverty accounts for 63 percent of poverty worldwide, reaching 90 percent or more in such populous countries as China and Bangladesh. Better technology can help both producers, who benefit from being able to grow more product, and the poor in general, who benefit from lower food prices. In many cases, the effects of agricultural technology improvements have been profound (see box 9.3).

Box 9.3 Research, maize, and pigs in rural Guizhou

Anyone who doubts the impact of agricultural research on farm income (and thus poverty) and household food security should visit rural areas in Guizhou, the poorest province of China. In small remote villages, on small farms set in the mountainous countryside where access is difficult, there has been an almost miraculous turnaround in the lives of poor people thanks to the introduction of quality protein maize (QPM). Until recently annual incomes were below \$50 per capita, and for up to three months a year families had virtually no food. Then hybrids were introduced into Guizhou in 1994. QPM is higher yielding, but more important, it is higher than conventional maize varieties in two essential amino acids that are vital for the growth of children. Today, the local people are better fed, with more nutritious maize and higher yields. Surplus maize has been used to produce pork, which has increased food security and disposable incomes. The income has been used for farm-enhancing investments such as irrigation. The lives of 25,000 families have been transformed in Guizhou, and the technology is being adapted to neighboring provinces.

Source: Bale 1999.

9.19 Despite advances in technology, though, there has been a steady decline in the growth rate of cereal yields in developing countries, from 2.9 percent in 1967-82 to 1.8 percent in 1982-94. Yield growth rates must not be allowed to fall any lower, because with population growth and rising incomes, demand in developing countries is predicted to increase in the next 25 years by 59 percent for cereals, 60 percent for roots and tubers, and 120 percent for meat.¹³ Thus for developing countries the challenge for agriculture in the near future remains enormous, particularly if it is not only to satisfy the growing effective demand for food but also to reduce poverty and malnutrition and do so in an environmentally sustainable fashion.¹⁴

9.20 But options to maintain and increase the growth rate are limited.¹⁵ Improvements will not come from increasing the cultivated area because of environmental constraints. Nor will they come from expanding irrigation, because of increasing competition for water in urban areas and rising environmental problems associated with chemical runoff.

9.21 Can advances in agricultural technology make a difference? Possibly. Some developed countries have made impressive progress through biotechnology—using living organisms to make or modify products to improve plants and animals. With far greater speed and accuracy than conventional technology, biotechnology can identify and introduce desirable traits into plant and animal strains (an example might be drought resistance in plants). Though more research must be done to analyze the potential benefits and risks of specific uses of biotechnology in developing countries, it is likely that if steered by the right policies, including biosafety measures, biotechnology could be a key component to addressing the problems of food security and poverty.¹⁶ But thus far, biotechnology has had little impact in most developing countries, particularly in the farming systems of the rural poor. One of the main reasons, again, is cost. Private institutions now hold a majority of the patents in biotech research, which means that the research is excludable (see box 9.4). Figuring out a way to let developing countries capitalize on advances in biotech research remains a key challenge to policymakers concerned about food security and poverty.

Policy responses

9.22 Provision of international public goods in the coming decades will therefore depend in large measure on the ability to create arrangements that account for the differing incentives and means of developing and developed countries. For most international public goods, increased provision will require that institutions—such as agreements and organizations—improve the incentives for either developed or developing countries and often the ability of developing countries to pay for the good as well.

¹³ Pinstrup-Andersen, Pandya-Lorch, and Rosengrant 1997.

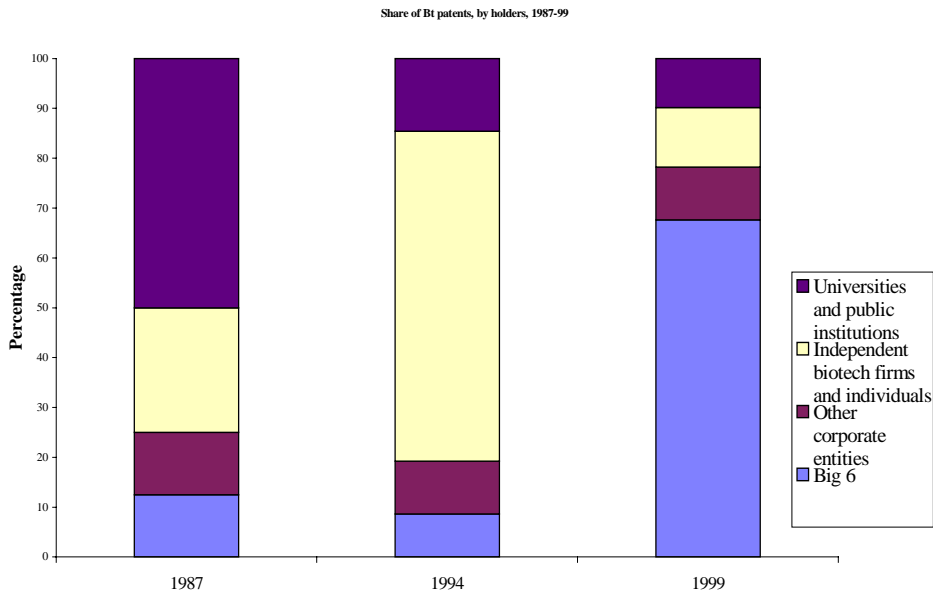
¹⁴ de Janvry, Graff, Sadoulet, and Zilberman 1999.

