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Achieving the Millennium Development Goals

How to make the Goals a reality

Expanding water and sanitation coverage is not rocket science. It requires neither colossal sums of money nor breakthrough scientific discoveries or dramatic technological advances. Although reaching the water and sanitation target will by no means be easy, particularly in the very poorest parts of the world, and worldwide the sanitation challenge is indeed daunting, achieving target 10 is possible.

The critical question is, how? This chapter focuses on the answer. Based on the analyses presented in the previous chapters, what do we, as a task force, think it will take to meet the water and sanitation target and to optimize water resources management for the entire set of Millennium Development Goals? More specifically, what are the key actions that we have identified as essential to meeting the Millennium Development Goals?

A call to action

We would like to set the stage by first identifying five critical guiding principles without which the Millennium Development Goals simply cannot be achieved.

The task force is unanimous in its belief that the water and sanitation target (target 10) will not be reached unless:

- *There is a deliberate commitment by donors both to increase and refocus their development assistance and to target sufficient aid to the poorest low-income countries.*
- *There is a deliberate commitment by governments of middle-income countries that do not depend on aid to reallocate their resources so that they target funding to their unserved poor.*
- *There are deliberate activities to create support and ownership for water supply and sanitation initiatives among both women and men in poor communities.*

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- *There is a deliberate recognition that basic sanitation in particular requires an approach that centers on community mobilization and actions that support and encourage that mobilization.*

Furthermore, our group is convinced that the Millennium Development Goals as a whole will not be met unless:

- *There is deliberate planning and investment in sound water resources management and infrastructure.*

Without these five preconditions, the poorest countries will miss target 10; the poorest people in on-target middle-income countries will be left behind; many of the gains that are made will not be sustained; the sanitation crisis will continue unabated; and, in many countries, water scarcity, variability, and contamination will hamstring progress toward all the goals.

Our starting points are thus clear: *poor people and poor countries must get priority, and resources and policies must be focused on spurring and supporting community-led action.* The key to reaching the targets will be to mobilize and support people themselves, country by country, particularly in slums, rural areas, and other marginalized communities where access to services is lowest.

Consistent with this focus on ground-level action, we believe that local, subnational, and national governments have the primary responsibility for expanding access to water supply and sanitation services. National governments must stand by their commitments to the Millennium Development Goals by making them priority national development goals, preparing strategies and action plans for their achievement, opening doors for community action, and mobilizing public awareness and support, especially for sanitation and hygiene. Though governments need not engage directly in service delivery, they do need to set standards for service providers (including public utilities and the private sector), and they must intervene, if necessary, to make things happen.

To make the Millennium Development Goals a reality for everyone, countries must focus their efforts and resources where needs and challenges are greatest, particularly among concentrations of very poor people in urban slum areas, periurban areas, and rural areas. They must ensure that the financial burden of serving the poor is not borne by the poor alone. For upper low- and middle-income countries, this commitment principally means that existing resources must be used more effectively. To make subsidies for the poorest possible, governments must end subsidies for the nonpoor. This reallocation of resources will require significant political will and commitment, since ensuring basic services for all rather than subsidizing “luxury” service for some will challenge powerful interests and create a new set of winners and losers.

That said, there is clearly a critical supporting role for international agencies, international nongovernmental organizations (NGOs), and, most importantly, donor countries, which have also committed to the Millennium Development Goals. Most of the countries with the lowest levels of human development and that have made the least progress over the past ten years are stuck in poverty

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traps, bypassed by economic development because of structural impediments like geography, climate, the burden of disease, rapid population growth, heavy debt burdens, dependence upon primary commodity exports, and the inequities of the global current trade regime. For these countries, all the governance reforms, enabling policy environments, and social mobilization efforts in the world will not address the fact that domestic resources are simply inadequate to support a meaningful expansion of services. Without more official development assistance, these countries simply cannot meet the water and sanitation target; they do not have and cannot generate sufficient resources from any other source. To meet the Goals, donor countries must fulfill their side of the Monterrey compact to provide more aid, as well as increase the efficiency of aid through better coordination.

At present, there is often an inherent tension in the process: Should countries outline in a serious way what it would truly take to meet the Millennium Development Goals or should they outline what they believe they can achieve *within likely levels of development assistance*? For the poorest countries most off-track for meeting the Millennium Development Goals, it is crucial to make transparently clear the gap between what they could achieve with likely levels of development assistance and what they really need in order to achieve their goals—and for the international community to step in with the necessary funding. In the water sector, donors and developing countries alike have become accustomed to identifying what can be done *within the confines of existing aid allocations and national budgetary limits*. To meet the Goals, this process must be turned on its head, with identification of needs and demands coming first and appropriate allocations being made second.

To ensure inclusion of and priority for the poor, the vulnerable, and the remote in improved services, official development assistance should be targeted within countries to programs that benefit the poorest. Subsidies should focus on access rather than consumption and should help to attract rather than take the place of community and private resources. Grant-based aid should never go to projects that will primarily benefit the middle- and upper-income groups. For low- and middle-income countries, actors at the international level can play a pivotal role as advocates, catalysts, mobilizers of international support, and sources of additional resources. The framework for this support must be national development planning and budgeting processes that focus on achieving the Millennium Development Goals. There is also a particular need for financial instruments that protect countries from risks, such as adverse currency movements.

Ten critical actions

Meeting the water and sanitation target and optimizing water resources for the Millennium Development Goals by 2015 will require a dramatic scaling-up of efforts—dramatic in terms of both the extent of action required and the speed with which these actions must be undertaken. The financial, governance, and

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capacity constraints low-income countries face will make this a complicated challenge. Scaling-up service delivery in the poorest countries will require unprecedented short-term action, as well as a focus on building the management systems needed to implement large-scale programs over the medium term and to sustain the gains made over the long term. It will also require a departure from “business as usual” on the part of all key actors, and new approaches that center on decentralization, transparency in budgetary allocations, and massive capacity-building efforts right down to the village level. This dramatic scaling-up of efforts that meeting the ambitious Millennium Development Goals and targets entails will require very significant investments, both in infrastructure and in institutional strengthening and reform, as well as at least ten complementary actions necessary to underpin them. These ten actions can be crystallized as follows:

Action 1. Governments and other stakeholders must move the sanitation crisis to the top of the agenda.

“Water supply and sanitation,” occasionally joined by “hygiene,” are words that often appear together in speeches and pronouncements, and indeed this trio belongs together as a cornerstone of public health, as well as social and economic well-being. Sanitation and hygiene, however, somehow disappear during the planning, policymaking, budgeting, and implementation phases, while the lion’s share of effort and resources are allocated to water supply. This needs to change: sanitation and hygiene promotion need to move “front and center” rather than continuing as add-ons to water supply. They are key to development with dignity.

Fundamentally, advocates and sector professionals must not be afraid to tell the plain, ugly truth about what really happens—namely, open defecation. That 42 percent of the world’s people lack what virtually all readers of this report take for granted—a toilet—is a travesty with devastating impacts on peoples’ daily lives, health, and self-respect; we should not be afraid to say so. Here, lessons from the successes in galvanizing global support for the HIV/AIDS epidemic are important; only when policymakers, civil society groups, and the woman and man on the street started speaking openly about how HIV spreads (mainly sexual contact) and how to stop it (condoms, monogamy) did rates of new infection start to decline.

In many cases, countries must approach the challenge of improving sanitation service with different strategies than those employed to expand access to water supply. Expanding sanitation depends not just on building latrines, but also on understanding what motivates people to act in certain ways, and then finding ways to capitalize on those motivations. Mobilization, education, communication, and social marketing, aimed at households, communities, schools, and public authorities are key. The focus needs to be on decisions and investments made at the household and community levels, rather than on

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installation of hardware. More and different types of people need to be pulled into this effort, including NGOs, women's groups, religious organizations, schools, youth groups, small-scale service providers, and local entrepreneurs; indeed, many "traditional" sanitation service providers will need to create space for more actors to enter, influence, and support the market.

Innovation, pragmatism, and, above all, community solidarity and mobilization must be brought to bear to find local solutions that respond to local needs in an affordable and effective manner. Design of sanitation facilities must respond to user preferences, beliefs, and practices; demand for different technical options; motivations for change; and capacity to maintain facilities in the long term. As in all sound marketing practice, sanitation promotion should take into account the distinct needs and preferences of different consumer groups, such as women and children.

Given the enormous ground to be covered to meet the sanitation target, the hallmarks of sanitation strategies should be maximum scalability, minimum transactions costs, full financial accountability, and closed revenue cycles, along with technical feasibility and operational and environmental sustainability.

Action 2. Countries must ensure that policies and institutions for water supply and sanitation service delivery, as well as for water resources management and development, respond equally to the different roles, needs, and priorities of women and men.

Gender differences and inequalities are fundamental to all efforts aimed at improving water supply, sanitation, and water resources management. Because they shoulder the lion's share of domestic responsibilities, women and girls suffer disproportionately when water supply and sanitation services are deficient. Across virtually all cultures, women have a greater need than men for facilities that are safe, private, and near their homes. In water resources management and development, women and men often have different priorities; women, for instance, often prioritize water for domestic use and household gardens, while men want water for irrigating cash crops. Women's relative access to and control over water (and other key resources linked to water, such as land, credit, and extension services), as well as gender biases within public institutions, greatly affect the degree to which women can take part in and benefit from water management and development schemes.

Addressing this reality is critical for the effectiveness and sustainability of water and sanitation interventions. In addition, community action and social mobilization around the provision of basic social services like water have been shown to be a valuable entry point for promoting women's empowerment. Having a leadership role in community management of water supplies, for instance, can increase women's social capital as well as their bargaining power within the household. Priority should be given to policies that capitalize on the potential synergy between the water and sanitation target and the gender equality Goal.

This focus on service delivery should also extend to monitoring systems

Action 3. Governments and donor agencies must simultaneously pursue investment and reforms.

