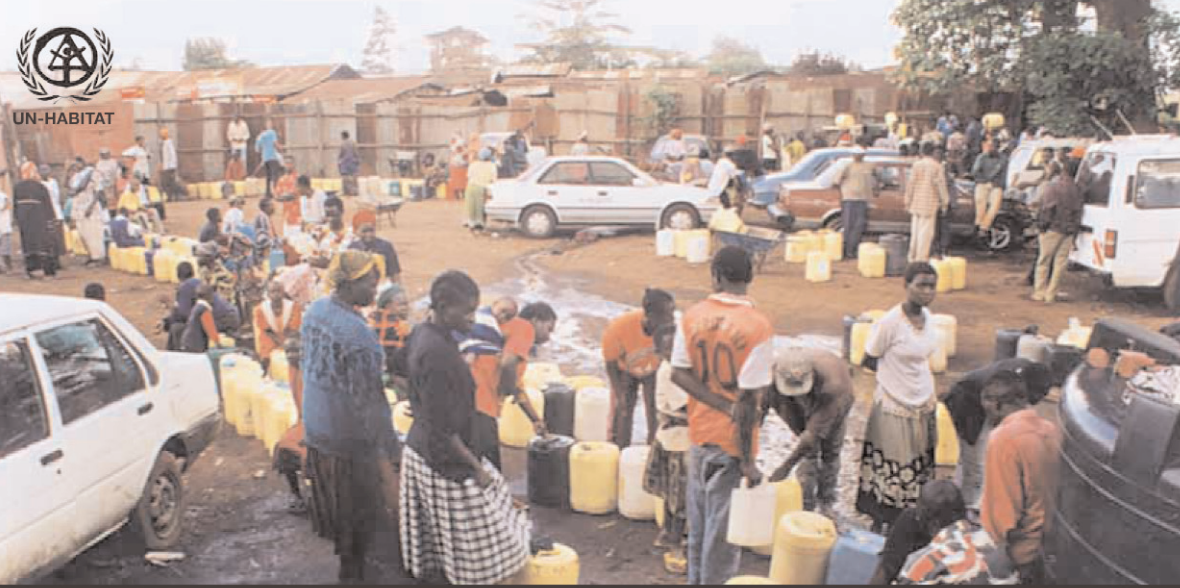




UN-HABITAT



MEETING DEVELOPMENT GOALS IN SMALL URBAN CENTRES

WATER AND SANITATION IN THE WORLD'S CITIES 2006



UNITED NATIONS HUMAN SETTLEMENTS PROGRAMME

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IN SMALL URBAN CENTRES**
WATER AND SANITATION IN THE WORLD'S CITIES
2006

United Nations Human Settlements Programme



UN-HABITAT

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FOREWORD



At their core, the Millennium Development Goals are all about bringing the vast majority of the world's population out of a poverty trap that robs them of their health, dignity and aspirations for fulfilling their human potential. While poverty is the underlying theme of all Millennium Development Goals, water and sanitation provide a strategic entry point for action in battling poverty and achieving these goals.

Human settlements provide a concrete context for this action. The struggle for achieving the Millennium Development Goal and related targets for water and sanitation are being waged in our cities, towns and villages, where water is consumed and wastes generated. Here is where the actions have to be coordinated and managed. It is at this level that policy initiatives become an operational reality and an eminently political affair: conflicts have to be resolved and consensus found among competing interests and parties.

As this publication highlights, by the year 2000, around a quarter of the world's population, nearly 1.5 billion people, lived in small urban centres, with less than half a million inhabitants. Characterized by rapid unplanned growth, high concentration of low-income population, run-down and often non-existent basic infrastructure, most of these small urban areas serve as market centres for their rural hinterland, strengthening rural-urban linkages and contributing to national economy. Often located on trading routes, these small urban centres experience huge population influxes during the day. Local authorities have little capacity to manage these influxes and their effect on urban service provision.

If these trends are allowed to continue, the rapidly growing small urban settlements may pose a major challenge to achieving the Millennium Development Goal for water and sanitation. *Meeting Development Goals in Small Urban Centres: Water and Sanitation in the World's Cities 2006* provides a timely assessment of the developing crisis, identifies the key challenges to reaching the goal and provides the key elements of a strategy for putting in place the needed pro-poor governance frameworks and financing water and sanitation in small urban centres.

While fresh investments and building capacity at local levels would be crucial to achieving the committed goal and targets in the small urban centres, a new emphasis on participation and partnership would be needed to sustain the results beyond the MDG target years.

I trust that this publication will help to bring a renewed awareness on the needs of small urban centres and their role in achieving the Millennium Development Goals.

A handwritten signature in blue ink, reading "Anna Kajumulo Tibaijuka". The signature is fluid and cursive, written in a professional style.

Anna Kajumulo Tibaijuka

Under-Secretary-General and Executive Director
United Nations Human Settlements Programme (UN-HABITAT)

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The Water and Sanitation in the World's Cities series, published every three years, was mandated by UN-HABITAT Governing Council Resolution 19/6, adopted on 9 May 2003, following the publication of *Water and Sanitation in the World's Cities: Local Action for Global Goals* in March 2003.

The production of *Meeting Development Goals in Small Urban Centres: Water and Sanitation in the World's Cities 2006* was funded by the Water and Sanitation Trust Fund of UN-HABITAT, currently supported by the Governments of Canada, the Netherlands, Norway and Sweden.

The report was prepared under the overall substantive guidance of Kalyan Ray, Officer-in-Charge of Water, Sanitation and Infrastructure Branch. Graham Alabaster and Iole Issaias of the Branch provided substantive management support in the preparation of the document.

The preparation of the report was entrusted to the International Institute for Environment and Development (IIED) with David Satterthwaite and Gordon McGranahan acting as the main consultants. Sida and DANINDA provided additional support to IIED in preparing this report. The report would not have been possible without the dedication, commitment, professionalism and passion which David and Gordon demonstrated in its preparation.

The report benefited from a number of consultations attended by eminent researchers, practitioners and policy-makers. In early 2005, an outline of the report was prepared by David Satterthwaite of IIED and in June 2005 the first expert group meeting took place in London to review the annotated outline. Participants in this expert group included Albert Wright (UN-HABITAT consultant), David Satterthwaite and Jessica Budds (IIED) and Kalyan Ray, Graham Alabaster and Andre Dzikus from UN-HABITAT. A number of contributors were identified at the consultation for preparing background papers for the report.

The commissioned papers included: (a) 'Water Supply and Sanitation Options for Small Towns and Large Villages in Developing Countries' by Duncan Mara (Leeds University); (b) 'Analysis of Donor Flows to Water Supply and Sanitation Services' by Rachel Cardone (independent consultant); (c) 'Experiences in Innovation: Financing Small Town Water Supply and Sanitation Service Delivery' by Rachel Cardone and Catarina Fonseca (IRC); (d) 'Operationalizing Water Sector Reforms at the Local Level: The Kenyan Experience' by Patrick Ombogo (Lake Victoria South Water Service Board, Ministry of Water and Irrigation, Kenya); (e) 'Enhancing Service Delivery in Water and Sanitation: The Case of Nyeri, Kenya' by Simon Thuo (Nile Basin Initiative); (f) 'Measuring Access to Water and Sanitation: Universal and Local Indicators' by Lucy Smith (London School of Hygiene and Tropical Medicine), with inputs from Kristof Bostoen (London School of Hygiene and Tropical Medicine) and Rolf Luyendijk (UNICEF); (g) 'Integrated Water Resource Management and the Provision of Water Supply and Sanitation in Africa, Asia and Latin America' by Jessica Budds (IIED Consultant); (h) 'Pro-poor Water Governance and Local Water Conflicts' by Rose Osinde (Bradford Centre for International Development); (i) 'A Review of Case Studies on Small Urban Centres in America' by Jojo Hardoy (IIED-America Latina); (j) 'The Links between Improved Water and Sanitation Provision and Local Economic

Development in Small Urban Centres’ by Cecilia Tacoli (IIED, London); (k) ‘A Review of French Language Literature on Water and Sanitation on Smaller Urban Centres in Sub-Saharan Africa and Elsewhere’ by Jonathan Rutherford (Consultant); (l) ‘The Orangi Pilot Project – Research and Training Institute’s Mapping Process and Its Repercussions’ by Arif Hassan (Consultant); (m) ‘Orangi Pilot Project Replication in Small Urban Centres in Pakistan’ by Arif Hassan (Consultant); (n) ‘Background Paper on Tirupur Project’ by Aditi Thorat and Sheela Patel (SPARC); (o) ‘Water Subsidies in Smaller Urban Centres’ by Diana Mitlin (IIED, London); (p) ‘Donor Contributions to Improving Provision for Water Supply and Sanitation in Small Urban Centres’ by Julie Crespín (Consultant); (q) ‘Constraints on Aid Agencies’ Capacities and Possibilities to Respond to Water and Sanitation Needs in Towns in Small Urban Centres’ by Julie Crespín (Consultant); and (r) ‘Lake Victoria Region Water and Sanitation Initiative: Supporting Secondary Urban Centres in the Lake Victoria Region to Achieve the Millennium Development Goals’ by Graham Alabaster. Valuable contributions were also received from Paul Taylor of Cap-Net (‘Capacity Building for Water and Sanitation Delivery in Small Towns’) and Albert Wright (‘Financing Water and Sanitation in Small Urban Centres’).

The second Expert Group Meeting was jointly organized by UN-HABITAT and IIED in London in December 2005. The meeting was attended by a number of experts: Nicole Barbery, Jessica Budds, Julie Crespín, Gordon McGranahan, Duncan Mara, Mike Muller (Independent Consultant), David Satterthwaite, Mario Vasconez (CIUDAD), Ranjit Wirasinha (Formerly of WSSCC) and Albert Wright. Kalyan Ray, Graham Alabaster and Iole Issaias attended on behalf of UN-HABITAT. The expert group meeting reviewed the draft Chapters 1–7 and recommended a reorganization and further expansion of the report.

The full report, in its final stage, was reviewed by Albert Wright, Mike Muller and Duncan Mara.

The report was widely circulated among UN-HABITAT professional staff members and consultants, and benefited from their review, comments and inputs. Valuable contributions were made by Graham Alabaster, Andre Dzikus, Iole Issias, Daniel Adom, Kulwant Singh, Roshan Shreshtha, Aniruddhe Mukherjee, Choung Phanrajsavong, Naison Mutizwa-Mangiza and Kalyan Ray.

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Kalyan Ray

Officer-in-Charge, Water, Sanitation and Infrastructure Branch
UN-HABITAT

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LIST OF ACRONYMS AND ABBREVIATIONS

ABES	Associação Brasileira de Engenharia Sanitaria e Ambiental
ADB	Asian Development Bank
AFD	Agence française de développement [French Development Agency]
AGBA	Aguas del Gran Buenos Aires
AHKMT	Akhtar Hameed Khan Memorial Trust
ANC	African National Congress
ASB	Anjuman Samaji Behbood
BPD	Building Partnerships for Development in Water and Sanitation
CAERN	Companhia de águas e esgotos do Rio Grande do Norte
CAESB	Compañía de Saneamiento Ambiental del Distrito Federal
CBO	community-based organization
CDF	comprehensive development framework
CEMIS	Community-based Environmental Management Information Systems
CIDA	Canadian International Development Agency
CIUD	Centre for Integrated Urban Development
CLIFF	Community-Led Infrastructure Finance Facility
CMR	Caracas Metropolitan Region
CODI	Community Organizations Development Institute
CRC	Conservation and Rehabilitation Centre
CWIQ	Core Welfare Indicator Questionnaire
DAC	Development Assistance Committee (OECD)
Danida	Danish International Development Assistance
DFID	Department for International Development
DHS	Demographic and Health Survey
DISCAP	District Capacity Building Project
DWAF	Department of Water Affairs and Forestry
EcoSan	ecological sanitation (latrine)
EHP	Environmental Health Project
ENDA	Environmental Development Action in the Third World
ESVAL	Empresa Sanitaria de Valparaiso
FDE	Fonds de développement de l'eau [Water Development Fund]
FEHIDRO	Fundo Estadual de Recursos Hídricos
FIRE-D	Financial Institutions Reform and Expansion
FNMA	Fundo Nacional do Meio Ambiente
GDP	gross domestic product
GIS	geographic information system
GNUC	Greater Nelspruit Utility Company

GPOBA	Global Partnership on Output-Based Aid
GWP	Global Water Partnership
HIPC2	Enhanced Heavily Indebted Poor Countries
IADB	Inter-American Development Bank
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IDUAR	Institute for Urban, Environmental and Regional Development
IEE	initial environmental examination
IFC	International Finance Corporation
IFI	international finance institution
IIED	International Institute for Environment and Development
IIED-AL	International Institute for Environment and Development–América Latina
IMF	International Monetary Fund
INDEC	Instituto Nacional de Estadística y Censos
IRC	International Water and Sanitation Centre
ITDG	Intermediate Technology Development Group
IUWM	integrated urban water management
IWRM	integrated water resources management
JMP	Joint Monitoring Programme for Water Supply and Sanitation
KMC	Karachi Municipal Corporation
LGU	local government unit
LIFE	Local Initiative Facility for Urban Environment
LPP	Lodhran Pilot Project
LSMS	Living Standard Measurement Survey
LVWATSAN	Lake Victoria Region Water and Sanitation Initiative
MAPPs	municipal action plan for the poor
MCWD	Metro Cebu Water District
MDG	Millennium Development Goal
MEKWATSAN	Mekong Region Water and Sanitation Initiative
MICS	Multiple Indicator Cluster Surveys
MIGA	Multilateral Investment Guarantee Agency
MM	Mahila Milan
MSE	micro and small enterprise
NGO	non-governmental organization
NPK	nitrogen, phosphorus and potassium
NSDF	National Slum Dwellers Federation
NTADCL	New Tirupur Area Development Agency Corporation Limited
NWASCO	National Water Supply and Sanitation Council
NYEWASCO	Nyeri Water and Sewerage Company
OBA	output-based aid
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
OPP-RTI	Orangi Pilot Project Research and Training Institute
PAC	Pan Africanist Congress
PCJ	Piracicaba, Capivari and Jundiá
PF	pour-flush

PKAUID	Punjab Katchi Abadi and Urban Improvement Directorate
PLUS	Programme for the Improvement of Livelihoods in Urban Settlements
PPI	Private Participation in Infrastructure
PPP	public–private partnership
PRAGUAS	Programa de Agua Potable y Saneamiento para Comunidades Rurales y Municipios Pequeños
PRODEL	Programa de Desarrollo Local, Nicaragua
PRSP	poverty reduction strategy paper
PURC	Punjab Urban Resource Centre
SanPlat	sanitation platform (latrine)
SCWS	Shahpur Chakar Welfare Society
SEEG	Société de Exploitation des Eaux de Guinea
SELAVIP	Servicio Latinoamericano y Asiático de Vivienda Popular
SENASA	Servicio Nacional de Sanidad y Calidad Agroalimentaria
Sida	Swedish International Development Cooperation Agency
SKAA	Sindh Katchi Abadi Authority
SNEC	Société Nationale des Eaux du Cameroun
SPARC	Society for the Promotion of Area Resource Centres
TMA	Tehsil Management Authority
TVE	town and village enterprise
UC	union council
UfW	unaccounted for water
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
VIP	ventilated improved pit
watsan	water and sanitation
WDM	water demand management
WELL	Water and Environmental Health at London and Loughborough
WHO	World Health Organization
WSP	Water and Sanitation Program
WSSCC	Water Supply and Sanitation Collaborative Council
WWO	water and waste-water operators
YTP	Youth Training Programme

MEETING WATER AND SANITATION NEEDS IN SMALL URBAN CENTRES

Inadequate provision for water and sanitation affects hundreds of millions of people in small urban centres and is a major constraint to the achievement of the Millennium Development Goals. At least one billion people who lack adequate provision for water live in small urban centres or in ‘large villages’ that have urban characteristics. The number living in such centres lacking adequate provision for sanitation is considerably more than one billion. Virtually all those lacking such provision live in low- and middle-income nations, and it is in small urban centres in these nations where much of the growth in the world’s population over the next 10 to 15 years is likely to be. The Millennium Development Goals (MDGs) target to halve the proportion of people without sustainable access to safe drinking water and basic sanitation between 1990 and 2015 will not be met unless there are significant improvements in the effectiveness of government and international donor programmes in small urban centres.

It is often assumed that it is more difficult to support good provision for water and sanitation in small urban centres than in large cities – because of weaker local governments, fewer economies of scale for infrastructure and management and less capacity to pay. But many small urban centres have some distinct advantages. For instance, relationships between citizens and the state can be less conflictive than in larger cities. The scale of work needed in small urban centres is often more manageable

and the different offices or departments of government more willing to work with each other and to share information. The smallness of an urban centre can permit more informal accountability measures to work better, for instance easier contacts between local politicians and civil servants and those who are unserved or ill-served. In addition, in small urban centres, local government can be more willing to accept partnerships with community organizations and local non-governmental organizations (NGOs) – in part because sophisticated engineer-dominated agencies are not the decision-makers. In many small urban centres, even wealthy households and neighbourhoods lack good provision in regard to sanitation, water and solid waste management so the whole urban centre becomes the project area rather than certain ‘poor’ neighbourhoods.

Domestic water and sanitation needs in small urban centres are clear and unambiguous – whether for women, men or children. Easy access to safe and sufficient water is essential for all needs for all persons – for drinking and also for food preparation, laundry, bathing and personal hygiene, at a price that can be afforded. Immediate, convenient, safe access for everyone is needed to toilets that ensure safe disposal of human excreta and waste-water. The health and time-saving benefits from good provision for water and sanitation are well known. So too are the range of technologies needed to provide this in different contexts. The actual volume of water

needed is also small in comparison to the water needs for agriculture (especially irrigated agriculture), industry and commerce. It is also obvious that good provision needs to fit within a broader framework of water and waste-water management. In locations with water scarcity, more attention is needed to using water efficiently (and where appropriate, recycling it and drawing on non-conventional sources).

However, this report is about more than small urban centres; it is also about how the policies and practices of national governments and international agencies can ensure that local needs are identified and acted on – and this has relevance for all settlements, whether rural, peri-urban and urban. Thus, the discussions on finance and governance and on how to generate the information base to support action and monitoring have relevance for all those lacking adequate provision. One of the reasons why provision for water and sanitation is so inadequate in most small urban centres is the failure of national governments and international agencies to support local action in ways that involve and are accountable to those who are ill-served or unserved and that tap local resources and capacities. But this also helps explain the inadequacies of provision in many cities and rural settlements.

The solution is clear but the means to achieve it less so. In one sense, the solution is obvious: more competent, effective local water and sanitation providing organizations in tens of thousands of small urban centres in which the unserved and inadequately served have influence. Recognizing that local contexts vary greatly, so the actual form that these local organizations take will also vary. Within most low- and middle-income nations, these local water and sanitation providing organizations will include a mix that varies from households meeting their own needs to private sector providers (from itinerant water vendors to water kiosk managers to companies responsible for entire urban centres), from community organizations or groups of households to cooperatives, and from local governments to

local branches of provincial and national government agencies. Obviously, their relative importance and mix and the way they work together will depend on local circumstances. But in each location, these must produce the best mix between good quality convenient provision, what can be afforded and what can be managed locally. In most small urban centres, there will be less capacity to pay than in larger cities but often also lower costs. However, many small urban centres also have prosperous economies in which there is more 'effective demand' for water and sanitation from enterprises as well as households, which means greater possibilities to finance more convenient and safer forms of provision. Combine this with the economies of scale and of proximity that most small urban centres present for better water and sanitation provision and the conditions for much improved provision become evident. There is good evidence to show that these kinds of factors can support much improved provision in small urban centres – as shown in the many case studies in this book. Some of these case studies show how much can be achieved with limited funding. Many of these examples required little external funding; some required none. But these good examples are rare. They are the exception. The question of why these are the exception and how they can be made to become the norm is the core concern of this report.

One key to improved services is official providers working with groups of households or with neighbourhood organizations rather than with each household. One often dramatic way to reduce the costs of better provision for water and sanitation for official water and sanitation agencies (whether government, private sector or NGO) is for them to work in partnership with groups of households – for instance a small neighbourhood or a street. This is obvious when provision is through communal or public facilities – for instance a water tap shared by 20 households or a community toilet with washing facilities serving several hundred households. But the resulting reduction in unit costs applies not only to capital investment per

person served but also to management costs – for instance as the 20 households sharing a tap or the households using the community toilet manage it and collect payments from members. The external agency providing water to these standpipes or toilets does not have to collect money from each person using these facilities and gets a regular payment.

The possibilities of improving provision for water and sanitation through serving groups of households can also achieve dramatic cost reductions through ‘component sharing’ as local utilities provide water mains and/or sewer connections to groups of households – and the groups of households have responsibility for funding and installing the infrastructure that connects them to the water mains and sewers. Many examples of this are given in this book, including the condominial water supplies and sewers in Brazil (now also being installed in many other nations) and the work of the Orangi Pilot Project Research and Training Institute in small urban centres (and large cities) in Pakistan. For instance, sewers are often considered to be far too expensive for low-income households – typically with costs per household of several hundred dollars or even of more than a thousand dollars. No low-income household can afford this. But in Pakistan, component sharing and design modification brought the cost per household to US\$35–50, as the inhabitants of a street or lane plan and manage the installation of the ‘internal’ pipes and official agencies provide the ‘external’ systems into which these integrate. In Brazil, the cost of providing ‘simplified sewers’ is much cheaper than conventional sewers – typically around US\$150 per household, although in some places brought down to around US\$60 – in part through a similar division of responsibilities between groups of households and external agencies. The cost of providing piped water connections to each household through a comparable division of responsibility has been brought down to under US\$50 in Brazil.

Where provision to each household is too expensive or not possible – for instance in low-

income informal settlements with high levels of room renting – community-managed provision of shared taps or of public toilets with washing facilities may be the most appropriate response. In India, the capital costs of building good quality public toilets and washing facilities is around US\$12 per person served. Where unit costs are kept down, even low-income households can make contributions to fund better solutions – for instance households in a low-income settlement in the Philippines contributed US\$2.20 each to the cost of providing community taps, working with the local utility. Households in a small urban centre in Vietnam contributed US\$9 each to work with the local authority to pave their alley. Partnerships between official service providers and organized groups of households can also address deficiencies in storm drainage and solid waste management.

Of course, there are potential difficulties in managing the ‘group’ – for instance with households sharing a water meter who are concerned that some use more water than others, or with some households unable to afford their contribution either to the installation or to the cost of the service. But where community organizations are strong and representative, these difficulties can be managed to allow the poorest households to obtain water or use toilets even when they cannot afford the payment. There is also a danger that this becomes the way by which the water or sanitation provider simply reduces its costs and maximizes its profits because it transfers costs and tasks to community organizations. But again, provisions can be made to avoid this.

Keeping down unit costs, building on what already exists and resources pooled through partnerships can make limited resources go much further. On the issue of funding, there is a paradox. On the one hand, the need for more funding from governments and international agencies is obvious: good provision for water and sanitation (and the urban centre-wide water and waste-water management infrastructure within which it is located) needs substantial investment. But on the other hand,

many of the innovations described in the report, including many large-scale innovations, did not need large amounts of funding from national governments and international agencies, while some needed none at all. Often, the key funding need is to support the development of local capacities that can then tap local and national resources, including local willingness to pay. In many middle-income nations, national governments have the resources needed to address deficiencies in provision in small urban centres – and considerable progress is being made in many such nations, with little or no international funding, as illustrated by examples in this book from Thailand, South Africa and Mexico.

Many of the initiatives described in this book that reached low-income households with better quality water and sanitation services combined three aspects: all measures sought to keep down unit costs; they built on what had already been built; and relied upon partnerships between official water and sanitation agencies or utilities and groups of households who pooled resources and divided tasks to further reduce costs.

In many instances, households who are unserved or poorly served by official systems have made substantial investments in providing for themselves. It is much cheaper for external programmes to work with these investments and complement them, rather than seeking to replace these.

But note should be made of just how little the lowest income households have to invest. In the small urban centre in Vietnam, households could not afford to contribute the US\$9 they needed to work with the local government in paving their alley without loans. In India, for much of the urban population, household incomes are so low that even public toilets that cost US\$0.02 per use are too expensive; the community-managed public toilets described in Chapter 4 charge households around US\$1 a month – which works out at around US\$0.03 a day but this covers all family members using the facility as many times as they need each day. A high proportion of the population living in small

urban centres in low- and middle-income groups have incomes that are 1/50th or 1/100th the average income in high-income nations. So if solutions for provision for water and sanitation are sought that cost households only 5 per cent of their incomes, a household with US\$30,000 a year can afford US\$1500 a year (or around US\$4 a day); a household with US\$300 a year can afford only US\$15 a year (or around US\$0.04 a day).

Greater effectiveness often depends on changing relationships between government service providers and low-income households.

One characteristic of most of the innovations in water and sanitation provision that benefited poor groups in small urban centres was a change in the relationship between local government and the urban poor – from hostility or indifference to engagement. Sometimes this was a result of changes within local government (or national agencies that support local governments) but more often, it was the result of what local grassroots organizations or local NGOs (or partnerships between these) did and what they negotiated. Local government reforms were often important in allowing more possibilities for this but these rarely produced this change by themselves. As Chapter 7 describes, this implies a need for international agencies to develop very different forms of engagement with local organizations. Not short-term big funding but long-term support, supporting local institutions, allowing local choices, allowing local (grassroots, NGOs and government) organizations to try out new ways of doing things and also to take risks – some of which will not work – and to learn from these.

Many of the innovations described in this book were initially developed by local NGOs and grassroots organizations – and then ‘went to scale’ through partnerships with local governments or utilities. It is generally community organizations and local NGOs that produced the cost reductions, but it was the willingness of local governments or private utilities to work with them that allowed the up-scaling.

The cost of providing the managerial and technical support to NGO–community organization partnerships in each urban centre can be very low, if this is provided by local teams. For instance, in the city of Uch in Pakistan, a local NGO that works with the local government in conservation (as this is a historic city) and in developing good sanitation (which will reach most of Uch’s 35,000 inhabitants and recover costs from households) has eight staff (all local) and an annual staff cost of less than US\$10,000.

There is much debate about whether solutions should focus on private, public or community provision. But experience in small urban centres suggests that improving how private, public and community provision work together is often more important than shifting from one to the other. Innovation also shows how the boundaries can blur – for instance as community organizations or public utilities become more businesslike in their investment plans and measures to recover costs and pay for maintenance, and as private utilities become more community-oriented through partnerships with groups of households or with grassroots organizations.

More attention is needed to generating the information base for local action in each small urban centre. The information needed on the ground in small urban centres to support good provision for water and sanitation is not the same as the information needed by national governments and international agencies to monitor the scale and scope of provision. This is rarely recognized, especially in the information-gathering systems supported by national governments and international agencies. There is a danger that the emphasis given to monitoring progress towards achieving the MDGs will detract from generating the information needed to improve provision in each locality – for instance detailed data about each household, each structure, each plot boundary and the forms of provision that already exist. Also maps that include contours and details of roads, paths and plot boundaries are needed. Chapter 5

discusses how to combine a concern for stronger local data to support local action with better national data to support good policy and allow progress to be monitored.

Organizational and financial frameworks should be designed to support local solutions, local actions and local partnerships. Improving provision for water and sanitation and extending good provision to those currently lacking this is often seen as a task for national governments and international agencies. Yet getting this to happen on the ground depends on more effective and more pro-poor local organizations in the tens of thousands of urban centres and hundreds of thousands of villages. It depends on ensuring that what these local organizations do is appropriate to local circumstances and possibilities – which means avoiding imposing and funding inappropriate technologies or institutional systems. If this is to be ‘pro-poor’, it means that these local organizations must be influenced by those individuals and households who usually have little or no influence. They must also be accountable to those for whom formal institutions (whether government, private sector or NGO) almost never have accountability. This is actually difficult for national governments and international agencies.

While the need for more effective local governance, including pro-poor local water and sanitation providers in each urban centre is obvious, the best means to achieve this is not. In large part because this will be different in each of the small urban centres that are the focus of this report. Large, centralized international agencies and national governments have not proved very good at supporting locally driven pro-poor development – for water and sanitation and for other local needs. How can they know which factors are most important in each particular locality and how to support effective, pro-poor responses there? In India, there are over 600 urban centres with between 50,000 and 200,000 inhabitants and thousands of urban centres with less than 50,000 inhabitants, with large variations between them in their wealth,

economic base, government competence and capacity, extent of support from higher levels of government and future prospects. In Brazil, the same is true for the 300 or so urban centres with 50,000–200,000 inhabitants and the 500 or so urban centres with 20,000–50,000 inhabitants. National or state governments and international agencies are often supporting interventions in small urban centres about which they have very little information. How can they help ensure the development of more competent, effective local water and sanitation providing organizations there (especially where most small urban centres have governments that lack resources, the right to raise local revenues and very limited technical capacity)? How can pro-poor solutions be developed when so many local governments have so little accountability to, and communication with, their lower income inhabitants?

The first global report on *Water and Sanitation in the World's Cities*, published in 2003, was subtitled *Local Action for Global Goals*. This stressed the importance of supporting local action and better local governance for achieving global goals, such as the MDGs. This second global report is about local actions for local goals – because the best means to improve and extend provision for water and sanitation in each small urban centre depends so much on a range of local factors – for instance, fresh water availability, settlement size and spatial form, topography, housing types and space per household, the nature of occupants' tenure, and what households are able and willing to pay. Also it depends inevitably on the form of local government. In addition, there is the need for better provision for water and sanitation not only in people's homes but in schools and workplaces. Good provision for public toilets is often needed, especially in markets and other public places – and where provision within homes is difficult to improve. Ironically, the less funding is available, the more ingenuity is needed. Only in wealthy societies can standard high quality solutions be provided by a single agency that serves everyone and provides piped water and sewers to all urban homes.

Government and international agency programmes to improve provision for water and sanitation are often developed and implemented without recognizing the extreme diversity that exists. In terms of settlements and water and sanitation policy, the world is still divided into 'rural' and 'urban' as if all settlements fall neatly into one or the other of these categories. But as Chapter 2 discusses, many rural settlements are actually small urban centres that require small urban centre solutions. In turn, many small urban centres require different approaches to the conventional urban approaches. So solutions must be locally developed and driven – but the possibility of each locality developing solutions also depends on appropriate support from higher levels of government. Chapters 6 to 9 have various examples of the kinds of provincial and national action that supports local solutions. Also, local solutions for water and sanitation in small urban centres depend on them being served by the types of infrastructure that local governments cannot generally provide – for instance roads, electricity and telecommunications systems linking them to other districts and regions.

Thus, what is important is to create a climate in which local decisions can be taken, informed by knowledge of the options available. Creating that climate is an important role for governments at all levels as well as for donor agencies. In many instances, as case studies in this report emphasize, this will benefit from the direct involvement of low-income groups in data collection, design, financing, implementation and management. As noted already, it is often partnerships between local service providers and neighbourhood organizations that underpin better provision. Criteria for allocating funding from higher levels of government can help ensure more support for urban centres where provision is worse and reward local revenue raising and local innovation that really reaches and works with low-income groups.

There are multiple routes to better provision for water and sanitation, including

those that are outside the water sector such as programmes for secure tenure, 'slum' and squatter upgrading, micro-finance and health care. Many of the ways in which lower income households get better provision for water and sanitation are not 'water and sanitation' initiatives – as Chapter 4 describes. For instance, better provision is often part of slum and squatter upgrading programmes and secure tenure programmes, or programmes through which urban poor households get land on which they can build new homes with water and sanitation infrastructure. Housing finance programmes that support households and communities fund improved provision in existing homes or fund them getting (and building) new better quality housing also support better provision for water and sanitation. It is often possible to integrate better household water supplies into irrigation improvements in small urban centres or large villages. These initiatives are important not only for the tens of millions of urban households that have got much improved provision for water and sanitation through them, but also for the way they can complement investments in 'big' water and sanitation infrastructure – and, indeed, can reduce the cost of this infrastructure.

Successful decentralization programmes will also create more capacities for water and sanitation provision and more pressure for action. Competent and accountable local health care centres would put pressure on local governments to address the main causes of illness and premature death – which obviously includes many water-related diseases. If the MDGs of promoting gender equality and empowering women were to be achieved, it is likely that this would also bring more attention to water and sanitation – and to forms of provision that better serve women's needs. Meeting the MDG target of significant improvements in the lives of at least 100 million slum dwellers by 2020 also requires significant improvements in provision for water and sanitation.

Local innovations and the precedents they set can drive ever-expanding learning networks and often drive policy change. In each nation, there is a need for local innovation in improving and extending provision for water and sanitation in small urban centres that then encourages and supports innovation, learning and investment in other small urban centres. Innovation sets local precedents to show what is possible – and precedents not only in water and sanitation infrastructure but also in how it is funded, built, managed and maintained. Particular attention is needed to reducing the cost gap between good provision and what can be afforded locally. National governments and international agencies need the innovations that are developed locally – even those that are developed without their funding and sometimes without their approval – to show new possibilities for more effective action and financing. Local innovation and precedent also present opportunities for learning – whether this is women's savings groups seeing the possibilities of constructing and managing their own community toilet, local authorities seeing new possibilities of partnerships with residents' associations, water engineers seeing how condominial water supplies or sewer systems can cut the gap between what can be funded and what can be afforded by users, or local water utilities seeing innovations in billing, community-tap management and cross-subsidy management working on the ground.

The many examples of innovation in this report are not so much international models to be copied as good pragmatic local responses to local opportunities and constraints. As such, their actual 'practice' may have less relevance to other nations than the 'good principles' that underpinned how they were designed, implemented, funded and managed. These innovations have importance for highlighting how most progress will be through pragmatic local responses to local opportunities – and one of the key tasks for external agencies is to expand the support available for such pragmatic local

responses and to support other groups learning from these, if they are successful. This report includes relatively detailed descriptions of some innovations. To allow the reader to understand the organizational processes that underpinned these innovations. In addition, wherever possible, the description of the innovations also describes the difficulties they faced and discusses their limitations.

The report has many examples of local precedents that showed new possibilities for improving provision for water and sanitation in small urban centres – which then encouraged action and investment in other urban centres. Successful local precedents become much visited by staff from local governments, local water utilities, NGOs and community organizations. The local organizations that developed them are often called on for advice in other urban centres. Some local precedents influenced national policy. This report has details of such precedents including those generated by national governments, local governments, international and local NGOs, water utilities and organizations of the urban poor. Many were generated by local NGOs and by organizations and federations of the urban poor – although in almost all instances, a key part of their innovation was setting precedents that governments and water utilities accepted and that allowed partnerships to form between official service providers, local governments and civil society organizations. Many of the most successful precedents took years of struggle to become influential; almost all faced opposition – often from international agencies. However, as Chapter 7 describes, the way donor funding is changing seems to be reducing the possibilities for supporting this kind of local innovation and precedent setting. This needs to change.

All low- and middle-income nations need funds available to support locally driven innovations and to support local governments, NGOs and grassroots organizations learning from these (and learning to work together). Donor funding for this is not so much ‘small-project’ grants as support for a process by which local initiatives

and innovations can develop. This needs to include support for documenting and disseminating these experiences in-country – to other community organizations, private enterprises, local NGOs and local governments – and support for other groups from that country visiting these innovations and discussing them with those who helped set them up and make them work. As each innovation or precedent is viewed, discussed and visited by the very people that could implement a comparable innovation in their own small urban centre, so the possibility for up-scaling is achieved – but through a multiplication of local initiatives rather than an expansion of a single initiative. Because potential local implementers learn directly from local implementers, the likelihood of inappropriate attempts at replication is much reduced. However, the means by which official donors can do this will not conform to current ‘conventional wisdom’ in regard to efficiency – it will not spend large sums of money (it should strive to support approaches that limit or even eliminate the need for donor funding), it will allow mistakes to be made (and to be learned from), and it may require considerable staff time (unless the work is contracted out). There also needs to be a recognition among international agencies that policy reform is or should be driven by local innovation. In high-income countries, much of the innovation in social and environmental policies was driven by local innovation and precedent. This implies a need for new models of engagement by international agencies for supporting local action.

Supporting local innovation and learning networks is more effective than imposing external solutions. There is now a large and diverse set of international agencies concerned about water and sanitation – or about water-related issues that have relevance to water and sanitation, especially integrated water resource management. There is an even larger group of individuals and organizations that are active in highlighting problems with water and sanitation and promoting solutions – and often seeking (and

receiving) funding from international agencies to promote what they see as the solution. Each of these must consider whether what they are doing, including what they are promoting, criticizing and funding, actually serves the hundreds of millions of people living in small urban centres that lack good provision for water and sanitation. External organizations need less certainty that they know the solutions; they have to make more efforts to support locally generated solutions in which those who are unserved or ill-served have influence. The choice of technology and the way it is used must be locally determined in ways in which the unserved and the ill-served have influence. Neither eco-sanitation nor water-borne sanitation – nor any of the other technologies described in Chapter 4 – are ‘solutions’ but options that may or may not be appropriate to local circumstances and possibilities. There are also no universal truths with regard to how funding should be provided, although as Chapters 4 and 7 discuss, there are some useful working principles: all measures should keep down unit costs, build on what is already there (in terms both of infrastructure and of local organization), and foster partnerships between official water and sanitation agencies or utilities and groups of households, with resources pooled and tasks shared to further reduce costs.

Governments in high-income nations often assess the efficiency of an aid agency or a development bank in terms of the lowest possible proportion of funding going to staff costs (or ‘administration’). This is not always a good measure of effectiveness, especially when so much poverty reduction depends on changing relationships between ‘the poor’ and local government. Many of the innovations described in this report were the result of local processes in which the unserved and ill-served had influence. For the international agencies, supporting these innovations can be staff intensive in relation to the funding disbursed and it may not deliver results quickly – for instance as they need to allow those lacking provision to develop their own responses and to build consensus and negoti-

ate with different official agencies. They may also not require much external funding. In theory, international funding agencies should applaud interventions that need little external funding because this means greater possibilities for increasing the scale of the interventions and generally greater possibilities for sustaining the initiative’s effectiveness. For governments, keeping down the need for loans also means keeping down debt burdens. But all the bilateral agencies and the multilateral development banks are under extreme pressure from the governments that fund them to spend their budgets or increase their loan portfolios, while keeping down their staff costs. Here, some creative rethinking is needed, although as Chapters 7 and 9 describe, some international agencies have developed new ways to support local innovation and action and better local governance.

If the water and sanitation Millennium Development Goals are to be met by 2015, there is a need for innovative fast-track delivery mechanisms. Since most small urban centres have a combination of rural and urban characteristics, there is a need for development assistance agencies to design new approaches and delivery mechanisms to improve and extend service coverage. In many cases, external support to small urban centres is provided to groups of such centres or comes under rural water supply and sanitation programmes. Under such schemes, little attention is given to capacity-building to support investments in physical infrastructure and this often means a rapid deterioration in services. Many small urban centres, especially those that are trading centres supporting their surrounding hinterlands, also have large influxes of non-residents, who also require services (and can often afford to pay for them!).

The time-frame for implementing water and sanitation projects in many development agencies is also too long to keep pace with the rapid unplanned growth in many small urban centres. Typical project cycles of five to ten years mean proposed schemes are outdated by the time they are implemented and inadequate in

relation to demand. New delivery mechanisms such as the European Union Water Facility, the African Water Facility and programmes such as UN-HABITAT's Lake Victoria Water and Sanitation and Mekong initiatives strive to change the approach. They promote pro-poor approaches in programme design that maximize the complementarity between investments in physical infrastructure and local capacity building to sustain the investments. There is evidence that if sufficient capital is injected into small urban centres to kick-start investments in water

and sanitation and support for capacity building to improved revenue collection, operation and maintenance, there is a real possibility that the MDGs can be achieved in a shorter time-frame. Although this report highlights water and sanitation needs, it is every bit as important to consider the associated elements of solid waste management and drainage. Apart from having a comparable impact on the living environment, they also present opportunities for linking provision of services with income generation.

SMALL URBAN CENTRES AND LARGE VILLAGES: THE HABITAT FOR MUCH OF THE WORLD'S LOW-INCOME POPULATION?



INTRODUCTION

The focus of this report is on the need for more attention by local and national governments and international agencies to improve provision for water and sanitation in small urban centres. This is important because:

- A significant proportion of the population live in small urban centres in virtually all nations. As described later, 20 to 50 per cent of the population in most low- and middle-income nations live in small urban centres or 'large villages' with small urban centre characteristics. These settlements also contain more than a quarter of the world's total population.
- A growing number of people live in small urban centres. As nations urbanize (as an increasing proportion of their population live in urban areas), there is generally an increasing proportion of the national population in small urban centres. Not only the number but also the proportion of people living in small urban centres is likely to increase in Africa, Asia and Latin America over the next ten to twenty years.
- The scale of need in these centres is large, hence their importance for meeting the Millennium Development Goals (MDGs). Available data suggest that the populations of most small urban centres are among the worst served among urban populations for water and sanitation (and for other services such as health care), and that most official statistics on provision for water and sanitation in small urban centres greatly overstate the quality and extent of provision (see Chapter 3). A large part of the world's population lacking adequate provision for water and sanitation live in small urban centres, so the 'better governance' needed to improve provision within such centres is important for meeting the water and sanitation MDGs. Better governed small urban centres are also important for meeting many other MDGs. Much of the rural population depend on small urban centres for access to goods and services. Many of the schools and health care services needed to ensure that the health and education MDGs are met for rural and urban populations will be in small urban centres. Improving water and sanitation in small urban centres should be part of improving local governance that allows many other development needs to be addressed.
- Improved water and sanitation can bring economic benefits, as well as the health

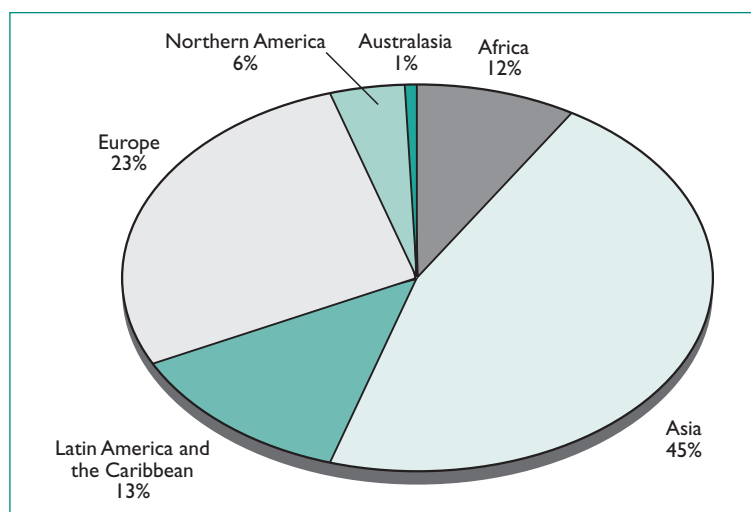


Figure 2.1

The regional distribution of the world's population living in urban centres with less than half a million inhabitants in 2000

Source: Derived from United Nations (2004) *World Urbanization Prospects: The 2003 Revision*, Population Division, Department for Economic and Social Affairs, ESA/P/WP.190, New York, 323 pages.

Table 2.1

Population distribution between different size categories of urban centres and rural areas in 2000

- They provide opportunities for better provision. Most small urban centres concentrate populations and demand for water from enterprises in ways that provide economies

of scale and proximity for improved provision. They may also have important economies of scale and proximity for improving sanitation and drainage.



HOW MANY PEOPLE LIVE IN SMALL URBAN CENTRES?¹

If small urban centres were taken to mean all settlements defined by governments as 'urban' with less than half a million inhabitants, then by 2000, around a quarter of the world's population, 1.5 billion people, lived in small urban centres, including more than a billion in low- and middle-income nations.² Figure 2.1 illustrates the regional distribution of this population. As this chapter describes in detail, hundreds of millions more live in large villages in low- and middle-income nations that have urban characteristics but that are still classified as rural. Although there are no reliable estimates for the proportion of the people in small urban centres and large villages that lack adequate provision for water and sanitation, it is clear that these concentrate a very significant part of the world's population in need of better provision (see Chapter 3).

Taking small urban centres to be those settlements defined as urban by their government with less than half a million inhabitants is an inadequate definition for this report – for reasons discussed below. But there are statistics covering all the world's regions and nations based on this definition and these will be presented and discussed before moving to a more

Nations and regions	Rural areas	% proportion of the total population in:			
		Urban areas with fewer than 500,000 inhabitants	Urban areas with 500,000– 4.999 million	Urban areas with 5million–9.999 million	'Mega-cities' with 10 million plus inhabitants
Africa	62.9	22.3	12.4	1.1	1.3
Asia	62.9	18.4	12.4	2.5	3.9
Europe	27.3	46.1	20.5	4.7	1.4
Latin America and the Caribbean	24.5	37.1	23.4	3.7	11.3
Northern America	20.9	29.8	35.6	4.3	9.4
Oceania	27.3	31.7	41.0		
World	52.9	24.5	15.7	2.7	4.1

Source: Derived from statistics in United Nations (2004), *World Urbanization Prospects: The 2003 Revision*, Population Division, Department for Economic and Social Affairs, ESA/P/WP.190, New York, 323 pages.

Note: These statistics need to be interpreted with caution. Obviously, the proportion of the population in 'rural areas' and 'urban centres with fewer than 500,000 inhabitants' is influenced by how urban areas are defined. And obviously, the proportion of the population in larger cities is influenced by how these cities' boundaries are defined.

RURAL	AMBIGUOUS	URBAN
Unambiguously rural settlements with most of the inhabitants deriving a living from farming and/or forestry	'Large villages', 'small towns' and 'small urban centres'. It depends on each nation's definition of 'urban' as to what proportion of these are classified as rural or urban	Unambiguously urban centres with much of the economically active population deriving their living from manufacturing or services
Population of rural settlements range from farmsteads to a few hundred inhabitants	Population range typically from a few hundred to 20,000 inhabitants	In virtually all nations, these include all settlements with 20,000 plus inhabitants; ³ in most they include many settlements with much less than 20,000 inhabitants

Increasing population size
 Increasing importance of non-agricultural economic activities

Figure 2.2
 The continuum of settlements from rural to urban

detailed discussion of what constitutes a small urban centre and the proportion of people that live in them within nations.

Of the 1.5 billion people living in urban centres with less than half a million inhabitants in 2000, nearly half lived in Asia and nearly a quarter lived in Europe (see Figure 2.1). Although Africa is still seen by most people as a predominantly rural continent (even if two fifths of its population now lives in urban areas), it is worth noting that it had twice as many people living in urban centres with less than half a million inhabitants as Northern America. There are also good reasons for suggesting that the scale of Asia's small urban centre population is underestimated by these figures – as discussed in more detail below. Table 2.1 is also a reminder of how small a proportion of the population in all regions live in very large cities, including the 'mega-cities' with more than 10 million inhabitants. However, care is needed in interpreting these statistics since, as the note below the table explains, differences in how nations define urban centres and urban boundaries limit the accuracy of these cross-regional comparisons and the cross-national comparisons made later in this chapter.

Some nations had more than half of their national populations in urban centres with less than half a million inhabitants in their most recent census – for instance Venezuela, Chile and Brazil – and many more had more than a third – for instance Argentina, Peru, Colombia, Guatemala, Iran, Malaysia and Turkey. Some relatively small population nations also have a large proportion of their national population in urban centres with less than half a million inhab-

itants because they are relatively urbanized and have no urban centre of more than half a million inhabitants – for instance Central African Republic in its 1988 census and Botswana in its 2001 census.

Seeking a more precise definition of small urban centre

The statistics in Table 2.1 demonstrate that a sizeable proportion of the population in each region of the world lives in urban centres with less than half a million inhabitants. But this does not fully capture the proportion in small urban centres. To ascertain how many people live in small urban centres requires a more precise definition of small urban centre, both in terms of a lower threshold (at what point does a rural settlement or village become a small urban centre?) and the upper threshold (when is an urban centre too big to be called small?). Neither threshold is easily defined. In addition, to set some specific population size as a threshold that is applied to all nations – for instance an urban centre stops being small when its population exceeds 500,000 – would exclude some urban centres that are small within their national context, especially in large population nations such as India and China and in the larger population, relatively urbanized nations in Latin America. Figure 2.2 highlights the ambiguity – and this ambiguity has importance because 20–40 per cent of the population in many nations lives in settlements that could be considered rural or urban – or as large villages or small urban centres.

Where any government chooses to draw the line between rural and urban settlements has

great significance for the proportion of their population in rural and urban areas. One of the dominant debates in development for 40 years has been over the relative priority that should be given to rural and urban development. Within this debate, both rural and urban proponents try to establish how much poverty there is in rural and urban areas, to bolster their claims for more attention to rural or urban. This debate rarely acknowledges that a large proportion of the population lives in settlements that could be termed small urban centres (and thus urban) or large villages (and thus rural). Many predominantly rural nations would become less rural or even predominantly urban if their large villages were reclassified as small urban centres. For example:

- In Mauritius, in the 2000 census, around a quarter of the population lived in settlements with between 5000 and 20,000 inhabitants and these settlements included various capitals of their district but these were not classified as urban areas.⁴ If they had been classified as urban centres, Mauritius's population would have been more than two thirds urban in 2000, rather than less than half urban.
- Egypt is still seen as predominantly rural yet in its 1996 census, nearly a fifth of its population lived in settlements with between 10,000 and 20,000 inhabitants, most of which have strong urban characteristics – and if these had been reclassified as urban, Egypt would have had nearly two thirds of its population in urban areas in 1996.⁵
- In India, in the 1991 census, there were 13,376 villages with populations of 5000 or more and if the 113 million inhabitants that lived in these were classified as urban, the level of urbanization would have risen from 25.7 to 39.1 per cent.⁶ If those who lived in rural areas but worked in urban areas were classified as urban, this would also raise the proportion of India's population living

in urban areas by a few percentage points (see Box 2.1 for more details).⁷

- In Pakistan, the 1998 census showed that 90 per cent of the rural population lived in settlements with more than 1000 inhabitants, including many in settlements with more than 5000 inhabitants. There were more than 3500 rural settlements that had more than 5000 inhabitants. If these had been classified as urban centres, it would have increased the number of urban centres from 501 to over 4000 and around half the nation's population would have been living in urban areas – instead of the official figure of 32.5 per cent.⁸
- Mexico was either 74.4 per cent urban or 67.3 per cent urban in 2000, depending on whether urban centres are all settlements with 2500 or more inhabitants or all settlements with 15,000 or more inhabitants.⁹

However, there are also cases of nations whose urban population may be overstated. For instance, in Ethiopia, in 1994, nearly half the urban population lived in some 881 urban centres with less than 20,000 inhabitants and these centres included many with less than 2000 inhabitants.¹⁰ It could be argued that some of these were better classified as rural.

