



Chapter 9

What Can International Institutions Do?

INTERNATIONAL INSTITUTIONS, COUNTRY DONORS, and the broader development community are rapidly coming to understand that knowledge is central to development—that knowledge *is* development. This entire Report implies roles for the World Bank and other international institutions in helping countries to close knowledge gaps and overcome information problems. These ideas should inform the lending and aid programs of these institutions, helping guide their project selection and design as well as their policy support activities. The development community can help countries develop the infrastructure and institutions they need to acquire and absorb knowledge, for example through supporting telecommunications projects and education reform (as discussed in Part One). It can also help them develop the institutional frameworks to minimize information problems, for example by improving laws against fraud, piloting community-monitored environmental projects, or working to improve access to credit for the poor (as considered in Part Two).

This chapter focuses on another set of roles that development institutions are taking on. With the recognition that knowledge is development, they are realigning their way of doing business and placing the creation, transfer, and management of knowledge at the center of their activities. Consider first the *creation* of knowledge. Chapter 1 introduced the idea of knowledge as a public good. Once placed in the public domain, it is free for others to use, and it can be disseminated widely at virtually no cost. This implies that people can often benefit from knowledge without paying the costs of creating it. Because the creators of knowledge cannot recoup their costs, the market will not supply enough knowledge, and gov-

ernments must decide whether to step in to finance its creation. In some instances, the spillover benefits of knowledge extend beyond national boundaries, so that no single government is willing to spend the resources to create it; even if it does make an effort, it will supply too little. International institutions can thus solve what might otherwise be a difficult problem of coordinating the actions of many countries to create knowledge that the world needs.

The green revolution is a case in point. Without an international effort, its breakthroughs in agriculture would not have occurred, or would have occurred only much later, leaving countless small-scale farmers and landless laborers destitute. Provision of such international public goods is a responsibility of international institutions and is the first topic addressed in this chapter.

Although knowledge created as an international public good can contribute to development, it is knowledge created in developing countries themselves that usually is most important. Every policy reform, every new program, every additional project creates new knowledge about what works and what doesn't work in development. But codifying this huge reservoir of knowledge and making it accessible is far from costless, and probably too enormous a labor for any one country to undertake. Another role for international institutions and other providers, then, is to help countries with the daunting task of sifting through international experience, extracting relevant knowledge, experimenting with it, and adapting it to local conditions. This two-way *exchange* of knowledge—from developing countries to development institutions and back again—is the topic of the chapter's second section.

That raises the question of how to manage knowledge, for knowledge created or adapted is only as good as the system that keeps it organized, accessible, and dynamic. Organizations have always managed knowledge, formally or informally, but new technologies offer formerly unimagined possibilities that require a rethinking of traditional systems. The third section of this chapter explores these possibilities for knowledge *management*, highlighting the choices that organizations must make and identifying some special challenges for development institutions. We also describe knowledge management efforts currently under way at the World Bank and plans to make relevant materials about development more widely available.

Knowledge creation: An international public good

Many types of knowledge are international public goods. No one country or private organization has the incentive to do the necessary research to create this knowledge, and international institutions can help fill this gap. Indeed, as already noted, most knowledge has the properties of a public good: there is no marginal cost to an additional person using the knowledge, and it is often difficult to exclude nonpaying users, which means that the private returns to knowledge creation may be low. Governments can and do act to protect some types of knowledge from uncompensated use by establishing intellectual property rights, which increase the returns to knowledge creation by making exclusion possible. But for some types of knowledge, such as basic research, exclusion is either impossible or has been deemed undesirable because the cost—the resulting underutilization of knowledge—would outweigh the benefit. These types of knowledge are an international public good, and their efficient supply requires international collective action. The need is even more acute when the knowledge is itself about the production of an international public good, such as how to protect the ozone layer or stem global warming.

International support for basic research

Agricultural knowledge is generally an international public good, and the Consultative Group for International Agricultural Research (CGIAR) is an outstanding example of how international institutions can act to provide such goods where other institutions, public or private, cannot. By researching higher-yielding varieties of staple crops for developing countries, the CGIAR was instrumental in sowing the seeds of the green revolution (see the Overview).

Formed in 1971, the CGIAR is an international research organization whose members include both industrial and developing countries as well as private foundations and international organizations. Its impact far exceeds its resources, especially in the development of new agricultural technologies that have raised crop yields and

helped food production more than keep pace with global demand. Through its sponsorship of 16 international agricultural research centers, it has developed new, yield-enhancing crop varieties, helped alleviate the scourge of agricultural pests and disease, and trained thousands of plant scientists and research technicians. The benefit-cost ratios of the CGIAR's undertakings demonstrate its high returns: for example, those for its rice programs are 17 to 1, and those for its wheat programs an astounding 190 to 1.

Today, however, the CGIAR is having to redefine its role (Box 9.1). Stronger IPRs and new biotechnological methods broaden the scope for private research efforts. The risk is that the poor will not have access to these innovations.

Box 9.1

Plow ahead or prune back? The challenges facing the CGIAR

In the past decade or so, the CGIAR has expanded its research horizons to include environmental issues, forestry, and aquatic resources, because of the complexity of today's world and the intertwined relationship between agricultural and environmental concerns. The CGIAR seeks to improve the yield of complex farming systems in an environmentally positive manner. Yet with declining overseas development aid, the CGIAR, like many other development organizations, has had to reexamine its research priorities, retaining only those where it has clear comparative advantage. Despite these funding constraints, the CGIAR continues to work toward strengthening global food security and helping farmers meet the day-to-day challenges of keeping their environment healthy and their farming sustainable. In a world where 90 million new mouths must be fed every year and where national research systems in developing countries are still weak, the nature of agricultural research remains such that continuing, if not strengthened, international sponsorship and participation by the CGIAR and groups like it seems essential.

The CGIAR has to respond to new developments in the institutional environment for agricultural research. Changes in national agricultural and science policies, in the international trading system, and, most important, in the incentives for private research all point to a need for the CGIAR to continually reexamine its activities and strategy. Whether within countries or globally, the reinforcement of IPRs, both in genetic resources and in biotechnological methods, has whetted the appetite of private firms to undertake plant research, which could result in the poor losing access to innovations in these areas. Moreover, if private researchers discover and patent promising new biotechnological tools, the need for public research may diminish. The CGIAR is meeting these challenges by becoming more constructively engaged with private research, while maintaining its relationships with national agricultural research systems and advanced research institutes.