Meeting the water and sanitation target by 2015 will require a dramatic scaling up of efforts—dramatic in terms of both the extent of action required and the speed with which these actions must be undertaken. Waiting for reforms to be implemented before making the necessary investments will make it impossible to meet the 2015 deadline. Over the past decade, donors have often made funding for infrastructure and service delivery contingent upon capacity building and institutional reform. However, in a number of cases, the acquired skills atrophied before the investments materialized, or the “reforms” were merely cosmetic. In other cases, expected official development assistance or funding from private-sector investment in service delivery following institutional reform never appeared. Allowing reforms and investments to take place simultaneously, which some call “learning by doing,” will help address the tension between the desire to have reforms in place before investments and meet the Millennium Development Goals by the deadline of 2015. It will also ensure that reforms are grounded in reality. This parallel approach could be made contingent upon a credible program of investments and a commitment (at the highest level) to simultaneous reforms.

Action 4. Efforts to reach the water and sanitation target must focus on sustainable service delivery, rather than construction of facilities alone.

The Millennium Development Goals necessarily focus on measurable targets, such as the proportion of people without access to water supply and sanitation. It is important to remember, however, that water supply and sanitation are services, not simply facilities. The former is a process—requiring the sustained involvement of government, service providers, and households—while the latter is a product that can be delivered in a one-off project. Adopting a service orientation requires attention to financial flows and institutional arrangements for operations and maintenance, as well as incentives for providing safe, reliable services to all customers (including the poor) on a continuing basis. This approach is being contemplated in Brazil, where government has proposed subsidizing service for the poor contingent not on the provision of physical infrastructure, but rather on the supply of reliable service.

This focus on service delivery should also extend to monitoring systems. Monitoring and assessment systems for access to water supply and sanitation services need to be active and adequately resourced from the sub-national to the international level. These systems need to employ valid and reliable measures of access to water supply and sanitation services. More specifically:

- Access to services, rather than to infrastructure, should be at the center of monitoring efforts. The parameters that matter most to users—including the convenience, reliability, sustainability, and adequacy of water supply and sanitation services—should be measured over time, as should equity of access by women and the poor.

Water supply and sanitation service delivery should be managed at the lowest appropriate level

- Monitoring systems should employ a sample survey approach.
- Collected data should be shared in user-friendly formats with NGOs, civic groups, and the public at large, as well as with national and international institutions.

Action 5. Governments and donor agencies must empower local authorities and communities with the authority, resources, and professional capacity required to manage water supply and sanitation service delivery.

Water supply and sanitation service delivery should be managed at the lowest appropriate level; however, this devolution of responsibility must be accompanied by corresponding devolution of financial resources and authority, as well as the provision of technical and managerial support to build local capacity.

Decentralization of authority and responsibility to local institutions that lack the requisite technical, managerial, or financial capacity and authority for planning and service delivery can hinder, rather than accelerate, the expansion of sustainable services. Partnerships with local businesses, women's organizations, and other NGOs can be used to help build capacity in local governments and move the service-expansion agenda forward. Civic organizations can help promote accountability through facilitation of information dissemination and citizens' exercise of voice and demand for services. Also important is the careful balance of authority between local institutions and the center—for example, with respect to setting standards and subsidy policies—so that the interests of low-income households are protected. Central governments should take explicit measures to ensure that decentralization of service provision is not captured by local elites; it should rather create incentives for local governments to serve the poor.

There are strong links between local government reform and reforms in water supply and sanitation sectors. The provision of water supply and sanitation services can, in some instances, be pivotal for strengthening local governments. It can also provide an effective entry point for women's participation (action 2) in local political processes, particularly when the equal representation of women in water management is a design feature of programs and policies. An emphasis on service provision (action 4) implies a greater focus on ongoing management, which depends upon effective local institutions.

Action 6. Governments and utilities must ensure that users who can pay do pay in order to fund the maintenance and expansion of services—but they must also ensure that the needs of poor households are met.

Only service providers that have adequate funds can operate and maintain present systems properly and establish the creditworthiness needed to support service expansion. Closing the revenue gap depends both on reducing costs and increasing revenues. Improving revenue collection can often be achieved simply by charging for what is delivered and collecting bills in a timely manner. Households and communities are capable of making responsible decisions

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about investments in sustainable water supply and sanitation, and will pay for them if service providers can be held responsible and accountable for the quality of the service they provide. In fact, willingness to charge by governments and service providers is often the limiting factor for adequate revenue generation and resource mobilization. Governments must set an example in their communities by paying their own water bills promptly and in full.

At the same time, governments must recognize that the financial burden of serving the poor cannot be borne by the poor alone. Some poor families and communities simply cannot pay for water supply and sanitation services; carefully targeted subsidies for this group are essential. Where the needs of the poor are not being met because available public resources are being captured by the rich and powerful, appropriate reforms must be implemented. Community-based financing or microfinancing may be a starting point, building a domestic financing system in the process. Governments can also develop financial models for support to nongovernmental and community-based organizations, which can often deliver services at lower costs.

In many areas without access to improved services, however, the financial resources for meeting the Millennium Development Goals must come from outside the communities concerned. Part of the additional funding must come from those already served, using appropriate cross-subsidies; part may come from national income redistribution mechanisms; and part from international donors. In general, subsidizing access (connections in network systems, for example) has proved to be a more transparent way of targeting the poor as compared to subsidizing consumption (for example, monthly bills). In addition, even in the poorest communities beneficiaries can typically contribute to the costs of improved service through various forms of in-kind contributions. Such contributions engender a sense of ownership necessary for sustainability.

It is also critical to recognize that financial sustainability for water supply and sanitation systems requires discipline within national-level budgeting processes. No system should be built unless it is known how it will be financed—not just the initial capital investment, but also the costs of operation and maintenance. Budgeting processes in general also need to become more transparent. Reduction of corruption at all levels, including in the donor organizations and international agencies, is key.

Action 7. Within the context of national poverty reduction strategies based on the Millennium Development Goals, countries must elaborate coherent water resources development and management plans that will support the achievement of the Goals.

Acting on this recommendation clearly requires that there is a coherent poverty reduction strategy in place from which a water resources development and management plan can be derived. Ideally, an integrated water resources management strategy based on the Goals will entail:

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- An assessment of the nature of a country's freshwater supply from all sources (both surface and groundwater), taking into account such key factors as the infrastructure already in place for water abstraction, the water available from shared sources, variability in time and space, and water quality.
- An assessment of the nature of the demand for water resources to meet poverty, hunger, health, and environmental sustainability Goals.
- A coordinated process to reconcile the supply and demand for water resources, one which conforms broadly to the recommendations from the Johannesburg Summit regarding the preparation of integrated water resources management and water efficiency plans by 2005.
- A coherent strategy for the implementation of such plans.

Action 8. Governments and their civil society and private sector partners must support a wide range of water and sanitation technologies and service levels that are technically, socially, environmentally, and financially appropriate.

Supporting a broad range of technological choices allows communities to install the water supply and sanitation infrastructure that they want, are willing to pay for, and can maintain in the long term; it can also lower per capita costs, thus permitting limited resources to bring service to more households. Hand pumps, improved wells, rainwater harvesting, locally designed latrines, installations using volunteer labor, community maintenance, and the promotion of small-scale independent service providers are examples of “lower-tech” approaches that may be particularly relevant and cost-effective for many rural and periurban areas. In some urban settlements, small, locally operated water supply and sanitation systems may be less expensive to construct and maintain than large, centralized systems.

Encouraging the development and use of a range of technologies and services levels helps to resolve the tension between the need for a swift scaling-up of services to meet the 2015 target and the aim of sustaining the gains made over the long term. One-size-fits-all approaches necessarily mean that some households and communities end up getting the “wrong” services, namely, those that are not technically feasible, socioculturally appropriate, or affordable for users, or that are simply not the types of services that users want. A failure to respond to user preferences and circumstances all but guarantees an eventual failure of the services themselves.

Action 9. Institutional, financial, and technological innovation must be promoted in strategic areas.

Innovation in institutional and financial mechanisms, as well as technological advances in key areas, could accelerate progress toward the water supply target, the sanitation target, and the Millennium Development Goals as a whole.

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To meet the water supply and sanitation targets, innovation is particularly needed in the financial, policy, and institutional arenas—such as service delivery systems that help service providers to ensure effective relationships with households and communities, to work with communities, households, local civil society, and private-sector partners, and to build capacity to innovate and adapt solutions. While most experts agree that a full complement of technologies is now available for safe, reliable water supply in almost any setting, progress toward the sanitation target is still constrained by the lack of technologies that are reliable and affordable enough to implement on a wide scale without having negative impacts on the environmental sustainability target. Technical advances in such areas as effective, affordable, and simple-to-operate sewage treatment plants that can be located close to residential areas; drainage and solid waste disposal; and urban wastewater treatment and management in large urban agglomerations should therefore be promoted and accelerated.

Innovation in financing systems, policies, institutions, and technologies is also needed to accelerate progress toward the Millennium Development Goals as a whole. Win-win technical and institutional systems that advance more than one Goal simultaneously, rather than achieve one goal at the expense of another, are particularly needed. Examples include mechanisms to improve crop per drop and thus both spur progress toward the hunger Goal and reduce the demand for water; and programs for the reuse of waste water in agriculture, which could contribute to both the sanitation and hunger targets.

Action 10. The United Nations system organizations and their member states must ensure that the UN system and its international partners provide strong and effective support for the achievement of the water supply and sanitation target and for water resources management and development.

UN organizations, together with their international partners (including international water and sanitation networks and partnerships), must strengthen both their ability to assist and the level of their assistance to countries to meet target 10 and to optimize water resources management and development. This will contribute to the corresponding goal and targets directly and also to all other Millennium Development Goals. Doing so will require that financing, technical support, capacity building, objective analysis, knowledge-sharing, global monitoring and evaluation, and advocacy functions are effectively aligned toward the achievement of the Millennium Development Goals. United Nations system organizations involved in water and sanitation and their Member States must therefore ensure that the UN system organizations engaged in such functions have, both individually and collectively, the organizational capacity, mandate, staffing, and resources needed to carry out these functions, and to provide leadership and strategic guidance to the international community in these areas.

