



5. Challenges, future needs and prospects

5.1 Future prospects

At present, sanitation coverage worldwide is still consistently lower than water supply coverage (cf. Figures 5.1 and 5.4). Rural coverage shows most disparities between regions, but is generally lower than urban coverage (cf. Figures 5.2, 5.3, 5.5 and 5.6). Globally, Asia has the lowest overall figures for coverage: almost two-thirds of those without access to improved water supply, and approximately 80% of those without access to improved sanitation, live in Asia (Figures 2.1 and 2.2). And in Africa, despite its much lower population size compared with Asia, lives almost one-third of the global population without access to improved water supply. Africa also has the lowest percentage coverage for improved water supply, with only 62% of the country's population having access (Table 5.1).

Global population projections suggest that the world population of 6.055 billion in 2000 will increase 20% to 7.105 billion by 2015, and to 7.825 billion by 2025, a 30% increase. There will be enormous strains on existing services, and substantial further service provision will be needed to meet the population increase and address the backlog.

To achieve the international development target of halving the proportion of people without access to improved sanitation or water by 2015 (Box 1.1), an additional 1.6 billion people will require access to water supply (Figure 5.1) and about 2.2 billion will require access to sanitation facilities (Figure 5.4). For water supply, that includes approximately 1.018 billion additional people to be served in urban areas (Figure 5.2) and approximately 581 million to be served in rural areas (Figure 5.3). The corresponding information for sanitation is shown in Figures 5.4–5.6. To achieve these goals will require immense effort and investment. If the change over the 1990s is used as a guide to future progress (see Section 2.2), then least progress might be expected in the area of rural sanitation.

There has been massive investment in water supply since 1980, but the health benefits have been limited by poor progress in other areas, especially in the management of human excreta. The lack of good excreta management is a cause of sickness and disease, a major environmental threat to global water resources, and a fundamental stumbling block in the advancement of human dignity.

There are many barriers to expanding access to improved sanitation services. Some are listed in Box 5.1.

The reasons for apparent low demand need to be understood, to determine whether changes can be brought about through political, financial or technical means, or simply by improving information. People may want sanitation very badly, yet be powerless to express that desire in financial or political terms. Some may want safe excreta management facilities, but not at the prevailing price. Others may not want the available “improvements” at any price.

BOX 5.1 SANITATION – BARRIERS TO PROGRESS

Barriers to progress in sanitation include:

- Lack of political will.
- Low prestige and recognition.
- Poor policy at all levels.
- Weak institutional framework.
- Inadequate and poorly used resources.
- Inappropriate approaches.
- Failure to recognize defects of current excreta management systems.
- Neglect of consumer preferences.
- Ineffective promotion and low public awareness.
- Women and children last.

Source: (15)

Cultural beliefs have a strong impact on sanitation, and even on the possibility of talking about sanitation. In many cultures, the handling of excreta is considered a taboo and viewed as disgusting or a dangerous nuisance, not to be discussed. No one wants to be associated with excreta. Those who reduce its offensive characteristics for others may be stigmatized by association. Problems cannot be solved if people do not want to talk about them and be associated with their solution. In many contexts, taboos – including modern technological ones – block the safe recovery of valuable agricultural resources from human wastes (16). To counter the excreta taboo, education promoting sanitation and hygiene should link the value of excreta (faeces and urine) with ecology and health protection.

Three principles are fundamental to the creation of socially, economically and ecologically sustainable sanitation systems:

- **Equity.** All segments of society have access to safe, appropriate sanitation systems adapted to their needs and means.
- **Health promotion and protection from disease.** Sanitation systems should prevent users and other people from contracting excreta-related diseases and should interrupt the cycle of disease transmission.
- **Protection of the environment.** Sanitation systems should neither pollute ecosystems nor deplete scarce resources (15).

Other factors to be borne in mind in implementing sanitation programmes are listed in Box 5.2. Achieving the 2015 target for sanitation will require an enormous increase in percentage coverage.

BOX 5.2 IMPLEMENTATION OF SANITATION PROGRAMMES

The implementation of effective sanitation programmes should:

- Help to prevent environmental pollution and degradation.
- Provide impetus for the development of a range of systems that are applicable to different cultural and environmental conditions.
- Treat sanitation as a major field of endeavour in its own right, with sufficient investment to revitalize training programmes and professional standing.
- Create a demand for systems that move increasingly towards safe reuse and recycling of wastewater.
- Encourage governments, nongovernmental organizations, the private sector and donors to review their sanitation policies.
- Involve in the design process people for whom the systems are being built.

Source: (15)

The coverage target most likely to be achieved by 2015 is that of rural water supply. This is because of the projected decline in rural populations, and the relatively high existing levels of rural water supply coverage compared with rural sanitation coverage (cf. Figures 5.3 and 5.6). Urban services face the greatest overall challenges, with more than a billion additional people needing access to both water supply (Figure 5.2) and sanitation (Figure 5.5) over the next 15 years, if coverage targets are to be met. Indeed, just to maintain the present percentage coverage in urban areas up to the year 2015, an estimated 913 million additional people will need access to water supply, and an additional 834 million will need access to sanitation. This effort is equivalent to building the water supply and sanitation infrastructure to serve approximately three times the population of Northern America.