Engaging the private sector through market incentives

On many knowledge frontiers, the skewed distribution of global wealth implies that the strongest incentives for private research are for innovations that interest primarily the richer countries. These innovations may or may not be high priorities for poorer countries, particularly in the area of health research. Some major diseases—malaria and tuberculosis, for example—afflict poorer countries far more than they do richer ones. Research and development will not be adequately targeted to these diseases without international support. The treatments for some other diseases, such as AIDS, are beyond the means of the poor. For such diseases a special effort must be made to develop affordable remedies. Yet the World Health Organization has estimated that, in the early 1990s, 95 percent of health-related R&D was devoted to issues of concern primarily to the industrial countries, and only 5 percent to the health concerns of the far more populous developing world.

One international effort launched recently seeks to develop a vaccine for AIDS. Many believe that technical advances in creating a vaccine hold the world's best hope of checking the spread of this disease. A low-cost, effective AIDS vaccine would solve technical, political, and economic problems. And the mere possibility that interventions in favor of vaccine development could eventually result in the eradication of AIDS is enough to command consideration of such interventions by the global community.

If technical changes to combat AIDS were already moving rapidly in the right direction, there would be little justification for public action. But the evidence suggests that existing, market-based incentives are biased in favor of developing a profitable treatment for AIDS, and against developing an inexpensive vaccine to prevent it. The reason is that effective demand for new treatments is strong, coming from AIDS patients in high-income economies, whereas demand for a vaccine from those at high risk in developing countries is weak. The tragedy is that a vaccine promises far greater spillover benefits: by limiting the spread of AIDS, it protects even those who never purchase or use the vaccine. An ounce of prevention is thus still worth a pound of cure, but in this case the unequal distribution of global income distorts the terms of that trade.

The question of how to create the knowledge to produce an AIDS vaccine is thus an important one. One possibility is for a new international organization to try to acquire the requisite skills and do the necessary clinical trials. But these require huge investments, which the major pharmaceutical companies are the obvious candidates to make. So development institutions are looking into a new approach to encourage private pharmaceutical companies to undertake research relevant to developing countries (Box 9.2).

Fostering collective action

Another area of research with strong international public good dimensions is the environment. Here cross-border externalities are legion: political and administrative boundaries, both within and among nations, mean nothing to the forces of the biosphere. Such problems as climate change, loss of biodiversity, ozone depletion, and the pollution of international waters are local in origin but global in effect. Because the costs of poor environmental policies accrue to the world, no one country has the incentive to research effective strategies for protecting environmental health. Problems of coordination also arise: how to foster collective action by dozens of nations to solve major problems that affect them all, at times unequally.

Environmental problems are thus largely knowledge problems. And to solve them, the international community has taken action through such mechanisms as the Global Environment Facility (GEF), a unique example of global collective action (Box 9.3). The GEF tackles three major challenges. First, any meaningful assessment of the

Box 9.2**Can contingent lending spur efforts toward an AIDS vaccine?**

The World Bank and other development institutions are investigating a new financing mechanism for AIDS research: a contingent loan. Such a mechanism might reduce the uncertainty about projections of the price and quantity of future vaccine sales in developing countries, while leaving key product R&D in the hands of the private pharmaceutical firms. Under a contingent loan scheme, the international community would make binding commitments to lend to developing countries sufficient funds to buy large amounts of an AIDS vaccine, once such a vaccine has been invented and demonstrated safe and effective. By assuring the pharmaceutical firms of a future market, the scheme would reduce the risks to which those firms are exposed, giving them a stronger incentive to conduct the necessary research.

The contingent loan approach is not without its problems. Even with adequate investment in basic research, the financial incentive provided may prove insufficient, in the eyes of the private decisionmakers, to outweigh all the risks in bringing an AIDS vaccine to market—especially when many other potentially lucrative avenues remain open for investment. And on the supply side, no amount of funds committed or research undertaken can guarantee that an AIDS vaccine can actually be produced. As in any technical endeavor, no one can know if something will succeed before it has been tried. But a virtue of the contingent loan approach is that the costs are limited: if no vaccine emerges, nothing will have to be paid out.

threats to the global environment, and of how to mitigate those threats, requires collecting, interpreting, and analyzing information from as many countries as possible. To this end, the GEF promotes international efforts—such as the Global Biodiversity Assessment and the Global International Waters Assessment—to collect and disseminate scientific and technical knowledge on planetary environmental issues. It also assists developing countries through a special program to enable them to take stock of strategic knowledge related to biological resources and climate change. This includes, for example, taking inventories of sinks and sources of greenhouse gases.

Second, once generated, this global environmental knowledge—standing alone or embedded in technologies—needs to be disseminated across countries. Within the GEF, information gathered at the national level is shared internationally through reports to the global conventions. The GEF also fosters market-based approaches to the diffusion of environment-friendly technologies. In the area of climate change, the GEF has mobilized \$4.5 billion to be used in transferring to developing countries the knowledge and technologies required to promote energy efficiency, the use of renewable energy, and the reduction of greenhouse gas emissions.

Third, incentives are needed to mobilize human and financial resources around the globe, to translate knowledge about the global environment into policy action. One key to the GEF's achievements is the incentive for cooperation that its way of operating inspires. Science-based technical and operational criteria for determining the eligibility of funding proposals are established in the GEF's operational strategy. These ensure transparency in funding decisions. And because they are designed to maximize global environmental benefits, they encourage broad support from the donor community. The GEF operational strategy also explicitly recognizes that promoting a healthy global environment must go hand in hand with supporting national efforts for sustainable development.

Exchanging and adapting knowledge

Most knowledge that is beneficial for developing countries is not the product of internationally sponsored research, vital though such research can be. It is rather the consequence of actions taken in developing countries themselves. Local knowledge creation—and its transfer from one country to another—thus has the potential to unleash powerful development forces. Learning from others, assimilating that knowledge, and adapting it to local circumstances offer the opportunity to make rapid advances without repeating others' mistakes.

If sharing knowledge about development successes and setbacks is so important, why don't countries do more of it? Part of the answer lies in the sheer difficulty of the task.

Box 9.3

Knowledge and institutions for managing the environment

The Global Environment Facility, created in 1991, provides grants and concessional funding to developing countries for projects and activities that promise global benefits in one or more of four areas: threats to biological diversity, climate change, pollution of international waters, and depletion of the ozone layer. Activities to counter land degradation, primarily those addressing desertification and deforestation at the national level, are also eligible for GEF funding, provided they are related to one of these four areas.

Some 164 countries now participate in the GEF. The facility underwent a restructuring in 1994 and was replenished that same year with \$2 billion and again in 1998 with \$2.7 billion. Activities funded by the GEF are implemented by the United Nations Development Programme, the United Nations Environment Programme, and the World Bank. A scientific and technical advisory panel ensures the mobilization of state-of-the-art scientific knowledge for the design, implementation, and monitoring of GEF programs and projects. The GEF has been selected as the interim financial mechanism of two major environmental conventions: the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change. As of February 1998 about \$1.8 billion in GEF resources had been allocated for project activities in more than 130 countries.

