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**Ending the crisis in
water and sanitation**

“The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use”

U.N. General Comment No. 15 on the right to water, 2002

“Civilized man could embark on no task nobler than sanitary reform”

Boston Board of Health, 1869

Ending the crisis in water and sanitation

The violation of the human right to clean water and sanitation is destroying human potential on an epic scale

Clean water and sanitation can make or break human development. They are fundamental to what people can do and what they can become—to their capabilities. Access to water is not just a fundamental human right and an intrinsically important indicator for human progress. It also gives substance to other human rights and is a condition for attaining wider human development goals.

At the start of the 21st century the violation of the human right to clean water and sanitation is destroying human potential on an epic scale. In today's increasingly prosperous and interconnected world more children die for want of clean water and a toilet than from almost any other cause. Exclusion from clean water and basic sanitation destroys more lives than any war or terrorist act. It also reinforces the deep inequalities in life chances that divide countries and people within countries on the basis of wealth, gender and other markers for deprivation.

Beyond the human waste and suffering, the global deficit in water and sanitation is undermining prosperity and retarding economic growth. Productivity losses linked to that deficit are blunting the efforts of millions of the world's poorest people to work their way out of poverty and holding back whole countries. Whether viewed from the perspective of human rights, social justice or economic common sense, the damage inflicted by deprivation in water and sanitation is indefensible. Overcoming that deprivation is not just a moral imperative and the right thing to do. It is also the sensible thing to do because the waste of human potential associated with unsafe water and poor sanitation ultimately hurts everybody.

This chapter documents the scale of the crisis in water and sanitation and traces its causes. It highlights the human development costs of the problem—and the potential benefits of

resolving it. Better access to water and sanitation would act as the catalyst for a giant advance in human development, creating opportunities for gains in public health, education and economic growth. So why are these opportunities being squandered on such a large scale?

Partly because of insufficient awareness of the scale of the problem and partly because of insufficient efforts by national governments and the international community to address the poverty and inequality that perpetuate the crisis. In contrast to some of the other global threats to human development—such as HIV/AIDS—the crisis in water and sanitation is, above all, a crisis of the poor in general and of women in particular, two constituencies with limited bargaining power in setting national priorities. Water and sanitation are also the poor cousin of international development cooperation. While the international community has mobilized to an impressive degree in preparing to respond to the potential threat of an avian flu epidemic, it turns a blind eye to an actual epidemic that afflicts hundreds of millions of people every day.

The water and sanitation crisis facing poor households in the developing world has parallels with an earlier period in the history of today's rich countries. Few people in the industrial world reflect on the profound importance of clean water and sanitation in shaping the history of their countries or their life chances. Not too many generations ago the inhabitants of London,

The world has the technology, the finance and the human capacity to remove the blight of water insecurity from millions of lives

New York and Paris were facing the same water security threats as those of Lagos, Mumbai and Rio de Janeiro today. Water polluted with raw sewage killed children, created health crises, undermined growth and kept people in poverty. New technologies and finance made universal access to clean water possible. But the crucial change was political. Social reformers, physicians, municipal leaders and industrialists formed powerful coalitions that elevated water and sanitation to the top of the political agenda. They forced governments to acknowledge that curing diseases caused by unsafe water was inefficient and wasteful: prevention through clean water and sanitation was the better cure.

At the start of the 21st century the world has the opportunity to unleash another leap forward in human development. Within a generation the global crisis in water and sanitation

could be consigned to history. The world has the technology, the finance and the human capacity to remove the blight of water insecurity from millions of lives. Lacking are the political will and vision needed to apply these resources for the public good. Progress in rich countries was made possible by a new social contract between governments and people—a contract based on the idea of common citizenship and the recognition of government responsibility. The world may be different today. But now, as then, progress depends on partnerships and political leadership. National policy is the starting point, because without strong national policies progress cannot be sustained. The challenge is for developed country governments to back credible national efforts in developing countries through a strong aid effort within a global plan of action for water and sanitation.

Lessons from history

For most of human history life has conformed to Thomas Hobbes' description as "nasty, brutish, and short". Life expectancy at birth for our hunter-gatherer ancestors was about 25 years, and in the Europe of the 1820s it was still only 40 years. From the late 19th century this picture started to change dramatically for the fortunate share of humanity living in today's rich countries.¹ New medicines, improved nutrition, better housing and increased income all contributed. But one of the most powerful forces for change was the separation of water from human excrement.

When it comes to water and sanitation, countries tend to have short memories. Today, people in the cities of Europe and the United States live free from fear of waterborne infectious diseases. At the turn of the 20th century the picture was very different. The vast expansion of wealth that followed industrialization increased incomes, but improvements in more fundamental

indicators such as life expectancy, child survival and public health lagged far behind. The reason: cities exposed people to greater opportunities to amass wealth but also to water contaminated with human waste. The mundane reality of unclean water severed the link between economic growth and human development. It was not until a revolution in water and sanitation restored that link that wealth generation and human welfare started to move in tandem (box 1.1).

That revolution heralded unprecedented advances in life expectancy and child survival—and better public health fuelled economic advances. As people become healthier and wealthier with the provision of clean water and sanitation, a virtuous circle of economic growth and human development emerged. But the increasing returns generated by investment in clean water also helped to create and to progressively widen the deep cleavages in wealth, health and opportunity that characterize the world today.²

“Parliament was all but compelled to legislate upon the great London nuisance by the force of sheer stench.” Thus commented the *London Times* on an episode known as the “Great Stink”. So severe was the stench of sewage emanating from the Thames River in the long hot summer of 1858, that the “mother of parliaments” was forced to close temporarily. Beyond parliament the problems were more serious.

As industrialization and urbanization accelerated in the 19th century, fast growing cities like Birmingham, London and Manchester became centres of infectious disease. Sewage overflowed and leaked from the limited number of cesspools into neighbourhoods of the poor and ultimately into rivers like the Thames, the source of drinking water.

Parliamentary nostrils were offended—while poor people died. In the late 1890s the infant mortality rate in Great Britain was 160 deaths for every 1,000 live births (figure 1)—roughly the same as in Nigeria today. Children died mainly from diarrhoea and dysentery. They died for the same reason that so many children still die in developing countries: sewage was not separated from drinking water. Between 1840 and the mid-1890s, average income doubled while child mortality increased slightly—a powerful demonstration of the gap between wealth generation and human development.

Growing awareness of the human costs of urban industrial life forced water onto the political agenda. In 1834 the Office of the Registrar General was formed, producing a steady stream of mortality figures that generated public concern. Social investigation became another powerful tool for reform. Edwin Chadwick’s *Report on the Sanitary Condition of the Labouring Population of Great Britain* provided an account of a crisis on a grand scale, documenting in graphic detail the consequences of the water and sanitation problem. Unaffordable water provided by private companies, poor drainage and overflowing cesspools figured prominently. “The annual loss of life from filth and bad ventilation”, Chadwick concluded, “is greater than the loss from death or wounds from any war in which the country has been engaged in modern times” (p. 369). His recommendations: a private tap and a latrine connected to a sewer for every household and municipal responsibility for providing clean water.

Reform came in two great waves. The first focused on water and began in the 1840s with the Public Health Act (1848) and the Metropolitan Water Act (1852), which expanded public provision of clean water. The discovery by John Snow in 1854 that cholera—the greatest epidemic scourge—was a waterborne infection and that its spread could be halted by access to uncontaminated water supplies added to the impetus. By 1880 municipalities had displaced private water operators as the main providers of water in towns and cities.

The second great wave of reform shifted the locus of the public action from water to sanitation. This wave gathered momentum

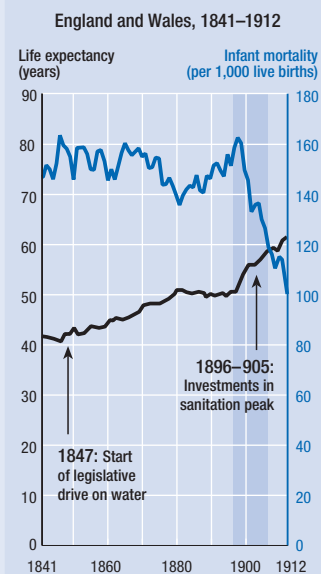
after 1880. It was reflected in a surge of public investment. Between the mid-1880s and mid-1890s capital spending per capita on sanitation more than doubled in constant prices (figure 2). It then doubled again over the next decade.

The gap between provision of water and provision of effective sanitation was a public health disaster. Streets and rivers became grossly polluted under the growing burden of waterborne wastes. The incidence of diseases such as cholera and typhoid fever fell, but deaths from gastrointestinal illness—especially diarrhoea among children—remained high. The outcome of the unbalanced early phase of local government intervention was an upward pressure on the incidence of waterborne disease.

Life expectancy and child mortality data highlight the problem (see figure 1). After 1840 life expectancy began to increase partly because of the first wave of reforms in water. However, the trend abruptly levelled off at the end of the 1870s. It was not until after the early 1880s, when the great sanitation reforms came into play, that the upward trend resumed, driven by a steep decline in child death. Sanitary reform cannot take all the credit. But the coincident timing between peak sanitary

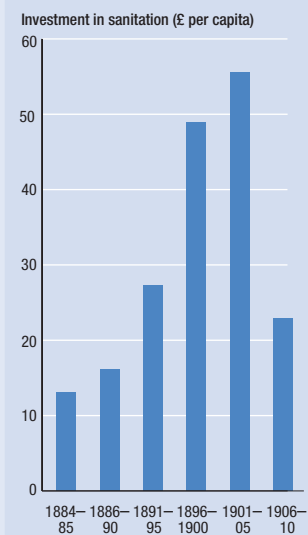
investment and the onset of a general decline in infant mortality suggests a causal relationship. In the space of little more than a decade from 1900 the infant mortality rate fell from 160 deaths per 1,000 live births to 100—one of the steepest declines in history. Public

Figure 1 Infant deaths fall...



Source: University of California, Berkeley, and MPIPR 2006.

Figure 2 ...as sanitation improves



Source: Bell and Millward 1998.

(continued on next page)

investment in sanitation, not rising private income, was the catalyst. Average incomes rose by only 6% between 1900 and 1912.

New approaches to financing played a critical role in the second wave of reform. Mounting political pressure for public action generated an active search for new fiscal mechanisms to address a dilemma familiar in developing countries today: how to finance large upfront payments from a limited revenue base without raising taxes or charges to politically unfeasible levels. Governments developed innovative solutions. Cities supplemented low-interest loans from the central government with municipal borrowing on bond markets. Water and sanitation accounted for about a quarter of local government debt at the end of the 19th century.

This huge mobilization of public finances reflected the changing place of water and sanitation in political priorities. Sanitation reform became a rallying point for social reformers, municipal leaders and public health bodies, who increasingly viewed inadequate sanitation

as a constraint not just on human progress but on economic prosperity. The public voice of civil society played a key role in driving the sanitation reform that made advances in public health possible.

But why the lag between the two great waves of reform? One of the major reform coalition partners in the first wave was the industrialists who wanted water for factories, but who were reluctant to pay higher taxes for extending sanitation to the poor. Politically powerful segments of society remained more interested in insulating themselves from the effects of poor sanitation among the poor than in universal provision. It was not until the electoral reform that extended voting rights beyond propertied classes that the voice of the poor became a more telling factor.

This is a story from 19th century Great Britain, not the 21st century developing world. But there are marked parallels both in how water and sanitation constrains social progress and in how the forces for change emerge from coalitions for social reform.

Source: Bell and Millward 1998; Szreter 1997; Hassan 1985; Woods, Watterson and Woodward 1988, 1989; Bryer 2006.

How water insecurity decoupled economic growth and human development

At the start of the 21st century waterborne infectious diseases are a thing of the past in rich countries, accounting for a fraction of 1% of overall mortality. At the turn of the 19th century, diseases like diarrhoea, dysentery and typhoid fever posed major threats. In the late 19th century they accounted for 1 in 10 deaths in US cities, with children the primary victims. Infant mortality rates in Detroit, Pittsburgh and Washington, D.C., were more than 180 deaths for every 1,000 live births—almost twice the rate in Sub-Saharan Africa today.³ Chicago was the typhoid capital of the country, reporting an average of 20,000 cases a year. In the United Kingdom, too, half a century after the first wave of public health reforms, water remained a potent threat. The infant mortality rate in Birmingham and Liverpool exceeded 160 deaths for every 1,000 live births, with diarrhoea and dysentery accounting for more than half the deaths.⁴ High child mortality acted as a brake on increases in life expectancy. Until the last quarter of the 19th century life expectancy barely rose in the industrialized world. People were becoming wealthier but not healthier.⁵

Why in the midst of the vast expansion of wealth created by industrialization did child survival and life expectancy, two of the most basic indicators for the human condition, not advance? Partly because industrialization and urbanization were drawing poor rural migrants into urban slums that lacked water and sanitation infrastructure—a scenario played out today in many of the world's poorest countries. While cities offered employment and higher incomes, they increased exposure to lethal pathogens transmitted through overflowing cesspools, sewers and drains.⁶

Almost every major city faced the same problem. At the end of the 19th century one public health report on Paris lamented that the poor quarters of the city had become “an open-air sewer”, posing a daily threat to health and life.⁷ Chicago's public health crisis arose because the city used Lake Michigan both for water and for waste disposal. That worked until the population expanded after the Civil War, and the city ended up drinking its own waste, to disastrous effect: 12% of the population died from waterborne diseases in the mid-1880s. Epidemics of typhoid and cholera regularly swept through cities like New Orleans and New York.⁸ Partly to combat disease, London and Paris had built sewerage systems before 1850. But the sewers drained into the Thames and the Seine, making

both rivers putrid—so putrid in the case of the Thames that in the hot summer of 1858 Parliament was forced into temporary closure by an episode known as the “Great Stink”.⁹

The water-sanitation disconnect— and delayed progress

Progress in water and sanitation was driven by advances in scientific knowledge, technology and—above all—by political coalitions uniting industrialists, municipalities and social reformers. But advances occurred in piecemeal fashion, with water provision fast outstripping the development of the sewers and drains needed for wastewater management. The upshot: an increase in the transmission of diseases (see box 1.1).¹⁰

Towards the end of the 19th century governments acted to close the gap between water and sanitation. In Great Britain public investment financed an expansion of sewerage systems. Life expectancy increased in the four decades after the 1880s by an astounding 15 years, with

reduced child deaths accounting for the bulk of the gain. In the United States the New York Board of Health, a municipal body created in 1866, was given the task of breaking the cycles of cholera and other health epidemics that afflicted the city. Its creation marked the recognition that the diseases associated with water and sanitation could not be contained in the city’s poorer tenements—and that public action was needed to advance private interests.¹¹ The example was followed elsewhere, with municipalities taking over the provision of water and then introducing filtration and chlorination systems.¹² By one estimate water purification alone explains half the mortality reduction in the United States in the first third of the 20th century (box 1.2).¹³ No other period in US history has witnessed such rapid declines in mortality rates. By 1920 almost every big city in today’s industrial world had purified water. Within another decade most had built large sewage treatment plants that removed, treated and disposed of human waste in areas where it would not contaminate drinking water.¹⁴

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Today’s global crisis in water and sanitation

Debates on globalization invariably focus on the large wealth gaps that separate rich and poor countries. Those gaps are highly visible (see *The state of human development*). Less attention is paid to other inequalities that shape the prosperity of countries and the well-being of their citizens. The global fault line that separates those with and those without access to water and sanitation is a case in point.

Rich world, poor world

For people in rich countries it is difficult to imagine what water insecurity means in a developing country. Concerns about a water crisis

periodically generate media headlines. Falling reservoirs, declining rivers, hosepipe bans and political exhortations to use less water are becoming more common in parts of Europe. In the United States management of water shortages has long been a public policy concern in states such as Arizona and California. But almost everyone in the developed world has safe water available at the twist of a tap. Access to private and hygienic sanitation is universal. Almost nobody dies for want of clean water or sanitation—and young girls are not kept home from school to fetch water.

Contrast this with the position in the developing world. As in other areas of human

Box 1.2 Breaking the links between race, disease and inequality in US cities

We feel it our duty to say that high-priced water is not in the interest of public health. Pure water in abundance, at a price within the reach of all, is one of the most powerful agencies for promoting the health of any community. It is for this reason that we believe so strongly in municipal ownership. North Carolina Board of Health, 1898

One hundred years ago people living in Chicago, Detroit and New York would have understood the public health problems of cities in the world's poorest countries today—and they understood through bitter experience the importance of clean water.

At the start of the 20th century infectious diseases accounted for 44% of mortality in US cities. Waterborne diseases like typhoid fever, cholera and diarrhoea were among the biggest killers, accounting for a quarter of deaths from infectious diseases. Only tuberculosis claimed more lives.

Two problems, both familiar to people in the slums of Lagos, Manila or Nairobi today, obstructed progress in human health. First, water supplies had been improved by private companies, but the poorest households could not afford connections. The statement above from the North Carolina Board of Health reflects the growing concern of public health agencies at the time. Second, early private and municipal water systems compounded another problem. Large amounts of human excrement and street waste washed down drains and into overburdened sewers that emptied back into the water supply system.

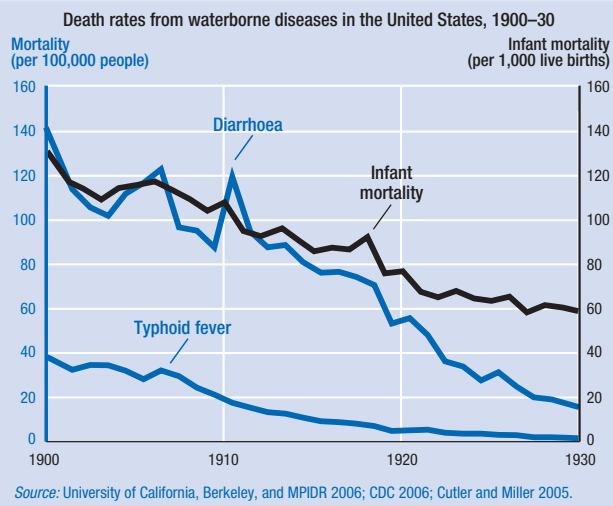
Although all sections of society were affected, some were more affected than others. Unable to afford either a water connection or bottled water, poor households relied on wells and surface water. They also suffered some of the worst drainage problems. Unequal access to clean water exacerbated unequal health. African Americans living in cities like New Orleans died at roughly twice the rate of whites from typhoid fever.

What brought about the breakthrough in curbing infectious disease? Municipalizing water was the main factor (figure 1). After 1900 municipal bodies gradually displaced private providers. In New Orleans, which municipalized water in 1908, public providers extended networks and lowered prices 25% below what private companies charged. In the decade to 1915 the water system, measured in pipe miles, expanded by a multiple of 4.5, with the expansion concentrated in some of the poorest districts.

Measures to protect people from harmful bacteria in water marked the other distinctive feature of the municipal revolution. Infrastructure programmes were important. Jersey City abandoned the Passaic River to seek clean water upstream. Chicago built drainage canals to carry waste down the Illinois and Mississippi Rivers rather than back into Lake Michigan, the city's water source. And Cleveland extended its water intake four miles out into Lake Erie. But it was the introduction of water filtration and chlorination systems that played the key role, as illustrated by Cincinnati (figure 2) and Detroit. Between 1880 and 1940 the share of the US population using filtered water rose from 1% to more than 50%.

Reforms in water contributed to wider public health gains. In the four decades after 1900 life expectancy at birth rose by 16 years, child death rates fell dramatically, and typhoid fever was virtually eliminated. No other period in US history has witnessed such rapidly falling mortality rates. By one estimate water and filtration systems explain almost half the mortality decline. Every life saved in this way cost about \$500 (in 2002 prices). But every \$1 spent generated another \$23 in increased output and reduced health costs. In the early 20th century US spending on water and sanitation represented a high value for money investment—just as it does for developing countries today.

Figure 1 Municipalizing water lowered prices, improved quality and saved lives



Source: Cutler and Miller 2005; Cain and Rotella 2001; Troesken 2001; Blake 1956.