¹⁵ de Janvry, Graff, Sadoulet, and Zilberman 1999.

¹⁶ Persley and Doyle 1999.

Box 9.4 The concentration of biotechnology patents in the private sector

Public research is often instrumental in pioneering biotech research, which is later transferred to private firms. That pattern is evident in this figure outlining the share of utility and plant patents directly involving insect toxicity of the *Bacillus thuringiensis* (Bt) microorganism. Until 1987 the majority of the patents were held by the public sector. Since then the share of patents in force (the overall number of which has increased) has shifted dramatically to the private sector. Patents are now particularly concentrated in the “Big 6,” the six large corporations which have been actively consolidating major global positions in agricultural biotechnology research capacity, intellectual property, and markets (Dow, Novartis, Aventis, Monsanto, AstraZeneca, and DuPont).



Source: de Janvry, Graff, Sadoulet, and Zilberman 1999.

9.23 Development assistance can be a powerful tool in these arrangements. But not the only tool—or a sufficient one. The correct policy instruments will vary with the international public good in question. This section lays out an incentives-based approach to these instruments. While the abilities of developing and developed countries to contribute always differ, no matter what the international public good, their *incentives* vary from good to good. Therefore, three scenarios are considered: when all relevant countries have the incentive to contribute to the good’s production, when developed countries have the incentive to contribute to the good but developing countries do not, and vice versa. A framework for addressing international public goods emerges from an analysis of these scenarios.

When all relevant countries have incentives to produce the good

9.24 If all the countries needed to produce an international public good agree that the good is valuable and should be produced, the only issue is how to do it. Box 9.5 outlines some ways in which individual country efforts can come together to form the

total supply of the good. Development assistance should play a different role in each case.

Box 9.5 How countries' efforts add up to an international public good

The level of some international public goods is determined by the largest individual contribution toward the creation of the good. Perhaps the best example is research on problems that affect both developed and developing countries. Developed countries have a special advantage in activities like finding cures for disease or monitoring the atmosphere because of their far greater technology and research and development capacity. These goods are called “best-shot” goods.

The level of some goods, however, is determined by the *smallest* contribution to the good's provision. An example is control of infectious disease. Eradication will not be accomplished until every country has eradicated the disease. Therefore, the country that makes the least contribution (probably because of a lack of resources) will determine whether the disease is eliminated. These goods are called “weakest-link” goods.

Other goods are produced by a “summation” of country efforts. The total amount of the good produced is equal to the total amount of country contributions. Greenhouse gases disburse rapidly in the world's atmosphere. Therefore, each country's reduction in greenhouse gases contributes to the overall reduction, which is a summation of every country's greenhouse gas reductions.

Public goods do not always need to be produced by governments. For example, many best-shot goods, such as the global communications satellite network INTELSAT and medical vaccines, are produced by private companies. The goods are called “public” because of the spillover of their benefits, not because of who produces them.

Source: Sandler 1998.

9.25 For example, “best-shot” goods (see box 9.5) can be produced effectively by developed countries largely on their own, because of those countries' technological advantages. Aid need play no role in the production of these goods, but rather in their dispersion and widespread use. An example is basic research on vaccines. Once a vaccine is developed, it is a benefit to all nations as long as it is made available to them.

9.26 Production of other international public goods requires much greater participation from developing countries, and they will often require assistance in paying for the goods. For example, preventing the spread of infectious diseases is in the interests of both developed and developing countries, but developing countries are at a great disadvantage in terms of medical systems or ability to pay for vaccines. In cases like these, development cooperation can be useful in building capacity, paying for equipment and vaccines, and training people.