A cornerstone of the GEF's operational strategy is the requirement that project ideas be country-driven. This provides an indispensable guarantee of in-country ownership of the project and long-term social sustainability. Consistency with national objectives and priorities is ensured by the application of detailed policies of stakeholder involvement and participation, and by the active engagement of NGOs in identifying and executing projects and programs.

Assessing the merits of alternative project interventions, or carrying out rigorous analyses of the policy experiments of dozens of other countries, is beyond the capacity of most developing economies. But partly it is a matter of incentives: the global benefits of a systematic analysis of policy experiments exceed those that accrue to any single country. Here we examine how international development agencies can support these efforts in three dimensions: innovating, adapting, and evaluating projects; assessing policy changes and outcomes; and building local capacity for policy analysis and evaluation.

Innovating and adapting at the project level

Development assistance can help create the local knowledge necessary for local public institutions to succeed. Properly managed, foreign aid can encourage better delivery of public services: primary schools in El Salvador, water supply in Guinea, road maintenance in Tanzania,

telecommunications regulation in Argentina. It can do this both by helping with particular development projects and through providing advice and analysis, and often through a combination of the two.

By supporting efforts initiated domestically, donors can help countries at every stage of a development project: from designing the first pilots to bringing those pilots to scale to evaluating the outcomes. Adaptation is crucial in all this, because one size often does not fit all. In many cases, if knowledge is to be effective, it must be locally created or re-created, domestically owned, and internalized. Good principles must always be adapted to new circumstances, and here domestic stakeholders—governments, businesses, and citizens—must take the lead. Effective adaptation also requires that governments and donors elicit and really listen to feedback from those whom the project is supposed to benefit.

Donors are also becoming more flexible about allowing adjustments to projects in midstream, and they are encouraging “structured learning.” Under this approach, information gathered in the course of a project’s implementation is fed back into its design, allowing continual improvements in service delivery. An example is the World Bank’s support of Brazil’s PROSANEAR sanitation project. Sponsored in part by the Caixa Econômica Federal (a state-owned bank specializing in lending for housing and sanitation projects), PROSANEAR uses an inexpensive but effective strategy for sewage collection that relies on a high degree of community participation and shared responsibility. Communities monitor household use and system performance, and they manage their own repairs. The project’s most striking feature is the Caixa’s commitment to adjust the project’s design in light of experience.

Development agencies and NGOs can also assist countries by supporting the diffusion of information about service provision drawn from their experience in implementing many projects in different countries with different institutional structures. West Africa’s AGETIPs (*agences d’exécution des travaux d’intérêt public*) are one example of an innovative mode of public contracting that has spread well beyond its country of origin. Started in Senegal, AGETIPs are based on the idea that public services of superior quality need not rely on direct public provision by government agencies. These not-for-profit associations instead enter into contractual arrangements with governments to carry out infrastructure projects. After Senegal’s successful experience—in which AGETIPs, through soliciting bids from and contracting with private suppliers, reduced construction costs and delays—other African countries adopted this model with help from the World Bank.

Development institutions can encourage the diffusion of such reforms by bearing some of the startup costs. In Guinea a World Bank loan facilitated a contractual ar-

rangement in which a private management agency took over the operation of a publicly subsidized water system. The loan paid the difference between the system’s costs and the revenues that could be recovered from users. Thanks to this financing, the subsidy, rather than being eliminated suddenly, could be reduced gradually as the operation moved to a commercial basis.

In numerous cases of public sector innovation—from parental involvement in school management to concessions for water supply—development assistance has contributed to better public services by supporting innovation and evaluation and by promoting the replication in other countries of a pioneer country’s success. Development agencies, especially when intimately involved in reforms, can thus provide a means of disseminating lessons from the innovators to the followers. That is precisely what happened with the Road Maintenance Initiative in Africa (Box 9.4).

Many donors also have an established capacity to evaluate projects by drawing on cross-country evidence and experience in ways that no single country could. Project evaluation benefits the country in which the project is located, particularly if the feedback results in continuous improvement. But when properly disseminated, the results of careful evaluation can benefit other countries as well. In this sense project evaluation is yet another international public good: one country bears the additional costs of learning, but many other countries ultimately benefit.

Donors can help secure these benefits by financing rigorous independent evaluations. In fact, much of the value of development projects comes through the ex post evaluation of innovative activities, whether successful or unsuccessful. Thorough evaluation includes listening to project beneficiaries and taking into account their measures of a project’s success or failure. It also requires analysis, which means not only recording perceptions of what constitutes best practice, but also digging into what really works, why it works, and what the most important contributing factors are. Analysis is needed not only to ensure continual improvement, but also because all too often what is “best practice” depends on both the details of a program and the context in which it is applied. Only careful analysis can determine which practices suit which contexts.

Modern scientific method shows us how best to conduct such analyses. Where possible, project evaluators engage in controlled experiments, in which similar groups receive different “treatments” and the outcomes are analyzed using statistical techniques. For instance, the close monitoring of family planning services in “treatment” and “control” areas in rural Bangladesh has provided far and away the most powerful evidence on the impact of family planning programs. Such knowledge will prove useful around the globe. And in Kenya a well-designed experiment has

Box 9.4**Maintaining roads by building institutions in Africa**

In Africa nearly a third of the road network as measured by value has become unpassable because of poor maintenance. To address this problem, a group of donor agencies including the United Nations Commission for Africa and the World Bank launched the Road Maintenance Initiative in 1987. The undertaking began with workshops with domestic stakeholders, to build a consensus on the need for institutional change and its direction. These workshops revealed that it was pointless to focus on road maintenance as an isolated problem. Instead, poor maintenance was recognized as merely a symptom—weak and unsuitable institutional arrangements for managing and financing roads were the real culprit. The next stage was to devise a process that would build effective institutions, bringing in the main users of roads—farmers, businessmen, transport operators—as full partners, since it is they who bear the costs of poor roads.

This type of institution building cannot, of course, solve all the problems related to road maintenance. Part of the difficulty stems from poor original construction, which in turn may have resulted from poor governance and corrupt inspectors. Further problems arise from failure to set and enforce weight limits on roads—a serious shortcoming given that heavy trucks do the most damage to roads. Nevertheless, the Road Maintenance Initiative has had considerable success, and its experience confirms some of the basic features of successful institution building:

- First, establishing a consensus on problems and solutions requires patience, because it takes time to analyze and think through solutions and to implement them in a self-sustaining fashion—it took five years for the Road Maintenance Initiative to show results.
- Second, lasting reform requires domestic interest and commitment. Only after the private sector became convinced that there was hope for improved roads, and the public agencies became convinced that gains were possible, did the process take on a life of its own.
- Third, ideas do spread from country to country. With each round of implementation, other African countries have learned both the pros and the cons of alternative approaches.

examined the impact of textbooks on learning by teaming independently financed researchers with small NGOs.