Figure 5.1 Actual and target global water supply coverage

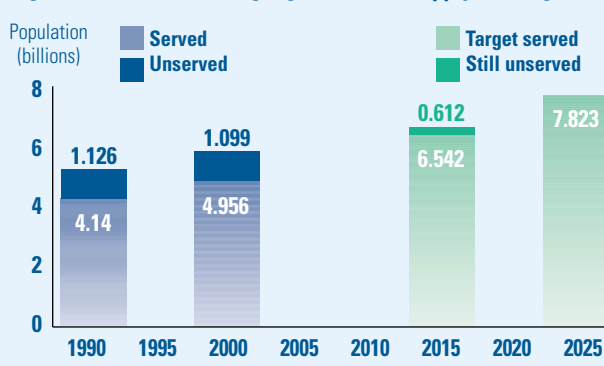


Figure 5.2 Actual and target global urban water supply coverage

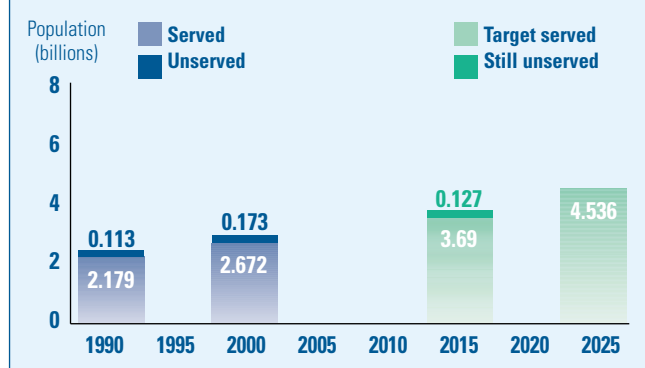


Figure 5.3 Actual and target global rural water supply coverage

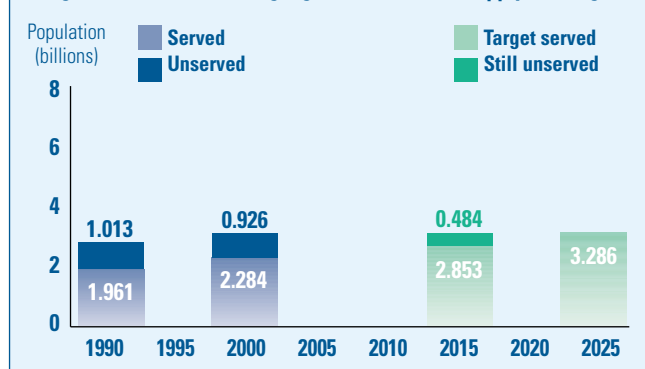


Figure 5.4 Actual and target global sanitation coverage

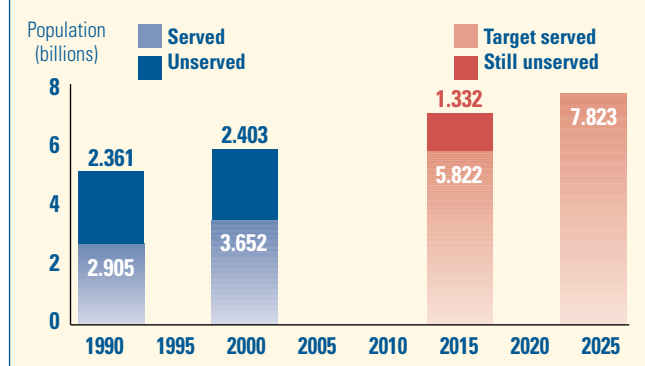
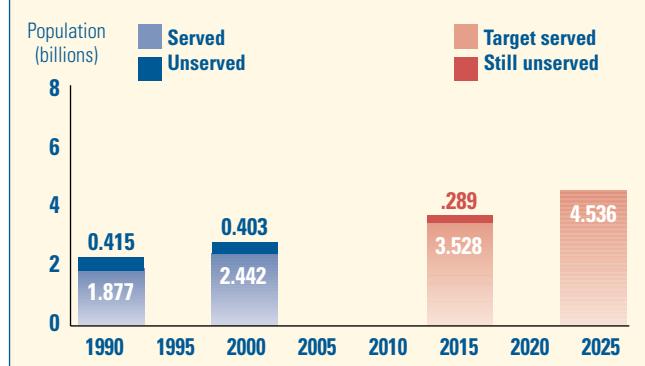
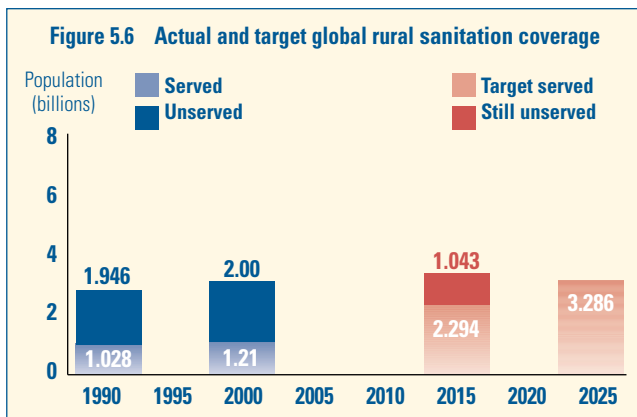


