



WATER AND SANITATION IN THE WORLD'S CITIES

LOCAL ACTION FOR GLOBAL GOALS



UNITED NATIONS HUMAN SETTLEMENTS PROGRAMME (UN-HABITAT)

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United Nations Human Settlements Programme
(UN-HABITAT)



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Foreword



The 20th century will be remembered for unprecedented technological advances, the acceleration of globalization and the urbanization across this planet. The closing years of the last century witnessed a slow but steady decline in the proportion of people living in extreme poverty, and several countries are now back on track to achieve universal primary education. Yet, despite these advances, at the start of the new millennium, over a billion of the world's people remain without access to safe drinking water and over twice that number are denied access to adequate sanitation.

World leaders meeting at the Millennium Summit and the following World Summit on Sustainable Development resolved to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. Achieving this goal will not be easy, given the mounting population pressures, rapid urbanization and ubiquitous resource constraints.

Unquestionably, the commitment of policy-makers to translate these global goals into country- and city-level goals and targets will be a necessary first step. The goals may be global in character but they must be implemented locally, where people live and where shelter and services are required.

Strong political leadership and support from national governments will be needed to turn things around. A stable policy environment will be essential to attract fresh investment in water and sanitation. And the urban poor, mostly living in slums and squatter settlements, should, unquestionably, receive the high priority regarding future investment that they deserve.

It will be equally important to put in place effective monitoring mechanisms that will allow the tracking of progress towards safe drinking water and basic sanitation. The global monitoring mechanisms currently available have proved to be incapable of capturing the real aspirations and needs at the local level. We need monitoring mechanisms that will allow local voices to be heard and their perceptions to be relied upon.

The timing of the UN-HABITAT report *Water and Sanitation in the World's Cities* could not be more opportune. The United Nations Millennium Project has just embarked on the identification of the best strategies for meeting the Millennium Development Goals and related targets. By the target year of 2015, nearly 60 per cent of the world's population will make cities their home. Meeting the rapidly growing urban demand for safe water and adequate sanitation facilities will be a daunting challenge. The analytical work in this report and its central finding – that local solutions are key to achieving global goals – should provide a valuable input to the work of the Millennium Task Force.

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Water and Sanitation in the World's Cities was prepared under the supervision of Kalyan Ray, Chief of Water, Sanitation and Infrastructure Branch. Key substantive support was provided by Graham Alabaster, Andre Dzikus, Brian Williams and Neeru Singh of the same branch.

An initial outline of the report was prepared by David Satterthwaite of the International Institute for Environment and Development (IIED) in close consultation with UN-HABITAT.

An annotated outline of the report was discussed in a Stakeholders' Consultation organized by UN-HABITAT during the first World Urban Forum held in Nairobi, Kenya, on 10 May 2002. The meeting was chaired by Sir Richard Jolly, Chairman of the Water Supply and Sanitation Collaborative Council, and was widely attended by expert delegates to the World Urban Forum, NGOs and representatives of external support agencies.

The preparation of the report was entrusted to IIED with David Satterthwaite and Gordon McGranahan acting as the main consultants and principal resource persons with support from Hannah Reid. They brought into this work strong personal commitment, extraordinary energy and a rare degree of professionalism to complete this report within an almost impossible deadline.

UN-HABITAT organized an Expert Group Meeting in Nairobi on 12–13 September 2002, to discuss the first draft of the report (Chapters 1–6) prepared by IIED. Experts attending the Meeting included: Jan G Janssens (the World Bank), Bernhard Griesinger (Organization of the American States), Sekou Toure, Henry Ndede and Gazoulit Kawtar (UNEP), Mario Vásconez (CIUDAD), Malick Gaye (ENDA-TM), Piers Cross and Japheth Mbuvi (Water and Sanitation Programme, East Africa), Pushpa Pathak (Water and Sanitation Programme, South Asia), Diana Lee-Smith (SIUPA-CIP), Professor R A Obudho (Nairobi University), Sunita Kapila and John D Skoda (Consultants), David Satterthwaite and Gordon McGranahan (IIED); from UN-HABITAT: Anna Tibaijuka, Daniel Biau, Nefise Bazoglu, Farouk Tebbal, Alioune Badiane, Iouri Moisseev, Andre Dzikus, Graham Alabaster, Brian Williams, Anne-Maj Lahdenpera, James Ohayo, Pireh Otieno, Junko Nakai and Kalyan Ray. Extensive comments and inputs were received from the experts which led to rewriting of several chapters and some reorganization of the report. Arthur McIntosh and K E Seetharam of the Asian Development Bank, Jamie Bartram of WHO, Sandy Cairncross of the London School of Hygiene and Tropical Medicine, Perween Rahman (Orangi Pilot Project-Research and Training Institute) and David Nilsson of Sida could not personally attend the EGM but offered their valuable comments and inputs to the report.