Figure 2 Clean water reduced typhoid deaths

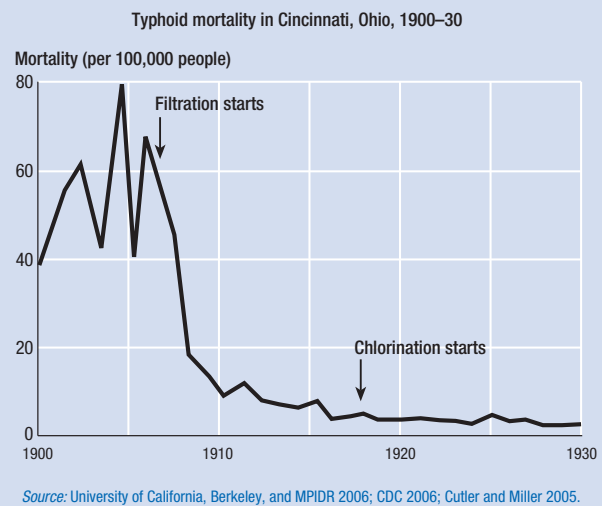
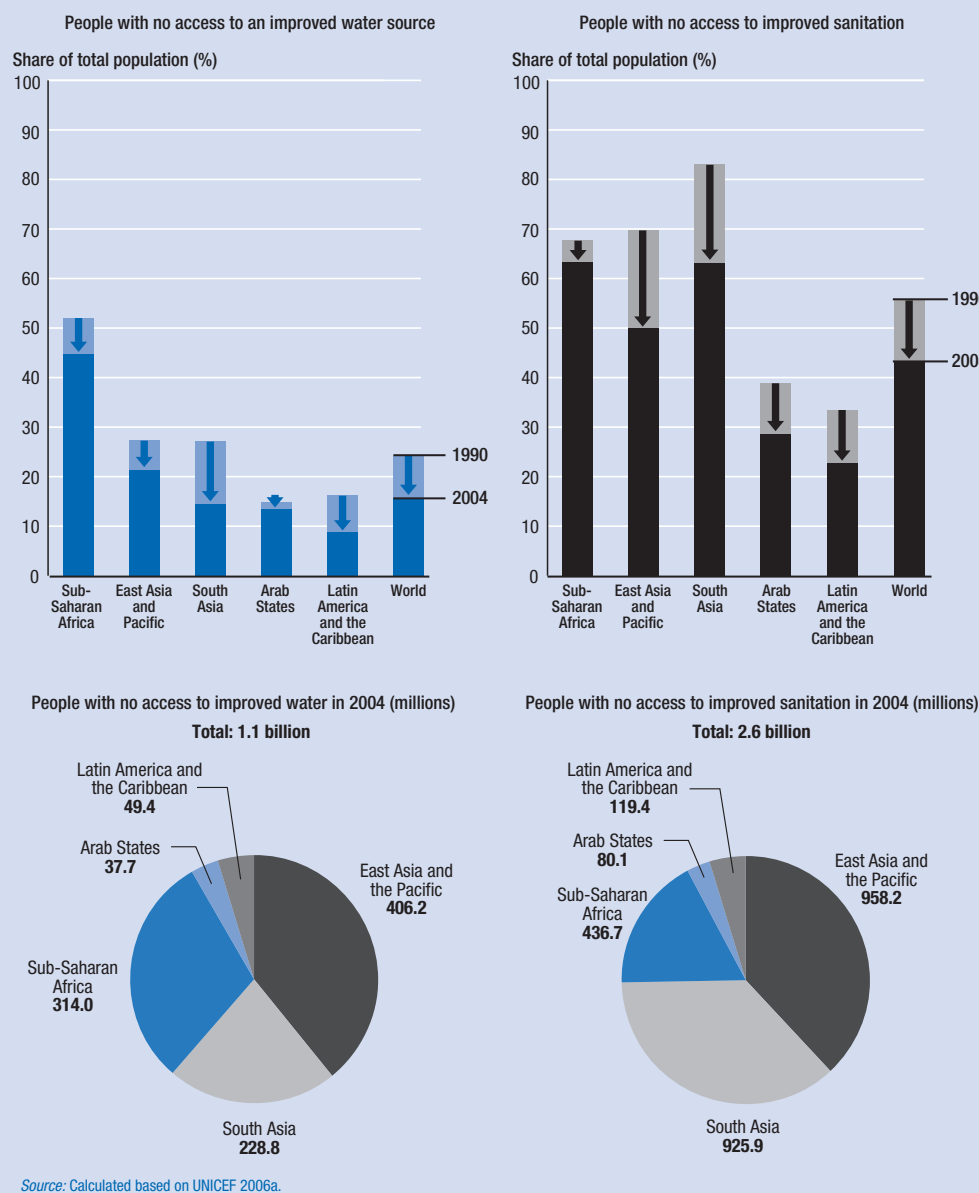


Figure 1.1 Shrinking slowly: the global water and sanitation deficit

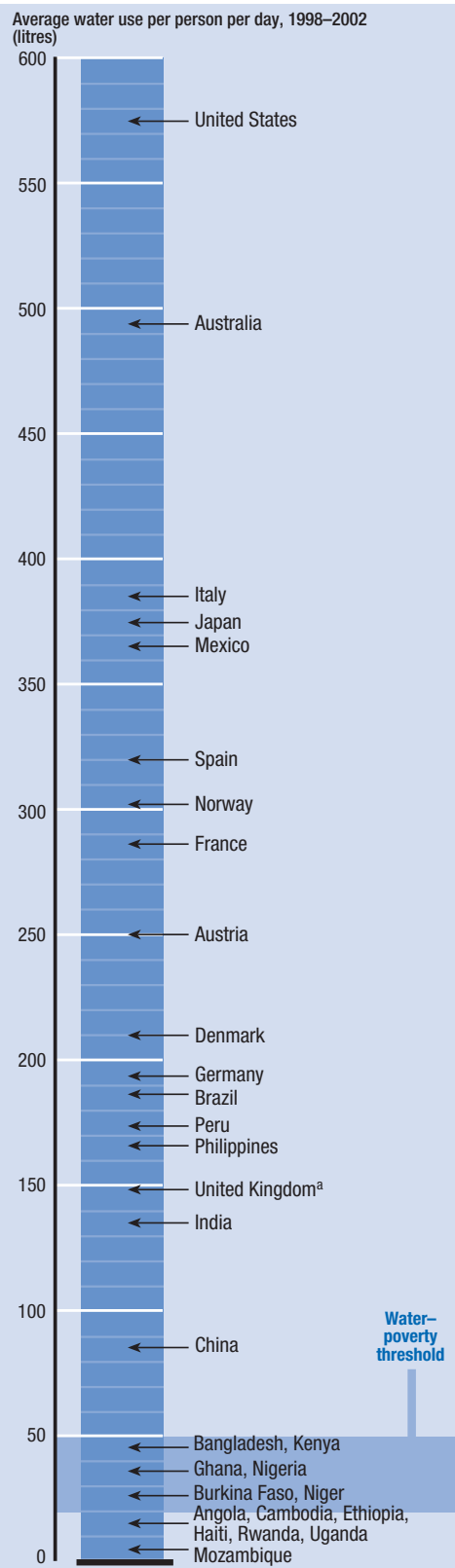


development, there has been progress in water and sanitation (figure 1.1). Yet at the start of the 21st century one in five people living in the developing world—some 1.1 billion people in all—lacks access to clean water. Some 2.6 billion people, almost half the total population of developing countries, do not have access to adequate sanitation. What do these headline numbers mean?

In important respects they hide the reality experienced daily by the people behind the statistics. That reality means that people are forced

to defecate in ditches, plastic bags or on road sides. “Not having access to clean water” is a euphemism for profound deprivation. It means that people live more than 1 kilometre from the nearest safe water source and that they collect water from drains, ditches or streams that might be infected with pathogens and bacteria that can cause severe illness and death. In rural Sub-Saharan Africa millions of people share their domestic water sources with animals or rely on unprotected wells that are breeding grounds for pathogens. Nor is the problem restricted to the

Figure 1.2 Worlds apart: the global water gap



poorest countries. In Tajikistan nearly a third of the population takes water from canals and irrigation ditches, with risks of exposure to polluted agricultural run-off.¹⁵ The problem is not that people are unaware of the dangers—it is that they have no choice. Apart from the health risks, inadequate access to water means that women and young girls spend long hours collecting and carrying household water supplies.

Simple comparisons between rich and poor countries highlight the scale of global inequality (figure 1.2). Average water use ranges from 200–300 litres a person a day in most countries in Europe to 575 in the United States. Residents of Phoenix, Arizona, a desert city with some of the greenest lawns in the United States, use more than 1,000 litres a day. By contrast, average use in countries such as Mozambique is less than 10 litres. National averages inevitably mask very large variations. People lacking access to improved water in developing countries consume far less, partly because they have to carry it over long distances and water is heavy. The 100 litre a day minimum international norm for a family of five weighs some 100 kilograms—a heavy burden to carry for two to three hours, especially for young girls. Another problem is that poor households are often unable to afford more than a small amount of water purchased in informal markets—an issue to which we return below.

What is the basic threshold for adequate water provision? Setting a water-poverty line is difficult because of variations relating to climate—people in arid northern Kenya need more drinking water than people in London or Paris—seasonality, individual household characteristics and other factors. International norms set out by agencies such as the World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF) suggest a minimum requirement of 20 litres a day from a source within 1 kilometre of the household. This is sufficient for drinking and basic personal hygiene. Below this level people are constrained in their ability to maintain their physical well-being and the dignity that comes with being clean. Factoring in bathing and laundry needs would raise the personal threshold to about 50 litres a day.

Large swathes of humanity fall well below the basic needs thresholds for water either permanently or intermittently. For the 1.1 billion or so people in the world who live more than 1 kilometre from a water source, water use is often less than 5 litres a day of unsafe water.¹⁶ To put this figure in context, the basic requirement for a lactating women engaged in even moderate physical activity is 7.5 litres a day. In other words, one in five people in the developing world lacks access to sufficient water to meet even the most basic requirements for well-being and child development. The problems are most severe in rural areas. In Uganda *average* consumption in rural areas ranges from 12 to 14 litres a day.¹⁷ Dry season use falls sharply as the distance to water sources increases. In arid areas of western India, the Sahel and East Africa dry season water availability can fall well below 5 litres a day. But people living in urban areas also experience extreme scarcity. Water use averages 5–10 litres a day in small towns in Burkina Faso and 8 litres a day in informal settlements in Chennai, India.¹⁸

Beyond the extreme deprivation experienced daily by some 1.1 billion people is a far larger sphere of deprivation. For people with access to a water source within 1 kilometre, but not in their house or yard, consumption typically averages around 20 litres per day. A 2001 WHO/UNICEF study estimated that some 1.8 billion were in this position.¹⁹

Without downplaying the seriousness of what are perceived as water shortages in rich countries, the contrasts are striking. In the United Kingdom the average person uses more than 50 litres of water a day flushing toilets—more than 10 times the total water available to people lacking access to an improved water source in much of rural Sub-Saharan Africa. An American taking a five-minute shower uses more water than the typical person living in a developing country slum uses in a whole day. Restrictions on the use of garden sprinklers and hosepipes may doubtless cause inconvenience to households in rich countries. But parents do not lack sufficient water to keep their children clean, to meet the basic hygiene standards that ward

off killer infections or to maintain their health and dignity.

Of course, water consumption in rich countries does not diminish water availability in poor countries. Global consumption is not a zero-sum game in which one country gets less if another gets more. But comparisons highlight disparities in access to clean water—and nowhere more so than in bottled mineral water.²⁰ The 25 billion litres of mineral water consumed annually by US households exceeds the entire clean water consumption of the 2.7 million people in Senegal lacking access to an improved water source. And Germans and Italians between them consume enough mineral water to cover the basic needs of more than 3 million people in Burkina Faso for cooking, washing and other domestic purposes. While one part of the world sustains a designer bottled-water market that generates no tangible health benefits, another part suffers acute public health risks because people have to drink water from drains or from lakes and rivers shared with animals and infected with harmful bacteria.

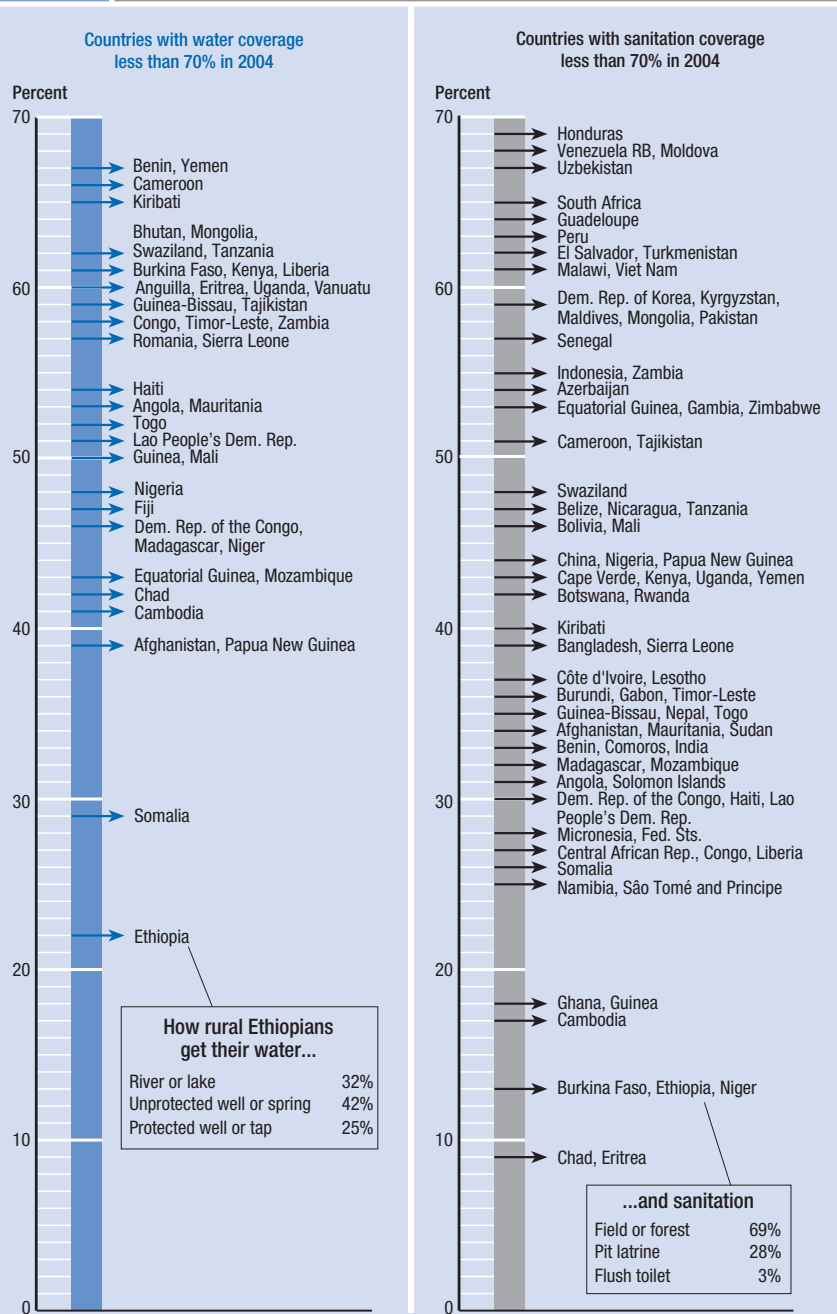
Wealth matters...

Global aggregates for water and sanitation coverage obscure large differences across regions. In the case of water Sub-Saharan Africa has by far the lowest coverage rates (55%), though most people without clean water live in South Asia. For sanitation the deprivation is more evenly spread. Coverage in South Asia is almost as low as in Sub-Saharan Africa, with two of every three people in both regions lacking access. Half the people in East Asia and a quarter in Latin America lack access to even the most basic sanitation. Some 40 developing countries provide clean water for fewer than 70% of their citizens, and 54 provide safe sanitation for fewer than half (figure 1.3).

The global snapshot highlights the daunting scale of the water and sanitation crisis. But it also draws attention to two wider problems. The first concerns the relation between wealth and the provision of water and sanitation. On average, coverage levels for water and sanitation rise with income: the richer the country the greater the coverage. That finding is not surprising

While one part of the world sustains a designer bottled-water market that generates no tangible health benefits, another part suffers acute public health risks because people have to drink water from drains or from lakes and rivers

Figure 1.3 Many countries face a long climb to universal coverage



Source: Indicator table 7.

because services have to be financed either out of household budgets or through public spending. More surprising is the very large variation around the average.

Many countries demonstrate the imperfect relationship between wealth and the provision of water and sanitation. The Philippines has a higher average income than Sri Lanka, but a smaller proportion of its citizens have access

to sanitation. Similarly, India may outperform Bangladesh as a high growth globalization success story, but the tables are turned when the benchmark for success shifts to sanitation: despite an average income some 60% higher, India has a lower rate of sanitation coverage. Similar gaps between wealth and coverage are observed for water. With a lower average income, Egypt has higher levels of access to clean water than China, and Tanzania has higher coverage levels than Ethiopia. In water and sanitation, as in other areas of human development, countries differ widely in the rate at which they convert wealth into progress in human development—an outcome that draws attention to the importance of public policies (figure 1.4).

...and sanitation lags behind water

The second problem highlighted in global data is the gap between water and sanitation provision. In all regions and in almost all countries sanitation provision lags far behind access to water—and there is no evidence that the gap is narrowing. In South Asia access to improved sanitation is less than half that for water. Elsewhere, the gap in coverage ranges from 29% in East Asia to 18% in Sub-Saharan Africa. These gaps matter not just because access to sanitation is intrinsically important, but also because the benefits of improved access to water and to sanitation are mutually reinforcing—a point demonstrated by Europe and the United States in the 19th century (see boxes 1.1 and 1.2). In Egypt high levels of pollution from raw sewage in the Nile Delta region undermine the potential health benefits of near universal access to water. Incidence rates for diarrhoea disorders and hepatitis A are far higher in many peri-urban settlements than is predicted on the basis of income, with wastewater pollution a major factor.²¹ Countries that allow sanitation coverage to lag are destined to see the benefits of progress in water diminished as a result.

The data systematically underreport the scale of the deficit

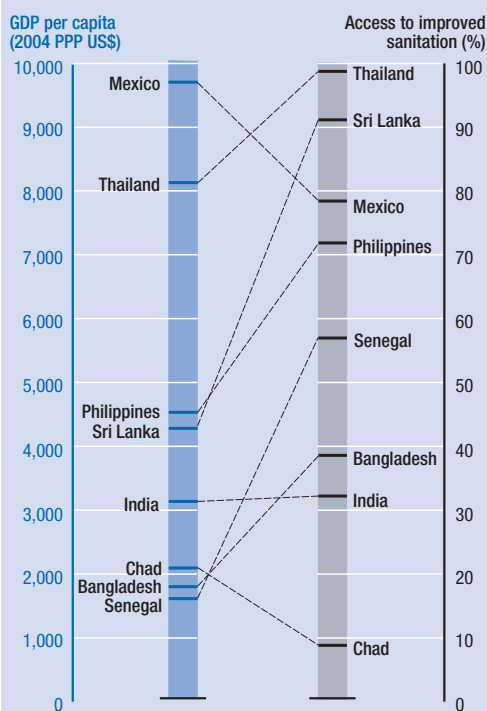
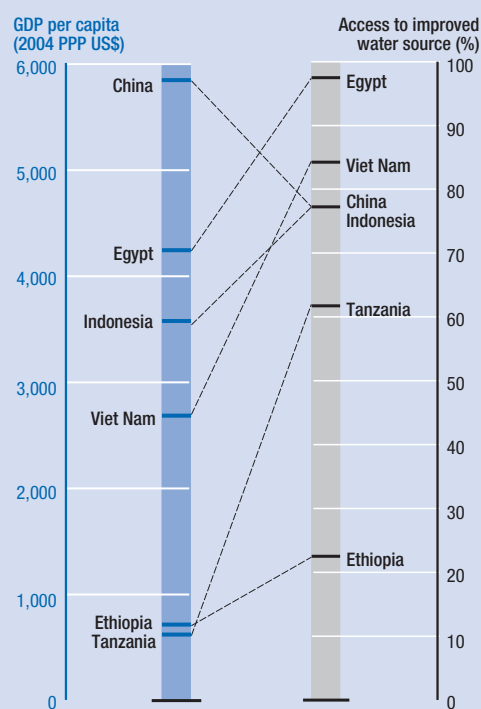
Global data on water and sanitation are provided through the Joint Monitoring Programme

of the WHO and UNICEF. That data tell a bleak story. But reality is even bleaker than the statistics show. While the data collection methodology has improved, the numbers understate the problems for a variety of reasons. Part of the problem is that the physical presence of an “improved” source—such as a pit latrine or a standpipe—is not always an accurate indicator for improved access: the technologies may not always function properly. Another difficulty relates to data coverage. When it comes to national surveys, some people—notably the poor—are undercounted because they live in areas that are not officially recognized by governments. Infrastructure deficits and decay are also unaccounted for in the statistics, as is the frequent unreliability of water services where they do exist, forcing people to rely on other sources much of the time.

Missing millions. Millions of poor people are missing from national statistics. Living in informal settlements, they simply are not counted.

- Mumbai.** Reported data indicate that Mumbai, the world’s fifth largest city, enjoys a safe water coverage rate of more than 90%. That figure is almost certainly exaggerated. By some estimates almost half the city’s 18 million people now live in the *zopadpatti*—literally hut areas—appearing on city maps as amorphous grey zones clustered along railway lines and extending into creeks and old mangrove swamps. Their residents do not figure in municipal data. One such area is Dharavi, a vast slum situated between the international airport and the Mumbai financial district and home to almost 1 million people. The slum residents live in an environment that poses a daily health threat. It is estimated that there is 1 toilet for every 1,440 people. In the rainy season streets, lacking drainage, become channels for filthy water carrying human excrement. People in areas like Dharavi rely on wells, tankers or unsafe sources for their drinking water. Beyond these areas are crumbling tenements, or *chawls*, where residents make do with rusting pipes, leaking taps and badly degraded storage tanks. In a typical case 15 families share one tap that works for two hours a day.²²

Figure 1.4 Incomes and outcomes in water and sanitation: wealth and performance often diverge



Source: Indicator tables 7 and 14.

The conditions here are terrible. You can see for yourself. There is sewage everywhere. Some people have pit latrines, but they are shallow and they overflow when it rains. Most people use buckets and plastic bags for toilets—and the children use the streets and yards. Our children suffer all the time from diarrhoea and other diseases because it is so filthy. Mary Akinyi, Mugomo-ini village, Kibera

Less than 7 kilometres from the Kenyan Parliament in central Nairobi the sprawling urban settlement of Kibera is one of Sub-Saharan Africa’s largest slums. Its inhabitants experience some of the worst deprivation in water and sanitation in the world. Yet people like Mary Akinyi are largely missing from the statistics.

According to the Kenyan government report on the Millennium Development Goals, 93% of Nairobi residents have access to clean water and 99% to sanitation. Those numbers are difficult to square with life in Kibera. Somewhere between 500,000 and 1 million people live in the slum—the true figure is unknown. With 2,000–3,000 people per square hectare this is probably the most densely populated area in Sub-Saharan Africa. The average family of three to four people lives in a single-room structure of mud, timber, plastic and corrugated iron sheets.

Simple observation of Kibera’s streets raises questions about data reporting. High population density, overcrowding and lack of infrastructure have created a water and sanitation nightmare. Drainage channels on the sides of roads are often blocked, pit latrines overflow in the rainy season and children scavenge in heaps of uncollected garbage.

Data on service provision are unreliable. Less than 40% of households have access to legal water connections, usually a standpipe. Of those that do, about a third receive water only once every two days. Some 80% of households purchase all or some of their water from private vendors, whose prices average \$3.50 per cubic metre but rise to almost double that in the dry season. The average price is some seven times higher than that paid by people in high-income settlements served by the Nairobi Water and Sewage Company—and higher than prices in London or New York. There are almost 700 water kiosks in the slum, although sales are

concentrated in larger kiosks operated by slumlords—a fact that restricts the scope of public protest against unfair practices.