Figure 5.5 Actual and target global urban sanitation coverage





5.2 Future needs and services

There are four major challenges facing the water supply and sanitation sector in the years to come:

- Keeping pace with a net population growth of more than a billion people over the next 15 years (Box 5.3; 17).
- Closing the coverage and service gap, with emphasis on sanitation which lags considerably behind water supply.
- Ensuring sustainability of existing and new services.
- Improving the quality of services.

The magnitude of these challenges can be seen clearly in the context of the international development targets described in Box 1.1. Whether or not these targets are realistic, they are helpful in quantifying the challenges faced by the sector in reducing the coverage gap.

Table 5.1 shows the practical implications of adopting the VISION 21 target of halving the fraction of the global population without improved sanitation and water supply by 2015 (1). To allow a more detailed regional analysis of needs over the next 15 years, the VISION 21 target has been applied to regional rural and urban populations. However, this report does not imply that all regions and countries of the world should have the same target. The table has been subdivided into urban, rural and total components, each of which is further subdivided between water supply and sanitation. In Table 5.1, 2015 target water and sanitation coverages for urban, rural and total populations were obtained by halving the fraction of the population without access to improved water or sanitation, as appropriate, for each region. The “additional population to serve” figures were obtained from the corresponding differences between the target population to have access and the current 2000 population with access, for each region. This figure represents the additional population that must be served if the fraction of urban population without improved services in the region is to be halved by 2015. The assumption is that services for those who are already served will be sustained. This is optimistic, as there are still huge constraints affecting the sustainability of water supply and sanitation services, including funding limitations, insufficient cost-recovery and inadequate operation and maintenance (Section 3.1). This suggests that, in addition to the great demand for constructing new systems, there will also be a need for substantive investments in capacity building, and operation and maintenance.

BOX 5.3 POPULATION GROWTH

The world population surpassed the 6 billion mark in 1999. From 1804, when the world passed the 1 billion mark, it took 123 years to reach 2 billion people in 1927. By 1960, 33 years later, the world supported a total population of 3 billion people. Since then the world population has grown at a pace of more than a billion people every two decades. It took 14 years to reach 4 billion in 1974; 13 years to pass the 5 billion mark in 1987; and only 12 years later, by 1999, the population reached 6 billion people.

Medium population growth projections by the United Nations – taking into account the HIV/AIDS epidemic – indicate that it will take another 12 years to add one more billion to the world population, reaching 7 billion people by 2011. From then on, the population growth trend will change, increasing the time required to add an additional 1 billion people and generating an inflection point in the population growth curve. It will take 15 years to pass the 8 billion mark in 2026 and another 24 years to reach 9 billion people by the middle of the 21st century.

All population growth is expected to occur in developing nations, as developed regions are projected to see their population decrease by 6% over the next 50 years. Meanwhile, the rural population is expected to stabilize at around 3.2 billion (from 2.97 billion today), indicating that the growing population will settle in urban areas. The challenge is to provide the basic infrastructure required by nearly 2 billion people in urban areas in the developing world, while at the same time reducing the proportion of people without access to water supply and sanitation services.

Source: (17)

Some of the conclusions that can be drawn from Tables 5.1 and 5.2 are striking:

- To meet the 2015 development target of halving the fraction of the population without services in Africa, Asia, and Latin America and the Caribbean, the number of people served by water supply must increase by 1.6 billion (32%), and those served by sanitation must increase by 2.2 billion (59%).
- For water, this means providing services for an additional 107 million people each year, or 292 000 every day, until 2015. Considering that only 816 million people gained access to improved water services during the 1990s, the pace has to be accelerated over the next 15 years.
- For sanitation, the challenge is even greater, with services to be provided for an additional 145 million people each year until 2015, or 397 000 every day until 2015. During the 1990s, only 75 million people a year gained access to improved sanitation services.

- Rapid urban growth means that more than half of the additional services must be in urban areas, despite the higher current levels of coverage. The lower levels of service in rural areas also mean that nearly half of the improvements will need to come in rural areas, even though the rural population will grow more slowly than the urban population.
- Most of the work will be in Asia. The absolute needs in Asia outstrip those of Africa, and Latin America and the Caribbean combined. This does not mean that the needs of the poor are any more acute in Asia than elsewhere, only that the majority of people without access to water supply and sanitation services are in Asia.
- Current progress is inadequate to meet the targets. Something will have to change dramatically if the targets are to be met. In reality, as highlighted at the World Water Forum in The Hague (1), a wide range of issues would need to be resolved, and the majority of these are institutional and social, rather than technical.