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The United Nations system organizations and their member states involved in water supply and sanitation and in water resources development and management should take the following actions:

- *At the country level*, the UN Country Teams should strengthen their efforts to provide technical and capacity-building support to governments, including in the preparation of national MDG-based strategies for water supply and sanitation and for integrated water resources management and water efficiency. UN organizations, development banks, and bilateral donor agencies must also effectively coordinate their actions at the country level, including harmonization of procedures and joint programs.
- *At the global level*, provision of leadership and strategic guidance to the international community is essential. UN system organizations and key operational actors and others involved in water and sanitation must be involved in this through a clear mechanism, which should build on each organization's strengths and comparative advantages and reduce duplication. UN-Water—with its recently defined mandate and widened participation—should be developed to this end. The WHO/UNICEF Joint Monitoring Programme should be strengthened as the key global mechanism for monitoring access to water supply and sanitation and provided with greater funding. WHO and UNICEF should ensure that arrangements increasingly enable contribution to and participation in the JMP. Bilateral agencies should both provide more funding and refrain from setting up parallel structures. UN-Water should be mandated to periodically report, through the *World Water Development Report (WWDR)*, hosted by UNESCO, on progress in water resources development and management for the Millennium Development Goals, including progress on the development of strategies for integrated water resources management and efficiency by 2005. UN-Water and WWDR must be strengthened and provided with greater funding to fulfill these roles successfully.

The recently established Secretary-General's Advisory Board on Water and Sanitation should focus on providing high-level policy commentary on progress toward the water and sanitation target, advising on strategic direction, identifying critical obstacles to progress, and making recommendations for overcoming them. It should independently and boldly comment on developing country, donor country, and UN system practices; and produce a periodic, brief, focused, high-profile report that would eschew advocacy in favor of pointed recommendations aimed at improving progress within the sector and at advancing the sector's position in the development arena.

The global networks engaged in water and sanitation with the funding agencies supporting must collectively strengthen and rationalize their efforts to provide technical support, capacity-building, objective analysis, knowledge-sharing, and advocacy functions, and align those functions towards the achievement of the Millennium Development Goals, while at the same time, taking steps to ensure they are accountable to the communities of the developing world.

An operational plan

The 5 guiding principles and 10 actions presented in chapter 13 represent, in broad strokes, the vital conditions needed both to achieve the Millennium Development Goals for water supply and sanitation and to ensure that sound water resources development and management underpins the broader effort to reach all of the Millennium Development targets. These principles and actions are further elaborated in this chapter within an operational plan that specifies the steps that each actor—national and subnational governments, donors, civic and community organizations, and research institutions—must undertake in support of the goals. Although the operational plan focuses only on actions by actors in the water sector, investments in other sectors, such as health and education, are crucial to the achievement of the water and sanitation targets. As stressed in previous chapters, progress in eradicating extreme poverty and hunger, achieving universal primary education, promoting gender equality, empowering women, and ensuring environmental sustainability will all help in advancing progress toward the Millennium Development targets for water and sanitation.

Operational plans for national and subnational governments, donors, civic and community organizations, and research institutions, respectively, are outlined in tables 14.1–14.7. In each table, entries in the action plan have been categorized into immediate priorities, short-term priorities, and medium-term priorities.

- *National and subnational governments.* National governments have principal responsibility for initiating the planning procedures and policy reforms, as well as for committing the financial and human resources, necessary to achieve the Millennium Development Goals. In addition, efforts by other stakeholder groups are often contingent upon strong initial action by national governments. The proposed operational plan should therefore be spearheaded by the actions that have to be taken by national governments, as outlined in table 14.1. Since some actions,

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such as setting of standards for water and sanitation technologies, are carried out at the national level in some countries and at the subnational level in others, we have grouped these actions together in this table, on the assumption that they would be assigned to the responsible parties within a given country. Actions that are typically exclusive to national governments, such as the carrying out of national planning processes, have been noted with an asterisk.

- *Bilateral and multilateral development assistance agencies, regional development banks, and donor agencies and countries.* As stressed in chapter 13, the task force is unanimous in its belief that target 10 will not be reached unless there is a deliberate commitment by donors to increase and refocus their development assistance and to target sufficient aid to the poorest low-income countries. If the target is to be reached, therefore, fundamental changes by the bilateral and multilateral development agencies, regional development banks, and donor agencies and countries will be required, as detailed in table 14.2.
- *The United Nations system.* As emphasized in previous chapters, the United Nations system organizations and their member states must ensure that the UN system with its international partners provide strong and effective support for the achievement of the water supply and sanitation target and for water resources management and development. The actions that have to be taken by the United Nations system organizations and their member states are outlined in table 14.3.
- *Other national and international actors.* The actions to be undertaken by other key actors—service providers, civic and community organizations, international networks and partnerships, and research organizations—are outlined in tables 14.4–14.7.

Other important actions that should be undertaken by all actors on a continual basis—both during the Millennium Development process and beyond—are identified in table 14.8.

The task force recommends that all organizations engaged in the effort to achieve the Millennium Development Goals—from national and subnational governments to donors and NGOs—should themselves prepare an operational plan to focus their support on the achievement of the Goals. The Water Supply and Sanitation Collaborative Council, for instance, has undertaken such an exercise.

There is still time for the world as a whole to meet target 10—but only just. 2005 is a critical year; it must be the start of a decade of bold action and swift progress. If the global community fails to act urgently, target 10 will be nothing more than a broken promise, another missed opportunity. But if stakeholders at the community, national, and international levels can join together in this common cause, the heartbreakingly simple dream of safe water to drink and private, clean sanitation to use can become a reality for literally

Table 14.1
Priority actions
for national and
subnational
governments

To reach target 10		
<i>Immediate priority actions</i>	<i>Short-term priority actions</i>	<i>Medium-term priority actions</i>
<ul style="list-style-type: none"> • Ensure that water supply and sanitation are included in national planning processes, especially poverty reduction strategies. • Undertake assessments of water and sanitation infrastructure endowments and deficits. • Create a national-level “institutional home” for sanitation. • Obtain current, accurate information about the characteristics of unserved households, so that appropriate policies to expand access to these households are pursued. • Review and modify subsidy policies as necessary to ensure that improved water and sanitation services are affordable to the poor, and subsidies are provided only to low-income households. • Prioritize activities and programs that raise the profile of and demand for improved sanitation. 	<ul style="list-style-type: none"> • Monitor changes over time to gauge the effectiveness of interventions and the impact of policy reforms and investments at national and subnational levels. • Ensure that appropriate, flexible standards for water, sanitation, and wastewater treatment technologies are in place. • Initiate policy reforms that improve the financial and technical sustainability of water and sanitation service provision, such as tariff reforms, “ring fencing,” and adequate support for ongoing operations and maintenance. • Initiate policy reforms to attract financing to and facilitate efficient use of human and financial resources in water and sanitation service delivery. • Initiate policy reforms that improve the accountability of service providers, such as the establishment and funding of credible regulatory institutions, reform of civil-service legislation, and limiting political interference in decisionmaking. 	<ul style="list-style-type: none"> • Monitor changes over time to gauge the effectiveness of interventions and the impact of policy reforms and investments at national and subnational levels. • Remove barriers to service provision in unregularized areas. • Shift principal control over water and sanitation planning and service delivery to local administrations, including budgetary authority. • Support decentralization by retaining strong oversight and support functions, particularly with respect to ensuring access to services by poor households. • Provide funding to support community mobilization and organization for actions towards the water and sanitation targets.
To improve water resources management for all the Goals		
<i>Immediate priority actions</i>	<i>Short-term priority actions</i>	<i>Medium-term priority actions</i>
<ul style="list-style-type: none"> • Support Goals-based planning and policy development by an integrated approach to land, water, and ecosystems. • Use the action target set by World Summit on Sustainable Development in Johannesburg for countries to develop integrated water resources management and water efficiency strategies by 2005 as an opportunity to infuse Goals-planning processes with consideration of water resources. • Develop a coherent approach toward deciding on the investments in water resources infrastructure and management needed to meet the Millennium Development Goals. 	<ul style="list-style-type: none"> • Monitor changes over time to gauge the effectiveness of interventions and the impact of policy reforms and investments at national and subnational levels. • Define and promote strategies that will contribute to multiple Goals and avoid strategies that create conflicts among them. 	<ul style="list-style-type: none"> • Monitor changes over time to gauge the effectiveness of interventions and the impact of policy reforms and investments at national and subnational levels. • Disseminate small-scale water technologies to provide livelihoods to small and landless farmers, while addressing the hunger and environment Goals. • Reduce the vulnerability of communities to water-related natural disasters by land reform, infrastructure construction for water storage and flood protection, and improved land-use planning, including slum upgrading. • Invest in community-based natural resource management, including urban agriculture, for hunger, poverty, and environment Goals.

Table 14.2**Priority actions for bilateral and multilateral assistance agencies****Immediate priority actions**

- Increase current aid in the water and sanitation sector to levels commensurate with the costs of attaining the water and sanitation target in the poorest countries.
- Redirect aid to the poorest countries and, within countries, toward programs that provide basic services for poor households.
- Prioritize investments in basic sanitation and hygiene.
- Reform aid procedures, so that aid supports policy reforms and infrastructure investment simultaneously, thereby enhancing institutional and policy frameworks while expanding services.
- Increase funding to Joint Monitoring Programme and refrain from setting up parallel structures.

Short-term priority actions

- Substantially accelerate the process for making aid available, and simplify the procedures for allocating aid.
- Prioritize investments in programs that help “crowd in” community and private resources to benefit the poor, as well as initiatives that have the potential to yield results at scale.
- Use the upcoming second Water Decade, 2005–15 (“Water for Life”), to mobilize international awareness and political commitment to sound water resources management and expansion of water and sanitation services to meet the Millennium Development Goals.

Medium-term priority actions

- Support initiatives that seek to encourage more open and frank discussion of sanitation needs and practices.
- Promote and finance research and development that fosters innovations in appropriate technologies, social marketing, and institutional arrangements that improve access to water and sanitation services by the poor.
- Promote initiatives that address multiple Millennium Development Goals.
- Support, where useful, the creation of new, regional-level multilateral donor mechanisms such as the African Water Facility.