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List of Acronyms and Abbreviations

BOT	build-own-transfer
CBO	community-based organization
CEMIS	community-based environmental management information system
CEPAL	Comisión Económica para América Latina y el Caribe (UN)
CSO	civil society organization
DALY	disability adjusted life year
DHS	demographic and health survey
DSM	demand-side management
ENDA	Environment and Development Association
GDP	gross domestic product
IIED	International Institute for Environment and Development
IWRM	integrated water resource management
Ksh	Kenyan shillings
N\$	Nigerian naira
Na\$	Namibian dollars
NGO	non-governmental organization
OPP	Orangi Pilot Project (Pakistan)
PAHO	Pan American Health Organization
PLC	public limited company
PPP	public–private partnership
PRODEL	Programa de Desarrollo Local (Local Development Programme)
Rs	rupee
SEMAPA	Servicio Municipal de Agua Potable y Alcantarillado (Bolivia)
SEWA	Self-Employed Women’s Association (Ahmedabad)
Sida	Swedish International Development Cooperation Agency
SPARC	Society for the Promotion of Area Resource Centres
UN	United Nations
UNCHS (Habitat)	United Nations Centre for Human Settlements (Habitat) (<i>now</i> UN-HABITAT)
UN-HABITAT	United Nations Human Settlements Programme (<i>formerly</i> UNCHS (Habitat))
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
WHO	World Health Organization

Introduction

Water and Sanitation in the World's Cities is the first attempt by the United Nations Human Settlements Programme (UN-HABITAT) as the 'city agency' of the United Nations to monitor, analyse and report on a major area of the *Habitat Agenda*, namely 'Environmentally sustainable, healthy and liveable human settlements'.¹ It also responds to the need for international action to achieve Millennium Development Goal 7, specifically addressing two targets: to reduce by half the proportion of people without sustainable access to safe drinking water by 2015; and to achieve significant improvement in the lives of at least 100 million slum dwellers by 2020 (with a specific indicator on sanitation for slum dwellers).²

The report has four central themes:

- 1 The under-estimation by governments and international agencies of the number of urban dwellers who have inadequate provision for water and sanitation, and the very serious health consequences that inadequate provision brings for hundreds of millions of people.
- 2 The inadequacies in the attention given by governments and international agencies to this, although there are many examples of innovation and ingenuity from around the world which suggest that the barriers to improved provision are not so much technical or financial but institutional and political.
- 3 The need for improved provision for water, sanitation and drainage to be rooted in the specifics of each locality, including the needs and priorities of its citizens and the local and regional ecology.

- 4 The need for improved provision for water and sanitation to be within a 'good governance' framework; it is difficult to see how improvements can be made and good quality provision extended to low-income households without more competent city and municipal governments that work with and are accountable to their citizens.

On the first of these themes, hundreds of millions of urban dwellers have inadequate provision for water, sanitation and drainage, which contributes to very large disease burdens and hundreds of thousands of premature deaths each year. Less than half the population in most urban centres in Africa, Asia and Latin America have water piped to their homes, and less than one-third have good quality sanitation. Those living in large cities are generally better served than those in smaller urban centres. However, more than half the population in most large cities in sub-Saharan Africa, and many in Asia, still lack water piped to their homes and good quality toilets. Perhaps as many as 100 million urban dwellers world-wide have to defecate in open spaces or into waste paper or plastic bags ('wrap and throw') because there are no toilets in their homes and public toilets are not available, too distant or too expensive. Low-income urban dwellers are often paying high prices for very inadequate water provision – for instance, purchasing water from vendors at 2–50 times the price per litre paid by higher-income groups, who receive heavily subsidized water piped into their homes.

This raises the issue of why is this so, after 50 years of aid programmes, dozens of

official aid agencies and development banks and hundreds of international NGOs with programmes for water and sanitation? And why haven't the promises made by governments been met? In 1977, representatives from most of the world's governments committed themselves to ensuring that everyone would have adequate water and sanitation by 1990.

The problem is not necessarily one of governments lacking funds. In many cities and smaller urban centres, it is possible to improve provision for water and sanitation in low-income settlements while charging their inhabitants less than they currently pay for inadequate provision. This book describes the innovations and ingenuity of certain international agencies, national governments, local governments, non-governmental organizations and community-based organizations in different cities in terms of improving water and sanitation provision. These show that deficiencies in water and sanitation provision can be enormously reduced without a reallocation of national investments and international aid that is politically unfeasible. They show that the targets related to water and sanitation within the latest set of internationally agreed goals – the Millennium Development Goals – are feasible. The need to meet these targets is all the more pressing, given that so many international goals have not been met and another failure will discredit the making of such goals. But to achieve these goals requires a change in attitudes and approaches, especially in regard to urban areas. Many governments and international agencies have inadequate urban policies, based on inaccurate stereotypes about urban areas and those who live in them. They fail to recognize the scale of need in urban areas. They still think that virtually all poverty is located in rural areas. They also fail to support the kinds of local processes that can bring the needed improvements.

Governments and international agencies need to recognize that urban areas have particular needs for water and sanitation that are distinct from rural areas, and they also have particular advantages over rural settlements. It is still common for the same definition of what constitutes 'adequate' or 'improved'

access to water to be applied to all urban and rural areas. For instance, some governments classify everyone who has a water source within 200 metres of their home as having adequate provision for water, but having a public tap within 200 metres of your home in a rural settlement with 200 persons per tap is not the same as having a public tap within 200 metres of your home in an urban squatter settlement with 5000 persons per tap. Urban settlements with large numbers of people concentrated in small areas present particular problems for avoiding faecal contamination if there are no sewers or other means to remove household and human waste. Many urban households have so little space per person that there is no room to fit toilets into each person's home. But urban settlements also provide more opportunities for good quality provision for water and sanitation, because unit costs are generally lower and urban dwellers often have more capacity to pay.