The estimated population growth in the next 15 years is 1.1 billion people, 88% of whom will live in urban areas. After 2015, all the population expansion will be concentrated in cities. If global expenditure and

approaches in water supply remain the same as during the past decade, by 2015 water supply services will be provided to an additional 739 million urban dwellers and 489 million rural inhabitants. Considering that the current urban and rural populations without improved water service are 173 million and 926 million, respectively, and that by 2015 the urban and rural populations will grow by 972 million and 127 million, respectively, it is obvious that the past pace of providing improved services will be insufficient to cope with the projected population growth. Unless the pace is increased, the number of people without access will increase sharply. To achieve the 2015 target, the annual investment in water supply should be increased by 31% (39% for the urban water sector and 19% for the rural water sector).

In sanitation, the numbers are even more dramatic as the current coverage level is low. In urban areas, 1.085 billion additional people should be provided with sanitation service, requiring a 28% increase in effective annual expenditure. In rural areas, the global target is to provide an additional 1.1 billion people with sanitation service, implying a quadrupling of the annual progress achieved over the 1990s. To achieve the total sanitation target by 2015 would require that the annual expenditures of the 1990s almost double.

TABLE 5.1 POPULATION COVERAGE REQUIRED BY THE 2015 INTERNATIONAL DEVELOPMENT TARGET

URBAN	2000 urban population (millions)	2000 urban population with access (millions)	2000 urban coverage	2015 target urban coverage	2015 urban population (millions)	2015 target urban population to have access (millions)	2015 target additional urban population to serve (millions)	2015 target increase in urban population to be served
Water supply								
Africa	297	253	85	93	501	464	210	83
Asia	1352	1254	93	96	1943	1873	619	49
Latin America and the Caribbean	391	362	93	96	504	486	123	34
Oceania	21.3	21.0	98	99	25.7	25.5	4.5	21
Europe	545	542	100	100	566	564	22	4
Northern America	239	239	100	100	278	278	396	16
Global	2845	2672	94	97	3817	3690	1018	38
Sanitation								
Africa	297	251	85	92	501	462	211	84
Asia	1352	1055	78	89	1943	1730	675	64
Latin America and the Caribbean	391	340	87	93	504	471	131	39
Oceania	21	21	99	99	25.7	25.5	4.5	21
Europe	545	537	98	99	566	561	25	5
Northern America	239	239	100	100	278	278	39	16
Global	2845	2442	86	92	3817	3528	1085	44

TABLE 5.1 POPULATION COVERAGE REQUIRED BY THE 2015 INTERNATIONAL DEVELOPMENT TARGET (CONT.)

RURAL	2000 rural population (millions)	2000 rural population with access (millions)	2000 rural coverage	2015 target rural coverage	2015 rural population (millions)	2015 target rural population to have access (millions)	2015 target additional rural population to serve (millions)	2015 target increase in rural population to be served
Water supply								
Africa	487	231	47	74	577	425	194	84
Asia	2331	1736	74	87	2404	2097	361	21
Latin America and the Caribbean	128	79	62	81	127	103	23	30
Oceania	9.1	5.7	63	81	10.4	8.5	2.8	49
Europe	184	161	87	94	154	154	0	0
Northern America	71	71	100	100	66	66	0	0
Global	3210	2284	71	85	3337	2853	581	25
Sanitation								
Africa	487	220	45	73	577	419	198	90
Asia	2331	712	31	65	2404	1569	857	120
Latin America and the Caribbean	128	62	49	74	127	94	32	51
Oceania	9.1	7.3	81	91	10.4	9.4	2.1	28
Europe	184	137	74	89	154	137	0	0
Northern America	71	71	100	100	66	66	0	0
Global	3210	1210	38	69	3337	2294	1089	90
TOTAL								
	2000 total population (millions)	2000 total population with access (millions)	2000 total coverage	2015 target total coverage	2015 total population (millions)	2015 target total population to have access (millions)	2015 target additional total population to serve (millions)	2015 target increase in total population to be served
Water supply								
Africa	784	484	62	82	1078	889	404	83
Asia	3683	2990	81	91	4347	3970	980	33
Latin America and the Caribbean	519	441	85	93	631	588	147	33
Oceania	30.4	26.7	88	94	36.1	33.9	7.3	27
Europe	729	703	96	100	719	718	22	2
Northern America	310	310	100	100	343	343	39	11
Global	6055	4956	82	91	7154	6542	1599	32
Sanitation								
Africa	784	471	60	82	1078	881	410	87
Asia	3683	1767	48	76	4347	3299	1532	87
Latin America and the Caribbean	519	402	78	90	631	566	163	41
Oceania	30.4	28.4	93	97	36.1	34.9	7	23
Europe	729	674	92	97	719	698	25	4
Northern America	310	310	100	100	343	343	39	11
Global	6055	3652	60	81	7154	5822	2175	59

Table 5.2 shows the urban-rural distribution of the additional population for which services must be provided to meet the 2015 international development target.