Disseminating and adapting the results of policy research

Any one country can accumulate only so much experience of its own with policy problems. To gather enough knowledge about how to deal with hyperinflation, for example, or regulation of the telecommunications industry, countries have to look abroad, drawing on the experiences of other

countries that have faced similar challenges. But carrying out careful analyses of policy experiments in many other nations is beyond the capacity of most developing countries. Even if their capacity were greater, they would carry out too little research of this type. Once created, the knowledge would spill across borders—whether through published reports or through informal observation leading to demonstration effects—and would benefit other countries. But the country doing the research will not take these benefits fully into account in deciding how much research to do.

The policy research of development institutions aims to fill this gap, by analyzing and codifying policy reforms around the world so that this information can be used worldwide. For example, it was only in the late 1970s that development agencies began to fully appreciate the value of openness to international markets as a spur to economic growth. In the two decades since, development agencies have worked to disseminate research showing the benefits of a reasonable degree of openness, encouraging insular economies to learn from the success of the more open ones.

It is hard to assess the impact of this dissemination, but clearly the past decade has seen a worldwide trend toward economic liberalization and greater openness. Of 35 countries that undertook major trade liberalizations over this period, almost all were influenced by the successful cases that had gone before. This influence would have been much less potent without systematic efforts to demonstrate and disseminate the lessons of success and failure.

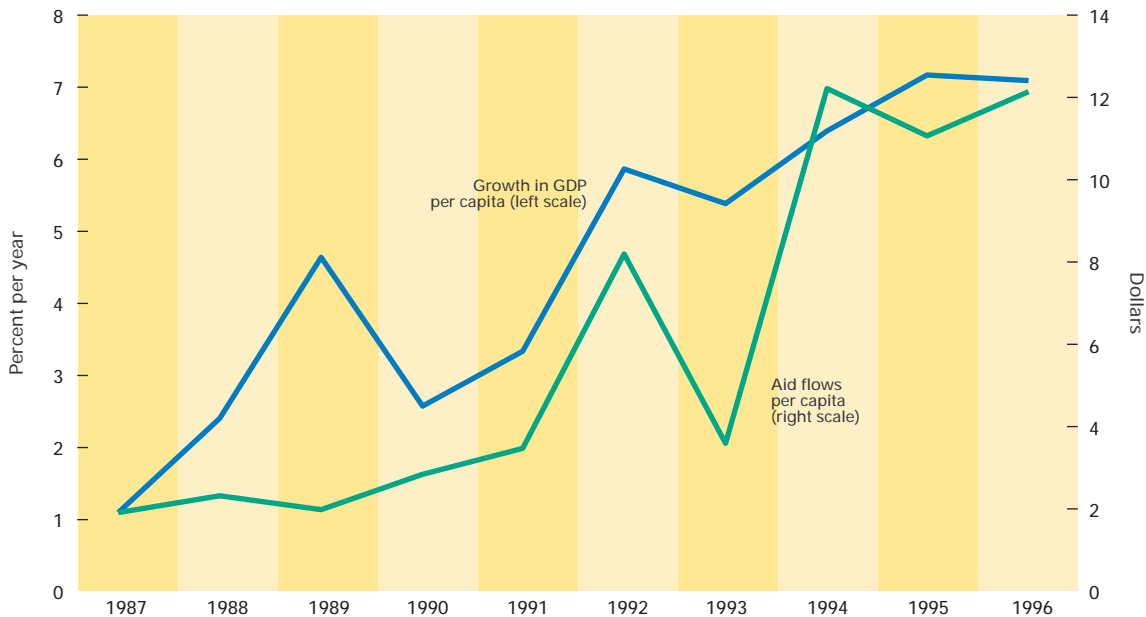
Other examples suggest that much good can come from knowledge dissemination sponsored by development agencies, even when unaccompanied by substantial financial transfers. Vietnam, for example, was plagued in the mid-1980s by hyperinflation, a huge fiscal deficit, poor incentives for production, and stagnant income per capita. The country began to reform in 1986, but because of its political estrangement from the West, it received no large-scale financial assistance. Vietnam did, however, receive a significant amount of technical assistance and policy advice, financed by the Nordic countries and the United Nations Development Programme (UNDP). Both the World Bank and the International Monetary Fund were active in delivering this assistance and advice. Only after a marked policy improvement between 1988 and 1992 did significant amounts of financial assistance begin to flow into the country in a sustained way (Figure 9.1). But by then a sharp improvement in economic performance had already taken place: income per capita was growing strongly, and inflation had fallen off dramatically, from over 400 percent in 1988 to 32 percent in 1992.

The important lesson from Vietnam's turnaround is that donor agencies can help with policy reform and institutional development before providing large amounts of money. Studies of Vietnam's reform point to the useful-

Figure 9.1

Aid flows and GDP per capita in Vietnam

Vietnam's policy reforms boosted growth even before aid flows increased.



Source: World Bank data.

ness of international agencies during this period and to some of the innovative approaches adopted. To take just one example, the Asia Foundation and the World Bank organized a series of workshops in which domestic private firms and government policymakers publicly debated economic reform priorities for the first time. Stimulating policy debate and the interaction of civil society and government is one of the most useful roles that development agencies can play. It seldom costs a lot of money, but it can have a very large payoff.

Another example comes from recent research on pension reform. Many developing economies have public pension schemes that operate on a pay-as-you-go basis, with current contributions paid out mostly to current recipients. The benefit-tax ratios of these schemes remain viable as long as there are many workers and few retirees, but will become unworkable as the ratio of retirees to workers climbs. A 1994 World Bank report, *Averting the Old Age Crisis*, showed how a low-cost form of international assistance can stimulate reform of pension policy. In the wake of that Report, donors have helped a wide range of countries—among them Argentina, China, Hungary, Mexico, Poland, and Uruguay—study the long-term fiscal and dis-

tributional consequences of their old-age security systems. These countries were able to draw on the lessons of, for example, the successful Chilean pension reform. Once the public understood that current benefit-tax ratios were not sustainable, political support for reform increased.

Although it cannot be proved (or disproved), it seems likely that development agencies have an important role in creating and disseminating knowledge about successful policies. Increasingly, donors are shifting their focus from finance to ideas. An example is the United Kingdom, whose recent white paper on international development states:

Research is an important weapon in the fight against poverty. Without research, many development interventions would fail or be much less successful; and research has significant multiplier effects—solutions to the causes of poverty in one part of the developing world may well be replicable in another. The principle of shared knowledge is an important component of the partnerships which are essential to development. The government sees the continued investment in knowledge generation as a key

element in achieving its aims and objectives for international development.