People relying on kiosks typically spend about one hour collecting water, but longer during dry periods. They also spend a large share of their limited income. For a family with two adults earning a minimum wage, average water use represents about 20% of income—a huge burden on household budgets.

Sanitation coverage is even more limited. In some areas up to 150 people share a single latrine. In many cases these latrines lack privacy and security and are unhygienic and poorly maintained, with broken walls and overflowing pits. The Nairobi City Council does not provide any sanitation services to Kibera.

One of the strongest pieces of evidence contesting data on service provision is the “flying toilet”. With neither public nor private latrines available, many of Kibera’s resident resort to defecating in plastic bags that they dump in ditches or throw on the roadside. Two in three people in Kibera identify the flying toilet as the primary mode of excreta disposal available to them. It is not difficult to see why. In one slum area—Laina Saba—there were 10 functioning pit latrines for 40,000 people at the end of the 1990s. To the extent that any estimate can be derived for the slum as a whole, sanitation coverage in Kibera is probably well below 20%.

Public health provides further evidence of the real state of water and sanitation in Kibera. Kiosk operators provide a lifeline. However, the pipes that they use to access the water network are often in disrepair. One consequence is that they draw in the excreta and other wastes that flow through wastewater. Inadequate water supply and the absence of infrastructure for excreta disposal and wastewater management are linked directly to the high incidence of diarrhoea, skin diseases, typhoid fever and malaria. Death rates from diarrhoea are far higher here than in the rest of Nairobi (see table).

Utilities have a weak record in meeting Kibera’s needs. There are only 25 kilometres of piped water network, and the slum gets far less water than other settlements, partly because the utility diverts water to high-income areas during periods of shortage. The Nairobi Water and Sewage Company loses 40% of the

Infant and under five mortality rates and diarrhoea prevalence in Kenya

Location	Infant mortality rate (per 1,000 live births)	Under-five mortality rate (per 1,000 live births)	Prevalence of bloody diarrhoea in children under age 3 in two weeks prior to interview (%)
Kenya (rural and urban)	74	112	3.0
Rural	76	113	3.1
Nairobi	39	62	3.4
Other urban	57	84	1.7
Nairobi, informal settlements	91	151	11.3
Kibera	106	187	9.8
Embakasi	164	254	9.1

Source: APHRC 2002.

(continued on next page)

water supplied to Kibera through leaks and illegal connections. Revenues collected by the utility are less than one-third of the amount billed, pointing to major problems in management. Residents spend an estimated \$5 million a year on water purchased from kiosks—money that could be used to extend the piped network and finance connections for the poor. Why is service provision so limited? Partly because Kibera is an “illegal” settlement, municipal authorities and landlords are not obliged to provide any services.

Private markets are failing to bring down costs and improve supply for several reasons. Vendors report having to pay bribes to officials and to the water utility to make connections to the network—a cost they pass on to their customers. The private costs of connections and pipe-laying are also high since vendors

do not benefit from economies of scale. It costs an average of \$1,000 to establish a kiosk—an investment amortized through water charges.

Another source of price inflation is the interaction between kiosk and utility. Because kiosks are categorized as commercial entities, they pay a block tariff twice as high as the household minimum, with costs passed on to the consumer.

The challenge in Kibera is for public authorities to acknowledge the scale of the problem—and to work with local communities to develop solutions. Formalizing property rights, regulating private sector providers, breaking water monopolies maintained by slumlords and extending public provision for the collection and disposal of sludge are all crucial. So too are legislative measures requiring landlords to improve water and sanitation provision.

Source: Kenya 2005; UN-HABITAT 2003; WSP-AF 2005c; Collignon and Vézina 2000.

- *Jakarta.* National data report improved water coverage rates of more than 90% for urban Indonesia. But surveys that factor in the large number of informal residents in Jakarta, a city of more than 12 million people, estimate that less than a quarter of the population is fully served by improved water sources. The rest rely on a variety of sources, including rivers, lakes and private water vendors. The discrepancy: some 7.2 million people.²³
- *Nairobi.* Data for the city record access to improved water and sanitation at more than 90%. That figure is hard to square with the living experience of poor people. More than 1 million people living in slums on informal settlements in Nairobi—about a third of the city’s population—depend on private vendors as a secondary water source. In sanitation the picture is even worse. The “flying toilets” of Kibera—plastic bags in which people defecate and then throw onto the street—bear testimony to the limited extent of sanitation coverage in Nairobi, as do the slums’ high child mortality rates (box 1.3).

Sanitation and water pollution. Adequate sanitation coverage is defined for international reporting purposes by technology (see chapter 3). But the presence of an improved sanitation technology—such as a pit latrine—is at best a partial indicator.

In many countries the age-old problem of keeping water and excrement separate continues

to pose a formidable challenge to public policy—and to public health. Infrastructure deficits and decay are at the heart of that challenge. In Latin America less than 14% of human waste receives any form of treatment: the rest is dumped in rivers and lakes or allowed to seep through into groundwater. China has a strong record in expanding access to water in both urban and rural areas, but pollution from human and industrial waste is a serious problem. Sixteen cities with populations of more than half a million have no wastewater treatment facilities.²⁴ Nationally, less than 20% of municipal waste receives any treatment, forcing households to boil their water before drinking it. In 2003 the State Environmental Protection Administration reported that more than 70% of the water in five of China’s seven major river systems was too polluted for human use.

An additional problem is that cities in many countries lack the infrastructure to collect waste from pit latrines, with the result that sewage enters the water systems. “Improved sanitation” for some can translate into pollution and public health threats for others—as in Manila (box 1.4).

Inadequate water infrastructure can create high levels of risk even in cities with high coverage rates. Urban improved water coverage rates for Pakistan are reported at more than 90%. But what does this mean in practice? Consider the cities of Lahore (population 5 million) and

The present water closet system, with all its boasted advantages, is the worst that can be adopted.... It merely removes the bulk of our excreta from our houses to choke our rivers with foul deposits and rot at our neighbour's door. It introduces into our homes a most deadly enemy.

Scientific American, 24 July 1869

In 19th century Europe and the United States social reformers and engineers complained that the spread of latrines without proper disposal facilities presented a threat to public health. Manila, the capital of the Philippines, shows that the problem has not gone away. Sanitation coverage rates are put at more than 80%, but that figure obscures a major public health challenge.

Since 1997, when municipal authorities privatized water and sewerage provision, there has been a sharp focus on increasing access to clean water, both in the eastern part of the city, where the privatized utility has improved provision, and in the western part of the city, where the privatized utility failed. Sanitation has received far less attention, partly because of the huge scale of underprovision and a legacy of underinvestment.

Less than 4% of Metropolitan Manila's population is connected to the sewer network. Richer households have responded by building their own sanitation facilities. Flush toilets are widely used, connected to private septic tanks, often serving large housing developments. Around 40% of households now have onsite latrines, which count as an improved source. There are an estimated 1 million or more septic tanks in Manila.

The problem is that sludge treatment and disposal facilities are rare. The result: indiscriminate disposal of inadequately treated effluents into the Pasig River—a complex network of waterways that links the Laguna de Bay Lake to Manila Bay through a huge urban conurbation. Another 35 tons of solid domestic waste is deposited in the Pasig annually by squatters dwelling in makeshift settlements on the river's banks. In total, some 10 million people discharge untreated waste into the river.

This has serious consequences for public health. The Pasig is one of the world's most polluted rivers, with human waste accounting for 70% of the pollution load. Faecal coliform levels exceed standards set by the Department of the Environment and Natural Resources by several orders of magnitude—and around one-third of all illness in Manila is water related. The 4.4 million people living along the river face particularly acute problems, especially during the floods in the June to October rainy season. During the low flow season the Pasig River reverses direction and carries pollution into Laguna Lake, creating further public health problems.

Ambitious blueprints have been drawn up for cleaning up the Pasig, but none has moved from the drawing board, partly because of the failure of government and water providers to develop a coherent strategy for tackling Manila's sanitation crisis.

Source: WSP-EAP 2003; AusAID 2006.

Karachi (10 million), where half the population is estimated to live in informal slum areas. Both cities rely on a combination of groundwater and canal water. With more than 40% of water supply unfiltered and 60% of effluents untreated, waterborne epidemic diseases are common. In Lahore only some 3 industries in 100 chemically treat their wastewater. There is no sewage treatment plant. In Karachi two of the largest industrial estates in the country have no effluent treatment plants. The sewerage system is in disrepair, and there are no sewage treatment facilities. Human waste and industrial pollution have severely degraded the groundwater on which a

growing number of households depend for their water supply.²⁵ Across urban Pakistan unclean water poses a constant threat to public health. In the first half of 2006 alone, major outbreaks of waterborne disease epidemics have swept Faisalabad, Karachi, Lahore and Peshawar as a result of the leakage of sewage and industrial waste into drinking water through damaged pipes. So severe is the crisis that a major public investment programme has been launched to finance more than 6,000 water filtration plants.

Mineral poisoning. Natural substances in untreated water create risks for millions of people. The use of untreated groundwater for drinking

has exposed an estimated 60 million people to arsenic contamination, more than half of them in Bangladesh. Projected human costs over the next 50 years include 300,000 deaths from cancer and 2.5 million cases of arsenic poisoning. Concentration zones for fluoride pose an additional threat. One zone in Africa extends along the East African Rift from Eritrea to Malawi, another from Turkey through Iraq, Iran, Afghanistan, India, northern Thailand and China. The latest information shows that fluorosis is endemic in at least 25 countries across the globe. The total number of people affected is not known, but a conservative estimate would be in the tens of millions.²⁶

Time, flows and availability. The presence of an improved water technology such as a tap or standpipe is another partial indicator for access. For many people taps run dry for long periods, forcing households into unsafe informal water markets. More broadly, millions of poor households use both improved and unimproved water sources on a regular basis, raising questions about the picture drawn by global data.

National statistics may indicate the physical presence of an improved water source, while households with access face problems of intermittent supply, especially in the dry season. In Delhi, Karachi and Kathmandu fewer than 10% of households with piped water receive service 24 hours a day. Two or three hours of delivery is considered standard.²⁷ While poor households face

the greatest deprivation in access to water provided by utilities because they are less likely to be connected, poor service provision affects most people. This suggests a strong complementarity of interest in improving and expanding provision.

Living near a functioning standpipe does not guarantee easy access. The journey time might be short, but the queuing time can be long. Dhaka has a coverage rate for an improved water source of more than 90%, but this includes public taps for slum dwellers where the tap to user ratio is 1:500.²⁸ Problems in rural areas are even more pronounced. In Burkina Faso, Malawi and Mali research suggests that a third or more of rural water points are out of order at any one time.²⁹ Similar figures have been reported for South Asia. In Andhra Pradesh, where a village survey found a high level of coverage from water points, villagers reported that more than half the water points were broken at any one time.³⁰ The more serious problem in rural areas relates to seasonal factors, with average collection times concealing large variations between dry and rainy seasons. One study in a semi-arid region of Nigeria found that the proportion of households collecting water from a source more than 1 kilometre away increased from 4% to 23% in the dry season, while average consumption fell from 38 litres a day to 18 litres.³¹ Shifts in availability were reflected in child health indicators, with the incidence of diarrhoea doubling during the dry season.

For individuals, for households and for whole societies access to clean water and sanitation is one of the foundations for progress in human development

The human development costs of the crisis

For individuals, for households and for whole societies access to clean water and sanitation is one of the foundations for progress in human development. In this section we look at the wider role of water and sanitation for:

- Reducing income poverty.
- Reducing child mortality.
- Breaking lifecycle disadvantages.
- Holding down wider health costs.

- Improving girls' education.
- Freeing girls' and women's time.
- Ensuring a sense of human dignity.

Worsening income poverty— the wealth effect of the crisis

Concern is sometimes raised about the financial costs of reducing water and sanitation deficits.

Across much of the developing world unclean water is an immeasurably greater threat to human security than violent conflict

National governments are acutely aware of the impact on scarce budget resources of multiple claims for increased expenditure. Less attention has been paid to the economic costs of the crises in water and sanitation and to the implications of these costs for poverty and prosperity.

Research carried out for this Report by the WHO used a global model to derive best estimates for the costs of the water and sanitation deficit.³² That model asks what different regions might save if the entire population had access to basic, low-cost water and sanitation technology. Among the results:

- The overall costs of the current deficit total \$170 billion, or 2.6% of developing country GDP.
- Costs for Sub-Saharan Africa total \$23.5 billion, or 5% of GDP—a figure that exceeds total flows of aid and debt relief in 2003.
- Regional losses of \$29 billion for Latin America, \$34 billion for South Asia and \$66 billion for East Asia.

These figures have to be treated with caution. Yet they highlight two important points. The first is a variation on the theme that prevention is better than cure. Achieving the Millennium Development Goal target of halving the proportion of people without access to water and sanitation would cost about \$10 billion annually for low-cost, sustainable technology. Universal access would raise this figure to \$20–\$30 billion, depending on technology.³³ Estimating conservatively from the lower end of the cost spectrum indicates that allowing the water and sanitation deficit to continue would cost roughly nine times more than resolving it. Ultimately, the case for public action in water and sanitation is rooted in human rights and moral imperatives. At the same time, cost-benefit analysis suggests that economic common sense makes a powerful supporting case.

The second point is distributional. The estimates for economic losses associated with the water and sanitation deficit are based on regional data. However, most of the losses are absorbed by people close to or below the poverty line. They are borne disproportionately by the poor because the poor account for a large share of the population lacking access to water and

sanitation. This implies that some of the world's poorest households are seeing their efforts to mobilize resources for nutrition, health, education and—critically—production undermined by inadequate investment in water and sanitation provision. It follows that the poor stand to benefit disproportionately from investment in this area, with attendant benefits for poverty reduction efforts.

Retarding improvements in child mortality rates—the deadly link at birth

Across much of the developing world unclean water is an immeasurably greater threat to human security than violent conflict. That threat starts at birth. Unclean water and lack of sanitation are directly implicated in the huge gulf in life chances at birth that separate children born in rich countries from children born in poor countries. While life expectancy is increasing in developing countries, the rate of increase and the progress towards convergence with rich countries are being held back by the deficit in water and sanitation.

Of the 60 million deaths in the world in 2004, 10.6 million—nearly 20%—were children under the age of five. These fatalities accounted for a third of deaths in developing regions such as Sub-Saharan Africa and South Asia but for less than 1% in rich countries. Water and sanitation are directly implicated in a large share of deaths in children under five. The link: the 5 billion cases of diarrhoea in children each year in developing countries. These sickness episodes represent the second largest cause of childhood death after acute respiratory tract infection. They claim the lives of 1.8 million children under the age of five each year, or a daily death toll of about 4,900 young lives (figure 1.5). The number of deaths associated with the twin threats of unclean water and poor sanitation is not widely appreciated. Globally, diarrhoea kills more people than tuberculosis or malaria—five times as many children die of diarrhoea as of HIV/AIDS.

The human security threat of the water and sanitation crisis is growing in many countries.

Most deaths from diarrhoea—more than 1 million in 2004—are caused by shigella, or bloody diarrhoea. Unlike other forms of diarrhoea, shigella cannot be treated effectively with simple oral rehydration therapies—it requires more costly antibiotics. Even for households that can afford treatment, shigella is a growing threat because it has rapidly developed resistance to antibiotics. In northern and eastern India drug-resistant shigella has re-emerged after a hiatus of 14 years. Similarly, in rural western Kenya half of all diarrhoea cases have proved resistant to treatment.³⁴

Clean water and sanitation are among the most powerful preventative medicines for reducing child mortality. They are to diarrhoea what immunization is to killer diseases such as measles or polio: a mechanism for reducing risk and averting death. In addition to saving lives, upstream investments in water and sanitation make economic sense because they would reduce the downstream costs facing health systems. Universal access to even the most basic water and sanitation facilities would reduce the financial burden on health systems in developing countries by about \$1.6 billion annually—and \$610 million in Sub-Saharan Africa, which represents about 7% of the region's health budget.

How much does the transition from an unimproved water and sanitation source to an improved source reduce the probability of childhood death? That question was addressed by cross-country research carried out for this report (see *Technical note 3*). Household survey data for 15 countries were used to analyze the change in the risk profile of households associated with improvements in water and sanitation. The findings underline the potential for upstream water and sanitation interventions to cut child deaths:

- *Uganda*. Access to an improved water source reduces the risk of infant mortality by 23%.
- *Egypt*. Access to a flush toilet reduces the risk of infant death by 57% compared with an infant in a household without access to sanitation (figure 1.6).
- *Peru*. Access to a flush toilet reduces the risk of infant death by 59% compared with

Figure 1.5 Diarrhoea: the second biggest killer of children

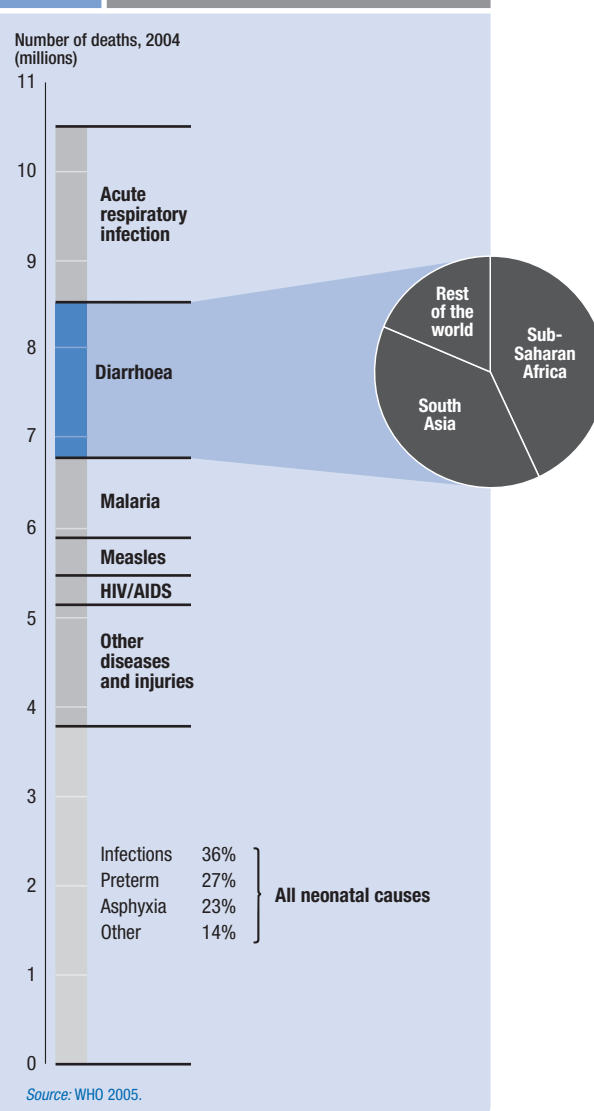


Figure 1.6 Clean water and toilets cut infant deaths

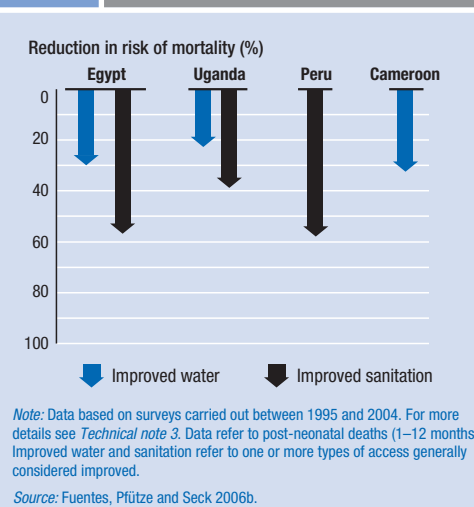


Figure 1.7 Clean water reduces the risk of diarrhoea...

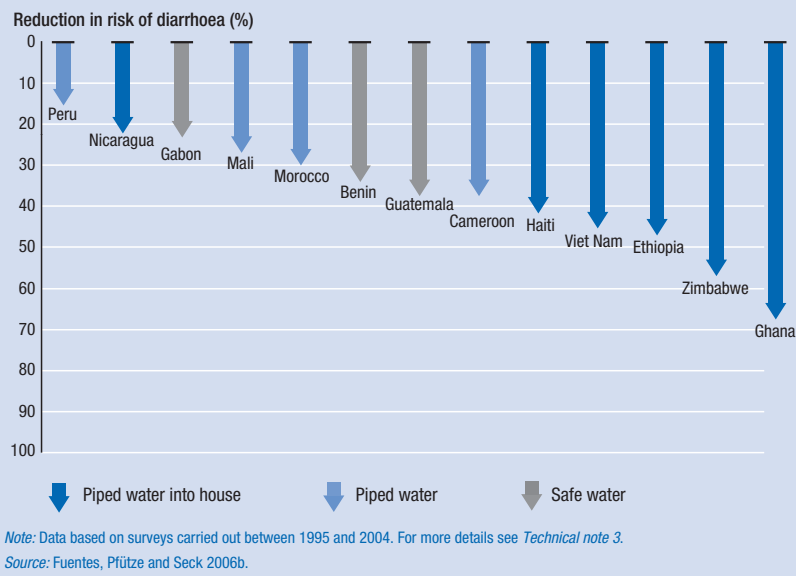
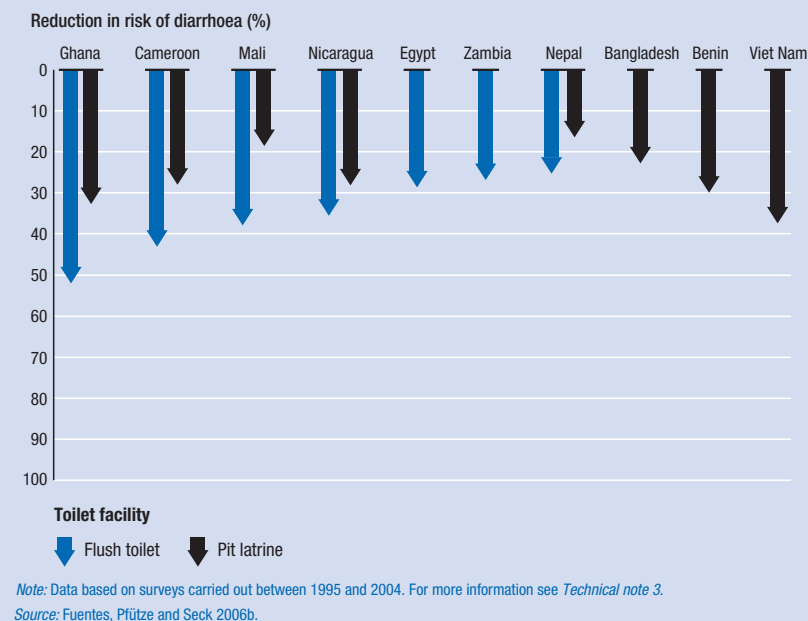


Figure 1.8 ...and so does access to sanitation



an infant in a household without access to sanitation.

