



WATER AND SANITATION IN THE WORLD'S CITIES

LOCAL ACTION FOR GLOBAL GOALS



UNITED NATIONS HUMAN SETTLEMENTS PROGRAMME (UN-HABITAT)

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(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.

Anna Kajumulo Tibaijuka

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Executive Director, UN-HABITAT*

A handwritten signature in blue ink that reads "Anna Kajumulo Tibaijuka". The signature is written in a cursive, flowing style.

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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 Tibajuka, 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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Contents

<i>Foreword</i>	<i>v</i>
<i>Acknowledgements</i>	<i>vii</i>
<i>List of Figures, Tables and Boxes</i>	<i>xiii</i>
<i>List of Acronyms and Abbreviations</i>	<i>xvi</i>
Introduction	xvii
Notes and references	xxv
1 Provision for Water and Sanitation in Cities	1
Introduction	1
Judging who has adequate provision	2
Setting standards	4
The lack of data	6
Provision for water and sanitation in each of the world's regions	8
The regions where provision needs the greatest improvements	12
Provision for water and sanitation in urban areas of Asia	12
Provision for water and sanitation in urban areas of Africa	21
Changes in provision for water and sanitation in urban areas of East Africa	24
Provision for water in Africa's larger cities	27
Provision for sanitation in Africa's larger cities	30
Provision for water and sanitation in urban areas of Latin America and the Caribbean	31
The special problems of smaller cities and towns in low-income countries	39
Provision for water and sanitation	39
Rural versus urban areas	48
Notes and references	50
2 The Impacts of Deficient Provision	57
Introduction	57
The health impacts of inadequate provision for water and sanitation	57
Overall impacts	57
Reinforcing inequality, poverty and destitution	61
Water consumption	66
Monetary costs of water and sanitation	66
Time spent getting water	71
Time and money lost to water-borne and other water-related diseases	72
Impacts on infants and children	73
Health burden for children	74
Children's vulnerabilities	76
The impacts for mental and social development	77
What matters for children with regard to water and sanitation?	78
Quantity and accessibility versus quality	78
Storing water	78
Sanitation	79
Drainage and waste collection	80
The quality of care and hygienic practices	80

X

Vulnerability and susceptibility	82
Women	84
Renters	91
Restricting economic development	91
Improved provision for water and sanitation and poverty reduction	92
Notes and references	93
3 Explaining Deficiencies in Urban Water and Sanitation Provision	101
Introduction	101
Proximate causes	104
Illegal status of many settlements	104
Community capacity to develop autonomous solutions	105
Household capacity to pay	106
Contributory causes	107
The weakness/incapacity of local utilities	107
Rapid population growth	108
The expansion of urban and city populations	108
Patterns of growth and change in the distribution of the world's urban population	110
What role for water within urban change?	112
War and civil conflict	113
Weak city and municipal government	113
The developmental role of local government	113
The weaknesses in local authorities	114
Underlying causes	117
The lack of international funding for investment in water and sanitation in urban areas	118
The 'lack of development'	120
The political under-pinning of good provision for water and sanitation	123
Conclusions	125
Notes and references	125
4 Increasing Water Stress and How it Relates to Urban Water and Sanitation Provision	129
Introduction	129
Global trends and increasing water stress	129
Predicting a global crisis	130
Indicators of regional water stress	131
Local variation and boundary issues	132
Temporal variation and seasonal issues	132
Adaptability and comparability issues	132
Accessibility and economic capacity issues	132
Unaccounted-for water	132
Regional water stress and its consequences for urban water and sanitation provision and health	134
Comparing statistics on water stress and water access	136
Water stress, sanitation and health	137
Urban development and its contribution to water stress	139
Urban water demand	140
Water pollution	142
Structural transformations	144
Disasters and water and sanitation	146
Floods	146
Other kinds of disaster	148

Defining disasters	149
Causes of disasters	150
Understanding disaster risks in cities	150
The growing number of water-related disasters	151
Keeping track of urban disasters in Latin America and the Caribbean	152
Notes and references	154
5 Changing Perspectives and Roles in Urban Water and Sanitation Provision: Privatization and Beyond	158
Introduction	158
Evolving international perspectives on water and sanitation	159
The increasing role of the private sector in water and sanitation utilities	162
Defining privatization, private sector participation and public-private partnership	162
Conceptual issues in the privatization debates: public goods, economic goods, natural monopolies and human rights	163
Public goods and the case for public provisioning	164
Economic goods and the case for private provisioning	165
Natural monopolies and the case for regulation	166
Human rights and the case for public accountability	167
Different forms of private sector participation in water and sanitation utilities	168
Service contract	169
Management contract	169
Affermage contract	169
Lease contract	169
Concession contract	169
BOT (build-own-transfer) contracts	170
Full privatization (divestiture)	170
Joint ventures, public water PLCs and cooperatives	170
Multi-utility contracts	170
What drives the public sector to involve private enterprises?	171
What drives the private sector to participate?	171
The bidding process and renegotiations for large contracts	172
Private participation and finance	173
Regulation of private water and sanitation enterprises	174
Privatization and measures for pro-poor provision	176
Trends in private sector participation in water and sanitation utilities	177
The role of small-scale providers	181
The role of CSOs	184
Notes and references	189
6 Improving Urban Water and Sanitation Provision as part of Integrated Water Resource Management	193
Introduction	193
IWRM	194
Urban demand-side water management as part of IWRM	196
Managing demand to save water without compromising on water services	198
Raising awareness of water and sanitation through public campaigns	202
Target audiences for campaigns	202
Campaign launch and duration	204
Managing demand to improve public health	206
Managing demand to increase economic efficiency and affordability	209