The impact of the adaptation and dissemination of ideas is obviously difficult to measure, but recent research has quantified one measure of the importance of analytical work, namely, the increased returns it generates on development projects. Empirical analysis of the performance of World Bank projects shows the value of the effort that goes into producing the economic memoranda, public expenditure reviews, poverty assessments, and other reports that underpin the policy dialogue with government, and of the wide range of sectoral reports that provide the foundation for specific lending operations. Even after statistically controlling for differences among countries, sectors, economic conditions, and amounts of staff input for project preparation and supervision, this research finds that analytical work—both macroeconomic and sectoral—improves project performance. Indeed, one additional week of analytical work by World Bank staff increases the benefits of an average-size Bank-financed project by four to eight times the cost of that week of staff time. And because analytical work typically relates to more than one project, the overall benefit is even larger: up to 12 to 15 times the cost. Moreover, these are just the benefits to projects financed by the Bank. If the changes inspired by the Bank's analysis affect other donor-financed projects, or even perhaps all government projects as well as policies, the returns to analytical work could be truly astronomical.

Building local capacity for policy analysis

Policymakers and communities in developing countries often have information, or local knowledge, that is not readily transferable to international institutions. It is often most efficient for development institutions to transfer internationally available knowledge to well-trained government officials or other local residents, who can then merge that knowledge with local knowledge to devise locally appropriate policies or projects. For this reason, donors often help create domestic capacity for policy analysis and devise mechanisms that allow a strong civil society to engage government in a dialogue on policy.

The African Economic Research Consortium, which supports research by Africans on African economic policies, is one such innovative effort to create and sustain policy analysis capabilities outside governments (Box 9.5). Another is an effort funded by the U.S. Agency for International Development to raise the quality of education by creating the capacity, outside ministries of education, to do serious analysis of educational reforms. This effort, initiated in several countries in Africa, looks to create a competitive element in policy analysis so that the government does not retain a monopoly on information and technical

Box 9.5

The African Economic Research Consortium: A successful experiment in capacity building

The African Economic Research Consortium, which started from a small effort in 1984 by Canada's International Development Research Center, has grown into a continent-wide organization supported by 16 donor agencies and NGOs. The consortium works to raise the quality of economic analysis through three mechanisms. It provides small grants to support the research endeavors of individual researchers, allowing them to supplement their (generally low) salaries while still maintaining time for study. It also provides a mechanism for review, discussion, and exchange among African researchers, to raise the quality of analysis through seminars and peer review as well as by linking African and non-African scholars working on similar issues. And it oversees a master's program in economics to train future analysts. The World Bank has for quite some time been involved in all three aspects of the consortium's work, providing financing, making staff specialists available for research seminars, and assisting in developing and delivering training courses.

There are clear signs that the consortium has fostered progress. Independent evaluations find that it has raised the esprit de corps of African economists and enhanced the amount and the quality of African research. Many early participants in the consortium are moving into positions as policymakers, where they can draw on their expertise and that of the network of researchers throughout Africa. Perhaps the best sign of the capacity of consortium members for policy analysis comes from an independent reviewer, who commented on their "excellent critiques of the analytical work of the [World] Bank and other international institutions."

capacity. Greater competition and enhanced analytical skills should accelerate the rate at which good policies are learned from international experience, adapted to local conditions, and adopted.

One of the main traditional solutions when a country lacks certain needed skills has been to provide technical assistance. This has often entailed spending considerable sums financing foreign experts, in the hope of alleviating critical short-term constraints and improving long-term human and institutional development. Technical assistance has had some important successes but overall has been disappointing, especially with regard to the long-term benefits. A UNDP evaluation in 1993 concluded with a fourfold censure: "There is a growing sense that technical cooperation does not work well, that as presently practiced it is ineffective, that such benefits as it brings are extremely costly, and that, in any case, it has little lasting impact."

Of course, the more a country or public agency is driving its own reform program, the more receptive it may be to technical assistance and institution building. Free-standing technical assistance provided by international consultants and the insertion of individual technical experts into government agencies have served some purposes. But when such assistance is not driven by domestic demand for expertise, foreign experts too often fail to be integrated into agencies in ways that allow the transfer of capacity. That is why technical assistance as a mechanism to promote effective public sector institutions has had only limited success. In many environments there is no way around a slow process to create the capacity for policy analysis and dialogue, both in the government and in civil society.

Some countries have used donor-financed short-term training opportunities to upgrade the technical skills of their staff and have achieved significant performance improvements. But many others have been unsuccessful. The reason is probably that lack of technical skills is not the key constraint. If public sector officials do not have the incentive to perform, if they are politically blocked from performing, or if they lack the materials or the resources to perform, additional training in what to do if they had the incentive, power, and resources is irrelevant.

Managing knowledge for economic development

The management of knowledge through systematic sharing is becoming more explicit in organizations around the world, including those involved in development assistance. The idea that knowledge for development should be shared is obviously not new. But the transfer of knowledge is inherently difficult, since even those who have knowledge may not be conscious of what they know or how significant it is. Knowledge is thus “sticky” and tends to stay in people’s heads. In response to this stickiness, communities have always used interactive knowledge-sharing mechanisms—from palavers under the baobab, village square debates, and town meetings to conclaves, professional consultations, workshops, and conferences.

Many factors have transformed the way organizations view knowledge and knowledge sharing, but perhaps most pivotal is the dramatically extended reach of knowledge through new information technology (Chapter 4). Thanks to the plummeting costs of communications and computing and the extraordinary growth and accessibility of the World Wide Web, organizations with operations and employees around the world can now mobilize expertise from any source and rapidly apply it to new situations. And their clients are coming to expect to benefit not merely from the know-how of the particular team assigned to the particular task, but from the very best that the organization as a whole has to offer. Knowledge sharing is thus en-

abling—and forcing—institutions that are already international in scope to become truly global in character.

Which organizations are most actively taking up the challenge of formal knowledge management? The major international consulting firms were among the early adopters, but its popularity is spreading rapidly across all sectors of business in the United States and Europe. In the field of economic development, the recent Global Knowledge 97 conference, convened jointly by the Government of Canada and the World Bank, brought together participants from scores of development organizations—multilateral, bilateral, NGO, and private sector—to discuss issues of knowledge sharing, access, participation, and the new information technologies (Box 9.6). At the level of the individual organization, comprehensive programs for sharing knowledge typically emerge when the organization’s know-how is perceived as critical to its mission, when the value of that know-how is high, and when the enterprise is geographically dispersed.