The main transmission route for risk reduction is a lower incidence of diarrhoea. Variations in risk reduction draw attention to the importance of a wide range of factors influencing risk reduction outcomes. As already noted, improved technologies cannot be considered in isolation. But they have the potential to unlock major

public health gains. We used household survey data to investigate the risk profiles for diarrhoea associated with different sanitation technologies. Two important findings emerge. First, both clean water and sanitation have a major bearing on the incidence of diarrhoea. Having piped water in the house lowers the incidence by almost 70% in Ghana and more than 40% in Viet Nam (figure 1.7). Similarly, flush toilets reduce risk by more than 20% in countries such as Mali, Nicaragua and Egypt (figure 1.8). Second, there is a hierarchy of risk reduction. Pit latrines reduce risk but less than flush toilets; and access to an improved water source outside of the home reduces risk less than piped water in the home.³⁵

Why are there such large variations in risk reduction by technology type and between countries? In broad terms, risk falls as households climb the technology ladder. Flush toilets and water piped into the house generate higher levels of risk reduction than pit latrines and public standpipes, for example. There are many reasons for such differences. Water quantity is one obvious consideration. Household-level research in Kenya, Tanzania and Uganda found that households with water piped into the homes used on average 16 litres a day for washing and hygiene. Households without piped water used less than 6 litres. Our research exercise did not directly ask why outcomes for similar technologies vary widely across countries. However, the findings point to the importance of factors beyond the technology deployed by the household, including the state of the community water and sanitation infrastructure (for example, even households that install a latrine and tap at home are exposed to risk from poor drainage in a street).

What our research does underline is the potential for progress in water and sanitation to cut child deaths on a large scale. That finding has a direct relevance to the Millennium Development Goals. With progress towards the target of reducing child deaths by two-thirds occurring at less than half the required rate—and a projected gap of 4 million child deaths between target and outcome in 2015—progress in water and sanitation could play a vital role in getting the world back on track.

Spawning lifecycle disadvantages

Premature mortality may be the most disturbing product of the water and sanitation deficit. But nonfatal disease episodes can have harmful effects over an entire lifecycle. Illness in infancy can be associated with disadvantages that stretch from cradle to grave, including both cognitive and physical infirmities.

Repeat bouts of diarrhoea before age one contribute to vitamin deficiency and malnutrition. Children who are malnourished are more likely to suffer from diarrhoea—and sickness episodes last longer. In turn, diarrhoea contributes to weight loss, stunting and vitamin deficiency. Studies in The Gambia, Sudan and Uganda have shown how diarrhoea impedes infant weight gain, especially at ages 7–12 months.³⁶

Children who suffer constant water-related illness carry the disadvantage into school. Poor health directly reduces cognitive potential and indirectly undermines schooling through absenteeism, attention deficits and early dropout. Water-related diseases cost 443 million school days each year—equivalent to an entire school year for all seven-year-old children in Ethiopia.

Almost half these days are lost due to intestinal parasites transmitted through water and faecal material. More than 150 million school-age children are severely affected by the main intestinal helminths such as roundworm, whipworm and hookworm. Children with infections are twice as likely to be absent from school as those without. Even when infected children attend school, they perform less well: tests point to adverse effects on memory, problem-solving skills and attention spans.³⁷

The link from water insecurity to health and education stretches into adulthood. Research in many countries has found a close correlation between adult height and income. Children who suffer repeated bouts of infectious disease and diarrhoea are likely to reach adolescence and adulthood with reduced height, which is correlated with cognitive impairment and educational underattainment. So bouts of diarrhoea in childhood can pave the way to reduced earning power and poverty in adulthood.³⁸

The immediate costs of lifecycle disadvantage are, of course, borne by individuals as health risks, lower incomes and increased vulnerability. But whole countries lose from the lower productivity and diminished human capital.

Raising wider health costs

Poor water and sanitation produce nonfatal chronic conditions at all stages of the lifecycle. At any given time close to half the people in the developing world are suffering from one or more of the main diseases associated with inadequate provision of water and sanitation such as diarrhoea, guinea worm, trachoma and schistosomiasis (box 1.5). These diseases fill half the hospital beds in developing countries. They probably account for an even greater share of the patients treated in primary health clinics, especially in slums and poor rural areas. Measured by conventional global health indicators, the burden of disease linked to water and sanitation is enormous: according to the WHO, it accounts for 60 million disability-adjusted life years lost each year, or 4% of the global total.³⁹

What figures like this do not capture is the pain and suffering associated with water-related disease. Nor do they capture the way sickness episodes can drive already vulnerable people into destitution. Blinding trachoma provides a stark example. The disease is spread by the *musca sorbens* fly, an insect whose preferred breeding medium is human faeces. These flies burrow into the eyes of anyone from infants to the elderly, leading to decades of repeat infection. Victims liken the infection to having thorns in their eyes.

For millions of people trachoma is a passport to poverty. As the disease progresses towards blindness, people lose their ability to work and depend on care from family members (see the special contribution by US President Jimmy Carter in chapter 3). Children are most heavily infected and women are more vulnerable than men, with infection rates some three times higher, largely because they look after children. Once common in the United States, trachoma is today restricted almost entirely to the developing world, where there are 150 million

At any given time close to half the people in the developing world are suffering from one or more of the main diseases associated with inadequate provision of water and sanitation

Box 1.5

The health costs of the water and sanitation deficit

We asked one woman in a programme area how trichiasis [a development of trachoma] affected her ability to work. She replied: “My lids are biting like a dog and scratching like a thorn. Can you stand on a thorn? Imagine you have a thorn in your foot that you can’t get out—then try talking of work.”

Dr. Paul Emerson, technical director of The Carter Center’s Trachoma Control Program

If I get my health back, it means everything; I’ll be able to work and support my family.

Mare Aleghan, Ethiopian trachoma sufferer, age 42

The health problems associated with inadequate water and sanitation go far beyond avoidable child deaths. Water-related illness accounts for about 5% of the global burden of disease. The anguish and suffering associated with that burden are beyond estimation.

By convention, water-related diseases are usually divided into three categories: *waterborne* (such as diarrhoeal infections transmitted through water contaminated with faeces), *water-washed* (linked to skin or eye contact with contaminated water, such as trachoma) and *water-based* (caused by parasites found in contaminated water, such as schistosomiasis and other helminths). A fourth category, not considered below, is disease caused by insect vectors, such as dengue and malaria. Some water-related diseases reach epidemic proportion in developing countries:

- *Internal helminths.* Up to 10% of the population of the developing world is infected with intestinal worms, including ascariasis, trichuriasis and hookworm. Infection is strongly related to unsanitary excreta disposal and poor hygiene. It contributes to malnutrition, cognitive impairment and anaemia. Children infected with helminths are four times more likely to be underweight.
- *Cholera.* Epidemics of cholera are a major risk in areas with high population concentrations and poor sanitation. Heavy rains can flood latrines, contaminating water and exposing populations to the cholera bacteria. In 2005 West Africa suffered more than 63,000 cases of cholera, leading to 1,000 deaths. Senegal was severely affected following rainy-season flooding in Dakar. During the first half of 2006 one of the worst epidemics to sweep Sub-Saharan Africa in recent years was claiming more than 400 lives a month in Angola.

Source: Sight Savers International 2006; WHO 2006a; The Carter Center 2006.

- *Trachoma.* *Chlamydia trachomatis*, the organism that causes trachoma, is transmitted by hands and flies that land on faces and feed from seeping eyes. Children are a favoured target. Some 6 million people have been blinded by trachoma, according to the WHO. Another 150 million need treatment, and an estimated 500 million are at risk. The disease is endemic in 55 countries, with China and India accounting for 2 million cases (see table). Ethiopia is thought to have the largest number of blind people, with trachoma implicated in a third of cases.

Once the disease reaches an advanced stage, it can be treated only by an operation. Although relatively simple and costing just \$10, the operation is nevertheless denied to many sufferers: in Ethiopia some 1 million people need the operation but only 60,000 are treated each year. Poor households are disproportionately affected since the disease is strongly related to overcrowding and the absence of safe water for washing. Productivity losses caused by trachoma are estimated at \$2.9 billion a year.

- *Schistosomiasis.* Some 200 million people in 74 countries are infected with schistosomiasis, and at least 600 million risk infection. Of those infected 20 million have severe disease and 120 million have symptoms. An estimated 80% of transmission takes place in Sub-Saharan Africa, causing thousands of deaths every year. Strongly related to unsanitary excreta disposal, schistosomiasis is transmitted through human contact with contaminated water when drinking, washing, fetching water and herding animals.

Number of people with blinding trachoma by country or region, 2004

Region	Number of people with blinding trachoma
China	1,174,000
India	865,000
Other Asia and islands	1,362,000
Sub-Saharan Africa	1,380,000
Middle East	927,000
Latin America	158,000
Total	5,866,000

Source: Sight Savers International 2006.

reported episodes and 2 million new cases of blindness each year.

Trachoma is one illustration of a wider interaction between water-related diseases and poverty. These diseases simultaneously reduce income, increase household spending and lead

to losses of future earnings. When people in poor households fall ill, their productivity declines and with it their ability to generate income or grow food. Because poor people are seldom insured against illness, they have to meet the costs out of their current income, sell assets

or borrow. The resulting depletion of resources reinforces poverty traps and increases future vulnerability.

Hurting girls' education

For young girls the lack of basic water and sanitation services translates into lost opportunities for education and associated opportunities for empowerment. Water and sanitation deficits threaten all children. But young girls and women shoulder a disproportionate share of the costs borne by the household.

The time burden of collecting and carrying water is one explanation for the very large gender gaps in school attendance in many countries. In Tanzania school attendance levels are 12% higher for girls in homes 15 minutes or less from a water source than in homes an hour or more away. Attendance rates for boys are far less sensitive to distance to water sources.⁴⁰ For millions of poor households, there is a straight trade-off between time spent in school and time spent collecting water. These are the words of a 10-year-old girl queuing for water by a stand-pipe in El Alto, Bolivia:

Of course I wish I were in school. I want to learn to read and to write—and I want to be there with my friends. But how can I? My mother needs me to get water, and the stand-pipe here is only open from 10–12. You have to get in line early because so many people come here.

Young girls, particularly after puberty, are also less likely to attend classes if the school does not have suitable hygiene facilities. Parents often withdraw girls from a school that does not offer adequate and separate toilets for girls because of concerns over security and privacy. On one estimate about half the girls in Sub-Saharan Africa who drop out of primary school do so because of poor water and sanitation facilities.⁴¹ That helps explain why improving school sanitation can increase the demand for education among girls: between 1990 and 2000 a UNICEF school sanitation programme in Bangladesh was instrumental in increasing the number of girls enrolling by 11%.⁴² Conversely, inadequate provision can retard progress

in countries striving to achieve universal education. In Uganda only 8% of schools have sufficient latrines and just one-third have separate latrines for girls—deficits that help to explain why the country has found it difficult to reduce dropout rates among girls after puberty.⁴³

Disparities in education linked to water and sanitation have lifelong impacts transmitted across generations. Education can empower women to participate in decision-making in their communities. As adults, educated girls are more likely to have smaller, healthier families—and their children are less likely to die and more likely to receive an education than the children of less educated mothers. These gains are cumulative, as are the losses associated with gender inequalities linked to water and sanitation.

Exacerbating time-poverty and gender inequality

In almost all countries the gender division of labour assigns women responsibilities that men do not share. The intrahousehold division of labour interacts with problems in service provision to reinforce deep gender inequalities.

Time spent collecting water represents a heavy burden on women. In Mozambique, rural Senegal and eastern Uganda women spend on average 15–17 hours a week collecting water. It is not uncommon for women to walk more than 10 kilometres during the dry season. Research in eastern Uganda found households spending on average 660 hours a year collecting water. This represents two full months of labour, with attendant opportunity costs for education, income generation and female leisure time.⁴⁴ One estimate suggests that some 40 billion hours a year are spent collecting water in Sub-Saharan Africa⁴⁵—a year's labour for the entire workforce in France. Reducing the time for other activities such as child care, rest or productive work, the time spent collecting water reinforces time-poverty, disempowers women and lowers income.

Research in India by the Self Employed Women's Association (SEWA) demonstrates the interaction. Women engaged in a successful microenterprise project in a semi-arid area of

For young girls the lack of basic water and sanitation services translates into lost opportunities for education and associated opportunities for empowerment

The loss of dignity associated with a lack of privacy in sanitation helps to explain why women attach more importance than men to sanitary provision

Gujarat spent three to four hours a day collecting water. During summer months, when the time to collect water increased by two hours a day, women adjusted by reducing the time spent on microenterprise work. SEWA calculated that reducing water collection to one hour a day would enable women to earn an additional \$100 a year depending on the enterprise—a very large implied income loss for households in an area of high poverty. But it was not only the loss of income that was important. Women also emphasized the importance of income generation to their independence.⁴⁶

Undermining human dignity

*We feel so dirty and unclean in the summer. We do not wash our clothes for weeks. People say, these Dalits are dirty and they smell. But how can we be clean without water?*⁴⁷

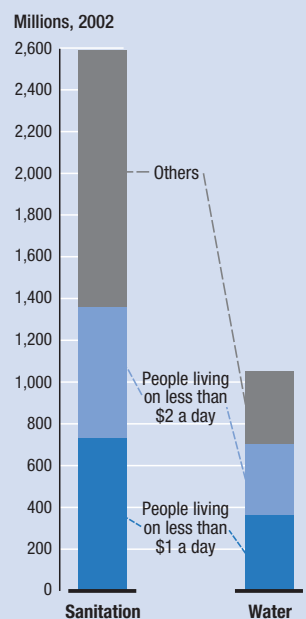
Spoken by a low-caste Indian woman, these words capture the relationship between human dignity and water. Dignity is hard to measure—but it is at the heart of human development and our sense of well-being, as Adam Smith recognized. Writing in *The Wealth of Nations* he included it among the “necessities” for well-being, commodities that “the poorest creditable person of either sex would be ashamed to appear in public without”.⁴⁸

Access to safe, hygienic and private sanitation facilities is one of the strongest indicators

of dignity. For millions of women across the world inadequate access is a source of shame, physical discomfort and insecurity. Cultural norms strictly control behaviour in this area, in many cases requiring that women not be seen defecating—a requirement that forces them to leave home before dawn or after nightfall to maintain privacy. As one woman in Bangladesh put it: “Men can answer the call of nature anytime they want...but women have to wait until darkness, no matter what problem she has.”⁴⁹ Delaying bodily functions is a major cause of liver infection and acute constipation in many countries.

The loss of dignity associated with a lack of privacy in sanitation helps to explain why women attach more importance than men to sanitary provision. When asked in surveys about the benefits of latrines, both women and men in Cambodia, Indonesia and Viet Nam said that the main advantage was a clean home and village environment free of bad smells and flies.⁵⁰ But women were more in favour of spending on toilets, rating them far higher on a “value for cost” basis, with a strong emphasis on the benefits of privacy. They were also more likely than men to initiate the process for purchasing latrines (see chapter 3). Underfinancing of sanitation provision in the allocation of household and government resources is thus partly a product of the weak voice of women in setting priorities.

Figure 1.9 Poor people account for most of the water and sanitation deficit



Source: Calculated based on Chen and Ravallion 2004 and WHO and UNICEF 2004b.

The crisis hits the poor hardest—by far

National average figures obscure deep structural inequalities in access to water and sanitation. In many countries these inequalities are tantamount to a system of water apartheid based on wealth, location and other markers for advantage and disadvantage. They translate into the wider inequalities in life chances that erode the basic principles of shared citizenship and equal opportunity.

The poor account for most of the deficit

How does the deficit in water and sanitation map with the distribution of global poverty?

Drawing on household survey data it is possible to develop an approximate picture of the overlap between poverty and lack of access to

improved water and sanitation. The association is most marked for water. About a third of people without access to an improved water source live on less than \$1 a day. Twice this share live on less than \$2 a day. These figures imply that 660 million people lacking access to water have, at best, a limited capacity to pay more than a small amount for a connection to water service. Of this total some 385 million people fall below the \$1 a day absolute poverty threshold (figure 1.9). More than half the 1.1 billion people without access are in the poorest 40% of the income distribution.

These figures are not evidence of causation: people might lack water because they are poor, or they might be poor because they lack water. However, the statistics are strongly suggestive of a two-way relationship between income poverty and deprivation in access to water.

In sanitation, too, there is a strong association between poverty and access: the poorest two-fifths of households account for more than half the global deficit. Nearly 1.4 billion people without access live on less than \$2 a day. But the coverage rates for sanitation are far lower than those for water, even in higher income groups. A quarter of the richest 20% of people in developing countries have no access to improved sanitation, rising to half for the second richest 20%.

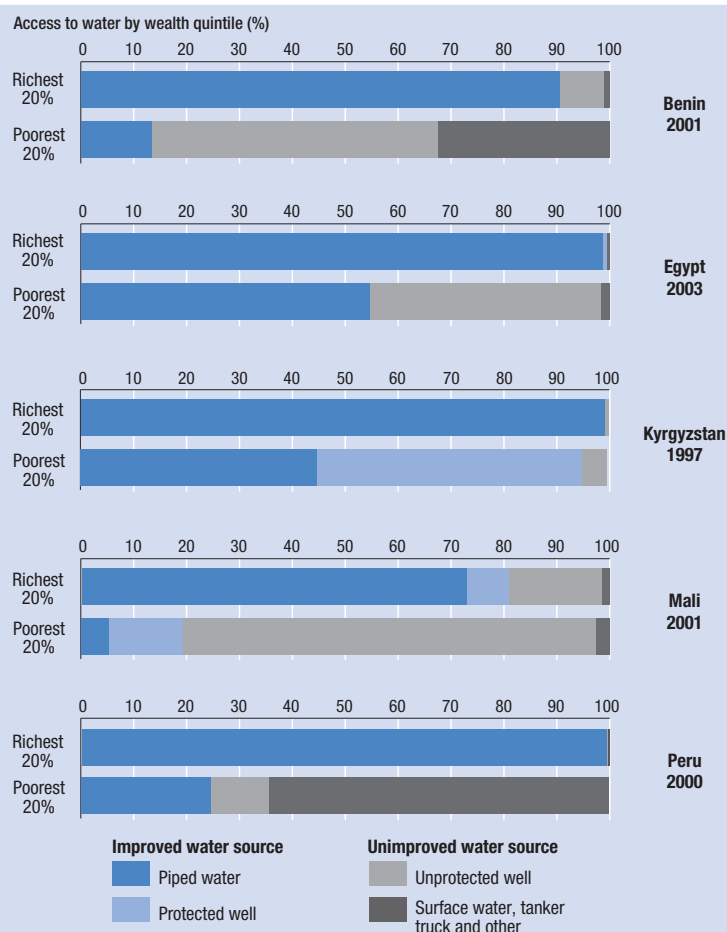
The wealth distribution of people without access to water and sanitation has important practical implications for public policy—and for the Millennium Development Goals. The main domestic sources of financing for water and sanitation are households (from payments for tariffs, connection costs, labour inputs and capital costs) and government (taxes or aid). In any country the appropriate mix of household and public finance will depend on circumstances, including average income, poverty and the income profiles of households lacking access to water networks. In high- and middle-income countries there is scope for households to finance operating costs for provision, though governments play a critical role in financing the capital costs of creating the network. In low-income countries, and middle-income countries with low coverage rates among the poor, public finance holds the key to improving access. The 660 million people living on less than \$2 a day who lack access to water and the equally poor

1.4 billion who lack access to sanitation are not well placed to finance water utility cost-recovery through household spending.

Inequality is a pervasive theme in access to water. In most rich countries people are not differentiated on the basis of where they draw their water, or what type of toilet facility they use. In many developing countries your place in the wealth distribution defines where you draw your water and what you do for sanitation.

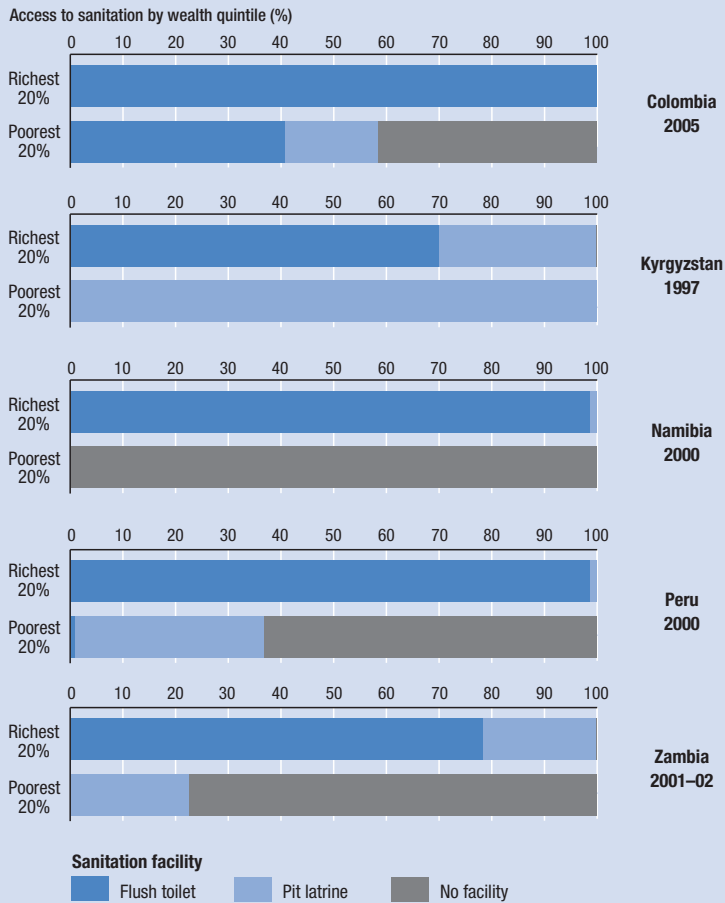
Access to piped water is highly differentiated. An analysis of 17 developing country Demographic and Health Surveys carried out for this Report found that availability was about 85% for the richest 20% of households, compared with 25% for the poorest 20%. Across a large group of countries the top to bottom quintile coverage ratio for household connections is typically 4:1 or 5:1. In Peru access to piped water is universal for the

Figure 1.10 The water divide



Source: Calculated based on Measure DHS 2006.