9.27 One way to think about the different roles in producing international public goods is to consider functions that are important to all countries involved and functions that are important only to some. This division of “core” and “support” functions has been used to describe the tasks needed to ensure global health.¹⁷ Core functions would include research and development and global surveillance of the spread of disease. Support functions would compensate for shortcomings in national health systems. Another example is INTELSAT, the global communications satellite network with a paid membership of nations and firms. The satellites are the core function; helping

¹⁷ Jamison, Frenk, and Knaul 1998.

developing countries pay for membership is a support function. Development assistance can strengthen support functions, in accordance with the country's need.

When incentives exist for developed countries but not for developing countries

9.28 Demand for some international public goods rises with income.¹⁸ Thus, richer countries may desire some international public goods that poor countries have no incentive to produce. For some of these goods, there will be no need for cooperation. For example, best-shot goods do not require developing countries to put any resources toward their provision, because developed countries can produce them on their own. But for summation goods and weakest-link goods (see box 9.5), developing country cooperation is essential. When developing countries are needed to produce the goods, how should arrangements be structured?

9.29 Dialogue on these arrangements must begin with a clear understanding of the issues. Developed countries must understand that most of the primary concerns of developing countries arise from their economic situation. Consider labor standards (see box 9.6). Labor standards are a weakest-link good: the country with the worst labor standards greatly influences the level of standards worldwide, because production will tend to move to where labor is cheaper.¹⁹ Avoiding this race-to-the-bottom in labor standards is in every country's interests, and if there were a way to raise labor standards worldwide, it would indeed be an international public good. The problem is designing a method that will not make people in poor countries suffer *more* than they do without international labor standards.

Box 9.6 Do labor standards help the poor?

Few debates related to the world economy are as controversial as labor standards.²⁰ No one is against the *idea* of higher labor standards, only how they should be encouraged. Developed country labor unions, which can influence their governments, argue that poor labor conditions in developing countries violate workers' rights and endanger jobs in developed countries. Many argue that trade sanctions should therefore be imposed on countries with poor labor standards. But developing countries argue that linking trade to labor standards is an excuse for protectionism and will diminish developing countries' comparative advantage in low-cost labor. Which side is correct?

It is difficult to argue that poor labor standards in developing countries directly affect jobs in developed countries. The products manufactured under the worst labor conditions usually have production competition only in other developing countries, not in developed countries. Consider the case of hand-knotted carpets, a labor-intensive product in which children are believed to have an advantage because of their small hands.²¹ Until the late 1980s, Iran was the largest exporter of hand-knotted carpets to the United States. Then (for reasons unrelated to child labor), the United States placed an embargo on imports from Iran. The gap was filled by imports of carpets from China, India, Nepal, and other poor countries, not by production shifts to industrialized countries.²²

It is also difficult to make a case for the argument that international labor standards enforced by trade sanctions would improve the lives of the poor. Consider labor standards that would make child labor illegal. The argument for such standards is generally that it would be better for the child not to work. Yet

¹⁸ Sandler 1997.

¹⁹ Harvey, Collingsworth, and Athreya 1998.

²⁰ Weiner 1999.

²¹ See Levison et al. Forthcoming.

²² These figures and the preceding anecdote are from Basu 1999.

this is often not true in developing countries.²³ In Ethiopia, for instance, where the per capita income is \$110 a year, more than 42 percent of children ages 10-14 work.²⁴ In situations like these, not uncommon in the developing world, children must work to escape poverty and help feed their household.²⁵ Not allowing children to work would severely endanger their well being.

However, as developing countries open themselves to the global economy, their demand for labor will become more elastic.²⁶ Employers will import cheaper products from other countries rather than producing them at home and will move their production elsewhere to take advantage of lower wages. A race-to-the-bottom could then ensue among *developing* countries. Enforceable labor standards that set minimum standards for developing countries could offset this employer-labor imbalance by strengthening the hand of labor.

How should these labor standards be encouraged? Trade sanctions are likely to do more harm than good. First, unless they are imposed on the entire country, not just the export sector, people working in the export sector will be forced to move to other sectors, where conditions are often worse.²⁷ Second, sanctions are likely to be used by protectionist interests in developed countries to limit perceived competition, rather than to raise labor standards. And third, trade is an engine of growth, which can alleviate the need for children to work: 21 percent of children ages 10-14 work in low-income countries, 8 percent in middle-income countries, and zero in high-income countries.