To take just one example, Skandia AFS, a Stockholm-based provider of financial services, began consciously to manage its stock of knowledge in 1991 to support a global expansion. As it founded each new startup, the firm initially used the administrative resources of an established business unit in the host country. This reuse of existing knowledge helped reduce lead times and startup costs, increasing productivity and quality. The company was soon completing two startups a year, not just one, having shrunk the lead time to seven months (the industry average was seven years at the time).

The diverse efforts of organizations around the world to share knowledge are being pursued under various labels: knowledge management, knowledge sharing, intellectual capital management, intellectual asset management. Whatever the label, an organization embarking on this course must confront some key choices about the dimensions of its knowledge management system. This section describes some of those choices and the tensions that underlie them—and some additional challenges that apply primarily to development institutions.

Key dimensions of knowledge management programs

The most important decisions that an organization must make in establishing its knowledge management system are the following: deciding with whom to share, deciding what to share, deciding how to share, and deciding *to* share. Knowledge sharing is a social process, which tends to occur in a community where there is trust and openness among members. In undertaking knowledge-sharing programs, many organizations, including the World Bank, have found that the nurturing of knowledge-based communities, or communities of practice (economists, educators, environmental scientists, and the like), is a *sine qua non*.

Box 9.6**Bilateral-multilateral cooperation to promote global knowledge sharing**

In June 1997 the Government of Canada and the World Bank co-hosted Global Knowledge 97, a conference that brought together in Toronto more than 1,700 participants from scores of countries. The organizers worked together with a large number of public and private organizations to explore the vital role of knowledge in sustainable development, and the ways in which the information revolution transforms the development process. The conference examined the new opportunities for partnership and dialogue created by the information revolution; the challenges for equity and access posed by new technologies; the ways in which information and knowledge can serve economic and social empowerment; and the ways in which the international development community must adapt to address these new opportunities and challenges. The conference also featured cybercafes, videoconference links with sites around the globe, and a Knowledge and Technology Forum highlighting innovative uses of technology to address development challenges.

As a follow-up, the organizers established an evolving Global Knowledge Partnership. The partnership includes public, private commercial, and not-for-profit organizations committed to sharing information and resources to promote broad access to, and effective use of, knowledge that can promote sustainable, equitable development. Members cooperate through a variety of initiatives, including pilot projects, conferences and workshops, capacity-building initiatives, information sharing, and project coordination.

The conference also led to the creation of a Global Knowledge Partnership site on the World Wide Web, with information in English, French, and Spanish. The website is the center for a growing dialogue; an information resource on tools, partnerships, and best practices; and the forum for a continuing Global Knowledge Virtual Conference. This on-line conference brings together individuals committed to ensuring that the world's poor are full partners both in the benefits of the information age and in building and sharing knowledge for sustainable and equitable development.

Such communities are typically based on the affinity created by common education, work practices, interests, or experience, where practitioners face a common set of problems in a particular knowledge area and share an interest in finding new solutions, or more effective solutions, to those problems. Some asymmetry of knowledge is essential for these communities to become dynamic, living entities: some members of the community must have knowledge that others in the community want and need. Various mechanisms are available to strengthen such communities, including specific work objectives, the provision of ade-

quate resources and management support, and the recognition, both formal and informal, of individual contributions.

Deciding with whom to share. The first major decision concerns the intended beneficiaries. Knowledge-sharing programs may aim at sharing with either an internal or an external audience. Internal knowledge-sharing programs typically aim at making the existing business work better, faster, or cheaper, by arming front-line staff with higher-quality, more up-to-date, and more easily accessible tools and inputs. This improved access allows them to add value for clients or reduce costs. Internal knowledge sharing was the thrust of the initial knowledge-sharing initiatives in the major international consulting firms in the early 1990s.

More recently, some of these firms—such as Arthur Andersen and Ernst & Young—have started offering external knowledge-sharing services so that clients can have direct on-line access to the firm's know-how. Arthur Andersen makes some of its knowledge resources available on-line through its KnowledgeSpace™ service, and Ernst & Young provides answers to clients through its on-line consulting service Ernie™. The World Bank's strategy for sharing knowledge has been explicitly external from the outset. Its objective is to make know-how and experience accessible not only internally, to World Bank staff, but externally to clients, partners, and stakeholders around the world—and in the process to reach many who now have little or no access to its expertise.

External knowledge sharing poses greater risks than do internal programs. It raises complex issues of confidentiality, copyright, and, in the private sector, the protection of proprietary assets. But it may also offer greater benefits. Some analysts believe that, in the next five years, knowledge-sharing programs will broaden from their current employee focus to encompass suppliers, business partners, and customers.

Deciding what to share. The knowledge that knowledge-sharing programs seek to make available comes in various types. Some programs, such as that of Manpower, Inc., provide customers with content that enables them to better use the firm's services. Others, such as those of Broderbund Software Inc. and Symantec Corporation, provide on-line service and support aimed at helping customers make better use of the software they have purchased. Still others, such as those of the international consulting firms and the World Bank, aim at sharing the know-how and best practices that make up the core expertise of the organization (Box 9.7).

The question of what to share encompasses both the type of knowledge and its quality. In organizing knowledge-sharing programs, it is common to put processes in place to ensure that the content shared reaches a minimum threshold of value and reliability. Some programs—for

Box 9.7**Knowledge management at the World Bank**

Recently a World Bank task team leader in the Republic of Yemen urgently needed to respond to a client about setting up management information systems in an education ministry. Not so long ago, such a request would have had to wait until the team leader returned to headquarters, where he could consult with colleagues and perhaps search libraries and databases for the answer. Using the Bank's knowledge management system, however, the team leader simply contacted the education advisory service in the Bank's Human Development Network, which, in collaboration with the relevant community of practice, ascertained that there was similar and relevant experience in Kenya. The information was dispatched to Yemen, enabling the team leader to respond to the client within 48 hours, rather than weeks later.

An Indonesian official needed to know the international experience on private sector involvement in vocational training. Again through the help of the Human Development Network, the relevant Bank task team leader was quickly able to provide the official a comprehensive analysis, performed jointly with the United Nations Industrial Development Organization. He was even able to suggest some potential partners, identified through the International Finance Corporation, a Bank affiliate.

Launched in October 1996, the World Bank's knowledge management system seeks to make the Bank a clearinghouse

for knowledge about development—not just a corporate memory bank of best practices, but also a collector and disseminator of the best development knowledge from outside organizations. By 2000, according to plan, relevant parts of the system will be made externally accessible, so that clients, partners, and stakeholders around the world can have access to the Bank's know-how. Now moving ahead rapidly on a broad front, the Bank's sectoral networks are leading the effort through the following activities:

- Building communities of practice
- Developing an on-line knowledge base
- Establishing help desks and advisory services
- Building a directory of expertise
- Making key statistics available
- Providing access to transaction information
- Providing a space for professional conversation, and
- Establishing external access and outreach to clients, partners, and stakeholders.