Figure 1.11 The great sanitation divide



Source: Calculated based on Measure DHS 2006.

(figure 1.10). Disparities in access to sanitation are equally marked. These inequalities have an important bearing on human development because of their association with the distribution of opportunity for survival, education and income poverty.

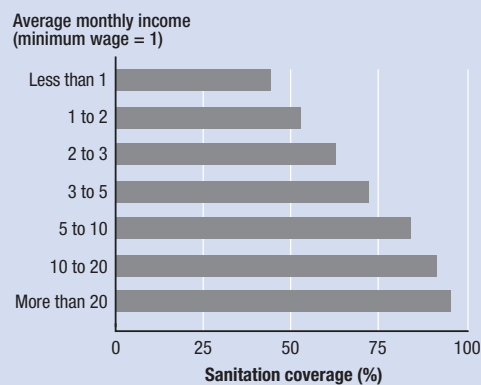
Some countries register high inequality even with very low provision. In Zambia three-quarters of the richest 20% of households have access to a flush toilet. Among the poorest 20% a similar proportion use open sites—and there is no registered access to a flush toilet (figure 1.11). As incomes rise, average coverage improves. But even fairly high average national incomes provide no guarantee of high coverage rates among the poor. In Brazil the richest 20% of the population enjoy access to water and sanitation at levels broadly comparable to those in rich countries. Meanwhile, the poorest 20% have lower coverage rates for both water and sanitation than in Viet Nam, with coverage rates clearly declining with income (figure 1.12).

Inequalities in access to water and sanitation are intimately related to wider inequalities in opportunity—starting with the opportunity to stay alive. Earlier in this chapter we emphasized the importance of water and sanitation inequalities in perpetuating large health disparities that are slowing the convergence of life expectancy levels across countries. The same story plays out within countries.

Poor households are far more likely to suffer infectious diseases—and children in these households are far more likely to die. Cross-country research shows that communicable diseases cause 56% of deaths among the poorest 20% of the population compared with 8% among the richest 20%. Similarly, death rates among children under age five in the poorest 20% of the wealth distribution are often more than twice those in the richest 20%⁵¹—in Bolivia and Peru they are four to five times higher. And death rates among the poorest 20% are falling at less than half the average rate of decline in many countries—a problem identified in *Human Development Report 2005* as a major threat to achieving the Millennium Development Goals.

Many poverty-related factors are behind inequalities in child mortality, including poor nutrition and access to affordable health care. But

Figure 1.12 Poor people have lower sanitation coverage in Brazil



Source: Heller 2006.

richest 20%, while two-thirds of the poorest 20% of households either purchase their water from vendors or collect it from unprotected sources

increased exposure to the risk of waterborne infectious disease is a major causal link. In the Philippine city of Cebu diarrhoea is the second largest cause of infant mortality—but mortality is four times higher for children in the poorest 20% of the population than it is for those in the richest 20%. Diarrhoea accounts for 12% of deaths in the city but for 20% of inequalities in death rates between the children of the rich and the poor.⁵²

Health and mortality inequalities highlight the need to look beyond aggregate figures to the specific problems facing the poorest households. Given the central role of unclean water and poor sanitation for the transmission of infectious disease, any strategy for narrowing health inequalities will have to attach considerable weight to reducing wealth-based inequalities in this area. Just as there are strong grounds for setting Millennium Development Goals-related targets that look beyond societal averages to the reduction of disparities as an explicit objective, so in water and sanitation there are grounds for setting clear equity-oriented goals. For example, halving disparities between the richest and poorest 20% of the population would help to focus public policy.

The poor pay more—and more than they can afford

Debates on water provision have given rise to polarized positions on pricing. One side calls for greater emphasis on cost sharing, with households paying more for the water they use. The other side expresses fears that cost sharing and the embrace of market principles will jeopardize poor people's access to cheap water. Both sides make important points. Yet both overlook some of the basic realities experienced by poor households. Many of these households lack the capacity to meet cost-recovery charges on a commercial basis. At the same time, the view that poor people have access to plentiful supplies of cheap water is illusory. Most are already paying far more than they can afford to pay to meet their basic water needs in water markets that reinforce their poverty. Water pricing reflects a simple perverse principle: the poorer you are, the more you pay.

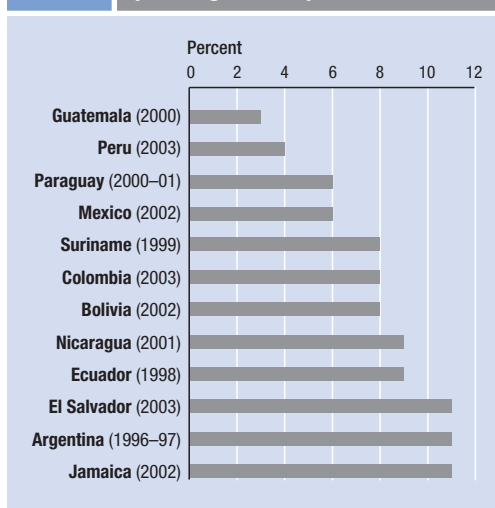
There is insufficient research on how water figures in the household budgets of the poor. What is clear is that for millions of households the high price of water strains already overstretched resources. Evidence for Latin America compiled for this Report found that the poorest 20% of households in Argentina, El Salvador, Jamaica and Nicaragua allocate more than 10% of their spending to water.⁵³ About half of these households live below the \$1 a day threshold for extreme poverty (figure 1.13).

Similar household expenditure patterns are reported for other regions. In Uganda water payments represent as much as 22% of the average income of urban households in the poorest 20% of the income distribution.⁵⁴ One household survey in Jakarta found more than 40% of households spending 5% or more of their income on water.⁵⁵ (Regulatory authorities in the United Kingdom define any expenditure on water above 3% of total household spending as an indicator of hardship.)

These figures on household spending caution against the undifferentiated adoption of greater cost recovery as a financing strategy. There is plenty of scope for more cost recovery from higher income groups, many of whom enjoy large subsidies. The same principle does not apply below the poverty line. High current spending by the poor is sometimes

Water pricing reflects a simple perverse principle: the poorer you are, the more you pay

Figure 1.13 Paying the price for poverty: water takes a large share of household spending for the poorest 20%



Source: Gasparini and Tomarolli 2006.

Poor people in urban areas of developing countries not only pay more for their water than high-income residents of the same city—they also pay more than people in rich countries

misinterpreted as evidence of willingness *and* ability to pay. At one level, the fact that poor households spend large amounts on water is evidence of willingness to pay. Given that the alternatives may range from using water sources that compromise health to spending large amounts of time collecting water, poor households may prefer to spend their limited resources on water.

However, willingness to pay is not the same as ability to pay—at least as that concept relates to human development. When spending on water accounts for a large share of the budget for households living on or below the income poverty line, expenditure in other areas—in health, education, nutrition and production—is compromised. Moreover, annual average payments can obscure the price spikes that cause extreme hardship during the dry season, when household budgets are most stretched.

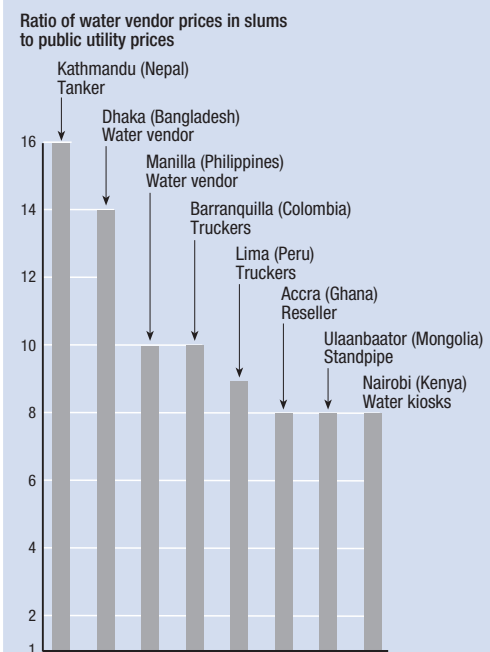
In effect, households are balancing the benefits of spending on water against the benefits of spending in other areas that ought to be seen as a social minimum of entitlements. Reducing the financial burden of water spending on the budgets of the poor would have the effect in many cases of increasing household income, improving prospects for escaping poverty and enhancing resilience against shocks.

Inequality in water provision relates not just to access and expenditure but also to price. One of the recurrent themes in water provision across the developing world is that price is inversely related to ability to pay. Indeed, some of the poorest people living in urban slums pay some of the world's highest prices for water. In Jakarta, Lima, Manila and Nairobi households living in slums and low-income settlements typically pay 5–10 times or more for their water than high-income residents of the same city. In Manila an estimated 4 million people receive water resold through kiosks, pushcart vendors or tanker deliveries. Their average monthly water bills are \$10–\$20. By contrast, households directly connected to the utility pay an average of only \$3–\$6 a month but consume five times more water⁵⁶ (figure 1.14). There is an international dimension to the wealth divide in water prices. Poor people in urban areas

of developing countries not only pay more for their water than high-income residents of the same city—they also pay more than people in rich countries. Some of the world's poorest people living in sprawling slum areas of Accra and Manila are paying more for their water than people living in London, New York or Rome (figure 1.15).

Why are water prices inversely related to ability to pay in many countries? The reasons vary, but in urban areas a critical factor is the market distance between the water user and the utility. Formal water providers operating municipal networks typically provide the cheapest water. Households with a direct link to the network through a tap at home get access to that water. Poor households without a connection have to purchase utility water through a web of intermediaries. Prices rise steeply as water passes through intermediaries—truckers, vendors and other carriers. Securing a connection to the network would lower the unit price of water. Two major barriers restrict this option: high capital costs and prohibitions on connecting people living in informal settlements without formal property rights.

Figure 1.14 The costs of being beyond the utility



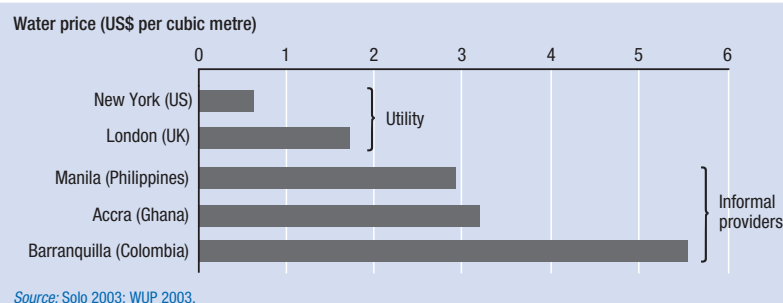
Source: Conan 2003; Solo 2003; ADB 2004; WUP 2003; WSP-AF 2005c.

These barriers help to explain inequalities in access to the network. In Accra, Ghana, connection rates average 90% in high-income areas and 16% in low-income settlements.⁵⁷ People in Adenta and Madina, sprawling slum areas in the southeast part of the city, buy their water from intermediaries served by tanker truck associations, which in turn purchase in bulk from the water utility. The upshot: many of the 800,000 people living at or below the poverty line in Accra pay 10 times more for their water than residents in high-income areas. To add insult to injury, the volume of water available for users in slums is often reduced because of overconsumption by households in high-income areas. Water provided to slums in cities such as Accra and Nairobi is reduced during periods of shortage to maintain flows to high-income areas, where provision amounts to more than 1,000 cubic litres per person a day. Residents of the prosperous Parklands district in Nairobi receive water 24 hours a day. Residents of the Kibera slums are forced to spend an average of more than two hours a day waiting for water at standpipes that function for 4–5 hours a day or less.

The interaction of price and locational disadvantage helps explain the deep disparities in water provision that divide many cities. Absolute shortage is seldom the underlying problem: most cities have more than enough water to go around. The problem is that water is unequally distributed:⁵⁸

- Lima produces more than 300 litres of water per capita each day, but 60% of the population receives just 12% of the water.
- In Guayaquil, Ecuador, billions of litres flow through the city each day in the Guayas River. High-income suburbs enjoy universal access to piped water. Meanwhile, some 800,000 people living in low-income and informal settlements depend on water vendors. About 40% of the population has to make do with 3% of the piped water.
- In Chennai, India, the average supply is 68 litres a day, but areas relying on tankers use as few as 8 litres. In Ahmedabad 25% of the population uses 90% of the water.

Figure 1.15 Water prices: the poor pay more, the rich pay less



- Many countries in Sub-Saharan Africa face a national crisis in water provision—but the crisis is unequally shared. Residents of the high-income Oyster Bay settlement in Dar es Salaam, Tanzania, use an average of 166 litres of water a day, while households without piped connection in Moshi use an average of 19 litres a day (figure 1.16).

Wealth-based inequalities do not operate in isolation. Within the household the gender division of labour means that women and young girls shoulder a greater burden of disadvantage than do men because they are responsible for collecting water, cooking, and caring for young, elderly and sick family members. Beyond the household, income inequality interacts with wider inequalities. Among the most important:

- *Rural-urban divides.* One of the deepest disparities in water and sanitation is between urban and rural areas. For developing countries as a group, improved water coverage is 92% for urban areas but only 72% for rural areas. Sanitation coverage is even more skewed: urban coverage is twice rural coverage (figure 1.17). Part of the rural-urban gap can be traced to differences in incomes and poverty: income deprivation is generally more marked in rural areas. But other factors are also important. Delivering services is more difficult and often more costly per capita for dispersed rural populations than for urban populations. Political factors also come into play, with people in rural areas—especially marginal areas—typically having a far weaker voice than their urban counterparts.

Figure 1.16 The water divide within countries: Kenya, Tanzania and Uganda

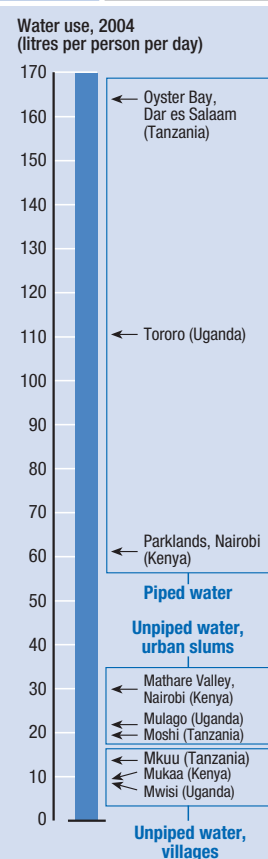
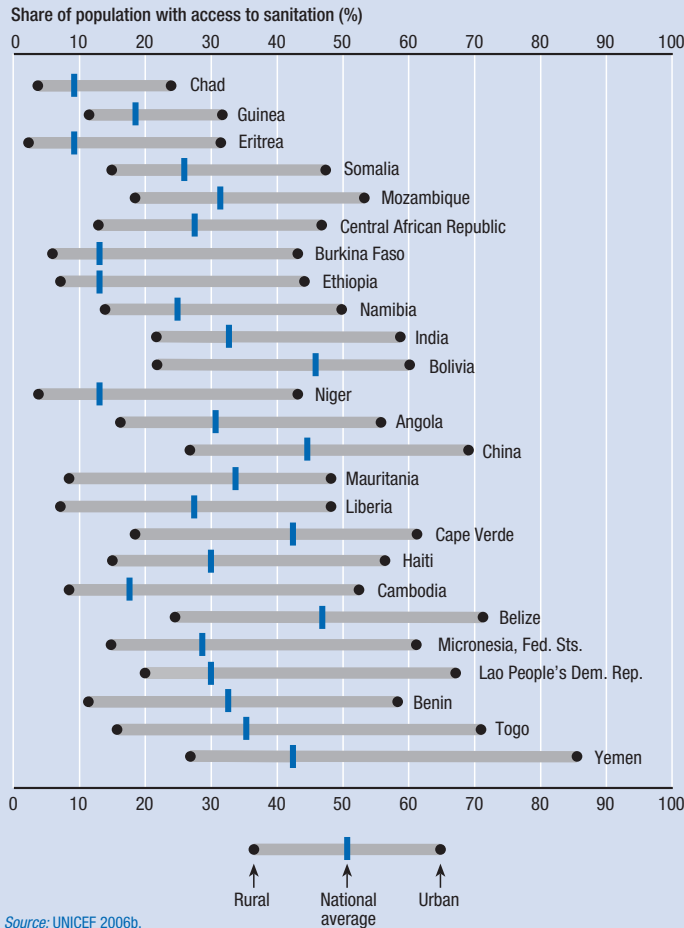
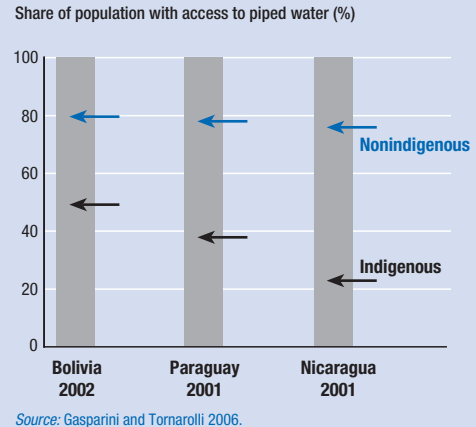


Figure 1.17 The rural-urban divide: disparities in access to sanitation remain large



- Group divides.* Group identity is a marker for disadvantage in many countries. In Latin America it is reflected in disparities between indigenous and nonindigenous people (figure 1.18). In Bolivia the average rate of access to piped water is 49% for indigenous language speakers and 80% for nonindigenous language speakers. Ethnic minorities in Viet Nam have less than a quarter of the coverage enjoyed by the majority Kinh people.⁵⁹ In South Asia caste remains an important source of inequality. In India caste rules that govern access to water have weakened—but they remain important, often in subtle ways. In Andhra Pradesh low-caste women are allowed to collect water from wells in high-caste villages, but they cannot draw the water themselves—an arrangement that leads to long waiting times and

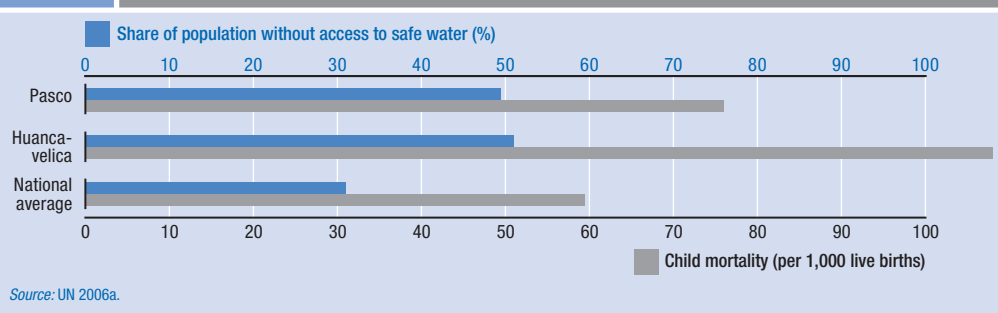
Figure 1.18 Some ethnic groups have much less access to water



dependence on cooperation from people of higher caste.⁶⁰

- Regional divides.* Rising average incomes create opportunities for reducing regional disparities through fiscal transfers to poor areas. But the transfers are often too limited to counter the effects of past disadvantage and local deprivation. In Mexico more than 90% of the population is connected to a safe water source—and two-thirds of households are connected to a sewer. But coverage drops sharply from more developed urban areas and more prosperous northern states through smaller towns, to more remote rural areas and the poverty-belt states of the south. The three states of Chiapas, Guerrero and Oaxaca underline the fact that physical availability of water and access to water are very different concepts: those states have the highest water availability from rainfall in Mexico and the lowest access to drinking water. Access is lower than in developing countries at far lower incomes—such as Sri Lanka and Thailand.

Regional inequalities in access to water and sanitation are associated with wider human development inequalities. In Peru provinces such as Huancavelica and Pasco have safe water coverage rates far below the national average and child death rates far above the average. Again, association is not causation, but it is difficult to avoid the conclusion that there is an interaction at play (figure 1.19).

Figure 1.19 Regional divide: in Peru lower coverage in poorer provinces costs lives

The Millennium Development Goals and beyond: getting on track

The Millennium Development Goals, set by the world's leaders at the UN Millennium Summit in 2000, aim at halving the proportion of people without access to safe water and sanitation by 2015 (target 10). This is not the first time that the international community has set ambitious targets. In the early 1980s governments enthusiastically embraced the goal of Water and Sanitation for All by 1990. At the start of the 1990s the Third Water Decade, the same goal was restated. The 1.1 billion people without access to clean water today and the 2.6 billion without access to sanitation bear testimony to the fact that high-level international conferences and impressive targets are no substitute for practical actions to provide water and toilets and sewerage systems.

Will the world in 2015 look back on another decade of missed targets? Or will this be the decade that closes the gap between international goals and outcomes on the ground? The answers will depend on national policies and international cooperation. What is clear is that success is possible and that failure will come with a very high price tag in lost human lives and wasted human potential. At the same time, the Millennium Development Goal should be seen as a floor not a ceiling—as a step on the way to universal access. It is sometimes forgotten that even if target 10 is

attained, there will still be 800 million people lacking access to water and 1.8 billion people lacking access to sanitation in 2015. Population growth means that any slippage from the Millennium Development Goal target will leave the world standing still on water and sanitation coverage.