It is difficult to reconcile definitions of 'adequate' water and sanitation provision from a health perspective with definitions that allow data on provision to be easily collected. It would be easy to meet international targets for improving water and sanitation provision if the definition of 'improved provision' were to be set too low. And in one sense, 100 per cent of urban (and rural) dwellers already have access to water and sanitation. No one can live without water. No city develops where there is no water. Virtually all livelihoods (and the economic activities that underpin them) also depend on water, directly or indirectly. Everyone has sanitation in the sense that they have to defecate; again, no one can live without doing so. The issue is not whether they have provision for water and sanitation, but whether they have adequate provision:

- Do they have water that can be safely drunk and used in food preparation (especially for infants and young children, who are particularly at risk from diarrhoeal diseases caught from contaminated food or water)?
- Do they have enough water for washing, food preparation, laundry and personal hygiene?

- Is getting sufficient water very expensive? If it is, this generally means less money for food in low-income households.
- Is getting water very laborious and time consuming? Water is very heavy to carry over any distance, and trips to and from water standpipes or kiosks often take up two or more hours a day.
- Is there a toilet in the home and a tap for hand-washing? If not, is there a well maintained toilet in easy reach? If this is a public toilet and there is a charge for using it, is it kept clean, can low-income households afford to use it and is it safe for women and children, especially after dark?
- Is there provision to remove human wastes and household wastewater?
- Are low-income areas protected against floods?

Any assessment of provision for water and sanitation has to be based on some implicit understanding or explicit definition of 'adequate'. In urban areas in high-income countries, 'adequacy' for water is considered as water that can be safely drunk piped into each home, distributed by internal plumbing to toilets, bathrooms and kitchens, and available 24 hours a day. 'Adequacy' for sanitation is at least one water-flushed toilet in each house or apartment, with a 24-hour guaranteed supply, a wash basin in the toilet or close by where hands can be washed, and facilities for personal hygiene – hot water and a bath or shower. And, of course, there must be an income level that allows all this to be paid for, or provisions to ensure supplies for those unable to meet their bills. If these are used as the criteria for 'adequate provision', as Chapter 1 describes, most of Africa's and Asia's urban population and much of Latin America's urban population have inadequate provision. Indeed, most have levels of provision far below this standard. In many urban centres in these regions, no one has this level of provision, because even piped water supplies to the richest households are intermittent and of poor quality. Most urban centres in Africa and Asia have no sewers, and in most of those that do, only a small proportion of the population is connected.

It can be argued that every urban dweller has a right to a standard of water and sanitation provision that matches the standards in high-income nations. Certainly, this level of provision produces the greatest health benefits. It virtually eliminates diarrhoeal diseases and many other water-related diseases as significant causes of death. As Chapter 2 describes, it brings many other benefits too – including improved nutrition and often higher real incomes and more employment opportunities for many of the poorest urban households. But it is unrealistic to set this standard in most low-income nations, since, with limited resources and limited institutional capacities, getting better provision for everyone is more important than getting very good provision for the minority. If the focus is on getting very good provision, the beneficiaries are likely to belong to the richer and more politically powerful groups.

If we take 'adequate' water to mean a regular piped supply available within the home or in the yard, at least half of the urban population of sub-Saharan Africa and Southeast Asia has inadequate provision (and perhaps substantially more than this). If we took 'adequate' sanitation to mean an easily maintained toilet in each person's home with provision for hand-washing and the safe removal and disposal of toilet wastes, a very large proportion of the urban population of sub-Saharan Africa (50–60 per cent?) and more than half of the urban population in most low-income nations in Asia and Latin America is likely to have inadequate provision. As examples in different chapters will show, public toilets can be 'adequate' in terms of cleanliness, accessibility and cost, but this is rare.

At present, there are no global figures for the proportion of the world's population or of each region's population that have adequate water and sanitation provision. The World Health Organization and UNICEF Joint Monitoring Programme for Water Supply and Sanitation (on whose work this book draws) can only give figures for the proportion with 'improved' provision, because of the lack of data on who has 'adequate' or 'safe' provision. As Chapter 1 describes in more detail,

'improved' provision can include water from public standpipes, boreholes and protected dug wells (with no guarantee that this water is safe to drink), provided that at least 20 litres per person per day is available from a source within 1 kilometre of the person's home. 'Improved' provision for sanitation can include shared pit latrines, with no guarantee that these are easily accessed or clean.

Table I.1 contrasts two different sets of estimates for the number of urban dwellers lacking water and sanitation provision in 2000. The first is based on the definition of 'improved' provision used by the above-mentioned Joint Monitoring Programme (because of the lack of data for measuring 'adequate' or 'safe' provision for most nations). The second set is based on the evidence presented in this book, drawing on all available city studies that have more detailed descriptions of the quality and extent of water and sanitation provision.

Most of the world's governments and international agencies have committed themselves to the Millennium Development Goals which arose from the United Nations Millennium Declaration adopted in September 2000. The most relevant of these for water and sanitation is Millennium Development Goal 7, addressing the following targets:

- Target 10: to halve, by 2015, the proportion of people without sustainable access to safe drinking water.