The lower threshold, to establish at what point a growing rural settlement should be reclassified as urban, is not easily defined. Within most nations, there are many settlements with concentrations of shops and services and some manufacturing (indicative of urban economies) with 1000 to 2000 inhabitants, while within many low-income nations, there are other larger settlements with several thousand inhabitants that have few shops and services and with most of the population engaged in farming (indicative of rural settlements). However, the lower threshold for this report is not so much related to the size of the population but to whether there is a concentration of people and enterprises with water and sanitation needs that may be best served through some kind of

Table 2.2

The small urban centres that are the focus of this report and their location within the settlement hierarchy of other urban and rural centres

Settlement hierarchy	Notes	The focus of this report
Primate city (usually the national capital)	In some large population nations, the most successful industrial/service/financial centres have comparable or more economic importance than the national capital (e.g. in China and India). In some others, new capitals have been developed, so the national capital is not the primate city (e.g. Nigeria, Brazil)	X
Other cities with national importance – usually capitals of the larger and more economically prosperous states/provinces	Smaller population, predominantly rural nations may have only one city with national importance; large population nations will have many – as in, for instance, China, India, Pakistan, Brazil, Mexico and Indonesia	X
Cluster of secondary cities/smaller urban centres around the primate city and other cities of national importance that have their own local government (even if they may be within the same administrative region as the large city or part of its metropolitan area)	Their number and size generally increases, the larger the city. Although spatially and usually economically linked to the large city, many such peripheral urban centres have levels of provision for water and sanitation far below the central city and very weak governments	✓
Secondary cities – most of them provincial capitals	In large population nations, there are many of these. They often include cities with the potential to develop to become cities of national importance	✓
Great range of small urban centres – many of them district capitals and urban centres serving agricultural areas (markets, centres for producer and consumer services); many tourist areas, mining cities, some specialized industrial centres, border towns, urban centres with military camps	In large population nations, there are thousands of these and they exhibit great diversity in, for instance, their economic base and population growth rates. In some nations, the criteria used to define 'urban' excludes many of these so there are many small urban centres that are still officially classified as 'rural'	✓
Great range of rural settlements that are too small to be considered urban	Some of these with the potential to become small urban centres – especially in regions with prosperous agriculture	X
Scattered farmsteads, pastoralist camps		X

Note: This table is to illustrate the different kinds of small urban centres that are the focus of this report. In most nations, human settlements and their spatial distribution (and clustering) are too diverse to allow the construction of any simple accurate typology – whether based on settlement size or on settlement's economic or political roles. For any nation, there will always be debate as to the most appropriate criteria for determining which settlement goes in which of the categories given above. For instance, what criteria should be used to determine which cities are considered of national importance or whether an urban centre is a secondary city or a small urban centre? (And even if criteria could be agreed on, can data be gathered on these?) If population thresholds are used, they will vary greatly from nation to nation – for instance in India and China, many secondary cities have several hundred thousand inhabitants, making them larger than the primate city/national capital for many small population nations. Criteria based on non-agricultural economic roles or political roles may clash with criteria based on population size thresholds (although in general, for any settlement with more than several thousand inhabitants, the larger the settlement, the greater the proportion of the economically active population working outside agriculture and the greater the likelihood of having some administrative role and thus a concentration of government organizations).

centrally managed water supply and wastewater management systems. So this report is actually about the need for more attention to improving provision for water and sanitation in those urban centres and large villages that currently lack the government structure and political weight and visibility within their nation to get the attention of national governments and international agencies. Not all small urban centres fall into this category, as some have high concentrations of relatively wealthy and politically powerful groups and are well served by water and sanitation systems. Examples will also be given later of many small urban centres in Mexico and Brazil where much of the population has good provision for water and sanitation. But most small urban centres in low- and middle-income nations do not have good provision. In large population low-income nations, many cities with several hundred thousand inhabitants lack the government structure and political visibility to get much attention. In addition, many parts of

large metropolitan areas are in effect small urban centres because they lack the political weight and visibility within their metropolis to get much attention to water and sanitation needs – as shown by examples given in Chapter 3. So the upper threshold for defining when an urban centre is too big to be small will vary a lot, depending on the nation. *This report is thus about small and intermediate size urban centres, large villages and poorer peripheral local government units within larger cities* – see Table 2.2.

The difficulty in establishing a clear typology of settlements also illustrates the difficulties in drawing a distinction between rural and urban since the line between the two can be based on settlement size, administrative importance or economic structure. Even when settlement size is chosen as the sole or main criterion for distinguishing rural from urban settlements, there are the ambiguities as to where settlement boundaries should be drawn. There are also forms of urban settlement for which boundaries are not

Table 2.3

Proportion of the national population in urban centres with under 20,000 inhabitants

Nation and date of census used	Proportion of the national population in urban centres with under 20,000 inhabitants (%)
Costa Rica (2000)	27.5
Guatemala (2002)	25.8
Cuba (2002)	21.4
Venezuela (2001)	19.4
Brazil (2001)	15.0
Colombia (2003)	14.8
Peru (1993)	14.7
Ghana (2000)	14.7
Chile (2002)	14.3
Argentina (2001)	11.4
Turkey (2000)	9.7
Mexico (2000)	9.6
Thailand (2000)	9.4
Paraguay (2002)	9.1
Namibia (1991)	9.0
Morocco (2004)	8.9
Mauritania (2000)	8.1
Tanzania (2002)	8.0
Bolivia (2001)	7.4
Botswana (2001)	7.3
Central African R (1988)	7.2
Indonesia (1990)	6.9
Malaysia (2000)	6.9
Ethiopia (1994)	6.0
South Africa (1996)	5.9

Note: The figures for any nation in this table depend heavily on how urban centres are defined. For the nations with low proportions (and the many nations with much lower proportions than these that are not included in this table – see Table 2.5), changing their urban definition could increase the proportion considerably.

easily drawn – for instance where urban activities are clustered on each side of a road for considerable distances. There is also the inertia in government systems that often mean that settlements' official boundaries are much smaller than their built-up area because they have not been adjusted to reflect population growth and growth in the built-up area. There are also many urban centres whose boundaries encompass large tracts of rural land and significant numbers of farmers.¹¹



THE SMALLEST URBAN CENTRES AND LARGE VILLAGES

Hundreds of millions of people in low- and middle-income nations live in settlements that have less than 20,000 inhabitants but that have concentrations of people and economic activities that make piped water supplies and some settlement-wide system for sanitation and waste-water

management feasible. As Chapter 4 describes, increasing population size and increasing density bring down the unit costs for piped systems for water and sanitation. In most nations, many of the settlements with less than 20,000 inhabitants (for instance all those with more than 2500 or more than 5000 inhabitants) are considered urban centres; in a few, all settlements with less than 20,000 inhabitants are regarded as rural. For nations that have urban definitions that include all settlements with more than 2000 or 2500 inhabitants as urban, up to a quarter of their national population can live in urban centres with less than 20,000 inhabitants. Table 2.3 shows the proportion of national populations living in urban centres with under 20,000 inhabitants, although this needs to be interpreted with caution because, for each nation, the proportion is heavily influenced by how urban centres are defined. The nations with the highest proportion of their national populations in urban centres with less than 20,000 inhabitants tend to be relatively urbanized nations that also have urban definitions that include most settlements with a few thousand inhabitants as urban. For instance, Guatemala with more than a quarter of its national population in urban centres under 20,000 inhabitants in 2002 has an urban definition that encompasses most settlements with 2000 plus inhabitants¹² while for Cuba it includes all settlements with 2000 plus inhabitants and some others with urban characteristics;¹³ Venezuela classifies places of 2500 inhabitants or more as urban centres, while for Costa Rica, urban areas are administrative centres of cantons, including adjacent areas with clear urban characteristics such as streets, urban services and electricity.¹⁴

Many censuses do not publish figures for the populations of all the smaller urban centres or give details of their numbers and the population they concentrate. In regard to some that do:

- Mozambique had 68 towns (*vilas*) each with less than 20,000 inhabitants in the 1997 census.

- Indonesia had over 1000 urban centres with less than 30,000 inhabitants in 1990.
- Mexico had 234 urban centres with between 15,000 and 50,000 inhabitants in 2000 (with a total population of around 6 million) and around 7 million in hundreds of urban centres with between 2500 and 15,000 inhabitants.¹⁵
- Ghana had 298 urban centres with 5000–20,000 inhabitants in 2000 and a total population of 2.7 million.¹⁶
- In 1991, 19.4 per cent of Bangladesh's urban population lived in settlements with fewer than 25,000 inhabitants, including 6.3 per cent living in centres with fewer than 10,000 inhabitants.¹⁷

Settlements with under 20,000 inhabitants can have strong and obvious urban characteristics – for instance economies and employment structures dominated by industry and or services and/or large, diverse concentrations of retail stores. They can include some settlements considered as cities – usually urban centres that had importance historically but that have not been successful in recent decades. They also include millions of settlements where much of the

population works in agriculture, forestry or fishing.

One way to get more clarity in regard to whether a settlement is rural or urban is to define urban centres based not only on population thresholds but also on the extent of its non-agricultural economic activities or the proportion of the economically active population working in non-agricultural activities. But this is problematic because many very small settlements have most of their workforce working in non-agricultural activities (for instance small mining centres, tourist centres or small river ports), while some much larger settlements can have much of their workforce still working in agriculture. In addition, many rural and urban households have both rural and urban components to their livelihoods so it is difficult to classify them as 'rural' or 'urban'.¹⁸ For instance, is a rural household that derives most of its income from family members who commute daily to an urban centre 'rural' or 'urban'? Is an urban household that draws most of its income from farming 'rural' or 'urban'? And an urban centre may have most of its workforce in activities that are classified as non-agricultural yet a high proportion are based on processing local crops or

Box 2.1 Are these large villages or small urban centres?

Tanzania

Sakasaka village in Meatu district has been given as an example of a village that developed a sound low-cost way to improve provision for water; its 784 households were served by 17 shallow wells, each owned by a single autonomous water user group, each with its own governance process. This decentralized system has the advantage that when one breaks down, the households affected can buy water from a neighbouring group until they repair their own.¹⁹ But in many nations a concentration of 784 households (or around 4000 people) would be considered a small urban centre.

Pakistan

In 1998, a very considerable proportion of the rural population lived in over 1000 settlements with more than 5000 inhabitants, which in most nations would have been classified as urban centres – including many that were considered urban in the 1972 census. In the 1981 and 1998 censuses, such settlements were not considered as urban centres unless they had a municipal government. This changed the status of 1483 settlements with more than 5000 inhabitants that, in the 1972 census, had been classed as urban centres.²⁰

Benin

Bérébouay with 5000 inhabitants and So-Zounko, a lakeside settlement of 8750 inhabitants dependent on fishing and trade are considered villages.²¹

Madagascar

A water supply scheme in which the Sandandrano Company manages 25 tap stands from which water supplied by the utility is sold to the 25,000 inhabitants of Sabotsy Namehana is considered 'rural' because this is a rural commune – but Sabotsy Namehana is on the outskirts of the national capital and the largest city, Antananarivo.²²

India

Most of the population of the state of Kerala in India (which has more than 32 million inhabitants) live in 'villages' with populations exceeding 10,000;²³ in most nations, these would be classified as urban centres.

providing goods and services to local farmers and local rural populations.²⁴

For any settlement, being classified as 'urban' often brings some potential advantages for water and sanitation if it means that there is a local government there with capacity to contribute to such provision (being designated as an urban centre can mean more scope for local revenue generation too) – but it may also bring changes that local elites fear, which explains why they may oppose their settlement being classified as 'urban'.

In China, several hundred million people live in small urban centres as defined by this report – but it is difficult to get precise statistics. Official sources give different figures for the total urban population, in large part because of different definitions for what constitutes the 'urban' population (see Box 2.2). For instance, statistics from China's Ministry of Construction stated that

by the end of 2002, there were 660 cities and 20,600 administrative towns in China with a total population of 502 million.²⁵ Another report by the Ministry of Construction suggested an urban population of 338 million at the end of 2003²⁶ – although this may be the figure for the population in 'cities' and so does not count the population in administrative towns. China's small urban centre population would include many of its cities as well as its administrative towns; it was reported that in 2005, more than half of the 660 cities on the mainland had populations of between 200,000 and 500,000 people.²⁷

The issue of the lower threshold used to determine when a settlement becomes urban can be politically charged because both governments and international agencies make decisions about resource allocations between rural and urban areas depending on the proportion of the population that live in them. They also have 'rural' and

Box 2.2 How urban are China and India?

China

The criteria for urban designation have changed dramatically in response to changing urbanization policies and economic development strategies. It has been estimated, for example, that the urbanization level in China in 1999 would have been 24 per cent according to the pre-1982 urban definition, 73 per cent according to the 1982 definition, and 31 per cent according to the 1990 definition.²⁸ Much of the difference between these relate to how the residents of small urban centres and peri-urban areas are counted. Two different classification systems have been used, one registering a segment of the population as urban and the other designating a selection of places as urban. Until the late 1970s, there was a reasonable degree of consistency between the two; people in urban places had urban registration. From the 1980s onwards, there was an extremely rapid growth in the number and area of (urban) designated towns and cities. After new criteria for town designation were issued in 1984, the number of designated towns jumped from 2781 at the beginning of 1984 to 6211 by the end of the year and continuously increased to over 20,000 by the end of 2000.²⁹ Urbanization policies encouraged townships to apply for town designation, and for the spatial extent of designated towns and cities to expand.³⁰

Especially for migrants, however, the conversion of rural to urban residence (*hukou*) continued to be tightly restricted. Thus on the one hand many designated towns and cities extended over large and often agricultural areas with low population densities, and on the other hand many people with rural (agricultural) registration lived in high density areas and worked in non-agricultural employment.

India

The 2001 census in India suggested that 27.8 per cent of the population were urban – that is, nearly three quarters of the population lived in rural areas. But much of the rural population live in settlements that would be classified as 'urban' if India chose to adopt the urban definitions used in most European nations – and most of the rural population would live in urban areas if India adopted the urban definition used in Sweden or Peru. In Sweden, all settlements with built-up areas with at least 200 inhabitants and with houses at most 200 metres from each other are considered urban, while in Peru, urban centres are populated settlements with 100 or more dwellings grouped contiguously, and administrative centres of districts.³¹

If India became reclassified as a predominantly urban nation, it would change the

perspective of both the government and international agencies. The idea that India is a predominantly rural nation could also be questioned by the fact that by 2001, 76 per cent of value added within India's GDP came from industry and services, most of which are located in urban areas. This is not to suggest that India's urban definition is wrong, and to apply Sweden's urban definition in India would clearly be very misleading in terms of how urban India's population would become and how this would make 'urban' tens of thousands of settlements underpinned by agriculture. But it does highlight how a large part of the population in India and in most other nations live in settlements that can be considered urban or rural.

In 1991, there were 13,376 villages in India with populations of 5000 or more and if these 113 million inhabitants were classified as urban, the level of urbanization in 1991 would have risen from 25.7 to 39.1 per cent.³² In 1987–1988, 4 per cent of the urban workforce were rural-based commuters (National Sample Survey data) and this proportion has probably increased since then.³³

The populations of many settlements in India that have urban characteristics prefer to retain their rural status, partly because of concerns about paying higher taxes.³⁴

Box 2.3 Common myths about small urban centres**Myth 1: Small urban centres are growing faster than large cities**

An analysis of population growth rates for all urban centres for the most recent intercensus period for 70 nations (and for many other nations for other intercensus periods) showed that there is great diversity among small urban centres within each nation with regard to their population growth rates, as well as great diversity in the extent of in-migration and out-migration. It is not possible to generalize about demographic trends in small urban centres. A review of population growth rates between censuses for all urban centres in a nation usually shows great diversity – including a group of small urban centres that grew very rapidly and a group that grew very slowly (and often some that did not grow or even some that had declining populations). Certainly, some small urban centres will have grown faster than the largest cities, but this can be misleading in that, adding a million people to a city of 10 million in a decade appears as a slower population growth rate than adding 600 people to an urban centre of 5000 inhabitants in that same decade. Analyzing why there are such

large differentials in the population growth rates of different urban centres, and what underpinned the rapid growth of those that grew rapidly, is much more useful for policy purposes than any attempt to find relationships between the size of settlements and their population growth rates. The potential of small urban centres to grow and develop more prosperous economic bases depends not so much on their current size but, rather, on their location, on the competence and capacity of their government, on their links with other urban centres, and on the scale and nature of economic change in their region and nation. Generally, there is also considerable diversity between large cities in terms of their growth rates, although many of the largest cities experienced considerable slow-downs in their population growth rates during the 1980s and/or the 1990s, and proved to be much smaller in 2000 than had been anticipated).³⁵

Myth 2: There are valid generalizations about small urban centres' economic bases or employment structures

Again, there is generally too much diversity in

regard to the economic or employment base of small urban centres to allow generalizations, although agriculture-related goods and services and local government services and employees are generally important for the employment base of most small urban centres.

Myth 3: Governments can push new investments to small urban centres to control the growth of large cities

The record of governments achieving success when doing this is very poor; they often push investment into unsuitable locations, or the choice of location in which public investment is concentrated is determined by political reasons not economic potential. More dispersed patterns of urban development (in which some small urban centres become increasingly important and grow to become large urban centres) are likely to develop, without economic losses, through national economic growth and through effective decentralization (especially increasing the competence, capacity and accountability of local governments in small urban centres).

'urban' programmes that may only be applicable in areas designated as rural or urban so the possibilities of getting government funding may depend on a settlement being reclassified as urban or on avoiding such a reclassification, long after the settlement has developed a strong non-agricultural economic and employment base. There are also some anomalies – for instance 'small town' programmes that are for rural areas or implemented within rural programmes and even statements claiming that small towns are not urban areas.

But a concentration of people and non-agricultural economic activities implies a need for water and usually for waste-water management – regardless of whether this concentration is in a settlement classified as a village, town or urban centre. There will be economies of scale and proximity in most of these settlements, which can lower unit costs for better provision for water and sanitation. There may be important synergies between the demand from households and from enterprises (including many

household enterprises). This link between economic activities and domestic needs may also span rural–urban definitions, as demand for water for livestock and crops can help fund improved provision for water that serves these needs and also serves domestic needs. In many such settlements, there may also be sufficient demand for electricity, and also economies of scale and proximity, which make its provision economically feasible – and this brings obvious advantages with regard to power for water pumping.

This report is interested in small urban centres because many of these concentrate sufficient population and productive activities to justify investment in collective provision for water and sanitation – collective in the sense that the provision serves many people and productive activities (although it may be provided by private enterprises, community organizations, NGOs, government agencies or partnerships between these). Whether most of these are considered officially as urban centres

Table 2.4

The division of national populations between rural areas and urban centres of different sizes

Nation and date of census	Rural areas	Percentage of population in						
		Urban centres with population of						
		Under 20,000	20,000–49,999	50,000–199,999	200,000–499,999	0.5–1.99 million	2–4.99 million	5 million +
Africa								
Benin (1992)	77.0	3.0	6.3	5.8		7.9		
Botswana (2001)	47.6	7.3	18.4	10.0	16.8			
Burkina Faso (1996)	83.0	2.7	3.2	1.2	3.0	6.9		
Central African R (1988)	64.2	7.2	10.3		18.3			
Cameroon (2001)	57.1	0.9	4.0	12.9	7.5	17.4		
Côte d'Ivoire (1988)	61.0	3.0	7.8	7.2	3.1	17.9		
Egypt (1996)	57.4	1.6	3.0	8.4	7.4	1.5	9.4	11.4
Ethiopia (1994)	86.3	6.0	1.8	2.0			4.0	
Ghana (2000)	56.2	14.7	6.5	6.9	1.1	15.0		
Guinea (1996)	69.0	3.5	4.3	8.0		15.3		
Kenya (1999)	80.6	1.6	2.3	3.9	1.9	2.3	7.5	
Mali (1987)	83.6	1.4	2.0	4.5	8.6			
Mauritania (2000)	50.6	8.1	16.2	2.9		22.3		
Mauritius (2000)	57.3 [†]			42.7				
Malawi (1998)	86.4	1.5	1.0	1.5	4.4	5.1		
Morocco (2004)	42.0	8.9	5.9	10.7	4.6	17.9	10.0	
Mozambique (1997)	71.5	3.6	2.3	9.2	7.3	6.1		
Namibia (1991)	73.2	11.6	4.7	10.4				
Niger (2001)	84.6	2.2	2.0	5.0	0	6.3		
Nigeria (1991)	64.0 ^{**}		6.1	9.0	4.7	7.9	2.4	5.8
Rwanda (2002)	83.2	0.1	2.6	6.6		7.4		
Senegal (2002)	60.3	3.2	2.6	11.6	2.4	19.4		
South Africa (1996)	46.3	5.9	2.0	6.9	3.7	5.1	12.1	17.9
Tanzania (2002)	77.0	7.4	1.4	4.2	3.3		6.8	
Uganda (2002)	87.7	1.6	2.8	2.7		4.9		
Zambia (2000)	64.9	4.7	2.8	9.2	7.5	11.0		
Zimbabwe (1992)	69.4	3.3	2.9	4.4	2.6	17.4		
Asia								
Bangladesh (1991)	79.9	4.2	3.1	2.6	1.0	1.3	1.9	6.1
Cambodia (1998)	84.3		3.4	3.1		9.4		
India (2001)	72.2	6.0 [†]		5.6	3.0	5.3	2.0	5.8
Indonesia (1990)	69.4	6.9	1.4	6.6	4.2	4.5	2.5	4.6
Iran (1996)	38.7	12.1 [†]		14.3	9.3	14.3		11.3
Jordan (1994)	24.4	1.0	2.8	16.0	9.2	46.6		
Korea, Republic of (2000)	na	na	2.6	9.1	11.2	20.1	18.5	21.4
Kyrgyzstan (1999)	65.4	4.5	6.2	4.0	4.3	15.6		
Malaysia (2000)	38.2	6.9	7.3	16.8	17.4	13.5		
Philippines (2000)	52.0	9.8 [†]		13.0	9.2	3.2		12.9
Saudi Arabia (2004)	24.3 ^{**}		5.8	10.3	13.8	15.3	30.4	
Sri Lanka (2001)	84.4	2.2	2.9	4.8	1.1	3.4	0	0
Thailand (2000)	68.9	9.4	3.2	6.2	1.8	0	0	10.4
Turkey (2000)	35.3	5.5	8.6	12.9	7.7	9.1	8.0	13.0
Yemen	76.5	7.7	2.6	2.5	4.2	6.5		

Notes: * Combined figure for those in rural areas and those in urban centres of up to 50,000 people.
 ** Combined figure for those in rural areas and those in urban centres of up to 20,000 people.
 † Combined figure for those in all urban centres of up to 50,000 people.
 na Data not available.

or large villages depends on how governments define urban centres. As the interest in small urban centres or other categories of settlements such as secondary cities or intermediate cities has begun to grow, so too have certain myths about them become common. Box 2.3 outlines these.



THE PROPORTION OF PEOPLE LIVING IN SMALL URBAN CENTRES

Small urban centres probably house far more people than the cities with more than a million inhabitants in Africa, Asia and Latin America,

Nation and date of census	Rural areas	Percentage of population in Urban centre with population of						
		Under 20,000	20,000–49,999	50,000–199,999	200,000–499,999	0.5–1.99 million	2–4.99 million	5 million +
Latin America								
Argentina (2001)	11.6	11.4	7.7	11.1	10.3	14.8		33.2
Bolivia (2001)	37.6	7.4	2.3	9.0	2.4	41.3		
Brazil (2000)	19.1	15.0	9.3	17.3	12.6	13.5	4.0	9.2
Chile (2002)	13.2	14.3	6.9	17.4	18.5		29.6	
Colombia (2003)	23.6	14.8	4.6	6.9	9.8	11.6	12.0	16.7
Costa Rica (2000)	41.0	27.5	17.2	2.9	11.5			
Cuba (2002)	24.1	21.4	10.4	11.8	12.6		19.7	
Dominican Rep (2002)	36.4	11.3	5.8	18.5		28.0		
Ecuador (2001)	39.0	7.3	6.8	15.0	4.0	27.8		
Guatemala (2002)	53.9	25.8	4.8	4.7	2.5	8.4		
Honduras (2001)	55.2	13.0	6.5	6.8	6.7	11.8		
Mexico (2000)	25.3	9.6	4.9	5.6	8.7	20.9	7.0	18.4
Paraguay (2002)	43.3	9.2	3.1	3.0	3.6	6.5	31.4	
Peru (1993)	29.9	14.7	5.1	8.6	7.9	5.1		28.7
Venezuela (2001)	13.0	19.4	5.0	23.5	12.8	26.4		

Source: These figures are derived from census data – from lists of urban centres and their populations (for virtually all nations listed here, this comes from www.citypopulation.de/) and from figures for national urban and rural populations, drawn mostly from government websites; for a complete list of all sources used, see Satterthwaite, 2006, op. cit.

Notes: Getting data for any nation for a table such as this depends on being able to get population figures for a complete list of all urban centres. Inter-country comparisons of the proportion of the population in rural areas and in urban centres with fewer than 20,000 inhabitants are not valid because of the differences between nations in how urban populations are defined. Also, inter-country comparisons of the proportion of the population in large cities only have limited validity because of the differences in the ways that governments set boundaries for large cities. Three points should be noted:

- The size of large cities, and thus the proportion of the population in large cities, is much influenced by the way in which governments define large cities' boundaries. For many large cities, their total population is overstated because the city boundaries encompass large areas that are rural and also villages and small urban centres that are at some distance from the city's built-up area. This helps explain why significant proportions of the workforce in many large Chinese or Bangladeshi cities work in agriculture. By contrast, the total population of some large cities is greatly understated, as boundaries have not expanded to reflect the large numbers of people and enterprises that have spilled over the official boundaries.³⁶ For nations with large cities, it is possible to create two different tables showing the population distribution in different size urban centres: one based on the population of cities, the other based on the population of metropolitan areas or urban agglomerations (where the population of the metropolitan areas or the largest urban agglomerations are made up of many different cities). Where there were data on both, the populations in metropolitan areas and urban agglomerations was used – for instance for Mexico, South Africa and Bangladesh. For Brazil, only population figures for cities and municipalities were found for the 2000 census, not figures for metropolitan areas and urban agglomerations, so the cities or municipalities around major cities that are within the major cities' metropolitan areas are counted as independent cities. This will have considerably elevated the population in some small urban centre categories and considerably decreased the population in the large city categories. For Sri Lanka, the population figure used for Colombo was for the city, not for the metropolitan agglomeration.
- The distribution of population between rural areas and urban centres with fewer than 20,000 inhabitants is much influenced by the census definition for what constitutes an urban area. Thus, in Peru, where the urban definition includes small settlements (populated settlements with 100 or more dwellings grouped contiguously, and administrative centres of districts), the proportion living in 'urban centres with fewer than 20,000 inhabitants' is high, and the proportion living in rural areas low. In some nations, complete lists of all urban centres were not available so part or all of the population in 'urban centres with less than 20,000 inhabitants' was derived from subtracting the population of all urban centres with over 20,000 inhabitants from the rural population. For most nations where this was done, some verification for the validity of the figure could be obtained from the national definition of 'urban'.
- Some censuses understate total urban populations because of the difficulties in defining urban centres or applying the definition to census data. For instance, the statistics on Sri Lanka suggest that 14.6 per cent of Sri Lanka's population was urban in 2001, but the government census office suggests that this will increase to around 30 per cent when a more refined analysis is applied to what proportion of the population live in urban areas.
For Indonesia and the Republic of Korea, the figure for the proportion of the population in urban centres of 20,000–49,999 inhabitants is only for the population in urban centres with 30,000–49,999 inhabitants while the population in urban centres under 20,000 is for urban centres under 30,000. For South Africa, the figure for the proportion of the population in the 20,000–49,999 inhabitant category is for urban centres with 25,000–49,999 inhabitants, which means that the proportion of the population in this category is understated and the proportion in urban centres with fewer than 20,000 inhabitants is overstated.

but it is difficult to get accurate measures of the proportion of people in them because many are still classified within the rural population, as described above. Census reports rarely give details as to the proportion of the population living in different settlement categories according to their population size. Table 2.4 shows the proportion of national populations living in different size categories. This table drew only on census data and was constructed from data tables that had figures for the populations of

urban centres. Only nations for which such data tables were available could be included so it is an incomplete list. As noted earlier, the figures for each nation for the proportion of the national population in urban centres with less than 20,000 inhabitants will be strongly influenced by how urban centres are defined. For the other urban categories, the figures can be compared between nations.³⁷

Table 2.4 shows how high a proportion of national populations can live in urban centres

Nation and date of census used	Proportion of the national population in urban centres with 50,000–199,999 inhabitants (%)	Number of urban centres with 50,000–199,999 inhabitants
Mauritius (2000)	42.7	4
Venezuela (2001)	23.5	55
Chile (2002)	17.4	26
Brazil (2000)	17.3	312
Malaysia (2000)	16.8	36
Jordan (1994)	16.0	6
Iran (1996)	14.3	92
Philippines (2000)	13.0	88
Cameroon (2001)	12.9	21
Turkey (2000)	12.9	100
Cuba (2002)	11.8	13
Senegal (2002)	11.6	10
Argentina (2001)	11.1	45
Morocco (2004)	10.7	36
Saudi Arabia (2004)	10.3	24
Botswana (2001)	10.0	2
Mozambique (1997)	9.2	16
Korea, Republic of (2000)	9.1	47
Nigeria (1991)	9.0	84
Peru (1993)	8.6	19
Egypt (1996)	8.4	63
Guinea (1996)	8.0	6
Côte d'Ivoire (1988)	7.2	9
South Africa (1996)	6.9	
Colombia (2003)	6.9	36
Ghana (2000)	6.9	14
Indonesia (1990)	6.6	147
Thailand (2000)	6.2	
China (1990)	6.0	755
Benin (1992)	5.8	4
Mexico (2000)	5.6	62
India (2001)	5.6	633

Table 2.5
Number of urban centres with 50,000–199,999 inhabitants and the proportion of the national population they contain

with less than 50,000 inhabitants – for instance around 45 per cent in Costa Rica, around 30 per cent for Guatemala, around a quarter of the population in Botswana, Mauritania, Brazil and Venezuela and around a fifth of the population in Ghana, Chile, Peru, Colombia, and Egypt.³⁸ For most of the other nations shown in Table 2.4 it was less, but for many nations, this is because the urban criteria their governments use do not classify most (or any) settlements with between 2000 and 5000 inhabitants as urban.³⁹

Several nations have more people in urban centres with less than 50,000 inhabitants than in urban centres with more than 200,000 inhabitants – for instance Costa Rica (2000), Guatemala (2002), Benin (1992), Botswana (2001), Ghana (2000), Ethiopia (1994), Mauritania (2000) and Thailand (2001). Namibia (1991) is also in this list because its largest urban centre had less than 200,000 in 1991.

Many nations have more than 10 per cent of their national populations in urban centres with between 50,000 and 199,999 inhabitants (see Table 2.5). Obviously, for some small population nations, this is because they have no urban centre that is larger than 199,999 inhabitants – as in Mauritius. Most of the other nations in Table 2.5 with the highest proportion of their national populations in this size category of urban are relatively urbanized nations – and it shows the importance of what might be termed ‘intermediate sized’ urban centres within their nation. Table 2.5 also shows how numerous these can be – for instance more than 750 urban centres in this size category in China in 1990⁴⁰ with more than 600 in India in 2001, more than 300 in Brazil in 2000, 147 in Indonesia in 1991 and 100 in Turkey in 2000; urban centres of this size category also contain significant proportions of the population in most high-income nations.⁴¹ It is also worth noting the number of nations in Table 2.5 with 5–10 per cent of their national populations in this size category of urban centre that are predominantly rural nations – for instance Mozambique, Nigeria, Benin and Niger.

Bangladesh had a low proportion of its national population in urban centres with 50,000–199,999 inhabitants in the 1991 census – but still had 34 such centres that housed close to 3 million inhabitants.

One final comment in regard to the statistics in Table 2.4 is the importance of urban centres with between 200,000 and 499,999 inhabitants in the national populations of many relatively large population, relatively urbanized nations. Table 2.6 provides some examples – for instance Chile, Malaysia, Saudi Arabia, Venezuela, Republic of Korea and Argentina.⁴² There is also a group of low-income nations within this table that are less urbanized but with several urban centres in this size category that are important regional centres, including some that may have increasing economic and demographic importance, if their economies grow – for instance Cameroon and Tanzania.

Large population nations can have many urban centres in this size category – for instance China with 125 in 1990 and India with 100 in 2001 (even if these concentrate only a few per cent of their national populations), Brazil with 70, Mexico with 26, Indonesia with 25 and the Philippines with 24. A few small population nations also have a relatively high proportion of their population in urban centres in this size-class because their largest city falls into this category – as in Botswana in 2001, the Central African Republic in 1988 and Mali in 1987.



SMALL URBAN CENTRES AND THE RURAL-URBAN CONTINUUM

Two conclusions can be drawn from the above. First, that small urban centres have a high proportion of the urban population in most nations and a high proportion of the national population in most relatively urbanized nations. Second, the pattern of small urban centres and their relation to rural settlements and other urban centres defies simple categorization or description. The spatial distribution of any nation's urban population is best understood as the 'geography' of its non-agricultural economy and government system.⁴³ Or, to put it another way, it is the map of where people live whose main income source is not from agriculture.⁴⁴ In general, as nations' per capita incomes increase, so too does the concentration of their population in urban centres, because most new investment and income-earning opportunities are concentrated there. Most low-income nations and all middle-income nations have less than half of their gross domestic product (GDP) in agriculture, and all nations with growing economies have decreasing proportions of their GDP derived from agriculture and decreasing proportions of their labour force in agriculture.⁴⁵ These figures on the proportion of GDP or of the labour force in industry and services can be misleading in that a considerable part of the growth in industry in most low-income nations may be from forward and

Nation and date of census used	Proportion of the national population in urban centres with 200,000–499,999 inhabitants (%)	Number of urban centres with 200,000–499,999 inhabitants
Chile (2002)	18.5	10
Central African R (1988)	18.3	1
Malaysia (2000)	17.4	13
Botswana (2001)	16.8	1
Saudi Arabia (2004)	13.8	11
Venezuela (2001)	12.8	10
Brazil (2000)	12.6	70
Cuba (2002)	12.6	5
Costa Rica (2000)	11.9	1
Korea, Republic of (2000)	11.2	18
Argentina (2001)	10.3	11
Colombia (2003)	9.8	13
Iran (1996)	9.3	18
Philippines (2000)	9.2	24
Jordan (1994)	9.2	1
Mexico (2000)	8.7	26
Mali (1987)	8.6	1
Peru (1993)	7.9	6
Turkey (2000)	7.7	18
Cameroon (2001)	7.5	4
Egypt (1996)	7.4	14
Mozambique (1997)	7.3	3
Zimbabwe (1992)	6.9	1
Nigeria (1991)	4.7	13
Morocco (2004)	4.6	4
Malawi (1998)	4.4	1
Indonesia (1990)	4.2	25
Yemen (1994)	4.2	2
South Africa (1996)	3.7	
Paraguay (2002)	3.6	1
China (1990)	3.3	125
Tanzania (2002)	3.3	5
Côte d'Ivoire (1988)	3.1	1
India (2001)	3.0	100

backward linkages with agriculture – for instance, the production and sale of agricultural machinery, fertilizers and other agricultural inputs, cold stores, and packaging and processing industries.⁴⁶ In addition, a considerable part of the growth in urban services can be to meet demand from agricultural producers and rural populations.⁴⁷

As noted earlier, it is difficult to generalize about the economic bases of small urban centres. In most nations, many will be 'market towns', concentrating markets and services for local agricultural producers and retail and service outlets for their populations and the surrounding populations (including entertainment and financial services). Many are 'administrative towns', in that a significant proportion of their population directly or indirectly derive their income from the concen-

Table 2.6
Number of urban centres with 200,000–499,999 inhabitants and the proportion of the national population they contain

tration of government functions there – including the staff who work for the local district government and those who work for government-funded services (health care, hospitals, schools, post, police and courts). Obviously, many small urban centres have both market functions and concentrate government employees. Among the many other economic underpinnings of small urban centres are mining enterprises, tourism, border posts, river ports (or ‘land ports’ in the sense of being key nodes linking local settlements to larger markets), education centres (for instance, one or more secondary school or a higher education institution), hotels/boarding houses, agricultural processing, retirement centres (sometimes with foreign retirees being an important economic underpinning for the urban centre) and centres for the armed services. Most urban centres will also have a proportion of their population working in agriculture. Economic trends in small urban centres will vary – usually from among the most dynamic to among the least dynamic. Many urban centres close to large and prosperous cities may develop stronger economic bases as they attract new enterprises whose output largely serves demands in the large city or external demands organized by enterprises located in the large city. They may also develop into dormitory towns, or at the least have their economy strengthened by having a proportion of their workforce commuting to the larger city.

With regard to comparing small urban centres’ economic and employment bases between different size categories, empirical studies have found no easily defined or clear dividing line although, in general, the larger the urban centre’s population, the smaller the proportion of the economically active population working in agriculture and the greater its importance within the government’s administrative hierarchy. In nations with effective decentralization, including democratic reforms, many municipal governments in small urban centres have become increasingly successful in support-

ing economic growth and in improving infrastructure provision.

Dividing a nation’s population into rural and urban and assuming that these have particular characteristics in terms of the settlements they live in and the sector in which they earn a living misses the extent to which (poor and non-poor) rural households rely on urban income sources (through remittances from family members, commuting or producing for urban markets), while many urban households in low-income nations rely on rural resources and reciprocal relationships with rural households.⁴⁸ It even gets to the point where rural specialists will talk at length about rural industrialization and ‘off-farm’ and ‘non-farm’ employment without mentioning ‘urban’, although much of the so-called ‘rural industrialization’ and much of the non-farm employment is actually in small urban centres.⁴⁹ Meanwhile, urban specialists almost never recognize the importance of prosperous agriculture and a prosperous agricultural population for urban development.

If our concern is to improve provision for water and sanitation regardless of where someone lives or works, there is a need to forget the rural–urban divide and see all settlements as being within a continuum with regard to both their population size and the extent of their non-agricultural economic base. Figure 2.3 illustrates this. Here, key rural characteristics are listed on the left and key urban characteristics on the right.

The characteristics listed under each column are two ends of a continuum. As noted already, many rural settlements have households that rely on non-agricultural jobs, and non-agricultural employment opportunities may be very important for reducing rural poverty. In many nations, landless labourers are among the poorest of the rural poor, and they too require better income-earning opportunities, just like the urban poor. Meanwhile, most urban areas exhibit some rural characteristics – for instance, the importance of urban agriculture for many low-income urban households. And, in addition, in the middle of this

continuum between ‘rural characteristics’ and ‘urban characteristics’, is a ‘rural–urban’ interface in which rural and urban characteristics are mixed, and most small urban centres in low- and middle-income nations have such a mix.



THE LINKS BETWEEN IMPROVED WATER AND SANITATION PROVISION AND LOCAL ECONOMIC DEVELOPMENT IN SMALL URBAN CENTRES⁵⁰

The benefits of ‘good’ provision for water and sanitation for enterprises as well as for individuals and households are obvious. It is also obvious that this is to the advantage of enterprises of all sizes, including micro enterprises and individual’s income-earning work undertaken in the home. Good provision to dispose of waste-water obviously becomes more important, the larger and more polluted an enterprise’s volume of waste-water. An important part of the justification for improved provision for water and sanitation in small urban centres is the contribution to economic activities.

But it is difficult to separate the contribu-

tion of good provision for water and sanitation from other factors in contributing to local economic development beyond the household level. While macro-level cross-country analyses confirm that there is a significant association between economic growth and improved water and sanitation provision, this is often embedded in much wider infrastructure provision that is also important for enterprises, including roads, transport, electricity and telecommunications. Micro-level evidence is limited, especially regarding small and micro enterprises. An additional problem is that it is difficult to make generalizations on the impact of improved provision on economic growth in small urban centres, since the economic potential of such centres and the importance of good provision for water and sanitation for such potential varies so much.

It can be argued that improved provision for water and sanitation stimulates economic growth but it is also evident in many case studies that it is economic growth that provides the context that allows better provision. One returns to the obvious point that it is the competence and capacity of local governments, their accountability to those within their jurisdictions, and their willingness to seek and support locally appropriate solutions that has such importance. Economic growth should provide more possibilities for better provision for water. And better provision will certainly support many enter-

RURAL		URBAN
Livelihoods drawn from crop cultivation, livestock, forestry or fishing (i.e. key for livelihood is access to natural capital)	RURAL-URBAN INTERFACE	Livelihoods drawn from labour markets within non-agricultural production or making/selling goods or services
Access to land for housing and building materials not generally a problem		Access to land for housing very difficult; housing and land markets highly commercialized
More distant from government as regulator and provider of services		More vulnerable to ‘bad’ governance
Access to infrastructure and services limited (largely because of distance, low density and limited capacity to pay)		Access to infrastructure and services difficult for low-income groups because of high prices, illegal nature of their homes (for many) and poor governance
Less opportunities for earning cash , more for self-provisioning; greater reliance on favourable weather conditions		Greater reliance on cash for access to food, water, sanitation, employment, garbage disposal
Access to natural capital as the key asset and basis for livelihood		Greater reliance on house as an economic resource (space for production, access to income-earning opportunities; asset and income earner for owners – including de facto owners)
Urban characteristics in rural locations (prosperous tourist areas, mining areas, areas with high-value crops and many local multiplier links, rural areas with diverse non-agricultural production and strong links to cities)		Rural characteristics in urban locations (urban agriculture, ‘village’ enclaves, access to land for housing through non-monetary traditional forms)

Figure 2.3
The rural–urban continuum

Source: Satterthwaite, D. and Tacoli, C. (2003) *The Urban Part of Rural Development: The Role of Small and Intermediate Urban Centres in Rural and Regional Development and Poverty Reduction*, Rural–urban working papers series, no. 9, IIED, London, 64 pages.

prises, lowering costs, perhaps increasing possibilities for expansion or diversification and reducing environmental burdens passed onto others. But care is needed in any assumption that better provision for water and sanitation will, by itself, support local economic development – since the constraints on such development may have little to do with the inadequacies in water and sanitation provision.

This section discusses the evidence for the role of infrastructure in local economic development, and the issue of local government's status and capacity. It draws on studies of the links between improved water and sanitation provision and the development of micro and small enterprises in African small market towns and on studies of the impact on water quality of the growing number of small urban centre and peri-urban micro enterprises in Vietnam and China. It also outlines the health concerns of peri-urban horticulture in Africa and India, where untreated urban waste-water is a major source of irrigation water. It begins with a discussion of the variations in the economic bases of municipalities at the periphery of large urban centres and of small urban centres.

The key point is that the nature and economic base of small urban centres is extremely varied, and this has important implications for the priorities in improving provision for the development of economic activities. In some areas, water quality and reliability may be more important than quantity, while in others the treatment of waste-water is the main issue. In other words, interventions to improve provision need to be tailored to local needs and priorities, and take into account the wide range of factors other than improved water and sanitation provision that shape local economies. In turn, identifying priorities and acting on them depends on local governments' capacity, accountability and access to sufficient revenue or external funding.

Variations in the economic base of small urban centres

While improved infrastructure is an essential component of local economic development in small urban centres, such centres are too diverse to allow generalizations on priorities for infrastructure and how this should be provided. Infrastructure provision needs to respond to the actual needs of users rather than follow an abstract blueprint. What follows is a broad description of the main characteristics of municipalities at the periphery of large metropolitan areas and small urban centres that are more independent spatially.

■ Municipalities at the periphery of large metropolitan areas

Municipalities within the sphere of influence of large metropolitan areas, especially dynamic cities with fast economic and population growth rates, usually undergo rapid transformations in their use of natural resources (especially land and water), occupational base and population density. The peri-urban interface of metropolitan areas (including what are termed the *desakota* regions in Southeast Asia⁵¹) is far from homogeneous. Differences in terms of residents' occupation and wealth can be significant: some areas, especially upstream of any river flowing through the metropolitan region, often have high concentrations of high- and middle-income residential areas. These often encroach on high-value agricultural land, as in Hanoi's upstream peri-urban district of Phu Thuong, which became an urban ward in 1996 and is still well known for its 'flower villages'. Its remaining vast expanses of rice fields are earmarked for further mega-urban projects.⁵² In contrast, downstream locations, where streams and rivers tend to accumulate urban waste as they pass through the city, almost universally host low-income housing areas and heavy industries.

Responding to increased demand from urban consumers, many peri-urban farmers specialize in intensive production of vegetables, flowers, ornamental plants and livestock. In this

case, access to and use of natural resources, especially land and water, can be a potential cause of conflict between farmers and residents, especially where population growth and density increase demand for domestic use in the larger city, and between farmers and industrial users. This is discussed in more detail later in this chapter.

In other cases, agriculture is a 'residual' occupation undertaken by local residents to supplement their diet or their incomes. In many Latin American nations, peripheral municipalities in metropolitan regions often concentrate low-income groups, sometimes relatively recent migrants who moved to the cities looking for non-farm employment and who, following the repeated economic crises of the 1980s and 1990s, have found shelter in informal settlements and work primarily in the informal economy.

■ Small urban centres and large villages

The economic base of this type of settlement depends largely on that of its surrounding region. Market towns in cash-crop production areas often specialize in trade and the provision of services and inputs to farmers. In areas where population density is high and agricultural land increasingly scarce, small urban centres provide much-needed opportunities for employment in non-farm activities. In many regions, and especially in much of sub-Saharan Africa, non-farm employment in small urban centres is essentially in services and trade and is closely linked to agriculture; indeed, many urban entrepreneurs continue to invest in farming, often employing relatives to look after their fields. Moreover, non-farm activities are constrained by demand – where there is broad-based demand, that is, where revenues are relatively equally distributed among both rural and urban populations of the region, small-scale enterprises are more likely to thrive.

In Southeast Asia, however, manufacturing in small urban centres is more widespread, especially in densely populated areas such as Vietnam's Red River delta and China's eastern

region. In its early stages, this transformation of the economic base from farming to manufacturing is likely to take place at the household level, with the proliferation of micro enterprises taking in production activities on a home-based, piece-work basis.⁵³ Goods produced in small urban centres are often sold on international markets through a series of intermediaries based in larger cities. The key problem in these settlements is water contamination and, perhaps to a lesser extent, air pollution caused by these largely unregulated production units.

Local economic development and general infrastructure in small urban centres

Infrastructure such as roads, electricity, water and sanitation, is essential for the economic growth of small urban centres. There are many instances of such centres that have developed thriving economies and become important centres for the growth of their surrounding rural regions. Mbulu, a district headquarters in northern Tanzania with a population of around 6500, is a good example of this. As the administrative local centre, Mbulu provides a range of services such as health, education and communications to its surrounding area. It is also an important economic centre with daily and weekly markets that attract traders from other districts, and many small-scale services and trade enterprises catering to the needs of the local population but especially that of the surrounding region. The introduction of electricity in 1999 has increased the role of the urban centre by supporting a wider range of activities such as electrically powered grain mills and improved services in guesthouses and bars. Although roads could be improved, Mbulu is nevertheless well located for connections to other larger urban centres and to rural settlements.⁵⁴

But while, on the one hand, infrastructure is an essential factor of economic growth, on the other hand, it is also argued that economic growth is essential for funding infrastructure provision. As urban economies grow, they generate the resources upon which local governments

draw to extend public services and invest in public health infrastructure. Public provision is especially important for small-scale enterprises that are less able to substitute poorly delivered public services with private provisioning (for example, through the use of generators and the drilling of private boreholes).⁵⁵ This is especially important as small and micro enterprises are usually the bulk of activities in small urban centres, and the main employment opportunity for low-income groups.

However, public provision depends greatly on the capacity of local governments to raise income through local taxation and through access to national budgets. This, in turn, is largely linked to the settlement's status as an urban centre, or as a rural village. In the case of Mbulu town, district-level authorities were able to improve provision because of their urban status, which also gave them access to greater funding and more skilled personnel. In contrast, the local government in the small centre of Bellandur, in the peri-urban interface of Bangalore, southern India, is limited by its village status. As the settlement's economic base evolves from agriculture to more diversified activities, revenue lands are being subdivided into smaller plots by small-scale landowners and service activities and some small-scale manufacturing are emerging. But with village status, the panchayat cannot impose development and betterment charges that reflect land use change, and thus has limited scope for investing in infrastructure. Similarly, residents only have access to loans for agricultural purposes from the Primary Land Development Bank.⁵⁶ This is often the case in peri-urban areas, where proximity to larger urban centres greatly affects economic activities, but where local governments have limited authority and funds to provide appropriate infrastructure.

The links between improved water and sanitation provision in small urban centres and economic development

The contribution of improved water and sanitation provision to local economic development involves two distinct but interrelated aspects. On the one hand, domestic provision is obviously related to economic development, if only because it contributes to users' health, and thus their capacity to engage in productive activities. On the other hand, it is assumed that access to water and sanitation is equally important for enterprises to function adequately. From a poverty reduction perspective, small and micro enterprises, as well as small-scale agriculture, are particularly relevant sectors as they have a high concentration of low-income groups. It is also likely that in small urban centres the division between the domestic sphere and the productive sphere is less obvious than in large cities (although even there, especially in informal settlements, the distinction is often blurred). For example, it is more likely that a substantial proportion of the residents in small urban centres engage in agriculture, either for household consumption or for commercial purposes, and often in conjunction with non-farm activities. It is also more likely that non-farm activities such as micro-scale manufacturing or running a small shop or bar, are undertaken within or in close proximity to domestic residential areas, thus often escaping environmental protection regulations.

Over the last few decades, there has been substantial research on the economic benefits to households of improved water and sanitation services. They include:

- a positive impact on health, which increases time and energy to invest in productive activities (including that of those who care for ill or injured relatives);
- closer proximity of water sources and increased quantity available reducing the time necessary to fetch water; and

- improvements that are especially relevant for women, who are traditionally responsible for looking after ill relatives, and for fetching water for the whole household.

Improved supply also usually means that water is cheaper. This can be a significant benefit for low-income households with no alternative but to buy water from private vendors. In some cases, improved supply has also improved private vendors' services by increasing their reliability when delivering water and by lowering their prices. This is likely to be the case especially when private vendors have access to improved (public) supply sources such as water kiosks.

Lower costs of water and less time spent on fetching water and looking after ill relatives can mean that disposable incomes are higher and can either be invested in non-farm productive activities, or spent on goods and services that in turn may spur local micro and small enterprises. While this is certainly true, it is important that due recognition is given to the diversity of the economic base of small urban centres and to the factors underpinning it, and that this understanding is integrated in projects and initiatives to improve water and sanitation.

The benefits of improved provision for small urban centres' micro and small enterprises: An example from Uganda

One of the very few studies to examine the benefits of improved water supply infrastructure to the development of micro and small enterprises (MSEs) compares two small urban centres in Uganda.⁵⁷ At the time of the study, Wobulenzi and Lugazi both had populations of about 20,000,⁵⁸ both are about 50 km from the capital, Kampala, to which they are connected by a relatively good highway, and both have a similar economic base, with small and micro enterprises dominating the urban economy. The difference between the two is that Wobulenzi had a recently installed piped water system, whereas Lugazi had not.