A progress report on the Millennium Development Goal target

Over the next decade the population of developing countries is projected to grow by 830 million, with Sub-Saharan Africa accounting for a quarter of the increase and South Asia for another third. Taking into account this population growth, the simple version of the Millennium Development Goal challenge is that at least an additional 900 million people need access to water and 1.3 billion people need access to sanitation by 2015. These targets will not be attained if the world continues on a business as usual trajectory.

This implies several hundred thousand new connections each day in some of the world's poorest countries. For some regions the rate of new connections will need to increase sharply to bring the targets within reach (table 1.1). South Asia will need to provide sanitation coverage for 43 million people a year compared

with 25 million people annually over the past decade. Sub-Saharan Africa faces an equally daunting challenge. In 1990–2004 the region increased coverage rates for clean water by an average of 10.5 million people a year. To meet the target over the next decade that figure will have to more than double to 23 million a year. For sanitation the number of people connected each year will need to increase fourfold—from 7 million to almost 28 million. Behind this regional aggregate many countries face an especially daunting challenge:

- Burkina Faso will need to provide access to sanitation for another 8 million people by 2015—almost six times the current population with coverage.
- Ethiopia will need to increase sanitation coverage by a factor of three, providing access for an additional 40 million people.
- Ghana will need to increase the rate at which coverage is increasing for water and sanitation by a factor of 9.

- Kenya will need to increase the number of people with access to water by 11.6 million and with access to sanitation by 16.5 million.

These targets are daunting but attainable. In some cases progress has accelerated in recent years, giving cause for optimism. Many of the world's poorest countries are demonstrating through practical achievements that the Millennium Development Goal target is within reach. However, the rate of progress required is far beyond that registered since 1990.

What are the prospects for the world achieving the water and sanitation Millennium Development Goal? The global aggregate picture is mixed. With strong progress in high-population countries such as China and India, the world is on track for halving the share of people without access to water, but off track on sanitation. The problem with this global aggregation is that it masks large differences between regions and countries. Disaggregation to a regional level shows less positive results

Table 1.1 The Millennium Development Goal target: past performance and future targets for water and sanitation

People with access to an improved water source (millions)

	1990	2004	Target 2015	Average annual number of people	
				Gaining access 1990–2004	Needing access to meet the target 2004–15
Sub-Saharan Africa	226.6	383.8	627.1	10.5	23.1
Arab States	180.1	231.8	335.8	4.7	6.5
East Asia and the Pacific	1,154.4	1,528.2	1,741.2	22.9	24.3
South Asia	840.6	1,296.4	1,538.1	32.5	22.1
Latin America and the Caribbean	334.3	499.0	527.8	9.0	6.1
World	2,767.7	4,266.4	5,029.5	79.5	82.4

People with access to improved sanitation (millions)

	1990	2004	Target 2015	Average annual number of people	
				Gaining access 1990–2004	Needing access to meet the target 2004–15
Sub-Saharan Africa	148.4	256.5	556.0	7.2	27.9
Arab States	120.6	196.0	267.2	4.9	6.9
East Asia and the Pacific	467.0	958.2	1,284.9	32.0	33.6
South Asia	242.9	543.8	1,083.3	24.7	42.5
Latin America and the Caribbean	279.6	423.2	492.2	8.6	8.4
World	1,456.9	2,663.9	3,994.0	77.5	120.4

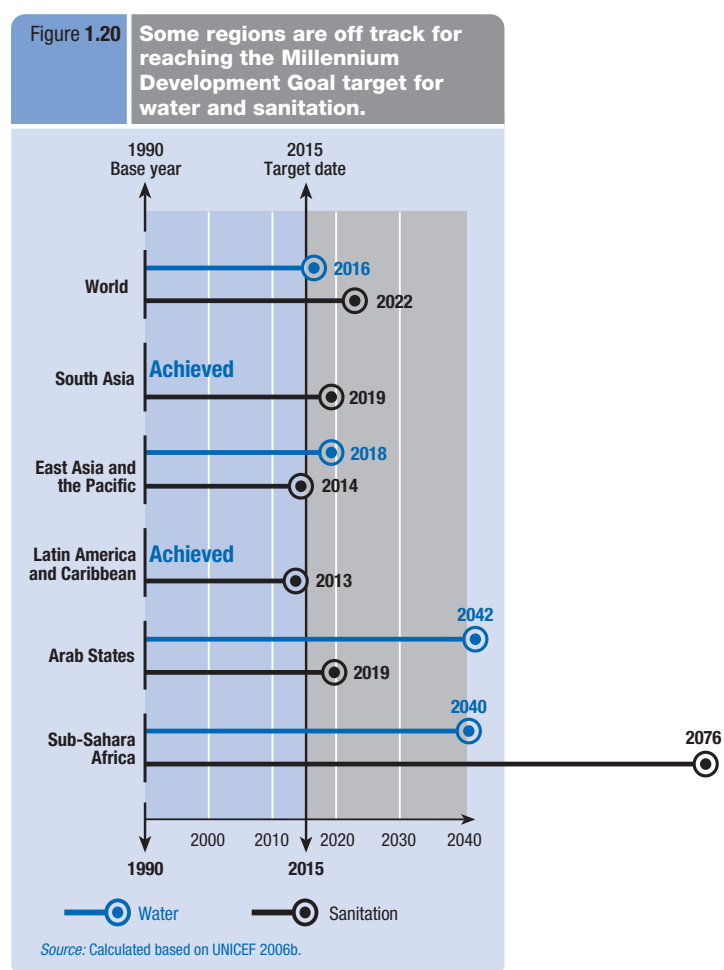
Source: Calculated on the basis of WHO and UNICEF 2006 and UN 2005.

(figure 1.20). On current trends some regions will miss the water and sanitation target. Sub-Saharan Africa will miss the water target by a full generation and the sanitation target by more than two generations. South Asia will miss the water target by four years, and the Arab States will miss the water target by 27 years. Looking beyond the regional picture to the national level reveals further cause for concern. Because the Millennium Development Goals are for everyone, it is country-level performance that counts—and current performance falls far short of the level required:

- Water: 55 countries are off track, and the target will be missed by about 234.5 million people, with a total of 800 million people still lacking access to water.
- Sanitation: 74 countries are off track, and the target will be missed by 430 million people, with 2.1 billion still lacking access to sanitation.

These figures understate the full extent of the shortfall. They do not factor in the problems linked to quality and continuity of provision discussed earlier, for example. Nor do they reflect the problems facing countries that need to go beyond the most basic provision. However, the projection highlights two important aspects of the Millennium Development Goal challenge. First, Sub-Saharan Africa, the world's poorest region, faces the largest prospective 2015 deficit. In water and sanitation, as in other areas of human development, Sub-Saharan Africa is falling further behind. By 2015 Sub-Saharan Africa will account for more than half of the global clean water deficit and just under half of the sanitation deficit, with South Asia accounting for the bulk of the remainder. This widening gap between Sub-Saharan Africa and the rest of the world will fuel wider inequalities in health, education and poverty reduction.

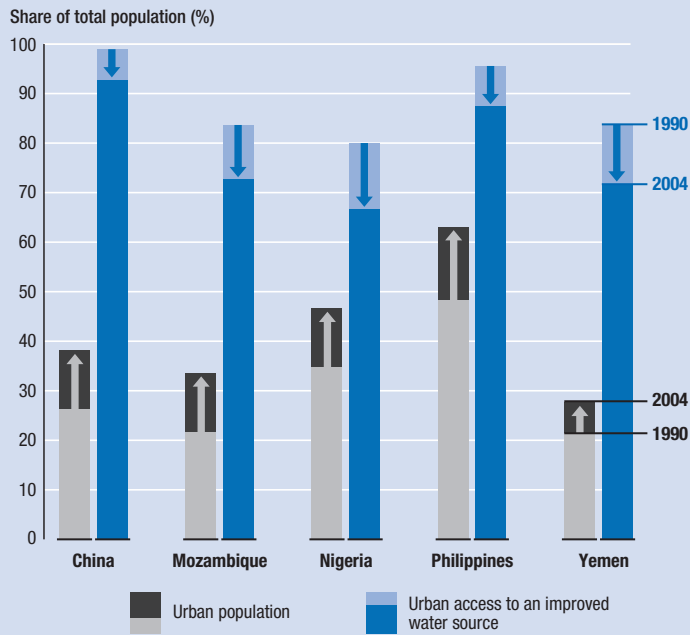
Second, the global water-sanitation gap is set to widen. The danger is that the potential benefits of progress in water will be eroded by a failure to achieve commensurate advances in sanitation. Indeed, an increased supply of water where drainage and human waste disposal provision are inadequate could exacerbate public



health problems, especially in overcrowded cities. It would be a grave setback for human development if the world repeats in the early 21st century the mistakes made in the second half of the 19th century in Europe.

The rural-urban divide will remain important. Rural areas will continue to account for the bulk of the global deficit in 2015. However, urbanization will generate growing pressures. Over the decade to 2015 the share of the developing world's population in cities will increase from 42% to 48%, or by 675 million. Just to maintain current coverage levels cities will have to provide for this increased population. Much of the growth will occur in or around already overcrowded slums, peri-urban areas and informal settlements, with desperately poor rural migrants entering residential areas lacking basic water and sanitation infrastructure. The warning signs are already visible. Some 29 countries—China,

Figure 1.21 Water coverage is slipping with rapid urbanization in some countries



Source: UN 2006b.

Indonesia, Mozambique, Nigeria, the Philippines, Uganda and Yemen among them—have seen coverage rates slip over the past decade (figure 1.21).

Savings from meeting the Millennium Development Goal target

What would it cost to change the current global trajectory on water and sanitation and get on track for the Millennium Development Goal? The answer depends on assumptions about the level and type of technology and about the costs of delivery. Unreliable data make global estimation hazardous, but there is a surprisingly high level of agreement across various research exercises.

Current spending on water and sanitation in developing countries is estimated at \$14–\$16 billion annually (excluding wastewater treatment). The broad consensus on the additional financing required to achieve the Millennium Development Goal target on the basis of low-cost sustainable technologies is about \$10 billion annually.⁶¹ This is the minimum financing threshold. It reflects the cost of extending water and sanitation provision at

the most basic level of technology. Providing a higher level of service while maintaining provision at current levels to people who are already supplied would add another \$15–\$20 billion a year. Much larger sums would be involved if the target included costs for collecting and treating household wastewater.

These figures approximate the cost side of the equation. What of the benefits? The WHO research carried out for this year's Report addresses this question. What emerges is an overwhelming case for more investment in water and sanitation. The case extends beyond the narrow calculus of cost-benefit ratios, impressive as these figures are, to a wider case for public action. Among the core findings:

- There would be 203,000 fewer child deaths in 2015 if the Millennium Development Goal target were reached, 124,000 of them in Sub-Saharan Africa. Cumulatively, more than 1 million lives could be saved over the next decade if the world got on track.
- The economic rate of return in saved time, increased productivity and reduced health costs for each \$1 invested in achieving the target is \$8.
- Total economic benefits amount to \$38 billion, with Sub-Saharan Africa accounting for \$15 billion (just under 2% of GDP), Latin America \$8 billion and South Asia \$5 billion.
- The reduction in diarrhoea alone would result in a gain of 272 million days in school attendance, most of them in Sub-Saharan Africa and South Asia.
- Achieving the water and sanitation target would save about \$1.7 billion a year in costs associated with the treatment of water-related infectious disease. Sub-Saharan Africa would save about \$2 per capita—equivalent to about 12% of public health spending.⁶² Reduced spending would release resources for other priorities, including HIV/AIDS.
- Taking into account just the impact of reduced diarrhoea, 3.2 billion working days would be gained for people ages 15–59. Annual time savings from more

convenient water supplies would amount to another 20 billion working days, most of them gained by women. Coupled with the higher productivity from better health, these savings represent a large potential source of economic growth and household income.⁶³

These figures provide only a very partial picture. They do not, for example, capture the benefits for education, for empowering women, for human dignity or for the reduced anguish and suffering associated with lower child death rates. But they do highlight the mutually reinforcing economic and human development case for investing in the Millennium Development Goal.

The headline numbers for achieving the Millennium Development Goal appear large. But they have to be put in context. The \$10 billion required annually to get the world on track for the 2015 goal represents about eight days of global military spending. In terms of enhancing human security, as distinct from more narrowly defined notions of national security, the conversion of even small amounts of military spending into water and sanitation investments would generate very large returns.

Of course, national security is an imperative for any country. However, if protecting the lives of citizens is the objective, it is difficult to think of a public investment with the potential to safeguard more lives.

On any reasonable criteria the price tag for achieving the Millennium Development Goal is a value for money investment. That investment has the potential to save more than 1 million lives over the next decade, to end the crushing waste of lost education potential and to act as a catalyst for economic growth. From a human development perspective the real question is not whether the world can afford to achieve the Millennium Development Goal target. It is whether it can afford *not* to make the investment—and, indeed, whether we can afford not to go beyond the target. Were the world to achieve universal access to water and sanitation by 2015, it would avert 2 million deaths over the next decade. Of course, many people will argue that such a target is unrealistic. But the fact that many of the world's poorest countries have sustained a rate of progress far in excess of that required to meet the target raises the obvious counter question: does the 2015 target lack ambition?

From a human development perspective the real question is not whether the world can afford to achieve the Millennium Development Goal target. It is whether it can afford *not* to make the investment

Making progress a reality

At the start of the 10-year countdown to 2015 the international community is fast approaching a crossroad. There is an opportunity over the next decade to do for the Millennium Development Goals what the great reform movements of the 19th century did for water and sanitation in Europe and the United States. These movements have much to show us about mobilizing coalitions for change: politics, not finance, technology and economics, still holds the key to progress. Realizing the 2015 goals and progressing rapidly towards universal provision would help free millions of people from

the scourge of poverty, boost economic growth and generate benefits for child survival, education and gender equity.

The Millennium Development Goal and 2015 are a first staging post, not the final destination. This is true in a dual sense. First, the ultimate goal in water and sanitation is universal access. With effective political leadership most countries have the potential to surpass the target and move rapidly towards universal provision. Second, the levels of provision required to meet the criterion for improved access should be seen as the first step on a ladder,

The unifying principle for public action in water and sanitation is the recognition that water is a basic human right

not the end of the journey. Ensuring that all people have access to the most basic technologies would make a huge difference. There would be almost 600,000 fewer child deaths in 2015. That would be a great achievement. However, it would leave more than 1 million children dying each year from diarrhoea. Bringing this number down will require sustained progress on higher levels of provision. Like their counterparts in the rich world, people in developing countries have a right to aspire to systems of provision that include piped water in their homes, access to networks for sanitation provision and a water and sanitation infrastructure that includes a capacity to process wastewater. While these aims may not be immediately achievable in many countries, it is important that public policies work progressively towards their realization.

The immediate concern at the start of the 10-year countdown to the 2015 target date is a real—and growing—threat that even the Millennium Development Goal target will be missed. Averting that outcome will require immediate action. Water and sanitation deficits are not amenable to quick fixes. Investments and policies put in place today will take several years to produce results on the scale required. Time is a luxury that developing country governments and aid donor countries cannot afford. If the policies and investments are not put in place quickly, it will be too late to catch up.

Chapters 2 and 3 look in more detail at some of the specific policies needed to bring the Millennium Development Goal target and wider water and sanitation targets within reach. Here, the focus is on some of the core policies and broad approaches needed in four areas that represent the foundations for future progress:

- Human rights.
- National strategies.
- International aid.
- A global action plan for water and sanitation.

Recognizing the human right to water and sanitation

The starting point and the unifying principle for public action in water and sanitation is the

recognition that water is a basic human right. In 2002 the United Nations Committee on Economic, Social and Cultural Rights adopted a General Comment on “the human right to water...for personal and domestic uses”, establishing a non-legally binding normative framework for the “progressive realisation” of the human right to water and sanitation.

Giving substance to this framework is now the primary public policy challenge. A central feature of a rights-based approach is that it is premised on the principles of equality, universality and freedom from discrimination. Exclusion from water and sanitation services on the basis of poverty, ability to pay, group membership or place of habitation is a violation of the human right to water. If water is a human right that governments have a duty to uphold, the corollary is that many of the world’s governments, developed as well as developing, are falling far short of their obligations. They are violating the human rights of their citizens on a large scale.

At a national level adherence to a rights-based approach requires the development of laws, policies, procedures and institutions that lead progressively to realization of the right to water. The provision of at least 20 litres of water a day to each person should be seen as the minimal goal for compliance with the right to water, with policies setting out nationally owned strategies for meeting this target and benchmarks for measuring progress. Mechanisms for redress and government accountability are also critical.

One of the features of a human right is universality. National governments bear primary duty for delivering on the obligation to provide water for all—but there are also global responsibilities. The 2002 General Comment recognized a special responsibility of the developed states to support poorer countries through “the provision of financial and technical assistance and necessary aid”.

Some commentators see the application of rights language to water and other social and economic entitlements as an example of rhetorical “loose talk”. That assessment is mistaken. Declaring water a human right clearly does not mean that the water crisis will be resolved in short order. Nor does a rights framework

provide automatic answers to difficult policy questions about pricing, investment and service delivery. However, human rights represent a powerful moral claim. They can also act as a source of empowerment and mobilization, creating expectations and enabling poor people to expand their entitlements through legal and political channels—and through claims on the resources of national governments and the international community.

Developing strong national strategies

The obvious starting point for a drive towards universal access to water and sanitation is political will, broadly defined as the resolve to put the issue at the centre of the national agenda. It is not difficult to identify the financial, technological and institutional obstacles to progress, but these obstacles are often symptoms of a deeper malaise—a deficit in political leadership. Providing clean water and sanitation is as fundamental to human development and national prosperity as economic policy, international trade, health or education. Yet water and sanitation are widely perceived as meriting a limited claim on financial and political resources.

Water and sanitation have a weak voice in government. Bringing water and sanitation out of the political shadow and into the mainstream is a starting point for change. Responsibility for domestic water supply is typically split among several line ministries dealing with wider issues, with authority on domestic water and sanitation allocated to junior ministers as part of a wider brief (extending from the environment to housing or rural affairs). Sanitation is even more remote from the centre of political power. Establishing dedicated water and sanitation ministries led by senior cabinet ministers would create a political structure capable of overcoming the fragmentation of policy and the resultant underresourcing. As important, it would send a clear signal across government that water and sanitation are in the first tier of national policy priorities.

To political underrepresentation can be added stigmatization. Inadequate sanitation

may kill large numbers of children, compromise public health, undermine human dignity and hold back economic growth, but the subject has a political stigma attached to it reminiscent in intensity to that surrounding HIV/AIDS. Overcoming that stigma and the political prudishness surrounding sanitation will require national political leadership of a high order.

Perhaps an even bigger obstacle to change is the interaction between stigma and social exclusion. For HIV/AIDS the indiscriminate nature of the disease, and its devastating impact on people across national wealth divides, has forced political leaders and high-income groups to confront their own prejudices: the disease has not respected social boundaries. For water and sanitation the picture is very different. Overwhelmingly, the costs of exclusion are borne by poor households, especially women. While it is true that some costs are transmitted to the whole of society, people living in urban slums and marginal rural areas bear the brunt. It is the children of the poor, not of the military high command and the top civil service, that face the greatest risk of premature death from diarrhoea. It is the young girls in poor households that are most likely to be kept home from school.

The water and sanitation crisis is overwhelmingly a crisis of marginalized social groups. However mistakenly, that crisis is widely viewed as a problem to be ring-fenced or dealt with on an incremental basis, rather than as a threat to the whole of society. That perspective is as big a barrier to progress as finance or technology. Changing it will require political leaders to put inequality and shared citizenship at the centre of national development strategies in a way that is seldom evident. It will also require a stronger voice for poor people and women among policy-makers and water providers.

The low priority attached to water and sanitation is apparent at many levels. With a few notable exceptions, clean water has seldom been a make or break issue in national elections—and it is difficult to think of a single case where access to toilets has been a core concern. Pressure for radical reform has been conspicuous by its absence. Within government, responsibility for water provision is often a junior ministerial

Water and sanitation have a weak voice in government. Bringing water and sanitation out of the political shadow and into the mainstream is a starting point for change

National poverty reduction agendas reflect the pervasive benign neglect of water and sanitation

post, and sanitation is often not deemed to merit a ministerial position at all.

National poverty reduction agendas reflect the pervasive benign neglect of water and sanitation. The sector seldom figures with any prominence in Poverty Reduction Strategy Papers (PRSPs)—the documents that set out national plans and define the terms of cooperation between donors and aid recipients. One review of five countries found only one case—Uganda—of successful integration.⁶⁴ In most PRSPs water and sanitation, in contrast to macroeconomic reform, education and health, are treated dismissively, receiving little more than a few descriptive paragraphs and broad declarations of principle without even a semblance of a strategic reform agenda or financing provisions. The weakness of PRSPs reflect in turn the limited donor interest in water and sanitation.