Knowledge management is expected to change the way the World Bank operates internally and to transform its relationships with all those it deals with on the outside.

example, that of OneWorld Online (Box 9.8)—make no explicit distinction between levels of reliability once an initial threshold has been met. This allows users to draw their own conclusions about its value. Other programs, particularly those that offer external knowledge sharing, provide explicit guidance on whether the material has been authenticated. Most knowledge-sharing systems also allow, to varying degrees, the inclusion of new and promising ideas that have not yet been authenticated and in this sense are not yet knowledge.

Knowledge-sharing programs have to cope with adapting know-how to the local context in which it is to be applied. Where this know-how is extremely robust and the local context largely predictable, adaptation may not pose much of a problem. But in most areas of development assistance, know-how is typically less than fully robust, and the local context almost always unpredictable. Knowledge of the local context and of local know-how thus becomes very important. This realization has spurred the effort to incorporate local knowledge into development-oriented knowledge management systems.

A recently launched initiative will expand the World Bank's knowledge management system to incorporate local knowledge from countries and sectors in which the Bank

is active. Gathered through field interviews, participatory community assessments, and focus-group meetings with NGOs, this knowledge is being catalogued by country, region, sector, and theme, to be made widely available to practitioners everywhere. By taking into account and complementing traditional practices in the least-developed countries, this approach should make knowledge available to far greater numbers of the poor. It may also ensure greater acceptance of development solutions.

Deciding how to share. Knowledge management programs can be seen as having both a collecting and a connecting dimension. The first "how" question is how to balance the two. The connecting dimension involves linking people who need to know with those who do know, thus developing new capabilities for nurturing knowledge and acting knowledgeably. Connecting is necessary because knowledge is embodied in people and in the relationships within and between organizations. Information becomes knowledge as it is interpreted and made concrete in light of the individual's understanding of the context.

For example, help desks and advisory services (small teams of experts whom one can call to obtain specific know-how or help in solving a problem) can be very effective in the short term to connect people and get quick

answers to questions, thus accelerating turnaround time and adding value for clients. At the World Bank such services have tended to prove more immediately productive than has the building of knowledge bases, which takes longer. Organizational “yellow pages” (lists of people indicating which of them knows what) can enable staff to connect to the right people and know-how more efficiently. But an organization that focuses entirely on connecting, with little or no attempt at collecting, can be very inefficient. Such organizations will fail to get the leverage that true knowledge sharing offers—and may spend much time reinventing wheels.

The collecting dimension relates to the capture and dissemination of know-how through information and communications technologies aimed at codifying, storing, and retrieving content, which in principle is continuously updated through computer networks. Through such collections of content, what is learned is made readily accessible. Even where comprehensive collections exist, their effective use may still require knowledgeable and skilled interpretation and alignment with the local context. Reading a newspaper article on brain surgery, after all, does not qualify one to conduct the operation. Thus it is that an organization focused completely on collecting, and making little or no effort to connect people, tends to end up with a repository of static, little-used documents.

Most knowledge management programs—particularly organization-wide programs such as those at Ernst & Young, Arthur Andersen, and the World Bank—aim at an integrated approach to managing knowledge, combining the benefits of both the connecting and the collecting dimension. They achieve a balance between connecting individuals who need to know with those who do know, and collecting what is learned as a result of these connections, filtering it, and making it easily accessible. When collected documents are linked to their authors’ websites or e-mail addresses or offer other interactive possibilities, allowing for more accurate interpretation and more in-depth learning, they can become dynamic—and thus much more useful.

A second “how” question concerns the choice of appropriate technology for knowledge sharing. There are many examples of systems that are not quick, not easy to use, and not easy to maintain. It is no trivial task to develop tools that reliably support knowledge sharing in an appropriate and user-friendly way, particularly when the scope of sharing is organization-wide. Most of the technological tools now available tend to help disseminate know-how, but offer less assistance in using it. Tools that assist in knowledge creation are even less well developed. Some of the more user-friendly technologies are the traditional ones: face-to-face discussions, the telephone, and flip charts.

In choosing information technology for knowledge-sharing programs, an organization must keep several im-

Box 9.8

Sharing knowledge at OneWorld Online

OneWorld Online (www.oneworld.org) is an electronic gateway for the public to the issues of sustainable development. It draws on the websites of over 250 partner organizations spanning government departments, research institutes, NGOs, news services, and international agencies. Among them are the European Centre for Development Policy Management (the Netherlands), the Institute of Development Studies (United Kingdom), the International Institute for Sustainable Development (Canada), the Centre for Science and Environment (India), and the Inter Press Service (Italy). These resources sum to a virtual library on development and global justice issues, encompassing more than 70,000 articles in six languages. Unlike in a bibliographic database, however, the documents are available in full text form and are free for anyone to read.

The partners of OneWorld Online came together because Internet users are generally looking for knowledge about a development theme, not about this or that organization. Thus, packaging the materials of these various organizations under topic headings makes them much more readily available. The headings include guides to key development themes, think tanks for professionals, news from a global perspective, educational resources, radio programming, and training opportunities. The service is proving very popular: the website receives more than 4 million hits a month from more than 120 countries on average, 60 of them in the developing world.

Owned by a charity and run by a team of 15 people based near Oxford, in the United Kingdom, OneWorld Online is establishing additional editorial centers in the Netherlands, India, Africa, and Central America. These are intended to provide a genuinely “one world” perspective, especially through the use of languages other than English. They also work to support local NGOs in maximizing the Internet’s potential as a tool for development.

A central feature of OneWorld Online’s website is a specialized search engine dedicated solely to sustainable development. This offers the user a way to avoid the needle-in-a-haystack approach of all-purpose search engines. Users of the OneWorld search engine know that the domain searched contains only relevant material of known date and provenance.

portant questions in mind. Is the technology responsive to users’ needs, pitched to users’ abilities, and well integrated with other technologies used by the organization? Can items be easily found and retrieved? Is new material entered in a way that preserves the quality of the system, and is obsolete material removed promptly?

Deciding to share. Even if the organization has a clear vision and answers to these questions—what, how, and with whom to share—its knowledge management efforts

will founder if they are not backed by senior managers. A real commitment to sharing requires substantial changes in resource allocation and organizational procedures.

First, formal knowledge programs can require a sizable commitment of financial resources. The typical organization-wide knowledge management program may consume as much as 5 percent of the total enterprise budget. The large international consulting companies are believed to spend on average between 6 and 12 percent of their revenues on knowledge-sharing activities and infrastructure.