Table 14.3**Priority actions for the United Nations system****Immediate priority actions**

- Strengthen UN country team efforts to provide technical and capacity-building support to governments.
- Effectively coordinate actions at the country level, including harmonization of procedures and joint programs, both within the UN system and with development banks and bilateral donor agencies.
- Support the Joint Monitoring Programme as the key global mechanism for monitoring sustainable access to water and sanitation and provide it with the necessary resources to carry out its work.

Short-term priority actions

- Expand monitoring efforts to include information on the actions and investments undertaken by the international community toward meeting the Goals, as well as on the impacts of those activities.
- Use the upcoming second Water Decade, 2005–15 (“Water for Life”), to mobilize international awareness and political commitment to sound water resources management and expansion of water and sanitation services to meet the Millennium Development Goals.
- Ensure the independence and adequate funding of the Advisory Board on Water and Sanitation as a means of achieving high-level strategic focus among the international community.
- Focus the Secretary-General’s Advisory Board on Water and Sanitation on providing high-level policy commentary on progress toward the water and sanitation target.
- Ask the Secretary General’s Advisory Board on Water and Sanitation to comment independently and boldly on developing country, donor country, and UN system practices, and produce a periodic, brief, focused, high-profile report with pointed recommendations.

Medium-term priority actions

- Develop clear mechanism to provide leadership and strategic guidance to the international community.
- Mandate UN-Water to periodically report through *World Water Development Report* on progress in water resources development and management for the Goals, including progress on the development of integrated water resources management strategies by 2005.
- Strengthen UN-Water and *World Water Development Report* and provide with greater funding to fulfill these roles successfully.
- Reform monitoring systems such that they measure access to sustainable services, rather than the presence of particular infrastructure.
- Support the use of scientific sampling and household surveys for water and sanitation monitoring.
- Ensure that data collected in global monitoring are widely disseminated in “user friendly” formats.
- Support initiatives that seek to encourage more open and frank discussion of sanitation needs and practices.

Table 14.4 Priority actions for service providers	Immediate priority actions	Short-term priority actions	Medium-term priority actions
	<ul style="list-style-type: none"> • Support and lobby for policy reforms in water and sanitation subsidies, so that benefits are targeted to poor households. • Support and lobby for policy reforms in water and sanitation tariffs, so that service provision becomes financially sustainable. 	<ul style="list-style-type: none"> • Seek out opportunities for partnerships with civic organizations that can improve access to water and sanitation services by poor households. • Revise budgets and institutional incentive structures, so that sustainable operations and maintenance of installed infrastructure receives sufficient priority and resources. 	<ul style="list-style-type: none"> • Pursue innovative strategies, including lower cost appropriate technologies, to expand services to unregularized settlements.

Table 14.5 Priority actions for civic and community organizations	Immediate priority actions	Short-term priority actions	Medium-term priority actions
	<ul style="list-style-type: none"> • Prioritize activities and programs that raise the profile of and demand for improved sanitation. • Use accurate information—the end product of reliable monitoring efforts—as a powerful advocacy tool for change. 	<ul style="list-style-type: none"> • Develop strategies for encouraging more open and frank discussion of sanitation needs and practices. • Seek out opportunities for partnerships with service providers that improve access to water and sanitation services by poor households. • Share information and experiences with service providers, as well as with subnational and national governments, seeking to better understand the characteristics of and obstacles faced by unserved households. 	<ul style="list-style-type: none"> • Help to hold service providers and governments accountable for expanding and improving water and sanitation services to the poor through audits, public information campaigns, etc. • Help to identify strategies for ensuring access to services by poor households while also maintaining financial sustainability for service providers.

Table 14.6 Priority actions for international networks and partnerships	Immediate priority actions	Short-term priority actions	Medium-term priority actions
	<ul style="list-style-type: none"> • Raise public awareness of the deficits in coverage and quality of water supply and sanitation services through public statements, articles, events, celebrity endorsements, and other innovative strategies. • Test, refine, and publicize effective strategies for water and sanitation service delivery to the poor that have the potential to yield results at scale. • Collectively strengthen and rationalize efforts and align them towards the achievement of the Goals while at the same time taking steps to ensure accountability to the communities of the developing world. • Use accurate information—the end product of reliable monitoring efforts—as a powerful advocacy tool for change. 	<ul style="list-style-type: none"> • Use the upcoming second Water Decade, 2005–15 (“Water for Life”), to mobilize international awareness and political commitment to sound water resources management and expansion of water and sanitation services to meet the Millennium Development Goals. • Publicly support policy reforms that better target subsidies to poor households, promote sustainability of service delivery, and heighten accountability of service providers to households. • Support initiatives that seek to encourage more open and frank discussion of sanitation needs and practices. 	<ul style="list-style-type: none"> • Help to hold service providers and governments accountable for expanding and improving water and sanitation services to the poor through audits, public information campaigns, etc. • Package and disseminate information collected in national and international monitoring efforts such that it is accessible to community organizations, the media, and the general public. • Explore ways to use the new UN ECOSOC affirmation of the Right to Water to influence national policy on water and sanitation.

Table 14.7
Priority actions
for research
organizations

Immediate priority actions	Short-term priority actions	Medium-term priority actions
<ul style="list-style-type: none"> • Better document and communicate the economic benefits of improved water and sanitation services. • Conduct research and disseminate findings on effective strategies for providing sustainable water supply and sanitation services in persistently challenging settings (unregularized urban communities, small towns, poor rural villages). 	<ul style="list-style-type: none"> • Support the development of appropriate technical standards for water supply, sewerage, and sewage treatment. • Increase research and development on technologies and institutional innovations aimed at meeting several Goals simultaneously and reducing tradeoffs among the uses of water resources to meet the various Goals. • Develop new sanitation technologies to reuse wastewater for periurban agriculture. • Develop a conceptual framework for defining and measuring the contribution of water resources development and management to the Millennium Development Goals. 	<ul style="list-style-type: none"> • Carry out research and development of appropriate, affordable sanitation technologies.

Table 14.8
Priority actions for
all actors throughout
the Millennium
Development process
and beyond

- Prepare an operational plan that outlines what they will do during the period 2005–15 to help achieve target 10 and the development and management of water resources for the Millennium Development Goals.
- Maintain a focus on sustainability to ensure that gains made in expanding access to water and sanitation services and improving water resources management during the Millennium Development process will be maintained in the long term.
- Incorporate gender considerations into policy recommendations and program design; address gender biases within their own institutions. Take measures to reduce corruption at all levels, whether in donor organizations, international agencies or companies, or public, private, or civic institutions in developing countries.
- Take measures to reduce corruption at all levels, whether in donor organizations, international agencies or companies, or public, private, or civic institutions in developing countries.

Insights from case studies

This appendix briefly describes some case studies that have been mentioned in the report to guide the strategies for achieving target 10. These case studies demonstrate a variety of approaches that appear to be working. They include community management of rural water and sanitation projects, improvements in service for the urban poor, and increasing urban coverage for both the poor and the nonpoor. We will, however, start with a case that shows what is being done to reach the water target.

Turning the “right to water” into a reality: the South African experience

This case study illustrates the importance of political will in introducing a radical policy of free access to basic water supply, thereby helping South Africa to make rapid progress toward the Millennium Development target for water (drawn from World Bank 2002).

In 1994, 15.2 million out of South Africa’s population of 40 million lacked access to basic water supply (defined as 25 liters per person per day of water of acceptable quality within 200 meters from home). Of these, 12 million lived in rural areas. In addition, 20.5 million lacked access to basic sanitation (defined as a ventilated, improved pit latrine or its equivalent). South Africa has used a combination of instruments to turn things around. These include introduction of policy reform with an accompanying legislative framework; devolution of responsibility for water supply and sanitation from the national level to local governments, using community-based approaches; launching of a capital works program that has provided infrastructure to meet the needs of more than 7 million people; and the introduction of free access to basic water supply, through which water has been provided for some 27 million people as

of July 1, 2002. As a result, South Africa hopes that within seven more years all residents would have access to basic water supply.

This remarkable success in increasing access to basic water supply has been underpinned by a strong political leadership and support from the national government, which made it possible to devote so much funds to support the capital works program and the free basic water policy. An important contributory factor has been the existence of a very substantial institutional and technical capacity that was already in place before 1994. The existence of an appropriate institutional framework facilitated the introduction of legislation needed for the program. Finally, the level of economic development in South Africa supported the policy of free access to basic water. This case is not necessarily applicable to less developed countries, unless they benefit from new and creative concessional funding from external sources.

Community-led total sanitation with no subsidies: a spreading revolution

Community-led total sanitation is a revolutionary low-cost approach to rural sanitation, which relies on hands-off facilitation and community appraisal, analysis, and action, without any subsidy for hardware. In a matter of often only weeks, communities transform themselves from open defecation to total sanitation. Community-led total sanitation is spreading in Bangladesh, India, and Cambodia, and is starting in Indonesia, Mongolia, Nepal, Uganda, and Zambia. It shows potential to become an exponentially self-spreading movement.¹

The methodology of community-led total sanitation by rural communities was pioneered in 2000 by Kamal Kar and colleagues with WaterAid and VERC, a nongovernmental organization (NGO) in Bangladesh. It spread there with support from CARE, PLAN, World Vision, other NGOs, and the government. The Water and Sanitation Program of the World Bank has been supporting and promoting community-led total sanitation in South and Southeast Asia. By mid-2004 community-led total sanitation had spread to more than 2,000 communities in Bangladesh, to several hundreds in India through the government of Maharashtra, and to Cambodia through Concern Worldwide. Starts had also been made in Indonesia, Mongolia, Nepal, Uganda, and Zambia. The impact has been dramatic drops in diarrheas and medical expenditures and major gains in well-being for women, children, and men.