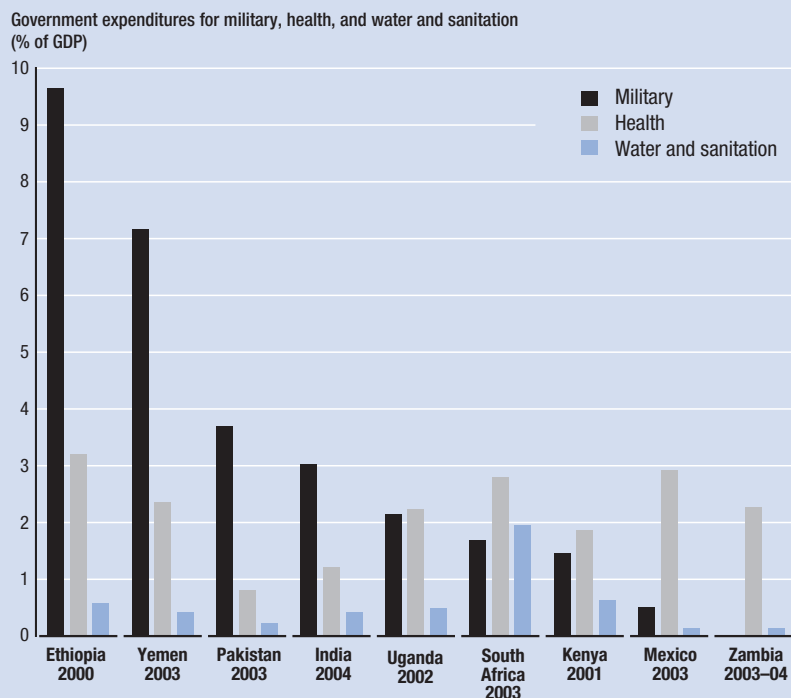
Budget allocations reinforce the picture of neglect. Few public investments do more to enhance human security or build prosperity than investments in water and sanitation. Clean water and functioning toilets are among the

most potent health interventions that government can undertake, rivalling immunization in the benefits that they generate. Like expenditure on education or health, public spending on water and sanitation creates benefits for individuals and for society. It also generates wider public goods, such as enhanced gender equity and reduced inequalities in opportunity. There are always competing demands for public expenditure, but the high social and economic returns from investments in water and sanitation suggest that they ought to be a priority rather than a budgetary afterthought.

National expenditure patterns tell their own story. It is difficult to capture real public spending on water and sanitation partly because of the fragmentation of financing across ministries, partly because of decentralization and partly because donor financing is often off-budget. However, public spending in the sector as a whole typically represents less than 0.5% of GDP, falling to 0.1% in Pakistan and Zambia (figure 1.22). Within the sector expenditure on sanitation typically falls well short of that for water. Sanitation investment averages about 12%–15% of the total in Sub-Saharan Africa and Asia. Overall spending is low not just relative to national income, but also to other areas of social spending, such as public health. When measured against military spending, the gulf widens to very large proportions. For example, India spends 8 times more of its national wealth on military budgets than on water and sanitation. Pakistan spends 47 times more. In Sub-Saharan Africa low average incomes clearly constrain public spending capacity. At the same time, Ethiopia, one of the poorest countries in the world with some of the lowest coverage rates (and some of the highest child death rates from diarrhoea), still manages to mobilize almost 10 times more for military spending than for water and sanitation. South Africa is one of the few countries that spend less on military budgets than on water and sanitation.

Budget priorities raise some important questions about public spending. All countries see national security and defence as priorities. But viewed through the prism of human security, it is difficult to avoid the conclusion that

Figure 1.22 Water: a low priority in many budgets



Source: Ethiopia, Kenya and South Africa, WSP 2003; Yemen, Yemen 2002; Pakistan, Pakistan 2004; India, Nayyar and Singh 2006; Uganda, Slaymaker and Newborne 2004; Mexico, INEGI 2006a; Zambia, Zambia 2004b.

water and sanitation are underfinanced relative to military spending. Diarrhoea claims some 450,000 lives annually in India—more than in any other country—and 118,000 in Pakistan. Both countries have far higher death rates from diarrhoea than predicted on the basis of their average incomes. Pakistan ranks 28 places higher in the global league table for deaths from diarrhoea than in GDP per capita and India ranks 14 places higher. Of course, many factors are at play, but low levels of spending on water and sanitation surely contribute.

Recent years have witnessed some encouraging developments in budgets for water and sanitation. Many governments, beginning to recognize the crucial importance of progress in this area, have raised spending under national strategies to achieve—or surpass—the Millennium Development Goal. Uganda has increased public spending on water and sanitation rapidly both as a share of GNI—from 0.1% in 1997 to 0.4% in 2002 (and a projected 0.7% in 2004)—and in absolute terms because of high growth.⁶⁵ In India central government spending on rural sanitation has increased fourfold since 2002, while spending on rural water supply has doubled. Public spending has been identified as a priority for achieving broad-based growth and accelerated human development. At about 0.41% of GNI in 2005/06 spending is a third higher than in 2002/03. Most of the increase has come from the national budget, with state spending constrained by large fiscal deficits and, in some of the worst affected states, questionable allocation decisions.

National budgeting is one of the key components of any strategy for achieving progress in water and sanitation. Without predictable flows of finance, setting targets or adopting goals can degenerate into a meaningless exercise. One of the features of countries that have sustained progress is political commitment backed by real budget commitments. Political capital is every bit as important as finance. And establishing water as a human right can be seen as a form of political capital investment—but it has to mean something more than the adoption of a vague principle. All too often governments have adopted the

language of human rights without adopting a policy framework for their delivery.

There are exceptions. In South Africa water was once a symbol of the inequality of apartheid. It is now treated as a basic human right. That is not unique in itself. More than 90 countries have the right to water in their constitutions.⁶⁶ For the most part, this has been a matter of profound irrelevance to their citizens. Constitutional provision has not been backed by a coherent strategy for extending access to water. But South Africa has demonstrated how the human right to water can serve as a mechanism for empowerment and a guide to policy. Rights-based water reform has enabled it to expand access and overcome the legacy of racial inequality inherited from apartheid, partly through rights-based entitlements (box 1.6). National success stories in sanitation are more thinly spread. Even here, however, there are some powerful demonstration effects. Countries as diverse as Bangladesh, Brazil, Lesotho and Thailand have overcome financial and technological constraints on progress through bold and innovative national strategies (see chapter 3).

In many countries progress in water and sanitation has been driven from below. Local and municipal governments and service providers have developed practical strategies for tackling inequalities in access. Communities have not waited passively for government help. The rural poor, women's organizations and associations of urban slum dwellers have mobilized their own resources. In some cases that mobilization has met with indifference, or even hostility. In others new partnerships have emerged between governments and people, with community initiative being scaled up.

One example comes from India. In the early 1990s the National Slum Dwellers Federation; Mahila Milan, a network of savings and credit groups formed by women slum dwellers; and the Society for the Promotion of Area Resource Centres (SPARC), a Mumbai-based nongovernmental organization, pioneered new designs for public toilet blocks to reduce excrement pollution in slums and give women more privacy. At the end of the decade, Pune, a city of more than 2 million inhabitants, adopted this

One of the features of countries that have sustained progress is political commitment backed by real budget commitments

Box 1.6 South Africa—acting on the right to water

Access to water was one of the defining racial divides in apartheid South Africa. Since apartheid was brought to an end, a rights-based legislative framework and public policies aimed at extending access to water have empowered local communities and reduced inequalities. The task is not yet complete—but there are important lessons for other countries.

Surveys before the 1994 elections that marked the end of apartheid showed that access to basic services, along with employment, was the people’s main expectation of the incoming government. The 1996 Constitution included a Bill of Rights enshrining “the right to adequate food and water”. This constitutional right was given legislative content under the Water Services Act (1997) and the National Water Act (1998). Key provisions include:

- Clearly defined medium-term targets to provide 50–60 litres of clean water to all households, along with adequate sanitation for all urban households and 75% of rural households.
- Lifeline tariffs to ensure that all South Africans can afford sufficient water services for adequate health and hygiene. Government used its regulatory powers to require all municipalities to provide a basic minimum of 25 litres free of charge to each household. The target is to achieve free basic water for all by 2008, with no household more than 200 metres from a water source.
- Stepped tariffs to provide a cross-subsidy from high-volume users to low-volume users.
- Equitable share transfers that take into account the number of poor people in each municipality in a formula for fiscal transfers.

The new policy framework has achieved important advances. Since 1994, 10 million more people have received access to safe water, with coverage rates rising from 60% to 86%. Some 31 million people are now served by free basic water.

Empowerment has been a less tangible but important aspect of the reform. The Department of Water Affairs provides a national regulatory framework, but responsibility for implementation has been transferred to local governments. Regulation places obligations on municipal providers and elected local authorities and gives users a rights-based entitlement to demand that these obligations be met. In addition, municipal water companies are required to publish detailed information on water provision by district, disaggregated for poor and nonpoor users.

As the reforms have rolled out, they have generated a political debate over design and implementation. Some argue that the 25-litre threshold for free basic water is too low. Supplies in some areas have been erratic, forcing households to collect water from far away. Moreover, government pricing policies have led to supply cutoffs for nonpayment in some areas, raising concerns about affordability.

Progress in sanitation has been less impressive than in water. There are still 16 million people—one in three South Africans—without access to basic sanitation. The absence of a consensus on an acceptable basic level of sanitation, allied to problems in generating demand, has contributed to the failure.

The South African experience highlights three crucial policy ingredients for progress: a clear national plan with well defined targets, a strong national regulatory framework with devolution to local authorities and constant monitoring of performance and progress.

Source: Muller 2006; Sinanovic and others 2005.

model, with local authorities working with the three pioneers to identify needs and mobilize communities. Such community mobilization backed by government action is a powerful force for change.

These examples demonstrate that rapid progress is possible. However daunting the challenge may appear, governments and people have shown that poverty and low income are constraints that can be overcome. The problem is that progress

has been partial and piecemeal. Small islands of success show what is possible—but they also highlight the shortcomings that perpetuate very large deficits in water and sanitation.

Every country has to chart its own policy course for overcoming these deficits. The poorest countries with low coverage face different constraints from middle-income countries with higher coverage, more extensive infrastructure and more resources. However, it is possible to

identify an indicative framework for action. That framework has five key pillars:

1. National planning. Each country should have a national water and sanitation plan, integrated in national poverty reduction strategies and reflected in medium-term financing frameworks and budget priorities. There are no global prescriptions for successful planning. However, the ingredients include clear goals backed by adequate financing and the development of structures for delivery that empower local governments, while building accountability to communities. Performance has been mixed—but there are signs of progress. Enhanced equity is critical to progress. Most countries will not achieve the Millennium Development Goal and wider goals simply by expanding infrastructure. They also need to address the inequitable distribution of access to water and sanitation linked to wealth, location, gender and other factors. Every national plan should therefore include both benchmark indicators for measuring overall progress and indicators for reducing inequalities. Among the measures for incorporating an enhanced commitment to equity in national strategies:

- *Establishing social minimum provision levels.* Every person has a human right to a minimum of about 20 litres of water each day, regardless of wealth, location, gender, or racial, ethnic or other group. All national plans should include policies for meeting the social minimum and benchmarks for measuring progress.
- *Revising Millennium Development Goal benchmarks for inequality.* Basic citizenship rights and considerations of social justice demand equity in the provision of water for basic needs. Overcoming inequality should be seen as an integral part of national water policies. The current Millennium Development Goal framework focuses on halving the share of national populations without access to water and sanitation. That target should be supplemented by targets for halving the gap in water and sanitation coverage rates between the richest 20% and the poorest 20% by 2010, with governments reporting on strategies for achieving the target and on outcomes.

- *Strengthening the treatment of inequality in Poverty Reduction Strategy Papers.* All Poverty Reduction Strategy Papers should include goals and strategies for narrowing extreme disparities in water and sanitation provision, with a special focus on inequalities based on wealth, location and gender.
- *Adopting pro-poor regulation and contracting.* All water providers should be bound by equity performance targets stipulating goals for extending access to poor households. The targets should include clear indicators for extending provision to unserved urban and rural communities, the expansion of stand-pipe provision in slums and the delivery of free or low-cost water to low-income households. Contracts drawn up within public-private partnerships should include targets in these areas, with full public disclosure, monitoring by an independent regulatory body and penalties for nonperformance (see chapter 2).

2. System financing. National plans need to include clear financing estimates for attaining their targets. All financing ultimately comes from government budgets (a category that includes aid) or users. The appropriate mix between the two varies. In low-income countries with limited coverage and high levels of poverty, a benchmark indicator is public spending on water and sanitation of about 1% of GDP (depending on per capita income and the ratio of revenue to GDP), with cost-recovery and community contributions providing an equivalent amount. Benchmarks for middle-income countries are more variable, though cost-recovery capacity rises with average income. Because water and sanitation infrastructure requires large upfront investments, with revenues coming on-stream in local currencies over a long period, strategies for mobilizing resources on local capital markets can help to spread costs.

3. Expansion of access to the unserved. The primary and immediate challenge in both water and sanitation is to extend access and improve quality for the unserved and poorly served. Later chapters set out some of strategies that have worked and delivered practical results,

Every person has a human right to a minimum of about 20 litres of water each day, regardless of wealth, location, gender, or racial, ethnic or other group

Governments have a responsibility to ensure that providers and markets deliver safe, affordable and reliable water and sanitation to the poor

though the same policies can produce different results in different environments. A pro-poor expansion package includes:

- *Lifeline tariffs* that provide free water up to a specified limit for poor households, as developed in South Africa.
- *Cross-subsidies* that transfer resources from higher income to lower income households through utility pricing or targeted fiscal transfers, as in Chile and Colombia. Where subsidies are used they should be targeted to ensure that the nonpoor pay a greater proportion of the cost of providing services than is currently the case in most countries.
- *Sustainable and equitable cost-recovery measures*. Service providers should set charges to cover recurrent costs, with public finance covering capital costs for network expansion. But affordability is one of the keys to equity. One rule of thumb is that no household should be spending more than 3% of its income on water and sanitation.
- *Strategies for supporting demand for water and sanitation among the poorest households*. Strategies have to take into account the fact that people lacking access to water overwhelmingly live below the extreme poverty line, while the sanitation deficit extends from below the extreme poverty line to higher income levels where households have a greater capacity to finance provision.

4. *Scale-up of initiatives from below*. The distinction between top-down and bottom-up initiatives is often overstated. Progress depends on governments doing what governments are supposed to do: creating an enabling environment, mobilize resources and setting a clear national policy framework. But in water and sanitation, as in most areas, governments work best when they work in partnerships that build on the energy, drive and innovation at a community level—and when they listen to people. Partnerships based on real participation create the potential for the rapid scaling up of local success stories.

5. *Regulation for human development*. Water and sanitation service delivery brings together a wide range of providers and extends across

complex markets. Governments have a responsibility to ensure that providers and markets are governed to prevent the abuse of monopolistic power and to deliver safe, affordable and reliable water and sanitation to the poor. One of the problems with current regulatory frameworks is that their remit does not extend beyond large-scale formal providers.

This is a broad agenda. It goes beyond the narrow preoccupation with private or public ownership that has dominated debates on water and sanitation. While these debates have highlighted important concerns, they have diverted attention from important public policy issues. Ultimately, water is a human right—and governments are the duty bearers for extending that right. Public agencies are also the primary providers and financers for water provision in most countries. However, the financing, delivery and regulation of water and sanitation services pose tough public policy challenges that cannot be resolved simply by claiming that water is a human right or by debating over public and private operators, issues returned to in chapters 2 and 3.

Increasing international aid for water and sanitation

International development discussions are often trapped in an unhelpful debate over whether money or policy reform is more critical for progress in human development.⁶⁷ The reality is that both are essential. Of course, money alone cannot resolve problems in service provision, especially problems that are the product of bad policies, but it can help to relieve constraints and support good policies. In water and sanitation, as in other areas, progress ultimately depends on the actions of developing countries themselves—but aid has a critical role. For a large group of low-income countries, domestic resource mobilization is too limited by poverty and low average incomes to finance investments on the scale required. Investments financed by aid can help unlock the high returns to human development by reducing the financing constraints on governments and poor households.

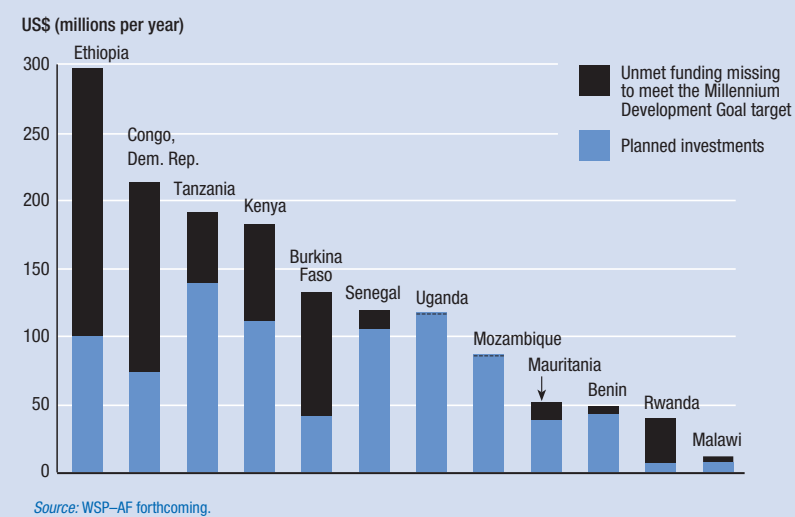
Sub-Saharan Africa most forcefully demonstrates the importance of aid to the realization of

the water and sanitation Millennium Development Goal and wider targets. Cross-country estimates suggest that reaching target 10 will require annual investments over the next decade of about 2.7% of GDP, or \$7 billion annually.⁶⁸ Cross-country budget analysis indicates that current spending is about 0.3% of GDP, or some \$800 million annually. There are no reliable cross-country estimates for revenues from household and utility sources. But cost-recovery by service providers and financial resource mobilization by communities to finance water delivery would probably increase total current spending to 1% of GDP, or \$2.5 billion.

Working on the optimistic assumption that public spending on water and sanitation and cost-sharing could be increased to 1.6% of GDP, this would still leave a financing gap of \$2.9 billion annually. Aid flows currently cover part of the financing gap, providing an average of about \$830 million annually. But the financing shortfall for meeting minimal Millennium Development Goal access requirements still amounts to about \$2 billion a year. Attempting to close this gap through cost-recovery would put water and sanitation services beyond the reach of precisely the people who need to be served to achieve the target. Recent estimates for the Millennium Development Goals point to a large gap between financing requirements and current provision for many countries in Sub-Saharan Africa (figure 1.23). With less than a decade to the 2015 target date, closure of that gap is an urgent priority because of the lag between investment and increased coverage.

Most donors acknowledge the crucial importance of water and sanitation to human development. But aid flows tell a less encouraging story. Taking out the large spike in development assistance for Iraq, total development assistance for water amounted to \$3.4 billion in 2004.⁶⁹ In real terms aid levels today are lower than in 1997, a marked contrast to education, where aid commitments doubled over the same period, or in health. Aid to water and sanitation has also fallen as a share of overall development assistance—from 8% to 5%. And international aid flows for the sector have been marked by large variations, pointing to the unpredictability

Figure 1.23 Public investment in water and sanitation is insufficient to meet the Millennium Development Goal target in many countries



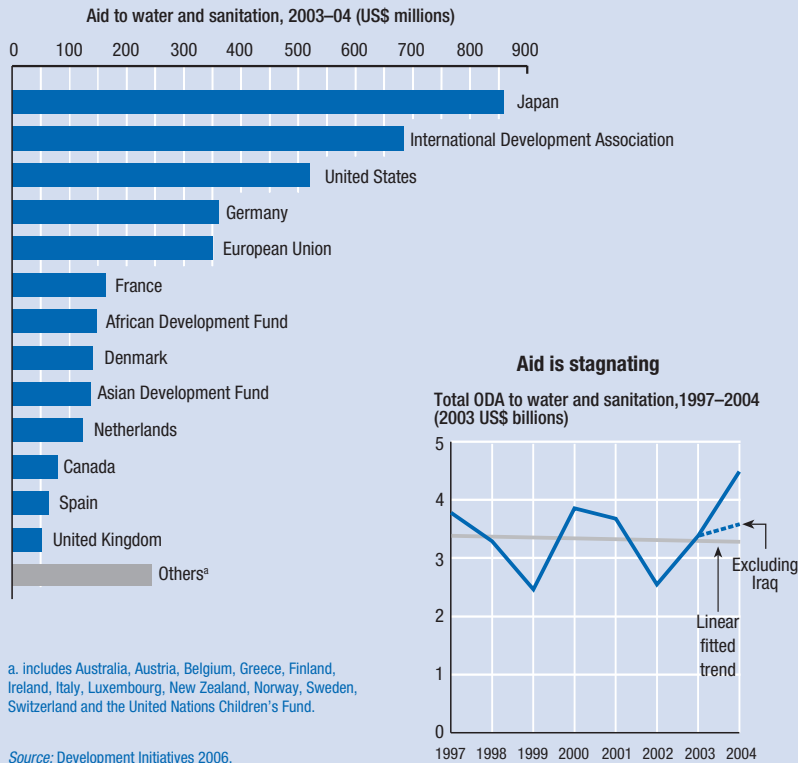
of financing. True, there are many competing demands for aid. But the donor community has long recognized the importance of water and sanitation for a wide range of development goals, so these are worrying trends.

Donors vary widely in commitments to water and sanitation. Japan is by far the largest bilateral donor, allocating an average of \$850 million in 2003–04 (figure 1.24). That figure represents more than a fifth of all aid to water and sanitation. Multilateral donors now account for about a third of aid flows, up from 20% five years ago, with the World Bank's soft-loan International Development Association and the European Union dominating. The shift towards multilateral aid has been important for Millennium Development Goal financing because it is more focussed than bilateral aid on low-income countries and Sub-Saharan Africa.

Behind the headline figures donors vary widely in the share of aid allocated to water and sanitation. Within the Group of Eight, for example, Germany and Japan invest more than 6% of total aid to the sector, while Italy, the United Kingdom and the United States invest 3% or less (figure 1.25).

For overcoming financing constraints, the distribution of aid flows is important. Here, too, there is cause for concern. Aid flows are heavily concentrated: just 20 countries account for about three-quarters of total aid. The 10 largest

Figure 1.24 Donors vary widely in commitment, and financing is unpredictable



recipients of bilateral aid receive two-thirds of total disbursements. Four of these countries are lower middle income. Sub-Saharan Africa, the region facing the largest financing gap and the greatest deficits in water and sanitation, receives only about a fifth of aid. Like government spending on water and sanitation, aid flows are skewed towards urban populations. Large-scale water and sanitation infrastructure financing accounts for about half of all aid to the sector, indicating a strong urban bias.