In Wobulenzi, groundwater is abstracted with electric pumps from a deep borehole and delivered untreated to a limited piped distribution system with 31 kiosks, with the option of paying for the installation of private connections. Water from the system is cheaper than it was before the system was installed, primarily due to subsidized capital costs through concessional financing from the World Bank, rather than increased efficiency. In contrast, residents in Lugazi fetch water primarily from springs and enterprises run by vendors at a much higher price than that of Wobulenzi's kiosks (but similar to that before the improved system was installed).

In both urban centres, small and micro enterprises operate almost exclusively in the trade and services sectors, and most are very small (mainly with two staff), very young (40 per cent are in operation for two years or less), and entrepreneurs themselves are young and the majority are women. The overwhelming majority of them are tenants, which has implications for water demand, as discussed below. Last but not least, profits are very low and many MSEs struggle to survive.

In Wobulenzi, the improved water system has eliminated water supply as a concern for MSEs, and reduced its cost. In contrast, water quality and quantity is considered a major constraint by Lugazi's entrepreneurs, comparable or greater to other infrastructural constraints. However, somewhat surprisingly, the amount of water consumed by MSEs in the two urban centres is identical, despite the difference in price – 25 shillings (US\$0.014) per jerrican from a kiosk in Wobulenzi against 125–150 shillings (US\$0.069–0.083) from vendors in Lugazi. Moreover, only two businesses in Wobulenzi had decided to invest in a private connection which, excluding the actual connection cost, would further decrease the price of water.

This would suggest that, while improved water supply is indeed important to reduce constraints, in itself it does not stimulate local economic development. The other factors that contribute to the relative stagnation of demand for water by MSEs in Wobulenzi are:

- The nature of the activity: aside from a guesthouse, the other enterprises (trade and services) do not require large amounts of water; in other words, demand for water by MSEs is relatively inelastic.
- The size of the activity: most MSEs have very low profits, making increased water use and especially payment for a private connection a big investment.
- Private connections are also not considered a good investment because MSEs are overwhelmingly tenants. This mirrors the fact that at the household level, demand for connections is usually higher among homeowners than tenants.

As the study authors point out, in small market towns where micro and small enterprises dominate the urban economy, the economic benefits of improved water services are lower for such enterprises than they are for households. In policy terms, public taps may be more appropriate in the central business districts of these small urban centres, while private connections should concentrate in residential areas.

Home-based and small-scale manufacturing and water pollution: Examples from Vietnam (and China)

In Vietnam's Red River delta and in China's eastern region, small-scale manufacturing is an increasingly important activity in small urban centres (including many that are still classified as rural), especially in the wide peri-urban corridors around and between large cities. In part, this sectoral specialization is due to limited availability of agricultural land and high levels of population density. Equally importantly, both regions are increasingly connected to global markets through networks of buyers and exporters.

In many cases, the primary production of goods takes place at the household level. This means that it is most often in the form of home-based, piecework sub-contracted from slightly larger enterprises. In Vietnam's Red River

delta,⁵⁹ entire villages specialize in the manufacturing of specific handicrafts – for example, rattan and bamboo woven baskets, dyed fabric and dried noodles. Many of these activities require access to water, which is generally not perceived as a major problem in the area because of the relative availability of surface water. At the same time, many activities rely on the use of highly polluting materials such as fabric dye, varnish and polish for rattan and bamboo baskets, many of which end up in surface and groundwater sources. Work is often undertaken by several generations of workers, including old people and sometimes children, in the home courtyard and around the house, creating further potential health hazards for the whole population of these densely settled small urban centres.

But because of their small size and dispersed organization, most micro enterprises in the Red River delta are overlooked by industrialization policies, despite being the largest employers in the region and despite the growing problems caused by the lack of environmental controls. For example, incentives for industries to relocate in the newly established provincial industrial zones include grants for each local worker employed. This, however, does not include the employment of home-based workers, and therefore excludes most handicraft enterprises. At the commune level, small industry and handicraft zones are being created, but there too, minimum requirements often do not correspond to these enterprises' needs: available plots of land are too large and payment conditions are not affordable. Moving the most polluting activities away from the residential areas into industrial and handicrafts zones with appropriate facilities to reduce pollution from manufacturing is highly desirable, but needs to take into account the specific nature and organization of these enterprises.

In China, the spatial dispersion and small size of town and village enterprises (TVEs) has made environmental control particularly difficult. In the mid-1980s, it was estimated that TVEs were responsible for one third of China's gas

emissions, one sixth of water pollution and one sixth of solid waste production.⁶⁰ Stricter environmental regulations introduced in the 1990s have affected many TVEs: in 1997, the national government ordered the closure of tens of thousands of TVEs engaged in highly polluting activities such as tanning, paper making and dyeing textiles.⁶¹ Increasingly, survival for the most successful TVEs has meant relocating to county and township industrial estates that provide pollution control facilities, and organizing into clusters of specialized production. As in Vietnam, the provision of basic infrastructure in small urban centres and urbanizing villages needs to take into account the needs and constraints of this increasingly important category of enterprises.

Agriculture-based activities in peri-urban areas of large cities: Examples from India, West Africa and China

The links between improved water and sanitation provision and agriculture-based activities, common in many peri-urban areas, include two main aspects: the use of waste-water for horticultural production and competition over fresh water resources between farmers and industries.

The use of urban waste-water for agriculture is common in peri-urban areas surrounding larger urban centres with demand for fresh fruit and vegetables. Around Ghana's second city, Kumasi, population increase and lack of investment have overstretched the few existing sanitation facilities and large volumes of untreated or partially treated waste-water, mainly from domestic sources, end up in nearby streams. As contaminated waste-water streams are used for irrigation, high levels of faecal coliform were recorded on Kumasi markets' vegetables. While peri-urban agriculture is generally a positive resource for peri-urban farmers who earn more from high value-added produce for urban markets, and for urban consumers who have easier access to fresh vegetables and fruit, the example of Kumasi is not unusual in showing the health risks for farmers and consumers

associated with the lack of appropriate sanitation facilities.⁶²

Similarly, the permanent streams of sewage-contaminated waste-water emanating from the twin city of Hubli-Dharwad in southern India have enabled small-scale farmers to diversify their cropping practices and adopt year-round intensive horticultural production systems. However, there are adverse health implications, including bacterial contamination of vegetables and intensive application of pesticides to combat the insects that infest these crops.⁶³

Waste-water is a general problem for municipalities at the periphery of large urban centres. In the municipality of Ningbo, in the Hangzhou-Ningbo Corridor in the Chinese coastal province of Zhejiang, the leading environmental issue is untreated waste-water from enterprises. This is made worse by the limited treatment facilities in the peri-urban area compared to the city proper. While the urban centre (city proper) produces 54 per cent of the total waste-water, 57 per cent of it is treated up to standard, but the proportion of appropriately treated waste-water is only 36 per cent of the total produced in peri-urban areas.⁶⁴

In southeast Nigeria, the industrial expansion around Aba has included the establishment of industries such as paper mills in peri-urban municipalities. While this has provided opportunities for non-farm employment, the untreated waste-waters from the mill have polluted the local river, an important resource for local residents who still rely on the combination of farming, fishing and non-farm activities.⁶⁵



CONCLUSIONS

Improved provision for water and sanitation stimulates economic growth but economic growth is often what provides the basis for the development of improved public services by expanding the public revenue base and the demand for water and sanitation services. What is needed in all instances is a local government that supports what is possible and appropriate to local circumstances. This can be particularly

difficult to develop in the smallest urban centres and in rapidly changing small urban centres – perhaps especially those on the periphery of prosperous, growing larger cities.

Improved water and sanitation provision is essential, but not the only factor of local economic development. A detailed understanding of these factors, and of the characteristics of small urban centres' economic bases is important to support economic growth, especially in sectors that benefit the poor. Such understanding will also help in setting the priorities for interventions in water and sanitation provision. Additional factors that shape local economic development include:

- The level of general infrastructure (including water and sanitation but also roads, telecommunications, electricity, etc.).
- The links to local, national, regional and international markets. Access to large urban centres often stimulates horticultural production (where access to natural resources allows for it), while access to international markets is important for handicrafts and manufactured goods. Where

markets consist mainly of low-income local populations (from the urban centre and the surrounding rural areas), enterprises are also likely to be small and less profitable.

A better understanding of the economic base of a small urban centre and its surrounding region can then provide the basis for identifying the priorities of different types of enterprises and activities. For example:

- Small and micro businesses specializing in trade and services are likely to be users of fresh water, for which their priority is reliability and quality rather than quantity.
- Peri-urban farmers are more likely to be users of waste-water, hence sanitation systems are likely to be more of a priority.
- Small and home-based handicraft and manufacturing activities can produce waste-water pollution, hence the key issue there is pollution control.
- In all cases, land tenure is likely to play an important role in the investment decisions of enterprises in water and sanitation.

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- 36 For more details, see Satterthwaite, 2005, op. cit.
- 37 However, there are at least two possible sources of error for cross-country comparisons in these size categories. The first is the differences between nations in the ways that the boundaries of urban centres are defined – for instance, in some nations, defined 'too small' in relation to urban expansion, in other nations defined 'too large' as they include significant numbers of rural populations. The second is whether the populations of local government units within or close to major cities have been incorporated into the population of these large cities as metropolitan areas or urban agglomerations or reported as distinct urban centres in their own right. See the notes to Table 2.4 for more details.
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- 39 The list of nations is restricted by the availability of census data that provide a list of all urban centres and their populations. The reader should also note the words of caution listed at the end of Table 2.4.
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- 43 See Satterthwaite, 2005, op. cit. This often in part also reflects the nation's or region's agricultural economy, as the areas with the most prosperous agriculture often have among the most dynamic urban centres, which are markets and service centres for farmers and rural households.
- 44 There are exceptions – for instance, urban growth in places where retired people choose to live or in tourist resorts but, even here, the growth is largely due to the growth in enterprises there to meet the demand for goods and services generated by retired people and/or tourists. Advanced telecommunication systems and the internet also allow some spatial disconnect, as a proportion of those who work for city-based enterprises can work from locations outside the city (including working from homes that are outside the city); these may be growing in importance, but they are unlikely to be significant yet in low- and middle-income nations. Many urban centres also have farmers and agricultural workers among their populations.
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DEFICIENCIES IN PROVISION FOR WATER AND SANITATION IN SMALL URBAN CENTRES



INTRODUCTION

One of the most detailed studies on life and conditions in a small urban centre (in Brazil) describes an event in 1982 to celebrate the centenary of the local government (*município*). The celebrations had all the ‘big men’ waiting to speak on the stage – the family that had controlled the urban centre for decades, the mayor, a state senator (the older brother of the mayor) and a federal senator. Before the event could begin, there were shouts from the crowd that sounded like ‘water’ that quickly became a chant calling for *água, água* – and then a large banner was unfurled by people in the crowd, saying ‘Cem anos e sem água’ (‘One hundred years without water’).¹

Available data suggests that at least one billion of the people who lack adequate provision for water live in small urban centres or in large villages with urban characteristics – with the numbers lacking adequate provision for sanitation in such settlements being considerably more than one billion (see Box 3.1). These constitute a very significant part of the population that needs to be reached with safe water and basic sanitation if the MDG target for water and sanitation is to be reached.

In high-income countries, generally, the quality and extent of provision for domestic water and sanitation does not vary much, if at

all, between large and small urban centres since virtually all urban houses and apartments (and workplaces and schools) have regular, continual supplies of potable piped water and connections to sewers. Available data suggests that this is not the case in most low- and middle-income nations – both in the quality of what is available

Box 3.1 The scale of the deficit in provision for water and sanitation in small urban centres and large villages

Within the population defined by governments as ‘urban’ in 2000, at least 680 million lacked adequate provision for water and at least 850 million lacked adequate provision for sanitation.² Reviewing the data presented in Chapter 2, it can be suggested that at least half the urban population in low- and middle-income nations live in small urban centres, while the studies reviewed in this chapter suggest that provision for water and sanitation is generally worse in small urban centres than in large urban centres. So it would be reasonable to assume that at least 400 million people in small urban centres lack adequate provision for water and at least 500 million lack adequate provision for sanitation.

Within the 3 billion people living in what governments define as ‘rural’ areas in low- and middle-income nations in 2000, it is not possible to estimate how many lack adequate provision for water and sanitation, as discussed in more detail in Chapter 5. But around one billion lack ‘improved’ provision for water and two billion lack ‘improved’ provision for sanitation;³ the figures for the proportion lacking adequate provision is likely to be significantly higher.⁴ It is also not possible to estimate with any precision the proportion of this rural population that live in large villages with urban characteristics and in need of what would normally be considered ‘urban’ forms of provision for water and sanitation. But looking at the proportion of people living in large villages with urban characteristics in Pakistan, India, China and Egypt and at the many case studies of large villages from other nations that are summarized in Chapter 2, hundreds of millions of people certainly live in large villages with urban characteristics – and the total may reach more than a billion. A high proportion of these people lack adequate provision for water and sanitation. Thus several hundred million people lacking adequate provision for water live in large villages with urban characteristics – and rather more lack adequate provision for sanitation. Thus, it is not unreasonable to suggest that at least one billion people who lack adequate (or ‘safe’) provision for water live in small urban centres or large villages with urban characteristics – with the numbers lacking adequate provision for sanitation in such settlements being considerably more than one billion.

and in the proportion of their populations served. There are exceptions – for instance, small urban centres in relatively wealthy parts of a low- or middle-income country may have better provision or a higher proportion of people with good provision than in large cities in poorer regions. In addition, there are many examples of small urban centres in, for instance, Mexico, Brazil and Chile where virtually all their populations have piped water supplies and connections to sewers.⁵ Furthermore, what appears to be relatively high levels of provision in many wealthy metropolitan areas masks the fact that there are local government units that have levels of provision that are much worse than many small urban centres; it will probably surprise many readers that several municipalities in Greater Buenos Aires have less than 10 per cent of their population served by public water supplies and sewers. In addition, in many low-income nations, provision for water and sanitation in their largest and wealthiest cities is so poor that the deficiencies in provision and the proportion of people who suffer may be comparable to that in small urban centres.

However, it is rare for detailed information on the quality and extent of provision to be available for all urban centres in a country. As Chapter 5 discusses in more detail, for most nations, much of the information on the quality and extent of provision for water and sanitation is from representative samples of national populations with sample sizes too small to allow the disaggregation of data by size of settlement.⁶ In most cases, information is simply presented as ‘urban’ or ‘rural’, often with no definition of the delimitations between these two categories, even when data from more than one country is presented.⁷ This point is illustrated by case studies of ‘rural communities’ that have tens of thousands of inhabitants.⁸ Presumably, most governments have census data that provide some information on the quality and extent of provision for water and sanitation in all urban centres – but not much of this is published. For example, the Brazilian Institute of Geography and

Statistics publishes data on the coverage of water supply, sanitation and solid waste collection, but with no disaggregation between region or state, size of settlement or individual locality.⁹ Chapter 5 also describes how local government officials have difficulties accessing census data about their urban centre in a form that is useful for identifying and acting on deficiencies in provision for water and sanitation.

This chapter reviews the information available on the scale and nature of inadequacies in provision for water and sanitation to small urban centres in Africa, Asia and Latin America. Given the lack of official data available specifically on small urban centres, the chapter draws in particular on descriptions available from case studies of individual small urban centres or of groups of such centres. Reviewing these case studies shows the diversity of services in small urban centres in terms of coverage and modes of provision, which range from localities with very little provision to others with near full coverage, and management options that include provision by communities, government agencies and the private sector. Following a section on coverage in small urban centres, the chapter examines case studies in urban centres of different sizes: with 50,000–199,999 inhabitants, 20,000–49,999 inhabitants, and less than 20,000 inhabitants. The chapter then considers conditions in peripheral municipalities of some metropolitan areas and smaller cities within their national context. The chapter then draws some conclusions.



COVERAGE IN SMALL URBAN CENTRES

Official statistics suggest that the proportion of people in urban areas with improved provision is almost always higher than their rural counterparts but, within urban areas, the proportion with improved provision is usually lower in small urban centres than larger ones. But in many nations, there are also large differences in the quality and extent of provision between different

small urban centres. This can be attributed to a number of factors, other than population size – for instance prosperity; proximity to a larger, relatively prosperous city, highway, port or important industrial, agricultural or tourist zone; the rate of population growth; the quality of the local government and reforms in the water sector; and attention from national governments and external agencies. Some of the case studies presented in this chapter have been documented because they have received (or are earmarked to receive) a project or funding that will increase the extent of provision to levels higher than comparable urban centres in their nation.

An analysis of service provision in urban areas of 43 low- and middle-income nations drawn from demographic and health surveys showed that provision for water and sanitation is usually worse in small urban centres (see Figures 3.1 and 3.2) and this is also supported by many case studies, including those summarized in this chapter. The variations in provision between urban centres of different size-classes is less dramatic for water in the home (Figure 3.1) than for flush toilets (Figure 3.2). For flush toilets, in all regions, urban centres with less than 100,000 inhabitants have the lowest proportion of their population served. Drawing from all the studies, less than 40 per cent of the inhabitants of urban centres with less than 100,000 inhabitants have flush toilets compared to 70 per cent for cities with 1–5 million inhabitants and more than 80 per cent for cities with 5 million plus inhabitants. Figure 3.2 is also a reminder of how small is the proportion of the urban population in Africa that has access to flush toilets.¹⁰

Various national or regional studies also show that provision is usually worse in small urban centres (see Box 3.2). In some cases, such as Ghana and Cameroon, the national water company does not operate in many small urban centres. In Bangladesh, only 101 of its 257 municipal towns have piped water supplies. In Brazil, generally the smaller an urban area's population, the lower the proportion of households with piped water and connections to

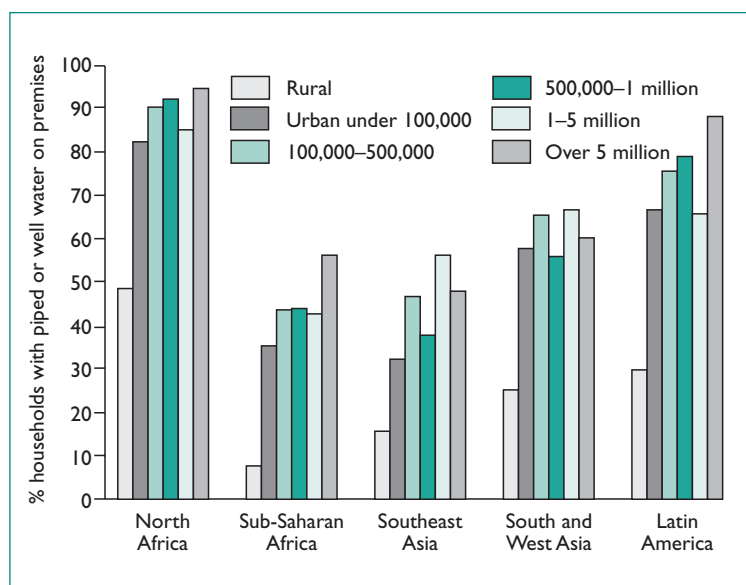


Figure 3.1

Water in the home for different size-classes of cities

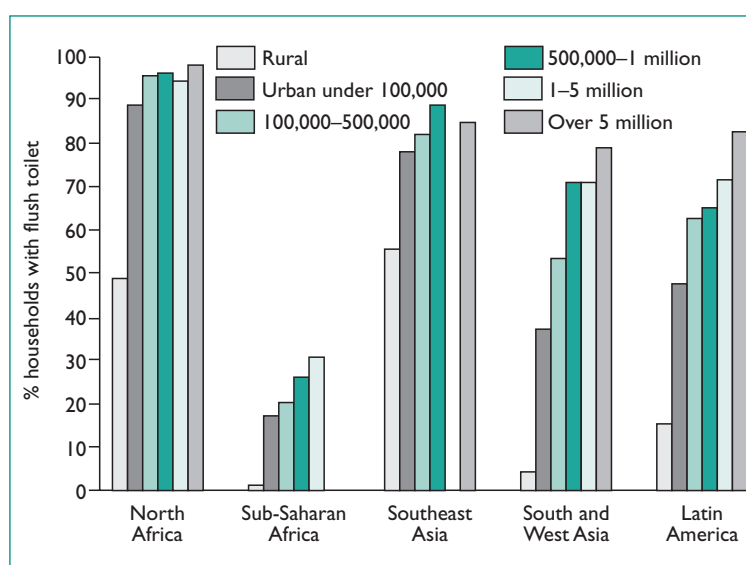
Source: Hewett, P. C. and Montgomery, M. R. (2002) *Poverty and Public Services in Developing Country Cities*, Population Council, New York, 62 pages.

sewers and the lower the likelihood that the water is treated. The case study from a department in northeast Senegal does not provide comparisons of provision in 47 small towns with other larger urban centres in Senegal, but official figures for Senegal suggest that 71 per cent of the urban population had household connections for water in 2002¹¹ – so clearly provision is much more rudimentary in these small towns than in most urban centres in Senegal. However, one note of caution is needed for all the findings of the case studies presented in this chapter: what these case studies report may no longer be accurate. Most of the case studies for which summaries are presented are from after 2000 but some are from the 1990s – and conditions may

Figure 3.2

Flush toilets for different size-classes of cities

Source: Hewett, P. C. and Montgomery, M. R. (2002) *Poverty and Public Services in Developing Country Cities*, Population Council, New York, 62 pages.



Box 3.2 National or regional overviews of provision for water and sanitation in smaller urban centres

Bangladesh

101 of the 257 municipal towns have piped water systems. People in city slums and fringes, and in medium and small towns rely on hand-drilled tube wells or illegal connections to piped water supplies. There is no legal provision for water supply and sanitation in most urban slums.¹²

Brazil

In general, the smaller an urban area's population, the lower the proportion of households with piped water and connections to sewers and the lower the likelihood that the water is treated. Only 46 per cent of households in municipalities with under 20,000 inhabitants have access to general water network systems. 15 per cent of Brazil's population lived in municipalities with less than 20,000 inhabitants in 2000. 48 per cent of municipalities in Brazil have no sewers – with a clear pattern of disadvantage in the poorer regions and among the smaller urban centres. On average, municipalities with more than 300,000 inhabitants have almost three times the proportion of households connected to sewers of municipalities with less than 20,000 inhabitants.¹³

Cameroon

In the late 1990s, only 99 of the 320 urban centres were served by the network of the national water company, Société Nationale des Eaux du Cameroun (SNEC). Public authorities had become more open and tolerant of alternative small-scale water provision systems. In addition, access to piped water networks was more expensive in Cameroon than in neighbouring countries with the cost of connection to the SNEC network in peri-urban zones of large cities being particularly high. Prior to 1998, the use of alternative water delivery systems such as drawing water from wells, storing water in tanks, and other methods of providing water for consumption were not officially recognized. A 1998 law sought to reduce the hold of the public monopoly, and to promote concessions and lease contracts, particularly in areas where the national network was not present.¹⁴

El Salvador

El Salvador is the most densely populated country in Latin America. The country has a population of 5.7 million people, roughly equally divided into urban and rural areas. Administratively, it is divided into 262 municipalities, each with an urban centre and rural communities, and only 13 of which have a population in excess of 20,000

inhabitants and three in excess of 50,000.¹⁵ Urbanization is increasing and 2005 estimates suggest that nearly a third of the population lives in the San Salvador metropolitan area (2.2 million inhabitants, of which 0.5 million live in the city proper).¹⁶ El Salvador has a large number of small urban centres with less than 10,000 inhabitants. The coverage of water and sanitation in El Salvador is the lowest in Central America, with very poor and intermittent water supply and sewerage practically non-existent outside of larger cities, leading to the widespread use of on-site solutions, especially pit latrines. The highly centralized National Water and Sewage Administration, an autonomous public agency, operates 150 water and sewerage systems in 181 of the country's 262 municipalities, from the largest in San Salvador to some of the smallest settlements with less than 200 connections.

A small number of alternative systems exist in smaller municipalities, managed by the municipal government directly (six others are managed by NGOs, private concessions and mixed economy models). There is also a growing number of informal private operators in urban and rural communities, and various independent water systems supported by donors.¹⁷

Ghana

Ghana faces serious constraints to meeting the challenge of providing adequate water for all rural and urban residents. These include the poor financial condition of the urban utility (Ghana Water Company), insufficient sector investment over the last ten years, weak implementation capacity caused by staffing problems and low salary levels. Ghana Water Company manages water supply systems for the 100 largest urban centres (the 2000 census suggested that there were 357 urban centres). 40 per cent of the urban population is covered by this utility's networks. Latrines that are not connected to sewerage systems account for all improved access to sanitation in rural areas and small towns and are the most common sanitation facility used in large towns and urban centres.¹⁸

Mauritania

All the small urban centres (and most of the districts of the largest city, Nouakchott) have no sewers and the households use pit latrines built by local masons. The coverage rate varies according to the age of the urban centre rather than to its size. The new urban centres have the lowest sanitation coverage (20–30 per cent) while the

older ones have higher coverage levels (85–90 per cent). 75 per cent of these small urban centres have more than 60 per cent sanitation coverage.¹⁹

Nigeria

Some 40 million people were estimated to live in 3000 small towns in 2000. These have generally been overlooked by development programmes that have focused exclusively on urban or rural areas. A survey of 37 small towns and peri-urban settlements with between 5000 and 20,000 or more inhabitants was undertaken in Nigeria in 1997. The results showed that the water and sanitation systems were generally very deficient. Less than 10 per cent of the population had access to safe water. Only 0.4 per cent of households had piped water from yard, shared or public standpipes. 27.4 per cent relied on water from rivers and streams, while 24.5 per cent used yard wells. The rest obtained water from community wells (13.4 per cent), water sellers (8.6 per cent), springs (6.6 per cent), boreholes (5.1 per cent), water tankers (4 per cent) and other sources (8.2 per cent), such as ponds. Many motorized boreholes in the towns were no longer in working order. The quality of water was poor, and cases of water-related diseases such as diarrhoea, dysentery, typhoid and cholera were prevalent. In addition, distance from water supply (up to 600 metres in some cases) and intermittency of supply were also problems. Residents declared that they would be willing to pay a higher amount of their household incomes in order to have access to safer and more reliable water supplies. The sanitation situation was also poor. Only 0.7 per cent of households had septic tanks and 4.9 per cent used simple pit latrines. 15 per cent had no sanitation facility at all and solutions included using public toilets, the bush or the farm. However, the majority (73.2 per cent) of households had toilets located within 20 metres of their homes.²⁰

Paraguay

In the 2002 census, Paraguay had a total population of 5.2 million inhabitants with close to three fifths living in urban centres with less than 50,000 inhabitants and rural villages.²¹ Paraguay has 93 municipalities of between 10,000 and 50,000 inhabitants, only 15 of which have populations in excess of 40,000 people.²² In these areas, provision is deficient or non-existent: 30–40 per cent (approximately one million people) are served by community-based water user associations (*Juntas*

Box 3.2 continued

Administradoras de Agua Potable) managed by the national sanitation authority, Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA), 18 per cent are served by independent networks and vendors (*aguateros*²³), and an estimated 40 per cent remain unserved. SENASA serves settlements of up to 10,000 people; this limit used to be 4000 until the water user association model was scaled up to larger settlements.²⁴

Peru

Around 4 million people in Peru live in small towns (district cities and capitals) with a population ranging from 2000 to 30,000 inhabitants in a total of 485 municipalities. Official coverage statistics, which are not disaggregated by size of settlement, state that 86.8 per cent of the urban population have access to water and 89.5 per cent to sanita-

tion; however, these figures include public water supply inside or outside households, standpipes and boreholes, and sanitation provision that can be networked sewerage, on-site septic tanks and pit latrines. In settlements of this size, water and sanitation can be provided by public management units, private or mixed bodies or directly by the municipality, because municipal water utilities tend to serve only urban centres with more than 30,000 inhabitants. In most cases, these services are deficient in terms of coverage, quality and continuity due to the poor state of the infrastructure, weak institutional capacities and the lack of financial resources to operate, maintain and expand infrastructure and services (a problem exacerbated by the low tariffs that are subsidized by municipalities such that users often only pay a third of the full cost of provision).²⁵

Senegal

In the Matam Department there are 47 small towns with between 2000 and 15,000 inhabitants that are part of a water management support programme. The typical water supply system is a borehole with motorized pump and a piped network with between 5 and 20 stand posts and one or two cattle troughs. For larger settlements, the number of private connections becomes significant (for example, up to 200 connections in towns of 10,000 inhabitants). In towns of 5000 or more, uncontrolled expansion of the original network causes water pressure imbalances and leaks.²⁶

have changed considerably since then.

Mexico is one of the few examples of a country for which disaggregated data are available on coverage of water supply and sanitation services by size of settlement. Data from Mexico also show that the proportion of the population with potable water and with connections to sewers is generally higher in urban centres with more than 50,000 inhabitants, compared to centres with 20,000–50,000 inhabitants and centres with 2500–20,000 inhabitants – but these data also show high levels of coverage in many small urban centres for potable water and

high levels of coverage for sewers in some.²⁷ In Mexico, the proportion of the urban population with piped water supplies has grown from 88.5 per cent in 1990 to 95.6 per cent in 2004. The proportion of the urban population served by sewers has grown from 77.8 per cent in 1990 to 90.7 per cent in 2004.

Figure 3.3 shows that, in general, a higher proportion of the larger urban centres (50,000 plus inhabitants) have nearly all of their population served with potable water than for urban centres with 20,000–50,000 inhabitants and for urban centres with 2500–20,000 inhabitants.

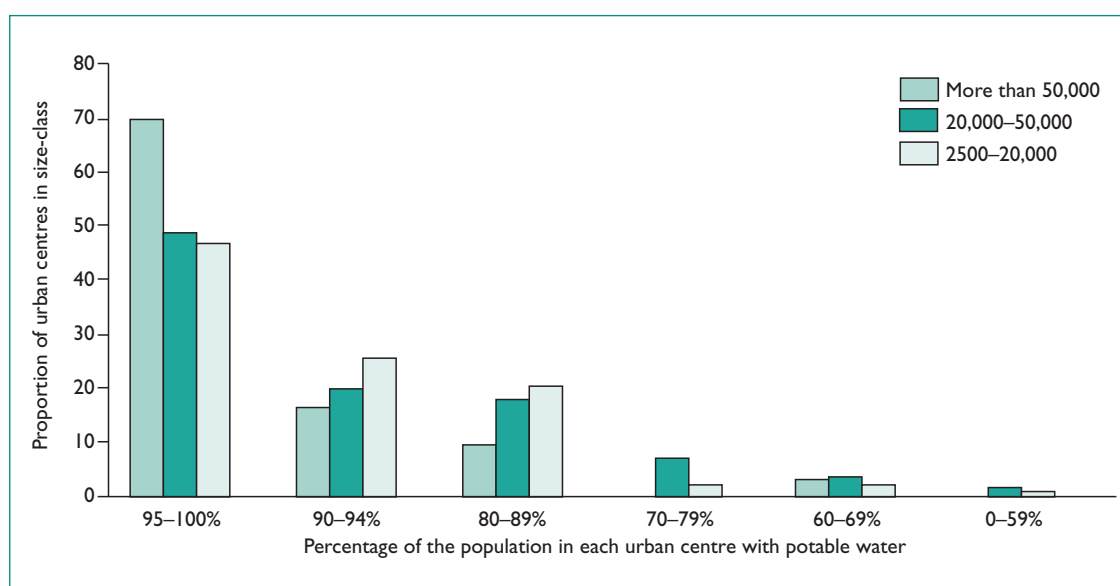


Figure 3.3

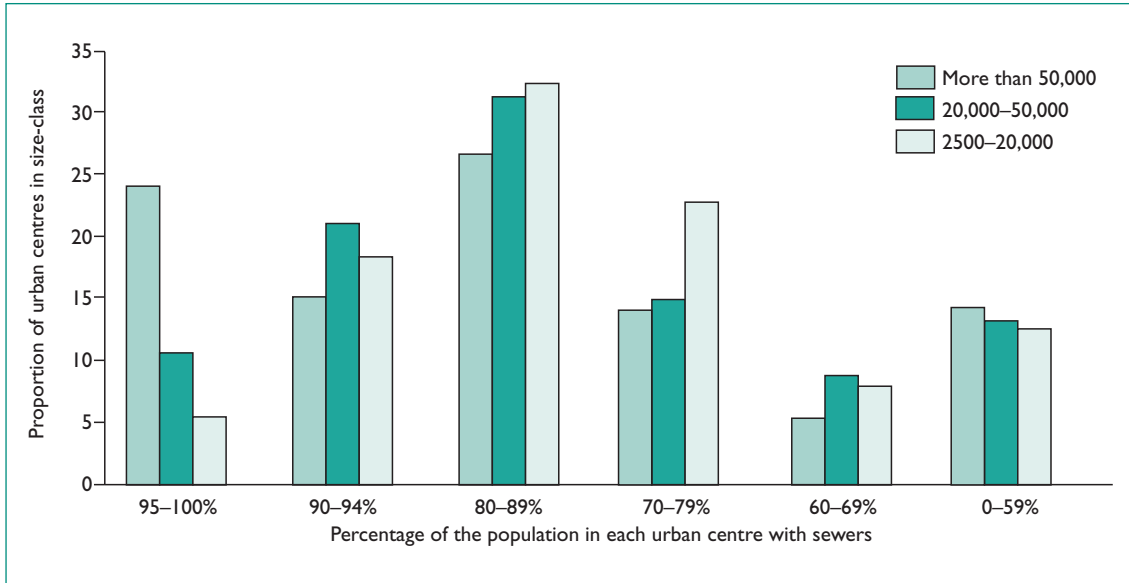
How the percentage of the population served with potable water varies by size-class of urban centre for a sample of urban centres in Mexico

Source: Derived from statistics in Comisión Nacional del Agua (CNA) (2004) 'Situación del subsector agua potable, alcantarillado y saneamiento', www.cna.gob.mx

Figure 3.4

How the percentage of the population served by sewers varies by size-class of urban centre for a sample of urban centres in Mexico

Source: Derived from statistics in Comisión Nacional del Agua (CNA) (2004) 'Situación del subsector agua potable, alcantarillado y saneamiento', www.cna.gob.mx



However, this is only for a sample of urban centres in each size category. In reports on 60 urban centres drawn from different states with more than 50,000 inhabitants, most are reported to have 95–100 per cent of their population with water, and all but two have more than 80 per cent.

For reports on 55 urban centres with 20,000–50,000 inhabitants, also drawn from different states, performance is more varied. Around half have 95–100 per cent coverage and most others have more than 80 per cent. However, three have 58–60 per cent and four have 70–76 per cent.

For reports on 74 urban centres with 2500–20,000 inhabitants, less than half have 95–100 per cent coverage although most have more than 80 per cent. What is notable is that provision is actually no worse in this size category than in the 20,000–50,000 inhabitant category.

Figure 3.4 shows that, in general, a higher proportion of the larger urban centres (50,000 plus inhabitants) in Mexico have nearly all of their population served with sewers than for smaller urban centres. However, what is perhaps surprising is that the differences between size-classes are not greater. It may be that the wealth of the urban centre or of the state in which it is located is a more significant influence on the proportion of people served with sewers than

population size. These statistics are also drawn from a larger sample of urban centres than for Figure 3.3.²⁸

However, the main source of information about the quality and extent of provision for water and sanitation in small urban centres comes from case studies. Although there are too few of these to be able to draw general conclusions, they do present a relatively consistent picture of smaller urban centres with local water and sanitation providers lacking the capacity to provide good quality services – and usually not reaching much of the population. Here, the findings from the case studies are presented for a range of small urban centres, using similar size categories to those used in Chapter 2:

- in urban centres with under 20,000 inhabitants (which includes provision in settlements with several thousand inhabitants which are still classified as rural by the government);
- in urban centres with 20,000–49,999 inhabitants;
- in urban centres with 50,000–199,999 inhabitants;
- in peripheral municipalities within larger urban agglomerations;
- in urban centres with 200,000–500,000 inhabitants in nations where these are not among the largest urban centres.

Box 3.3 Case studies of provision for water and sanitation in urban centres with less than 20,000 inhabitants**Kumi (Uganda)**

Kumi town is a district capital and has a population estimated at 17,000 inhabitants in 2000. The town council is responsible for water and sanitation services. The town's water supply comes from boreholes and pumps, plus overhead tanks feeding a piped distribution network with public kiosks (at the time of the study there were 15 kiosks but 2 were not working) and a few household connections. In February 2000, water was available for two hours a day. Lakes that are 10 and 16 kilometres away could be tapped but this would require external funding. In Kumi, virtually all households are reliant on water kiosks or water vendors. A family with an income equivalent to the average daily wage and consuming 24 litres per person per day would be spending 15 per cent of their income on water; if they relied on vendors, it would be 45 per cent of their income. Around 60 per cent of households have pit latrines and there are two public pit latrines in the town, one near the bus park, the other near the market, and these are free. They should be available during daylight hours but the latrine near the market was locked when visited by a study in 2000. According to the market traders, the keyholder is often absent. A third public toilet with a septic tank was built beside the new market but construction was never completed and the water had not been connected. Men collecting water are mostly vendors and they bully women and children to obtain priority access, even when women have been queuing as long as two hours. Children have lower priority in the queues than the women.²⁹

Kyotera Town (Uganda)

The busiest centre in its district in Uganda, this is on one of the main roads leading to Tanzania. There are around 10,000 inhabitants and the population is growing rapidly. There is no public water supply and the town relies mainly on piped water supplied by a local church project, although the water is of poor quality, not adequately treated and supply is frequently interrupted due to power failures. Other water sources are boreholes, wells and rainwater (although most households lack the funds to be able to afford collecting and storing rainwater). A groundwater supply system is being developed. There are no sewers. Around two thirds of the population have pit latrines, around 20 per cent use four public toilets. There is no domestic solid waste

collection service and the storm drain system is very inadequate. The few drains that do exist are clogged with solid waste.³⁰

La Ligua (Chile)

This small market town in central Chile has a population of 12,000 people. It is the administrative centre of Petorca Province. The economic activities in Petorca Province include small-scale mining, a vibrant woollen textiles industry and a booming export agriculture industry, based on the production of fresh fruit (avocados, citrus fruits and nuts) for export. The town's water and sewerage is provided by the former state and now private utility, Empresa Sanitaria de Valparaíso (ESVAL) that covers all urban centres in the Valparaíso region, based on full-pressure piped water with multi-tap household connections and a trunk sewerage system. The town is in the process of installing a waste-water treatment plant in order to reduce pollution into the River Ligua.³¹

Mandiana (Guinea)

This is an administrative centre of 7640 inhabitants, close to the borders with Mali and the Côte d'Ivoire.³² Rural activities dominate, with nearly half of heads of households working in agriculture. The local administration run by the prefect includes decentralized forms of all national services and provides basic infrastructure (for instance schools, hospitals and credit institutions). Water provision comes from two boreholes with solar pumps managed by the water company Société de Exploitation des Eaux de Guinée (SEEG), which supply a water tower, from which an 8 kilometre long network serves 12 active standpipes (with two taps each); there are also three inactive standpipes. Each standpipe serves an average of 50 people. Standpipe maintenance is by 'fontainiers' (standpipe operators) who are paid per volume of water sold; three quarters of these are women. Most operators live primarily from their salaries. These standpipes are regularly used by 85 per cent of households during the dry season (when traditional wells have dried up) and 55 per cent of households during the winter period. The high cost of water from the standpipes means that it is used primarily for cooking/drinking, rather than washing, which is carried out either at the river or at home. The Service National d'Aménagement des Points d'Eau (SNAPE), the institution that devel-

ops water provision in rural areas, has also built various boreholes managed by water point committees elected by users, and these must collect the necessary fee from each family to ensure the upkeep of each water point. There are also numerous traditional seasonal wells, managed by their owners, and well owners tend to provide water free of charge to their neighbours. Finally, the river Sankarani offers another source for 23 per cent of the population in winter, but only 10 per cent in the dry season. Individual private connections are possible for a small number of 'subscribers' given the limited production (for a subscription fee of 60,000 francs (US\$13)), but there were none in 1997 (having been three in 1996). Access to water at the standpipes should follow the official opening times (5.30 a.m. to 10 p.m.), but in reality they only open between 8 a.m. and 6 p.m., with the busiest time around 9 a.m., and a long average waiting time of around 50 minutes. It is women and children who are the most frequent transporters, using basins, buckets or cans.

San Julián (El Salvador)

This is a small urban centre of 5200 people within a municipality of 22,700 inhabitants. The principal economic activity in the municipality is agriculture, and the area produces a combination of cash crops (for example, coffee and sugar) and subsistence crops (for example, maize and beans). Under a project supported by the United States Agency for International Development (USAID), San Julián obtained the first municipal-operated water and sanitation company in El Salvador. The new provider has achieved coverage rates of water of 96 per cent and a continuous service, almost unheard of for a municipality of this size, and especially for one that is dispersed.³³

Wobulenzi (Uganda)

The population was estimated at 12,000 in 2000. The town council is responsible for water and sanitation but has delegated responsibility to a water users association. Around 70 per cent of households have latrines. There are also three public latrines – but the number of users is low because of a high charge (100 shillings (US\$0.055) per use). A piped water network covers most of the town and feeds 31 kiosks and 64 private connections and 6 institutions.³⁴

Box 3.4 Case studies of provision for water and sanitation in urban centres with 20,000–49,999 inhabitants

Bunda (Tanzania)

With 46,178 inhabitants in 2002, around half the population is served with a piped water system with water available for eight hours every two days. The distribution system was laid in 1971 and there has been no further development. Many new areas are unserved (including low-income areas) and their inhabitants get water from the lake or wells or from street vendors. In 2004, there were just 365 connections, 191 of which were metered. 73 per cent of the water entering the system is unaccounted for. There are no sewers in the town and only a few houses have septic tanks. There is no public provision for solid waste collection in residential areas and the drainage system is inadequate.³⁵

Chertala (India)

With around 43,000 inhabitants in 2000, there is an abundance of water and a high incidence of mosquito-related disease, especially malaria and filariasis. Water supply is operated by the state water authority. The main water supply comes from tube wells and is distributed untreated to 437 stand posts (around 1 per 100 people) and 238 house connections. The piped supply is both inadequate and commonly regarded as unfit to drink. There is strong dissatisfaction among the town dwellers with the state agency and there are plans to develop municipal water supplies in each ward. Estimates suggest that 70–80 per cent of households have latrines. There are three pay and use toilets – at the hospital, bus station and market place. Two further toilet complexes are planned. Officials regard these facilities as only suitable for busy public places, not for residential areas.³⁶

Homa Bay (Kenya)

A trading centre, fishing centre and district headquarters with around 32,600 inhabitants. The water supply system was constructed in 1958 and last rehabilitated in 2001. There is a full treatment plant but with electro-mechanical breakdowns and the wearing down of the filtration system, water quality is often poor and water volume is far below demand. It currently serves around 15,000 residents through 1672 legal connections. Water supply is not continuous and the system suffers from low pressure, vandalism, illegal connections, leakages, old age and blockages (40 per cent of water is unaccounted for). The town has several unplanned informal settlements and most of their inhabitants get their water direct from the lake.

Only 22 per cent of the population is connected to sewers; most people use pit latrines or toilets connected to septic tanks, or the bush.

Overflowing toilets are common during rainy seasons; overflowing sewers are also common. There is no exhauster tanker to empty pit latrines and septic tanks. Storm drains are not available for most of the town and provision for the collection of solid wastes is very inadequate, so it is common for drainage networks to be blocked.³⁷

Iganga and other small urban centres (Uganda)

A project is underway to improve provision for water and sanitation in 60 small urban centres with a total population of 320,000 inhabitants. Only one of these is reported to have 'definite urban characteristics' – Iganga (which had 38,009 inhabitants in the 2002 census). The project appraisal report noted how access to clean water and adequate sanitation is also very poor, reflected in the low per capita water consumption of only 13 litres per person per day. With the exception of Iganga, which has a water network covering about 10 per cent of the population with water available for two or three hours per day, the urban centres rely mainly on untreated river or shallow well water from vendors (at high cost), and to a lesser extent on a few boreholes with hand or motorized pumps (some of which were provided by the government in response to a cholera outbreak). Adequate sanitation is generally lacking in almost all the towns, with most of the population using unimproved pit latrines. Iganga, however, has a partial sewerage network, but sewage is now discharged directly into the river due to the breakdown of the sewage treatment plant.³⁸

Itagua (Paraguay)

Itagua is a small town with 25,000 inhabitants located 25 kilometres east of the capital city, Asunción. In 1974, the village, as it was then, created a community-based water user association and constructed a small-scale water supply system designed for a population of just 2975 inhabitants. The water user association model is common in Paraguay, but is usually adopted in rural villages or small towns with up to 4000 people. With its improvement and expansion over the years, including to two nearby rural districts and a community of summer residences, the association provides full coverage and an uninterrupted service to the town and shows that the association model can be scaled up from a rural village to

a small town.³⁹

Kabale (Uganda)

With 27,905 inhabitants in 1991, this is a market town in an extremely fertile and high density rural area. For water supply, there were just 217 connections to the piped water system and, on average, water was supplied for four hours in the morning and two hours in the evening. Estimates suggest that less than 16 per cent of the population had access to water from this system. Provision for sanitation was also very deficient. Refuse collection relies on one working tractor and trailer that collects wastes from 20 areas marked with signposts where refuse may be deposited by the public. It is estimated that around 10–20 per cent of the daily refuse is collected.⁴⁰

Marinilla (Colombia)

Marinilla has 26,000 inhabitants and is located in a prosperous agricultural area in Antioquia Department. In 1997, Marinilla and six other municipalities transferred responsibility for their water and sewerage services from the regional water agency, Acuantioquia, to a local private sector operator, Conhydra, under a management contract. In 1997, 21,600 people were connected to the piped water supply and 19,500 to the sewerage network. By 2000, an additional 3,500 people had been connected to the water supply and 3,500 to the sewerage service. The town now has 99 per cent water coverage and 90 per cent sanitation coverage, and the overall quality of the service is reported to have improved in terms of water quality, pressure and continuity of service. However, Marinilla still lacks a waste-water treatment plant, although plans are in progress to construct one.⁴¹

Mbandjock (Cameroon)

Only about 20 per cent of the population (estimated at 20,000 in 1996) have access to piped water; the rest rely on wells and springs for their water supply but tests found that all spring and well waters presented evidence of faecal contamination from human and/or animal origin. Data from the city hospital show that gastrointestinal and diarrhoeal diseases are among the most prevalent diseases in the community (after malaria and onchocerciasis). The city has no sewer system and the only method of sewage disposal is by pit latrines or septic tanks.⁴²

Box 3.5 Case studies of provision for water and sanitation in urban centres with 50,000–199,999 inhabitants**Bukoba (Tanzania)**

This is a regional and district headquarters with 81,221 inhabitants in 2002. Around 63 per cent of the population have water services from the Bukoba Water and Sewerage Authority. There are no sewers in the town; residents rely on pit latrines or septic tanks. As a result, sullage and septic tank effluent are discharged into storm water drains and contaminate the lake (which is also the town's main source of water). The water distribution system was inaugurated in the 1940s and small sections of the distribution system were last rehabilitated in 1986. 60 per cent of water is unaccounted for – around two thirds of this as a result of leaky pipes and a third attributable to administrative losses, including illegal connections. The town has only one (very old and run-down) vehicle for collecting solid wastes; collection is irregular and most of the collection points are overflowing with waste spilling onto streets and into adjacent storm water drains. The storm drainage system is very limited and many of the drains are blocked.⁴³

Debre-Berhan (Ethiopia)

Only 55 per cent of the population of 55,000 inhabitants (mainly homeowners) has access to sanitation (independent dry or watertight latrines). Five types of sanitation system are present in the town:

- 19 communal latrines (used by 13 per cent of households) shared between families renting social housing in the dense old neighbourhoods of the town, but financed by the municipality and various external partners;
- 19 per cent of households have access only to dedicated open-air fields for defecation, usually located on the outskirts of the town, but increasingly on waste ground in the centre as the town extends;
- four public latrines located in busy public

areas and managed by the municipality with free access but with maintenance and hygiene problems;

- 41 per cent of households have private latrines, half of which are relatively recent and of good quality, and half of which are older and have disposal problems that can lead to waste flowing out onto the roads creating a health hazard;
- traditional hole in the ground latrines are used by 26 per cent of households.

Kindia (Guinea)

In this regional capital of 100,000 inhabitants, water is provided by a piped network to a small proportion of the population in central areas and to a number of standpipes managed by private operators that are used by almost a third of the population – but typically drawing between 20 and 30 litres per day, which reduces the profitability of the network. Most water is drawn from traditional water resources such as wells and springs, which provide water that can be used for washing. Households classify different types of water according to their alleged quality (network, spring, well, etc.). Wells are used for some water needs in nearly all neighbourhoods. Rainwater is a major source during the wet season.⁴⁴

Kaolack (Senegal)

In this urban centre with 172,305 inhabitants in 2002, there are large disparities in access to water between neighbourhoods. Peri-central areas like HLM Bongré and Sara Ndiougary have more than 60 per cent of people with private connections, and central areas have 50 per cent or more, while peripheral neighbourhoods rarely reach levels of 20 per cent.⁴⁵

Kisii (Kenya)

Headquarters of a district and a trading centre on the main Nairobi–Mwanza road, this had 59,248 inhabitants in the 1999 census with a core urban

population of 25,634. The water supply is insufficient to meet existing demands from the 4056 registered consumer connections in the urban core but only 2430 are active due to lack of supply. The water treatment works are poorly maintained and there are only 800 functioning water meters. Most low-income households outside the urban core are not served. Only 30 per cent of households in the low-income areas get piped water, the rest rely mostly on springs and water vendors. The town has a sewer system that was rehabilitated and expanded in 1999, including provision of a new treatment works. But the sewers experience frequent blockages especially during the rainy season due to the lack of manhole covers. Due to water shortages, sewers are not utilized in some areas. Only 10 per cent of the town and 15 per cent of households are connected to sewers; 65 per cent use septic tanks and 20 per cent use conventional unimproved pit latrines. There is one exhauster tanker but it was broken down when the survey was done. The municipal council lacks the capacity to collect household wastes and drainage channels are usually blocked with solid wastes, especially in residential areas, which leads to standing pools of waste-water.⁴⁶

Ngaoundéré (Cameroon)

This is Cameroon's seventh largest urban centre and had 189,800 inhabitants in 2001.⁴⁷ A report in 1998 described how it had an official piped water network provided by the national water company but the high cost of connection had kept down the number of subscribers. A survey of 1200 households found little more than 4 per cent were connected to the network, due mainly to high cost – although the water company claimed that the price at which it sold water was well below its cost. 43 per cent of households obtained their water from 20 local wells and around 20 per cent from the 29 springs in the town. Nearly 40 per cent of households bought



PROVISION IN URBAN CENTRES WITH LESS THAN 20,000 INHABITANTS

in urban centres with less than 20,000 inhabitants and rural settlements with more than 1000 inhabitants. Box 3.3 summarizes the deficiencies in provision for which case studies were found.