In community-led total sanitation community members are facilitated to do their own appraisal of open defecation. Facilitators do not teach, educate, advise, criticize, preach, or tell people what they should do. They simply convene and facilitate appraisal and analysis. Community members together map their households and where they defecate. They then stand, smell, and discuss in their defecation areas; calculate the amounts of feces produced; analyze pathways of contamination through dirt, flies, and animals; and estimate

how much each person ingests each day. Disgust, shame, religious precepts for cleanliness, and self-respect then commonly combine in a decision that open defecation must stop. People dig holes and construct homemade pit latrines according to local designs. To achieve total sanitation quickly, some latrines are shared. Those who are better off often help the poorer and landless with space and materials. Communities put up boards at the entrances to their villages proclaiming proudly that they are totally sanitized. The resulting social solidarity provides a base for further collective action. Communities evolve their own systems of monitoring and penalties for default. A social ratchet effect evidently sustains total sanitation once it has been established through such a process.

There are no standard designs. An explosion of innovative, low-cost models designed by community engineers has taken place. Many people start with very simple temporary structures of bamboo, sacking, and the like. In Bangladesh the cost of purchased materials can be less than \$1. Progressive improvements then follow. Some start higher on the sanitation ladder and construct toilets in their houses. Local traders meet new demands for pans and accessories. Latrines are evacuated when full or are covered over and planted with trees, and new latrines are dug or constructed.

For community-led total sanitation to ignite, two conditions admit no compromise. First, there must be no policy, practice, or even rumor of subsidies for hardware. Community-led total sanitation has been inhibited and slowed by a national survey of sanitation, which led to expectations of subsidy. Community-led total sanitation cannot spread well, if at all, when there is hope of hardware subsidies. Second, facilitation by outsiders must be hands-off, enabling community members to do their own appraisal, calculations, and analysis, not prescribing but at most, when asked, telling them about practices in other communities. To ensure these behaviors requires careful hands-on training and mentoring.

Community-led total sanitation has been spread by not just by NGO facilitators but increasingly, with light external support, by community consultants and communities themselves. Community consultants have their own effective ways of facilitating, drawing on their experience of total sanitation in their own villages. Communities themselves have become lead institutions: CARE Bangladesh has pioneered a low-cost approach, also adopted by the government of Maharashtra, in which a community is rewarded for every other community totally sanitized through its efforts. Following the lead of Maharashtra, the government of India has changed its guidelines from providing an up-front hardware subsidy to households to offering a fiscal incentive of a lump sum to villages in which open defecation is assessed to have ended. Innovations such as these can be expected to continue as the approach expands in scale.

Community-led total sanitation presents many challenges. It demands shifts of mindset and policy as well as behavior:

- From teaching and educating to facilitating the communities' own analysis.
- From "we must subsidize the poor" to "communities can do it."
- From "we persuade and motivate" to "it's up to you, you decide."
- From top-down standardization to bottom-up diversity ("they design").
- From bigger budgets to lower budgets to allow more to be achieved.

For community-led total sanitation to realize its huge potential demands changes in mindsets and behaviors away from the standard philanthropic ("subsidize"), professional ("set high standards"), and bureaucratic ("demand big budgets") approaches. Instead, supporters concentrate on lower-cost training, facilitation, and support for community facilitators. If there are vested interests and ingrained practices, they have to be confronted. The challenge to those working in aid agencies, governments, and NGOs is to be consistent in making these big switches and to support sharing and learning across and within organizations and countries. It remains to be seen which organizations and who within them will have the vision, realism, and guts required. Continuous learning is needed about how and where spread occurs and how it can and should be supported. But enough is already known to see that if community-led total sanitation can become exponentially self-spreading, the scale of gains in well-being, for tens or hundreds of millions of rural people, will be enormous, and can make a major contribution to all the Millennium Development Goals.

From central to local government and community-based approaches to rural water supply: the experience in Ghana

This case study involved a shift from a supply-driven central government approach to a demand-driven approach to rural water supply and sanitation. It also involved a shift in the role of central government, from that of an implementer to that of a facilitator, with greater involvement of the private sector, thereby introducing competition with consequent improvement in performance and reduction in the cost of service provision (drawn from World Bank 2002).

It all started in 1990. Up to that time, one national public authority, the Ghana Water and Sewerage Corporation (GWSC), was responsible for water and sewerage services for both urban and rural areas throughout Ghana. During that period, most rural communities were served by boreholes equipped with hand-pumps. The boreholes were drilled by the GWSC, donors, or NGOs that also maintained them. There was only one private drilling company. The drilling market was characterized by lack of competition. As a result, the average cost of boreholes in Ghana was \$9,000, compared with \$3,000 in the United Kingdom or the United States. Mobile crews were responsible for the maintenance. In these circumstances, only about 40 percent of handpumps worked at any given time. There was no sense of ownership by the communities that were

served by handpumps. So when handpumps broke down, people simply waited for them to be repaired when the mobile repair crew reached their communities. The situation was no better for piped systems that suffered long periods of supply interruptions because of breakdowns and maintenance neglect.

Beginning in the late 1980s, a number of institutional and policy reforms were introduced. New legislation was introduced under which the GWSC was replaced by the Ghana Water Company Limited (with responsibility for urban water supply) and the Community Water and Sanitation Agency (with responsibility for rural water and sanitation services). A new national water and sanitation policy was also introduced to shift the approach to service provision from a supply-driven one to a demand-responsive approach.

Under the new national policy, certain core functions were transferred from central government to the local government and the communities. Ownership of water supply was transferred to the local governments and the communities. The private sector became increasingly involved in various aspects of service provision. In one \$20 million World Bank-financed community water and sanitation project implemented in 26 of the 110 districts in the country, district assemblies constructed 1,200 water points and 29 piped systems. There was a lot of private-sector and NGO involvement in the project. This included four drilling companies and 32 NGOs and community-based organizations. Several national and international NGOs were commissioned to train and build the capacities of the district-level NGOs and community-based organizations. The success of this project has led to a follow-up \$80 million, nine-year World Bank-supported project. One of the aims of the new project is to shift from individual donor-supported water supply projects to a sectorwide approach under which all external support agencies would be encouraged to pull their resources into a single national water-sector program.

Several factors have helped to make this reform successful. Foremost was the speed of implementing the reform process. It was not rushed. Instead, a gradual approach was followed in the transfer of responsibility from the central level to the local government and community level. The transfer rate was matched to the rate of technical capacity building and support from the central level in the areas where local capacity was deficient. Second, the involvement of the private sector was accompanied by an incentive structure under which contractors were paid for their outputs rather than their inputs. Finally, the decentralization of service provision was facilitated by the general process of decentralization taking place within the country at the time.

Unbundling between different zones in an urban area: experience from Thailand

This case study shows how unbundling of service facilities can be used as an instrument for reducing the constraints of technologically complex, large-scale urban sewerage

projects. The project in Bangkok also reduced the lumpiness of investments in urban sanitation, thereby removing barriers to access to urban sanitation services.

Bangkok, the capital of Thailand, is a city of 10 million people. In 1968, the Bangkok Metropolitan Administration prepared a wastewater master plan for the entire metropolitan area. Though technically sound, the plan was found to be prohibitively expensive and was shelved for 16 years. In 1984, the master plan was revised under a Japanese (JICA) technical assistance program. Instead of a single centralized program, the inner city was divided into ten sewerage zones, each with an independent collection and treatment system. The revised approach is an example of horizontal unbundling between different zones of an urban area. Sanitation investment in each of the ten zones is lower than the investment for a single project in the whole city. Each zone project is also technically simpler than the citywide project. These two impacts of unbundling have made it possible for the Bangkok Metropolitan Administration to implement various sanitation projects in different zones of the city, using a more affordable, phased investment program.

Unbundling, coupled with greater responsiveness to demand, helps to remove major barriers to the expansion of coverage. Yet they still do not address the question about where the boundary between public and private infrastructure should be drawn. Demand for improved sanitation is almost always based on perceived private benefits. These are much lower than the total benefits from citywide sanitation investments, which are known to include externalities or benefits that are realized beyond the boundaries of the direct user of sanitation services. Experiences in Pakistan and Brazil show how these issues have been addressed.

Reaching the urban poor with improved sanitation: the experience in Pakistan

This case study illustrates a tripartite partnership between community, government, and an NGO in the provision of improved sanitation services to a low-income urban fringe community. It also illustrates a stepwise approach to urban sanitation, in which the technology is adapted to the technical capacity and financial means of the beneficiary community. Its salient features include the use of such instruments as unbundling, community management with social intermediation, and internalizing the financing of community infrastructure for sanitation.

Orangi is a large *katchi abadi* (or low-income informal settlement) in Karachi. It has a population of more than 1 million. The Orangi Pilot Project (OPP) is a nongovernmental organization, and sanitation is one of four projects the NGO is undertaking in Orangi.

After years of research and learning by doing, the OPP has developed a model of low-cost sanitation in which government, the community, and the NGO are treated as partners, and sanitation development takes place at two

levels: an “internal component” level and an “external component” level. The internal component has three sequential sanitation subcomponents: an in-house sanitary latrine or toilet, a lane sewer that collects sewage from houses along a lane in the community, and a neighborhood sewer that collects sewage from the lane sewers in a neighborhood. The last two subcomponents together are equivalent to what is known as a feeder sewerage system. The external component has two subcomponents: trunk sewers that collect sewage from neighborhood sewers and a sewage treatment plant for treatment and final disposal of the sewage from the trunk sewerage system. These two subcomponents may together be regarded as a trunk sewerage system.

The OPP sanitation project started with the NGO approaching the community and urging residents to form lane organizations and to elect a lane manager. Once this was done, technical support was provided to the lane organization to construct a lane sewer to collect waste from their houses. It had been hoped that the government would then step in and provide a sewer network to collect the sewage from the lane sewers. This did not happen. So the lane managers from each neighborhood came together and pooled their human and financial resources to construct neighborhood-level sewers to collect the wastes from the lane sewers.

Initially, the sewage from the neighborhood sewers was discharged into nearby natural drains. But eventually, the Karachi Municipal Corporation and the District Municipal Corporation agreed to finance the construction of a trunk sewer to collect the waste from the neighborhood sewer. This meant that there was a transitional period during which the untreated sewage from the Orangi community polluted the local environment. However, this was corrected when the public component of the sewerage system was installed. Without the price of the transitional environmental pollution, the community would not have gained access to basic sanitation, and the environmental pollution would have continued all the same through other means.