- Target 11: to achieve, by 2020, a significant improvement in the lives of at least 100 million slum dwellers.

The World Summit on Sustainable Development in 2002 added another relevant target:

- to halve, by 2015, the proportion of people who do not have access to basic sanitation.

If we apply these goals to urban populations, the scale of the funding needed to halve the proportion of urban dwellers who do not have safe drinking water and basic sanitation may be considerably under-estimated for two reasons. First, estimates for the funding needed may be based on large under-estimations as to the number of people lacking adequate provision. For instance, looking at Table I, if there are only 98 million urban dwellers in Asia in need of better water supply (as all but these have 'improved provision') the problem seems soluble financially. If there are 500 million urban dwellers in Asia in need of better water supply, because the 402 million urban dwellers who have 'improved provision' still have very inadequate provision, the picture changes dramatically. The second reason that the funding requirements for urban areas may be considerably under-estimated is the need for investment in infrastructure, facilities and institutions upstream of the pipes and

Table I Estimates as to the number of urban dwellers lacking provision for water and sanitation in 2000 based on who has 'improved' provision and who has 'adequate' provision

Region	Number and proportion of urban dwellers without 'improved' provision for: ^a		Indicative estimates for the number (and proportion) of urban dwellers without 'adequate' provision for: ^b	
	Water	Sanitation	Water	Sanitation
Africa	44 million (15 per cent)	46 million (16 per cent)	100–150 million (circa 35–50 per cent)	150–180 million (circa 50–60 per cent)
Asia	98 million (7 per cent)	297 million (22 per cent)	500–700 million (circa 35–50 per cent)	600–800 million (circa 45–60 per cent)
Latin America and the Caribbean	29 million (7 per cent)	51 million (13 per cent)	80–120 million (circa 20–30 per cent)	100–150 million (circa 25–40 per cent)

Sources: *a* WHO and UNICEF (2000), *Global Water Supply and Sanitation Assessment 2000 Report*, World Health Organization, UNICEF and Water Supply and Sanitation Collaborative Council, Geneva, 80 pages; *b* based on the evidence presented in Chapter 1.

downstream of the drains to allow better provision.

But estimates for the scale of external funding that is needed can also be over-stated because too little consideration is given to local resources, including the current or potential roles of investments made by households, communities and local governments. The extent to which unit costs can be reduced by community–non-governmental organization (NGO)–local authority (and/or local utility) partnerships can also be under-estimated, which in turn reduces the gap between good quality provision and what low-income households can afford. Many case studies in this book show the possibilities of much better provision financed by local resources.

This highlights another constraint – that the official development assistance agencies were not set up to support households, communities and local governments. Official bilateral aid programmes and multilateral development banks were set up to work with and through national governments. Most seek to support local governments, and some seek to support community initiatives or steer their funding through other institutions that can do this – but this represents a small part of their funding for water and sanitation, except in nations where national governments have supported this stance. And all official development assistance agencies have difficulties supporting a large and diverse range of ‘cheap’ initiatives by local authorities and NGOs because of the high administrative cost of doing so.

If the Millennium Development Goals of halving the proportion of people lacking adequate water and sanitation provision by 2015 are to be met, along with the goal to have achieved a significant improvement in the lives of at least 100 million slum dwellers by 2020, international agencies will need to develop a greater capacity to support good local governance and the investments and initiatives undertaken by households, communities and local governments. This inevitably means channelling more support to local governments that are committed to improving provision and less to local governments (or national governments) that are not. This can be awkward politically; it may mean some

redirection of funds away from some of the poorest nations because of their government’s lack of interest in improving water and sanitation provision and the local governance structures that this needs. It is also inconsistent with poverty reduction goals to penalize poor groups in nations that have unrepresentative and anti-poor governments. Here, international agencies need to consider how to support local initiatives directly, including those undertaken by community organizations, residents’ groups and local NGOs. This will usually require new funding channels and local institutions through which such funding is channelled. This is not incompatible with better local governance in that, as many examples given in Chapters 5 and 7 show, supporting representative organizations of the urban poor to develop better water and sanitation provision helps build good local governance from the bottom up.

There is also the need for improved provision for water, sanitation and drainage to be rooted in the specifics of each locality, including the needs and priorities of its citizens. Some of the most compelling evidence for the need for changed approaches in this book comes from interviews with low-income households. These reveal just how poor water and sanitation provision is, even when their settlement is officially classified as having ‘improved provision’ or even when the local authority reports that everyone has house connections. They raise issues that are rarely seen in technical discussions of water and sanitation – for instance, as shown by interviews with women in Pune and Mumbai that are reported in Chapters 1 and 2:

- The difficulties in getting water from public taps and of the conflicts that often occur at the tap, including the pressure from those in the queue behind you not to take ‘too long’ or take ‘too much water’.
- How heavy it is to fetch and carry enough water for domestic use to and from a standpipe, even if this is less than 100 metres away from one’s home.
- The indignity of having to defecate in the open and the sexual harassment that

women and girls suffer when having to do so.

- The opposition that people so often face collecting water from a standpipe in a neighbouring settlement (why are you using 'our tap'?).
- How disgusting it is to have to use public toilets that are not cleaned and well maintained, 'the insects that climb up our legs,' the need to use public toilets only once a day because low-income households cannot afford to use them more often, children's reluctance to use public toilets (for all the above reasons and because they have difficulty waiting in queues), and how dangerous public toilets can be for women and girls to use, especially after dark.