TABLE 5.2 DISTRIBUTION OF ADDITIONAL POPULATIONS TO BE SERVED TO MEET THE 2015 INTERNATIONAL DEVELOPMENT TARGET

Region	Urban %	Rural %	Total %
Water supply			
Africa	13.1	12.1	25.3
Asia	38.7	22.6	61.4
Latin America and the Caribbean	7.7	1.5	9.0
Oceania	0.3	0.2	0.5
Europe	1.4	0.0	1.4
Northern America	2.4	0.0	2.4
Totals	63.6	36.4	100
Sanitation			
Africa	9.7	9.1	18.8
Asia	31.0	39.4	70.6
Latin America and the Caribbean	6.0	1.5	7.4
Oceania	0.2	0.1	0.3
Europe	1.2	0.0	1.1
Northern America	1.8	0.0	1.8
Totals	49.9	50.1	100

5.3 Ways to face the challenges

While water, sanitation and hygiene promotion interventions are clearly linked in their effects, the problems addressed by each are fundamentally different. Water supply, sanitation and hygiene promotion require different skills and approaches, and a style that works well for one may not work for another.

To most people, and especially to the poor, the need for a convenient and safe water supply is self-evident. It is not hard to “generate demand” for drinking water supply among the poor; they already calculate the time it costs to fetch water, and are often willing to pay vendors far more than affluent families pay the public utility for superior service. There is no lack of demand for water supply among the poor or anybody else, and historically this is almost always the first priority for communities.

The current challenges in water supply involve the development of appropriate institutional, economic and financial arrangements to attract initial investment and ensure continued sustainability. These challenges are usually met through collective efforts by governments, commerce, community, or civil society; they almost always involve sharing resources (such as water treatment works or handpumps), regardless of the technology or scale of the system.

In contrast, the construction and maintenance of sanitation facilities is often an individual or household affair. In some cases, sanitation systems mirror community water supplies, with an extensive piped network in the urban environment. By and large, however, such solutions are too expensive for the people currently without service, and would require a radically improved water supply service to function. On-site sanitation (pit latrines, septic tanks, etc.) is appropriate for the unserved population in

many rural areas, and is increasingly common in periurban and urban areas. On-site sanitation is, however, a household affair and its development consequently requires a different promotional approach from that required for water supply. Experience suggests that a marketing approach is needed. That is, there should be a focus on developing and distributing products that match consumer demands in both quality and price. This in turn requires understanding the reasons why people want sanitation, which may differ significantly from the agendas of national or international agencies (see Box 5.4). To be successful, sanitation programmes need to provide education for behavioural change and to ensure community participation. Because of high levels of illiteracy, conventional training methods may be ineffective. Many local projects are not achieving the expected results because of a failure to provide effective education.

BOX 5.4 WHY PEOPLE WANT LATRINES

A survey of rural households in the Philippines elicited the following reasons for satisfaction with a new latrine. The reasons are listed in order of importance, starting with the most important:

- lack of flies;
- cleaner surroundings;
- privacy;
- less embarrassment when friends visit;
- reduced gastrointestinal disease.

These results are echoed in other parts of the world. Candid personal reflection, even by health sector professionals, often reveals that health is a less intense motivator for sanitation than dignity, convenience and social status.

Source: (7)

The importance of hygiene (the behaviour of individuals in the management of excreta and cleanliness) has only recently returned to the fore in the sector. Concerns about hygiene and the use, rather than simply the construction of latrines are not new. What is new, is the rapid increase in epidemiological evidence pointing to the importance of relatively small behavioural changes in protecting families from faecal-oral disease (reviewed in 17).

There is an increasing consensus that much of the health benefit of water supply and sanitation comes from the changes in hygiene they promote. People wash more often when water taps are conveniently located on their property, and people are more likely to practise safe excreta disposal when there is a nearby latrine. Yet other practices, such as hand-washing with soap and preventing contamination of drinking-water, are also important, and these behaviour changes do not come about automatically through the provision of hardware. Promoting and motivating people to make these changes requires skills that differ from those required to develop and manage an effective water supply system, or to promote a successful sanitation facilities programme.

Ironically, while epidemiologists agree about the importance of

hygiene improvement for health protection, it is at present often not well understood and is not sufficiently documented. None of the data presented in this report directly describes or reflects hygiene practices. While the observation of hygiene behaviour has become an increasingly well-documented field (*e.g.* 18), these observations are not routinely included as a component of household surveys.

From the above, it is clear that water supply, sanitation and hygiene are not simply “collective goods,” but rather affect each person as an individual. This means that progress in the sector requires a focus on results at the household level. The need to focus on household results is precisely why the use of household survey data in this report is so important. A focus on the household has been recognized as critical in sanitation and environmental health (19). In setting priorities, and establishing “next moves” to improve services, the question must always be: “How does this affect the individual household?” The household-centred approach is not merely an evaluation method. As the data in this report show, individual households are the primary actors in the extension of sanitation coverage – sometimes even without the knowledge of the formal “provider” agencies. To build on household capacities and initiative, there must also be a household-centred approach to implementation.