Chapter 2 described how most nations have a considerable proportion of their population living

Box 3.5 continued

their drinking water from the 38 points of sale where 182 resellers sold water at 25 francs (US\$0.05) per 20 litres; this is 2.5 times the price per litre that they paid to people connected to the network. This is a new system that has replaced the public standpipes where water was available, but not managed. A major problem with the wells and the springs is that they are often situated in low-income, informal settlements near to cesspools that are a serious health risk.⁴⁸

Ponani (Kerala, India)

With a population of 51,770 in 2000, this is one of the poorest towns in the state. Most of the poor live in ten coastal wards and rely on fishing for their livelihoods. The coastal wards have saline ground water for six months of the year and poor drainage. The piped water system has 845 house connections (serving roughly 12 per cent of all households), 75 non-household connections and

488 standpipes. Most taps deliver water for 8–12 hours a day. Officials estimate that all houses will have latrines by 2001.⁴⁹ The positive impact of the communal latrines used by 13 per cent of households was highlighted, as they offered decent access to sanitation for inhabitants of 'problem areas', even if this is relatively expensive and has been financed by external assistance. Each latrine is used by around 20 families, all of whom participate in its cleaning and maintenance.⁵⁰

Trinidad and Potosí (Bolivia)

Trinidad is a city with a population of 79,963 located in the lowlands of the Department of Beni. Beni is one of the most rural and least developed regions of Bolivia, with urban water and sanitation coverage rates of just 41 per cent and 23 per cent, respectively. Coverage in Trinidad is slightly higher, at 57 per cent and 45 per cent, but these figures disguise the fact that 7606 house-

holds have access to piped water, while 1281 rely on public standpipes, 12,036 on boreholes and 1045 on tankers. The situation with sewerage is similar, with only 211 households connected to a public sewer, while 6766 have septic tanks and 6331 use pit latrines. Potosí, located high in the Andes, is a lower income city with a declining tin-mining industry and a population of 145,057. In comparison with Trinidad, it has much higher coverage rates for both water supply and sanitation, at 90 per cent and 75 per cent, respectively. In Potosí, 29,830 households are supplied with piped water, while relatively small proportions use other means (1666 households use public standpipes, 1744 use boreholes and just 27 rely on tankers). A similar situation is found in relation to sanitation, as 26,045 households have sewerage, while only 283 use septic tanks and 257 pit latrines.⁵¹



PROVISION IN URBAN CENTRES WITH 20,000–49,999 INHABITANTS

Many nations have 5–10 per cent of their national population in urban centres of this size with some having more than 10 per cent – for instance Botswana, Costa Rica and Mauritius. These are also often important market and service centres for agriculture in their regions (see Box 3.4).



PROVISION IN URBAN CENTRES WITH 50,000–199,999 INHABITANTS

As Chapter 2 showed, many nations have 10 or more per cent of their population in urban centres with 50,000–199,999 inhabitants. Many urban centres of this size are important provincial, state or regional headquarters, even in nations where urban centres in this size category do not have more than a few per cent of the total population (see Box 3.5). Chapter 2 also noted

how numerous urban centres of this size can be in large population nations – for instance several hundred of them in China, India and Brazil and 100 or more in Turkey and Indonesia.



PROVISION IN PERIPHERAL MUNICIPALITIES WITHIN LARGER URBAN AGGLOMERATIONS

Municipalities that are within the metropolitan areas of major cities would not normally be considered as small urban centres. In addition, many such municipalities clustered around major cities have high proportions of high-income groups and among the highest levels of coverage for piped water to the home and of good provision for sanitation.⁵² However, some municipalities on the periphery of major cities have high concentrations of low-income groups and very low levels of coverage for water and sanitation – but this can be hidden by aggregate statistics for the whole metropolitan area. For instance, major metropolitan centres in middle-income nations in Latin America generally have high levels of coverage –

Box 3.6 Case studies of provision for water and sanitation in peripheral municipalities within larger urban agglomerations**Buenos Aires peripheral municipalities (Argentina)**

The municipality of Malvinas Argentinas is part of Greater Buenos Aires. By 2001, it had 290,000 inhabitants, with only 4 per cent served by a public water network and only 1.2 per cent connected to the public sewer network. Most of the population get supplies from groundwater; low-income groups generally rely on the upper aquifer where water is highly contaminated. Less than 10 per cent of the population of the municipalities of Ezeiza, Ituzaingo and Jose C. Paz were served by the public water network and by the public sewer network in 2001.⁵³ In the municipality of Moreno, only 18.7 per cent of the population have water supplied by the official provider and only 10.7 per cent are connected to sewers.⁵⁴

Caracas (Venezuela)

According to the 2001 census, the total population of the Caracas Metropolitan Region (CMR) was 4.2 million, 65.5 per cent of which live in the core city. In the ten years between 1990 and 2001, the rate of growth in Caracas had been very slow. The peripheral region of Caracas that is undergoing the fastest growth is the Middle Tuy Valleys, which grew by an average of around 4.5 per cent per year between 1990 and 2001. It now accounts for 12.7 per cent of the population of the CMR. The Tuy Valleys have grown so fast because of expectations that the public transportation system will expand outwards, with additional housing constructed and new land made available. The area has attracted groups that can no longer afford housing in the CMR and lower income groups who seek land to occupy. Bachaquero and Paso Real 2000 are two low-income communities originating in illegal land occupations by poor families who are excluded from the formal housing market. Bachaquero has about 3664 inhabitants

and Paso Real 2000 has approximately 4122 inhabitants. Both communities have a low socio-economic status and lack secure employment. In Bachaquero, access to water supply and sanitation is precarious. The settlement contains a public water supply network that was built in parts, but which is dilapidated and the service from which varies in pressure and continuity between sectors. Many existing connections are illegal, using hosepipes. In relation to sanitation, there are no networked sewers in most of the settlement and many families use either old septic tanks or have no provision. Paso Real 2000 also has illegal water connections. In this settlement, the distribution networks are self-built, with technical advice from the main city utility, Hidrocapital. The topography in some parts of this settlement also impedes water supply, because landslides caused by improper sewage disposal have broken illegal connections, but in any case the low water pressure cannot overcome the slope. Paso Real 2000 has a sewerage network, but with very few connections, and frequently becomes blocked, leading to the dumping of sewage on the streets.⁵⁵

Ggaba Parish (Uganda)

This is within Kampala municipality but spatially detached since it is located on a peninsula. It has around 10,000 inhabitants, most with low incomes. It is Kampala's main fish-landing site and fish market and also where fish is brought daily to be cleaned, filleted and smoked before being sold. It is located next to Kampala's major water treatment works but only a quarter of households have house connections for water. 60 per cent of the population depend on water fetched from the lake (which is of very poor quality). Some others depend mainly on a few communal standpipes and privately owned taps. In regard to sanitation, there

are no sewers and 70 per cent of households do not have access to any latrine. Pit latrines are the most common form of sanitation but most are of very poor quality and a large but unknown proportion of the population defecate on the lake shore. There are five communal latrines that look well kept and cost 100 shillings (US\$0.055) per usage but these close at 10 p.m..⁵⁶

Kumasi (Ghana)

Ghana's second city has a population of around 1.2 million inhabitants. While piped water is available in most parts of the city from the Ghana Water and Sewerage Corporation, the service suffers from low pressure and intermittency. Most low-income households do not have connections and rely on buying water from neighbours' taps at inflated prices, or obtaining it from streams. The worst level of water provision is on the city periphery, where settlement is rapidly expanding without the accompanying water infrastructure. Sanitation and urban drainage are also very poor, with only 30 per cent having adequate facilities in their homes. Of the rest, nearly 40 per cent rely on public toilets that are totally insufficient for the number of people using them. For instance, in Atonsu, there are only two public toilets, each with 14 squat-holes, to serve 10,000 inhabitants (that is, more than 300 people per squat-hole). In addition, previously public or community-managed latrines have been privatized with a resulting decline in standard and rise in charges (even for children). In view of this, many people turn to unsatisfactory practices such as bucket latrines, that are emptied into the same streams that others use for water supply, or plastic bags that are disposed of into community refuse skips or elsewhere, or open air defecation.⁵⁷

for instance São Paulo and Buenos Aires – but with some municipalities still having very low levels of coverage. In other instances, particular settlements or districts within major cities can have very low levels of coverage. Box 3.6 gives examples of Buenos Aires (Argentina), with low

levels of coverage in some municipalities, Caracas (Venezuela), with low levels of coverage in one particular region, Kumasi (Ghana), for peripheral areas, and Kampala (Uganda), for one parish within the municipality.

Box 3.7 Case studies of provision for water and sanitation in medium-sized urban centres with 200,000–500,000 inhabitants**Bharatpur (India)**

This urban centre in Rajasthan had 205,104 inhabitants in the 2001 census. A study in 2000 found that 61 per cent of households have legal household connections to the piped water supplies. The rest rely on stand posts or other water sources. Water supplies in the piped system are intermittent and at risk of contamination. There are no sewers; 52 per cent of the population rely on toilets connected to septic tanks with 15 per cent using twin-pit pour-flush latrines and 33 per cent with no latrine or a 'service latrine' (a simple dry latrine in which faeces are deposited on the ground beneath a squat-hole and removed each day by a 'sweeper'). There are also problems with flooding, especially for poorer groups who live in the most flood-prone areas.⁵⁸

Cancún (Mexico)

This major international tourist resort is the principal source of foreign tourist revenue in Mexico. With approximately 400,000 inhabitants according to Mexico's 2002 census, it attracts an additional 3.5 million tourists each year, principally from North America. Provision for water and sanitation varies greatly within Cancún. The city can be divided into four areas: the coastal hotel resort (which is separated from the mainland city by the Nichupté Lagoon and lies on a narrow coastal bar), the main city centre, established low-income neighbourhoods and more recent peripheral and peri-urban settlements. The coastal resort has an average population of 37,000 inhabitants (including seasonal tourists), and complete water and sewerage infrastructure was installed by the National Tourism Fund. Despite the tourist industry's high per capita demand for both drinking water and waste-water disposal, the area receives continuous water supply and sewerage services. The city centre on the mainland part of the city has 165,000 people, most of whom work in the coastal resort. The National Tourism Fund also provided full water and sewerage infrastruc-

ture to this area of the city, which presents the highest demand for both drinking water and waste-water disposal. However, the water supply is only available for a few hours each day, leading inhabitants to adjust their water use and invest in storage facilities. The established low-income neighbourhoods surrounding the city centre contain 245,000 inhabitants, primarily comprising lower income workers in the tourist industry. These areas were settled up to 30 years ago, and have gradually received legal land tenure and water and sewerage infrastructure provided by the state government and other institutions. Despite the presence of infrastructure, many households are not connected to the networks, due to unaffordable connection costs. Unconnected households use independent water providers, paying about US\$35 per month, that is, about ten times as much as those connected to the network in the city centre. Septic tanks or unlined pits are used for sanitation, which raises particular concerns due to the high water table. This highlights the contradiction between the high official rates of water and sewerage network coverage in Cancún and the *real* extent to which those networks provide services to urban residents. More recently, and largely due to the high cost of living in Cancún, additional settlement has been developing on peripheral and peri-urban areas around the city. These areas constitute the poorest and most outlying areas of the city, and have an estimated population of 13,000 inhabitants. At present, there is no networked water or sewerage to these areas, because they are outside the official limit of the city. The inhabitants use shallow wells and unregulated private vendors for water supply and unlined pits or trenches for sanitation, although some have no sanitation provision at all.⁵⁹

Pilar (Argentina)

Pilar municipality is around 50 kilometres from the city of Buenos Aires, although it can be classi-

fied as part of the Buenos Aires agglomeration. In 2001, it had around 223,000 inhabitants. 79 per cent of the population are not served by the public water supply and 87 per cent have no sewer connections. With its good road connections with Buenos Aires, its population has grown rapidly since 1990, in part because of the development of gated neighbourhoods, in part as an industrial centre. This new investment was not matched by investments in social and physical infrastructure. The privatization of the water and sanitation service only covered the central area of the municipality and the gated communities. Most of the low-income population lives in areas without basic infrastructure and vulnerable to floods. Most access water from individual wells with no water treatment, which has led to a high incidence of water-related diseases. In 2003 and 2004 there were hepatitis A epidemics. Much of the groundwater used is also contaminated with industrial effluents. To address this, a range of institutions and community organizations are developing a water quality monitoring programme and the local government is supporting the expansion of the networks with community participation.⁶⁰

Sambalpur and Siliguri (India)

Sambalpur in Orissa had 226,966 inhabitants in the 2001 census, while Siliguri in West Bengal had 470,275 inhabitants. A study in the early 1990s surveyed 400 households in each city, drawn from different 'slums'. In Sambalpur, surveys in 12 slums found that four had no source of piped water. Of the households surveyed, 95 per cent depended on communal sources for water and more than three quarters had no provision for any kind of toilet in their house. In Siliguri, half the households surveyed used a communal source for water and 18 per cent used communal toilets.⁶¹



PROVISION IN MEDIUM-SIZED URBAN CENTRES WITH 200,000–500,000 INHABITANTS

As noted in Chapter 2, in many large population nations, there are many urban centres with

200,000–500,000 inhabitants that are not among the largest cities within their nation. For instance, India had 100 urban centres in this category in 2002, while Mexico had 26 (2000), Indonesia 25 (1990) and the Philippines had 24 (2000). Box 3.7 gives some examples of deficiencies in provision in some urban centres within this size-class. In effect, these are not small

Box 3.8 The history of water and waste-water management in Morelia, 1541–2000

During the city's early development in the 16th century, under Spanish rule, water was drawn direct from the Chiquito river. There are records of a wooden aqueduct in the mid-16th century and stone drains and channels introduced later – although with limited durability and utility. By the late 16th century, the provincial governor (viceroys) had received many petitions to address the city's problematic water supply. In 1590, a tax was imposed on wine sellers to collect revenue to construct and rehabilitate the aqueduct and water system. As the urban centre's population expanded, tax revenues were used to finance investments – but this never provided a regular, sufficient supply because of a combination of insufficient funding, bureaucratic inefficiency, misappropriations of the wine tax revenues and deficient designs. A distribution system was developed for the elite that carried water in canals direct to individual homes, gardens, convents and public buildings. Elite groups also received formal permits to use the water but the general population had no such permission and had to make do with tanks and outdoor taps or using the few springs and water holes that were not controlled by the elite.

A bequest by a bishop of Michoacan in 1705 produced funds for an ambitious project to supply water that included a stone aqueduct and an underground distribution system, so the church displaced the local government in water management. This was constructed over 30 years and though this improved provision for elite groups, the majority of people still had to rely on public tanks. By 1785, the aqueduct had deteriorated and needed urgent repairs. The church and the civil

authorities authorized large sums for public works to avert social upheaval and a reconstruction project improved provision.

After Independence, the city grew rapidly, becoming the tenth largest city in Mexico. The local government had responsibility for managing the water system and from 1857 to 1890, 12 public tanks were built – while also restoring many sections of the distribution system and reconstructing parts of the aqueduct. However, the water available in the tanks was often less than demand and the system's operation was marred by frequent technical failures and water diverted by the government to irrigation.

One problem was the poor water quality in the river from which supplies were drawn. During the first decade of the 20th century, a basic water purification system was built – apparently the first of its kind in Mexico. In 1910, construction began on an iron pipe distribution system to replace the aqueduct and household taps began to replace public taps. Demand for water increased, which exacerbated the problem with waste-water. During 1910–1920, the local government expanded the sewer system to draw in more of waste-water flows and forced people to install flush toilets – what were termed 'English toilets' – connected to the sewers. Attempts were also made to regulate the use of waste-water for irrigating vegetables and other agricultural products. After the revolution (1910–1921), legal and institutional changes strengthened the state's role in water management. Water became public property with supply and irrigation systems the responsibility of the state governments. During the period

1934–1940, the state developed a water policy to guarantee urban supplies and irrigation. A federal government-funded programme in 1935 funded a household supply system and sewers. Irrigation and water management investments controlled flooding and irrigated large areas. The city's population was growing rapidly and it still depended on the Chiquito river; in the late 1940s, some water was drawn from another source although this angered farmers. In 1948, work began on a very expensive water purification plant.

By the early 1970s, with 161,040 inhabitants and a growing industrial sector, new water sources were needed and farmers were opposed to any reductions in water available for irrigation, so wells were dug to tap groundwater. Rapid growth continued during the 1980s and 1990s with the population reaching 550,000 by 2000. Many squatter settlements were established and drew directly on groundwater. By the 1990s, nearly two fifths of water was being drawn from wells. By 2000, 89 per cent of dwellings had running water; 2 per cent relied on public taps and 9 per cent lacked access to water. Supply within the piped system was insufficient and of the 230 neighbourhoods, only 139 had regular services, 44 received water two or three times a week and 47 were irregular settlements that depended on one public outlet or tankers. Wealthy areas generally have more regular services than low-income neighbourhoods – and also have more capacity to manage irregular services through constructing tanks. Problems of water pollution from urban and industrial sources also present serious problems for farmers and those who fish around Michoacan.

Source: Ávila, P. (2006) 'Water, society and environment in the history of one Mexican city', *Environment and Urbanization*, vol. 18, no. 1., pp 129–140.

urban centres in absolute terms but they are in relation to the urban system within their nation. This is illustrated by the fact that Bharatpur in India with over 200,000 inhabitants may be considered too big to be a small urban centre but it is not even within India's largest 150 cities.

Morelia, capital of Michoacan state with 549,000 inhabitants in 2001, would be regarded as a large city within most nations – but in

Mexico, on this date, it was the 21st largest city. It is also interesting to review how water and sanitation has been managed and who benefited over time since there is a history of this over the last 460 years⁶² (see Box 3.8). Throughout this period, there have been problems with raising needed funds for investment in the city-wide system and sharp differentials in the quality of provision between rich and poor groups.



CONCLUSIONS

This chapter has highlighted how provision for water and sanitation is inadequate for large sections of the population in most small urban centres for which data about such provision are available. There is little reason to think that the case studies summarized in this chapter are unusual. Four points are worth highlighting.

- 1 *Little of the population (or in some instances none of the population) in many small urban centres have access to a piped water system, either within their home or yard (private connection) or close by (public or communal standpipe).* As a result, a high proportion of the population in most of the case study urban centres rely on untreated water. It is also worth highlighting how in most case study urban centres, much of the access to piped supplies is through standpipes or kiosks.
- 2 *Most small urban centres in sub-Saharan Africa and Asia have no sewers at all.* For instance, there were no sewers in small urban centres in Mauritania and Ghana, in small towns in Nigeria, in Bukobam, Debre-Berhan, Bunda, Mbandjock, Kyotera
- and Bharatpur. Provision for sewers was also almost non-existent in smaller urban centres in El Salvador, in Trinidad and in Potosi, Bolivia (and probably also in many other small urban centres in Latin America). Many case studies also pointed to no other forms of public provision for sanitation – for instance no service to advise on pit-latrines construction (so they function effectively and do not pollute ground-water) and no equipment and services to empty them. Some case studies highlighted how significant proportions of the population had no latrine. Communal or public latrines were common in many case studies
- 3 *In small urban centres that appear to have relatively high levels of coverage, the coverage figures for the whole settlement may mask high levels of inequality* where some parts of the urban centre are very well served and some parts very inadequately served – as illustrated by many of the case studies, especially those of Cancún and Kaolack.
- 4 *There are exceptions to these generalizations* – for instance, note the relatively high proportion of the population served in case studies of Marinilla (Colombia), Itagua (Paraguay) and La Ligua (Chile).

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ADDRESSING NEEDS: HOW TO ATTAIN THE MDG TARGETS IN EACH LOCALITY



INTRODUCTION

This chapter focuses on the experiences with improving provision for water and sanitation in small urban centres. It includes a discussion of how provision has been improved outside of ‘water and sanitation’ programmes – for instance through upgrading programmes, new house programmes and housing finance programmes.

As noted earlier, in one sense, the solution is obvious: more competent local water and sanitation providing organizations in each urban centre in which the unserved and ill-served have influence; yet with the recognition that local contexts vary greatly comes the realization that the actual form that these local organizations take will also vary. What is needed in each location is the best possible mix between good quality convenient provision, what can be afforded and what can be managed locally. While this is obvious, the means to achieve it is not. In many instances, there is a large gap between what can be afforded and what good quality provision costs. In most small urban centres, there is a lack of technical capacity for the systems that have the potential to work best. In addition, external support – whether from national governments or international agencies – has not proved very good at supporting the most locally appropriate, pro-poor development for water and sanitation and for other local needs.

This chapter describes various programmes that sought to improve and extend provision for water and sanitation in small urban centres. It also includes descriptions of some initiatives that were in low-income areas in cities that have points of relevance for small urban centres. The examples given should be considered not so much as ‘best practice’ that can be applied elsewhere as good pragmatic local responses to local opportunities and constraints, from which some key principles can be drawn that do have validity for other places.¹ It is worth noting how, in most of the innovations, it was the local capacity to reduce unit costs for installation and maintenance that had particular importance – making it more affordable for low-income groups and more financially viable for the water and sanitation service providers.



THE TECHNICAL AND INSTITUTIONAL OPTIONS FOR WATER SUPPLY AND SANITATION²

It is clear that the choice of technology and the way it is used must be locally determined in ways in which the unserved and the ill-served have influence. Neither ‘eco-sanitation’ nor ‘water-borne sanitation’, nor any of the other technologies described in this section, are ‘solutions’ but options that may or may not be

appropriate to local circumstances and possibilities. There are also no universal truths with regard to the most appropriate institutional form or funding mechanisms, although there are some useful working principles. For instance, it is nonsense to think that full cost recovery through user fees is always possible for water and sanitation, especially for solutions that work best for the poorest groups. But it is good practice to seek solutions in all locations that keep down unit costs and that maximize cost recovery from users. In large part this is because the less subsidy needed, the more the possibilities of greatly increasing the scale of the initiative and reaching those with very limited incomes, and also the less the dependence on external funding. As described in a later section, there are many good examples of this. Externally funded 'solutions' can also very often be too expensive, which discourages and may even crowd out more appropriate locally funded solutions.³ It is time for external agencies to support local capacities to develop locally appropriate solutions, not impose their (often inappropriate and over-expensive) solutions and (often inappropriate) conditions.

This chapter also emphasizes the importance of changing the relationship between official water and sanitation service providers and the unserved or ill-served in ways that bring advantages for both sides. One way to reduce the costs of good provision for low-income households *and* costs for water and sanitation service providers is to have groups of households agreeing to take on some of the management (including fee collection) and, where appropriate, some of the capital works (for instance managing the water and sewer/drainage pipe installation within their group or lane, or managing the construction and management of communal facilities).

Water supplies

To minimize the transmission of water-related diseases, in particular, what are often termed the water-washed diseases,⁴ water needs to be easily

accessible and use of around 25–30 litres per person per day is generally thought to be necessary, although with higher volumes provided where possible.⁵ WHO recommends at least 50 litres per day, provided flush toilets with a high volume per flush are not used (as may be expected in most urban centres).⁶ This value of 50 litres per day seems reasonable, but hygiene education will generally be required so that the users can maximize the health benefits from the non-wasteful use of this quantity of water. Guideline figures for 'minimum provision' are often given for households – and as examples given later in the chapter will show, these vary from 120 to 400 litres per household per day.

Reviewing how water is provided in small urban centres, these usually fall into one of five service levels:

- 1 Unimproved water sources – for example, unprotected shallow wells and untreated surface waters such as a local river or lake (which may be faecally contaminated).
- 2 Public standpipes connected to the urban centre's piped supply or a protected well. The public standpipe may provide water free of charge or be managed with water charged for – for instance a water kiosk managed by a community organization or a private enterprise. (If this water is charged for, it is common for households to use this where available for drinking water and to draw on unimproved sources for other domestic needs.) Obviously, the quality of the water depends on competent management of the water system.
- 3 Cooperative standpipes (serving and managed by a defined group of households – typically of between 5 and 25 households).
- 4 Yard taps (with one tap per household).
- 5 In-house taps (including multiple taps and in-house plumbing).

Levels 2, 3 and 4 have particular relevance for small urban centres; 1 is not good enough (in view

TYPES OF PROVISION	MANAGEMENT	COST
1 Shared unimproved water sources	Individual or communal	Shift from management by households and communities to professional management; increasing sophistication for technical management and higher capital costs
2 Shared public standpipes	Mixture of formal (for instance for supply) and community	
3 Cooperative standpipes (e.g. 1 per 20 households)	Formal organization (government or private sector)	
4 Yard taps for each household		
5 Individual house supplies (including multiple-tap)		

→

- Increasing convenience (and decreasing time needed to obtain water); usually increasing cost
- Increasing use of water, usually with health benefits (especially for washing, laundry and personal hygiene)
- Shift left to right more possible with increasing size of population, more commercial and industrial demand and more households with greater capacity to pay

of the heavy pollution of such sources in most urban environments) and 5 is generally too expensive.⁷ However, for levels 2, 3 and 4 to support good health, they have to be well provided. For instance, all need a regular, sufficient, good quality water supply. For service level 2 to work well, there need to be sufficient standpipes at not too great a distance from all households for which queue times are minimized.⁸

Figure 4.1 summarizes these different water supply options and notes what these imply with regard to management, convenience, water use, cost and possibilities of cost-recovery from users. Most households would prefer to be as far down these steps as possible, so one of the critical issues is how to reduce the cost and increase the possibility of cost recovery for achieving this. Two ways to do this are emphasized here: first, the use of condominium water supplies; second, arrangements between groups of households and the water supply agencies that cut costs and increase cost recovery for the agency, yet keep down costs for the consumers.

Condominial water supplies (and sewerage systems, as discussed later) have been used in many cities (such as Durban, La Paz and Buenos Aires) and smaller urban centres (for example, Iquitos, Peru⁹ and various small urban centres in Brazil). First developed in Brazil in the 1990s,¹⁰ the best example is Parauapebas in the northern Brazilian state of Pará (with around 100,000 inhabitants), where the cost savings achieved by the condominium water supply network were considerable: the cost per connection was only

US\$45 in 1997, compared to US\$167 for a conventional water supply network, despite the basic design criteria being the same in both cases (90 per cent service coverage and a design supply of 250 litres per day). Some condominium systems have attracted criticisms for being too brittle, but this is more to do with inadequacies in their construction. More details of these systems are given in Box 4.1.

The condominium water supply system described in Box 4.1 has relevance for most small urban centres because it shows how much the costs of a piped water supply network can be brought down. Some of the features of the system will not be replicable in most small urban centres, especially in sub-Saharan Africa and Asia – for instance such a high water consumption per household and the provision of connections to each household. But the basic concept remains valid: the cost of the public distribution network can be substantially reduced if the water agency provides the supply to groups of households (including condominiums or cooperatives), rather than to individual households, with these groups managing the connection to each household. As described in some detail in a later section, the success of the Orangi Pilot Project model for water pipes and for sewers – which has now been extended to many small urban centres in Pakistan – is also in large part through external agencies focusing on the ‘external’ pipes, with residents managing the installation of the ‘internal’ pipes within their lanes and neighbourhoods.

Figure 4.1
Water supply options for households for small urban centres

Box 4.1 Condominial water supplies in Parauapebas, Brazil

Comparative costs of conventional and condominial water supplies in Parauapebas (US\$ 1997)

Item	Conventional supply		Condominial supply	
	Total Cost	Cost per individual house connection	Total cost	Cost per individual condominium connection
Excavation	454,000	88	101,000	19
Pipes	407,000	79	129,000	25
Total	861,000	167	230,000	45

These cost savings were achieved because there was a much lower total pipe length for the public distribution network (287 km of streets served with only 43 km of pipes), which meant that substantially less 'public' excavation was required. The condominial branches were routed along the pavements (sidewalks) at a depth of roughly 400 mm and an entry point for each housing block (condominium) provided. The block residents (that

is, the members of the condominium) purchased all the materials to complete the in-block distribution system and household connections (in this case in-house supplies for multi-tap provision for 250 litres per person per day) as well as contributing their own labour for trench excavation.

Initially each household connection was metered and the households paid a monthly water bill that included: a standing charge equivalent to

US\$2.78 and a charge of US\$0.25 per m³ for the first 10 m³, which went up to US\$0.99 per m³ above this. Later, new connections were not metered and the monthly bill was US\$5.28 (that is, the standing charge plus US\$2.50 for an assumed consumption of 10 m³ per month).

Source: Melo, J. C. (2005) *The Experience of Condominial Water and Sewerage Systems in Brazil: Case Studies from Brasilia, Salvador and Parauapebas*, Water and Sanitation Program Latin America, Lima.

This model of provision to groups of households can also be applied to public, communal or shared facilities, where there is not the capacity to pay for in-house or yard taps. There are three levels of provision:

1 standpipe cooperatives (one or two standpipes per group of member households – see Figure 4.2);

- 2 yard-tap cooperatives (one tap per member household);
- 3 In-house multiple-tap cooperatives (usually only affordable by non-poor household groups).

Each group of households decides which type of water supply cooperative it wishes to form and each is billed collectively for its water consumption (which makes serving it with water much easier and more financially attractive for the water supply agency). Normally this will have to be done in collaboration with the water supply agency as the type chosen determines how much the cooperative will pay for water. Each cooperative receives a single point supply from the water supply agency (Figure 4.3) and pays for all materials and labour (or contributes its own labour) for the supply beyond this point (although the water supply agency may choose to supply and locate the standpipes for level 1 cooperatives). If the water agency is using progressive tariffs for water (that is, with charges per litre of water increasing with total consumption), this will need modification for these kinds of cooperative schemes, otherwise the cooperatives will pay higher prices for water than households with individual connections.

Figure 4.2

Two standpipe cooperatives in an existing low-income area

Note: Each cooperative is shown with two standpipes (●) fed from a single supply point (○).

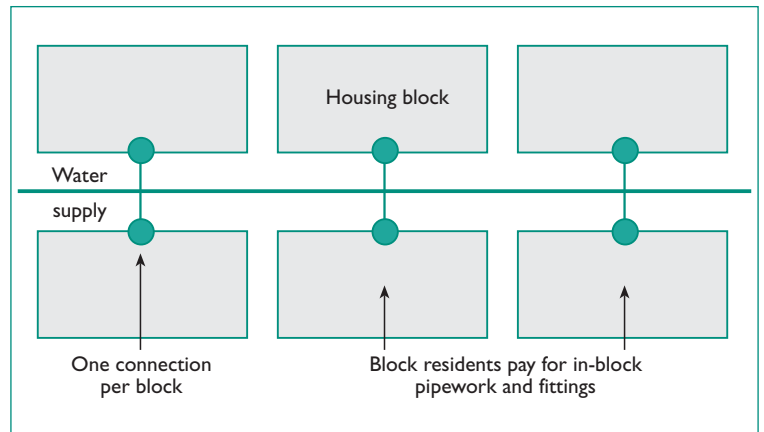


In any settlement, the following questions need to be addressed at the pre-feasibility stage:

- Is the supply to be based on standpipes (for which no charge is made), standpipe cooperatives, yard-tap cooperatives or in-house multiple-tap supply cooperatives?
- If based on standpipes, how many standpipes are required? Will they be managed by community organizations and will the water supply be paid for (thus with the community having to make arrangements for managing this)?
- If the supply is for standpipe, yard-tap or multiple-tap cooperatives, how many households should there be in each cooperative? (The answer need not be one figure; a range is preferable to allow for variations due to topography and housing density.)
- What should be the design water consumption for standpipe and yard-tap cooperatives? Is 50 litres per person per day locally sufficient?
- Will the cooperatives contribute labour and/or money to reduce the costs of implementation? If not, will the scheme be viable?

Water treatment

Water treatment in small urban centres has to be simple, effective and reliable. If surface water is to be treated, then often the best option is multiple-stage filtration.¹¹ If groundwater is used, then the ideal solution is to abstract the groundwater from an uncontaminated and protected aquifer, so that treatment is not required. Initial chemical analyses must, however, be undertaken to ensure there are no problems with, for example, arsenic, or to detect high concentrations of iron and manganese (which are easily removed by aeration, even at small-village level).¹² Disinfection, although very desirable, may not be practical, especially in the smaller, poorer, more isolated urban centres.¹³



Water supply tariff structures

Setting the right price for water supply is important because this influences both the proportion of people that get adequate supplies and whether the supply can be maintained (and even improved and extended to others). In regard to setting prices for groups of households, water supply tariff structures are important as they influence the decision by any group of households regarding the type of cooperative it wishes to form, as well as setting out how much they will pay for their water consumption and how the amount they pay may change with the amount of water consumed. Each type of cooperative could be charged as follows:

- 1 Standpipe cooperatives: the supply is unmetered and the cooperative pays a 'nominal tariff' (a fixed monthly charge equal to a small percentage of the local minimum wage (say, 1 or 2 per cent) \times the number of member households).
- 2 Yard-tap cooperatives: the supply is unmetered and the cooperative pays a 'minimum tariff' (a fixed monthly charge equal to a slightly larger percentage of the local minimum wage (say, 5 per cent) \times the number of member households).
- 3 In-house multiple-tap cooperatives: the supply is metered and the cooperative pays for its consumption on the basis of a block tariff structure.

Figure 4.3

Single water supply connections for yard-tap or in-house multiple-tap water cooperatives

Note: Each cooperative has a single connection (●) with in-house multiple-tap cooperative having a metered supply. Each housing block (or group of housing blocks) forms a separate cooperative.

There are no connection fees because each cooperative will have paid for all the materials and labour required to install the water supply beyond the single supply point provided by the water service agency. The availability of credit can make the costs to cooperatives of their 'internal' pipes more easily paid because it allows the cost to be spread over a number of years.

Each cooperative is responsible for collecting payments from its members (members can choose the most convenient way to do this) and for paying the water service agency. Each cooperative will also have to decide how to treat those of its member households who do not pay their contribution to its water bills. Discussions between cooperatives and the water service agency can develop the most appropriate payment schedules and the procedures to cope with customer-cooperatives who fall behind in payments.

In most urban areas, the water supply agency will have a mix of the three types of cooperative and also large consumers (for instance industries, hospitals, schools, government offices, military establishments and prisons). Financial viability often depends on ensuring that these larger consumers pay realistic prices. It is likely that some provision will be needed for 'social' supplies to very poor households (that is, those unable to form standpipe cooperatives), if everyone is to be reached. However, in small urban centres (and large villages) the proportion of type 3 cooperative households will generally be much lower than in large urban areas, so the main customer base will be type 1 and type 2 cooperatives. It may be more difficult for the water service agency to maintain its financial viability with a large proportion of unmetered customer-cooperatives.

This can be addressed in part through cross-subsidies from wealthier households with in-house supplies but the difficulties of doing this are illustrated in the case study of Mbombela in Chapter 6. The case highlights the importance of discussing the different options with households and community organizations when planning new

or extending existing water supplies in small urban centres. The water service agency wants to ensure that all households that want and can afford the yard-tap or house-tap options get this since this increases its revenues. If non-poor consumers choose not to form cooperatives for in-house connections, then the water services agency should increase their monthly water bills by including a standing charge to cover the increased costs of additional billing (for instance meter reading, computer time, bill delivery, receipt of additional payments). The standing charge should be high enough to encourage these consumers to form cooperatives.¹⁴

■ Aggregation

Aggregation means the grouping of neighbouring small urban centres (and large villages) into one water supply 'zone' under one water supply organization, so that some economy of scale may be realized.¹⁵ There are various levels of aggregation with different functions and responsibilities (for example, bulk water supply only, or including local distribution, operation and maintenance). Aggregation may be voluntary (local urban centres choosing to aggregate) or mandatory (local centres being told to aggregate by a higher authority – for example, state/provincial or central government).¹⁶ If aggregation is not mandatory, then its local advantages and disadvantages should always be considered in detail at the pre-feasibility stage.

■ Engineering aspects

Apart from the basic hydraulic design of the water supply network, there are three principal engineering aspects that need to be considered:

- 1 The possible use of flow-control valves at the single supply point to cooperatives to restrict consumption to a predetermined level to be decided on in discussion with the cooperatives.
- 2 Provision of adequate drainage facilities at every standpipe.¹⁷
- 3 The use of water-saving plumbing fixtures in houses with in-house multiple-tap coopera-

tives (that is, low-volume flush toilets and flow-control valves for showerheads and taps). In water-short areas (and these will become more common in the near future) their fitting should be mandatory in all houses and commercial premises¹⁸ and other measures such as provision for rainwater harvesting and use might be appropriate.

From the above, it becomes obvious that there needs to be a good and clearly defined partnership between the water services agency and the cooperatives. The agency's staff (engineers, sociologists/social scientists, financial analysts) need to work with the cooperatives, especially low-income cooperatives (namely, those with standpipe and yard-tap supplies), so it can understand their water (and sanitation) needs and respond to them in a sympathetic, professional way. Without such partnerships (and it is not so difficult to develop them properly) the water supply 'improvements' are unlikely to fully meet the community's needs. In many instances, as illustrated by examples given later in this chapter, local NGOs and organizations formed by the urban poor have been important intermediaries in helping such partnerships develop.

Sanitation

As with water supply, ideally, each household should have its own toilet and most would want this, if provision was possible and affordable. But it often is not possible – for instance it is too expensive, or there is too little room (many low-income households live in accommodation with less than one square metre per person) or the house owner is not interested in providing this – for instance where they are renting out their house or shack. In addition, in most urban contexts, it is more complicated and more space-intensive to provide a good sanitation solution if there is no sewer to connect to – as is the case for the vast majority of people living in small urban centres. As with water supply, unit costs come down through communal provision but it is more difficult to make communal facilities work

for sanitation, especially in keeping toilets clean, well maintained and accessible to all – although there are exceptions, as discussed later. The problems of communal provision are generally less if relatively few households who know each other share a toilet – for instance a toilet shared by those living in a yard. There are also good possibilities of cutting unit costs through groups of households working together to install and manage their own sewer system that then allows each household to have their own toilet, which is also discussed later. Public toilets can be successful as a business but these often fail to meet residential needs, especially at night, for children and the elderly and for those who cannot afford to pay. But before discussing how and where household, communal and public sanitation has worked, first, the different technological options for sanitation are reviewed.

Available options for sanitation fall into two categories, based on whether the excreta is managed 'on site' or 'off site':

- On-site systems:
 - 'SanPlat' latrines;
 - ventilated improved pit (VIP) latrines;
 - pour-flush (PF) toilets;
 - ecological sanitation ('EcoSan') toilets.
- Off-site systems:
 - communal sanitation facilities;
 - conventional sewerage;
 - settled sewerage;
 - simplified sewerage.

Each of these options is described briefly¹⁹ and their relevance for small urban centres discussed. Conventional sewerage is not discussed in detail because only very rarely would there be the demand and resources available to consider it.²⁰ Cost is really the most important criterion for sanitation technology selection for low-income and very low-income households since, given good design, implementation, and operation and maintenance, all of the above sanitation technologies achieve approximately the same

Sanitation technology	Capital cost	
	rupees	US dollars
Single-pit VIP latrine	2150	49
Single-pit pour-flush toilet	1900	43
Alternating twin-pit pour-flush latrine	2500	57
EcoSan toilet without urine diversion	4200	96

Source: www.toiletsforall.org.
Note: costs are per unit and calculated using average exchange rates in April 2004 (US\$1 to 43.8 rupees).

Table 4.1
Sanitation technology options and costs in India, April 2004

Table 4.2
Sanitation technology options and costs in South Africa, February 2002

Sanitation technology	Capital cost	
	rupees	US dollars
Single-pit VIP latrine	600–3000	52–261
Pour-flush toilet	2000–3000	174–261
Simplified sewerage	2500–3000	217–261
EcoSan toilet with urine diversion	3000–4000	261–348
Conventional sewerage	6000–7000	522–609

Source: DWAF (2002) *Sanitation for a Healthy Nation: Sanitation Technology Options*, Department of Water Affairs and Forestry, Government of South Africa, Pretoria.
Note: costs are per unit or connection and calculated using average exchange rates in February 2002 (US\$1 to 11.5 rand).

level of health benefits²¹ and all can address water scarcity and other ecological constraints or be adapted to do so. However, some systems depend more heavily on competent local sanitation agencies and on regular water supplies than others, which influences what is the most appropriate system for any location. Off-site systems have the great advantage for households of

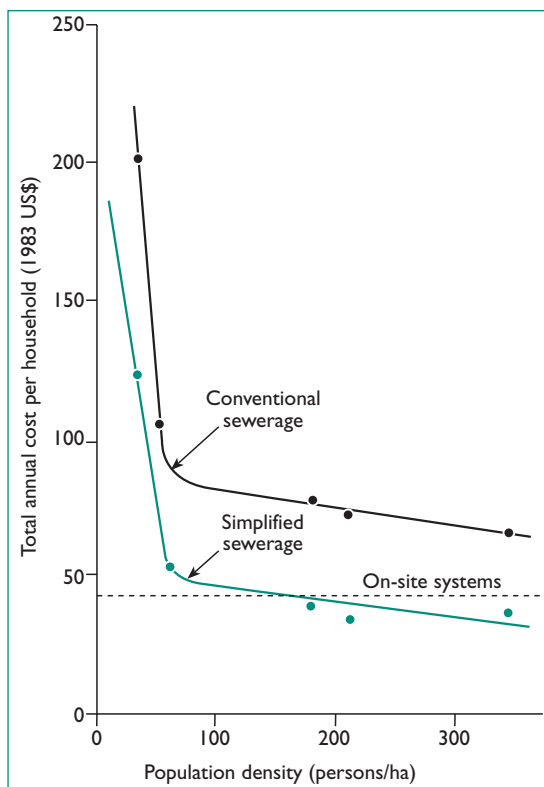
removing human wastes from their home and house plot and also removing waste-water, without requiring much space. But they depend on an off-site physical and institutional infrastructure that works and that is well maintained – for instance, they cannot work well if sewers get blocked. On-site systems have the great advantage for households of reducing their dependence on external infrastructure and service providers and of requiring less or no water to work, but they require more space, time and knowledge from households to make them work well and, in most urban contexts, good and affordable emptying services.

There are few recent sets of cost data comparing different sanitation options. Tables 4.1 and 4.2 show costs in India in 2004 and in South Africa in 2002, and Figure 4.4 shows costs in northeast Brazil in 1983. These cost data are very pertinent (although they would need to be verified locally). They suggest that a rural Indian would normally choose a single-pit pour-flush toilet and a rural South African a single-pit VIP (ventilated improved pit) latrine, and that Brazilians and South Africans living in small urban centres could be expected to opt for simplified sewerage.

Of course, the preferred household-level technology has to be affordable. Figure 4.4 shows that in Natal, northeast Brazil, simplified sewerage became cheaper than PF toilets above the relatively low population density of some 160 people per hectare. Further details on simplified sewerage costs are given below.

Figure 4.4
Annual costs per household for conventional sewerage, simplified sewerage and on-site sanitation (PF toilets) in low-income areas of Natal, northeast Brazil, in 1983

Source: Sinnatamby, G. S. (1986) *The Design of Shallow Sewer Systems*, United Nations Centre for Human Settlements, Nairobi.



Simplified sewerage

Simplified sewerage (also called condominal sewerage) was developed in northeast Brazil in the early 1980s. It was originally developed for use in low-income peri-urban areas in the state of Rio Grande do Norte,²² and has been implemented in a variety of locations in Brazil, from low-income peri-urban areas in major cities to small urban centres to villages with populations up to 1000 inhabitants (for instance in rural areas of the state of Ceará).²³ This, together

Table 4.3

Comparative costs of conventional and simplified sewerage in Parauapebas, Brazil

Item	Conventional sewerage (US\$ 1997)		Simplified sewerage (US\$ 1997)	
	Total Cost	Cost per connection	Total Cost	Cost per connection
Excavation	263,000	39	186,000	28
Inspection chambers	181,000	27	85,000	13
Sewers	185,000	28	102,000	15
Total	629,000	94	373,000	56

Source: Melo, J. C. (2005) *The Experience of Condominial Water and Sewerage Systems in Brazil: Case Studies from Brasilia, Salvador and Parauapebas*, Water and Sanitation Program Latin America, Lima.

with its replication in other countries, including low-income areas with low water consumption, show that it is clearly applicable to many small urban centres, provided that it is locally affordable and cheaper than other household-level options and is installed properly.

Simplified sewerage is designed, like conventional sewerage, to receive unsettled waste-water and the current design procedure ensures its blockage-free operation by using a minimum tractive tension (rather than a minimum self-cleansing velocity), which is achieved at least once a day at peak flow.²⁴ Assuming a mean waste-water flow of 50 litres per person per day (a typical figure for small urban centres in Africa and Asia) and a peak factor of 1.8, a 100 mm sewer laid at a minimum gradient of 1 in 200 can serve over 3000 persons.

■ Costs

Simplified sewerage is low cost: when it was first installed in 1981 in northeast Brazil, it was less than a quarter of the cost of conventional sewerage (US\$325 per household compared to around US\$1500 per household for conventional sewerage), with a monthly payment by each household of only US\$1.50.²⁵ Costs have since fallen slightly – for example, current costs in Brasília are US\$200–300 per household.²⁶ In South Africa they were US\$217–261 per household in 2002.²⁷ Costs in India, where simplified sewerage is known as ‘slum networking’, are around US\$150 per household.²⁸

The cost of simplified sewerage in villages with up to 1000 inhabitants in rural Ceará, northeast Brazil, was around US\$80 per connection in 1999.²⁹ The monthly charge to

householders was US\$1. In the city of Parauapebas in the northern Brazilian state of Pará (with a population of around 100,000), where condominial water supply was first implemented (as described in Box 4.2), the cost of condominial sewerage was much lower: US\$56 per connection in 1997 compared to US\$94 for conventional sewers, as shown in Table 4.3.³⁰ To place this 1997 cost for condominial sewerage of US\$56 per connection into context, the minimum salary in Brazil was then the equivalent of around US\$110 per month, so the cost for each household was about half one month’s minimum salary.

Currently CAESB, the water and sewerage company for Brasília and the Federal District in Brazil, has a surcharge on the water bill as follows:

- households with ‘back-yard’ or ‘front-yard’ condominial sewers: 60 per cent;
- households with condominial sewers in the public pavement/sidewalk (generally non-poor households): 100 per cent.³¹

Simplified sewerage is now regarded as an acceptable sanitation technology throughout Brazil where it has been successfully used for over 25 years.³² The reasons for its widespread adoption in Brazil are outlined in Box 4.2. Following early experience in Brazil, simplified sewerage was transferred to Pakistan³³ where, in early 1985, in the low-income area of Christy Nagar in Karachi the cost, including primary waste-water treatment was US\$45 per connection, and the residents obtained their water (about 27 litres per person per day) from public standpipes. The concept of simplified sewerage

Box 4.2 Development and dissemination of simplified sewerage in Brazil

Simplified sewerage was developed by the Research and Development Division of Companhia de águas e esgotos do Rio Grande do Norte (CAERN), the water and sewerage company of the northeastern state of Rio Grande do Norte. It was first field-tested in the low-income areas of Rocas and Santos Reis in Natal, the state capital, in the early 1980s. The CAERN team presented its experience at the biennial Congress of Associação Brasileira de Engenharia Sanitaria e Ambiental (ABES) the Brazilian association of sanitary and environmental engineering held in Balneário Camboriú, Santa Catarina in November 1983, and also described the system in the ABES technical journal *Engenharia Sanitária*.³⁴

CAERN's development of simplified sewerage in Natal was partially funded by the World Bank Medium-sized Cities Project, which also saw the implementation of condominial sewerage in the city of Petrolina in the state of Pernambuco. The Brazilian office of the World Bank/United Nations Development Programme (UNDP) Technology Advisory Group evaluated the Rocas and Santos Reis scheme very positively. This led to the production of the Brazilian national design manual for simplified sewerage³⁵ and the formation of the ABES Low-cost Sanitation Committee (1984–1986), which in turn led to the adoption of a minimum sewer diameter of 100 mm in the revision of the Brazilian national sewerage design code.³⁶ A further key feature in the development of simplified sewerage design in Brazil was the realization by the late Brazilian sanitary engineer Eugênio Macedo that the sewer gradient should be based on the initial design flow and the sewer

diameter on the final design flow; this is an important consideration (incorporated into the 1975 Brazilian national sewerage design code) as in low-income areas the latter may be up to five times the former. The hydraulic design basis was changed from a minimum self-cleansing velocity of 0.5 m/s to a minimum tractive tension of 1 Pa,³⁷ a change that was also included in the 1986 Brazilian national sewerage design code.

Compañía de Saneamiento Ambiental del Distrito Federal (CAESB), the water and sewerage company of Brasília and the Federal District, started implementing simplified sewerage in low-income areas in 1991 and now it considers simplified sewerage as its 'standard solution' for high- and low-income areas alike. CAESB now has over 1200 km of condominial sewers in operation – the largest example of simplified sewerage in the world.

Simplified sewerage has now been successfully adopted into mainstream Brazilian sanitary engineering. The reasons for this success have been: first, the ease of dissemination of innovative technologies at the biennial ABES Congresses that are attended by all the state water and sewerage companies; second, the group of leading Brazilian sanitary engineers who have been committed to, and have been excellent advocates of, the technology; and third, the keen interest shown in the technology since its beginning by the World Bank and UNDP, which have acted within Brazil to give the system a 'seal of international approval'. A recent survey of simplified sewerage schemes in Brazil found user satisfaction levels high, even after some 20 years' operation.³⁸

was embraced by the Orangi Pilot Project (see the next section for its application in small urban centres),³⁹ and in Sri Lanka where there are now around 40 schemes. Simplified sewerage was used in the El Alto Pilot Project in Bolivia,⁴⁰ one of the outcomes of this was the development of a Bolivian standard for simplified sewerage.⁴¹ Simplified sewerage has recently been developed in South Africa⁴² and successfully implemented in an informal settlement in Buenos Aires.⁴³

Community-based sewerage schemes have been developed in Indonesia⁴⁴ and 'slum networking' schemes in India.⁴⁵ While not designed precisely according to the principles of Brazilian simplified sewerage, these have been nonetheless very successful.

Hydraulic theory and visual observation both indicate that small waste-water flows pass better in small diameter sewers. Yet many national sewerage design codes specify minimum sewer diameter greater than 100 mm in the mistaken belief that larger must be better. Such

codes need to be altered to take into account present practice in simplified sewerage; otherwise local design engineers will be forced to continue to develop very conservative, and hence expensive, 'solutions' for the poor.

The waste-water collected by simplified sewerage should be treated prior to surface-water discharge or reuse in horticulture, agriculture and/or aquaculture. In small urban centres, the best option for waste-water treatment is generally waste stabilization ponds as these are especially effective in removing or destroying faecal pathogens.⁴⁶

Other sanitation systems

■ Settled sewerage

Settled sewerage (also called 'solids-free sewerage', 'small-diameter gravity sewerage' in the United States, and 'septic tank effluent drainage' in Australia) is a sewer system that conveys only septic tank effluents. As these effluents are

solids-free the sewer is designed differently from conventional and simplified sewers (which convey all the waste-water solids). Each house or a small group of neighbouring houses has a septic tank that discharges into the settled sewer. The minimum sewer diameter is 75 mm and the sewer gradient closely follows the ground slope, with the flow in the sewer alternating as necessary between open channel flow and pressure flow.⁴⁷ Settled sewerage is best applied in areas already served by septic tanks. Thus it is unlikely to be applicable to low-income households in small urban centres for which simplified sewerage is generally a better and cheaper alternative.