These are also a reminder of how progress towards more adequate water and sanitation provision in any city for those with low incomes is always a political struggle – as it was when provision improved so much in what are today the world's high-income countries. Most of the examples of better provision in this book arose because of government institutions responding to democratic pressures or through partnerships between water and sanitation utilities and communities, or through autonomous actions by community organizations which governments permitted (or at least did not prevent).

The need for improvements to be rooted in local realities is also important from an ecological perspective. This is particularly so in a world where fresh water is increasingly in short supply in more and more places, and where finite fresh water resources are often being over-used, depleted and polluted. City-based demands for fresh water by businesses and affluent residents should not over-ride the needs of other users (as they often do). But here, as in the other main themes of this book, this discussion is complicated by the great diversity of circumstances among the tens of thousands of urban centres around the world. Accurate generalizations are not easily found. Inaccurate generalizations abound. As Chapters 3 and 4 discuss, the inadequacies in water and sanitation provision in many cities

and smaller urban centres have nothing to do with a shortage of water resources in their regions. Most deficiencies in urban water and sanitation provision are caused by other factors. The amount of water required to achieve adequate water and sanitation provision is small compared with the demands associated with other uses of water. Urban centres in water-scarce regions can, and often do, make a special effort to improve residents' access to these scarce resources. What is perhaps more remarkable than water-scarce cities is the number of cities that have increased their population more than fiftyfold in the last century (and their draw on fresh water resources much more than fiftyfold) and still have not run out of water. Even some of the world's largest cities still meet their water needs from local sources.

One issue that falls under the discussion of the need for provision for water, sanitation and drainage to be rooted in the specifics of each locality is the need for less certainty by international 'experts' and agencies and more willingness to listen to those with inadequate provision and to support local innovation. As the issue of water scarcity has become more central to discussions both of environment and of development, so new generalizations are made and new policies are proposed by national governments and international agencies. There are lots of strong opinions about what should be done among politicians, senior staff from international agencies and national governments and 'experts', especially the experts who advise international agencies. Amongst most international agencies, priorities are set, policies are designed or changed, programmes are developed and projects set in motion with little or no consultation with those who suffer the worst water and sanitation provision.

In recent years, for example, increasing private sector involvement in water and sanitation utilities has been put forward as a widely applicable means of improving water and sanitation provision. As shown in Chapter 5, however, many of the most critical obstacles to improved provision persist when private sector participation increases, and in some circumstances privatization heightens (rather than

reduces) the political conflicts surrounding water and sanitation provision. Rapid and radical shifts in private sector involvement often provide little scope for measures promoting the interests of those without adequate water and sanitation. Also, the urban centres and neighbourhoods most in need of improvements in water and sanitation provision tend to be those that are least attractive to private investors and operators. Moreover, where the public sector lacks the will or capacity to provide urban water and sanitation, it often also lacks the will or capacity to regulate private provision effectively. In some circumstances, increasing private sector involvement may be an appropriate response to local water and sanitation problems. Much depends on local conditions, on the forms that private sector involvement actually takes, and on what else is being done to improve water and sanitation provision. It is not a 'solution' that should be promoted internationally in the name of those who currently lack adequate water and sanitation. As Chapter 7 emphasizes, the stress should be on getting the best out of public, private and community organizations.

Similarly, there is a great deal of discussion internationally of the need to take a more integrated approach to water resources management. Within this integrated approach, there is a tendency to view demand-side water management principally as a means of preventing water from being wasted. In many of the more deprived urban settlements, however, the major challenge is not to find new ways of saving water, but to find new ways of making more water available, and ensuring it is put to good use. As described in Chapter 6, demand-side management can also play a role here, but only if it is taken to include issues of sanitation, hygiene behaviour and giving deprived groups more influence over their own water and sanitation systems. So for demand-side water management, it is critical to adapt new approaches to local conditions, and to ensure that local voices – including especially the voices of those without adequate provision – are heard and have an influence.

Meeting the Millennium Development Goals for water and sanitation means that the

voices, opinions and priorities of slum and pavement dwellers in Indian cities, and the inhabitants of Humura in Nairobi and of some informal settlements in Cali that are reported in this book, get to influence the policies and practices of the international development agencies (as well as influencing their own local governments). There is a huge physical and institutional distance between decision-making structures in most international agencies and 'the poor', who are meant to be their clients but who have no formal channels to influence priorities and hold these agencies to account. But as Chapter 7 describes, there are some hopeful signs on this – international agencies who recognize the need for solutions to be developed within each local context in ways that ensure the solutions are influenced by those lacking adequate provision.