A more appropriate way of dealing with labor standards is for developing countries to coordinate them on their own, using a variety of policy instruments to raise standards and prevent them from gradually spiraling downward as developing countries compete with each other.²⁸ Research has shown that measures that keep children in school—making schooling mandatory, providing school meals or subsidies—can be highly effective in some situations.²⁹ Developed countries could encourage these programs by providing development assistance to offset the cost. However, even these policy measures need to be tailored to a country's stage of development. A gradual approach is best, perhaps with programs that combine part-time schooling with part-time work.³⁰

9.30 Doing this will take a clear understanding of the costs and benefits of any action. As last year's *World Development Report* showed, a clear understanding of the costs and benefits of environmental regulation was a major step forward in spurring collective action to fight destruction of the ozone layer (see box 9.7). Greater certainty about costs and benefits can be not only a spur to collective action,³¹ but also a guide to appropriate policies. The Montreal Protocol was an effective international environmental agreement because it was based on clear scientific evidence of the costs of ozone depletion, as well as an understanding that many developing countries would have trouble meeting the costs of joining. Flexibility was therefore incorporated into the design of regulations for developing countries. The same approach would likely be helpful in the case of labor standards.

Box 9.7 The design of the Montreal Protocol

The Montreal Protocol is one of the most successful international agreements. The 165 parties to the protocol agreed to the full phaseout of 94 substances that cause ozone depletion. Why has this been such a

²³ Basu and Van 1998.

²⁴ World Bank 1999c.

²⁵ Basu 1999.

²⁶ Rodrik 1996.

²⁷ UNICEF 1994.

²⁸ Basu 1998.

²⁹ Weiner 1991; Grootaert and Kanbur 1995.

³⁰ Grootaert and Patrinos 1999.

³¹ Sandler 1998.

successful agreement when other environmental agreements, such as the Kyoto Protocol on greenhouse gases, have not?

The answer lies in two characteristics of the Montreal agreement. First, studies in the mid-1980s clearly established the damage that ozone-depleting gases were doing and the costs that this would transfer to all countries. These findings were complemented by existing technological and institutional abilities to find cost-effective, environmentally benign substitutes.

Second, the protocol was designed so that all countries had an incentive to join it. Developing and transition economies were offered a grace period of exclusion from controls on certain ozone-depleting substances that would be more difficult to phase out.³² And developed countries issued payments to them to cover the incremental costs of complying with the agreement, since the costs of *not* phasing out the substances would be so much higher. Furthermore, to discourage countries from not joining, trade sanctions were threatened against countries that did not sign. The trade sanctions were credible because if they were not used, industry would relocate to the countries that did not join.

The Kyoto Protocol has been less successful largely because there is less certainty and consensus on the dangers of greenhouse gases.

Source: Barrett 1999; World Bank 1999a.

9.31 Thus, while provision of international public goods is enormously complicated when incentives differ for developed and developing countries, two steps can help bridge the differences. Dialogue on costs and benefits, most likely in a multilateral setting and based on sound research, is likely to clarify the need for the good. And the flexible use of a wide range of policy instruments (including development assistance in some cases) will help account for circumstances in developing countries and spur their cooperation.

When incentives exist for developing countries but not for developed countries

9.32 Finally, there are public goods that could be of great benefit to developing countries, but there is no market incentive for developed countries to produce them. This is especially important for best-shot goods, which almost always must be produced by developed countries, often by the private sector (see box 9.5). Furthermore, because even developed country *governments* may have no particular incentive to contribute to the goods' production, they are unlikely to devote as much development assistance as they would to goods that benefit them. For this reason, multilateral development organizations such as the World Bank and the United Nations should make these goods a priority. Even if they do not take the lead in producing certain international public goods, their financial, analytic, and policy support are likely to be vitally important.³³

9.33 For example, malaria, tuberculosis, and AIDS kill about 5 million people a year—about 9 percent of all deaths in the world (figure 9.5). Communicable diseases in general are much more of a danger to poor countries than to rich, accounting for nearly 60 percent of all deaths in the poorest fifth of the world's population and only 7.7 percent of deaths for the richest fifth.³⁴ Because these diseases are heavily concentrated in poor