According to S. Akbaar Zaidi, the OPP model has been replicated in 59 settlements in 11 cities (Zaidi 2000). It has also been reported that the principles of the model are being applied to projects in Nepal, Central Asia, South Africa, and Sri Lanka (Hasan 2000).

The OPP model allows for vertical unbundling between the internal and the external sewer components, as well as horizontal unbundling between parallel neighborhoods. A feature of the OPP model is that the normal boundary between private and public provision is extended from the household level to embrace the entire neighborhood. That is to say, the neighborhood sanitation infrastructure is a public facility that is privately and collectively owned by those in the neighborhood. Thus, its ownership is private, but its use is public. Under this arrangement, investment and operational responsibility within the neighborhood is now treated as internal development and is left to the community. The responsibility for investment, operation, and maintenance beyond the neighborhood is treated as an external responsibility and is assigned to the public utility.

This definition of what is private and what is public has a number of attractive features. The entity that expresses demand to the public utility is not the household; it is the community. This reduces the number of respondents for demand assessment, thereby reducing the transactions cost for such assessments. Furthermore, this definition makes it possible for the neighborhood to be used as the channel for expressing the “voice” of households, thereby giving the households bargaining powers. In addition, the definition expands the responsibility for financing of private infrastructure beyond the household level. Financing of infrastructure within the neighborhood is thus internalized.

Another feature of the approach is that it defines a clear set of target groups that would serve as partners, along with social intermediaries, in the internal development of sanitation projects. A similar definition of the private-public boundary has also been used in the Brasilia condominiumal model.

A community-based approach to urban sanitation: the condominiumal model in Brazil

This case study illustrates a shift from conventional sewerage technology to a technically equivalent, lower-cost alternative known as the condominiumal system. The lower cost arises from the use of sound technical standards based on current scientific and technical research, as well as current experience and innovation, rather than a reliance on the 100-year-old concepts inherent in conventional sewerage. Community participation is an integral part of the project, as is the joint ownership of community resources, such as the sewerage system within a condominiumal block. This feature of unbundling is analogous to ownership of neighborhood-level sanitation infrastructure in the OPP model.

Brasilia’s model for supplying sanitation services to its 2 million residents is the latest version of the condominiumal sewerage system. Developed in the 1980s in the state of Rio Grande do Norte by Jose Carlos Melo for low-income communities, the system has now become a standard solution for entire urban areas in Brazil, irrespective of residential income. The Water and Sewerage Company of Brasilia has been using this version of the condominiumal system for more than 10 years. Within the first 8 years, 121,000 homes were linked to the condominiumal system, using 1,300 kilometers of condominiumal branches and more than 660 kilometers of public networks at average costs per person of \$27 and per meter of sewer network of \$16.

The basic planning unit in this model is the condominium. It is defined as the urban block, square, or its equivalent. The residents of a condominium define its boundaries. They do so through an informal community organization. It is this block or condominium that is connected to the public sewer. This is in contrast to conventional sewerage systems, where connection to the public sewer is made directly to the individual house, a more costly approach.

The connection in the condominium system is made through the condominium branch sewer. Thus, the network within the condominium block is treated as private infrastructure, and its investment costs are borne by the residents of the condominium block, just as is the case for the OPP model in Pakistan. The infrastructure beyond the condominium branch sewer, up to the treatment plant, is treated as public infrastructure, and its investments are the responsibility of the public service provider. The cost of this system is, however, recovered from the sanitation charge.

The public network is divided into two parts, namely, a number of parallel microsystems and a citywide system. The microsystems are defined by subdividing or unbundling the urban area into small natural drainage basins, each with its own independent sanitation system, from collection to treatment and disposal. The microsystems receive wastes from the condominium blocks and either purify them within the corresponding microdrainage basin or feed them into a citywide sanitation network. The microsystems can therefore be operated as independent systems permanently or until such time that local or citywide development imperatives make it necessary that they should be connected to the citywide system. The citywide system receives flows from parallel independent microsystems. In much the same way, there could be a regional system that receives wastes from a number of parallel independent citywide systems.

Community participation is an integral part of the condominium model, just as it is in the OPP model. Community participation in decisionmaking and in community activities is viewed both as a right and as a duty of citizenship. It is viewed as a way of helping to find solutions for the common interest within the block. Participation is also considered a process of negotiation among interested parties to reduce costs, mobilize resources, and stimulate community actions, including monitoring of jointly owned resources such as the condominium sewerage.

The Brasilia example illustrates both horizontal and vertical unbundling. The city sanitation system is subdivided horizontally into a number of parallel microsystems. Each of these microsystems is subdivided horizontally into a number of parallel condominium blocks. In addition, the boundary for the private component of the sewerage system extends to cover the block, square, or equivalent. With this arrangement, sewage flows from households into a sewer network within the condominium area and from there into a network of micro-systems and eventually into a citywide system.

The Brasilia condominium model thus gives rise to a decentralized sanitation system with the possibility of interconnection into an integrated citywide network of clearly identifiable subsystems. The model has a lot of flexibility; it is demand-responsive and lends itself to service differentiation within different condominium blocks and within different microsystems. It has good prospects for overcoming most of the barriers to sustainable expansion of coverage in an urban area. It is being replicated in a number of countries in Latin America.

Its use, together with the concepts in the OPP model, holds very good promise for achieving the Millennium Development target of improving access to basic sanitation in many urban areas, large and small.

Tapping the strengths of spiritual organizations: the experience in India

Religious organizations tend to have motivational and organizational skills that make them highly effective in mobilizing followers and changing entrenched mindsets and habits. However, these strengths are not often appreciated or tapped for community-based water and sanitation programs. This case study illustrates the successful use of these skills in a rural sanitation project in the Medinipur District of West Bengal, India (drawn from Chowdhry 2002; Sengupta 2001; UNICEF 1994, 2002a).

The Medinipur District rural sanitation project, also known as the Intensive Sanitation Project (ISP), was launched in 1990. It involves a partnership among UNICEF, state and district governments in West Bengal, a religious NGO (the Ramakrishna Mission), and voluntary grassroots community organizations. It is implemented by the Ramakrishna Mission, a development-oriented religious organization established in 1897, with its headquarters at the outskirts of Calcutta, but heavily involved in social development and rehabilitation works in India and abroad.

The project is designed to motivate people to move away from the age-old practice of open defecation. Paradoxically, the practice of open defecation in the area was based on the belief that defecation is unhygienic, and hence it is best done far away from the home. As people used the open field, however, they were exposed to outbreaks of cholera and other excreta-related diseases that occurred during rainy seasons. The project implementation strategy was thus driven by a need to change mindsets and habits toward not just in-house sanitation, but also a clean and hygienic living environment. Thus, hygiene education was an integral part of the project.

The project has a three-tier organizational structure, with the Ramakrishna Mission interacting both with state and district governments at the top and also with cluster organizations, voluntary youth clubs, and beneficiaries at the community level. The organizational unit for the project implementation is the community development block. There are 54 such community development blocks in the project area, each with a population of about 150,000. Within the community development blocks are voluntary youth clubs, more than 1,000 in the project area. These are aggregated into a number of groups known as cluster organizations. There are 11 such cluster organizations in the project area.

The mission involves the local community in each stage of the program, especially in the delivery of sanitation messages, and strives to mobilize the community and develop local human resources. Community mobilization is

done through trained motivators from the target communities. Its primary goal is to create awareness of the importance of health and hygienic practices through home visits, motivational camps, exhibitions, and such communication materials as flash cards, calendars, motivational kits, and audiovisual materials. Sanitation messages are conveyed through writings on walls, video and slide shows, and song squads. Training, especially the training of trainers, is given a high priority in the project. All categories of workers are given appropriate training related to their work.

In 1990, barely anyone in the villages of West Bengal's Medinipur District had household latrines. But just a decade later, roughly 80 percent of the families in Medinipur possess latrines—reducing exposure to communicable diseases of excretal origin and making Medinipur a role model for other parts of India.

Local involvement was also critical in the physical development of the latrines. Each component of the latrine was produced at production centers where local women were trained to manufacture the sanitary wares. A range of cheap and effective sanitation technologies, such as single-pit latrines, were made available. To help persuade reluctant villagers to switch to latrines, representatives of the production centers were enlisted to motivate and prepare households for such a change. These representatives received an incentive for every household they could motivate.

To date, approximately 1.2 million latrines have been delivered through the program throughout West Bengal, and another 1.5 million have been built through other programs. The impact of widespread latrine development has been accompanied by a remarkable reduction in illnesses and deaths associated with diarrheal diseases. The Intensive Sanitation Project in Medinipur has proved to be a successful people's movement and has helped develop a sense of pride and belonging among the villagers.

The Sulabh sanitation movement in Indian communities

This case study outlines a successful, low-cost sanitation approach developed and implemented by a nongovernmental organization, Sulabh International Social Service Organisation. The program, named "Sulabh Shauchalaya," means "easy access to sanitation."²

Sulabh's approach to improved sanitation is twofold: innovative modifications of an existing low-cost technology, and equally innovative institutional and social programs, combining sanitation objectives with social reform. Sulabh popularized the use of the pour-flush system in India, first as a domestic latrine and second as a public "pay-for-use" facility. Both have been very successful as a result of the institutional arrangements used by the organization.

The pour-flush technology has many advantages. It is affordable, even by the poorer members of society, as there are designs to suit different levels of

income. Flushing requires only 2 liters of water, instead of the 10 liters needed by other flush toilets. It is never out of commission since, with the twin-pit option, one pit can always be used while the other one is being rested to allow its contents to decompose. The latrine can be built with locally available materials and is easy to maintain. It has a high potential for upgrading because, while it is a stand-alone, on-site unit, it can easily be connected to a sewer system if and when one is introduced in the area. The toilet is also culturally acceptable, inasmuch as it is flushed by the water used for ablution, and its water seal makes it odorless and insect-free.