There is also the long established tradition among commentators on development issues and environment issues of judging urban areas as 'parasitic' or seeing them as 'places of privilege' to which fewer resources should be steered, including those needed to improve water and sanitation provision. This helps explain why water and sanitation provision in urban areas has received inadequate attention. It is common for judgements to be made about cities 'unfairly' drawing water from rural areas and damaging the rural ecology in doing so. There are certainly instances where such judgements are justified, but many specialists assume that this is the norm. It is not. And even where it does happen, it is rarely the city poor who benefit. There is an urgent need for more priority to be given to improving water and sanitation provision in urban areas, but this should not be at the expense of rural investments. Indeed, this book's claim that the inadequacies in water and sanitation provision in urban areas are under-estimated is likely to be valid for most rural areas too. And as Chapter 2 describes, there is no clear line between what is rural and what is urban. A sizeable proportion of the people with the world's worst water and sanitation provision live in settlements with between 1000 and 20,000 inhabitants. In some nations these are considered rural, in others urban. This suggests the need to consider water and

sanitation provision in rural and urban areas together. However, as noted above, for water, sanitation and drainage, most urban contexts are different from rural contexts because of the size and spatial concentration of the population and the number of non-agricultural enterprises – all of which need water and all of which produce wastewater. In a nation which defines urban areas as settlements with 2500 or more inhabitants, the best means of improving water and sanitation provision in ‘rural’ villages of 1000–2499 inhabitants may have much in common with improving provision in many market towns and agricultural service centres that have between 2500 and 10,000 inhabitants. But the means used for these villages and small urban centres will not have much in common with the means needed for a city of 1 million plus, or a metropolitan region of 10 million plus inhabitants.

The fourth central theme of this book is that deficiencies in water and sanitation provision in cities are often as much the result of inadequacies in the institutions with responsibilities for providing water and sanitation, and the governance structures within which they operate, as a lack of funds. This makes the task of improving provision more difficult. This helps explain why progress has been so limited. Unlike most subjects related to environment and development, there is very little disagreement about the need for better water and sanitation provision in Africa, Asia and Latin America. There may be disagreements about where the priorities should be (with many being anti-urban), about who the best providers are (public, private, community) and about the best technologies to use. But the need for better provision is very rarely questioned. In 2002, Nelson Mandela made the need for improved provision for water one of the central points in his speech to the World Summit on Sustainable Development. During the summit, *The Economist* emphasized that the need to help the world’s poorest secure safe drinking water and adequate sanitation was the least controversial of all the priorities discussed at the summit, and even used the image of someone drinking from a cup as its cover photo.³ But many of the same points

were made 26 years earlier at the UN Conference on Human Settlements in 1976 and at a subsequent UN Water Conference in 1977. Here too, there was a very firm and broad consensus among government representatives and staff from international agencies about the importance of better water and sanitation provision. In some key aspects, better water and sanitation provision in urban areas is also ideally suited to funding from international agencies, because well designed and managed systems need capital upfront (which is what most agencies provide) and then deliver their benefits over many years or even decades.

Good water and sanitation provision in cities needs competent city and municipal authorities that are accountable to their citizens and able to manage improved provision – whether as providers themselves or as the institution that provides the legal and regulatory framework for other providers (whether large-scale private, small-scale private, non-profit, NGO or community based). Most aid agencies and development banks backed away from large capital projects in urban areas during the 1980s because local governance structures proved unable to manage and maintain them. As a result, most such agencies now have ‘good governance’ programmes – although many still underestimate the importance of applying these to local governments. But supporting improvements in city and municipal governance is never easy for international agencies. These agencies were not set up to do so, and it can be difficult to promote such ends when their official counterparts, national governments, are reluctant to let local governments have the power, resources and fund-raising capacities they need to be effective. But in the end, it is difficult to see how most international goals and targets, including those directly or indirectly related to water and sanitation, can be met without more competent, effective, accountable local governments. The quality of local governments and their capacity to represent, support and work with their citizens has great relevance for the achievement of sustainable development, within which good quality water and sanitation provision is so important.

Notes and references

- 1 UNCHS (Habitat) (1997), *The Habitat Agenda*, HS/441/97E, UNCHS (Habitat), Nairobi, Chapter IV, Section C. Available at: www.unhabitat.org/unchs/english/hagenda/ch-4c-5.htm.
- 2 The Millennium Development Goals arose from the United Nations Millennium Declaration adopted by the United Nations General Assembly (the Millennium Assembly) in September 2000.
- 3 *The Economist*, 31 August 2002, page 66.

CHAPTER



Provision for Water and Sanitation in Cities



Introduction

This chapter reviews the quality and extent of provision for water and sanitation in urban areas. It highlights how the inadequacies in provision in much of Latin America and Asia and most of Africa are much worse than most international statistics suggest. As such, they are key contributors to poverty and premature death. It also highlights how too little attention is given to sanitation. Many people still assume that clean water is the main issue, as can be seen in international conventions and declarations that forget to mention sanitation. It must be remembered that human excreta is extremely dangerous unless disposed of safely. Where provisions for water and sanitation are inadequate, the diseases that arise from faecally contaminated food, water and hands are among the world's leading causes of premature death and serious illness; such diseases also contribute much to under-nutrition, as diarrhoeal diseases and intestinal parasites rob people's bodies of nutrition. Good provision for sanitation should virtually eliminate these health burdens.

This chapter is also about definitions. Less than half of the urban population of Africa, Asia and Latin America has adequate provision for water and sanitation. Yet 85 per cent of the urban population in these same regions has 'improved' water and 84 per cent has 'improved' sanitation. Both of these statistics are correct; the statistical evidence for both is robust. Here, we explain how this is possible and the important differences between

what is defined as 'improved' provision and what is considered 'adequate' or 'safe' provision. 'Improved' provision for water is often no more than a public tap shared by several hundred people with an intermittent supply of water. 'Improved' sanitation is often no more than a latrine, to which access is difficult, shared among many households.