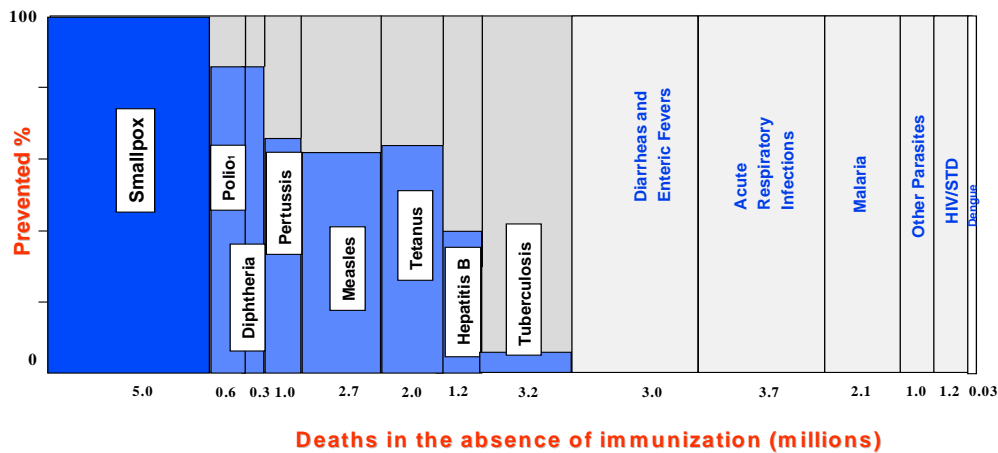
³² Chlorine and bromine ozone-depleting substances.

³³ Eccles and Gwin 1999.

³⁴ Gwatkin and Guillot 2000.

countries, they are unlikely to elicit research by private companies from developed countries.³⁵

Figure 9.5 Deaths from potentially vaccine-preventable diseases



¹ Includes lifetime disability

Source: World Bank.

9.34 In these cases, development assistance agencies can be useful in two ways. One is by providing incentives for private companies by “creating” demand. An example would be the creation of an AIDS vaccine fund, which would guarantee fair prices for producers once a vaccine is produced (see box 9.8). Similar efforts are needed in bridging the gap between private holders of biotechnology patents and their potential beneficiaries in developing countries. In some cases, creating demand might require nothing more than researching markets and informing private companies about them. For example, many producers approach an AIDS vaccine with the same mentality as they have approached a malaria vaccine, even though the willingness-to-pay may be much higher for an AIDS vaccine (for example because AIDS spreads over richer countries than malaria or because it tends to affect income-generating rather than children). More rigorous research is needed.

Box 9.8 International action for fighting AIDS

Few epidemics in the 20th century have had a more devastating impact than the AIDS pandemic. More than 33 million people worldwide are infected with HIV and more than 13 million have died of AIDS.³⁶ More than 90 percent of infections are in the developing world. Sub-Saharan Africa has more cases of existing and new infections than the rest of the world combined, although the rate of increase is now steepest in Asia.

Poverty alleviation efforts and improved education for the poor will reduce the incidence of AIDS in the long run. However, the devastating impact of AIDS requires more focused attention. With some 5

³⁵ Sachs, Kremer, and Hamoudi 1999.

³⁶ World Bank 1999b.

million new cases annually, action is urgent and the cost of delays huge. At the national level, substantial benefits can be gained through national prevention campaigns. But an effective and affordable vaccine could dramatically reduce the scope of the epidemic, not just in developing countries but in the entire world.

The vaccine would almost certainly have to be developed in a rich country with superior scientific knowledge and technology, but there are many market obstacles. Private companies—which are most likely to apply basic research toward a vaccine because of the profit potential—focus their money on AIDS treatments rather than vaccines. Of the 33 million people already infected with HIV, 3 million live in industrialized countries where purchasing power is high. The perceived market for an HIV vaccine is small, and the costs of vaccine trials are enormous. Thus, in the private sector worldwide, less than \$50 million per year is allocated to AIDS-vaccine related work among only about 200 scientists.³⁷ Only about \$5 million a year is being spent on AIDS vaccines specifically designed for use in developing countries.

International cooperation can affect the incentives for private companies in three primary ways. First, developing countries must acknowledge the impact that AIDS is having on their countries and partner with other governments, industry, and civil society in the search for a vaccine. They can support vaccine development by fostering political support and greater research and development in their own countries—in order to develop vaccines appropriate for local populations. Second, international organizations can “push” the market by subsidizing relevant scientific research. The International AIDS Vaccine Initiative (IAVI), an international nonprofit, NGO, was established by the Rockefeller Foundation in 1996 to stimulate investment and demand for HIV vaccines for use in both the developed and developing world. The IAVI works with the public and private sectors through advocacy, targeted support to research and development for novel vaccine approaches, and measures to reduce obstacles to private investment.

Finally, international organizations can also “pull” the market by demonstrating or guaranteeing a substantial market in developing countries for vaccines. One way is to commit themselves to fully implementing the vaccines already on the market. As figure 9.5 shows, vaccines have not been used to their full potential for many diseases. Another way is to ensure an acceptable price for the vaccine by creating an AIDS vaccine fund—a trust fund—to be released once a vaccine with certain characteristics (for example, high effectiveness, heat-resistance, and one-dose delivery) is developed.³⁸ Multilateral development banks might also issue contingent loans to developing countries, which would be released to help countries purchase a vaccine once it is developed. Because an AIDS vaccine is many years away, many organizations may hesitate to reserve money that could be used in the meantime. But an AIDS vaccine is worth it.