So far, more than 1,000,000 units have been constructed (or substituted for existing unhygienic latrines) in houses, and 5,500 have been installed in pay-for-use public toilets since the organization's beginnings in 1970. A key aspect of Sulabh's program is its inclusion of facilities for bathing and doing laundry. Their public toilets are staffed by attendants 24 hours a day and supply powdered soap for hand washing, bathing, and laundry. Free services are offered to children, the disabled, and the poor. This is very important for the homeless and the very poor, who live under cramped conditions. More than 10 million people use the complexes every day. Some special facilities have also provided telephone services and primary healthcare. Another technological aspect of the program is the modification of the pour-flush toilets for the production of biogas from human excreta for electricity generation, cooking, and lighting. Sulabh's research and development activities are geared to practical solutions for solid and liquid waste disposal, including recycling and resource recovery.

Despite the virtues of the technology, the Sulabh program might not have been so successful had not public awareness and community participation been considered critical aspects in the goal of improving sanitation. Among isolated populations, unlikely to feel responsible for wider environmental conditions, the Sulabh International Social Service Organization has undertaken educational efforts to help reverse this frame of mind and instil strong community awareness. The approach includes door-to-door campaigns by Sulabh volunteers and workers who persuade people to convert from bucket latrines. Once approval is gained, the organization takes responsibility to relieve the beneficiary of the bother of constructing the twin-pit, pour-flush toilet. Sulabh also educates people on use and maintenance of their new latrine and promises to fix construction defects and solve technical problem at no cost. After construction, service is provided, and problems in use and maintenance are resolved by locally posted Sulabh workers.

The program includes technical training to local people to enable them to construct more latrines themselves. In rural areas, latrine builders are also trained in such fields as hand-pump repair, brick laying, social forestry, and biogas production. The organization estimates that 50,000 employment opportunities have been created through the Sulabh Shauchalaya program. Sulabh also helps local communities set up, operate, and maintain the community toilet complexes.

Another key institutional aspect of Sulabh's program is that the NGO has, in some municipalities, taken over these complexes from the city officials for a contracted period of 30 years, relieving the municipal authorities of the task of operating and maintaining them. This has vastly improved the quality of facilities available to users. Often these comfort stations are the cleanest ones in town, even in major cities such as Delhi, Bombay, Calcutta, and Madras. Sulabh's experience shows that, where financial resources are constrained by central administrations, functions can effectively be delegated to grassroots and community organizations.

Financing rural water supply and sanitation in China

Financing for rural water supplies and sanitation in China comes from many sources, including users, township enterprises, village committees, and national and provincial governments, as well as foreign loans and grants. Users, the largest source of financing, are expected to pay a significant share of capital costs and all operation and maintenance costs, including servicing of World Bank project loans.³

The Chinese government has made it a priority to invest in water and sanitation, aiming for 95 percent of the rural population to have access to improved water supplies, 70 percent to have piped water supplies, and 65 percent to have sanitary latrines by 2010. China is well on its way to meeting these goals with significant gains in coverage over the past 15 years. World Bank and other assistance have aided these efforts. The World Bank China Rural Water Supply and Sanitation Program has initiated projects aimed at serving about 23 million people in 18 provinces. China differs significantly from most developing countries in that there is little history of the central government providing large subsidies for the financing of rural water supply. Instead, there is greater emphasis on cost-sharing by provincial, county, and community institutions. This context proved to be compatible with the World Bank's development of a significant cost-recovery model, where capital, operation, and maintenance costs, including repayment of loans, are ultimately repaid by the rural beneficiary.

One concern regarding cost-recovery programs is that those served are often not the very poorest, whose needs are greatest. In China, the national policy is to use government funds for increasing coverage through providing basic levels of service to those in greatest need and to use external funds, such as from the World Bank, to provide greater levels of service, through piped water supply systems, where demand exists. Within the World Bank-assisted projects, however, the more remote and scattered areas are also provided water supply systems similar to the ones covered under the government programs: hand-pumps, rainwater collection systems, and small tube wells. The cost-recovery policy for the basic level of schemes in both World Bank-assisted and government programs is the same: full labor contribution and full responsibility for

operation and maintenance costs. Debt servicing is not passed on to the consumers of these schemes with lower service levels.

The functional level of project management is the township water-supply plant. The cost of running the water plant, as well as the debt servicing cost, is met from those benefiting from higher-service-level schemes. The water plant collects water fees from households, each of which has a metered connection. Water tariffs are set by the plant management and the County Price Bureau, and prices are raised when necessary to cover increased operating costs. The tariff calculation is comprehensive and includes the cost of electricity, salaries, water-source fees, depreciation, debt servicing, interest on debt, overhead, and taxes.

To protect consumer's interests, China has developed an effective price regulatory system at the county level. Once the proposed tariff has been calculated at the water plant, it is sent through the County Project Office (CPO) to the County Price Bureau (CPB) for approval. The CPB reviews the calculation, holds discussions at the water plant and CPO levels, then visits the concerned villages and holds public hearings with the consumers to determine the affordability of the new tariff. In some cases, the Price Bureau asks the water plant to revise its tariff.

Cost-sharing by users promotes financial sustainability of water-supply systems, but many observers worry that poor households may not be able to afford cost-recovering tariffs. In most cases, the costs appear to be affordable. As an example, households supplied with water from the project typically consume 3 cubic meters a month. At a tariff of 2 yuan per cubic meter, the annual water bill comes to 72 yuan. Assuming an annual per capita income of about 2,000 yuan in rural China, this works out to 3.6 percent of annual income.

In 2002, 868 million Chinese rural residents—92 percent of the total—had access to improved water supplies. Of these, 57 percent had access to piped water systems, a 43 percent increase over 1985. In addition, 49 percent of rural households had sanitary latrines, 41 percent more than in 1993. Government programs have dramatically increased awareness of health care and hygiene issues among rural populations. Such progress has greatly improved the lives and health of rural residents and promoted rural economic and social development.

The scaling up and achievements of rural water supply and sanitation in China are closely linked to the country's political willingness to charge—and users' willingness to pay—cost-covering water tariffs. There are other factors, as well, including the country's stable political situation, rapid economic growth, commitment to rural residents, and the fact that external funding is only a small percentage of China's financial resources. The question of whether China's financing policy can be replicated is not an easy one to answer, but there are lessons to be learned in the government's willingness to price rural water supply services at financially sustainable levels, a condition that is not met in many other countries. Perhaps this case can help demonstrate to decisionmakers in other countries that cost recovery in rural water supply and sanitation can be realized.

Notes

Preface

1. These definitions of sustainable access to domestic water supply and basic sanitation are considerably broader than those used by the Joint Monitoring Programme for Water Supply and Sanitation, which is administered by the World Health Organization and the United Nations Children's Fund. The United Nations has charged the Joint Monitoring Programme with monitoring progress toward target 10.

Chapter 1

1. UN Millennium Project www.unmillenniumproject.org.
2. World Summit on Sustainable Development www.Johannesburgsummit.org.
3. Some text in this section and the section that follows titled, "The institutional context," was drawn directly from the annex of UN WEHAB Working Group 2002.
4. UN Millennium Development Goals www.developmentgoals.org.
5. Much of this section was drawn directly from UNDESA 2002b. Special thanks to task force member Manuel Dengo of UNDESA for allowing us to incorporate sections of this text verbatim.

Chapter 2

1. The remainder of this section draws extensively on *Water Governance for Poverty Reduction* (UNDP 2004). Special thanks to task force member Ingvar Andersson of UNDP for allowing us to incorporate sections of this text verbatim.
2. All dollar values in this report are U.S. dollars unless otherwise indicated.

Chapter 3

1. A survey instrument being prepared by the WSSCC task force gives further elaboration of the meanings of these two aspects of improved water supply.
2. Defined as domestic wastewater resulting from bathing and washing of dishes and clothes in the home.
3. For example, the Public Affairs Center (PAC) in India has conducted a survey of 36,500 households regarding basic services. Their data indicate a gap, sometimes wide,

between the availability of a service and its satisfactory functioning (for example, water pumps installed in villages, but not functioning).

4. WHO/UNICEF JMP www.wssinfo.org.

5. If possible, coverage estimates are based on all available national household surveys and censuses. All available surveys and censuses are plotted on a time scale. A linear trend line, based on the least-squares method, is drawn through these data points and determines the estimates for 1990 and 2000. In case household surveys and censuses are not available, coverage data given through the GWSSA 2000 questionnaire is used. In the future the linear trend line might be replaced by a curvilinear trend line. For a more detailed description of the methodology, please refer to WHO/UNICEF JMP 2000.

6. To be used in the calculation of coverage data for a country, surveys must meet certain criteria: The survey needs to be representative of the entire country; it needs to be well documented; and details about the data should be available. In the JMP approach, coverage data are based on the type of services used, so if a survey only gives one total figure for people with *access*, this survey cannot be used to calculate the coverage estimates because it is not clear whether this access meets the JMP standard of *improved*. However, details of surveys, even those not used, have been included in the country files and are visible in the graphs for purposes of comparison. Examples of valid surveys are the Demographic and Health Survey of ORC-Macro (funded by USAID) (see www.measuredhs.com), UNICEF's Multiple Indicator Cluster Survey (see [/www.childinfo.org/MICS2/MICSDataSet.htm](http://www.childinfo.org/MICS2/MICSDataSet.htm)) and some of the World Bank's Living Standard Survey (see www.worldbank.org/lsm/s/). Many censuses have also been used, but sometimes their data are given with insufficient detail.

7. The Technical Advisory Group is made up of individual experts from academic institutions and civil society, plus representatives of organizations involved in water and sanitation and data collection, including UN-HABITAT, ORC Macro, the UN Environment Programme, the Environmental Health Project of the U.S. Agency for International Development, the World Bank, the Water Supply and Sanitation Collaborative Council, and the Millennium Project.

Chapter 4

1. Progress in Bangladesh must be evaluated in the context of the significant problem the country is currently facing with arsenic contamination of groundwater supplies.

2. Special thanks to task force member Jennifer Davis, who devised the community typology outlined in this section and who wrote the text that follows.

3. It should be noted that freshwater scarcity is one supply issue that receives limited attention in the typology. The International Water Management Institute estimates that 30 percent of the world's population lives under conditions of physical water scarcity (that is, without enough water to meet minimum industrial and domestic needs and provide for present levels of food production). Scarcity is also an important explanation for lack of access to water supply in many local-level analyses. Overall, however, the association between physical water availability and coverage is not as strong as, for example, the (inverse) association between poverty and access.