■ On-site systems

On-site systems are ‘SanPlat’ latrines, VIP latrines, pour-flush toilets and ecological sanitation toilets. Septic tanks are not discussed here since these are generally only affordable by non-poor households.

‘SanPlat’ (*sanitation platform*) latrines are simply traditional (unventilated) latrines provided with a concrete cover slab (the ‘SanPlat’).⁴⁸ Ventilated improved pit latrines are an improvement on this. They were developed in rural Zimbabwe⁴⁹ and have been used in various urban locations – for instance in low-density low-income urban areas in Botswana.⁵⁰ The vent pipe effectively controls odours and flies. There are single-pit and alternating twin-pit versions.⁵¹ They are applicable in low-density urban areas, provided that they are cheaper than simplified sewerage or where local organizational capacity cannot develop simplified sewage. Emptying costs must be included in this cost comparison – and these costs can be considerable (as outlined in greater detail below).

On-site pour-flush (PF) toilet systems comprise the toilet itself, with its integral water-seal, a discharge pipe and either a single leach pit or alternating twin leach pits (the toilet bowl or squat pan can be and is used in other situations – for example, simplified and settled sewerage). The volume of flush water is around 2–4 litres per flush and the leach pits are designed both for solids digestion and storage

and infiltration of urine and the flush-water.⁵² As with VIP latrines, PF toilets are only applicable in low-density urban areas if they are cheaper than simplified sewerage or where there is no local capacity to install and manage simplified sewerage.

■ Pit emptying

The pits of SanPlat and VIP latrines and pour-flush toilets require emptying when they are full; the faecal sludge is removed manually (alternating twin-pit version only), or mechanically by high-powered vacuum tankers (both versions).⁵³ However, in practice pit emptying is often not well planned: the vacuum tankers are not properly maintained and low-income households are often disadvantaged as they are the last to be serviced.⁵⁴ Many low-income households also live in sites that tanker trucks cannot reach. This alone should militate against on-site sanitation systems in small urban centres. As already mentioned, this can incur considerable cost.

■ Ecological sanitation toilets

The basic philosophy of ‘ecological sanitation’ (‘EcoSan’) is to recycle all the nutrients in human excreta because each person excretes almost enough NPK (nitrogen, phosphorus and potassium) to produce all the cereals she or he needs.⁵⁵ A consequence of this is that the various ‘streams’ of excreta and waste-water should not be mixed as they differ greatly in their volumes and nutrient loads. Thus ‘yellow water’ (urine), ‘brown water’ (faeces and toilet flush waters) and ‘grey water’ (waste-water from sinks and showers or baths) should be kept separate to facilitate nutrient and water treatment and reuse,⁵⁶ although in some EcoSan systems yellow water and brown water are combined to form ‘black water’.⁵⁷ EcoSan can be either on site or off site, and it can even be partially on site and partially off site. There are many EcoSan variants: some are high-tech and high-cost; others are low tech and low cost, and may or may not include urine diversion. On-site treatment options for brown waters include double-vault dehydrating and composting toilets,

and anaerobic digestion (possibly supplemented by domestic animal excreta) and use of the resulting biogas for cooking (as in some small urban centres in northern Vietnam).

There is currently much discussion on whether ecological sanitation refers only to those systems in which yellow, brown and grey waters are source-separated and reused separately, or whether it can also refer to any sanitation system in which all (or almost all) the nutrients are reused (and so would include, for example, simplified sewerage plus waste-water treatment in waste stabilization ponds plus reuse of the treated waste-water in horticulture, agriculture and/or aquaculture). However, the cost data in Tables 4.1 and 4.2 suggest that EcoSan toilets, either with or without urine separation, are too expensive for use in most small urban centres.

■ Communal sanitation facilities

In almost all small urban centres in low- and middle-income nations, there are many very low-income households who are unable to afford any kind of individual household-level sanitation, whether it be an on-site or off-site system. In addition, many households lack the physical conditions to install a latrine, such as those with no yard and those living in homes built over waterways or on steep slopes. On-site systems are also difficult to install in all floors in multi-storey buildings other than the ground floor. Many low-income individuals or households rent accommodation and much cheap rented accommodation does not have provision for toilets.

Although international agencies have been reluctant to support communal sanitation, this can be the means by which large sections of the poorest groups are reached with improved provision – and also the means by which open defecation is reduced (with obvious health benefits). Two examples of communal or public provision are the sanitation blocks of the type implemented in India by Sulabh International⁵⁸ and by the alliance formed by the Mumbai NGO, SPARC (the Society for the Promotion of Area Resource Centres), with cooperatives of women pavement and slum dwellers (Mahila Milan –

MM) and the National Slum Dwellers Federation (NSDF).⁵⁹ Sulabh International has built some 6400 sanitation blocks throughout India, used by over a million people every day. The blocks provide toilet and washing facilities, and soap is provided to all users. There is a charge of 1 rupee (the equivalent of around US\$0.02) per use (other than use of urinals), but children, disabled people and those unable to pay are not charged. The blocks are maintained 24 hours per day by caretakers who are employed by Sulabh and live on the premises. The caretakers also collect the user charges and the blocks are regularly inspected by Sulabh and the local council.⁶⁰

For the SPARC–NSDF–MM blocks, generally families pay a monthly charge to allow all family members to use the facilities – for instance 20 rupees per family per month (US\$0.45), which is obviously much cheaper than 1 rupee per person per use. Most of the blocks built by this alliance are in large cities (with very large programmes in Mumbai and Pune) but there is a growing programme of sanitation blocks in small urban centres – as described in a later section.

Of course, communal sanitation facilities have disadvantages. They are much less convenient than household sanitation, and women and children are often afraid to use them, especially at night. They also have to be well maintained and managed – and, for instance, to be well lighted at night. They have to be close to users and ensure that waiting times are low and that women and children do not get pushed out of queues by men.⁶¹ There should be special provision for young children who will have difficulties waiting in a queue – as recognized by SPARC–MM–NSDF as special toilets for children are included in most blocks. But, if communal sanitation is the only realistic option, then clearly it is much better than no sanitation facilities. However, it is very important that communal facilities are well designed and well managed and maintained. Without this, they quickly degenerate into total faecal disarray with the result that people, especially women and children, prefer not to use them at all.

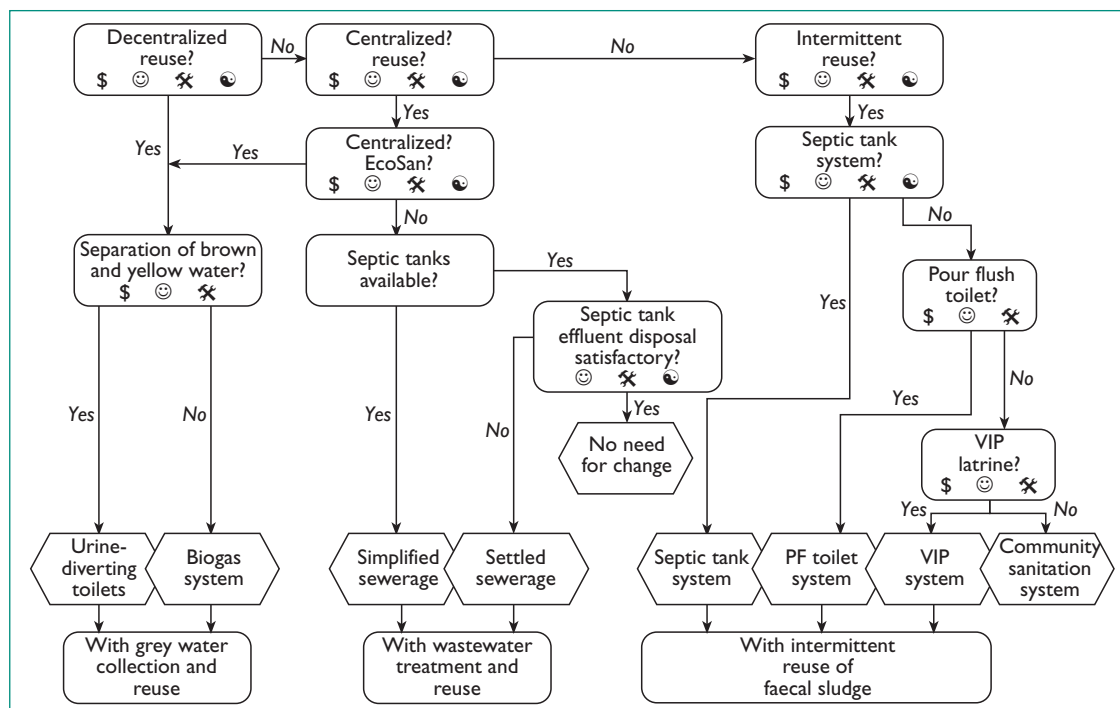


Figure 4.5

Sanitation selection algorithm

Source: Mara, D. D., Drangert, J. O., Nguyen, V. A., Tonderski, A., Gulyas H. and Tonderski, K. (2006) 'Selection of sustainable sanitation arrangements', *Water Policy*, in press.

Sanitation cooperatives

A water cooperative formed by a group of households can become a water and sanitation cooperative: its member households decide, with help and advice from the water services agency, which household-level sanitation facility they will all have. This could be an on-site system, such as VIP latrines, PF toilets or ecological sanitation toilets, or an off-site system such as condominial sewerage. The availability of space on each housing plot, and whether or not an on-site system is cheaper than condominial sewerage, will generally be the deciding factors in this choice. The cost of on-site systems should include the cost of desludging them at the required intervals; similarly the cost of condominial sewerage should include the cost of waste-water treatment.

The responsibilities of the group of households or cooperative include, in the case of on-site sanitation systems, the construction of the chosen system for each member household and arranging for the pits to be emptied at the appropriate frequency (the cooperative can collect a little more money each month from its member households to pay for pit emptying). In the case of condominial sewerage, the coopera-

tive pays for the construction of the condominial sewers and their connection to the street sewer; it can choose whether or not to contribute its own labour for excavation. The water services agency is responsible for the construction of the street sewers and for waste-water treatment. It should also be responsible for supervising the construction of the condominial sewers and also for training small local contracting firms to lay small diameter sewers at flat gradients (for example, 100 mm sewers at 1 in 200) correctly – only contractors who have been trained should be permitted to install condominial sewers. As in the case of cooperative water supplies, the availability of credit to support the cooperatives constructing the sanitation facilities may be needed. Again, the quality of the relationship between the agency and the cooperatives is a key part of success.⁶²

Selecting the most appropriate sanitation system

Figure 4.5 shows a sanitation selection algorithm developed by Duncan Mara to prompt planners and engineers to answer key questions as they consider which sanitation system might be used in a particular context. It includes questions that

Table 4.4

Water and sanitation interactions

Type of water supply	Sanitation options	Notes
Public standpipes	Community-managed toilet blocks	It is assumed that individual household sanitation facilities are unaffordable or impossible to implement (e.g. low-income rental areas)
Standpipe cooperatives	On-site systems or condominial sewerage	Choice depends on space availability and costs
Yard-tap cooperatives	On-site systems or condominial sewerage	Choice depends on space availability and costs
In-house multiple-tap cooperatives	Condominial sewerage	In low-density areas with higher income groups, on-site septic tank systems may be used

are often not considered. It is based on the premise that human wastes and household waste-waters should be treated and reused in horticulture, agriculture and/or aquaculture wherever possible. Such reuse may be decentralized, centralized or intermittent, depending on user preference, local feasibility and the type of sanitation technologies used. Decentralized reuse is reuse at household or local community level (a housing estate, for example). Centralized reuse is reuse at the level of either natural drainage basins within an urban area or the whole urban area (town, city, metropolitan area); it will normally require waste-water collection in a sewer system followed by waste-water treatment, possibly with biogas production and collection, and then aquacultural and/or agricultural reuse of the treated effluent. It may also refer to grey water collection within a natural drainage basin followed by treatment and reuse. Intermittent reuse refers to on-site systems, including pit latrines, pour-flush toilets and septic tanks, which provide biosolids for agricultural or horticultural reuse only when they are desludged.

The algorithm is a series of boxes containing abrupt questions (for example, 'Decentralized reuse?') with up to four symbols that indicate the criteria that should be used to answer the question. The symbols are \$ (to indicate cost and affordability), ☺ (socio-cultural acceptability), ✕ (technical feasibility) and ♻️ (environmental impact and reuse potential). The 'answers' given by the algorithm are likely to be correct, but they are no substitute for 'engineering judgement' and they must always be carefully checked in the local socio-cultural and socio-economic circumstances.

Combining this algorithm with local

surveys and discussions to determine user preferences and affordabilities is likely to result in a recommendation for either simplified sewerage plus waste-water treatment and reuse of the treated waste-water in horticulture, agriculture and/or aquaculture, or communal sanitation, unless the housing density is low enough for on-site sanitation to become feasible, both technically and financially.

Water and sanitation interactions

The choice of sanitation system depends on the level of water supply service, as illustrated in Table 4.4.

Public standpipes and condominial sewerage are not incompatible: a very poor area in Orangi, Karachi, Pakistan, had water supply from public standpipes and was successfully served by 'Brazilian style' condominial sewers.⁶³ For in-house multiple-tap cooperatives, conventional sewerage would be technically feasible, but its costs are very high and only very rarely recovered from the users (even if their water bill is surcharged by 100 per cent, which is commonly the maximum that is politically acceptable).⁶⁴ Moreover, if non-poor households are served by conventional sewerage, low-income groups who are not served by sewerage, often end up paying more for their water as the water and sanitation agency tries to recover its sewerage costs by increasing the price of water for everyone.

The shift to what might be termed a new paradigm with water and sanitation service providers working with groups of households who assume responsibilities that bring cost reductions and other advantages for the service providers has many of the properties essential for successful water supply and sanitation

Box 4.3 Recommendations for action with regard to water and sanitation

Details about condominial water supply and sewerage schemes need to be disseminated widely, so that design engineers in each locality understand and have the confidence to implement them. National design codes need to be altered to permit their use. However, changing such codes is a lengthy business, even in high-income nations; an initial first step would be to permit their use for demonstration purposes.

Local research needs to be undertaken to develop condominial models best suited to local conditions – for example, condominial yard-tap supplies or condominial standpipes, and operation and maintenance responsibilities for the in-condominium networks. Socially and financially appropriate water and sewerage tariff structures need to be developed locally. (Alternatively, several regional models could be developed, from

which local design engineers and communities could select the one most suited to their needs.)

In all sanitation programmes for small urban centres, it should be ascertained whether condominial sewerage is cheaper than on-site systems (to determine a local version of Figure 4.4). If it is not, then on-site systems should be used.

Consideration should be given to whether micro-credit facilities are needed to help householders to afford the cost of installing their in-condominium networks for water and sewerage, or constructing their on-site sanitation systems.

The aggregation of neighbouring small urban centres into a single operating water and sanitation/sewerage authority should be considered, as it has the advantage of economy of scale, especially for design engineers and the operational staff of the authority.

Source: Mara, D. D. (2005) *Water Supply and Sanitation Options for Small Towns and Large Villages in Developing Countries*, background paper for the 2nd UN-HABITAT Global Report on Water and Sanitation, 35 pages.

programmes: lower costs, community participation, a strong pro-poor focus and potential for good cost recovery. Of these, its principal advantage is that it has the least public-investment costs, and it also requires public (or private) water supply and sanitation authorities and local funders to work effectively with low-income urban communities in an open and transparent way.

Constraints

There are a number of constraints that adversely affect the achievement of the water and sanitation MDGs in small urban centres: These can be grouped under three headings: technical, financial and institutional.

■ Technical

In regard to technical constraints, there is currently a general lack of knowledge among sector professionals, especially in Africa and Asia, of condominial water supplies and condominial (simplified) sewerage (and, indeed, of many other pro-poor interventions). Simplified sewerage has not been promoted as vigorously and as effectively as, for example, ecological sanitation, yet it has to be known much more widely if low-income groups in small urban centres are to receive improved water supplies

and sanitation. Condominial water supplies and sewerage are both very close in theory and design to conventional piped water supplies and conventional sewerage, so that, once they are understood, they should be readily embraced by design engineers.

Many, if not most, national water supply and sewerage design codes do not currently permit the adoption of condominial water supplies and sewerage. Even in the case of India, where the national sewerage code at least mentions both simplified and settled sewerage (as ‘shallow’ and ‘small bore’ sewerage, respectively), so little detail is given that these options are in practice ignored (both these technologies are covered in just 7 pages, whereas over 100 pages are devoted to conventional sewerage).⁶⁵

■ Financial

In regard to financial constraints, too little money is budgeted for water supply and sanitation improvements in small urban centres by national, provincial/state and local governments – as well as international agencies (as described in Chapter 6). Later sections of this chapter discuss the ways that this has been addressed in some nations. Current water supply and sanitation/sewerage tariffs are often structured in a way that disadvantages the poor – and innova-

tions in this area are also discussed later in this chapter.

■ Institutional

In regard to institutional constraints, most small urban centres are too small to be able to employ design engineers of their own and they are unable to judge whether any consultants they might engage are sufficiently knowledgeable about water supply and sanitation improvements in small urban centres; nor are they able to be critical of, or even understand in detail, any consultant's recommendations. Poor governance, combined with an absence of explicitly pro-poor policies, often excludes poor and very poor households from water supply and sanitation improvement projects.

The lack of planning at local level often means that one year's budget allocation remains largely untouched until just before the end of the financial year, with the consequence that it is seldom spent wisely, and often not on pro-poor projects as these are commonly felt to be too 'difficult' to design and implement in a short time period. Box 4.3 contains some recommendations for action.



WATER AND SANITATION PROGRAMMES IN SMALL URBAN CENTRES

Following the review of different technical and institutional options, this section describes the experience of various programmes for water and sanitation in small urban centres and their strengths and weaknesses. These include the extension of two programmes developed in major cities to smaller urban centres: the Orangi Pilot Project (OPP) 'component-sharing' model developed in Orangi in Karachi, which has been extended to smaller urban centres in Pakistan; and the community-managed toilet programme developed by the National Slum Dwellers Federation, Mahila Milan and SPARC in major Indian cities, which has been extended to Tirupur.

It also includes the community taps programme in San Roque (the Philippines) and various initiatives to improve provision for water and sanitation in Hue, Vietnam. There is little to compare between these programmes in terms of the actual form that the intervention took and the technology and institutional system chosen, except that all represent pragmatic pro-poor responses to local opportunities, circumstances and institutional structures developed primarily by civil society and all sought to involve local governments or other official service providers, recognizing that civil society responses cannot go to scale without doing so.

Orangi Pilot Project replication in small urban centres in Pakistan⁶⁶

This section describes the increasing amount of work developing sanitation in small urban centres undertaken by the Pakistan NGO, the Orangi Pilot Project Research and Training Institute (OPP-RTI). Chapter 5 describes how this NGO's work on mapping and on youth training has supported improved sanitation and drainage at lane, neighbourhood and city levels.

OPP's aim is to change the way that local governments plan and manage investment in infrastructure, so this reaches low-income households with infrastructure that is good quality, affordable (both to users and to those who install and manage it) and sustainable. At its core is the concept of 'component sharing' where each street or lane takes responsibility for planning, installing, financing and managing the 'internal' pipes connecting each house to a street sewer, which then connects (ideally) to a government provided 'external' sewer or to a natural drain.

Pakistan is a federation of four provinces, and each province has an elected provincial assembly. At the centre there is a national assembly in which every province is represented in proportion to its population. In addition, there is a central senate in which each province is represented equally. Every province is divided into *zilas* or districts, which in turn are divided into rural and urban *tehsils* or sub-districts. The *tehsils*

are further subdivided into union councils (UCs) that are the lowest administrative unit. The *zilas*, *teshils*, and the UCs are headed by elected *nazims* and *naib nazims* (mayors and deputy mayors) who are elected indirectly by directly elected councillors. There are 103 *zila* governments in Pakistan, 335 *tehsil* councils and 6022 UCs.

According to the Devolution Plan enacted in 2001, all three levels of local government have considerable autonomy and can raise funds and plan and implement physical and social developments independently – supported by their own bureaucracy. The *zila nazim* is responsible for the district administration as a whole and is assisted by the district coordinating officer who coordinates the functioning of all government departments in the district. These departments are headed by district officers.

The Orangi Pilot Project was formed in 1980, to support new models of providing infrastructure and services in Orangi – a large cluster of low-income, informal settlements in Karachi.⁶⁷ Since then, it has supported one of the world's largest programmes for improved provision for sanitation in low-income areas – in Orangi and in many other cities and small urban centres – as well as supporting improvements in other forms of infrastructure and in services. OPP's initial focus was on Orangi (which now has around 1.2 million people) but from the mid-1990s, it supported local NGOs and CBOs (community-based organizations) outside Karachi, drawing on financial assistance from WaterAid, a UK-based international NGO. This consisted of financial support to NGOs and CBOs so that they could develop and operate the OPP's low-cost sanitation programme, as well as technical and managerial support and funding for training sessions in Karachi and advisory visits to project sites by the staff of OPP's Research and Training Institute. Training was provided on community mobilization, surveying, planning, cost estimation and construction of sewers and on documentation of the work, reporting, accounting and management. There have been 13 NGO/CBO attempts at replicating the sanitation

programme outside of Karachi. Four of these have been failures, three have been remarkable successes and six show signs of promise.

Initial attempts to replicate the OPP sanitation model outside of Orangi showed that this could not be done without a local organization taking over the responsibility for social mobilization and technical support (supporting each neighbourhood or lane to plan, cost, implement and manage their own internal system). In all but one of the cases of replication outside Karachi, the NGO/CBO set up a small unit whose administrative and overhead costs were paid for by the OPP or by WaterAid. In all these projects, disposal points for sewage were not available through natural drains, as they were in Orangi, so new long collector drains were needed to connect the lane or neighbourhood sewer system to existing government trunks or the natural drainage system. These had to be constructed before 'internal' development could take place. For this, credit was arranged for the NGOs and CBOs and this credit is repaid by households, when a lane connects to the collector drain. Thus, the credit has become a revolving fund. In other cases, the communities have negotiated with their government counterparts to develop the collector drains that they have identified and costed. This identification and the cost estimates have been prepared by the technicians of the NGOs/CBOs with OPP support.

In one case in southern Punjab, the NGO identified external sewerage work to which the entire town could connect completely. For most of the work that it identified, the NGO managed to get the funds approved and work implemented through government. Wherever local initiatives have been successful, they quickly establish a dialogue with local government agencies in charge of sewerage system and press for the acceptance of the 'internal-external' concept. Local governments are under pressure from their voters to perform and this helps ensure that they informally accept this concept and support the communities.

NGOs/CBOs who successfully replicate the OPP-RTI model receive many requests from

neighbouring areas to assist them in solving their sanitation problems. Many OPP replication projects have developed the capacity to do this – for instance Anjuman Samaji Behood (ASB) in Faisalabad, Lodhran Pilot Project (LPP), Lodhran, Muawin in Lahore and the Conservation and Rehabilitation Centre (CRC) in Uch Sharif. Even where the OPP replication projects have not been successful, the activists and communities that have promoted them have enhanced their power of negotiation with government agencies, understood the OPP's 'internal-external' component-sharing methodology and modified and applied it to other poverty-related issues in the project areas.

The OPP's method of working in small urban centres consists of identifying community organizations and providing financial and technical support to their activists. Where community organizations do not exist, activists are supported to create them. Technical support is through training of activists at the OPP-RTI through orientation, site visits and practical training in surveying, levelling and mapping. Local capacity for administration, monitoring, documentation and account keeping are also developed through an association with OPP. All projects are also carefully documented, including photographs, and some of them have also made videos of their work. One of them in Uch has established a computerized mapping system with the help of the architects who are working on the rehabilitation of the monuments of this historic city through CRC. The replication projects interact with each other and often seek each other's support, independently of the OPP. The support of ASB in Faisalabad is often sought for social mobilization and that of the CRC in Uch for mapping. All these projects are also members of the Community Development Network that provides a forum through which experiences can be shared and alliances built to influence government policies.

■ OPP principles

- Identification of existing community organizations and dialogue with them.
- The development of a technical/social organization team from the community to survey and document what infrastructure exists; also existing physical and economic conditions, social actors and their relationships, and technologies in use. This is to be done with the help of the actors involved in the infrastructure development.
- Development of a conceptual plan on the following principles:
 - provision divided between internal and external infrastructure components;
 - component sharing between community, NGO and/or government (but never cost sharing);
 - decentralization and miniaturization of functions/technology;
 - establishment of the optimum local relationship between needs, resources and standards but appreciating that all three are dynamic and can change over time.
- Use of the above principles to build on what exists.
- Identification of activists and financial and technical support to them.
- Development of skills within the community. Conventionally trained professionals are not an alternative to local technicians and para-professionals.
- Monitoring through weekly meetings, informed discussions between staff and community members (occasionally with support from resource persons), record-keeping from meetings and regular follow-up.
- Documentation, dissemination and modification of programmes (involving experts, academic institutions and local people).
- Patience to wait and consolidate rather than drive always to expand the programme. Establish a culture of simplicity

and austerity that is compatible with the sociology and economics of low-income communities.

- Transparency in account keeping and the involvement of local people on the board of the local NGO. It is necessary to separate the sanitation budget and accounting procedures from those of other programmes to avoid financial confusion.
- Collective decision making; all decision making made through consensus between resource people, activists, staff members, government officials and politicians.
- Relate local-level issues to larger urban realities, with cooperation sought from government officials and/or politicians. Support to the OPP methodology has come from many public-spirited politicians and government officials. Many of these came to orientation meetings at the OPP-RTI or attended public administration courses where the OPP work was discussed.

■ OPP replications with local government involvement

The OPP low-cost sanitation programme has been replicated in 257 locations outside Orangi. Local governments have invested the equivalent of US\$242,763 in developing external sanitation while communities have invested the equivalent of US\$1,368,866 in building internal sanitation. Of these 257 locations, 216 are outside Karachi and are located in one major city (Faisalabad), three intermediate-size urban centres and eight small urban centres. A total of 43,618 households have benefited from this programme outside Karachi.

One of the most successful replication projects has been in Faisalabad, one of Pakistan's largest cities; which, by 1998, had close to 2 million inhabitants. However, work here also has importance for supporting projects in small urban centres, especially drawing on the advice of ASB, the local NGO that supported the development of sanitation in Faisalabad, and through the replication in Jaranwala Town.⁶⁸ In Faisalabad, the sanitation programme that began in two settle-

ments has now been extended to 66, and a total of 497 lane sewers and various small and large sewers have been laid. The *nazim* (mayor) of nearby Jaranwala town requested the help of ASB, and UNDP's Local Initiative Facility for Urban Environment (LIFE) programme provided core support and facilitated a partnership with the town office. Work has been completed on the external-internal self-financed OPP-RTI model in 22 lanes and one secondary sewer. 321 households have invested the equivalent of US\$18,376 in this work.

ASB has also mobilized the Punjab Municipal Development Fund for geographical information systems (GIS) mapping of seven medium-sized urban centres in Punjab province. At the request of the Tehsil Management Authority (TMA), Bhalwal, ASB visited Bhalwal and undertook a preliminary survey of the urban centre and its sewage disposal system. A partnership agreement is being developed.

Many government and donor officials, professionals, development activists, journalists, social organizations and community groups are visiting ASB. This gives them an opportunity to study the work on site and develop an understanding of the dynamics of community work. The ASB coordinator regularly presents the ASB work at various meetings, forums and workshops. Regular visits were made to partner LPP in Lodhran town (see below) to guide its work of expansion in 100 villages in the Punjab. All ASB's staff and activists come from the low-income settlements of Faisalabad or the urban centres where its programme is being replicated.

Uch Sharif is a historic urban centre, in the southern Punjab, with a population of 35,000. It is one of Pakistan's oldest monuments of Islamic culture and learning; during the 13th century it had the Firozi College accommodating 2500 scholars. In the past, it was also an important riverine port on the Indus and an important political centre – although its economic and political importance declined, in part because of the changing course of the river. Administratively, Uch is a union council under Tehsil (town council)

Ahmedpur East and District Bahawalpur. Municipal functions are administered through the union council. Due to scarcity of funds for development, Uch depends on Member Provincial Assembly/Member National Assembly funds or on funds from the *tehsil* and district administration. The Public Health Engineering Department has invested in major sewerage schemes that have recently been extended through *tehsil* funds and following OPP advice. OPP has also supported this department in laying a main sewer into which 150 lanes can connect.

This work is supported by the CRC, which is made up of architects and engineers involved in conservation of the architectural heritage. Disposal of sewage is a severe problem. To initiate the programme, a group of Uch activists and CRC staff members visited OPP for training. In June 1999, UNDP's LIFE programme provided a grant for core funding for the sanitation programme, and later this received support from WaterAid. The CRC team trained six young members from the community in plane table surveys and computer mapping and they now run the CRC water and sanitation programme. Using a plane table survey, the team prepared maps of the city with documentation of all sewage infrastructure. The digitized map showed a total of 725 lanes. On CRC's request, OPP prepared a conceptual master plan for sewage disposal for Uch city. The master plan was presented to the district government by CRC in an effort to mobilize government finances for external development (main sewers and sewage treatment plants). The government then approved three projects for main sewers estimated at 1.18 million rupees (US\$26,500). One project is complete and two more are nearing completion.

CRC has now become an advisor to the local government, and assists by supervising and guiding their external development projects as well as guiding road construction and lane paving so that sewers are laid before paving. Recently, at the request of the TMA, CRC provided the detailed plan, design and estimates for main sewers that, when completed, will

provide 80 per cent of Uch with a sewage disposal system. Earlier, CRC had supervised government in laying main sewers, providing disposal for 150 lanes. Total work on internal sanitation funded and managed by the community has been completed. It consists of 194 lane sewers and eight secondary sewers. In total, 1646 houses have invested the equivalent of US\$65,724 in this work. Recently, CRC held meetings with the Punjab Katchi Abadi and Urban Improvement Directorate (PKAUID), as well with the *Nazim* and town officers of the nearby town of Alipur. The PKAUID project of Southern Punjab Basic Urban Services financed by the Asian Development Bank (ADB) is being initiated in Alipur. CRC has been made a member of the review committee to guide mapping, documentation and programme replication.

The CRC members working in Uch all belong to the Uch neighbourhoods. They have now successfully designed and promoted projects for the city with the local government. These projects include the creation of a park in the inner city, roofing the main street in the ancient bazaar, and the protection of the old monuments from inappropriate construction and conservation techniques.

PKAUID has been working on the regularization and development of *katchi abadis* (unauthorized settlements on government land) since 1987. The directorate has adopted the policy of component sharing on the OPP model and has undertaken the development of *katchi abadis* with the assistance of Mauwin, an NGO supported by the OPP, for internal development. In 2001–2003, the UNDP supported a programme called the Programme for the Improvement of Livelihoods in Urban Settlements (PLUS). This was the replication of the OPP model in four urban centres in the Punjab province with the collaboration of PKAUID. PLUS staff were trained at the OPP-RTI. In 2003, UNDP withdrew support from the project and so it was wound up. The trained staff formed the Mauwin NGO that is closely linked to PKAUID. Meanwhile, PKAUID has also adopted

the OPP model of development for informal settlements in the Punjab and Mauwin has become its partner. Due to the lobbying by PKAUID and Mauwin, the Southern Punjab Basic Urban Services and National Urban Poverty Alleviation Programmes, both funded by the ADB, have adopted the OPP model for water supply and sanitation. Mauwin is helping in the development of both these projects. Meanwhile, Mauwin is also replicating the OPP model in the Punjab – both in Lahore (the largest city) and in small urban centres. Mauwin has been requested by the TMA of Ferozwala, a small town in the Punjab, for technical support in solving sewage disposal problems. Mauwin has initiated making a map of the whole town.

A new direction is the replication of the Urban Resource Centre of Karachi in the Punjab. This is known as the Punjab Urban Resource Centre (PURC) and this strengthens advocacy and city-wide networks. Mauwin and the PURC work closely together.

Shahpur Chakar in Sindh province is a 300-year-old small urban centre with 20,000 inhabitants. A main sewer has been laid by the Public Health Engineering Department and this is connected to a disposal station, but this is silted up and does not function properly. The disposal of sewage from the pumping station depends on the electricity supply (which is erratic) and of the pump operator (who is often absent). In view of these problems, a number of neighbourhoods have disconnected their sewage pipes from the main sewer and resort to disposing of the sewage in a nearby ditch or low-lying vacant land. As a result, Shahpur Chakar is facing acute environmental problems. Its union council lacks the funds to refurbish the existing system and to develop a new system and is instead reliant on either the *tehsil* or the district administration under which it comes or on grant-in-aid from a provincial or national assembly member.

The Shahpur Chakar Welfare Society (SCWS) started working in Kamil Shah Colony after receiving training from OPP. To serve the

250 houses in the colony, plans and estimates were finalized for a secondary sewer, 19 lane sewers and a sewage treatment unit. Area activists received training at the OPP and on site by OPP staff. In December 2003, work on site began. OPP staff spent ten days providing supervision and training to SCWS members. Work on two lane sewers and two secondary sewers serving 20 houses was completed. People's investment on sewers and 34 latrines has been US\$1403. In New Colony, work on five lane sewers was completed. 35 houses have invested 98,124 rupees (US\$1366) on lane sewers and 48 latrines. On request, plan/estimates have been provided to community activists for 32 more lane sewers. SCWS together with a partner NGO, SRSP, have held regular meetings with the *nazim* and councillors. The *nazim* directed people to lay lane sewers while agreeing to try to support lane paving and laying secondary sewers for those settlements or lanes who developed their own sewerage systems. Two such lanes have been paved and work has begun on a main sewer funded by the local government. This external development project was identified and designed by SCWS. The cost of the project is US\$1333 and SCWS is monitoring the quality of work. SCWS members have also surveyed and prepared a map of the union council with documentation of the existing sewage disposal system. The map shows that the union council is made up of eight settlements, 192 lanes and 1072 houses. A level survey is in progress for preparing the sewerage plan for the union council and creating a disposal system that functions by gravity.

■ Lessons learned

OPP partners have also been active not only in the small urban centres noted above but also in many of Pakistan's major cities, other than Karachi – for instance in Faisalabad, through the work of ASD as noted above and through the work of Akhtar Hameed Khan Memorial Trust (AHKMT) in Rawalpindi and the work of Al Watan Forum and Organization Pan Environment in Gujranwala. The OPP has learned a number of lessons – both from the successful and the unsuc-

successful replications – that have important implications for work in smaller urban centres.

The most important lesson is that local educated young people are best suited to carry out the OPP low-cost sanitation programme. This is because they are interested in their urban centre and have no problems of continuing to live and work there. Outsiders do not wish to stay in remote locations for long periods of time and on comparatively low salaries, and the high salaries they demand are unsustainable for more than a year. The work that these young men and women do while implementing the OPP sanitation programme enhances their image and reputation among the residents of their urban centre and they emerge as leaders. This provides them with an incentive to continue working and to own the organization with which they work. However, these young men and women require guidance and training, which can be provided by the OPP-RTI at their request or through networking with other OPP replication projects and partners. If they are interested they are proactive, and they are interested only if they are locals and if they can be made to feel that the programme and organization which they are operating actually belongs to them.

The other important lesson is that the situation in small towns is very different from that of larger cities like Karachi, Lahore and Faisalabad. In the small towns, the district and local administration is more willing to accept the programme because sophisticated engineer-dominated agencies are not the decision-makers regarding sanitation issues. Also, community projects do not threaten the power of consultants and contractors as they do in bigger cities. Nor do they have to challenge the internationally funded mega-projects that are so common in large cities. As such, most administrators of small urban centres see the programme as the only way to improve the quality of life in their districts. The scale of work needed in small urban centres is also more manageable and one does not have to distinguish between rich and poor areas since they are all equally ill-served in

regard to sanitation, water and solid waste management. So the whole urban centre becomes the project area rather than certain neighbourhoods.

Developing an accurate map of the urban centre is a key part of effective planning. The availability of a map showing houses, infrastructure systems and their problems changes the perceptions of communities and people in regard to their settlements. The map generates interest and makes the stakeholders relate neighbourhood problems to city-level problems. It also makes it possible for local government agencies to plan effectively and estimate costs accurately, something that local government and line agencies, in the absence of a plan, do not do in the vast majority of cases in Pakistan. Finally, the cost of operating a support unit in one of these small towns is very low. For instance, the Conservation and Rehabilitation Centre in Uch has eight staff and an annual staff cost of around Rs550,000 (equivalent to around US\$9200).

The main lesson drawn from the Youth Training Programme (YTP) and its spin-offs is that the sewage-related ground reality has not been documented in Pakistan and as such it is ignored in official planning. When it is documented, it changes planning perceptions and calls into question existing government planning assumptions and methodologies. Developing this documentation not only trains the youth who compile it, but also produces documentation in a form that mobilizes public opinion. This documentation is an important tool for promoting appropriate planning and involving civil society organizations and institutions in infrastructure development issues. OPP's experience with the YTP and its spin-offs clearly points out that there can be no appropriate macro-planning policy without a micro-level understanding.

Activists who have been exposed to the OPP's low-cost sanitation project and have worked closely with the OPP institutions are able to promote the internal-external concept in sectors other than sanitation. The communities

who have seen the successful results of the application of this concept willingly participate in its extension. The local administration is not averse to the concept either. However, it requires an interested government official to make the concept workable for 'external' development.

Various lessons can also be drawn from the projects that never happened or that ended. One is the problem posed by rich and ambitious NGOs, donors and international agencies who are always there, wooing CBOs and NGOs with big money once they have established the OPP sanitation programme. It is very difficult to discourage young people from becoming part of these high profile networks. CBOs are less open to seduction of this type than NGOs. These involvements create a lack of concentration on actual on-site work, research and monitoring and lead to priority being given to workshops and seminars. They also widen the gap between the community and the NGO staff on the one hand and within the staff on the other. Often NGOs and CBOs do not realize their own limited capacities but immediately start expanding their scale of work, get involved in too many parallel programmes, and even become advisers to other projects. This results in a lack of focus and in dissipation of energies.

The OPP has also noticed that it takes a long time for NGO and CBO staff to overcome the 'charity' mentality. Deviations from OPP principles like provision of loans to communities, lobbying on their behalf and managing their finances turns people into dependants rather than owners of the programme. It also gives people the possibility of accusing the NGO and CBO staff for all failures that may occur. Again, these observations hold true more for NGOs than for neighbourhood CBOs.

The OPP has also learned that there should never be an overlapping of the credit and sanitation projects as the concept and nature of the two is completely different. Credit means loaning money to the community, whereas in sanitation, the community needs to collect and invest. When

these opposite tasks are done by the same team it confuses the community. In addition, the NGO or CBO in their impatience to get work done in the lanes often increases credit, which later causes major problems as the money is never recovered and becomes a demonstration of subsidy. Also related to finances are the problems of accounting and reporting that are not taken seriously by most NGOs and CBOs. Therefore, it is important to fund NGOs and CBOs in the initial stages through small instalments and on the basis of regular feedback through quarterly reports.

The OPP has also learned that it is not its role to be proactive. It is NGOs and CBOs who must take the initiatives themselves, contact the OPP and keep up links. This will only be done by those who are genuinely interested in the programme. The OPP also realizes that project areas that do not have sewage disposal points require 'external' development that the state has to provide and this invariably leads to delays. Therefore preference is given to those projects where external development already exists or the problem related to it is minimal.

OPP has also identified its own weaknesses as a result of working with the organizations who were not able to replicate its model. It realized that since it had no experience of working with NGOs and CBOs, it did not show much understanding of their problems and their repercussions. It has learned through trial and error. The OPP also realized that it needs to build up its own human resources and training programmes so that it can better respond to the needs of NGOs and CBOs that wish to replicate its sanitation programme. Furthermore, there is a realization that there must be an additional training centre in the Punjab for NGOs and CBOs (the OPP-RTI is not sufficient for this purpose) since Punjab, with the largest number of human settlements in Pakistan, is seen as potentially the most suitable region for the replication of the OPP sanitation programme.

Details of Tirupur slum settlement surveys	Nos
Total slum population	204,553
Total number of existing toilets	382
Total no of toilets required to be built (@ 1 toilet for 50 persons)	3709
Land Ownership	
Private	11
Municipal corporation	36
Collector	17
Railways	6
Religious trust	3
Basic Amenities	
Total no. of toilets	382
Total no. of water taps	126
Total no. of wells	21
Total no. of pumps	35
Total no. of street lights	1015
Total no. of house lights	26,730
Total no. of toilets connected to sewerage lines	5
Total no. of toilets connected to storm water drains	23

Table 4.5
Findings from the
Tirupur slum settle-
ment survey

Water and sanitation programmes in other small urban centres

■ Developing community-designed and managed toilet blocks in Tirupur, India

One large-scale programme that has improved provision for sanitation and washing facilities for 'slum' dwellers and those who live on the pavements is the programme for community-designed, built and managed toilets in urban centres in India, undertaken by the National Slum Dwellers Federation and Mahila Milan (savings cooperatives formed by women slum and pavement dwellers), working with the Indian NGO SPARC. Large-scale community toilet block construction programmes were developed first in Pune and then in Mumbai, after local government staff saw how much better the community-designed, built and managed toilets built by the NSDF–Mahila Milan–SPARC Alliance worked than the contractor-built public toilets they had previously constructed. This Alliance has been responsible for around 500 community-designed and managed toilet blocks that serve hundreds of thousands of households in Pune and Mumbai.⁶⁹ Comparable toilet programmes are developing in many other urban centres, including Vijaywada, Hyderabad and Bangalore. Here, a description is given of the programme in Tirupur to illustrate how it operates in a small urban centre.

Many community organizations, NGOs and government officials from all over India have visited the community toilets in Pune and Mumbai and through this have become interested in exploring the possibilities of similar initiatives in their own urban centres. During these visits, NSDF and Mahila Milan leaders explain how the community sanitation process works on the ground, starting from surveys that identify the lack of sanitation facilities, then coming to the community contracting and construction process and then finally the community maintenance and management systems that are responsible for the long-term sustainability of these investments. These visits often generate invitations to the Alliance to come to other urban centres to explore the possibility of developing community toilets there – as in, for instance, Vishakapatnam, Vijaywada, Puri, Tirupur and Ahmedabad.

The work in Tirupur began when Sameer Vyas, the managing director of the New Tirupur Area Development Corporation Limited (NTADCL) heard of the Alliance's approach and then visited Mumbai in April 2004. He invited the Alliance to conduct a detailed slum survey of Tirupur, identifying the extent to which public toilets were needed and the availability of land for this. For the Alliance this was an important opportunity for collaboration and also to make inroads in the state of Tamil Nadu. They offered to conduct this survey to assess the sanitation situation in the slums of Tirupur, negotiate for land within the settlements and then take on the responsibility for the construction of toilet blocks. Not only would the Alliance be building toilets, they would also organize communities and train them in the construction and management of these toilet blocks.

Tirupur is rapidly expanding beyond a small urban centre, with a rapidly growing economy based largely on the expansion of knitted cotton production. Its current population is around 350,000 but there is a large floating population of about 600,000 people within a radius of 40km, many of whom are engaged in or

linked to economic activities in Tirupur. In many of Tirupur's factories, there are three shifts. Although this is a prosperous urban centre, infrastructure provision has not kept up with the rapid population growth.

Within an ambitious area development programme that seeks to improve provision for water, sanitation, drainage, roads and other infrastructure, Larsen and Toubro Limited, a major engineering and construction company was chosen as the principal contractor to provide water, sewerage and low-cost sanitation, including over 200 toilet blocks (with a total of some 2000 toilets). However, this company lacked experience in providing sanitation blocks in slums and in negotiating with the inhabitants of informal or illegal settlements for land on which to construct them. Although 88 slums had been identified in 1997 as places that needed the construction of a toilet block, most of the sites for toilets had been encroached or the Tirupur municipality had constructed toilet facilities there through other sources of funding. Land for toilet block construction had been identified in only nine locations and it was hoped that the Alliance could generate the base information needed for the toilet programme.

The Alliance undertook a survey in 79 slums, involving a team of 25 NSDF leaders from Tamil Nadu, Maharashtra, Pondicherry and Karnataka headed by the South India NSDF coordinator. This began by identifying the slum settlements and documenting who lived there, locations and land ownership of particular sites. The survey also collected information on existing amenities in the slums, such as toilets, water taps, wells, electricity and drainage connections. It also calculated what new toilets were needed to ensure one toilet per 50 inhabitants. Information was also collected regarding the priorities of each slum community. The survey team spent four days on this survey – and this also permitted in-depth discussions with slum dwellers about the work of the Alliance and the community toilet programmes they had managed. Although there

is a slum dwellers federation in neighbouring Coimbatore city, this was the first time this process was initiated in Tirupur and many slum dwellers were eager to join the NSDF and work on sanitation activities.

Through the survey process, the Tamil Nadu Slum Dwellers Federation supported by the NSDF began to mobilize the slum dwellers in Tirupur to form CBOs and their own federation. They also began to train them, through exchanges (during which they visited sites with functioning community toilet blocks) and peer-learning, so they could take up the maintenance and management of the toilet blocks once they were constructed. The Alliance planned to take up the sub-contract of providing sanitation in Tirupur's slums, beginning with a few locations, and assist slum communities to manage and maintain these toilet blocks. Once the project was successful in a few locations, it would be scaled up to cover all the slums in Tirupur.

The findings from the survey (see Table 4.5) were discussed with the municipal commissioner and representatives from other local bodies. These showed a total slum population of 204,553 in Tirupur for whom there were only 382 toilets, of which only 28 were connected to sewers or storm water drains. This meant that a total of 3709 toilets were required if there was to be one toilet per 50 persons. The survey also revealed that the primary landowner of the slum sites was the municipal corporation.

The Alliance submitted a proposal to construct seven toilet blocks at a cost of 60,000 rupees (US\$1350) per toilet. The design included separate sections for men and women, special toilets for children that are easily accessed, open, with smaller squat plates and no large open holes (since children are often frightened to use adult toilets, which are dark and have large open holes), bathing areas, wash basins, a caretaker's family room of 225 square foot, suction tanks, overhead tanks and complete plumbing and electrification. At first the Alliance drew up a memorandum of understanding with Larsen and Toubro and NTADCL for the

construction of the seven toilet blocks as well as the mobilization of communities to maintain these. However Larsen and Toubro noted that it was not their practice to have such memorandi with sub-contractors and they agreed to give the Alliance a sub-contract instead, as per mutually agreed terms and conditions. Thus, the Alliance had to complete the documentation required to apply as a sub-contractor for this work, including evidence of the Alliance's previous work in construction and detailed technical specifications of the toilet block as well as designs for construction. The Alliance also opened a bank account in the name of the Tirupur project with UTI Bank, Mumbai, which had a branch in Tirupur so that all the financial transactions could be carried out through this account.

However, three months after all the documentation had been submitted, the work order still had not been received. The Alliance also required pre-finance to begin construction and a request to Larsen and Toubro for an advance of 15 per cent of the contract was not met, in part because of ongoing negotiations with NTADCL regarding the overall value of the sanitation contract for the city of Tirupur. During a visit to Tirupur by senior Alliance advisers in January 2005 to finalize the locations of the toilet blocks, an agreement was reached and in February 2005, a letter of intent confirmed a contract for seven toilet blocks. The high price of land in the city centre meant that six of these toilets would be located in semi-rural locations outside the city. This required special permissions to allow for construction as these sites were outside Tirupur's municipal limits. Tirupur Federation leaders offered to assist NTADCL in getting the necessary resolutions passed to provide land and other support for this process. However, this process requires delicate negotiations and the primary party responsible is the NTADCL; if the Federation leaders begin to take too active an interest in getting the necessary resolutions passed, the local political leaders will oppose them on the grounds that this is due to their vested interests

in the project. By October 2005, permissions for all the six sites had not been received, however, work got underway on one site using two contractors from Bangalore, with supervision by the Tirupur Federation leaders as well as senior sanitation advisers and engineers on behalf of the Alliance.

Building public or community toilets in slums is not simply a mechanical or technical construction exercise, but rather a process that needs strong communities who are organized and supportive and trained in maintenance and supervision. This means that implementing such toilets requires a capacity to work with and support such community processes. For the Alliance, the work in Tirupur is particularly interesting both for the expansion of the community toilet programme to a smaller urban centre and for providing them with an initiative in Tamil Nadu – a state where the Alliance had not worked on sanitation before. As in all Alliance initiatives, it is hoped that the example in Tirupur will catalyse interest in other urban centres in the state. The initiative in Tirupur is also interesting in that the local government and other local institutions are seeking to raise their own resources for this. Sanitation is being provided or funded through a multi-level partnership involving the municipality and the private sector.

■ Community taps in San Roque Parish, Mandaue City⁷⁰

Mandaue City in the Philippines had 259,728 inhabitants in the 2000 census. It is just beside Cebu, one of the largest and most successful cities in the Philippines and within Cebu's metropolitan area. But within and around Cebu are many urban poor communities, often hidden behind factories, shopping malls and resorts, living in crowded informal settlements that lack basic services. This is especially so in Mandaue City, which has a high proportion of its population living in informal settlements. Most are on low-lying land, squeezed between land subdivisions and factories. A thriving urban poor federation in Mandaue has six large savings

schemes, each with its own area resource centre, and it has set up the San Roque Parish Multipurpose Cooperative, which provides a legal umbrella for a number of community-managed development projects, including land acquisition, income generation, savings and credit, community provisions stores and canteens, and the construction of common toilets and access roads in some settlements.

In most of these settlements, basic services are almost non-existent. Access to water is a particular problem – and much of the groundwater is saline. Up to 500 families share each water tap, which means long queues. The cost of water is also expensive, sometimes reaching 1 peso per litre (around US\$0.02); at this price, a daily supply of 100 litres for one household would be the equivalent of about US\$2. One of the San Roque cooperative's most urgent projects has been installing and managing community water taps, using the Metro Cebu Water District's Community Faucet Programme, which gives poor communities permission to tap into the mains and get water at a low cost, as long as they lay the pipes, install the taps and pay for it themselves. Responsibility for planning, implementing, and managing the water taps rests entirely with the residents. Groups borrow money from their savings schemes to buy the pipes and materials, and undertake the often difficult task of negotiating with factory-owners and subdivision developers for permission for the water pipes to cross their land. Some groups use a pay-and-use system for managing the community faucets, in which people pay 1 peso per bucket, and the profits go into a special community fund for income generation activities and welfare.

We used to get our water from one tap. But the water was not enough for all of us. The lines were so long, and people would always fight. Some people would throw their water containers at each other. They would even pick on the children waiting in line. Those were the hassles of having just one water source. (Nilda Suan, resident)

A community water association is formed by 30–60 families. They elect officers and name the association after the place where they live in. Once the association is formed, personnel from the Metro Cebu Water District will meet them and appraise what needs to be done. The water is provided at a subsidized rate, but the association has to pay for the infrastructure – and the water company only maintains the meters, while the pipes and faucets are maintained by the residents.