9.35 Another way development assistance can help is by facilitating developing countries’ access to services when a market already exists but is obstructed. For example, more than 50 developing countries depend on three or fewer commodities for more than half of their export earnings (in about 20 countries, the share exceeds 90 percent). Yet during 1983-98, the prices of many commodities varied tremendously, swinging from below 50 percent to above 150 percent of their average prices.³⁹ Easing this volatility would be of substantial benefit to commodity producers in these countries.

9.36 Insurance products have been developed to address volatility in commodities, but they are available almost exclusively to developed country producers. The reasons for this include a lack of market infrastructure in developing countries, a lack of risk management instruments appropriate for the needs of developing countries, and the high costs of providing these instruments to poorer countries due to the risks

³⁷ Batson and Whitehead 1999. In contrast, an estimated \$2 billion is spent worldwide on research for AIDS treatment, most of it in the private sector.

³⁸ For a discussion of how such a might operate, see Sachs, Kremer, and Hamoudi 1999.

³⁹ International Task Force on Commodity Risk Management in Developing Countries 1999.

involved.⁴⁰ There are, however, ways to facilitate access to these products, and international efforts are under way to do so (see box 9.9). This would be a major contribution of international development cooperation.

Box 9.9 Reducing vulnerability to commodity price fluctuations

After wide consultations with the private sector, officials in poor countries, and other stakeholders, an international task force on commodity risk management has recommended establishment of an international intermediary to facilitate developing countries' access to market-based commodity price insurance mechanisms available in developed countries. The idea is to bridge the gap between the providers of risk management instruments and developing country producers. The insurance instruments would set a lowest price for producers and exporters (price floors) and a highest price for consumers and importers (price ceilings).

The intermediary would perform three main functions:

Provide partial guarantees. Numerous risks are involved in the provision of price insurance. The intermediary could identify and “unbundle” the risks, so that participants in each transaction could take on the risks they could handle efficiently. Based on sound due-diligence procedures, the intermediary could then provide partial guarantees to other risks, such as sovereign risk.

Act as a pass-through. In some cases, the intermediary may offer price insurance directly, but only where the private sector is unable or unwilling to do so. The extent of coverage would be limited by the intermediary's ability to offset its own risk prudentially through hedging on risk management markets. The intermediary would thus act as a pass-through between providers and users of risk management instruments.

Provide core services and technical assistance. The intermediary would provide potential users of risk management insurance with specific core services needed to extend the market to them and ensure that transactions occur in an efficient, fair, and transparent manner. These services would include timely dissemination of market information and support for the development of local transmission mechanisms that would extend price insurance to small-scale producers.

An intermediary would not end the volatility of commodity prices, and it would deal only (at least in the beginning) with commodities traded on international commodity risk markets. However, it would reduce the uncertainty associated with price volatility and provide market-based compensation for adverse price movements within a certain time horizon.

Source: International Task Force on Commodity Risk Management in Developing Countries 1999.

Institutional implications

9.37 Appropriate policies and arrangements for the provision of international public goods therefore vary widely, depending on the incentives and means in the countries that must cooperate for their provision. However, three overarching institutional implications nonetheless arise from this discussion.

9.38 First, developing countries must be included in the provision of many—indeed, the majority of—international public goods. Their inclusion has implications for

⁴⁰ International Task Force on Commodity Risk Management in Developing Countries 1999. The risks include those caused by the factors particular to the country (such as exchange controls or even war or civil disturbance), commercial risk such as default of the insured, the difference between local and international prices, and events such as natural disasters.

institutional design, because, as discussed in the next chapter, country-focused development assistance has shown that effective participation includes “ownership” and accountability. Often, it will not be enough to consult developing countries. A mechanism will be needed to give them ownership of the provision.⁴¹ This is likely to be a large factor in the incentive for developing countries to cooperate. Without it, international cooperation will not succeed.

9.39 Boxes 9.10 and 9.11 describe two structures for international public goods provision that have been successful largely because of their inclusive structures: the Consultative Group on International Agricultural Research and the Global Environment Facility. Their structures ensure both that developing countries participate in the production of the international public good and that the product is relevant and useful to them. Reformed or newly created institutions that provide international public goods should be similarly designed to be participatory in nature and owned by all relevant countries.