4. Water quality is, of course, a concern when households use water primarily intended for irrigation. Installing handpumps along irrigation canals as described above is just one strategy for improving the quality of water to levels needed for domestic purposes; the water is drawn through a natural sand filter before being pumped and captured. Point-of-use treatment technologies may be another option for households wanting to treat irrigation water for domestic use.

5. See, for example, Tendler's (1997) discussion of the importance that centralized functions had in development projects across several sectors in Ceará, Brazil.

6. These costs may be particularly high in urban settings where water supply and sanitation agencies are subject to technical standards that are often excessively stringent or inappropriate. Many former colonies in Africa, for example, use construction standards that were adopted without modification from Western Europe.

7. Some information was also supplied by task force cochair Albert Wright, based on his personal knowledge of the program.

8. For instance, the technical standards for sewers in some African countries include pipe specifications intended to allow networks to withstand snow loadings—clearly an artifact of the European climates in which the standards were developed.

Chapter 5

1. For example, most of the world's poorest countries did not include target 10 among their priority objectives in their Poverty Reduction Strategy Papers (PRSPs). See Mehta (2002).

2. Ring-fencing refers to the compulsory reservation of funds for use within a specific limited sector or department, such as a specific agency, utility, or division of a company. It implies, for instance, that income a utility gains from providing water supply would then remain with that utility to cover operation and maintenance costs, to pay salaries, or to fund expansion of services.

3. The term “institutional constraints” refers to obstacles developing countries face in a wide range of areas required for effective development policy-making and implementation, such as human resources, managerial skills, monitoring and evaluation systems, work processes, organizational cultures and norms, and legal frameworks.

4. We use the term “capacity building” as defined in Agenda 21 (chapter 37): “capacity building encompasses the country’s human, scientific, technological, organizational, institutional and resource capabilities. A fundamental goal of capacity building is to enhance the ability to evaluate and address the crucial questions related to policy choices and modes of implementation among development options, based on an understanding of environment potentials and limits and of needs perceived by the people of the country concerned” (UNCED 1992).

5. The Orangi Pilot Project in Pakistan is a well-known example of this type of “bottom up” capacity building that led to a locally planned and implemented sanitation project.

6. In nominal terms, official development assistance for water and sanitation has declined since 1995, fluctuating between \$18 billion in 1996 and \$13.5 billion in 1999. These commitments were about \$16 billion in 2002.

7. Calculated based on Silva and others (1998) as quoted in Annamraju and others (2001).

Chapter 6

1. For example, improved sanitation services are far more effective than improved water supply in reducing the incidence of such diarrheal diseases as cholera, thereby reducing public health costs, improving the productivity of workers, and underpinning higher academic attainment for children. While beneficial to individuals and households, these effects also have substantial macroeconomic impacts on the economies of their countries as well. (See, for example, Evans and others 2004.)

2. Of course, along with consumer demand for sanitation, it is important to recognize several other factors that can influence the likelihood that improved facilities will be constructed. These include access to water supply; security of land tenure; awareness of various technological options; availability of materials and personnel (for example, masons)

needed for construction; and such technical considerations as availability of sufficient space to construct a latrine or bathroom, or proximity to a feeder sewer.

3. While many countries have already achieved this type of decentralization, others have not; many centralized water and sanitation agencies still take full responsibility for all aspects of sanitation service delivery.

4. There is a pressing need for more analysis of the most effective ways of utilizing public funds to leverage increased access. The success of approaches such as that adopted by ZimAHEAD in Zimbabwe, and the total sanitation campaign in Bangladesh, certainly point to the need to focus on and support local decisionmaking. A recent evaluation of hygiene promotion programs also suggested that their impacts are robust and long lasting (Bolt 2004; Cairncross and Schordt 2004). Further work is needed, however, to evaluate the conditions under which different approaches work best.

5. The role of public funding in urban sanitation is crucial. In congested urban areas, shared infrastructure or systems of waste disposal are essential if household actions are to result in a cleaner and healthier living environment.

6. It is important to note, however, that progress toward the environmental sustainability goal is still constrained by the lack of sanitation technologies that address waste management adequately. Technical advances in such areas as effective, affordable, and simple-to-operate sewage treatment plants that can be located close to residential areas; drainage and solid waste disposal; and urban wastewater treatment and management in large urban agglomerations should therefore be promoted and accelerated.

7. Whereas the community-led total sanitation approach explicitly prohibits subsidies for the construction of sanitary facilities, there may be cases in which cross-subsidies among households or direct subsidies to poor households are justified. Given the wide range of socioeconomic characteristics, technical challenges, and costs of providing improved service found across unserved communities, blanket principles regarding subsidies are inappropriate.

8. Various tools exist for promoting dialogue on sanitation. The construction of simple latrine acquisition curves, for example, can force professionals into a discussion with households about what has changed over time, and the reasons some households have made investment and behavior decisions about sanitation and hygiene while others have not.

Chapter 8

1. The full needs assessment methodology can be found at www.unmillenniumproject.org/html/mpmethodology1.shtm. Special thanks to Guido Schmidt-Traub, who conducted the analysis outlined in this section and wrote the text that follows.

2. The water and sanitation needs assessment does not include the following interventions: soakaway pits for treating and disposing of sillage; large-scale infrastructure for water storage and transport; infrastructure for flood management and control; upgrading of existing water and sanitation infrastructure; advanced wastewater treatment for industrial effluents and other chemicals; or integrated water resources management (IWRM), including hydrological monitoring systems.

3. Macro International website www.measuredhs.com.

4. Albert Wright, a coordinator of the task force, has kindly provided us with these principles. They should, however, not be misinterpreted as rules. Instead, countries must develop their own coverage targets based on local needs and preference.

5. Estimating human resources, administrative capacity, and related costs pertaining to the maintenance of water and sanitation is extremely difficult. For example, staff requirements for water and sanitation systems can vary between 2 and 10 employees per

10,000 users, depending on the complexity of the system, its efficiency, and the extent to which automation or labor-intensive approaches are used (Muller 2003).

6. Macro International website www.measuredhs.com.

7. The reason is that, although septic tanks are a very good means of disposing of human excreta if properly maintained, experience has shown that systematic maintenance and regular emptying are difficult to ensure.

8. www.sulabhinternational.org.

9. UNAIDS is an innovative joint venture of the United Nations family that brings together the efforts and resources of 10 UN system organizations. It has been successful in putting AIDS on the global agenda, which has generated additional funds for the sector from the Bill and Melinda Gates Foundation to create the Global Fund. See www.unaids.org.

10. The UN Millennium Project is working with a number of governments to revise the preliminary estimates.

11. www.unmillenniumproject.org

Chapter 9

1. The number of people below the poverty line has been calculated by multiplying the national poverty headcount ratio by the population. National poverty headcount ratios are taken from the World Development Indicator database (World Bank 2004). Countries for which no poverty or water and sanitation data are available are not included in the calculations, which is why the totals are less than the total number of unserved people, for both water and sanitation. We are grateful to Michael Krause and Alice Wiemers of the Millennium Project Secretariat, who carried out this analysis.

2. The Ethiopian national poverty line is substantially below the \$1 a day standard used by the World Bank.

3. National poverty lines are typically defined as the income equivalent required to meet minimum caloric food requirements as well as basic essential expenditures. In most countries, households living below the national poverty line have insufficient resources to provide sufficient food for all household members.

4. For example, aid modalities are discussed in some detail in UN Millennium Project (2004b).

Chapter 10

1. Table 10.1 and the following four sections (on poverty and hunger, environmental sustainability, health, and gender equality) draw extensively on UNDP 2004 and on material prepared by John Soussan of the Stockholm Environment Institute at the request of the task force coordinators. Special thanks to task force member Ingvar Andersson of UNDP for allowing us to incorporate sections of the UNDP report verbatim.

2. Schistosomiasis, also known as bilharzia, is a disease caused by water-borne flatworms or blood flukes that spend part of their development in human intestines or in their urinary tracts; the second part of their development takes place in small water snails (that act as intermediate hosts of the flatworms) when they are discharged into surface waters through feces or urine. The disease is endemic in 74 developing countries, affecting people in agricultural and periurban areas. It is a disease of great public health and socioeconomic significance. Those with the urinary types of the disease discharge blood in their urine and sometimes develop bladder cancer.

3. The material in this section is drawn from Scherr 2004.

4. Direct irrigation refers to wastewater streams being applied directly, undiluted, and often untreated, to agricultural land. Indirect irrigation with wastewater takes place when

wastewater is discharged in streams or irrigation canals, mixed with freshwater and used for irrigation diluted.

5. Virtual water is the amount of water that is embedded in food or other products needed for its production. Trade in virtual water allows water-scarce countries to import high water-consuming products, while exporting low water-consuming products, and in this way make water available for other purposes.

Chapter 11

1. Global Water Partnership www.gwpforum.org.
2. These are the areas that have been dubbed “economically water scarce” by the International Water Management Institute.
3. These events will in turn impact hydropower, dilution capacity, transport, flood control, and agricultural production and thus threaten gains made toward the poverty, hunger, health, and environmental sustainability Goals.
4. An IWMI study projects that about a quarter of all the population in 2025 live in countries that do not have sufficient water resources to meet reasonable needs without relying on high food imports (Seckler and others 1998).

Chapter 12

1. For example GRID; GEMS-Water; the Global International Waters Assessment (GIWA) of the UN Environment Programme; the Global Runoff Data Center (GRDC) of the World Meteorological Organization (WMO); AQUASTAT of the Food and Agriculture Organization; the International Groundwater Resources Assessment Centre (IGRAC) of WMO and UNESCO, the water supply and sanitation databases of the World Health Organization and UNICEF; and the databases of the World Bank Group.

Appendix 1

1. Special thanks to Robert Chambers and Kamal Kar for preparing this case study.
2. This case study is based on WSSCC (2000). Some information was also supplied by task force co-chair, Albert Wright, based on his personal knowledge of the program.
3. This case study is based on Water and Sanitation Program (2002). Additional information provided by Mi Hua, task force member and UN Millennium Project water and sanitation specialist.

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