We submitted all the requirements. We had no problems getting approval from the city administrator because Jerry Peralta (who worked for the MCWD – Metro Cebu Water District) took care of everything. Having connections in MCWD made the process easy for us. We followed the instructions of the city inspector. We made sketches and layouts of the pipes, from the watershed to the source. Each member of the association contributed 120 pesos (around US\$2.20) to fund this project. We also accepted donations in kind such as materials for the roof and foundation. We had no difficulties because the 30 members cooperated. Now we run the communal water tap by ourselves. We got the support of the parish. We did the work, while they mediated for us. (Nilda Suan, resident)

Everyday, somebody has to stay and watch the tap to collect the money. We have schedules and deadlines so that everything is organized. Each day is assigned to a different member. If one is not available, we get another person to replace him. The person watching the tap gets a commission of 30 percent of the total profit. (Tony Luna, resident)

The community tap programme has also encouraged other improvements – for example the installation of communal toilets funded by the profits earned from the communal taps. Some communities in Mandaue use the profits from the communal water system to start income-generat-

ing activities such as small community stores and to pave roads. 'Part of the profits from the sale of the water, we use that to buy supplies for our community store. We put our profits in the bank. We now have 18,000 pesos (US\$350) in our account. We used some of the money to pave our roads' (Monica Bani, resident).

■ Improving provision for water and sanitation in Hue, Vietnam⁷¹

Three examples are given here of initiatives to improve provision for water or sanitation in the Vietnamese city of Hue. These are considered quite novel in Vietnam because they involve people working directly with local authorities and members of the people's committee working with participatory development techniques. Hue is the former imperial capital of Vietnam and it had a population of 220,000 in the 1992 census.⁷²

Phu Binh ward is a poor low-lying suburban area with a population of 10,300 people. It is often hit by floods during the rainy season and the alleyways between houses are often wet, the puddles providing breeding grounds for mosquitoes. One day, parents from three households living in X'om alleyway discovered that all of them had children suffering from a type of haemorrhagic fever. While taking care of their children at the hospital, the parents talked about the disease and worried that the polluted water in the alleyways had contributed to this. They decided that the land should be levelled and paved but did not know how to set about this. They discussed the problem with their neighbours and eventually a cell meeting was organized for all those living in the alley. Based on these meetings, the cell leader presented the local authorities with a petition for the upgrading of the alley and a request for financial support. With the agreement of the people's committee, the local authorities submitted a proposal to the city government, and the people's committee agreed that the X'om alley should be paved but noted that they would only provide 30 per cent of the budget. After community meetings to discuss how to come up with the remaining 70 per cent of the budget, it was

agreed that the 16 households residing in the alley would contribute 140,000 dong each (equivalent to around US\$9) – drawn from a savings and credit programme sponsored by ENDA (Environmental Development Action in the Third World). Loans were interest free. The recipients saved 3000 VND per day (US\$0.20), which was given to their cell leaders. Every ten days the project management board collected the money from the cell leader.

Those unable to afford loans because of low or unstable incomes, would contribute labour in lieu of payment. When the alley paving was finished residents agreed that life had definitely improved and it also encouraged the residents to clean up the waste that had been dumped nearby. This project also stimulated the local authorities of the ward to apply the 70/30 recipe to 18 other alleys in the area.

Kim Long ward, located in the west of Hue, was established in 1995 with the resettlement there of 200 *sampanier* (boat-dwelling people)⁷³ and since then an additional 300 *sampanier* households have been relocated here. When the resettlement area was established, the government provided basic infrastructure such as electricity, water, health stations and a market along the main roads. However, residents who lived away from the main road were responsible for connecting themselves to the public systems. This constituted a considerable financial burden to the households, most of whom were accustomed to using river water, without cost, for their daily activities. Many households could not afford these new expenses and criticized the local authorities for creating additional difficulties for their families. To address this problem, local authorities suggested that the Water Supply Company of Hue provide public taps to people and divide the monthly water bill equally by the number of users. Although this solved the problem of water supply in the community, it also created conflict as households accused each other of using more water than they had paid for. In order to identify community needs, meetings were organized between social workers, local

authorities and the community. In order to solve the water problem in the area, 70 households agreed to install a common pipeline. The Water Supply Company also agreed to provide water meters at a cost of 600,000 dong (US\$40) for each household within 100 metres from the tap, with households more than 100 metres away having to pay increased costs based on their distance from the tap.

All households interested in installing a water meter received 500,000 dong of credit from ENDA (US\$33). Households were organized into savings groups, each with four members. The members agreed to repay 1000 dong daily to their group leader (US\$0.07). The project management board then collected the repayment every ten days. The inhabitants now have access to clean water without having to pay high prices in the informal market and there are no longer arguments about water use, as each family pays its own monthly fees based on water usage. The public pipelines and water meters have also made water access more convenient, giving women more free time to pursue other activities. The residents of Kim Long are also more aware of the benefits of saving. Community members have continued to participate in savings and credit groups, using this system to deal with other problems in the area. This project has given the community the tools to finance other upgrading projects and the repaid loans are now being used as revolving funds. Local authorities hope that by 2005, all households in Kim Long will have access to their own water meters.

Vy Da is a suburban ward with 15,478 residents, many of whom are *sampanier*. Although many *sampanier* have now moved to land, they often face severe difficulties in obtaining access to employment and services. Although they no longer live on the river, for many it is still a place of work and they spend their days collecting sand and gravel from the riverbed or fishing. Block 6B of Vy Da ward is an island located in the middle of the river. The 500 inhabitants earn a living by collecting and selling

mussels, cakes and sweetcorn or running other small enterprises. Severe flooding and cyclones often affect this area. Most of the population lack toilets. Local authorities sought to solve this problem by building one public toilet but this did not meet the needs of all those in the community. In August 2000, ENDA Vietnam began a project in the area. Utilizing an approach developed over years of work in Vietnam, ENDA organized a project management board consisting of members of the local people's committee, as well as community representatives, to implement the project. Using participatory rapid appraisals, a needs assessment was undertaken and this showed that everyone in the community considered toilets a priority. Meetings with social workers, community representatives and community members were organized to consider how this could be financed. Because the need was great but project funds were lacking, it was decided that savings and credit groups would be established in the area. Consisting of 5 to 10 people, members began saving.

The cost of building a toilet in the area was 3 million dong (US\$200). It was agreed that each household would have to save 1,500,000 dong (US\$100) before applying for a loan to build the toilet. Repayment terms were drawn up by project social workers who decided that loans should be repaid over 10 months. It was also agreed that repayments would be collected every week by the leaders of the savings groups who would then transfer the money on a monthly basis to the project management board. 30 toilets have now been built in the area, although the project has not been without its difficulties. Flooding and cyclones have hit the area and made construction impossible for long periods of time. There have also been situations in which families experienced job losses after the loans had been disbursed, meaning that they were unable to repay the loans on time. These difficulties were reported to the project management board, which decided to continue encouraging repayment while allowing for late repayment where necessary. This project,

although focused on toilet building, has also provided the impetus for further environmental improvement in the area. The project management board and the social workers are currently discussing new initiatives to collect waste on the banks of the river and clean local roads. The savings and credit system has, despite its problems, also proved successful in harnessing the participation of the local community. Collected loans are now used as a revolving fund for water connections and the paving of paths and small roads.

■ Improving provision for water and sanitation in Nyeri, Kenya⁷⁴

The Kenyan town of Nyeri has improved and extended provision for water and sanitation after setting up its own agency, the Nyeri Water and Sewerage Company (NYEWASCO), which took over water services and utility management from the town council. This was made possible as it received support from four key quarters: central government, local government (including three successive mayors), administrators and technical management. Nyeri had 98,908 inhabitants in the 1999 census. NYEWASCO reduced unaccounted for water from 52 to 42 per cent, increased monthly revenues by 44 per cent, and considerably increased water availability. Between December 1999 and March 2003, the number of registered connections increased from 6586 to 8318 – with the number of metered connections and connections billed for sewers also increasing. The utility received a US\$10 million loan from KfW, the German government's bilateral development bank. The company plans to increase the number of connections to 10,000 and to expand fourfold the number of kiosks serving informal areas. It also intends to reduce the overall consumption of public institutions and to reduce its vulnerability to delayed payments. It hopes to reduce unaccounted for water to 25 per cent.



IMPROVING PROVISION IN SMALL URBAN CENTRES AROUND LAKE VICTORIA⁷⁵

There are many rapidly growing small urban centres in the Lake Victoria basin that have an increasingly important role in the development of the region's economy and in increasing non-agricultural employment opportunities. The Lake Victoria catchment has a gross domestic product (GDP) of around US\$5 billion and supports around 30 million people – most of whom work in agriculture. Around half live on incomes below the poverty line. The lake's fish resources sustain around 3 million people's livelihoods directly or indirectly – and fisheries have an annual landed value of US\$300–400 million – and particular importance in earning foreign exchange.

Coverage levels for water, sanitation and waste management services in these urban centres is often little better than 20–30 per cent. Sanitary survey and water quality assessment in 244 shoreline settlements by the Lake Victoria Environmental Management Programme show that waterborne and other water-related diseases are very common in about 90 per cent of the settlements – common diseases occurring mainly in the rainy season include cholera, typhoid and dysentery. Most of these centres are also experiencing unplanned, spontaneous growth combined with run-down and often non-existent basic infrastructure and services. The most affected are the poor living in urban and peri-urban areas, most of whom are outside the reach of municipal services. There are also serious problems with pollution and eutrophication in the lake from untreated sewage and other waterborne wastes from many small urban centres on or close to the lake and from pollution from industries outside urban centres, from farming and from gold mining.

Although a number of international initiatives have been undertaken in recent years in the lake region, their main objectives have been

water resource management, lake resources management and conservation and the involvement of stakeholders, including the lake communities, in general conservation of the lake basin. While some of these initiatives include water and sanitation as a component, these are often targeted to rural areas and lack sufficient emphasis to make any measurable impact. Some bilateral aid programmes have directed their support to some small urban centres in Kenya, Uganda and Tanzania but they did not target the lake region in particular, and have not succeeded in stimulating replication of such initiatives in urban centres in the region.

The small urban centres in the region urgently need an initiative to address the water and sanitation needs of the people, particularly the poor, in an integrated manner, taking into account the physical planning needs of these centres together with attention to drainage and solid waste management (as integral parts of environmental sanitation). In many urban centres, modest investments are needed, targeted primarily at rehabilitating existing infrastructure, with due emphasis on capacity building at local level to ensure the sustainability (including financial sustainability) of these services. Achieving the MDG targets for water and sanitation in these centres could be an important entry point for addressing other MDGs related to poverty alleviation and integrated water resources management. The interventions could also show innovations and set precedents that could inspire other urban authorities and national authorities to replicate these interventions to create a basin-wide impact.

A project is being developed to improve and extend provision for water, sanitation, drainage and solid waste management in 16 small urban centres, ranging in population from 10,000 to 115,000: five in Kenya, five in Uganda and six in Tanzania. Most are independent urban centres – although one is on the periphery of Uganda's capital, Kampala and one is part of Jinja. These 16 centres have a total population of around 800,000 – 73 per cent of these lack adequate

provision for water and 85 per cent lack adequate provision for sanitation. Chapter 3 includes overviews of the deficiencies in provision for six of these centres: Kyotera and Ggaba (Uganda), Bunda and Bukoba (Tanzania) and Homa Bay and Kisii (Kenya).

The project has been designed with a clear pro-poor focus to improve and extend access to water and sanitation services and to build local capacity for management and maintenance. It will also contribute to reducing pollutant loads entering into Lake Victoria. Local NGOs and CBOs and small-scale service providers are expected to have an increasing role in service provision, working with newly formed utilities under the sector reform process. Local agencies will be responsible for environmental monitoring, with local government bodies being responsible for development planning and regulatory functions.

In each urban centre, baseline surveys with relatively large samples (up to 1500 households in each urban centre) and stakeholder workshops will help identify the most appropriate interventions. The stakeholder workshops will also seek to develop consensus on service priorities and levels, technologies to be adopted, willingness to pay and the roles and responsibilities of different groups (including, where relevant, community organizations and NGOs). These also have to recognize the variety of different water users and their different interests – for instance commercial enterprises, those making a living from fishing, residents from different neighbourhoods with different income levels, policy-makers and planners and a range of civil society groups including environmental groups. Multi-stakeholder forums will be established in each urban centre to ensure continued participation during implementation and to help in monitoring. Flexibility in deciding on service levels is also important as user preferences (and willingness to pay) are likely to vary over time (and with economic development). A flexible design would allow changes in local demand to be accommodated. In terms of technological choices, a mix of designs may be preferable in many urban centres

combining low-tech solutions with standard engineering designs (for example, on-site sanitation and waterborne systems).



IMPROVING PROVISION IN POOR PERIPHERAL MUNICIPALITIES WITHIN LARGER CITIES

Figures for water and sanitation provision for major cities may suggest that most of the population are well served – as in, for instance, Buenos Aires or Caracas. But as Chapter 3 described, this can obscure poor peripheral municipalities where most of the population lack adequate provision. Such municipalities are also often ignored because it is assumed that they will benefit from investment programmes for the larger city when in reality they can be as isolated from such support as any other small municipality. Here two examples are given of programmes to improve provision in a low-income municipality within Greater Buenos Aires and in settlements on the periphery of Caracas.

Partnerships in Malvinas Argentinas

The municipality of Malvinas Argentinas is part of Greater Buenos Aires; by 2001, it had 290,000 inhabitants of whom only 4 per cent were served by a public water network and only 1.2 per cent were connected to the public sewer network. Most of the population get supplies from groundwater; low-income groups generally rely on the upper aquifer where water is highly contaminated.

A neighbourhood named La Hoya with 775 inhabitants obtained tenure of the land they occupied and registered it in the name of a community organization, Asociación Civil Barrio la Hoya. In 2003, they asked a nearby university (the University of General Sarmiento) for help in improving provision for water. A local system was designed with the help of staff and students from the university, a local entrepreneur paid for materials and members of the community did much of the work – supported by a national

employment programme that provided a subsistence income for the unemployed. Water for the network came from a deep well. There was no room in the settlement for the water tanks needed to ensure sufficient pressure – and permission was received to install these in the gated neighbourhood next door.⁷⁶

Water committees in peripheral settlements in metropolitan Caracas⁷⁷

Hidrocapital (the water utility of metropolitan Caracas) has been working with community organizations in settlements on the periphery of Caracas to improve provision for water and sanitation. This represents a major change both for the utility (and required training for its staff) and for community organizations (who previously simply made demands on external agencies without engaging in developing solutions and actively helping to implement them).

In the settlement called Bachaquero, there was a public water network that had been built incrementally but with services that were irregular and with many households having illegal connections, above earth with flexible water hoses. There were no sewers. In a settlement called Paso Real (formed by an invasion in 2000), the community had constructed piped water networks and had various illegal/informal connections to Hidrocapital's sewerage network (although not all households were connected and blockages were frequent). In both settlements, water was only available for a few hours a day so a number of strategies were used by residents – for instance storage tanks, water drawn from municipal tankers and purchasing water from neighbours. The utility provided the water for the systems and did not charge for it or had a social tariff of less than US\$1 a month – but the irregular and often poor quality service forced many inhabitants to spend significant sums purchasing water from other sources.

Mesas técnicas de agua (water committees) were proposed as a new way to organize the link between the inhabitants and external institutions, including the water utility and local

government. These coordinated work on water and sanitation (although other local bodies were involved) and contributed to improved provision. For instance, they organized the gathering of data and a participatory diagnosis, helped develop responses and supervised services. This helped to improve access to potable water and to reduce conflicts. These water committees also provided more scope for women's involvement – they represented three quarters of those who took part and also many leaders. Some have also begun to work on other community issues.



ALTERNATIVE MEANS AND MECHANISMS TO SUPPORT IMPROVEMENTS IN PROVISION FOR WATER AND SANITATION IN SMALL URBAN CENTRES

Many of the ways in which lower income households get better provision for water and sanitation are not 'water and sanitation' initiatives. For instance, better provision is often part of slum and squatter upgrading programmes and secure tenure programmes, or programmes through which urban poor households get land on which they can build new homes with water and sanitation infrastructure. Housing finance programmes that support households and communities fund improved provision in existing homes or fund them getting (and building) better quality housing, and this also generally supports improved provision for water and sanitation. These initiatives are important not only for the tens of millions of urban households that have got much improved provision for water and sanitation through them, but for the way they complement investments in water and sanitation infrastructure – and, indeed, can reduce the cost of this infrastructure. This section discusses these alternative means and includes detailed descriptions of two programmes: the Baan

Mankong programme in Thailand, especially its application to small urban centres, and the Local Development Programme in Nicaragua, which was specifically targeted at small urban centres.

Upgrading and secure tenure

From the 1970s onwards, one of the most important means by which provision for water and sanitation has been improved for low-income urban households is through slum and squatter upgrading projects that include water and sanitation components. The record of such initiatives is mixed, both in the quality and extent of provision for better water and sanitation (including many upgrading programmes that had no sanitation component) and in the extent to which the new water and sanitation infrastructure was maintained (or even whether there was any provision to support a local capacity for operation and maintenance). But these limitations are now better understood and usually addressed.

Most of the documentation on upgrading programmes has been for large cities, which probably reflects the fact that most such programmes have been in large cities. However, in some nations, perhaps most notably Indonesia and Thailand, there have been nationwide upgrading programmes that have supported upgrading in a considerable number of small urban centres. The upgrading programme in Thailand is described in some detail here because it is unusual not only in its aim to support upgrading in hundreds of small urban centres, but also in the extent to which it supports locally driven solutions, seeks to ensure that the unserved and inadequately served are fully involved and seeks city-wide solutions. This is followed by a description of the Local Development Programme in Nicaragua, which focused on smaller urban centres in Nicaragua, and which provides an interesting example of how an international funding agency can support locally driven development in a range of urban centres, acting through an intermediary institution located in Nicaragua.

Supporting community-driven upgrading in smaller urban centres at a national scale: The example of CODI and Baan Mankong in Thailand⁷⁸

In 2003, the Thai government launched the Baan Mankong (secure housing) programme, an ambitious national slum and squatter upgrading programme, which works not only in the larger cities but also in hundreds of small urban centres. Its goal is to support improved housing and secure tenure for 300,000 households in 2000 poor communities in 200 Thai urban centres. This programme will be described in some detail here, since it illustrates the kind of government mechanisms that can support community-driven development and partnerships with local governments at the scale of urban centres, entire cities and a nation. It also serves as a reminder of the importance of upgrading programmes for improving and extending provision for water and sanitation, even though these are rarely (if ever) classified as water and sanitation interventions.

The Baan Mankong programme is implemented through the Community Organizations Development Institute (CODI). It centres on providing infrastructure subsidies and housing loans to community organizations formed by low-income households to support upgrading in situ wherever possible and, if not, to develop new homes close by. Support is provided not only to community organizations formed by the urban poor for projects but also to their networks, to allow them to work with municipal authorities and other local actors and with national agencies on urban centre-wide upgrading programmes. It seeks to go to scale by supporting thousands of community-driven initiatives within programmes designed and managed by urban poor networks working in partnership with local governments and other local actors.

This initiative also demonstrates how to regularize the insecure or illegal land tenure that is evident in so many urban poor communities and that both inhibits their inhabitants' investments in improving provision and prevents or inhibits

any investment there by official water and sanitation utilities. Within this national programme, there are a variety of means by which those in illegal settlements can get legal land tenure – for instance by the inhabitants purchasing the land from the landowner (supported by a government loan), negotiating a community lease, agreeing to move to another location provided by the government agency on whose land they are squatting, or agreeing to move to part of the site they are occupying in return for tenure of part of the site (land sharing). The CODI also provides loans to community organizations to on-lend to their members to help build or improve their homes. It also supports city governments in taking the initiative in collaboration with urban poor organizations – for instance providing a site on which those living in various 'mini' squatter settlements in their jurisdiction could relocate, with the land provided on a 30-year lease. These are the kinds of solutions that can develop when there is a city-wide process in which urban poor communities are involved. This is also a good example of an institution that is not a water and sanitation agency, whose work would not normally be considered part of 'water and sanitation' investments, but that has a direct role in increasing the proportion of poor urban dwellers in Thailand with improved provision.

■ **Surveys**

The Baan Mankong programme in any urban centre begins with a detailed survey of all slums/informal settlements covering the whole urban centre. It is undertaken by community organizations and their networks, working with local governments, professionals, universities and NGOs. From this, they plan an upgrading programme to improve conditions for all these within three to four years. Once the plans have been finalized, CODI channels the infrastructure subsidies and housing loans directly to the community organizations.

■ **The process**

Figure 4.6 illustrates the process through which this upgrading/housing development programme

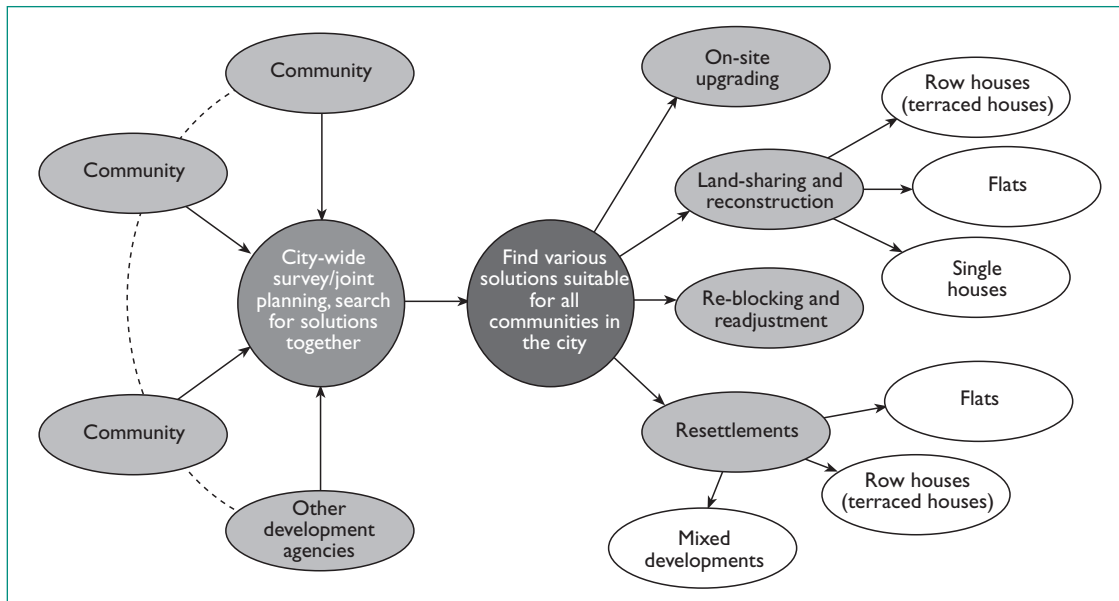


Figure 4.6

The linkages for a local housing development partnership by city-wide networks with communities and local authorities

Source: Boonyabantha, S. (2005) 'Baan Mankong: going to scale with "slum" and squatter upgrading in Thailand', *Environment and Urbanization*, vol. 17, no. 1, pp21–46.

is developed for the whole urban centre, bringing all actors together. Its design involves certain key steps:

- identifying the stakeholders and explaining the programme;
- organizing network meetings, which may include visits from people in other urban centres;
- organizing meetings in each urban poor community, involving municipal staff if possible;
- establishing a joint committee to oversee implementation. This includes urban poor community and network leaders and the municipality, and also local academics and NGOs. This committee helps to build new relationships of cooperation to integrate urban poor housing into each urban centre's overall development and to create a mechanism for resolving future housing problems;
- conducting a meeting where the joint committee meets with representatives from all urban poor communities to inform them about the upgrading programme and the preparation process;
- organizing a survey covering all communities to collect information on all households, housing security, land ownership, infrastructure problems, community organizations, savings activities and existing development initiatives. Doing the survey also provides opportunities for people to meet, learn about each others' problems and establish links;
- from the survey, developing a community upgrading plan that includes all urban poor communities;
- (while the above is going on) supporting community collective savings, as these not only mobilize local resources but also strengthen local groups and build collective management skills;
- selecting pilot projects on the basis of need, communities' willingness to try them out and the learning possibilities they provide for those undertaking them and for the rest of the urban centre; preparing development plans for pilots; starting construction; and using implementation sites as learning centres for other communities and actors;
- extending improvement processes to all other communities, including those living outside communities, for example the homeless and itinerant workers;
- integrating these upgrading initiatives into urban centre-wide development. This includes coordinating with public and private landowners to provide secure

tenure or alternative land for resettlement, integrating community-constructed infrastructure into larger utility grids, and incorporating upgrading with other urban development processes;

- building community networks around common land ownership, shared construction, cooperative enterprises, community welfare and collective maintenance of canals;
- creating economic space for the poor (for instance, new markets) or economic opportunities wherever possible within the upgrading process;
- supporting constant exchange visits between projects, other urban centres and regions for all those involved, including community representatives and local government staff.

A good city-wide survey in which everyone in the city has been involved helps produce an understanding that the urban poor's settlements are no longer something that is feared but seen as part of the city's system – not something outside that system. It then becomes something that the city's system can help to deal with. City authorities, politicians and other groups within the city start to engage in discussions with urban poor groups about how their housing problems can be addressed, so that they become part of the city's regular development. This also means addressing the issue of land. Real upgrading goes beyond the physical aspects; it changes relationships and allows urban poor communities space and freedom.

Infrastructure subsidies of 25,000 baht (US\$625) per family are available for communities upgrading in situ, 45,000 baht (US\$1125) for re-blocking and 65,000 baht (US\$1625) for relocating. Families can draw on low-interest loans from either CODI or banks for housing, and there is a grant equal to 5 per cent of the total infrastructure subsidy to help fund the management costs for the local organization or network.

This differs from conventional approaches in at least seven aspects:

- Urban poor community organizations and their networks are the key actors, and they control the funding and the management. They also undertake most of the building (rather than contractors), which makes funding go much further and brings in their own contributions.
- It is 'demand-driven by communities' rather than supply-driven, as it supports communities who are ready to implement improvement projects and allows a great variety of responses, tailored to each community's needs, priorities and possibilities (for instance, communities choose how to use the infrastructure subsidy).
- The programme does not specify physical outputs, but provides flexible finance to allow community organizations and local partnerships to plan, implement and manage directly. Government agencies are no longer the planners, implementers and construction managers delivering to beneficiaries.
- It promotes more than physical upgrading. As communities design and manage their own physical improvements, this helps stimulate deeper but less tangible changes in social structures, managerial systems and confidence among poor communities. It also changes their relationships with local government and other key actors.
- It helps trigger acceptance of low-income communities as legitimate parts of the urban centre and as partners in the centre's wider development process. People plan their upgrading within this broader development framework, so their local housing development plan is integrated within urban planning and development strategies.
- Secure tenure is negotiated in each instance, but locally – and this could be through a variety of means such as cooperative land purchase, long-term lease

contracts, land swaps or user rights. But in all cases, the emphasis is on communal (rather than individual) tenure.

- Its commitment to reaching all low-income communities within a three- to four-year period, drawing on local resources.

Boon Kook is a new settlement in a central area of the northern Thai city of Uttaradit where 124 households that had been living in many mini squatter settlements are being rehoused. Uttaradit had around 53,000 inhabitants in 2000. To resettle these households (which were identified by the community network in their city-wide survey), the municipality agreed to purchase a 1.6 hectare site and grant the inhabitants a 30-year lease. The community network helped start daily savings schemes among the inhabitants, CODI provided housing loans to families that needed them and the National Housing Authority provided the infrastructure. Row housing is being built and the average unit cost (for housing, infrastructure and land) is US\$6415. The unit cost of the houses varies between US\$750 and US\$3750, with repayments of US\$5–22.5 per month. The settlement also includes five collective housing units for the elderly, the poor and physically disabled members of the community.

■ Supporting decentralized action within cities

Most people still think that the municipality should manage the city, but municipal authorities do not have much power, and governance systems need to be opened up so that citizens feel that it is their city and that they are part of its development. Responsibility for different aspects of urban management can be decentralized to communities – for instance, for public parks and markets, maintenance of drainage canals, solid waste collection and recycling, and community welfare programmes. Opening up more room for people to become involved in such tasks is the new frontier for urban management – and real decentralization. Upgrading is a powerful way to spark off this kind of decentralization. When low-income

households and their community organizations do the upgrading, and their work is accepted by other actors, this enhances their status within the urban centre as key partners in solving urban centre-wide problems.

Six techniques are being used for scaling up the Baan Mankong upgrading process in order to reach its ambitious five-year target:⁷⁹

- 1 *Pilot projects* (such as those described above) are organized in as many cities as possible, to get things going, to generate excitement and to demonstrate that community-driven upgrading can work. These pilots become examples of how upgrading can be done, and are much visited by other community organizations and city government officials.
- 2 *Learning centres*: 12 cities with strong upgrading processes have been designated as learning centres for other towns and cities in their regions.
- 3 *Big events*: when an upgrading process is launched or a project inaugurated, people from neighbouring cities are invited to see what is happening and what is possible, turning each city's milestone into a mass learning opportunity.
- 4 *Exchanges*: these are organized between communities, pilot projects, cities and regions involving community representatives, officials, NGOs and academics.
- 5 *Sub-contracting*: CODI sub-contracts most of the support and coordination work to partners in urban centres.
- 6 *Frequent meetings* are organized at all levels, including regular meetings between Baan Mankong staff and sub-contracting partners.

Within each urban centre, the following steps are taken:

- coordinated setting up of local working group or committee involving various partners;

- a community survey;
- urban centre-wide planning covering all communities at different stages of improvement;
- first-year implementation: get training cases together; learning process of upgrading;
- managing knowledge, making handbooks;
- reviewing what has been learned;
- expanding to second and third years;
- exchange visits and meetings, and learning shared between groups.

Urban centre-wide processes are now underway in many places and the form they take is illustrated in Figure 4.6. For instance, in Uttaradit, it started with a survey that mapped all the slums and small pockets of squatters, identified the landowners and established which slums could remain and which needed to relocate. This helped link community organizations and initiated the building of a community network, supported by young architects, a group of monks and the mayor. Looking at the scale of the whole urban centre, they sought to find housing solutions for 1000 families with the most serious housing problems within the existing urban fabric. They used a range of techniques – land sharing in one area, re-blocking in another, as well as in situ upgrading and relocation. Solutions included the Boon Kook programme described above, which is providing homes for 124 households that previously had lived in mini squatter settlements. Their housing plan became the basis for the Uttaradit-wide upgrading programme under Baan Mankong, and it includes infrastructure improvement, urban regeneration, canal cleaning, wasteland reclamation and park development.

In Khon Kaen (a city with 141,000 inhabitants in 2000), 69 poor communities were identified and the 50 poorest are being improved between 2004 and 2006. Some of the poorest and most insecure are situated alongside the railway tracks; some will relocate to nearby land (mostly those living closest to the tracks), but

most will stay, be upgraded and obtain leases.

In Ayutthaya, Thailand's old capital city and a world heritage site (with 76,000 inhabitants in 2000), the community network has surveyed and mapped all informal settlements. These totalled 53, comprising 6611 households, most of which are situated within the historic areas. The community network then organized a seminar with the city authorities, where survey information was presented. This showed that it would be possible to improve conditions in their settlements, bring in basic services, construct proper houses and shift the settlements a little to allow the monuments to be rehabilitated. Some pilots are underway to show that poor communities and historic monuments can be good neighbours.

The Local Development Programme in Nicaragua

The Local Development Programme (PRODEL) in Nicaragua provides funds for co-financing small infrastructure and community projects in many urban centres (including improved provision for water, sanitation and drainage) and loans and technical assistance for households for housing improvement and micro enterprises. PRODEL was set up with support from the Swedish International Development Cooperation Agency (Sida). This is not an implementing agency but an agency that provides funds to local governments, NGOs, community organizations and households. Over a ten-year period, 484 projects were implemented that benefited some 60,000 households. Just over half the funding was provided by Sida with the rest mobilized locally, by households and the municipal authorities. In the same period, loans supported 12,500 low-income families to enlarge and improve their homes, along with more than 20,000 micro-enterprise loans. Cost recovery and low default rates have been sustained over time, despite the persistent economic difficulties faced by the country.⁸⁰

PRODEL's long-term goal is to develop and institutionalize a participatory model for the provision of infrastructure and services and for

support for housing improvement and micro-enterprise development that can be sustained by local organizations in all urban areas of Nicaragua. Similar kinds of funding organizations supporting community-based and local government-based improvements have been set up in other Central American nations, with support from Sida.⁸¹ Perhaps their greatest significance for the MDGs is their demonstration that it is possible for official donor agencies to reach agreements with national governments about setting up donor-funded organizations within the recipient nation that can support a multiplicity and diversity of local initiatives through local organizations and local processes with community participation.

Programmes to regularize land tenure in informal or illegal settlements have particular importance for extending provision for water and sanitation for three reasons. First, the official water and sanitation utilities are often not allowed to provide services to those in illegal settlements. This is especially the case for illegally occupied land that is privately owned. However, there are also many instances of informal settlements on land owned by government agencies where it is the government agency that does not permit official water and sanitation providers to work there. Second, households living in settlements with insecure tenure are discouraged from investing in improved provision themselves. Third, even if an official water and sanitation utility wants to provide services in informal settlements, it is difficult to do so because there are generally no maps of these settlements (and extending piped supplies or sewers to them depend on detailed maps with accurate boundaries for each house/house plot). In addition, there is no official record of who lives in each house and households lack the official documents that water and sanitation utilities need to establish a connection and a service.

One of the most significant constraints on upgrading unauthorized settlements is the time that government bureaucracies take to provide legal tenure, the complexities of the procedures

and the costs (which are often passed onto the households seeking tenure). But there are ways around this – for instance governments making formal commitments to supporting upgrading and tenure transfer for specific settlements or providing community land leases, which provide the inhabitants with security before the formal procedures to provide legal tenure are completed.

New housing as the means for improving provision for water and sanitation

A very large part of meeting the water and sanitation MDGs and targets is ensuring provision for water and sanitation to expanding urban populations. United Nations estimates suggest that the urban population in low- and middle-income nations will expand by 930 million people between 2000 and 2015 with at least half this expansion being in urban centres with under half a million inhabitants.⁸²

Whether or not this expanding urban population will be housed in slums and squatter settlements with very inadequate provision for water and sanitation will be much influenced by the land use policy of city and municipal governments. There are many direct and indirect ways by which urban governments can increase the supply and reduce the cost of land for new housing with provision for water and sanitation. But in most urban centres in low- and middle-income nations, government policy does not do this – and this explains why large and often increasing proportions of the population live in very poor quality and overcrowded accommodation, including much of it in illegally occupied or subdivided land and most of it lacking basic infrastructure.

Although politicians and civil servants often claim that there is no available land for urban poor groups, detailed surveys generally show that there is sufficient unused or underutilized well-located land.⁸³ In addition, it is common for large amounts of this land to be in public ownership – although much of it may not be owned by local government but by national government agencies.

In many urban centres, churches or other religious institutions are also major landowners. The Methodist Church in South Africa is acting on this fact, as it is identifying vacant land it owns that can be allocated to housing projects for homeless families and, in rural areas, to support their livelihoods. Working with the South African Homeless People's Federation, this initiative is reviewing church records, checking them against other official records, identifying potential land sites with more than one hectare and visiting them. This produces a list of land sites that can be developed by the Church and the Federation. The initiative has importance not only for the new land it could provide for housing for low-income households but also for encouraging more action from the government on land redistribution and tenure reform and in setting an example that other churches in South Africa may follow.⁸⁴

Thus, all urban centres need what might be termed a 'twin track' approach to land that combines improving tenure security in existing settlements (and supporting upgrading there) and revising regulatory frameworks to increase the supply and reduce the cost of land for new housing.⁸⁵ There are a range of regulatory reforms that can increase the supply and reduce the cost of land for housing – for instance changing regulations that demand unnecessarily large minimum plot sizes, building setbacks and land for roads, inappropriate floor area ratios and maximum densities, and slow, unnecessarily complex administrative procedures (many of which require informal payments to progress).⁸⁶

Changes in the approach of the city government of Windhoek illustrate how to make land for housing with provision for water and sanitation more accessible to low-income households.⁸⁷ Windhoek's population reached 233,529 by the 2001 census. The city authorities recognized that to reach low-income households, they had to cut unit costs in their government-funded serviced site programme and recover costs from the land they developed for housing. The new policy, developed with the Shack Dwellers Federation of Namibia, shows a willingness to

overturn conventional approaches to standards and regulations (for instance in plot sizes and in infrastructure standards) to reduce prices. Two new options were developed. First, a rental plot of 180 square metres serviced with communal water points and gravel roads with the rent charged being just sufficient to cover the financing costs for the land investment, plus water services and refuse collection. Second, group purchase or lease of land with communal services and with minimum plot sizes allowed that are below the official national minimum plot standard of 300 square metres. Families living in areas with communal services have to establish neighbourhood committees to manage toilet blocks. These new options acknowledge the importance of the urban poor's representative organizations and seek to offer improvements to the lowest income groups while still achieving cost recovery. Savings groups from the Shack Dwellers Federation (and other communities) are now able to purchase public land as a group, increasing densities and slowly upgrading their plots with water and sanitation services. As with many of the examples given already, the change in the city government's policies was influenced by strong community organization, community-driven initiatives that demonstrated what was possible and the Namibian Federation's willingness to form a partnership with the city government. The change in policy also built on the fact that the city authorities had a long-established policy of supporting self-help and community projects – but these needed to change if they were to reach the poorest groups and increase in scale. Other urban authorities have used comparable programmes of serviced plot provision that include plots with minimal provision (to cut costs to what low-income households can afford) and with incremental improvements in provision, as and when these can be afforded. For instance, this was done in the city of Ilo in Peru, which allowed its very rapid population growth from 10,000 in 1961 to 60,000 by around 2000 to be accommodated, without rapidly expanding illegal or informal settlements.⁸⁸

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INFORMATION FOR ACTION AND INDICATORS FOR MONITORING PROVISION¹



INTRODUCTION

Any government agency intent on improving or extending provision for water and sanitation needs to know the scale and nature of the deficiencies in provision. The same is true for any international agency that wishes to support this. Different water and sanitation service providers (whether they are government, private sector, NGOs or community organizations) also need information on this. But different agencies have very different information needs and it is important that the information needs of these different agencies are not confused. In addition, the information needed for measuring and monitoring provision is not necessarily the same as the information needed to generate action or to inform action.

Although there is some overlap, it is important to distinguish between the data needed:

- to monitor provision within a nation (which also provides information on the scale of need nationally and internationally);
- to identify the scale and nature of need within any urban centre or urban district (with such data needed for all urban areas and districts, to guide support from higher levels of government);
- to design and implement interventions to improve or extend provision in specific settlements.

This becomes evident when comparing the information needs of a national ministry or a bilateral or multilateral development assistance agency intent on getting more resources for water and sanitation with those of an organization that has responsibility for improving and extending provision in a particular urban centre – whether this organization is within local government, a branch of a national government water agency, a private enterprise, an NGO or a community organization. As this chapter describes in some detail, the need for better data on water and sanitation provision for national populations is widely recognized. This also has importance; national governments and international agencies need data on deficiencies in provision for nations, both to establish the scale of the task at hand and to provide a baseline from which progress can be monitored. The current focus on achieving the Millennium Development Goals (MDGs) has led to an emphasis on monitoring progress towards achieving the stated targets and has stimulated efforts to identify indicators that can provide the basis for this. These indicators need to provide the means to progress towards the MDGs within each nation; international agencies also want the same indicators to be used in each nation to allow international comparisons of progress.

It might be assumed that these indicators will provide a stronger information base for national and local action but this is not necessarily so. Indeed, there is a danger that a focus on a

limited, standard set of indicators for each nation that can be compared across nations will detract attention from the kind of indicators needed to inform action on the ground. The strong focus given by the international community to the MDGs and their specific, time-bound targets for water and sanitation, together with the need for national governments to report on their progress, has to be complemented by the collection of data that stimulates, supports and informs local action.

Data for local action needs more detail in regard to provision. There is a danger that standardized definitions for what constitutes 'improved' provision for drinking water and for sanitation that are used in national monitoring are assumed to be valid for supporting local action. But local action needs more specific, detailed and context-specific information on provision. There is also a particular need for more data on the quality and extent of provision in small urban centres than that currently provided by monitoring systems. The standard definitions of 'improved' provision that are used for the purpose of national and global monitoring fail to recognize differences in rural and urban contexts. For instance, in many urban contexts, vendor-provided water and public toilets have greatly improved provision, yet these are considered as 'not improved' in the global monitoring system. A government intent on better performance when measured by the standard, internationally agreed definitions of improved provision may thus ignore or suppress some of the most effective means of improving provision for lower income groups in urban areas. Similarly, in many urban contexts, what are considered as improved drinking water sources have serious limitations – for instance piped water systems serving public taps where the water is of inadequate quality, the supply is irregular and access is very difficult for most of the population that they are meant to serve.

Data for local action are not well served by national sample surveys. Most data gathering about provision for water and sanitation is from

household surveys drawing on a representative sample of a nation's population. These sample surveys may provide figures for coverage for regions or provinces or sometimes for a major city but their data are of little use to any organization with responsibility for provision of services in a particular locality. Such an organization needs detailed data about the extent of provision in each neighbourhood in their jurisdiction. They need detailed local maps with contours, roads and paths marked for any investment in water pipes, sewers and drains. If they have the capacity to support provision to each household – for instance piped water and sewer connections – they need detailed data about each household, each building structure, each plot boundary and about what forms of provision already exist. This is very different from the information needed by national governments and international agencies that measure provision nationally and monitor how this changes. As this chapter describes, the means by which this very local, specific information is collected is very different from the means used for national surveys.

In theory, national censuses should and could provide core data for both national monitoring and for local action. The great advantage of a census is that it covers (or should cover) all households – even if it has a limited number of questions about water and sanitation and is only held every ten years. But in practice, in most low- and middle-income nations, censuses do not provide data for local action. Either no recent census has been held or the census is not organized in a way to provide this basic local data to local governments in a form that they can actually use.² For instance, local governments cannot get the data about water and sanitation provision to households in their jurisdiction in a form that identifies which households, streets and neighbourhoods lack adequate provision. So local agencies concerned with water and sanitation have to generate this information themselves. As this chapter describes, there are good examples of how this

lack of local data has been overcome. But there is a lack of support from national governments and international agencies for local processes that generate the data needed for local action. A lack of detailed data and a lack of recognition by governments of the need to support the collection of such data in each locality hinders the possibilities of improving provision in most small urban centres.

This chapter has two particular interests. The first is to support the generation of the local data needed for improving and extending provision on the ground – and for this, the emphasis is on information collected primarily to inform local action and only secondarily to corroborate or contribute to national and international indicators. As examples in this chapter show, community organizations and other civil society groups can contribute much to this. The second is to support more accurate measuring and monitoring of the quality and extent of provision for water and sanitation at sub-national levels – so this better reveals the scale and nature of deficiencies in provision, especially in small urban centres. Inevitably, this will draw primarily on standardized surveys implemented for representative samples of national populations by professional organizations. Thus, this chapter emphasizes the need for a hierarchy of indicators – with a lot more detail and coverage at local level to serve local action, part of which can feed and support a more limited range of core indicators to measure and monitor provision at provincial and national level. This illustrates the different demand for and use of information at different levels of decision-making.

The methods of differential data collection and aggregation suggested here require an acceptance that there can be different definitions and indicators for a similar performance measure at different levels of policy and action, even if these may give different figures for the proportion of the population served. Generally, the further data are disaggregated, and the more detailed the definitions become, the lower the proportion of the population with good access to

water and sanitation gets. Ironically, as the data about provision become more precise and detailed, this generally reveals larger deficiencies in provision. As explained in more detail later, the data currently used to monitor provision for water and sanitation certainly understate the scale and depth of deficiencies in provision, especially in urban areas.

Many of the methods for generating data for local action also fall outside what many development professionals and international organizations conceive as appropriate, because they involve data generated by community organizations (especially representative organizations formed by low-income groups) and local NGOs.³ But as described below, these have often produced the detailed data needed for action – at costs that can be afforded locally. They have also been the means by which those who were ill-served or unserved by water and sanitation systems got their needs recognized and were able to influence the means by which these needs were addressed. Supporting local information-gathering processes such as these has enormous importance for improving provision for water and sanitation in small urban centres.



THE TOOLS AND METHODS THAT SUPPORT ACTION ON THE GROUND

There are a range of data-gathering tools and methods that are not so much to inform governments and international agencies about the scale and nature of the problem but to provide the information needed for addressing these problems in each locality. They serve both to identify the problems and to help define the most appropriate courses of action. Unlike national sample surveys, they provide scope for the unserved and the ill-served to influence what data are collected. Perhaps as importantly, from the outset, they seek to support local discussions of what needs to be done, informing and involving all stakeholders. Some of these tools and

methods have also contributed much to a better understanding of the scale and nature of the problem – for instance in demonstrating the extent to which households and communities have acted to improve provision, independent of governments and other official service providers.

There are a range of information-gathering tools and methods that have been used successfully in many different contexts to document the quality and extent of provision for water and sanitation and, perhaps as importantly, to record what investments and provisions households have already made, on which external support can build. These have provided data to levels of detail and local relevance that conventional surveys never achieve. They have also demonstrated a capacity to provide basic data on all households, all dwellings, and all individual and communal water and sanitation facilities – which is the data needed to allow investment and action within each settlement. In some instances, they have also provided the basis for local discussions of how best to address the deficiencies in provision for water and sanitation in which those who are unserved or ill-served have a central role – for instance in the community-driven upgrading programmes in small urban centres in Thailand, in the community–local government partnerships in small urban centres in Pakistan, and in the community-designed, built and managed toilet blocks in India, as described in Chapter 4.

Much of the development of these tools and methods has been by local NGOs or by organizations and federations formed by the urban poor that are active in many nations, although as this section describes, some local governments have also innovated on these. The tools and methods have been used both to support community-driven improvements in provision for water and sanitation and to support dialogue and often partnership between community organizations formed by urban poor groups and local governments or other official service providers. The tools and methods have also demonstrated that it is possible to generate needed data and maps

even in informal settlements where there are no official records or maps, including data in regard to who lives in these settlements, who claims ownership of each site, where each house's plot boundaries are, what space exists for roads and paths and what infrastructure exists.

It is worth distinguishing between surveys and maps for specific settlements and larger scale surveys and maps that cover a whole urban area – although the smaller scale maps and surveys feed into the larger surveys, or the larger surveys are done as a scoping exercise and provide the broader information base within which to initiate and support the settlement-specific surveys.

Surveys and mapping of specific settlements

Chapter 4 described some of the water and sanitation programmes designed and implemented by federations of slum and pavement dwellers/shack dwellers/the homeless and how their initial concentration in large cities has expanded in some nations to include small urban centres. Detailed household surveys and mapping have been among the most commonly used tools through which these federations initiate action and dialogue with government agencies or other official service providers. These also provide the information needed for local investments to improve or extend provision for water and sanitation.

Detailed slum enumerations and surveys are mostly done by federation members, with support from local NGOs.⁴ They draw information from each household while also informing each household about why the survey is being done. When asked why they cover all households rather than doing a representative sample, the response is that they want to talk to and involve every household, so everyone on the settlement knows the enumeration is being done and for what purpose. In addition, by drawing information from each household, these surveys can develop very detailed maps, including specifying the plot boundaries for each structure – which is always difficult to do in an informal settlement where residents have no formal title. The infor-

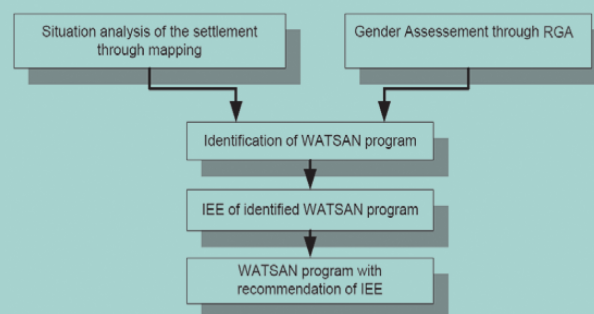
Box 5.1 Developing methodologies for mapping the poor, gender assessment and initial environmental examination

Development of peri-urban areas in Asian cities is often left behind by the pace of urbanization. In the case of many Asian cities, poor and rich live together in a cluster, particularly in small urban centres. Due to lack of clear demarcation between the 'haves' and the 'have nots', the most needy population – the deprived urban poor and women – are yet to receive the support. A framework for pro-poor water and sanitation governance is a prerequisite for meeting targets 10 and 11 of the MDGs. Identifying the poor households and bringing the services directly to their doorsteps for taking affirmative actions, and thereby meeting MDG targets, however, is a challenging task. For this purpose, mapping the poor becomes a primary activity while designing the programmes. The socio-economic information can be obtained by survey as well as by using a geographic information system (GIS) as a major tool for addressing the needs of the poor.

Water and sanitation ('watsan') issues also relate to cultural and behavioural aspects where women have a vital role to play. Therefore, meaningful participation of women from the planning stage to its implementation, and of course in the operation and maintenance stages, is very important for sustainability of any water and sanitation programme.

UN-HABITAT's Water for Asian Cities Programme, in partnership with the Centre for Integrated Urban Development (CIUD), has developed three methodologies – mapping the poor, gender assessment and initial environmental examination – to carry out water and sanitation programmes in peri-urban areas of Asian cities. This process has been tested in one of the peri-urban settlements of Kathmandu.

The information revealed by socio-economic survey and rapid gender assessment (conducted through focus group discussion with various groups of women of different ages and their male counterparts) was used to address the



gender issues. Recommendations from the analysis of this information were incorporated while preparing the Water and Environmental Sanitation Improvement Plan of the settlement. The above diagram presents the proposed flow of activities.

In this water and sanitation programme, initial environmental examination (IEE) was conducted to identify potential pollution in water bodies caused by the proposed activities. Mitigation measures, as recommended by IEE, were incorporated in the design of this programme.

Keeping the community in the forefront in this approach, all the stakeholders, including local government and line agencies, were brought together for programme sustainability. The end result of these exercises is presented in the Water and Environmental Sanitation Improvement Plan. These methodologies should facilitate identifying environmentally sustainable water and sanitation programmes. These methodologies can also be adopted while implementing other water and sanitation related programmes.

mation collected from these community-managed enumerations is also returned to community organizations to check, and it can provide the basis for detailed plans for installing or improving provision for water and sanitation. As Chapter 4 described, the enumerations also mobilize populations to help in designing and implementing improved provision.

The enumerations also allow the development of maps that provide:

- details of each housing unit and its boundaries and the paths and streets through which pipes and drains have to be laid;
- details of existing infrastructure (often extensive and usually undocumented);
- other details important for designing and implementing improvements – for instance slopes and existing drains.

Such maps are staff-intensive and costly if done by professionals. Professional staff are also often reluctant to work in informal settlements (which are regarded as 'too dangerous') or simply refuse to do so. It is also difficult for outsiders to know how to deal with disputes over boundaries – for instance as different individuals claim 'ownership' of the same plot or disagree on plot boundaries with their neighbours. In many informal settlements, a significant proportion of the population are tenants and there are often tensions between 'owners' and tenants, especially if owners feel that the survey may question their ownership, or that it might provide their tenants with some basis for claiming ownership rights. However, this kind of mapping has been successfully undertaken in many nations by urban poor federations or other community organizations working with local NGOs. It tends to be more accurate because community organi-

zations can check the data; it is also much cheaper.