Second, the organization's incentive structure must be altered to reinforce its knowledge-sharing system. An open, sharing culture will promote the success of knowledge management programs, and incentives can help in turn to make such a culture a reality. Some organizations such as Price Waterhouse and Ernst & Young have made knowledge sharing an integral part of their formal personnel evaluation systems, apparently to good effect. Knowledge fairs (company-wide events at which knowledge professionals present their services to communities of practice) and knowledge-sharing awards have also been used. A recent study of successful knowledge management projects has identified a knowledge-friendly culture and supporting incentives as two of the factors critical for success in almost all of them—but emphasizes that other factors, such as the appropriate technical and organizational infrastructure, may be even more important.

Third, the organization must be prepared to accept some ambiguity, or at least to rely on nontraditional measures, when evaluating the impact of knowledge sharing. Measuring that impact, whether in terms of return on investment (for private companies) or in terms of development success (for international development institutions), remains problematic. In principle, inputs lead to activities, which generate outputs, which in turn produce outcomes, which in turn result in an overall impact. But measurement problems arise at each link of this chain.

It is difficult to disentangle knowledge-sharing inputs and outputs from other operational activities, although the formal definition of specific knowledge management activities has proved helpful. Outcomes can be illuminated by the use of surveys, focus groups, and groupware sessions, but often it is not easy to interpret what the results mean for the system as a whole. Impact can be assessed through correlations with other measures, but causal connections are difficult to trace and often speculative at best. The study just cited shows just how difficult and speculative: in deciding which knowledge management projects were "successful," the authors had to rely on input, usage, and qualitative measures to supplement limited information about financial returns.

The bottom line is that few organizations, if any, have devised credible measures to establish a causal relationship between spending on organization-wide knowledge sharing and specific improvements in key performance measures. The assessment usually comes down to a qualitative judgment: is it working?

Knowledge management for development assistance:

Special challenges

Like other organizations, international institutions and the development community today enjoy an unprecedented opportunity to use new technologies for knowledge management to get better and faster results on the ground. But their choices have broader ramifications, requiring decisions not only on the technical issues but also on the larger principles at the heart of the development process. Now that new technology makes sharing much easier and cheaper than ever before, it is vital that these tools be used for the public good. To achieve this, collaboration and openness become the dominant principles of operation, particularly in international assistance (Box 9.9).

International institutions should take care to orient knowledge-sharing programs to the needs and technological capabilities of users in developing countries. Part of this challenge is one of technical design. Systems must be geared to users who have limited technical means, such as low-speed modems and little computing capacity, so that their low-end technology is not a barrier to access. Systems should use public rather than proprietary software where possible and provide alternative means of access for those without computers. User fees for access to knowledge bases should be avoided, if they risk limiting access for low-income users.

Also part of the challenge is the authentication of content. Since human beings often fully trust only the knowledge they themselves have helped create, development knowledge bases will reach their full potential only if practitioners in developing countries take part in building them. For explicit know-how, participation can be facilitated by opening knowledge bases for comment and review and by providing the means to register alternative views. For know-how that remains tacit, active participation by developing countries is needed in all phases of knowledge creation—for example, in project design and in building new knowledge bases.

A prerequisite for knowledge sharing is free information flows. So far, the Internet has been open and inclusive in spirit, although there have been efforts to encroach on that freedom. Some countries have banned access to the Internet entirely; others use prohibitive pricing to preclude access for much of their population. Continued vigilance is thus needed to ensure that the Internet remains a

Box 9.9**Knowledge partnerships for the environment**

Sustainable development requires a wide range of stakeholders working together toward common goals. The World Bank is therefore trying to serve as a knowledge hub, facilitating the interchange of knowledge among stakeholders and, especially, between the institutions of the industrial and the developing world.

Much of the knowledge shared will be knowledge about the environment. In sustainable forestry, the Bank has set ambitious targets to protect large areas of the world's remaining tropical forests. Achieving these targets will require the commitment of and support from a wide range of stakeholders. To this end, a range of partnerships and on-line discussions have been established, involving among others the Bank, the World Wildlife Fund Alliance, and the CEO Forum, a group that represents the world's top private forestry companies.

A second example is the Bank's partnership with the Biodiversity Conservation Information System (BCIS), a consortium of 12 of the world's leading conservation NGOs. The consortium's members are working to improve access to their large databases on protected areas, threatened ecosystems and species, and environmental law. Through partnership with the BCIS, the World Bank can add its knowledge resources and make a wealth of information available to its operational staff and clients. Just as important, it can help increase the flow of data and knowledge from its country operations back to the international system, while ensuring that those engaged in project-based activities have access to the best available environmental data and practices.

truly international and freely accessible public good. Any approach to limit access under whatever guise—commercial priorities, moral values, national pride, linguistic predilection—must be weighed against the enormous opportunity costs of interfering with free information flows.

The same logic that drives the international community to manage its knowledge applies with equal force to developing countries. They must establish their own knowledge bases, authenticate them from their own experience, interpret what is meaningful from their own perspectives, and create a future that meets their needs. As international institutions learn how to share knowledge more effectively, they can and should help developing countries to understand what is at stake in managing knowledge and

to nurture similar capacities. This will be a large-scale and long-term undertaking.

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Now that knowledge is recognized as central to development, the development community is taking on a new set of tasks related to the creation, transfer, and management of knowledge. Because no one country or organization will create all the international public goods that are needed, it is up to the entire development community to pitch in to do so. But the agenda is daunting: a cure for malaria, a vaccine for AIDS, restoration of the ozone layer—to name only a few of the challenges. The Consultative Group for International Agricultural Research has shown what is possible, but also what is no longer possible in today's world. Whichever of these public goods the development community addresses, the roster of players will have to extend beyond governments, the major philanthropies, and international organizations to enlist businesses and NGOs. This should ease the burden but will complicate the process of public good creation in this new age of partnership.

Because knowledge of successful development practices is too often locked in a few people's heads, another major task for the development community—another global public good—is to assess the merits of alternative policy actions and to conduct rigorous policy experiments in a wide variety of settings. Transferring the knowledge produced by project evaluation and policy research, and adapting it to local circumstances, can avoid mistakes and propel the development process forward. But the adaptation is the trickiest part and will require adequate local capacity.

A vital element in building this capacity is developing systems for managing and sharing knowledge. Global corporations and international institutions have recently begun to do this for their own operations, greatly abetted by advances in computing and communications. As they refine these systems, they are opening them to their clients, so that the institutions can respond faster to client needs and deliver products and services of the highest possible quality. For the World Bank and the rest of the development community, the advent of knowledge management is beginning to stimulate true exchanges of knowledge, not just one-way transfers. And as developing countries begin to put their own knowledge management systems in place, the opportunities for creating and exchanging knowledge about all aspects of development will soar.