This chapter also makes clear why it is so difficult to reach low-income groups in urban areas with good quality provision for water and sanitation. Most of the world's urban population lives in low- and middle-income nations in Africa, Asia and Latin America and the Caribbean. A significant proportion of these people have incomes that are so low that they can afford no more than US\$0.01–US\$0.05 a day on water and sanitation. If piped water is not available at this price, they will use any other available water source that is cheaper or free (for instance, drawing from polluted and faecally contaminated lakes, rivers or shallow wells). Tens of millions of urban dwellers defecate in the open or into plastic bags or waste paper (what is often termed 'wrap and throw') because they have no toilet they can use. Many such people live in such cramped conditions (5–6 persons in a small room) that there is no room in their homes for toilets. Many are tenants and their landlords make no provision for sanitation in the rooms they rent. This is the challenge facing governments and international agencies intent on improving provision.



Judging who has adequate provision

Official statistics on provision for water and sanitation suggest that it is only a minority of urban dwellers who are unserved, even in low-income nations in Africa, Asia and Latin America. For instance, even in Africa, by the year 2000, 85 per cent of the urban population had 'improved' provision for water and 84 per cent had 'improved' provision for sanitation. The total number of urban dwellers worldwide lacking improved provision by the year 2000 (173 million for water, 403 million for sanitation) is obviously a serious problem, but greatly reducing this should be relatively easy, given that urban centres concentrate people in ways that usually reduce unit costs for improving provision. Much of the urban population is willing and able to pay for improved provision. Problems seem much more serious in rural areas, where most of those lacking improved provision live. Indeed, if international commitments to halve the proportion of people lacking water and sanitation by 2015 are to be met, this would imply giving priority to rural areas.

But what if the hundreds of millions of urban dwellers who are said by government statistics or household surveys to have improved provision for water and sanitation still have very inadequate provision, which also means very large health burdens from water-related diseases? This chapter seeks to demonstrate that this is the case and to present the evidence for this. It is not claiming that the official statistics are wrong, but it is suggesting that most governments and international agencies misinterpret these statistics and, in so doing, give a false impression of the extent of provision for water and sanitation in urban areas. It also suggests that new benchmarks need to be set to monitor global trends on provision for water and sanitation in urban areas.

Everyone has access to water in some form since no one can live without water. The issue is not whether they have access to water but whether the water supplies are safe, sufficient for their needs, regular (for instance available 24 hours a day and throughout the

year), convenient (for instance piped to their home or close by) and available at a price they can afford. Similarly, for sanitation, everyone has to make some provision for defecation, even if this is defecating on open land or into an open drain (as is the case for tens of millions of urban dwellers). The issue is not whether they have provision for sanitation but whether they have a quality of provision that is convenient for all household members (including women and children), affordable and eliminates their (and others') contact with human excreta and other wastewater (which may also be contaminated with excreta) within the home and the wider neighbourhood. If households do not have toilets in the home, do they have access to toilets close by that are well maintained, affordable and accessible without queues? Are there toilets that children are happy to use? As Chapter 2 will describe, children are frightened to use many toilets. If the toilets are not connected to sewers, there is also the issue of what happens to the excreta (for instance, is it polluting groundwater or going into open drains?) and also the provision for the disposal of households' wastewater. If they are connected to sewer systems, there is the issue of whether the outputs from these systems are polluting other people's waters.

Thus, any assessment of provision for water and sanitation (in cities, smaller urban centres or rural areas) has to begin with a definition of 'adequate provision' against which to compare actual provision. In high-income nations, the need for all urban households to have water piped to their home that is safe (ie drinkable) and regular (available 24 hours a day), internal plumbing (so piped water is available in bathrooms, kitchens and toilets) and their own sanitary toilet within the house or apartment (usually connected to sewers) is unquestioned. These expectations can be used as the standards. Virtually all urban dwellers in high-income nations live in houses, apartments or boarding houses that meet these standards. These standards may also be set and achievable in well-governed cities in middle-income nations, as demonstrated by cities such as Porto Alegre¹ and Seoul.² These are good standards too from a public health

viewpoint, as will be elaborated later in this chapter and in Chapter 2. They are also the standards preferred by households so long as they are not too expensive, because they eliminate a lot of hard work and drudgery fetching and carrying water and getting rid of human wastes and wastewater. But by these standards, most of the urban population in Africa and Asia and much of the urban population in Latin America and the Caribbean have inadequate provision both for water and for sanitation. Indeed, large sections of the urban population in these regions have levels of provision that are nowhere near this standard. Hundreds of millions of people only have unsafe and inconvenient water sources, compete with hundreds of others to get water from distant standpipes, have to share dirty, poorly maintained toilets with dozens of other people, or have no toilets at all within the home. This fact will surprise no one who works in cities and smaller urban centres in these regions but it does seem to contradict the official international statistics on provision for water and sanitation, which suggest that it is only a minority of urban dwellers that lack provision.