Access to house connections for water supply and sewerage, handpumps or latrines is not random. Overwhelmingly, those currently not served by improved water supply and sanitation are the poor and powerless. Not surprisingly, public health statistics for water-related and sanitation-related disease also vary with income, leading to the painful conclusion of Hardoy, Cairncross & Satterthwaite (20) that the poor die young. The relationships between health and services are complex, and involve many other factors besides simple access to environmental services; but bad water supply and sanitation certainly contribute to the cycle of disease, poverty and powerlessness. Interventions in water supply and sanitation, through their impact on health and development, are powerful elements of efforts to enable the poor to escape poverty.

Even among the relatively powerless, those with the least power suffer the most. Children and women are the most affected by failures in water supply, sanitation and hygiene promotion. The major portion of the burden of death and disease falls upon children under five years of age; the major burden of care falls upon the mothers, although they may not be explicitly targeted with messages such as the need for safe disposal of stools from children under five. Similarly, there are 40 million refugees and 100 million people displaced from their homes within their own countries as a result of disaster, civil war and conflict. These populations face problems with water supply and sanitation that they may already have solved in their own homes.

Despite the grim statistics of inadequate coverage presented in Chapter 2, this report also reflects the tremendous capacity of society to solve these problems. Simply maintaining a given percentage of coverage often reflects extensive mobilization of skills and resources to keep pace with population growth. Although considerable resources are being provided by external agencies to the water supply and sanitation sector, these are still insufficient. While sanitation coverage in rural India is still far too low, planners were shocked when they first recognized the significance of individual and household investment. Government-funded

sanitation could only reach 2% of the population in the 1980s, but household surveys revealed that four times as many households had made the decision to invest in basic sanitation themselves without government assistance. This suggests that governments and external support agencies, including nongovernmental organizations and the private sector, need to understand how water supply and sanitation improvements actually come about; how their activities can help or hinder the process; and need to learn how to work with that.

According to information provided by governments to this Assessment about US\$ 16 billion have been spent annually in constructing new water and sanitation facilities over the past 10 years. Yet at the end of the 10 years, huge numbers of people are still without services. In contrast, US \$11 billion is spent each year in Europe on ice cream, US \$17 billion is spent each year in Europe and the United States on pet food, and US \$105 billion is spent each year in Europe alone on alcoholic drinks (15). National budgets for armaments are also large. Water supply, sanitation and hygiene are low-cost essentials compared with these items. It should not be beyond human capacity to achieve a safe, reliable water supply, and sanitation and hygiene for all.

Lack of water supply, sanitation and hygiene causes both social and individual problems. There is increasing consensus that solutions are only achieved in a local context, in which the appropriate mix of government, private sector, individual and civil society contributions must be locally appropriate; that all sectors have a part to play; and that the part must be locally determined. In contrast, much of the debate during the 1990s focused upon the limits of governmental capacity to provide water supply and sanitation services. Some have seen the private sector or civil society (led by nongovernmental organizations or the community itself) as the preferred provider of the services that government could not provide in a more efficient and more accountable way. The evidence is only now beginning to trickle in and the results are mixed.

For example, preliminary studies show that multinational companies are playing an increasing role in water supply in developing countries, and it is plausible that the private sector outlook promotes greater efficiency. These same studies suggest, however, that multinationals are not necessarily bringing much new capital investment to the sector. In any discharge of responsibility from the public to the private sector, care must always be taken to ensure that enforceable regulatory, contractual mechanisms are in place to meet public objectives, and to provide the private sector with sufficient stability to attract continuing investment in extending and upgrading service. Without such mechanisms, it is unrealistic to expect the private sector to invest in services and not maximize their return on investment. Similarly, field studies have suggested that community-managed systems are not necessarily more effective or fairer than systems run by traditional government agencies.

Much of the rhetoric on both sides of the public-private debate has been confused because it does not always consider the full diversity of the private sector. While large multinational water companies are significant players, many other players are much smaller in size. These include local water vendors, contractors and masons who build latrines. While none of these smaller actors may bring in large amounts of capital, all can have a direct impact upon the quantity and quality of services provided.

5.4 Sustaining the solutions

This section considers how solutions can be sustained in institutional, financial and natural resource terms. Sustainable development has been usefully defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (21). While many aspects of sustainability have been explored by a number of authors, there are two principal ones of concern to hygiene, sanitation and water supply:

- **Functional sustainability.** Can the institutions and finances carry on long after the initial excitement of system inauguration? Or will the system collapse into disuse because essential funds or skills for operation and maintenance cannot be found?
- **Environmental sustainability.** Will system operation damage the environment (and thereby health and prosperity) for future generations? Will other environmental changes damage the water resource to the point where future services become difficult or impossible to maintain?

These questions are explored in greater detail below, starting with issues of functional sustainability. Some of the factors with implications for the sustainability of water supply and sanitation systems are examined in Box 5.5.