Box 9.10 The Consultative Group on International Agricultural Research

The Consultative Group on International Agricultural Research (CGIAR) was founded in 1971, the culmination of efforts after World War II to spur international agricultural research to relieve the fear of serious food shortages throughout the world. A network of centers around the world, the CGIAR has had a remarkable string of research successes, beginning with the development of high-yielding rice and wheat varieties that started the Green Revolution. An independent evaluation in 1998 called CGIAR “the most effective use of official development assistance (ODA), bar none.”⁴²

International agricultural research had taken place long before the CGIAR was created, but fears of widespread famine after World War II spurred intensified efforts. The Rockefeller and Ford Foundations sponsored new agricultural research institutes in the developing world. Their success led donors to agree to support an international network to support agricultural research. The network has grown from 4 to 16 centers with an annual budget of \$345 million, making it probably the largest international group dealing solely with research in one sector.

The CGIAR also has a unique structure. It has no constitution, statutes, regulations, by-laws, or written rules of procedure. The group consists of a chairman, cosponsors (the World Bank, FAO, the United Nations Development Program, and United Nations Environmental Program), members (countries, private foundations, and institutions that invest money in the system) and elected nonmember representatives from less developed countries. Members, once exclusively donor countries, are now balanced between developed and developing countries. The group comes to decision by consensus, rather than voting.

The CGIAR’s 16 research centers around the world are all autonomous with their own boards and management. The group has a set of program priorities that it supports (increasing agricultural productivity, protecting the environment and biodiversity, improving policies and national research capacity). Members donate money to the CGIAR as a whole, but they may designate which center receives the money. Certain members give “unrestricted” money that the CGIAR Secretariat can use to top up the funding of some centers.

This structure allows a certain amount of flexibility to centers in their programs and management, within the framework of an internationally coordinated effort. Twice a year, the CGIAR meets to review policies, assess the impact of research, exchange views with centers and partners, adopt a research agenda for the following year, and pledge funds in support of that agenda. The result is a cross-fertilization of ideas and findings.

⁴¹ Woods 1999.

⁴² CGIAR System Review Secretariat 1998.

From the beginning, CGIAR members understood that the value of its research would be small unless it was disseminated and understood by farmers. This was primarily the responsibility of national agricultural research and extension services, and an effort was made to strengthen their capacities. Over the years, as the capabilities of national services have increased, they have assumed a great role in the distribution of knowledge. This has led to a steadily increasing percentage of farmers who have actually *benefited* from international research. As this has taken place, the contributions of the research centers have become less pronounced, and donors now see less of a reason to fund them. This endangers future research efforts.

The CGIAR model is therefore an example of a structure that ensures developing country participation so that the international public good is produced effectively. And it also demonstrates that effective production of some international public goods requires actions at many levels, from international to local. Funding must be made available for *all* of these activities, or the international public good will not be produced.

Sources: Anderson 1998; Anderson and Dalrymple 1999; Baum 1986; Greenland 1997.

Box 9.11 The Global Environment Facility

The Global Environment Facility (GEF) is a financial mechanism for fostering international cooperation and action to protect the global environment. Through grants and concessional financing, it funds the additional costs incurred when a national, regional, or global development project also addresses environmental concerns related to biological diversity, climate change, international waters, and depletion of the Earth's ozone layer. Efforts to stem land degradation are also eligible for funding, as they relate to the other four areas.

The GEF was started in 1991, and after a trial period was capitalized by 34 nations (including 13 developing countries) at \$2 billion for a four-year period. In 1998, 36 countries donated a total of \$2.75 billion to keep the facility running until 2002. Its governing structure ensures representation by all stakeholders. The GEF Assembly, with representatives of all 165 participating countries, meets every three years to review general policies. The GEF Council, with representatives of 32 constituencies (16 members from developing countries, 14 from developed countries, and 2 from transition economies), meets every six months on operational policies and programs. The GEF Secretariat translates the decisions of the Assembly and Council into action.

The GEF's three Implementing Agencies—the United Nations Development Program, the United Nations Environment Program, and the World Bank—are responsible for developing projects for GEF funding and for implementing them through executing agencies. These three organizations partner with a wide variety of organizations to execute the projects, including government agencies, other international organizations, private sector institutions, and international, national, and local nongovernmental and civil society organizations.

In participating countries, there is a political focal point, which is the contact point with the GEF Secretariat and other participating countries, and an operational focal point, which identifies project ideas that meet country priorities and ensures that GEF proposals are consistent with them. These representatives help to ensure country ownership, as do 16 NGO regional focal points that disseminate information, and provide coordination between national and local NGOs and the GEF.