Managing demand to empower deprived communities	214
Combining demand-side strategies and serving the urban poor	218
Notes and references	222
7 Governance for Good Water and Sanitation Provision: Getting the Best Out of Public, Private and Community Organizations	224
Introduction	224
The role of city governments	224
From improved government performance to good governance	229
Towards more effective approaches	231
Governance for small urban centres	240
Better governance and mechanisms for extending provision to unserved or inadequately served households	241
Community upgrading	243
Supporting new homes with provision	245
Better governance and the performance of water and sanitation utilities	249
Better governance and integrated water resource management	250
Developing strong local information systems	251
International support for better local governance for water and sanitation	254
Water and sanitation and the Millennium Development Goals	258
Notes and references	261
<i>Index</i>	<i>265</i>

List of Figures, Tables and Boxes



Figures

1.1	How the risk of transmission of faecal–oral pathogens varies according to the quality of provision for water, sanitation and hygiene	5
1.2	Water in the home for different size classes of cities	41
1.3	Flush toilet for different size classes of cities	41
2.1	Regional differentials in average health burdens from diarrhoeal diseases	62
2.2	Comparing provision for water and sanitation between the poorest and the wealthiest 20 per cent in Accra, Jakarta and São Paulo	64
2.3	Variations in average water tariffs for selected Asian cities	68
2.4	The very large variations in the cost of water from different providers in different cities	70
2.5	Proportion of selected Asian city populations served with public taps and number of persons per tap	73
3.1	Examples of the range of proximate, contributory and underlying causes for the prevalence of diarrhoeal diseases in a squatter settlement	102
3.2	Infrastructure expenditure per person in 1990 (selected cities)	115
3.3	Annual investment in urban water supply by region, 1990–2000	119
3.4	Annual investment in urban sanitation by region, 1990–2000	119
3.5	The percentage of urban populations in Latin American nations with house taps in relation to their national per capita incomes, 2000	120
3.6	The percentage of urban populations in Latin American nations with sewer connections in relation to their national per capita incomes, 2000	121
3.7	The percentage of households in selected Asian cities with household connections for water (circa 1995) in relation to their nations' per capita income, 2000	122
3.8	The percentage of households in selected African cities with household connections for water in relation to their nations' per capita income, 2000	123
4.1	World map of projected water scarcity in 2025	133
4.2	Relationship between urban water access, national water stress and national GDP per capita	136
7.1	Management of water and sanitation	230
7.2	Elements of good governance for water and sanitation	230
7.3	Schematic representation of how provision for water and sanitation often varies in smaller urban centres with increasing population and increasing wealth in low- and most middle-income nations	241
7.4	The many factors that help support more effective action by local governments to improve provision for water and sanitation	257