BOX 5.5 SUSTAINABLE WATER SUPPLY AND SANITATION SYSTEMS

A series of meetings across Africa led to the conclusion that important factors determining the sustainability of water supply and sanitation projects included:

- Community participation in all stages of project planning, design, implementation, management and operation, with consideration of gender issues.
- Political commitment.
- Intersectoral coordination, collaboration and cooperation.
- Adequate institutional frameworks.
- Human resources development in all its forms and at all levels.
- Self-improvement of communities.
- Better hygiene and sanitation.
- Improved information management.
- Improved environmental sanitation in communities.
- Use of appropriate technologies.
- Involvement of the private sector through sound regulatory and controlling mechanisms.

Source: (22)

One of the hardest lessons for the water supply and sanitation sector is that making the initial capital investment is often the easiest part of the job. It is often relatively easy to find the resources (money, labour, materials and organization) for one big push to build something. It is, however, much more difficult to maintain a truly sustainable system. A number of principles illustrate this point (see Box 5.6).

BOX 5.6 SUSTAINING OPERATION AND MAINTENANCE THROUGH GOOD RESOURCE MANAGEMENT

At the beginning of the 1990s, following an extensive consultation process, the Operation and Maintenance Working Group established crucial principles that were aimed at improving the sustainability of water supply and sanitation services. They are:

- The provision of safe water is a service and requires a service-orientated attitude on the part of the agencies involved. Water should be managed as a commodity: its use should be financially sound, but subject to legal and regulatory controls to ensure its conservation, protection and well-balanced use.
- Water and sanitation services should normally be set at a level that users are willing to finance, operate and maintain.
- Water supply and sanitation systems should be managed and operated in accordance with the principles of good business practice. The form of management will vary according to the local situation. The agency should adopt an open policy and be fully accountable to its customers.

The Working Group also considered that governments should have a legitimate concern to satisfy the basic needs of disadvantaged segments of their population, and may require agencies to provide services through special financial arrangements, possibly on a temporary basis, to promote public health and economic development.

Source: (23)

No service is sustainable in the long run if its costs cannot be recovered; to the extent that recurrent costs are subsidized directly by the state, the system's users are hostage to political whim. On the other hand, this does not mean that all users must necessarily pay the same share of the cost, or even that the cost of each user's services must be recovered from that individual user. In practice, some degree of cross-subsidy is inevitable due to the complexity of calculating the costs of individual household service. More importantly, some degree of cross-subsidy from wealthier to poorer users is desirable to ensure access for all, and thus minimize disease and maximize public health benefits.

Institutional sustainability and the mobilization of individual resources for water supply and sanitation depend upon the existence of a reliable and fair legal framework. The enormous energy that individuals and families can mobilize for water supply and sanitation depends greatly upon the security of their future. No family will invest in sanitation if they will not benefit from it; for example, if they fear eviction. Similarly, the problem of groundwater depletion in south Asia and other parts of the world has much to do with poorly defined property rights between drinking-water consumers and those who irrigate agricultural fields. These examples are symptoms of the overall complexity of many aspects of water-related law and regulation.

There has been increasing recognition of the need to treat water as vulnerable and scarce resource, especially since the Dublin conference (24). Domestic water supply plays a small role in the water balance of most countries, and water consumption for irrigation often exceeds domestic consumption by a factor of ten or twenty. Uncontrolled irrigation, on the other hand, can play a major role in eroding the sustainability of domestic water supply. This is apparent in parts of south Asia, where the water table in some areas has dropped dramatically because of overpumping for heavily subsidized irrigation. As the water table drops, domestic water wells and boreholes dry up and water supplies fall into disuse. In other areas, exploitation of relatively good quality groundwater for irrigation may occur alongside expensive treatment of contaminated surface water for domestic supply. Resolution of this type of conflict has led to the recognition that integrated management approaches are important, particularly integrated water resource management.

5.5 Need for monitoring

The use of household surveys in the Assessment 2000 greatly improved our understanding of coverage. But coverage statistics are only part of the story, and the assessment questionnaires sent out to country representatives illustrated many other issues: institutional relations, cost, intermittency of water supply and so on. More work is therefore needed to develop and apply indicators and techniques to help clarify the current situation. While national statistics are helpful to national planners and international agencies, they are of limited value in setting priorities for practical action. For this, a more local picture is crucial and this picture cannot be built up from simple coverage statistics.

Ideas about monitoring and assessment have developed significantly during the 1990s. The routine collection of data for possible use only by a distant project manager or official is no longer considered adequate, and it is increasingly recognized that monitoring needs to be designed and implemented with a view to answering specific practical questions. Shordt (25) noted four important developments in thinking about monitoring for water supply and sanitation:

- More groups and stakeholders have been brought into the processes of data collection, analysis, interpretation and use.
- There is an increased emphasis on monitoring behavioural change.
- With the development of participatory appraisal and qualitative research techniques, a wider range of strategies, and measurement tools to support the strategies, has emerged.
- There is increased emphasis on the timely use of results of monitoring and evaluation.