But there is a danger in setting the standards for adequate provision too high. In any city or smaller urban centre where large sections of the population have very inadequate provision (and low incomes), and where there are limited resources available for improving provision, setting too high a standard could work to the disadvantage of those with the worst provision. It could mean that all available resources go to providing a small proportion of the population with high standards – and of course, it will generally be the higher-income groups and those with greater political muscle who benefit from this. In such circumstances, it can be argued that the priority should be to ensure that everyone has improved provision, with higher standards provided to areas of the city where the inhabitants are willing and able to pay the full cost of this. From a public health perspective or a poverty reduction perspective, it is better to provide a whole city's population with safe water supplies by means of taps within 50 metres of their home than to provide only the

richest 20 per cent of households with water piped to their homes.

But care needs to be taken in setting lower standards. Set the standards too low and the problem appears to disappear. A survey that asks households whether they have access to piped water can find that most say yes, whereas a more detailed set of questions about whether they have safe, sufficient, convenient, affordable water supplies produces very different results. Obviously, there is little point in ascertaining the proportion of people whose homes are connected to a piped water system if there is no water in the pipes (which is the case for many urban households). The value of piped water supplies is also diminished if water is only available irregularly and the quality of the water in the pipe is very poor. One-third of the urban water supplies in Africa and in Latin America and the Caribbean and more than half of those in Asia operate intermittently, and many do not disinfect their water.³ The problems of intermittent supplies are particularly serious in many cities in North Africa and the Middle East.⁴

Assessments of provision for water and sanitation are complicated when water piped to the home and internal plumbing and sanitary toilets in each housing unit are not the norm. If a lower standard than 'water piped to the home' is set, then 'adequate provision' has to consider not only whether a household has a water source close by but the regularity of the water supply and issues of water quality and price. For urban settings, consideration must be given to ease of access as well as distance, since being within 100 metres of a single public tap may be adequate in a small settlement but very inadequate in a high-density settlement, as hundreds of people compete for access to it. Interviews with low-income dwellers often reveal difficulties that external agencies do not anticipate: the need to queue for two hours or more to get enough water; the difficulty in getting enough water from a standpipe for household needs, because of pressure from others in the queue not to take too much; the unreliability of supplies to the standpipes (water is often available for only a few hours a day) and low water

pressure, both of which act to increase waiting times; and the physical effort needed to fetch and carry water from distant standpipes or other sources.

In addition, households that lack convenient access to good quality and reasonably priced water supplies often rely on multiple sources – for instance, getting (expensive) water from vendors for drinking and cooking, and using (cheaper) river or well water for laundry and washing. It is difficult to develop common standards for such varied sources. Other issues such as seasonal variations in quality or reliability also have to be considered.

Similarly, for sanitation, if ensuring provision for all households of a sanitary, easily cleaned and maintained toilet inside their house, apartment or shack is unrealistic, consideration needs to be given to how to ensure access to shared, community or public facilities that are close, easily accessed, cheap and clean. Assessments of 'adequacy' should pay attention to whether there is adequate provision for disposing of excreta, wastewater and storm and surface run-off. Similarly, assessments should include some consideration of health behaviour, since reducing the incidence of diseases caused by human excreta (the so-called 'faecal–oral' diseases, of which diarrhoeal diseases are the most common) depends not only on the availability of water and sanitation but on hand-washing and personal hygiene.

It is clear from many case studies that public, communal or shared toilets are important for large sections of the urban poor in many nations. Yet there is surprisingly little discussion of these in the general literature on water and sanitation. Particular care is needed in assessing whether public, communal or shared provision of toilets is adequate. Urban populations with communal or public toilets close by may be assumed to be adequately served when large sections of the urban population do not use them – for instance, because parents do not have time to accompany their children and young girls to these toilets (and of course young children have great difficulty in waiting and queuing), or because women and children are afraid to visit them, especially after dark. Few official studies of

provision for water and sanitation acknowledge the high proportion of people who defecate in the open in many urban centres in Africa and Asia, and the particular problems that women and girls face in terms of harassment and sexual abuse as a result of doing so.



Setting standards

Perhaps the most relevant basis for setting standards for water and sanitation provision is the extent to which provision reduces the very large health burden that arises from inadequate provision. Chapter 2 documents just how large this health burden is and how it is difficult for those who do not experience it to recognize its significance and its contribution to poverty. Non-health criteria for provision are also important – for instance, price and convenience – but these are partially covered by a focus on reducing health burdens, in that high prices and inconvenient supplies lead to lower levels of water use that are then reflected in higher health burdens. Of the many diseases associated with inadequate water and sanitation, the faecal–oral diseases are among the most significant in terms of health impact (although there are many other important diseases related to inadequate provision: see Chapter 2 for more details). Figure 1.1 illustrates how the risks of human contamination from faecal–oral diseases vary with different levels of provision for water, sanitation and hygiene. This illustrates the difficulty of setting appropriate benchmarks for assessing the provision for water and sanitation, since – even if we ignore the variation at each level – it is unclear where within Figure 1.1 to draw the line between 'adequate' and 'inadequate' provision.

The dividing line between those who have adequate provision and those who do not could be set close to the top of this figure, so that those who have access to shared standpipes and pit latrines are classified as adequately served – but as the figure suggests, the risk of human contamination from faecal–oral pathogens with this level of provision remains very high. This dividing line does not measure who has safe water, or who has sufficient provision for water, or who has safe sanitation. The dividing line can be set right at the bottom