A recent comprehensive independent evaluation of the GEF found that, in a short amount of time and with low resources, it had performed effectively in creating new institutional arrangements and approaches and leveraging cofinancing for GEF projects. It also has had positive impacts on policies and programs in recipient countries. Although there is room for improvement, particularly in efforts to mainstream attention to the environment, the evaluators concluded that the GEF had potential for much greater success and that donors should strengthen it.

Source: Porter, Clémenton, Ofosu-Amaah, and Philips 1998.

9.40 Second, although many of the examples in this chapter are global in nature, international public goods vary in their geographical coverage. Problems that cross even one border—such as a polluted lake that borders two countries—are still international public goods. The effort to eliminate river blindness discussed in box 9.1 is an example of a regional good. Solutions to these international public goods should be guided primarily by the countries affected by the problem.⁴³ If those countries need assistance—financial or otherwise—to solve the problem, that assistance should be given to the smallest relevant group. For example, if the problem crosses four countries, the smallest regional group that incorporates those four countries would be the appropriate vehicle. Thus an institution such as the Economic Community of West African States would be the most appropriate institution to deal with cross-border problems involving its member states. This principle of *subsidiarity* can be applied all the way up the geographical scale of international public goods, though it must also be reconciled with economies of scale and scope.⁴⁴

9.41 This principle has wide implications for international institutions. It implies that regional institutions should be significantly strengthened to handle cross-border spillovers. Consistent with the importance of ownership discussed above, it is apparent that such institutions would, in many cases, be a better choice for problem solving at more local levels than global institutions like the World Bank and the United Nations. Because most of these institutions will not have wide-ranging expertise, sector-specific organizations should also be strengthened to assist when needed.

9.42 And third—as implied throughout this chapter—a shift in the resources for development assistance is needed to reflect the growing importance of international public goods. In addition to traditional country-focused programs, donors should assist development by financing the provision of goods that have benefits both for developing countries and developed countries. This is expected to be an attractive prospect for donors, both because of the benefits for developed countries and because international attempts to provide international public goods, as shown in the boxes in this chapter, have often had much higher incidence of success than traditional country-focused projects.

9.43 If those successes lead to higher financing of international public goods at the expense of country-focused aid programs, the implications for institutions of development cooperation will be considerable. For example, there is likely to be a greater focus on regional and global problems than now exists. And a movement of staff from global institutions to regional and more local institutions would also be expected, following the subsidiarity principle. These changes would likely increase the effectiveness of development cooperation.

9.44 However, though an increased focus on international public goods is warranted, it should not be exaggerated. As discussed above, country-focused aid programs will also be necessary to ensure that essential international public goods—such as protection against the spread of infectious disease—are provided. And a country's

⁴³ Breton (1965) and Olson (1969).

⁴⁴ Kanbur and Sandler with Morrison 1999.

overall policy environment affects not only country-focused aid programs, but efforts to produce international public goods as well. Finally, while international public goods are important for development, they are no substitute for government expenditure on *national* public goods, such as education and infrastructure.

Conclusion

9.45 International public goods are an effective instrument for fighting poverty. Thus in addition to supporting country programs along the lines espoused in the rest of this Report, poverty reduction efforts can take the form of international goods that will often have benefits for developed countries too.

9.46 This chapter has shown that development assistance in the pursuit of international public goods is likely to be useful in a variety of ways, by creating the incentives and capabilities for developing countries to contribute. But its use will not be appropriate in all situations. If developed and developing countries both have the incentive to produce a best-shot good, the developed countries can produce the good on their own. The use of development assistance in these cases should be limited to the distribution and utilization of goods that are, for reasons often having to do with cost, excludable from developing countries. In cases where a best-shot good is needed by developing countries but developed countries do not have the incentive to produce it, development assistance can help to create incentives, as in the case of an AIDS vaccine fund, or facilitate market access, as in the case of commodity insurance. This may be a function best suited to multilateral development assistance agencies, because of their coordination abilities.

9.47 In cases in which developed countries have the incentives to produce a good and developing countries do not (and the good is not best-shot), development assistance can offset the costs to developing countries of participating in the good's production. However, assistance will almost certainly need to be complemented by institutional flexibility to address developing countries' poor economic situation relative to developed countries.

9.48 Finally, in cases in which developed and developing countries have mutual incentives to produce a summation good or a weakest link good, such as global health, effective development assistance can play a major role in building developing countries' capacity to contribute to the overall good.

9.49 With this framework to complement the themes of empowerment, opportunity, and security in guiding the substance of international cooperation for poverty reduction, this Report now turns to the question of how the actual mechanisms of development assistance can operate most effectively.

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