Box 5.7 illustrates some of the questions that can be answered through better sector monitoring. While some of the data from assessment questionnaires sent to country authorities make an important start on a number of these issues, more objective information is needed. As with coverage, it will be important to validate these results from a household perspective.

The questions listed in Box 5.7 are important not just for a formal regulated system, but also for the informal systems used more frequently by the poor and most vulnerable. Finding indicators or techniques with which to answer the questions in Box 5.7 is challenging, however. Many of these questions can be answered only by the providers of services (concerned ministries, national water supply and sanitation agencies, water authorities, local services), whereas others would be more reliably obtained through population-based surveys. Such surveys are increasingly

conducted at the country level and are extremely useful for determining water supply and sanitation statistics. But there are still huge problems concerning comparability of core data, uniformity of indicators and their definition, and concentration of surveys in some regions or countries.

An important challenge lies in building and sustaining the capacity to monitor progress, and to use the results of monitoring, in these areas. This challenge is already being addressed by the African Water Utilities Partnership in its work on the development of benchmarking and performance indicators (Box 5.8). While benchmarking statistics are helpful for the utility, other work must be done at the household and community level, and will require training of skilled people. Fortunately, training in such techniques will pay off for other sectors in development, as many face similar issues of assessing and monitoring sustainability.

BOX 5.7 ISSUES TO ADDRESS WITH IMPROVED SECTOR MONITORING

Water supply

- **Equity** What portions of the city or district are not served at all? What portions of a city's population pay what charges to private vendors selling water obtained from the utility? How are intermittency and hours of service distributed across the city? In rural areas, do different socioeconomic groups have different access to wells or taps?
- **Quality of service** What is the type of access to water supply and sanitation services? What type of technology is used? How effective are the services provided through these technologies? What is the quantity of water used per person a day? How clean and safe is the water at the point of distribution? How safe is it at the point of consumption? What are the water quality parameters of greatest concern to the consumer, and how can progress in improving these be gauged?
- **Sustainability** How sound is the physical, institutional, financial and environmental basis of the water supply? Are there short-, mid- or long-term threats to its functioning in terms of physical, institutional or financial constraints? How effective and realistic are plans for cost recovery? Are capital costs and operation and maintenance costs affordable?
- **Efficiency** How efficient are the services? What proportion of the time is the water supply out of service? For what fraction of the population? How predictable is down-time? Can consumers plan around it? In piped systems, what are the amounts of physical and non-physical (apparent) losses?

Sanitation

- **Use** Sanitation facilities are a means to an end, and not ends in themselves. Are sanitation facilities used? By whom? Are there differences by age and gender? As young children are the most likely to be infected and also the most vulnerable, safe disposal of children's stools is critical. Does the population always use toilets, or are there frequently conditions under which no suitable sanitation is available?
- **Ultimate disposal** It all has to go somewhere, so where does it go? Is sewage treated before discharge? How are latrine contents removed, and where do they go? Are the contents biologically safe at the time of removal?
- **Sustainability** How sound is the physical, institutional, financial and environmental basis of the sanitation system? Are there short-, mid- or long-term threats to its functioning? How effective and realistic are plans for cost recovery? What is the level of pollution originated by the treatment and disposal system?

Hygiene

- **Behaviour** Are hands washed after use of the toilet? Is soap or another aid used when hands are washed? (The use of soap, earth or mud with water has a dramatic effect on the effectiveness of transmission control.)

BOX 5.8 PERFORMANCE INDICATORS FOR AFRICAN WATER SUPPLY AND SANITATION UTILITIES¹

Twenty-one water and sanitation utilities in Africa participated in a project assessing key performance indicators. The project is managed by the Water Utility Partnership and the intention is to extend the programme to all utilities. The data will be used as a management tool for enhancing the performance of the utilities. The indicators measured and the range of some results were:

1. Source of water.
2. Annual water production (14 – 967 million m³).
3. Service coverage (7 – 100%).
4. Per capita production.
5. Per capita consumption (41 – 217 l/day).
6. Average domestic consumption.
7. Unaccounted for water (10% – 59%).
8. Hours per day of service (10 – 24).
9. Average tariff (8 – 402 US cents/m³).
10. Working ratio.
11. Collection efficiency (6 – 115%).
12. Staff per 1000 connections (4 – 45).
13. Unit production cost (5 – 101 US cents/m³).
14. Personnel cost.
15. Distribution of production costs.

Key lessons learned from the programme:

- Many utilities have difficulty in collecting and maintaining records related to the performance indicators.
- The quality of the data need to be cross-checked, as many of the utilities are not happy with the quality of their own data.
- There is a need to address concerns among utilities that they are providing confidential information which may be made public.
- There is a slow response to questionnaires and evidence of lack of commitment on the part of some utilities.

¹The benchmarking programme promoted by the World Bank has a larger spectrum and includes indicators not presented in this box. For additional information visit: <http://www.worldbank.org/html/fpd/water/topics/benchmarknetwork.html>

Source: (26)