Tables

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	xx
1.1	The proportion of urban populations with access to 'improved' water supply and sanitation, 2000	9
1.2	The proportion of households in major cities connected to piped water and sewers	9
1.3	Proportion of the urban population in Asian nations with access to improved water supply and sanitation	12
1.4	Provision for water supplies in Asian cities, mid-1990s	13
1.5	Water availability and cost in Asian cities, mid-1990s	21
1.6	Proportion of the urban population in African nations with access to improved water supply and sanitation, 2000	22
1.7	Africa: provision for water in the largest cities within each nation, 2000	28
1.8	Africa: provision for sanitation in the largest cities within each nation, 2000	29
1.9	Proportion of the urban population in nations in Latin America and the Caribbean with access to 'improved' water supply and sanitation, 2000	32
1.10	Provision for water to households in selected Latin American cities	36
1.11	Provision for sanitation to households in selected Latin American cities	37
1.12	The distribution of the urban population between different size urban centres, 2000	40
1.13	Coverage of basic services in five 'secondary cities' in Nicaragua, 1995	47
1.14	Provision for water and sanitation in selected smaller cities in Latin America	48
2.1	Examples of water- and sanitation-related diseases and the aspects of inadequacy that are linked to them	58
2.2	Potential reductions in morbidity for different diseases as a result of improvements in water supply and sanitation	62
2.3	Aspects of inequality in provision for water and sanitation	63
2.4	Provision for water and sanitation among different socio-economic classes in Bangalore	65
2.5	Predicted percentage of households with access to water on the premises and flush toilets by relative poverty status	66
2.6	The very large variations in the cost of water in cities	69
2.7	Examples of differentials in the price of water within cities	71
2.8	The cost of water from house connections, public taps and water vendors in Asian cities	71
2.9	Monthly expenditure on water: shack dwellers in Namibia	72
2.10	Mortality rates for infants and young children in the informal settlements of Nairobi	75
2.11	Loss in the time of cholera; Peru, 1991	92
3.1	The range of causes contributing to inadequate water and sanitation in urban areas	103
3.2	The distribution of the world's urban population by region, 1950–2010	110
4.1	Water withdrawals by sector and region (combines various recent years)	140
4.2	Global water withdrawals and consumption by sector	140
4.3	The impact of flood disasters by region and by human development score	147
5.1	Allocation of key responsibilities for private participation options	169
5.2	Investment in water and sanitation infrastructure projects with private sector participation (US\$ billions)	178
5.3	Private water and sanitation projects in selected regions, 1990–1997	179
5.4	Investment in water and sewerage projects in selected countries, 1990–1997	179
5.5	Contract types for water and sewerage projects 1990–1997 in low- and middle-income countries	180
5.6	Dominant private companies in the water and sewerage sector	180
6.1	A typology of participation in water and sanitation provision	215
6.2	Comparing different approaches to demand-side water management in the household sector	219
7.1	Addressing the underlying, contributory and proximate causes of inadequate provision for water and sanitation in urban areas	234
7.2	Main aspects of different management options for water supplies in small urban centres	242

7.3	Comparison of the cost of land purchase, individual water and sanitation connections and gravel roads between municipal development and community development	247
7.4	Different estimates as to the number of urban dwellers lacking provision for water and sanitation in 2000	258



Boxes

1.1	The many complications in determining whether provision for water and sanitation is adequate	7
1.2	Examples of the inadequacies in cities' water supply and sanitation in Asia	15
1.3	Provision for water and sanitation in Mumbai; interviews with inhabitants of Dharavi in July 2002	19
1.4	Examples of the inadequacies in cities' water supply and sanitation in Africa	23
1.5	Provision for water and sanitation in Huruma in Nairobi	27
1.6	Examples of the inadequacies in cities' water supply and sanitation in Latin America and the Caribbean	33
1.7	Struggles for water and sanitation in Latin American cities	35
1.8	The availability of water in the home and flush toilets in rural areas and urban areas by size class	41
1.9	Differences in provision for water and sanitation by the population size of the urban centre in Brazil	42
1.10	Examples of provision for water and sanitation in small African urban centres	43
1.11	The deterioration in the quality of municipal water supplies in Iganga (Uganda)	44
1.12	Examples of water and sanitation provision in smaller urban centres in India	45
1.13	Provision for water and sanitation in three small urban centres in China	46
2.1	The global burden of disease from water, sanitation and hygiene	61
2.2	Examples of differentials in water volumes used	67
2.3	Managing children's faeces in Lima	80
2.4	The informal settlement of Banshighat in Kathmandu	82
2.5	Women from Pune talk about the difficulties they face with water and sanitation	86
3.1	Reaching the poor in urban areas of Bangladesh	107
3.2	The constraints on extending water and sanitation in Bangalore	116
4.1	Guadalajara's water crisis	135
4.2	Floods and landslides in Vargas, Venezuela	149
5.1	The Dublin Principles	161
5.2	Community-managed water provision: the politics and the pipes	186
5.3	El Mezquital: a community's struggle for development	188
6.1	Value-based approach to water education	201
7.1	The use of untreated urban wastewater in agriculture in low-income nations	226
7.2	Community toilets in Pune and other Indian cities	232
7.3	Beyond pilot projects: the work of Orangi Pilot Project	236
7.4	Building water and sanitation provision from the bottom-up in Luanda	238
7.5	Urban sanitation micro-enterprises: the UN-HABITAT Vacutug Development Project	240
7.6	Water supply in Ananthapur, India	243
7.7	The experience of the Local Development Programme (PRODEL) in Nicaragua	245
7.8	People-managed resettlement programmes in Mumbai	246
7.9	Community development in Namibia	247
7.10	Community-managed housing development by the South African Homeless People's Federation	248
7.11	Quito's water conservation fund: pooling demand for watershed services through trust funds	252
7.12	Empowering communities to generate their own information system: CEMIS	254
7.13	Replicating the Rufisque experience through the Water for African Cities Programme	256
7.14	The Managing Water for African Cities Programme	259

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