This process allows carefully costed estimates to be developed for necessary investments, and enables community organizations to assess the validity of government and international agency proposals and, where needed, to propose alternatives. These enumerations allow careful documentation of existing investments by households and communities in water and sanitation (including sewers and drains) and existing drainage networks. This has particular importance because such investments are often quite extensive; external solutions that recognize and seek to enhance and work with these are often far cheaper. But in most schemes developed by governments and international agencies to improve provision in informal settlements, no survey of existing infrastructure is done. This can lead not only to unnecessarily expensive designs but also to designs that are inappropriate.⁵

Much of the experience with community-managed enumerations and mapping has been in informal settlements in large cities – but the basic methodology for this could as easily be applied to a small urban centre. In Nairobi, where around half the population lives in informal settlements, the Kenyan urban poor federation (Muungano wa Wanvijiji) formed by hundreds of savings groups and a local NGO, Pamoja Trust, have been preparing maps and community-driven enumerations of various informal settlements, along with a city-wide survey of all such settlements. This process in an informal settlement helps to build consensus among all inhabitants on upgrading plans and develops community capacity to manage this. It also helps build consensus between the conflicting priorities of landlords and tenants. In one settlement on the outskirts of Nairobi, Huruma, where a community-managed upgrading programme is underway, an enumeration and mapping programme provided the information base and the means of brokering agreements for all inhabitants on how to upgrade. This mapping

programme also identified the inadequacies in provision for water and sanitation that the upgrading programme has to address – including the number of inhabitants whose only means of sanitation is ‘flying toilets’ (excreta wrapped in plastic bags or waste paper and thrown away).⁶

Community-driven surveys also help generate interest from governments. The data that these surveys provide help community organizations and their federations in their negotiations with government agencies and water utilities. Low-income groups no longer make demands because ‘they are poor’ but, rather, based on detailed facts and figures on the ground. They also provide water utilities and local government agencies with data they do not have – and data they need to support improved provision. This helps redefine the tone of the negotiations, as they move from being defensive to becoming more proactive. The detailed information provided by the surveys also provides the local government with the data they need to justify supporting action. This community-driven production of detailed data also contributes to a more equal relationship with external agencies, as it is produced and owned by the communities, not produced by external agencies and presented to communities. The surveys also give each person and household an official identity, as their occupation of land and housing is recorded – often for the first time.⁷

City-wide surveys

In some middle-income nations, both national and local governments are well served by official statistics for water and sanitation provision, since these provide both national and local civil servants and politicians with a strong information base for their policies. However, in many nations, such an information base is lacking.

City-wide surveys that provide information on all settlements and neighbourhoods, including details of the quality and extent of provision for water and sanitation, have underpinned many ambitious upgrading programmes. The importance of the city-wide, community-driven survey

Box 5.2 The role of surveys of entire urban centres in upgrading programmes

Experiences with surveys covering whole urban centres in Thailand and elsewhere have shown that if these surveys and the discussions that precede them are managed properly, they become a key source of learning from which all groups can learn about their own urban centre. They are also particularly important for highlighting the differences between urban poor communities in circumstances and possibilities for improvements. Urban poor groups learn by comparing what is being done in another community with what they know from their own neighbourhood. Discussions and surveys covering the whole urban centre help spark discussions within all urban poor communities about why conditions are so poor. These groups develop an understanding of what caused the different conditions.

This kind of understanding helps empower urban poor groups; when they do not have this understanding, it makes them vulnerable, weak and easy for outside professionals or institutions to push around. By being involved in processes that look at the whole urban centre and all neighbourhoods, and looking at the differences between them, they start understanding the causes of

the difficulties they face – for instance why the people living along the railway tracks are considered squatters, and why the people living on private land have different problems to those living on government-owned land.

In addition, when urban poor communities have the possibility of looking at the urban centre in its entirety, they find that they are no longer isolated within their individual settlement – they have allies, friends with similar difficulties, similar fates, similar ways of doing things. Linkages start forming between peer groups in different settlements and these can become extremely powerful. There is now a large network of community organizations from which to learn and from which to draw support. They are no longer isolated but have many other community organizations to learn from. This is the way of bringing urban poor communities into an understanding of structure and into a process of making structural changes – by learning, by forging new friendships, by working together on concrete actions, and by starting to mobilize certain kinds of change, driven by groupings or networks of communities working together.

Source: Boonyabancha, S. (2005) 'Baan Mankong: Going to scale with "slum" and squatter upgrading in Thailand', *Environment and Urbanization*, vol. 17, no. 1, pp21–46.

was noted in Chapter 4 for Tirupur, to provide the information needed for the community toilet block programme – both to generate community support for it and to allow the identification of land sites where these toilets could be built. Such city-wide surveys are a critical part of the Thai government's Baan Mankong (secure tenure) programme described in Chapter 4 and these have been implemented in many small urban centres, as well as large cities. In these surveys, low-income households and their community organizations and networks work with local governments, professionals, universities and NGOs to survey all poor communities, and then plan an upgrading programme to improve conditions for all these within three to four years. The survey collects information on all households, housing security, land ownership, infrastructure problems, community organizations, savings activities and existing development initiatives. Doing the survey also provides opportunities for low-income groups to meet and to learn about each others' problems and solutions. Once plans for the whole urban centre have been finalized, the Thai government (through CODI) channels infrastructure subsidies and housing loans

directly to the communities, each of which develops the initiatives that best respond to their needs and circumstances.

For instance, the upgrading programme in Uttaradit (an urban centre with around 53,000 inhabitants in 2000) started with a survey that mapped all the slums and small pockets of squatters, identified the landowners, and established which slums could remain and which needed to relocate. This helped link community organizations and initiated the building of a network of community organizations, supported by young architects, a group of monks and the mayor. Looking at the whole of Uttaradit, they sought to find housing solutions for 1000 families with the most serious housing problems within the existing urban fabric. They used a range of techniques to do this – for instance land sharing in one area (where the inhabitants of an informal settlement return part of the site to the landowner in return for secure tenure on the other part), re-blocking in another (to make better use of existing space and improve road and path networks), as well as *in situ* upgrading and relocation. Solutions included the Boon Kook programme described in Chapter 4, which is providing homes for 124

Primary or secondary sort of data	Source	Thematic or primary maps	Synthesis Maps	Derived maps
Visual search (quality of housing [†] and urban landscape)	Can draw on municipal data – for instance, cartography of land uses in planning or urban development offices	Housing quality and urban landscape		Income poverty
Fiscal land values	Drawn on records on provincial taxes	Fiscal land value		
National Census of Households, Population and Houses	Instituto Nacional de Estadística y Censos (INDEC), the national institute of statistics and census	Potential dependency ratio of infants		Capacity poverty [†]
		Percentage of extended households		
		Percentage of overcrowded households		
		Percentage of household heads with low educational level		
		Percentage of large households		
		Percentage of households with irregular tenure situations		
Availability of piped water network	Municipality or private service company	Urban areas with water network	Integrated map of accessibility to infrastructure [*]	Housing or habitat poverty [†]
Availability of sewerage network		Urban areas with sewerage network		
Availability of piped gas network		Urban areas with gas network		
Routes of urban public transport		Urban areas with public transport		
Addresses of public kindergartens	Municipality or provincial education council	Physical accessibility to public kindergartens	Integrated map of accessibility to social public services [*]	
Addresses of public primary schools		Physical accessibility to primary schools		
Addresses of public nurseries	Municipality	Physical accessibility to public nurseries		
Addresses of public health care services	Municipality or regional sanitary unit (it includes several municipalities that share the more complex services such as hospitals with specific specialities)	Physical accessibility to health care services		
Areas usually affected by floods	Municipality, civil guard	Areas usually affected by floods	Critical conditions of natural and built environment [*]	
Precarious settlements	Municipality	Precarious settlements		

Notes: * Variables to be built through overlaying of different maps; † Variables to be built by weighted values and matrixes

Source: Navarro, L. (2001) 'Exploring the environmental and political dimensions of poverty: The cases of the cities of Mar del Plata and Necochea-Quequén', *Environment and Urbanization*, vol. 13, no. 1, pp185–199.

Table 5.1
Building an information base from multiple sources: The different data sources used to identify, assess and map poverty in Mar del Plata and Necochea-Quequén

households that previously had lived in mini squatter settlements. Their Uttaradit-wide housing plan became the basis for the upgrading programme under Baan Mankong, and it includes infrastructure improvement, urban regeneration, canal cleaning, wasteland reclamation and park development. The upgrading programme in Korat described in Chapter 4 also had a settlement-wide survey to provide the basis for the upgrading plans.⁸ These city-wide surveys in which urban poor groups are involved have importance far beyond the information they generate – as described in Box 5.2.

City-wide surveys undertaken by urban poor federations working with local NGOs have also proved important catalysts for action in many other nations – including Kenya, India, Cambodia and South Africa.⁹ They have also proved important in both large cities and smaller

urban centres in Pakistan, as described in some detail in a later section.

Some local governments in small urban centres have also recognized the need to generate their own local information base. A study of two urban centres in Argentina – Mar del Plata (with 541,7423 inhabitants in 2001) and Necochea Quequén (with 79,983 inhabitants in 2001) – showed the lack of information available to the local authorities to address poverty and environmental problems, including deficiencies in provision for water and sanitation. In Argentina, as in many other nations, governments in small urban centres face particular problems as they seek to cope with new duties arising from decentralization programmes without increased resources and often with less staff. Local governments also face increased demands but without the information base needed to allow a better use

of limited resources. The lack of local data also limits their capacity to develop proposals for external funding. In Argentina, a national census is held every ten years but local governments do not get access to census data in a form that allows local action. A country-wide household survey is held three times a year with a sample of 30,000 urban households but only in the capital city of each province and in a few intermediate-sized cities. However, it proved possible to develop profiles and maps to support local action by drawing data from many different sources (see Table 5.1). These not only informed local action but also provided a catalyst for more participatory and integrated action. Many of the indicators that were available did not measure what might be considered the best indicator and so proxy indicators had to be used. For instance, 'availability of public network of piped water' had to be used instead of 'connection to the network', even though connections cannot be afforded by every household. In addition, much of the statistical information was only available for the spatial units used by the national census and sometimes these were too large to allow the needed identification of deprivation within the spatial unit. The author of this study also noted the importance of not seeing these indicators as ends in themselves but as an information base to inform discussion and action, including discussions with all social groups. In addition, building this information base also seeks to get more cross-sector, cross-department and cross-agency links.¹⁰

Other information gathering tools and methods that support community-driven approaches¹¹

Community-driven improvements for water and sanitation will depend on well-organized urban poor groups that are able both to manage household- or community-level work and to negotiate collectively with local governments and other external groups. Many of the examples of this in Chapter 4 were developed by federations of urban poor organizations – and urban poor federations are now active in at least 15 nations and

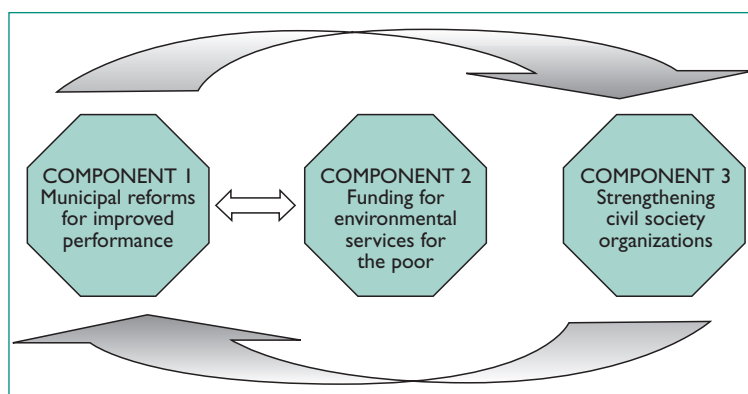


Figure 5.1

The three components of the Andhra Pradesh Urban Services for the Poor programme

Source: Dove, L. (2004) 'Providing environmental urban services to the poor in Andhra Pradesh: Developing strategic decision-making', *Environment and Urbanization*, vol. 16, no. 1, pp95–106.

developing in many more.¹² At the base of these federations are community-managed savings groups and it is these savings groups that provide the organizational basis for action. As the South African federation has stressed, their savings groups collect people as much as money. These savings groups provide emergency credit to members when they need it, and can accumulate savings that can help fund housing construction or improvement. But, as importantly, through operating these savings groups, communities also learn to manage finance collectively, which in turn means learning the skills needed to manage other initiatives collectively, including those related to water and sanitation. Apart from community-managed savings and the enumerations and mapping described already, two other tools have particular importance for generating relevant information: house modelling and community exchanges.

House modelling is the process by which urban poor groups and their organizations develop designs for the houses that they want to build and the facilities they need for water and sanitation. It usually begins with individuals drawing or making models of their ideal house, then discussing this in a group and agreeing on the designs that serve them best. Then a life-size model is developed, usually in a public site with the involvement of large numbers of people. This serves as the basis for discussing improvements and modifications among federation members and government staff – and for producing accurate estimates of how much each housing unit would cost and what modifications can be

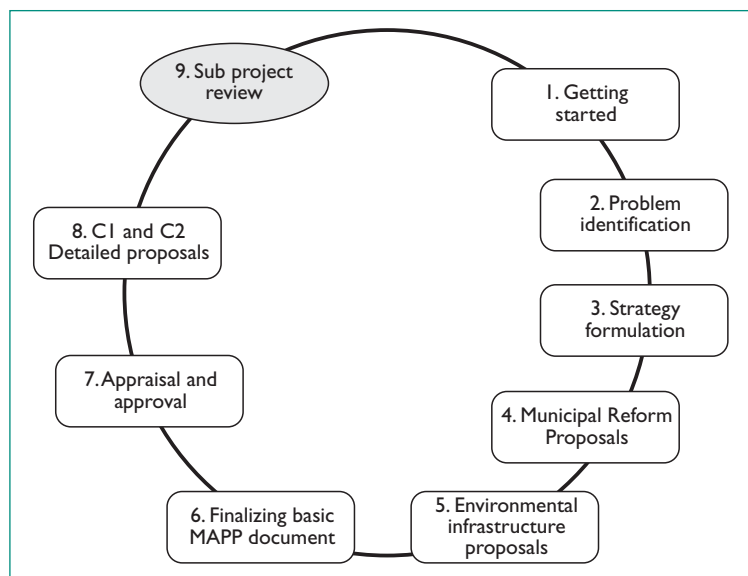


Figure 5.2

The basic MAPP process

Source: Dove, L. (2004) 'Providing environmental urban services to the poor in Andhra Pradesh: Developing strategic decision-making', *Environment and Urbanization*, vol. 16, no. 1, pp95–106.

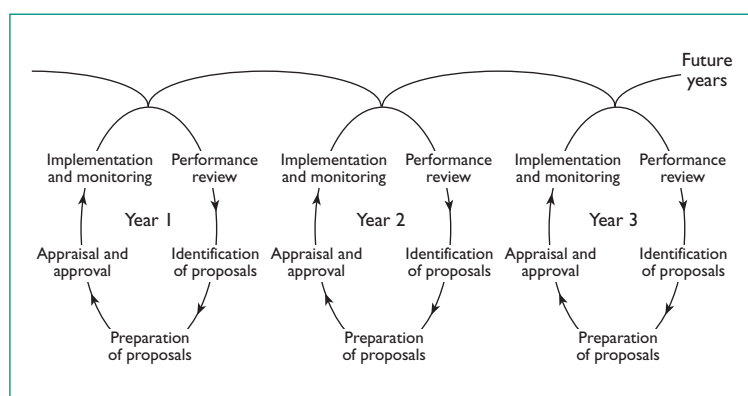
made to reduce costs. When urban poor groups can walk inside a life-size model, it makes it much easier for them to evaluate whether this design is appropriate to their needs.

Community exchanges are also important for supporting information generation. In all the federations there are many visits between community organizations so they can learn direct from each other. Most are between groups within a city – but groups also travel to other cities and smaller centres to see what has been accomplished and discuss how it was done. This has particular importance in allowing community organizations in one particular settlement or urban centre to evaluate whether they can learn and draw from the projects or innovations used by another group. For instance, in India, community exchanges were particularly important in spreading knowledge and learning about how community organizations can design, build

Figure 5.3

The full MAPP cycle

Source: Dove, L. (2004) 'Providing environmental urban services to the poor in Andhra Pradesh: Developing strategic decision-making', *Environment and Urbanization*, vol. 16, no. 1, pp95–106.



and manage community toilets and washing facilities. Many international exchanges have also taken place as those with long experience in supporting savings groups, undertaking enumerations and house modelling help develop this capacity in other nations. Many urban poor federations are now experimenting with the design, construction and management of public toilets and washing facilities after visiting the toilets constructed and managed by the federations in India.

MAPPING WITH MAPPS IN 32 MUNICIPALITIES IN ANDHRA PRADESH¹³

Maps developed by women living in settlements that had very inadequate or no formal provision for water and sanitation were an important part of a programme in Andhra Pradesh in India to improve urban services for the poor. This programme was implemented in 32 local authorities in the state, with support from the UK Government's Department for International Development (DFID). This programme sought to improve municipal performance (and increase revenues), to fund environmental services for the poor (including provision for water and sanitation) and to strengthen civil society organizations. In each municipality, it was supported by developing municipal action plans for the poor (MAPPs) in a process that sought to involve all stakeholders in identifying the problems and developing responses – see Figures 5.1 to 5.3. A review of six of these MAPPs, which included interviews with a wide range of stakeholders, found that relationships among stakeholders had improved, municipal accountability had increased and civil society groups were eager to take a greater role in decision making. Women's networks had grown, their skills had been enhanced and their input was acknowledged and appreciated by other stakeholders, even if there continue to be barriers to their participation.

Each MAPP included micro-planning for environmental infrastructure in poor communities, in which residents had central roles, led by representatives of women's groups, and facilitated by municipal staff. For most of the women involved, this was their first experience in micro-planning – and it was considered a great improvement over the usual top-down methods of identifying infrastructure needs. Part of the micro-planning involved the women drawing maps of their areas, identifying gaps in environmental infrastructure and prioritizing works to be undertaken within their settlement. The maps gave them a visual means of expressing their need for infrastructure improvements, including roads, drains, street lights and taps.

We got an opportunity to talk about our problems. We never opened up about our infrastructure problems before. Especially, women could not voice our problems like we do now. Before we were afraid to voice our problems in the open – now we have gained confidence as we are all involved, so now we talk without any fear. (Chitoor resident)

Before we did not know what was happening – whether they were laying roads or not. Even if we tried to enquire about such things, we did not know who to ask. Now we are making the decisions as to what is required where. We know the amounts of funds to be released. (Ananthapur resident)

In Qutubullapur, resident community volunteers stated that the community had become aware of their existing infrastructure and their requirements; they had become more active and the women had worked together, knowing that had they squabbled they might have ended up with nothing. In Kakinada, women said that they had been alerted to the functioning of the municipality by their involvement in micro-planning. A small minority of dissenting voices were heard, for example from one ward where the inhabitants did not get involved because they felt this was like other schemes, where promises are made but nothing gets done.



MAPPING INFORMAL SETTLEMENTS FOR WATER AND SANITATION: THE EXPERIENCE OF THE ORANGI PILOT PROJECT RESEARCH AND TRAINING INSTITUTE¹⁴

This section describes in some detail the mapping programme of the Orangi Pilot Project's Research and Training Institute (OPP-RTI) in Pakistan and the training programmes that support it. There are three reasons for giving this example some attention. First, it has produced over 1000 maps that provide the basis for improving and extending provision for water and sanitation in a great range of settlements, including small urban centres, and has helped catalyse and support such local action. Second, although this is an NGO initiative, it works with and supports local governments and other government agencies. Third, the techniques it uses for doing this are not costly and are easily transferable. The experience shows how the information gap evident in most small urban centres can be filled – by local governments or NGOs working with community organizations.

The Pakistan NGO Orangi Pilot Project is best known for demonstrating how community-managed sewers and drains can be installed in informal settlements in Karachi at a unit cost that the inhabitants can afford and for supporting this both in Orangi (a settlement with 1.2 million inhabitants) and in other settlements in Karachi. What is less well known is their work outside of Karachi, including supporting improved provision for water and sanitation in many smaller urban centres (as described in Chapter 4) and their work in generating the basic information needed for investment in any piped system for water, sanitation and drainage – which is described here. This mapping process not only produces the information needed to

improve and extend provision for water, sanitation and drainage in informal settlements. It can also be compiled to produce city-wide maps for city-wide systems of water, sewer and drainage mains and for identifying the most appropriate form and location of sewage treatment.

This section describes not only how OPP-RTI developed this capacity to map informal settlements, but also the repercussions this has had in terms of planning, operation and maintenance of water and sanitation infrastructure, NGO–local government partnerships and government policies regarding infrastructure projects and upgrading programmes. It includes some details of how this mapping first developed in Karachi before it expanded and extended to other cities and smaller urban centres. It also includes a box on mapping an informal settlement of 100,000 inhabitants that is within Karachi – but as noted earlier, the tools and methods used to map informal settlements of this size and the way they help underpin community investment and community–NGO–local government partnerships for water and sanitation has much of relevance to mapping smaller urban centres. The techniques used to map an informal settlement of 100,000 inhabitants within a large city are not much different from those needed to map an urban centre with a total population of 100,000 inhabitants.

Around 24 million urban dwellers in Pakistan live in informal settlements – some 9 million in *katchi abadis* and another 15 million in housing developed on informal subdivisions of agricultural land on urban peripheries. Both kinds of settlement lack provision for water and sanitation when first developed, but most manage to acquire or develop provision over time, along with electricity, gas and some form of social infrastructure. However, sewage invariably flows into cesspools or into the natural drainage system. Provision for infrastructure, including that for water and sanitation, is developed through *ad hoc* arrangements made by the residents or through small, usually unconnected projects implemented with funding from politi-

cians. Pakistan's urban areas require some 350,000 new housing units a year and only a third of this is met by the formal sector; the rest is accommodated in informal settlements. The OPP-RTI mapping programme was developed to provide the information needed for investment in water and sanitation (and other infrastructure).

Most urban centres in Pakistan have no capacity within their local government to develop the detailed, large-scale maps needed for planning and managing infrastructure investment in settlements. In addition, even in the larger urban centres where there is capacity, there has been little mapping of informal settlements – or the mapping is at a scale that is too small to be useful for infrastructure planning for the street/lane and neighbourhood. Planning departments for all districts in Pakistan are still relying on the aerial maps produced in 1969, although these have been updated and added to, as and when the need arises – for instance in the larger cities, planned settlements and some *katchi abadis* have been mapped. But no mapping has been done for the informal subdivisions that constitute the bulk of informal settlements that need to be integrated into urban infrastructure plans. Water and sewage agencies, electricity and gas companies use available maps or make maps (or hire consultants to make them) for the areas into which they are extending their services. There is no standard scale to these maps so they seldom relate to each other. No urban area in Pakistan has a proper map and all the agencies interviewed feel that a proper map that could regularly be upgraded is the most important requirement for planning purposes.¹⁵

Detailed maps are needed, not only to support investment but also to document in detail the infrastructure investments already made by households and community organizations. In informal settlements, communities organize to lay sewerage lines to the nearest drainage channels, depressions and water bodies and they tap existing government water lines and extend them informally to their settlements. Much of this is actually government funded but

not through any coordinated investment plan but in an *ad hoc* manner through the funds that are allocated to and managed by members of national and provincial assemblies. Much of the past investment was also provided by similar funds that used to be managed by ward councillors. Some of these investments are of reasonably good quality and much of it can be rehabilitated and integrated into overall neighbourhood, district and urban centre-wide infrastructure planning – but these investments are ignored when plans for upgrading informal settlements are developed.

Mapping and estimates for the cost of the work are a very important part of the low-cost sanitation programmes that OPP-RTI supports. The technical assistance provided by the OPP-RTI has consisted of providing communities with plans and maps, estimates of labour and material, tools, training for carrying out the work and supervision of work. OPP-RTI's research has developed new standards, techniques and tools of construction that are compatible with what poor communities can afford and community involvement in construction.

The methodology of the OPP-RTI's low-cost sanitation programme system consists of:

- Holding meetings to mobilize people at the lane level to form an organization for building their underground lane sewer.
- Once the organization is formed, it elects, selects or nominates a lane manager who applies to the OPP-RTI for technical assistance and managerial guidance.
- On receiving the application, the OPP-RTI survey team visit and survey the lane and establish benchmarks.
- Back at the OPP-RTI office, a map of the lane is prepared giving the position of the manholes (along with their details and invert levels), diameter and joint details of the pipes, and the disposal point that is inevitably a natural drainage channel.¹⁶ The lane manager and the lane committee

collect money from the people and organize the work.

Initially, a draftsman, a surveyor and an adviser (who was a teacher at the local polytechnic) were employed for the map-making process that centred around each particular lane. However, soon requests were received from lanes that were far from the natural drains and the only way they could connect to the natural drainage system was through collector sewers. For this to happen a settlement-wide plan was needed so a drainage master plan could be developed and within which the lane and collector sewers could be accommodated.

An external adviser to the project suggested in 1983 that a surveying company should be hired to document the Orangi settlements and to prepare the plan. However, OPP decided to get students from the Department of Civil Engineering at the university and from the Architecture Department at the Dawood College to document the settlements. There were two reasons for this. First, the concept of community participation in urban planning and infrastructure development would be introduced to these academic institutions and so encourage their involvement with such programmes and lead to changes in their curriculum. Second, it was felt that if 30 to 40 students would move across the settlement where they worked at that time (Orangi), accompanied by activists and OPP's social organizers, discussions and debates on the sanitation system and on the need to develop collector sewers would take place and as a result people's involvement in the process of developing a sanitation system for the whole settlement would increase.

The first step for documenting the settlements was to acquire whatever plans were available from aerial surveys and from the local (municipal) government. These plans were on different scales and were incomplete since the settlements had expanded far beyond the limits marked on the maps. Also, the plans had no contours, levels or land uses marked on them,

Box 5.3 Mapping Manzoor Colony in Pakistan

Manzoor Colony is an informal settlement with 100,000 inhabitants, living in about 20,000 houses. The Manzoor Colony community organizations contacted the OPP because they wanted to replicate the OPP-RTI sanitation programme. Through a process of training and supporting local activists and technicians, maps for the settlement were developed along with plans and estimates for an underground sanitation system that drained into a natural drain. Separate estimates were prepared for each collector drain and each lane. All surveying was done through plane table by equipment supplied by the OPP-RTI.

The survey of the settlement was carried out by two teams working together. The first consisted of OPP-RTI staff that took levels and trained a local person associated with them in the process. The second was of representatives of the Manzoor Colony community-based organizations (CBOs) who measured the lengths of the streets and counted the houses in each lane. Joint field inspections were carried out and possible sewage disposal points were identified. Regular visits of the CBO activists and technicians were arranged to the OPP-RTI and Orangi settlements where they met with people, similar to themselves, who had built their sanitation systems and were maintaining them. In the process, the community got to learn about designing a sanitation system and the reading of maps and preparation of estimates.

On the basis of these maps the community organizations contacted their councillor and asked him to fund the construction of the collector sewers. This was the first community–councillor

dialogue in which the community was asking the councillor for funding for a specific programme that they had designed and costed. The negotiations failed and the communities funded the collector sewers themselves. They informed the mayor of Karachi that the Karachi Municipal Corporation (KMC) should take over the maintenance of the sewage system that the community had constructed. The corporation refused saying that they did not have funds or staff for this purpose. As a result, the community organizations contacted the provincial ombudsman and after a number of hearings, the ombudsman gave his verdicts in favour of Manzoor Colony and instructed that the Karachi Water and Sewerage Board should take charge of the maintenance of sewerage lines laid by the people. The Manzoor Colony case was pleaded by a community activist and members of the Manzoor Colony community organizations water and sewerage committee. No professional lawyer was hired. In all these negotiations and hearings, the maps of the settlement were presented as evidence and substantiated the point of view of the Manzoor Colony CBOs. These maps were later utilized for the lease and regularization negotiations that were successfully negotiated by the Manzoor Colony CBOs with the KMC. They were also utilized for negotiating a deduction in the lease and development charges that individual houses have to pay for acquiring ownership papers. A deduction to the extent of the amount households have spent on sanitation was demanded by the residents.

although the natural drainage system was clearly marked.

Students were trained to conduct ‘walk-through’ surveys. They walked along the lanes in groups of two or three with an area activist and/or an OPP social organizer. They identified and marked the direction of the slope of the lane or road, land use along it, existing infrastructure (usually open drains built by funds provided by the councillors) and marked the extensions to the existing settlements. The extensions were marked not by accurate measurement but by ‘steps’ – although they were accurate enough for preparing a master plan. Once lanes in the extension areas applied for assistance, accurate dimensions were included.

One element was maps prepared for each local politician. At this time, Orangi was divided into 15 councillors’ wards or circles and each councillor had funds that could be spent on some of the ‘external’ work – the collector sewers.

Each councillor received a handbook of maps showing the natural drainage system, existing infrastructure and proposed collector sewers to which lanes could connect, as well as major landmarks and social facilities. Estimates were provided on request to the councillors for the proposed collector sewers. Community organizations and lane residents were informed about these handbooks and about the fact that their councillors had them – and as a result, people started pressurizing their ward councillors to support the building of collector sewers to the OPP design and estimates. Three councillors collaborated with the OPP and in the other wards people formed a confederation of lanes, collected money and built the collector sewers themselves. In the process, a map for the whole of Orangi to a single scale was prepared for the first time – and this had details of all the lane and collector sewers that had been built. This map is to a scale of 1:6000. This map marked on

it all the infrastructure built by people, trunk sewers built by local government and open paved drains built by the Karachi Municipal Corporation. The map has continuously been updated since 1984.¹⁷

This mapping process was carried out by university and college students and the OPP social organizers and community activists under the supervision of the OPP Sanitation Director and her technical team of three people. Many of the social organizers learned the technical skills needed to support this process.¹⁸ A number of students who participated in this process later became involved as teachers, consultants and employees in organizations related to informal settlement upgrading and community participation programmes.

Between 1985 and 1988, a number of communities outside of Orangi applied for assistance from the OPP for replicating the sanitation programme. Attempts to do this were made in three settlements but these were unsuccessful; it could not be done without strong local community organizations (or activists who could create them). In addition, for the replication to be sustainable, mapping, surveying, documentation and monitoring skills had to be available in the community. It was realized that these skills would only develop through training local activists and technicians. This was one of the reasons why in 1988 the OPP-RTI was created.

One example of how the capacity to map was developed outside of Orangi is Manzoor Colony (see Box 5.3). This is also an interesting example of how the maps they prepared were used in negotiations with their local politician and with government agencies for land tenure and for maintaining the sanitation system they built themselves.

In 1991, the OPP office shifted from Orangi to the neighbouring settlements of Qasba – and extended its programme there. The first step was to document the Qasba settlements. Local high school students and school-educated young people were recruited to work on this and

trained by the OPP technical team both in the office and in the field. Each received a small daily stipend. Maps of Qasba were acquired from the local government and updated. The equivalent of US\$2330 was provided by the international funding agency Servicio Latinoamericano y Asiatico de Vivienda Popular (SELAVIP) to document 10 *katchi abadis*, but instead 50 *katchi abadis* were documented with this support and in the process a number of young men from these settlements became associated with the OPP-RTI programmes. The documentation of the Qasba *katchi abadis* consisted of identifying existing infrastructure, schools, clinics, sewage disposal points, building component manufacturing yards, slope of the land, a number of houses, and the investment made by people and government in infrastructure development. Again, this emphasized the scale of the investments made by people in seeking to improve the physical and social environment of their settlements.

The Youth Training Programme

After the documentation of 50 *katchi abadis*, the OPP-RTI recognized the need for a much wider documentation of informal settlements and *katchi abadis*. At first, the focus was on Karachi to establish contacts with activists and CBOs outside of Orangi and give a larger base to its community and advocacy work. It would also train people in informal settlements to help in the replication of the OPP-RTI's programmes. OPP-RTI had also become a consultant to the Sindh Katchi Abadi Authority (SKAA), a government institution in charge of regularizing and improving *katchi abadis* in the province of Sindh, where Karachi is located. SKAA has accepted the OPP-RTI's 'internal-external' concept and requested OPP-RTI to train its staff in the OPP-RTI methodology. Surveys of *katchi abadis* to document existing infrastructure were also required to facilitate SKAA's work.

As a result, in 1994, the Youth Training Programme was initiated. The students at the programme are matric and/or intermediate (10

Box 5.4 *Katchi abadi* documentation format**Overall statistics of surveyed *katchi abadis***

- Abstract;
- analysis;
- detail statistics:
 - sewage lines;
 - water supply lines;
 - clinics, schools and *thallas*.

Photographs**Location**

- Map of city showing location of *katchi abadis*;
- list of *katchi abadis* surveyed.

Individual *katchi abadi* information and maps

- Map showing location of Karachi;
- map showing the immediate neighbourhood of the *katchi abadi*;
- statistics of 'internal' and 'external' development:
 - people's efforts (sewage and water);
 - government's efforts (sewage and water);
 - number of government and private schools, clinics and *thallas*;
- maps (separate for each item) showing:
 - people- and government-laid sewage lines and their direction and disposal points;
 - people- and government-laid water lines and their direction and source;
 - private and government-built clinics, schools, and *thallas* and mosques.

and 12 grade) and most are also studying in schools and colleges. Training is provided for sanitation and the main focus is on surveying, drafting, documentation, levelling, designing and estimation. In addition, training is provided to community activists – with the focus being on estimation, construction, on-site supervision and community mobilization. Training has also been provided in housing so as to produce para-architects.

The students are taught through both theory and by mapping and documenting *katchi abadis*. Initially, they went to the field with an OPP-RTI technical staff member. However, over time the older students started to guide the new ones. Teams now consist of one senior and one junior member. They go out and document physical and social infrastructure in the *katchi abadis*

and identify the slope of the land; they also document the *nalas* (natural drains) into which sewage discharges. In the *nalas* they document slopes, widths, encroachments on them and major sewage and storm water inlets into them.

Initially, whoever applied for training in this programme was given a three-month probation period during which they were given a daily stipend rather than a regular salary – but this resulted in a large drop-out rate. Now the Technical Training Resource Centre runs a 26-day training programme for applicants and those who are successful in this become students of the Youth Training Programme. To date, over 100 youths have been trained. Around half of the trainees are full time and receive a monthly salary equivalent to US\$37–42; the rest are part time because they are either studying or working and are paid the equivalent of US\$29 per month. Almost all of those who are studying say that they have been able to continue to study because of the income provided by this programme.

To date, OPP-RTI and its Youth Training Programme have completed the documentation of sanitation, water supply, clinics, schools and *thallas* (building component manufacturing yards) in 359 *katchi abadis*, and 89 natural drains. The documentation of these *katchi abadis* has been digitized and results, along with detailed maps of 100 *katchi abadis*, have been published. The documentation of an additional 100 *katchi abadis* is in the press. As a result, a computerized mapping unit is now functioning and two trained persons from the Youth Training Programme are part of the unit. The format of the documentation is given in Box 5.4.

One key part of this mapping is to document existing investments. For instance, the mapping of informal settlements in Karachi has shown that 62 per cent of the lanes have sewage disposal facilities and 50 per cent have water lines, both laid on a self-help basis. The equivalent of US\$5.6 million has been invested by the people in this work. Government investment has also been made for sanitation and water supply

but most of their work is on main sewers, drains and water mains. The survey results show that the internal–external concept of the OPP-RTI has been followed in an unplanned manner by the government and the communities. Furthermore, 1041 clinics and 773 schools have been set up by entrepreneurs and/or charities in these settlements as compared to 12 government clinics and 143 government schools.¹⁹

Repercussions of this mapping process

The setting up of the Youth Training Programme and the mapping process had a number of repercussions on policy issues related to infrastructure and *katchi abadi* upgrading, planning concepts in local government and community-managed development work:

- Documenting of *katchi abadis* showed people’s involvement and investment in development. As a result, planning agencies and local government have realized the need to support this work rather than duplicate it or simply go out and build schools (often without teachers), clinics (often without paramedics) and water and sanitation systems that are not properly designed, maintained and operated.
- People in communities were trained in skills and knowledge that communities require to establish a more equitable relationship with government agencies, improve their settlements and build local institutions.
- The documentation lays the basis for questioning the planning policies and development projects of governments and international finance institutions and for promoting viable alternatives based on a sound knowledge of ground realities that government agencies and their foreign consultants do not have, and nor do they possess the skills to develop this understanding.

The documentation process has also meant that OPP-RTI’s advice is sought at the national, provincial and city level in all matters related to sewage and *katchi abadi* upgrading. One example of this is the work of the Sindh Katchi Abadi Authority, whose work and finances have been transformed by following the OPP-RTI methodology for upgrading *katchi abadis*. This consisted of documenting and integrating community- and KMC-councillor funded infrastructure into an overall plan for each *katchi abadi*. It was also decided that SKAA would only build ‘external development’ and leave the building of the ‘internal development’ to communities. OPP has worked in 31 informal settlements with SKAA.

OPP-RTI’s work as consultant to SKAA has consisted of:

- Documenting existing sanitation and water supply in the settlements and identification of external sanitation and water supply projects. Community activists assist the OPP-RTI and SKAA teams in both these activities.
- Preparation of detail design and estimates by SKAA engineers and review of these by OPP-RTI.
- Approval of the project by community members before finalization.
- Financing and contracting of external development is arranged by SKAA either by conventional contracting or through departmental work.²⁰
- Supervision of work by SKAA engineers and its monitoring by OPP-RTI and community activists (guided by OPP-RTI).
- On completion, checking of the infrastructure through tests and, if approved by the community, issuing of a ‘no objection’ certificate by the community and OPP-RTI before final payment to the contractors.

The most important aspect of this work is the documentation of the *katchi abadis* leading to the identification for external development and an overall plan that integrates existing infrastruc-

ture. This work was done by the Youth Training Programme under OPP-RTI supervision. As a result of this work, SKAA, which had previously been dependent on external (Asian Development Bank) funding, has become solvent and now has considerable surplus funds derived through lease charges from the communities it has partnered with.²¹

OPP-RTI partner CBOs and NGOs outside of Karachi have also developed expertise in mapping – with support from OPP-RTI. The strategy used has developed over time and consists of:

- CBO/NGO or community activists contact the OPP-RTI for support;
 - OPP-RTI invites them for orientation to the OPP-RTI office in Karachi or directs them to one of its partners;
 - after orientation CBO/activists convince their community to adopt the programme;
 - they create a team of a social organizer and a technical person who are trained at the OPP-RTI and/or on-site in their settlements through visits by the OPP-RTI staff;
 - the training is in surveying, mapping, estimating, construction supervision, documentation and accounts;
 - training does not have a specific period but continues throughout the life of the project;
 - OPP-RTI arranges financial support for the team and related expenses drawing on support from the UK charity, WaterAid. Initially, it is around US\$3500 per year.
- Invariably the CBO/NGO comes into contact with local government departments as its work expands. When that happens local government representatives are invited to the OPP-RTI for orientation. If they are convinced, they send their staff for training. Neighbouring settlements and sometimes even villages and local governments of neighbouring towns contact the CBO/NGO for replicating their programme. Some of the results of this strategy are:
- Anjuman Samaji Behbood (ASB) is a Faisalabad CBO that has been replicating the OPP-RTI programmes. It has collected all available maps of Faisalabad city, documentation of main disposals and main and secondary sewers. In addition, it has related its own mapping of neighbourhoods where it has worked to these maps. It has also acquired knowledge of geographic information systems (GIS) mapping and has supported Jaranwala Town in acquiring satellite imagery, digitizing it and establishing a GIS base. Similar support is being given to Chiniot Town. ASB is visited by CBOs, NGOs and staff of local government agencies for training and orientation.
 - The Lodhran Pilot Project is an NGO working in partnership with the local government of Lodhran Town. With support of consultants they have developed a complete plane table survey of the town on the basis of which they have developed a sewage and water supply master plan. They have extended their services to five nearby towns and completed sewage schemes in 12 neighbouring villages. They have, with the support of local communities, prepared maps for all these projects. They are flooded with requests and are attracting training groups from various government and NGO agencies.
 - The Conservation and Rehabilitation Centre (CRC), Lahore, has a project of conservation of historic monuments in Uch Sharif, a small, historic urban centre in southern Punjab. CRC was interested in providing better infrastructure and asked the OPP-RTI for help, and a replication project was established (see Chapter 4 for more details). The CRC team trained six young members from the community in plane table survey and computer mapping. They have prepared sewage and drainage master plans and maps of the city, on the basis of which government is building external development and the people are building internal development.

- Plane table expertise has also been established in seven other CBOs outside of Karachi and, in the case of Rawalpindi city, it has led to collaboration between the Asian Development Bank (which is preparing an environmental project) and the local OPP-RTI partner, the Akhtar Hameed Khan Memorial Trust.
- The OPP-RTI mapping methodology has also been transferred to the Punjab Katchi Abadi and Urban Improvement Directorate (a government of Punjab agency in charge of regularizing and improving *katchi abadis* in the Punjab province) and the NGOs and CBOs working in collaboration with it.

The OPP-RTI now has more than a thousand maps of *katchi abadis* and other settlements in Karachi and other cities and smaller urban centres, as well as many maps prepared by federal, provincial and local governments in the cities and smaller urban centres where it and its partners have worked. A programme to digitize all these maps has begun, both for maps that are related to the OPP-RTI's work and for maps that are unrelated to its work but that can be of great value to CBOs, NGOs and government agencies. A very large volume of unrelated maps are available for the second arrangement and they will keep on increasing. OPP-RTI hopes to set up an autonomous mapping unit to work with the latter maps.



MONITORING PROVISION FOR WATER AND SANITATION WITHIN A NATION

What is an indicator?

The purpose of an indicator for water and sanitation is relatively simple: to collect information that has relevance to what is sought, when what is sought cannot be measured directly. For instance, for water, what is sought is for all individuals to have safe, easy access to uncontaminated water for all uses at a cost that is easily

Box 5.5 Key Considerations for Determining Indicators

To be successful in their role as a proxy for measuring the parameter of interest, indicators must be:

- **Comprehensive:** represent all important concerns that have a statistical relevance; an ad-hoc collection of indicators that just seem relevant is not adequate.
- **Concise:** the number of indicators should be kept to as few as necessary since collecting extra information that does not change the statistical outcome is a waste of resources.
- **Appropriate:** express as precisely as achievable the level of actual performance attained i.e. represent reality as accurately as a surrogate is able to in the absence of being able to assess the actual measure of interest directly.
- **Policy relevant:** generate the information needed to be able to monitor progress towards agreed targets and objectives.
- **Clearly defined:** as such indicators will be unambiguous, understandable, practical and reproducible; they should also be objective in order to avoid introduction of personal or subjective appraisal during measurement.
- **Verifiable:** ability to cross-check data with other sources, scientific where possible.
- **Easily measurable:** not only straightforward to understand, but also easily measured, at a reasonable cost.
- **Acceptable:** since indicators need to guide policies and decisions at all levels of society from village, town or city through district or region/province to national and global.
- **Developed with participation:** to ensure that the chosen set of indicators encompasses the visions and values of the community or region for which it was developed.

Source: Adapted from Bostoan, K. (2005) *Monitoring of Water Supply Coverage*, WELL Fact Sheets; ISO (2005) *Service Activities Relating to Drinking Water Supply Systems and Wastewater Systems: Quality Criteria and Performance Indicators*, Committee Draft ISO/CD24510; and Redaud, J. L. (2005) 'Improving governance in water services, a world-wide challenge', www.pacinst.org/innii/WATER/ISOTC224Description.pdf

afforded and with good provision for safe disposal of water, once used. But this is not easily measured. There is a need for an indicator that is more easily measured that serves as a proxy. Every indicator needs to fulfil a set of criteria to present an appropriate approximation to the measure of interest. These criteria (such as the indicator being comprehensive, concise and acceptable) are outlined in Box 5.5.

Progress indicators are a compromise between the *policy* that aims for a certain progress, the *welfare* that is the policy's ultimate goal, and the *feasibility* of the measurement of such progress. An indicator that does not take into account these three factors is less likely to be effective in its role – although obviously policies should not be restricted by the feasibility of measurement.

Both the definition of indicators for water and sanitation and their actual measurement will inevitably be subject to political pressures. Both governments and international agencies will want to demonstrate their achievements in improving and extending provision. This means careful attention is needed to ensure an appropriate baseline (from which progress can be made) and appropriate definitions (so the ‘improvements’ shown by the monitoring system are real).

Setting and monitoring policy goals

Virtually all governments have made explicit commitments to improving provision for water and sanitation. So too have most international agencies. The MDGs on water and sanitation²² are just one among many such commitments made over the last 30 years – but they have particular importance in that virtually all governments and international agencies have committed themselves to achieving these goals. At present, these are certainly the international water and sanitation goals that have the greatest influence on policy and resource allocation decisions.

But these goals are vague. For instance, the water and sanitation targets within the MDGs come under Goal 7, which is about ensuring environmental sustainability.²³ But provision for water and sanitation is much more about meeting needs than it is about ensuring environmental sustainability, even if such provision needs to be planned with attention to environmental issues. The wording of the targets is simple – but not very specific. For instance, Target 10 is to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. But what constitutes ‘basic’ sanitation? Even if this can be defined, is there information available to allow this to be measured? What does sustainable access to safe drinking water actually mean? Does having to queue for half an hour to get water from a standpipe and carry the water 120 metres back to the home constitute ‘access’? What about all the water needs that are not to

do with drinking – such as for laundry, house cleaning, food preparation, washing up and bathing/personal hygiene? In the indicators proposed for monitoring provision, the language has changed from ‘safe’ drinking water and ‘basic’ sanitation to ‘improved’ provision. Indicator 30 is the proportion of people with sustainable access to an *improved* water source²⁴ – but how is an ‘improved’ water source to be defined in ways for which data is available or can be collected? The same question can be asked for Indicator 31, the proportion of people with access to *improved* sanitation.²⁵ For slum upgrading, what kinds of provision for water and sanitation would constitute a ‘significant’ improvement? The translation of these broad and general goals into action and monitoring requires more precise definitions than are evident in their wording. And of course, these definitions are constrained by what data are already collected or can be collected.

In addition, some governments have made much more specific commitments than the MDG goals, including recognizing their citizens’ right to water within national legislation and policy statements.²⁶ Almost all governments have also committed themselves to recognizing this within international declarations. For instance, in the run-up to the World Water Forum in Kyoto in 2003, the UN Committee on Economic, Social and Cultural Rights published *General Comment 15: The Right to Water*,²⁷ which aimed to regroup the various treaties relating to health more specifically around water issues. The addition to Article 12 of the International Covenant on Economic, Social and Cultural Rights²⁸ in fact accepts the Vision 21 definition and affirms that: ‘The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses’.²⁹ It further specifies that water must be:

- sufficiently and continuously *available*;
- of suitable chemical and biological *quality*, as well as aesthetically acceptable;

- *accessible* both physically and economically, and in a non-discriminatory manner.

This is much more specific than the MDGs and their goals – although it is notable that these international texts give much less or even no attention to sanitation and hygiene behaviour. In addition, while the treaties and conventions themselves are legally binding for those countries that ratify them, additions such as General Comment 15 are not. Thus, there are virtually no enforcement mechanisms to ensure the adoption of national laws protecting the rights to specific standards in water and sanitation services for the population.³⁰

The task of monitoring the extent to which the water and sanitation MDGs are being fulfilled has been given to the Joint Monitoring Programme for Water Supply and Sanitation (JMP), a WHO–UNICEF collaboration. This programme has published a series of reports – for instance in 1993, 1996, 2000 and 2004. So far, the JMP has depended on existing data, especially the nationally representative DHSs (Demographic and Health Surveys), the MICSSs (Multiple Indicator Cluster Surveys), national censuses, World Health Surveys, LSMSs (Living Standard Measurement Surveys), CWIQs (Core Welfare Indicator Questionnaires) and Health and Nutrition Surveys. The JMP database currently holds data from more than 500 of such surveys and censuses, the bulk of which cover low- and middle-income countries. The need to define what constitutes sustainable access, safe drinking water and basic sanitation in a way that could be measured using existing data led to the classification by the JMP of ‘improved’ drinking water sources and ‘improved’ sanitation facilities as used in the MDG indicators 30 and 31. This illustrates a key consideration for any indicator, namely that it can be unambiguously measured to provide an approximation of reality that is as accurate as possible.

The JMP would prefer to measure what proportion of people have ‘safe’ and ‘sufficient’ water from sources that are sustainable, but data on this are not available and very costly to

collect on the scale needed for monitoring progress towards the MDGs. The use of indicators that only approximate what needs to be measured is often the only practical or affordable alternative. The indicators of the MDG target consider that improved technologies, by nature of their design, provide ‘safe’ water and ‘adequate’ basic sanitation. This is discussed in more detail below.

Measuring and monitoring welfare

Since the main justification for governments’ and international agencies’ greater attention to water and sanitation is the health benefits they should provide, it might be assumed that monitoring health status would be a good way to monitor progress on water and sanitation provision. The MDGs also recognize this, setting very specific goals for reducing child and maternal mortality rates and for reducing the prevalence of major diseases. And as the first *Global Report on Water and Sanitation* described in detail, water-related diseases constitute a large part of the preventable disease burden in low- and most middle-income nations. For instance, diarrhoeal diseases are responsible for 2.5 million deaths each year, most among children under five years old.³¹ But there are no information systems in place in most nations that monitor the prevalence of diarrhoeal diseases and other water-related diseases and their health impacts.

Our knowledge of the health impacts of water and sanitation interventions has been built up from many different studies. Much is known about the individual pathways that produce health benefits but it is difficult to know their relative importance in relation to the many other factors that influence health.³² Even for individual water and sanitation projects, it is rare for any attention to be given to measuring their impact on the health of those to whom provision is extended or improved – and it is also difficult to measure. For instance, to assign an observed health impact to one particular intervention (for example a particular ‘improved’ latrine design), it must be possible to rule out or account for all

other factors that may also influence the same health outcome. For water and sanitation this cannot even be achieved under ideal research trial conditions and is further complicated by the nature of the main health outcome of interest, diarrhoea. Diarrhoea is caused by a wide variety of disease-causing agents (pathogens) transmitted by numerous different routes – including contaminated water, food and personal contact. It is also influenced by factors such as nutrition and education – and by seasonal variations in temperature and water availability. If a health impact is measured, it is very difficult to assign it unequivocally to specific improvements in provision for water and/or sanitation. In addition, evaluations of health impact alone have no diagnostic power: if a reduction in disease is found, it is not possible to say how this was achieved or how this could be replicated in the future. And if no disease reduction occurred, it does not provide useful information of what went wrong.