Caution is required in assessing current aid allocations. Viewed from a human development perspective, simple associations between aid and low-income countries can be misleading. Lower middle-income countries such as Morocco, South Africa and Tunisia are all large aid recipients in water and sanitation—and each has major problems and a claim to external support. The same is true for low-income countries such as China, India and Viet Nam, all of which figure prominently in bilateral aid allocations. Increasing aid for Sub-Saharan Africa should not be at the expense of legitimate

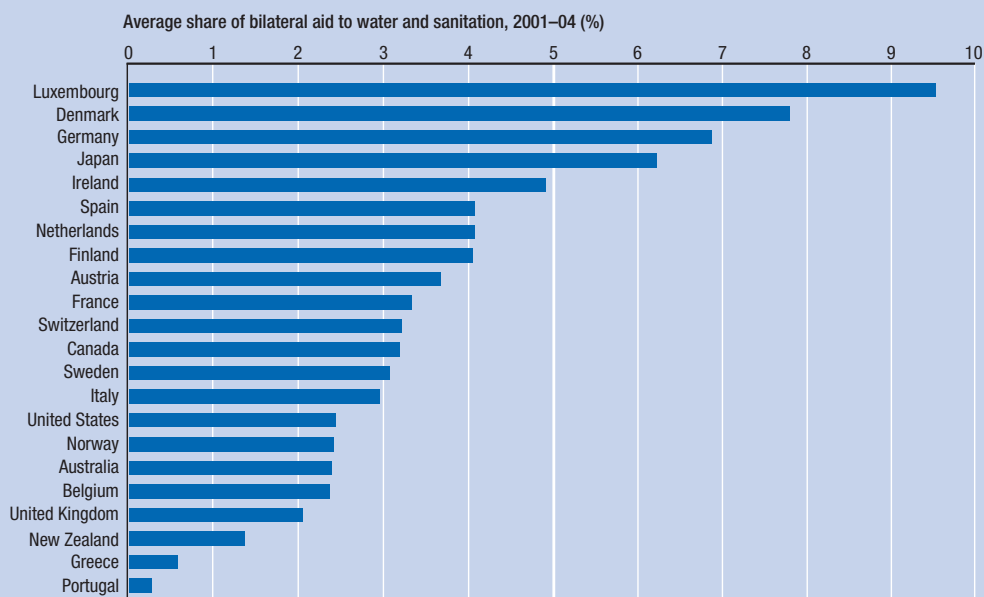
claims from other sources. Similarly, it is important to avoid simplistic distinctions between large-scale and small-scale infrastructure. There are strong development grounds for supporting large-scale water and sanitation infrastructure as part of an overall sector strategy: the development of wastewater treatment facilities and water and sanitation networks are not development luxuries.

Nor can the small share of aid allocated to Sub-Saharan Africa be attributed solely to donor bias. Many African governments have failed to make the sector a priority or to tackle long-standing problems in institutional fragmentation. In many countries an unhealthy interaction between governments and donors acts to marginalize water and sanitation. Donors often express their preferences by prioritizing spending in areas with strong sectoral plans or sectorwide approaches. These are chronically underdeveloped in water and sanitation, creating disincentives for donor engagement. In turn, limited donor support restricts the potential for the development of sectorwide approaches, creating a vicious circle of weak planning and underfinancing.

For the global financing of the Millennium Development Goal, current development assistance patterns suffer from two shortcomings. The most visible is the large aid deficit relative to financing requirements. On a rule of thumb indicator, aid flows to water and sanitation will have to increase by about \$3.6–\$4 billion a year to bring the target within reach, with an additional \$2 billion allocated to Sub-Saharan Africa. This is an immediate priority. Without more aid, many governments will lack the revenue base to make the upfront investments needed to bring the Millennium Development Goal within reach. And policy reforms and investments in water and sanitation take considerable time to yield results.

The second problem is that aid resources are inevitably skewed towards countries with a strong donor presence—more specifically, towards countries with a critical mass of donors that prioritize aid to water and sanitation. That outcome is at once unsurprising and important. Countries in which Japan is a major partner are

Figure 1.25 Some donors attach more priority to water and sanitation than do others



Source: Development Initiatives 2006.

more likely to secure aid for water and sanitation. The upshot is that good policies are not always backed by sufficient aid for water and sanitation in countries where donors display a weak commitment to the sector. While many factors determine aid allocations, it is difficult to avoid the conclusion that there is a mismatch in many countries between national financing needs and aid flows. In 2004 Ghana and Tunisia both received \$88 in aid for every person without access to an improved water source; Burkina Faso and Mozambique received \$2 per person. South Africa received \$11; Chad and Nigeria received between \$3 and \$4.

Aid pessimists question the role of development assistance in fostering human development. That pessimism is unfounded. International development assistance has been pivotal in supporting progress in access to water in countries such as Ghana, South Africa and Uganda—and it continues to support progress towards sanitation for all in Bangladesh and Lesotho. For millions of people in the world's poorest countries aid has made a difference. That does not mean that more cannot be done by both donors and aid recipients to increase the effectiveness of development assistance. Weak coordination among donors, a preference in some cases for operating

through projects rather than government programmes, and tied aid—all diminish the impact of development assistance and raise transaction costs for developing country governments. At the same time, the failure of some governments to ensure that budget outcomes reflect planned commitments has left many donors hesitant to increase programme aid. But across a large group of countries the quality of aid is improving as national policies become more effective.

Another cause for optimism is the momentum behind international aid partnerships developed since the Millennium Development Goals were launched. The Gleneagles summit of the Group of Eight (G-8) in 2005 pledged a doubling of aid by 2010—a commitment that translates into an extra \$50 billion, with half the total earmarked for Sub-Saharan Africa. Innovative mechanisms have been developed to frontload development assistance through prefinanced disbursements budgeted against future aid flows. In view of the capital intensity of water investments, the need to frontload aid and the long timeframe over which water and sanitation plans have to be implemented, it is important to mobilize an early increase in aid disbursements—and to prefinance disbursements budgeted for later periods.

Strong national planning is the foundation for an accelerated drive towards the Millennium Development Goal target and—ultimately—to universal access to water and sanitation

Rich countries financed their revolution in water and sanitation more than a century ago by drawing on a wide range of new financing mechanisms, including municipal bonds that spread costs over a long period. In the globalized world of the early 21st century, it is important that the new aid partnerships developed around the Millennium Development Goals extend the same opportunities to the world's poorest countries. The International Finance Facility proposed by UK Chancellor of the Exchequer Gordon Brown is one example (see special contribution).

Looking beyond aid, many countries will need to mobilize large amounts of finance on domestic capital markets. In some cases these markets are limited and the perceived risks associated with bonds issued by municipalities or service providers can raise interest rates to prohibitive levels. This is an area in which domestic policies and effective capital market regulation are critical. Developed countries and multilateral financial institutions can support national efforts through measures aimed at reducing risk and lowering the costs of borrowing, such as credit guarantees (see chapter 2).

Building the global partnership—the case for an international water and sanitation global action plan

Strong national planning is the foundation for an accelerated drive towards the Millennium Development Goal target and—ultimately—to universal access to water and sanitation. Mobilization of domestic resources, development of efficient, accountable and responsive institutions and implementation of strategies for overcoming inequalities are foundations for progress in all countries. But in some countries they are not enough. That is why aid is so important. More generally, national planning and international aid efforts could benefit from a broader global plan of action for water and sanitation.

The case for such a plan is rooted partly in the peripheral status of water and sanitation on the international development agenda and partly in the lessons from international efforts in other areas, such as HIV/AIDS and education.

Beyond water and sanitation, it is difficult to think of any other area of comparable importance for human development that suffers from such limited global leadership. The problem is not a shortage of high-level conferences or ambitious communiqués. These have been a standard feature of international conference calendars for the more than three decades since the first UN conference on water, held in Mar del Plata, Argentina, in 1977. That event led to the adoption of an action plan that gave rise to the first International Drinking Water and Safe Sanitation Decade. To this day, that conference remains a milestone in terms of its influence. But the impressive target of “water and sanitation for all” by 1990 and the subsequent reaffirmation of the same unachieved goal for 2000 at yet another high-level conference revealed a large gap between target setting and strategic planning to attain the targets.

Since the mid-1990s there has been a proliferation of conferences dedicated to water. Two large international partnerships—the World Water Council and the Global Water Partnership—have emerged and overseen an impressive succession of global meetings, such as the triennial World Water Forum, held in Mexico City in 2006, and reports. Water has also figured prominently in wider UN meetings, such as the World Summit on Sustainable Development.

Yet it is difficult to avoid the conclusion that today, as in the 1970s, there is a very large gap between ministerial declarations and conference communiqués and practical strategies to achieve water and sanitation for all. None of this is to diminish the critical role of international conferences in informing opinion and increasing awareness of problems among policy-makers and the public. But if the ultimate objective is to improve the access of poor women and men to water, the record is less impressive—and the case for more international conferences that lack a clear agenda for achieving change is limited.

Stated in blunt terms, when it comes to water and sanitation, the world suffers from a surplus of conference activity and a deficit of action. It also suffers from fragmentation. There are no fewer than 23 UN agencies dealing with water and sanitation. Apart from problems

of coordination and transaction costs within countries, the diversity of actors has militated against the development of strong international champions for water and sanitation.

The agenda of the G-8 countries bears testimony to the problem. Three years ago, at its summit in Evian, Switzerland, the G-8 adopted a Water Action Plan to achieve a wide range of goals, “assisting as a priority, countries that make a political commitment to prioritize safe drinking water and basic sanitation”.⁷⁰ Since then, nothing meriting the description of an action plan has emerged. Aid levels have stagnated, and no credible attempt has been made to translate into practical global strategies capable of delivering results the commitments made at such international conferences as the Third and Fourth World Water Forums held in 2003 and 2006.

If evidence were needed of the low profile of water and sanitation on the G-8 agenda, it was provided at the 2005 Gleneagles Summit. Not only was there no reference to what was agreed at Evian, but the issue was not mentioned in the G-8 strategy set out for Sub-Saharan Africa.

With a decade to go to 2015, it is time to act on the commitment to develop a global action plan for water and sanitation. That does not mean the creation of complex, bureaucratic, top-down planning processes. Rather, the aim would be to provide an institutional point for international efforts to mobilize resources, build capacity and—above all—galvanize political action by putting water and sanitation in a more central position on the development agenda.

For any global framework to produce results, it has to be grounded at the country level and embedded in national planning processes. It also has to be rooted in a genuine development partnership. Ultimately, it is the responsibility of national governments to deliver credible national plans and to develop transparent and accountable institutions for implementation. But the core principle that underpins the Millennium Development Goals is that governments committed to progress will not be held back for want of international support and financial resources. The development of a global action plan would help to translate this commitment from words into action.

Current initiatives provide a useful point of reference. Both the Global Fund to Fight AIDS, Tuberculosis and Malaria and, on a less impressive but nonetheless important scale, the Fast Track Initiative in education have delivered real results.⁷¹ Neither involves large organizational structures. The Global Fund has a small bureaucracy, with no in-country staff, and acts only as an instrument for financing and capacity building. It relies on government strategies and facilitates a strong role for civil society. The added value of the Global Fund has been as a focal point for political action, leveraging resources to support good policies, and building capacity. Similarly, the Fast Track Initiative has helped to reduce financing gaps and coordinate donor support for education in about a dozen countries.⁷²

How would a global plan of action work for water and sanitation? And what difference would a global action plan make to the lives of poor people? In operations terms, a global plan would bring donors together under a single multilateral umbrella organized under the auspices of relevant UN agencies, the European Union and the World Bank. The emphasis would be on delivering resources and support for capacity building and on coordination and coherence, rather than on the creation of new bureaucracies.

A global framework, grounded at the country level and embedded in Poverty Reduction Strategy Papers and national development plans, could provide a platform for tackling the policy, institutional and financing issues as countries seek to scale up water and sanitation strategies and accelerate progress. Going global is not a substitute for starting locally. But it can build on the basic Millennium Development Goals compact: that good policies and serious intent to deliver at a national level will attract the support of the international community. Such a plan could bring interlocking benefits to countries with governments committed to action:

- *Galvanize international commitment and raise the profile of water and sanitation.* Adoption of an action plan by the G-8 and the wider donor community would highlight the central importance of progress in water

With a decade to go to 2015, it is time to act on the commitment to develop a global action plan for water and sanitation

From Japan to the European Union and to the United States people in the developed world take clean water and basic sanitation for granted. But across the world too many people are still denied access to these basic human rights. This Report powerfully documents the social and economic costs of a crisis in water and sanitation.

Not only are water and sanitation essential for human life but they are also the building blocks for development in any country. That is why one of the eight Millennium Development Goals has a specific target to halve the proportion of people without sustainable access to safe drinking water and sanitation by 2015.

The lack of clean water and sanitation disproportionately affects women and girls, who are traditionally responsible for fetching water for the family. For school-age girls the time spent travelling—sometimes hours—to the nearest source of water is time lost in education, denying them the opportunity to get work and to improve the health and living standards of their families and themselves. Schools with no access to clean water or sanitation are powerful evidence of the interconnectedness of human development and the Millennium Development Goals: you cannot build effective education systems when children are constantly sick and absent from school. And you cannot achieve education for all when girls are kept at home because their parents are worried by the absence of separate toilet facilities.

Today the link between clean water, improved health and increased prosperity is well understood. We have the knowledge, the technology and the financial resources to make clean water and sanitation a reality for all. We must now match these resources with the political will to act.

The infrastructure for an effective nationwide water and sanitation system—from water pipes to pumping stations to sewerage works—requires investment on a scale beyond what the poorest countries can begin to afford. Moreover, it requires large upfront investments as well as longer term maintenance costs. Given the high proportion of people in developing countries that lack access to water and sanitation and survive on less than \$1 a day, it is not feasible to meet these upfront costs through user fees.

In 2005 developed country governments promised to increase the overall amount of aid for development. The European Union has committed to increasing aid to 0.7% of its income by 2015. The G-8 has committed to doubling aid to Africa by 2010. In making that promise, the G-8 recognized that one of the purposes of this aid was ensuring that developing country populations would have access to safe water and sanitation. However, traditional increases in donor aid budgets will not be enough to provide the additional resources and meet the aid targets that have been set. Innovative financing mechanisms are needed to deliver and bring forward the financing urgently needed to achieve the Millennium Development Goals—and nowhere is this more evident than in water and sanitation.

Bluntly stated, the world cannot wait for the incremental flows of finance to come on-stream before tackling the water and sanitation crisis. That crisis is killing children and holding back development today—and we have to act now. That is why a range of

innovative financing mechanisms have been considered and implemented with a view to mobilizing development finance upfront. The International Finance Facility (IFF) is one example.

The IFF mobilizes resources from international capital markets by issuing long-term bonds that are repaid by donor countries over 20–30 years. A critical mass of resources can thus be made available immediately for investment in development, while repayment is made over a longer period from the aid budgets of developed countries.

The frontloading principles have already been applied to the IFF for Immunization, which by immediately investing an extra \$4 billion in vaccinations for preventable disease will save an astonishing 5 million lives between now and 2015 and a further 5 million thereafter.

These principles may also be very relevant for water. The rates of return from upfront investment in water and sanitation would significantly outweigh the costs of borrowing from bond markets, even taking into account the interest costs. Indeed, the WHO has estimated that the return on a \$1 investment in sanitation and hygiene in low-income countries averages about \$8. That is a good investment by any system of accounting.

The mobilization of resources from capital markets for investment in water and sanitation is not new. Industrial countries used bond issuances and capital markets to provide financing for investment in water and sanitation infrastructure at the start of the last century. And just recently countries such as South Africa issued municipal bonds to rapidly raise the critical mass of resources to make such investment.

Of course, we have to recognize that the new aid partnerships underpinning the Millennium Development Goals are a two-way contract. There are obligations and responsibilities on both sides. Developing countries should be judged on their ability to use aid resources efficiently and transparently to reach the poorest with clean water and sanitation. But they and their citizens are entitled to expect good policies to be backed by a predictable flow of aid financing commensurate with the scale of the challenge.

Developed countries should be judged not just on willing the Millennium Development Goals but on delivering the resources to achieve them. Helping provide clean water and basic sanitation will show that these promises are more than just a passing fashion—that they are a commitment for our generation.



Gordon Brown, MP, Chancellor of the Exchequer, United Kingdom



Ngozi Okonjo-Iweala, Former Minister of Finance, Nigeria

and sanitation to the Millennium Development Goals. Properly designed and implemented, such a plan could do for water and sanitation what the Global Fund has done for HIV/AIDS—provide an institutional focal point that raises the profile of the water and sanitation problem. It could send a strong signal to national governments that the sector will be a growing priority, creating incentives for stronger national planning. On the policy front the global plan could identify broad best practice strategies for overcoming inequalities and accelerating progress, creating a global indicative framework as a basis for assessing policy. Monitoring the implementation and progress of these strategies would become a focal point for water and sanitation at International Monetary Fund–World Bank meetings and at the G-8.

- *Monitor performance.* Aid donors justifiably demand a high level of accountability and transparency by aid recipients. Far weaker standards are applied to the donor community. There are no mechanisms for holding developed countries to account for the delivery of aid against their commitments, or for the quality of aid. The global water and sanitation action plan would create such a mechanism. It would include an annual assessment of donor performance. The annual evaluation exercise would have two parts. It would include a review by aid recipients of the degree to which donors are complying in water and sanitation with wider Organisation for Economic Co-operation and Development guidelines and targets adopted in 2005 for enhancing aid effectiveness through increased budget support, greater predictability in aid flows and lower transaction costs through improved harmonization and coordination. It would also include independent evaluation of aid programmes against the targets set out in the Millennium Development Goal and in national strategies, helping to improve both donor and aid recipient understanding of what works and what does not.
- *Mobilize additional aid resources.* The global action plan would provide a focal point for

international efforts to align the external resources needed for achieving the Millennium Development Goal with the financing gaps in individual countries. With this in mind, the first key ingredient is the creation of a reliable, long-term commitment of resources contingent on countries adopting and implementing credible reform plans. The strength of prior commitments of donors can provide countries the assurance that, if they fulfil their commitments, donors will deliver funding.

Because expansion of access to water and sanitation calls for major upfront investments but delivers returns over a long period, the sector often loses out to more immediate and tangible investment projects for which political leaders can more readily claim credit. Secured financing can strengthen the hand of reformers by providing the leverage that comes with commitments of external financial support. Central to the plan would be a concrete timetable to increase aid to water and sanitation by \$3.4–\$4 billion annually over the next decade, with provisions for frontloading. Sub-Saharan Africa would be a focal point for the global action plan, not only in mobilizing \$1.5–\$2 billion in additional aid but also in putting water and sanitation at the heart of the Africa strategy adopted by the G-8 at Gleneagles. The global plan would provide a framework for performance-based aid, with aid recipients setting clear benchmarks for performance under national plans and donors adhering to benchmarks for delivering on their aid commitments (see special contribution by Gordon Brown and Ngozi Okonjo-Iweala).

- *Mobilize domestic resources.* The global action plan would support and complement domestic resource mobilization. For most middle-income countries and some low-income countries national capital markets represent a potential source of long-term financing. Because revenues from water and sanitation investments are in national currency, it is important that borrowing to support that investment be in national rather

The global plan could identify broad best practice strategies for overcoming inequalities and accelerating progress

While the precise shape of any global plan is obviously an issue for dialogue and debate, business as usual should no longer be viewed as an option

than foreign currency—one of the hard lessons of the failed privatization episodes. The problem is that market perceptions of risk and the weakness of local capital markets can both raise the cost of borrowing and diminish the flow of resources available. International support through multilateral and bilateral institutions can mitigate these effects by providing credit guarantees to utilities or municipal entities, enabling them to secure a AAA rating. This is an area that has witnessed rapid growth in recent years (see chapter 2). While a global action plan would not institutionalize credit provision, it could offer a framework for coordinating and supporting public-private partnerships, developing best practices and offering technical advice.

- *Support capacity development and national planning.* Overcoming the deficit in water and sanitation presents many of the poorest countries with acute planning problems. The legacy of fragmentation, weak institutional development and underinvestment in technical capacity building is itself a barrier to progress. In HIV/AIDS and education global initiatives have provided technical and capacity-building support as a mechanism for enhancing eligibility for development assistance. In water and sanitation the global plan framework would support sectorwide planning and mobilize resources for capacity building. As in HIV/AIDS and education, a strong vertical programme would facilitate the diffusion of best practice, accountability, performance measurements and communication to political stakeholders and civil society. It would also help to ensure that aid resources actually expand overall financing rather than substitute for government resources.
- *Improve donor coherence and coordination.* At the national level a credible global planning framework would provide an instrument for donors to align their separate programmes behind a national strategy, supporting current efforts to harmonize donor procedures and reporting requirements. It would establish a common set of

standards, reducing the transaction costs associated with multiple donor-reporting requirements—and ensuring that donors are not duplicating projects and efforts in support of their pet programmes. The global planning framework would also help to identify mismatches between aid allocation and government commitment. It would provide a multilateral vehicle to close financing gaps for countries inadequately covered by bilateral aid—as with the Global Fund and the Fast Track Initiative.

Recent developments in Sub-Saharan Africa highlight the potential for a compact on water and sanitation. Recognizing that the water and sanitation deficit is holding back advances in health, education and economic growth, the African Development Bank has established a Special Water Fund to support progress towards the Millennium Development Goal and universal provision by 2025. An indicative medium-term action plan has been developed through the African Ministers Council on Water and the New Partnership for Africa's Development for 2005–09. Through separate negotiations with eight donors the African Development Bank has secured pledges of some \$50 million over periods varying from one year to three years against a target of \$615 million.⁷³ A global framework backed by major donors would help both to reduce transaction costs and to secure financing on the scale required.

A global plan of action for water and sanitation is not an end in itself. It is a means to enhance the effectiveness of international cooperation and to build aid partnerships that can get the world on track for achieving the Millennium Development Goal and progressing towards universal access to water and sanitation. With less than a decade to go to the target date of 2015, a global plan of action could provide the predictable long-term framework for aid partnerships that could act as a catalyst for human progress, with the benefits spreading from water and sanitation to other areas of human development. While the precise shape of any global plan is obviously an issue for dialogue and debate, business as usual should no longer be viewed as an option.