The key goals for water and sanitation quite rightly are to provide ‘safe’ and ‘sufficient’ water and ‘adequate’ sanitation – which implies that these eliminate or greatly reduce the health impacts of ‘unsafe’ water and ‘inadequate’ sanitation. But as noted already, the data commonly collected on provision for water and sanitation by national governments and international agencies are not detailed enough to be able to say who has ‘safe’ water and ‘adequate’ sanitation. This is why the JMP is so careful to state that its figures for provision for water and sanitation are not for ‘safe’ water and ‘adequate’ sanitation but only for ‘improved’ provision. For non-specialists, this concern for the difference between ‘improved’ and ‘safe’ or ‘adequate’ might be considered of little relevance. But actually, it is one of the central issues that needs to be understood if the MDG targets are to be met. At present, there is no monitoring in most low- and middle-income nations that can say what proportion of the population has access to ‘safe’ drinking water and ‘adequate’ sanitation. In effect, the policy goals are well ahead of the

capacity to monitor their achievement. It must also be recognized that it is very difficult to ascertain this, until the point when there is a capacity to provide piped water services 24 hours per day and ensure there are hygienic, easily maintained toilets within each dwelling.³³

Instead of seeking measures of disease rates or burdens as an indicator of provision for water and sanitation, measures are needed of the facility and of other ‘links in the chain’.³⁴ This means that more details of use should also be measured (namely, who is using the facility and how?) since these greatly influence levels of access and consequently the health benefits that a water- and sanitation-related service or facility provides.³⁵ This is discussed in more detail below.

Two other aspects of provision deserve attention: dignity and time. The word dignity is widely used in the water and sanitation sector as well as in broader discussions of development and human rights. Its relevance is obvious in the indignity for men, women and children of not having facilities for washing, defecation and personal hygiene that provide privacy. This indignity is perhaps most extreme for the hundreds of millions of urban dwellers who have to defecate in public places – but it is also evident in the lack of privacy for this within homes, schools and public water and sanitation facilities. It is an issue so often raised by women who have to rely on communal or public standpipes and toilets.³⁶ It raises many other issues – for instance the sexual harassment of women and the extent to which people resort to open defecation or defecation into waste materials (‘wrap and throw’) because of the lack of privacy or insecurity in public or communal facilities. But while it is easy to understand the indignity, it is difficult to define an unambiguous, objective and easily collected indicator on this. But even if this is an issue that is not easily incorporated into national surveys, it is an issue that local service providers should seek to address.

In regard to time, various studies have shown that the time saved by women not having

to travel long distances or wait in queues – to which intermittent water supplies or sources with a low flow rate often contribute – can translate into a number of direct and indirect health benefits, including the greater quantity of water collected and consumed for domestic and personal hygiene.³⁷ Evaluation of a community water management project in the informal settlements of Dhaka highlighted numerous welfare benefits of time savings due to availability and ‘ownership’ of a water point nearer to the household. Female participants reported that they had more time for other household work, there were no longer quarrels regarding ownership of water (compared to the previous practice of using illegal water points further away in the settlement) or harassment by the water lords, and they felt more secure when collecting water.³⁸ So water collection time provides a useful and accurate indicator of water consumption and the subsequent direct and indirect welfare benefits; as such it provides key information relating to a more comprehensive definition of access.

Feasibility

The main methods available to measure water supply and sanitation issues are structured questionnaires or surveys and observations (either spot checks or longer, structured observations). Each of these has its own strengths and limitations when considering the nature of data that can be collected and the logistics required.

Questionnaire surveys, through fixed wording and order of questions, have the advantage of collecting information in a consistent manner that enables quantitative figures to be calculated and analysed. Not only is this easier for policy implementers to act upon and allows comparison between different survey locations, it can be collected relatively rapidly and at reasonable cost. However, while household surveys are a relatively cost-effective instrument to obtain nationally representative data, they become more costly when used for representative samples for individual provinces, districts or urban centres as the sample sizes greatly

increase. A nationally, regionally or even city-wide representative sample still does not identify which settlements, neighbourhood or lanes do or do not have adequate provision. They inform policy as to the scale of the inadequacies in provision but do not show where they are. They also do not provide the kind of household-level data needed by water and sanitation providers.

One of the major limitations of questionnaires, particularly relating to sensitive topics such as those surrounding defecation and hygiene practices, is that respondents may report what they think the interviewer wants to hear rather than actual practice.³⁹ Thus they are more useful for certain questions and topics than others. Spot or structured observations overcome this to some degree by either directly observing practices as they occur in normal daily life (as is the case in structured observations where the observer remains in the household for a number of hours) or by using quicker proxy observations to ascertain, for instance, use and cleanliness of a latrine (spot check observations). Structured observations clearly have the cost constraints related to the length of time they need for those undertaking the survey, especially if data are wanted from a large proportion of a population. The increase in accuracy that a larger sample achieves may not be worth the increase in time and cost it implies. Spot observations, on the other hand, can be done much more quickly as a checklist after survey questions to supplement and verify the information gathered.

Pocket voting, which enables respondents to vote anonymously on a particular water and sanitation topic without worrying about judgement by the interviewer or fellow participants, is another method that attempts to overcome problems of reported behaviour. However, this may also be too time consuming for a large-scale study and is likely to be of greater use in small-scale data collection. But this also requires particular care where much of the population cannot read. Pockets for voting almost always have pictures, drawings or pictograms but these

are difficult as well because they can be interpreted in various ways. Good interviewer skills are required.

Participatory techniques such as focus group discussions are extremely useful to gain deeper insight into particular issues affecting a community. However, since the information generated is qualitative in nature it is harder to report in a standardized manner or compare with information from other locations in anything more than a descriptive manner.⁴⁰ For this reason, it is of more use in determining problems and areas for attention at the local level than for national reporting of progress.

Thus, the way in which an indicator can be measured also needs to be considered when deciding whether it is appropriate or not (see Box 5.5). For example, can it be measured using questionnaire-based survey data, or does it need direct observation? For data collection for representative national samples, most attention is generally given to household questionnaires.

Questionnaires collect data for households. The rationale behind this is that individuals are more mobile and so more difficult to find if not linked to a dwelling. In addition, many questions regarding water and sanitation (by and large) apply at the household level, for example water source. However, collecting information at the household level means that important issues such as equity of access within households – for instance by gender and age and provision for those with disability – is lost. It is possible to include such information but it also makes the survey technically (statistically) harder to handle and analyse.

This focus on the household can also mean particular difficulties collecting relevant data from those who do not own the dwelling – including tenants, boarders and sharers. For instance, in many informal settlements, there are many single (mostly male) individuals who rent accommodation and share it with several others or who live in cheap boarding houses. In many urban settings, it is also common for a proportion of low-income groups to sleep at their workplace

and for sizeable numbers of people to sleep rough – in open spaces, streets and public places.⁴¹ The documentation of the extent of this is mostly from large cities and it is likely that the proportion of those in such accommodation or homeless is generally higher in larger cities – although some case studies point to its importance in smaller urban centres.⁴² So a focus on household surveys with an assumption that questions asked to one household member will represent conditions for all those living there can miss a significant section of the population – including a section that has particular difficulty accessing water and sanitation. Collecting information through household surveys in many informal settlements also faces the problem of high levels of non-response as so many people are rarely at home, as they work from dawn to dusk every day.

Also, public places and services such as communal latrines or public taps cannot be evaluated by household surveys. Since in many urban settlements these form the vast majority of water and sanitation services, and as Chapter 3 showed, perhaps especially in small urban centres, systematic source surveys are also needed. For certain aspects relating to access to water and sanitation, such as the reliability of water sources and the number of beneficiaries per source, the water source should become the basic sampling unit.

Such surveys often use GIS and have been implemented by various organizations such as WaterAid⁴³ and UNDP. The methods are complementary to the household survey discussed here and can help to capture a larger part of a complex reality. However, as noted earlier, GIS have their limitations, especially in regard to producing the basis for action on the ground.

Using household surveys to measure provision for water and sanitation within a nation and monitoring how it changes over time means that only a representative sample of households can be covered. It would be very expensive to cover all households. But it is possible to get accurate figures for national populations, as long as a

Table 5.2

Classification of water sources and sanitation facilities as 'improved' or 'not improved'

	Drinking water source	Sanitation facility
Improved	Piped water into dwelling, yard or plot Public tap/standpipe Tubewell/borehole Protected dug well Protected spring Rainwater collection Bottled water*	Flush/pour-flush to piped sewer system, septic tank or pit (latrine) Ventilated improved pit latrine Pit latrine with slab Composting toilet
Not improved	Unprotected dug well Unprotected spring Cart with small tank or drum Vendor-provided water Tanker truck Surface water (river, dam, lake, pond, stream, canal, irrigation channel)	Public or shared latrine Pit latrine without slab/open pit Bucket latrine Hanging toilet/latrine No services (people use any area e.g. open defecation) 'Flying toilets'

Note: *Bottled water is considered an 'improved' source of drinking water only where there is a secondary source that is 'improved'.

Source: Adapted from WHO/UNICEF (2005) *Water for Life: Making it Happen*, www.who.int/water_sanitation_health/waterforlife.pdf

representative sample is chosen. However, most samples are biased against the poor and unserved. Statistically rigorous sampling methods invariably select the basic sampling units at random from a complete list, known as a 'sampling frame'. Sampling with clearly defined sampling frames is often seen as the only statistically reliable method of representative data collection and even though compiling the sampling frame is very expensive, some statisticians see sampling without one as a false economy. In low-income countries, however, a number of problems arise. First, existing listings are not always reliable, because minorities or those living in informal settlements may be excluded (and these may represent a significant proportion of a nation's urban population). Second, if sample frames are not available, which is often the case, they are extremely difficult and expensive to build, particularly in informal settlements where there are often no typical locators such as house numbers (in many informal settlements, few if any housing units have an official, registered address). Third, there is often a lack of the statistical skills required to compile them. Fourth, it is difficult to keep a sampling frame up to date as there are often no procedures for reporting changes. This is particularly true in dynamic informal settlements where migration (inward and outward) can be considerable. Finally, those who undertake the household surveys are often unwilling to collect data in informal settlements. Low-income groups, including those with the worst provision for water and

sanitation, should not be deprived of assessment when they live in situations where data collection is challenging. There is clearly a need for alternative methods of representative sampling where current methods fail, most notably in informal urban settlements.

Searching for a universal 'watsan' indicator

The international water and sanitation target and indicators of the MDGs are defined as proportions: namely, to halve the proportion of people without safe water and basic sanitation. This means that the data collected to monitor their progress have to result in a simple categorical or dichotomous value – whether or not they have safe water – which is one of the reasons behind defining access according to whether people use an improved water source/sanitation facility or not (see Table 5.2).

This implies that the complex reality of service provision or hygiene behaviour can be summarized into a simple 'yes' or 'no'. As demonstrated by the previous discussions around the many factors that may contribute to a positive health impact from water, sanitation or hygiene behaviours and what constitutes the human right to water, this excludes a lot of important information regarding access. It also focuses too much on the facilities and not on whether they provide a good service – for instance, in most urban contexts, whether or not pit latrines are satisfactory depends in part on how easily, quickly and cheaply they can be emptied.

Table 5.3

Standard household survey questions on access to drinking water and sanitation

Drinking water supply	
1	What is the main source of drinking water for members of your household?
2	[When the answer to question 1 is 'bottled water'] What is the main source of water used by your household for other purposes such as cooking and hand washing?
3	How long does it take to go there [to the source], get water and come back?
4	Who usually goes to this source to fetch the water for your household?
5	Do you treat your water in any way to make it safer to drink?
6	What do you usually do to the water to make it safer to drink?
Please see the original guide for the standard response categories	
Sanitation facility	
7	What kind of toilet facility do members of your household usually use? (If flush or pour-flush) Where does it flush to?
8	Do you share this facility with other households?
9	How many households use this toilet facility?
Please see the original guide for the standard response categories	
Source: WHO/UNICEF (2006) <i>Guide for Drinking Water, Sanitation And Hygiene Related Household Survey Questions</i> , in print, www.wssinfo.org	

As discussed in the 2003 UN-HABITAT report, *Water and Sanitation in the World's Cities*, on the basis of these definitions most of the urban population in Africa, Asia and Latin America have 'improved' provision for water and sanitation, and it is possible to claim that there were significant improvements in the number of people gaining access to improved water and sanitation during the 1990s. However, a large proportion of those with improved provision still have very inadequate provision.⁴⁴ To illustrate this, a second set of estimates that used more detailed definitions for 'adequate' provision (including continuous, good-quality piped water supplies into the house or yard; hygienic, well-maintained, easily accessed toilets that are used by all family members; and safe and convenient disposal of waste-water) showed a much larger number of urban dwellers lacking adequate provision.⁴⁵ A very large part of this population lacking adequate provision live in small urban centres.

The challenging task of monitoring access is made even harder by the fact that there are no direct ways to capture any of these measures of interest through the collection of a single piece of data. Since indirect measurements are only *proxy* indicators, they are inherently open to debate, precisely because they are imperfect surrogates for what they are designed to represent. This is not to say that the search for a 'universal indicator' (as represented by the categorization of access by type of water source/sanitation facility) is unreasonable, rather its significance

should not be overemphasized; it is more important to recognize that information regarding access holds different values and is put to different purposes by the multiple levels of actors involved in the water and sanitation sector.

Measuring and monitoring at national level

The JMP has responsibility for tracking progress in access to drinking water and sanitation for all 228 countries and territories in the world. As such, the use of indicators focuses on comparison in time to measure progress and in space to make geographical comparisons. To make such comparisons meaningful, the data collected have to be consistent and comparable as well as straightforward and cost effective to collect. The definition of access used to monitor the water and sanitation MDGs has been criticized by some as too narrow and non-specific. However, it is a pragmatic one that provides a yardstick to track an internationally set target for the purposes of advocacy. In addition, the JMP has to rely on the data that is routinely collected; it does not have the funding base to allow it to support new data collection in all nations.

In order to ensure that the various different survey instruments collect comparable data, a task force of the JMP Technical Advisory Group has formulated a standard set of household survey questions that survey programmes are encouraged to use. This set is already included in the new DHS and MICS surveys (see Table 5.3).

Coverage estimates derived from household

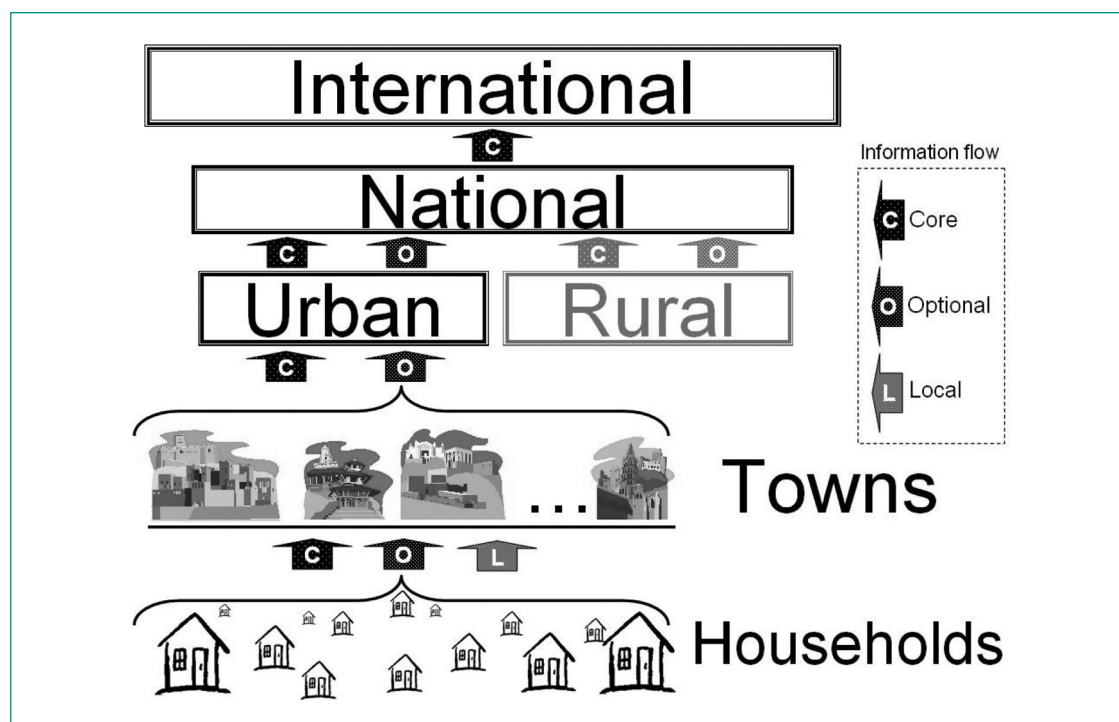


Figure 5.4

Information flow from collection at household level

Note: In this figure, local additional data remains within the urban centre where it was collected. Optional data is aggregated between different towns and cities for use at the national level. Core data from highly standardized questions can be aggregated between urban centres and collected along with the same information from rural areas to represent the national access figures for the purposes of international comparisons and advocacy.

surveys (including those reported in the 2000 and 2004 JMP progress reports) are certainly not comprehensive in their ability to measure access (as previously discussed). However, they provide some idea of progress within each nation and comparability between countries. This is as good as can be achieved based on data currently available on a global level. The figures have helped to raise the profile of the issue on the international political agenda. But the limitations of the data collected need to be acknowledged when they are cited. The additional questions now included in DHS and MICS surveys (see Table 5.3) begin to expand the access information gathered at the national level, for example the extent of use of shared facilities and those about household water treatment.

Implementing local policy

In contrast to the percentages used for the purposes of national and global advocacy, practitioners on the ground (who are generally involved in the data collection) see little incentive in collecting non-specific data that only serve the national and international reporting process. For example, the sample sizes for the national assessments are generally large enough to allow figures

for the proportions of people with improved provision to be presented, disaggregated by first administrative division and by urban and rural areas – and often for the largest city. But little or no information can be gained to further levels of disaggregation. No data is available on provision in specific urban centres (aside perhaps from a country's largest city). But data on deficiencies in provision in each urban centre is vital if action is to be taken to address these deficiencies. To inform policy and allocate resources to improving access, a more detailed information base is needed than that provided by national surveys – for instance more needs to be known than what type of water source or sanitation facility people use, for example how many people rely on public latrines and their cleanliness, intermittence of water supply, seasonal variation in water sources, affordability and physical safety. The current global indicators also do not provide information on sustainability. And as noted earlier, they do not recognize differences in the adequacy of facilities between rural and urban contexts.

There are two levels of data collection below the national sample survey that have importance for local action. One is the representative sample survey for a specific urban centre –

which is useful for showing the scale and nature of deficiencies and how these vary between neighbourhoods or districts within the urban centre. This can also contribute to more accurate and detailed assessments of deficiencies in provision at regional and national level. It is also possible for place-specific studies such as these to use the same set of questions as national sample surveys, which then allows the inadequacies in provision within that urban centre to be compared to national and regional figures.⁴⁶ However, this also does not provide the information needed for action on the ground. For this, a second level is needed: the tools and methods described earlier in this chapter that collect data about each household, street and district.

Making national data collection better serve local action

The potential conflicts and difficulties between reconciling the data needs at national and local levels are illustrated in Vision 21, which states that ‘reliable monitoring will depend on greater efforts to standardise definitions, to improve data collection and expand reporting to all countries’, but then goes on to comment that they want ‘specific indicators’ and ‘no universal standard is possible, due to the social or environmental differences [between countries]’.⁴⁷

To ease this dichotomy, it is proposed that different levels of data collection are required within countries. This would allow more context-specific data to be collected for local use at the same time as standardized data for nationwide and international comparison. Data collection may be divided into three strata: first, core data for the ‘universally accepted’ indicators for international comparison, necessarily as context-independent as possible; second, *optional* data to generate extra information of interest that is not yet ‘universally accepted’, allowing more flexibility without affecting the ‘core’ of the survey data; and third, *additional* data for locally defined indicators and action.

Data collected can then be aggregated at the national level only for the core questions,

allowing international comparisons to be made for the purposes of advocacy, whilst the additional locally specific data remains disaggregated at the level of collection for planning, implementation and monitoring of actual access (see Figure 5.4).

This method of differential data reporting and aggregation, however, requires an acceptance that there can be different definitions and indicators for a similar performance measure at different levels of policy and action, even with the strong likelihood that this may result in different prevalence figures. Generally the further one disaggregates data, the lower the prevalence figures become, which is a source of a lot of confusion and frustration, especially when working towards such an ambitious goal as the water and sanitation MDGs. The difference here is that this highly disaggregated data is used only for local purposes and should not disproportionately affect national figures since only particular standardized core indicators will be aggregated to this level.

This should not create conflict between the different levels of use (as commonly feared), as long as it is clearly recorded how the data was collected, since the biggest problem of aggregated data is mistrust. It should also have the highly desirable effect of making the global figures accurate, so that the true scale of those without adequate provision can be demonstrated and acted upon. Learning to handle a complex system means learning to recognize a specific set of indicators and to assess what their current state means for access to the household. This, among other characteristics, must be strongly considered in the design of indicators (see Box 5.5).

Indicators for use for individual urban centres

Before considering indicators for use within each settlement, there is a need for a clear definition or description of the measure of interest. To monitor progress towards the MDG target to halve the proportion of people without sustain-

able access to safe drinking water and basic sanitation by 2015, it is necessary to define what exactly constitutes sustainable access, safe drinking water and basic sanitation.

■ Measuring whether sanitation is 'basic'

The MDG Task Force on Water Supply and Sanitation has defined 'basic sanitation' as:

*the lowest-cost option for securing sustainable access to safe, hygienic and convenient facilities for excreta and sullage disposal that provide privacy and dignity while ensuring a clean and healthful living environment both at home and in the neighbourhood of users.*⁴⁸

This comprehensive definition of basic sanitation introduces a large set of variables, some of which are more suitable for measurement as indicators than others. Although this cannot be used as the basis for global monitoring, it does provide a useful basis when monitoring access to sanitation at a more local level.

In addition, it is also useful to consider the classification in the Global Assessment⁴⁹ that an excreta disposal system is 'improved' when first, it is private or shared but *not* public, and second, it hygienically separates human excreta from human contact. This already results in two indicators that can be measured more straightforwardly: level of access to a latrine (including whether it is private, shared or public) and appropriate technology.

In regard to ownership of a latrine, through questions and observations it should be possible to determine if the latrine is private, shared or public. But this will need observations to verify information provided by respondents, since households have been known to falsely claim ownership of a latrine:

- *Private* means it is only used by the household interviewed and everybody in the household who has the autonomy to go to the toilet has access, for example children also have the key if one is needed.

- *Shared* means that the use is restricted to some neighbouring households or those living in a compound in which everybody in these households has access to the toilet.
- *Public* means a wide range of persons can use the latrine. This includes latrines with no restriction as to who can use them and latrines that are managed to allow use by those in the neighbourhood (for instance community-managed public toilets).

JMP figures show that of all sanitary facilities used, most are located on premises providing ready access to members of a household. But in poorer urban areas and informal settlements, millions of people have no choice but to rely on public or shared toilets, or practice open defecation or defecation into bags or waste materials, as there is often no space on the plot where they live for a private facility. When facilities are not located on the premises, safe physical access may be compromised. The JMP's concerns regarding shared or public facilities are, however, mainly with their cleanliness, which often impacts on the likelihood of people using such a facility, but which may also pose a health risk to users. For this reason, in the 2004 Midterm Report⁵⁰ shared latrines were no longer considered an 'improved' form of sanitation (in contrast to the 2000 Global Assessment, when it was not always possible to differentiate between shared and private latrines in the existing databases). This restriction in definition that excludes shared latrines for the basis of global access figures and policy is probably necessary, otherwise the data collected is likely to be misleading with regards 'hygienic separation of faeces from the environment' (and consequent disease transmission).

However, it can be argued that the use of a public facility is preferable to open defecation and may be preferable to shared facilities – especially if there is provision to maintain the public facility. With increasing urbanization, growing concentrations of people with very limited incomes, growing numbers of tenants and

informal settlements, it is likely that more and more urban dwellers will rely on public facilities. It is worth noting that innovations in public toilets that seek to make good provision for maintenance and for provision for washing have been driven from below – especially those designed, built and managed by federations of the urban poor. No official development assistance agency thought that this was a relevant part of water and sanitation investment. As Chapter 4 described, most of the innovation in better provision for public and community toilets has been in large cities. This has been widely demonstrated in India, where urban poor federations and women's cooperatives successfully operate several hundred community-managed toilet blocks that serve hundreds of thousands of households. However, these innovations, driven by the National Slum Dwellers Federation in India and its partner, Mahila Milan, have extended their construction and management of public toilets to some smaller urban centres. In India, Sulabh International has also pioneered better public provision and it may be that in many public places, for instance at bus and railway stations and markets, there is sufficient demand for public toilets and washing facilities to allow these to be built and operated profitably.

UN-HABITAT and the JMP have agreed on a study to determine how to monitor the cleanliness of public or shared facilities in order to assess if the users of such facilities could be considered to have access. The study will first focus on the cut-off for the number of households sharing a facility with their neighbours or those living in the same apartment block. It is clear that more detailed observations of such facilities will be needed, which may be more appropriate and relevant for smaller scale, context-specific surveys to be able to judge shared/public facilities on an individual basis.

The different technologies used for toilets/latrines all have their advantages and disadvantages, as discussed in Chapter 4, although the major point of concern for this discussion is whether the technology hygienically

separates human excreta from human contact. This applies to both on- and off-site waste collection, that is, safe containment of faeces is possible even without connection to a sewerage system (off site), provided the facility is designed appropriately (for example, a pit latrine with well-fitting slab and provision for emptying it) and there is a good service to empty it. As data are collected at the household level, identification of the different technologies must be possible by simple observation and questions, since the interviewee and sometimes the interviewer may not be aware of the wide range of different excreta disposal technologies – but there is no easy list of 'technologies' that serve to identify which is hygienic. Even the best quality facility may be unhygienic – for instance a conventional flush toilet if poorly maintained or if there is no regular water supply to allow it to flush.

Since handwashing after defecation is an integral part of the process to separate human excreta from human contact it may be argued that presence of handwashing facilities should also be included in the definition of access to sanitation. However, this is better used as an indicator for hygiene practices rather than sanitation to avoid discarding otherwise acceptable sanitation facilities due to lack of handwashing opportunities.

Whether all household members use the toilet/latrine depends on how long it takes to get to the latrine (as described above when differentiating between private, shared and public latrines), the quality of the latrine and the privacy that such a facility provides. In principle, people should prefer using a sanitation facility over open defecation or 'wrap and throw.' But for this to be the case, such a facility should meet local defecation preferences and practices, be well-maintained, free of visible excreta and preferably be without flies or smell and provide an adequate level of privacy. In addition to access close to the home, both privacy and dignity lower the threshold for people to actually use a sanitary facility.⁵¹ One difficulty here is whether young children use the facility; they

often do not like using latrines, especially if they have large openings and are dark and smelly.⁵²

Proof of use of the toilet is probably the most powerful access indicator of all since use of a sanitation facility indicates that the toilet is probably socially acceptable for the users, provides the safety required, offers the comfort and privacy needed and can be run at an acceptable cost. But it is not feasible or possible to measure all of the parameters that may influence use. For example, both smell and flies are difficult to measure objectively and as such are inaccurate indicators where data collected are to be shared or aggregated. Presence or absence of 'non-contained' faeces in the facility that may be contacted by subsequent users is easier to observe objectively with appropriate training of data collectors. Dignity is also hard to measure directly. However, other simple indicators of use exist such as a well-trodden path to the latrine, lack of cobwebs; some type of door will also indicate whether the facility provides privacy, in particular for women.

It is more difficult to ascertain equity of access, namely whether all members of the household are able to safely access the facility at any time of the day or night, including women, children and the sick – one of the biggest reasons for excluding public (and shared) latrines from a measurement of adequate access. This will require longer structured observations.

The definition of the MDG Task Force for access to basic sanitation also concerns itself with access to waste-water facilities and services. The Task Force interprets this to include waste-water collection, disposal and treatment systems. While less of a problem in rural areas, where sewerage is virtually non-existent, proper disposal and treatment of waste-water from urban areas is of major public health importance. While access to sewerage is monitored at the household level, proper disposal and treatment should be measured at community or neighbourhood level. Household surveys are not the right monitoring instruments to collect such information. Instead it requires a separate

assessment of the collection, disposal and treatment of waste-water for those clusters of households that are surveyed in a household survey. Though technically feasible, for all practical purposes it presents quite a challenge. City-specific surveys are best done to assess what percentage of sewage reaches a sewage treatment facility and what percentage is dumped untreated in surface water.

As for 'improved' on-site systems such as covered pit latrines, even if they work properly there will come a time when they will need desludging or emptying. In contrast to bucket latrines, the interval between emptying will be longer and the excreta over time will have evolved to a lower pathogenic load. However, in urban areas there will always be households in need of emptying services as space for digging a new pit is generally not available. Although the quality and extent of provision for latrine emptying should be taken into consideration, due to its serious public health implications, it is not seen as an easy (or appropriate) indicator for measurement during a household survey, nonetheless it should receive attention by local practitioners.

■ Measuring access to 'safe' and to 'sufficient' drinking water

The MDG Task Force on Water Supply and Sanitation has defined 'safe drinking water' as 'water that is safe to drink and available in sufficient quantities for hygienic purposes',⁵³ In regard to quantity, in addition to the two to four litres per person per day needed for direct consumption, the term drinking water is generally assumed to include water for food preparation and for basic domestic and personal hygiene. There seems to be an agreement that activities like extensive bathing and clothes washing do not fall within this definition. Such activities usually require amounts of water equal to or larger than the amount used for the other basic personal and domestic water needs combined. If households lack a piped water supply to their home or yard, such activities often take place at or near the source or

Box 5.6 Water quality testing in Maputo, Mozambique

WaterAid have recently initiated a system for the monitoring and evaluation of water and sanitation infrastructure and hygiene behaviour in parts of Maputo, Mozambique. Among other parameters being tested (including many that are discussed above), they have been conducting spot checks of water quality both at source and in households.

In addition to providing information for regulators and local government to encourage quality control and assurance, preliminary feedback has found that households also want to know the quality of their water and the visible demonstration of poor water quality that the simple tests provide has led to behaviour change around improved household water management.

Contrary to worries about the cost of water quality testing, the results so far are extremely positive and the Mozambique national regulator has asked for the monitoring and evaluation system (including water quality testing) to be scaled up to city-wide and then nationwide level over the next couple of years.

Source: Information courtesy of Ned Breslin, WaterAid.

water point or in rivers or streams. From a health and economic perspective, Howard and Bartram argue that an improved source should provide adequate quantities for bathing and clothes washing as well, but recognize that the quantity per person thus required corresponds to the level of intermediate access and not the level of basic access.⁵⁴

The measurement of drinking water access, according to the MDG Task Force definition requires indicators representing 'safe' drinking water, the various aspects to access (physical safety, affordability and equity) and to some extent sustainability. In regard to 'safe drinking water', the WHO Drinking Water Quality Guidelines provide concentration limits for a set of physical, chemical and microbiological parameters that ensure drinking water safety. Safe drinking water as defined by the guidelines does not represent any significant risk to health over a lifetime of consumption. The guidelines stress that drinking water should be free of faecal coliforms, tastes and odours that would be objectionable to the majority of consumers, and should not be highly turbid or coloured in appearance.⁵⁵

A water quality analysis along these parameters of one drinking water source is relatively easy to carry out. Repeated sampling of the same source, to check if the water quality remains acceptable throughout the year is possible, albeit more costly. To sample multiple sources regularly requires a water quality analy-

sis infrastructure with laboratories, well-trained staff, quality control measures and lots of funding for transportation, consumables and salaries. Most countries do not have the resources to maintain an elaborate water quality control infrastructure that reaches beyond the main urban areas and main piped water supply schemes. As Chapter 3 made evident, in many smaller urban centres, there is not even the capacity to ensure good water quality for the limited proportion of the population with access to piped supplies.

The logistical problems with conducting water quality testing on a nationally representative scale and the JMP's current reliance on existing data, meant it was decided to identify improved facilities as a proxy for water quality. Improved facilities by nature of their design protect the water from contamination by surface water run-off, and in particular from faecal contamination, which poses the most widespread and immediate threat to human health. Though not ideal (since any source can be polluted, with the risk just being higher for some sources than others), the use of this proxy has allowed the JMP to track progress on an indicator that otherwise would be unmeasurable.

However, the limitations of this method are recognized. UNICEF and WHO have recently completed a pilot study to determine whether a workable protocol of water quality testing alongside a household survey is possible for the future. For this to be of use in monitoring the global situation it must be designed and supported in such a way that all countries are capable of conducting the assessments, otherwise data cannot be aggregated or compared between countries. But it would be useful for individual urban centres to conduct at least spot checks for their own planning, and users' information and household water management practices (see Box 5.6).

It is now widely accepted that the quantity of water available to individuals or households is in fact more important for health than the quality, since a greater amount of water permits both increased personal and domestic hygiene

practices.⁵⁶ However, getting data on the amount of water consumed (or even collected) at the household level is extremely difficult, as is defining what constitutes ‘sufficient’.

However, it has been shown that water collection time provides a strong indicator of the quantity of household water consumed (see Figure 5.5). As this figure illustrates, if between 3 and 30 minutes are needed to make the round trip for water collection (including going to and returning from the water point, queuing and pumping but excluding socializing and any washing of clothes or utensils at the water point), the amount of water collected varies little with the distance; if more time is needed, the amount of water collected drops. Although the actual level of the 3–30 minute plateau in terms of volume of water consumed varies between different contexts, it has been accepted to provide an appropriate indicator of sufficient basic water requirements. Thus, this indicator of time needed to collect water is extremely useful in contributing to determination of access.

Physical access also has to be measured and monitored. The advantage of investigating water collection time rather than distance to water source (aside from the difficulties of respondents to estimate distances accurately) is that this indicator also accounts for physical access to the water source (namely, terrain, steep hills and so on), the energy needed to get there and other factors such as pumping and queuing time, which are individually difficult to measure. There are concerns regarding the ability of respondents to accurately report time. Data from a study in Thakhek, Laos showed that water collection times were consistently under-reported by interviewees⁵⁷ and as such will not lead to overestimations of low water consumption (and therefore inadequate access) as many fear.

Safe physical access is also important. As a design criterion for new services, safe physical access should have a high priority. Preferably, communal water points should be located in easily accessible, open spaces near settlements to reduce harassment risks, especially for women

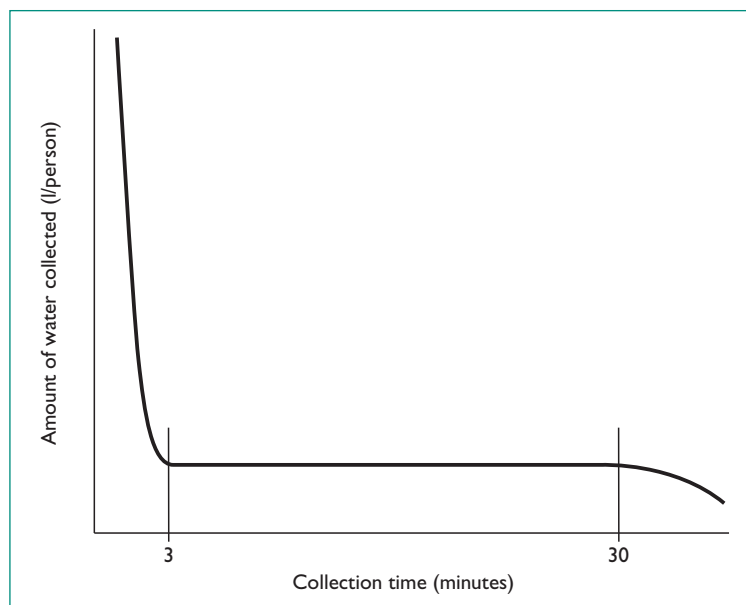


Figure 5.5

How the amount of water collected varies against collection time

Source: Adapted from Cairncross, S. and Feachem, R. G. (1993) *Environmental Health Engineering in the Tropics*, John Wiley & Sons, Chichester.

and girls. It is difficult to use criteria for safe physical access for the assessment of existing communal services in an objective and reliable way, as the paths to the water point cannot be assessed for their safety from harassment. Moreover, surveys to detect harassment events or fear of harassment while hauling water, hinge on a common notion of what constitutes harassment. In the absence of objective indicators, one could argue that only people with access to drinking water located inside their dwelling, plot or yard could be considered to have safe physical access. But this is not realistic as such a high proportion of people living in small urban centres depend on improved communal services. Safe physical access can therefore not be considered as an indicator for basic access as measured globally. It will nonetheless be important when conducting more localized surveys, perhaps requiring participatory sessions with female water collectors, as well as observational source surveys.

Affordable access. Safe drinking water does not flow from taps for free. It needs to be collected, protected, treated and often transported and it is, therefore, an economic good. The question is how much should a household pay for meeting their basic drinking water needs? What constitutes affordable access to drinking water? The previous *Global Report on*

Water and Sanitation showed the 500-fold difference in prices paid by urban populations for water per litre. Many studies in particular urban centres have shown that poorer groups pay more for drinking water than richer groups.⁵⁸ Such findings indicate a striking inequity between rich and poor, but they do not constitute a measure of affordability. It is, however, those people who depend on public taps where water has to be paid for or without access to institutionalized supplies and who depend on water vendors or tanker trucks for whom affordability is the biggest issue – and this includes a high proportion of those living in small urban centres. They often have no choice but to use the only available water source in their neighbourhood and pay exorbitant prices, if calculated by volume used.

The ability to pay for water is certainly a critical influence on adequate consumption of water. On a regional level it may be possible to set price criteria adapted for the local situation based on the average local income but there are no universal criteria to set this level. In addition, data about household incomes are rarely accurate. It may also be possible to get some idea of how much households spend on water from the household expenditure surveys that are commonly used to define poverty lines, and some of these have shown expenditure on water representing a few per cent of total expenditures – but these, like most household surveys, draw on too small a sample to allow the levels of disaggregation needed to see household expenditures on water among lower income groups.

Site-specific, local surveys can seek to obtain data on ability to pay, where sufficient information is known to be able to set and verify affordability ranges, but in the absence of an objective and measurable standard for affordability, affordable access at household level cannot be used as an indicator for measuring global access.

Equitable access. Access by all people, irrespective of gender, age, race, location, income, physical impairment and so forth, is an obvious goal. Nevertheless, measuring equity is not

commonly done. Certainly, the major international household survey instruments do not analyse access by ethnicity, nor do and can they differentiate between access by gender or age since household surveys measure access at household level and not at individual level. They do allow, however, for differentiating access between the poor and the rich: each household surveyed is classified into a wealth quintile ranging from the poorest 20 per cent to the richest 20 per cent. Results obtained this way have shown striking differences in access between the rich and the poor. Likewise these surveys disaggregate between urban and rural areas, but as has already been extensively discussed, such disaggregation often misrepresents the actual situation in the majority of urban areas, particularly small urban centres.

Since access is measured at household level and not at the individual level, equitable access is not taken as an indicator for monitoring global access. It is yet another indicator of access that is more amenable for measurement on a smaller, more specific scale.

Sustainability of access. There is no agreement on what sustainable access means – but measuring sustainable access should include regularity of supplies (namely, limited intermittence), including within each day or week and also seasonally, reliability and management and financial capacity to ensure continuous operation of facilities through proper operation and maintenance. In regard to intermittence and reliability of water source, no water distribution network is free from leaks, but as long as the network is under pressure the chance of pollution getting into the network and contaminating the water is low. If pressure in the network drops, pollution can get into the distribution network. If the source becomes intermittent, the risk of pollution increases with each cycle of low pressure in the network. For that reason intermittent piped water sources are not considered improved drinking water sources. Intermittent water sources also limit access to water, which can limit the amount of water used. Because hygiene needs

more water, it will suffer first under an intermittent water supply.

However, a high proportion of those served by piped water systems within small urban centres (and larger cities) only receive water for part of the day as the pressure and/or water volume is not sufficient to serve all those connected continuously at the same time. A household used to getting water only every morning or every evening usually ensures that it stores enough water to last the day. If sufficient water can be stored to consistently meet a household's basic water needs then one could argue that its people have access. However, as supplies become more intermittent – for instance with water only available in certain days of the week – the cost of storing sufficient water and the space needed to do so rises, so poorer households cannot store sufficient water. Where intermittence is ad hoc and unpredictable, it can greatly compromise the availability of a sufficient quantity of water and likewise one can argue that people in this case do not have access. It may not be possible to standardize responses to such questions for use at the international level, and it is likely that this will require local surveys able to study the issue in more depth.

Seasonal variations in water supply are also not straightforward to assess. It is difficult to express seasonality in a simple 'yes' or 'no': if a household has ten months of access to an improved water source and two months of no access according to our indicators, does that mean they have no access? One possibility is a recommendation that the survey is best held when water is scarce – but the dry season is not necessarily the worst case for access to improved water sources and timing the survey in a specific season may not always be realistic. Asking questions on situations during a different season could lead to recall and strategic bias. Such issues may be avoided for surveys conducted on a smaller scale or with strong institutional support if they can be carried out twice per year – in both the dry and rainy seasons to assess the two extremes and their impacts on water access.

For maintenance, although some household questions may be able to provide certain information on the maintenance and functioning of a water source, these data will certainly be more reliably collected through a survey of the water source itself. Interviews or focus group discussions with those responsible for the operation and maintenance of the source (for example, community water committees and private providers) and consultation of any records regarding repairs will also provide additional insights into the sustainability of a particular source.

Feeding data collected into indicators and action

As the discussion shows, access to water and sanitation is made up of many components. There is no single piece of information that fully describes all the critical aspects of the different access indicators, so the indicators will have to be built up from multiple variables. Figure 5.6 illustrates one way in which data from variables relating to drinking water can be used to classify the access/no access indicator.

Clearly other factors influence whether a household has access or not and similar flowcharts can be made for different data collection variables. Learning to handle a complex system means learning to recognize a specific set of indicators and to assess what their current state means for access to the household, namely, how all of the different variables for access to safe drinking water (and, separately, basic sanitation) are combined will depend on whether the information is being used to monitor progress at the global level for advocacy purposes, or for the use of practitioners aiming to improve access to services. To reiterate, Figure 5.6 is not intended to be prescriptive since the particular variables measured will depend on the context in which the information is to be used and as such require considerable discussion at the appropriate level; it merely illustrates that not only must the collection of data be standardized but also the way in which it is ultimately related to the final access indicator.

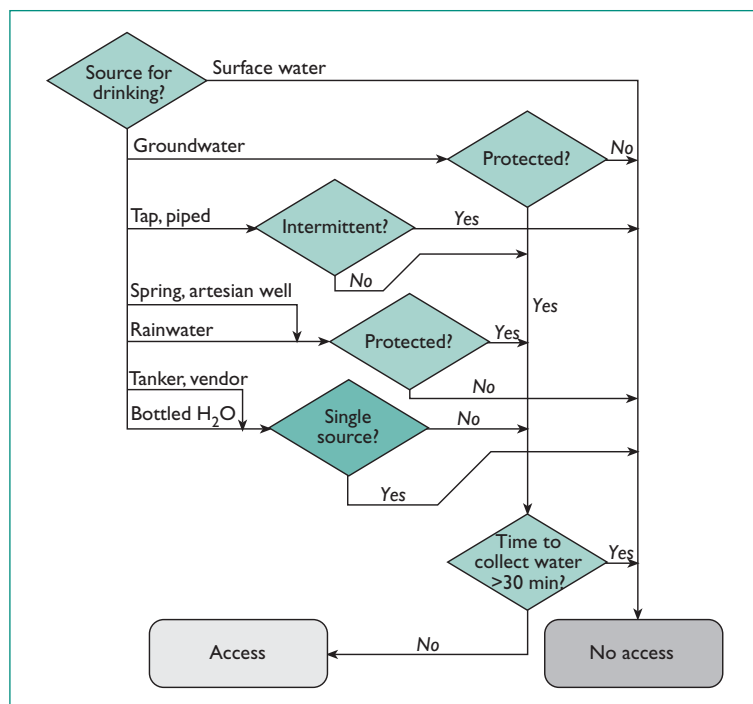


Figure 5.6

Incorporating multiple indicators regarding quality of drinking water into assessment of access and no access

Any measure of sustainable access to safe drinking water and basic sanitation depends on the definitions or standards used and how these standards are measured depends largely on the availability of existing data and cost-effective and reliable data-gathering instruments. While the use of 'improved' and 'not improved' facilities are only proxies for the actual safety or cleanli-

ness of facilities, they serve their purpose: to identify the number of people who remain without any kind of access. It is this group that is the focus of the MDG that calls for halving the proportion of the people without access. Though further refinement of the indicators will only enlarge the number of people without access, the current numbers of 1.1 billion people without water and 2.6 billion without sanitation should already be enough to trigger a massive response to accelerate progress towards the MDGs.

To conclude the discussion on monitoring, information is most relevant at the level where it is actually used to take corrective action. This is the ultimate purpose of monitoring. Though one challenge to monitoring is to formulate and reliably measure more variables that better describe access, another (perhaps more important) challenge is to ensure that this information is gathered from a representative proportion of the poor who are the ones most likely to be without safe water and basic sanitation. Both of these factors will only increase the numbers without access; they will, however, present a more representative idea of the work that must be done at the grassroots level if the water and sanitation MDGs are to be achieved.

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KEY CHALLENGES TO MEETING NEEDS IN SMALL URBAN CENTRES



INTRODUCTION

This chapter discusses the current and potential roles of a range of private and community service providers in improving and extending provision for water and sanitation in small urban centres. But this does not imply a withdrawing of the public sector; indeed this generally requires an increased engagement by government. In many instances, the public sector will remain the largest water and sanitation service provider – although as this chapter describes, there are also many options for its engagement with, and partnership with, other service providers.



WHO PROVIDES WATER AND SANITATION IN SMALL URBAN CENTRES?

The size of a settlement affects how different water and sanitation institutions function. Water and sanitation utilities, for example, are more appropriate to large urban centres, while water committees are usually better suited to rural settlements. Many reports on water and sanitation in small urban centres start from the perspective that these settlements create special challenges, as they are too small for conventional utilities and too large for community-based water committees.

There are, however, a great many institutional forms other than the conventional utility

and the community-based water committee, and there are a great many factors that influence the success of different institutional forms other than settlement size. Moreover, a range of different water and sanitation institutions often serve a single urban centre. For water, some residents may rely on their own or shared wells, others may have a connection to a public utility, others may fetch water from a community-managed tap or borehole and others may purchase water from itinerant vendors. Some (or many) may rely on several sources. For sanitation, some residents may have their own or shared pit latrines or latrines with septic tanks, some may have their toilets connected to a public utility's network, others may share community toilets, others may use pay latrines, and some may not have access to any sanitary facilities at all. Even conventional utilities and community-based water committees can operate in combination or in competition with each other. Given the right incentives, conventional utilities in large cities can also collaborate with water committees in small urban centres to help them provide water and sanitation. Chapter 4 also gave various examples of how provision for water and sanitation was extended or much improved for low-income groups through collaboration between conventional (public and private utilities) and organized groups of households. The combinations and permutations are endless.

The institutional variation not only involves the types of providers, but also their level of

decentralization, the regulatory environment within which they operate, relations among providers and, perhaps most important, relations between residents, providers and public authorities. Governments often struggle to define their own role in providing water and sanitation in small urban centres. Some of the questions that are particularly critical to smaller urban centres, and may elicit different answers depending on the size or administrative position of an urban centre, include:

- Which governmental responsibilities for water and sanitation should be centralized, and which should be devolved to local government authorities?
- For responsibilities that are centralized, which administrative, regulatory and technical capabilities should be concentrated, and which should be localized?
- For responsibilities that are decentralized, how can commensurate administrative, regulatory and technical capabilities be developed to support decentralized management?
- Should responsible authorities delegate local management to private or locally constituted managers and operators, or retain direct control over provision?
- How should the responsible authorities engage with unofficial water and sanitation providers?

While national governments and their advisers often do not have a satisfactory system for administering their responsibilities for water and sanitation in small urban centres, this does not mean that small urban water and sanitation systems are inherently difficult to manage. Indeed, as noted in Chapter 4, there are often more possibilities for pro-poor innovation in small urban centres than in larger cities. The challenges specific to small urban centres are often simply neglected.

Following this introduction, this chapter begins with a brief review of formal responsibili-

ties for water and sanitation provision within national governments. While rarely providers as such, these national authorities are typically expected to develop the policy framework within which water and sanitation providers operate. Even at this level, there is considerable variation internationally. Within countries, responsibilities are quite often divided between water and sanitation and between urban and rural areas, with different ministries or agencies taking the lead. Some of the international variation reflects local conditions and the different sorts of provider operating in urban and rural areas and in water and sanitation. Some represents policy choices and priorities. Regardless of its origins, this variation indicates some of the challenges involved in creating coherent water and sanitation strategies in small urban centres. Particularly in countries where water and sanitation provision is poor, there is rarely a single authority responsible for water resources, and water and sanitation provision. Moreover, when responsibilities for rural and urban areas are separate, the interests of small urban centres are likely to be neglected, with a rural agenda designed to respond to the needs of small villages and an urban agenda designed to meet the needs in large urban centres.

The level of government that is responsible for water and sanitation provision is often more important than the sector of government, and here too there is a great deal of variation. Small urban centres can benefit when strong and representative local governments are given the responsibility for water and sanitation. Alternatively, they can suffer inordinately when water and sanitation responsibilities are delegated to local governments without the authority, the capacity or the inclination to fulfil their new responsibilities. Decentralization is therefore an important part of the context for water and sanitation provision, although it can create obstacles as well as opportunities.

The chapter then provides a brief summary of the role of planning, markets and community action in providing water. It is common to treat

public, private and community-based provision systems as alternative models, built upon different principles, centred on different types of providers, and with contrasting implications for the quality and access to water and sanitation services. Most water and sanitation systems, however, combine elements from and characteristics of public, private and community-based provisioning. Improving the ways in which these different institutional forms combine can be as important as shifting between one form and another, or improving the operations of private, public or community-based providers independently.

The chapter then goes on to examine the changing role of the private sector in providing water and sanitation, and the influence that the shift towards greater private sector participation has had on water and sanitation providers in small urban centres. At least until recently, efforts to promote private sector participation have focused on large contracts for operating water and sanitation utilities, and the multinational water companies that bid for them. Such contracts have been very controversial. Also, they are of doubtful applicability to smaller urban centres, where other private water and sanitation providers already have a far more active role, and are particularly important to those urban dwellers who currently lack adequate provision. This includes the national companies that are winning an increasing share of the contracts in parts of Asia, the independent water network operators best documented in parts of Latin America, and the small and often informal water and sanitation enterprises that are particularly prevalent in the urban centres of low-income countries, including those of sub-Saharan Africa.

While these alternative private water and sanitation providers have not received the attention they deserve in efforts to increase private sector participation, water sector reform and decentralization have created new opportunities for them. There have also been new opportunities for civil society organizations to play a role in

water and sanitation provision. Unfortunately, while the rise and decline of investment in public private partnerships involving multinational companies has been comparatively well documented, the shifting fortunes of the smaller private and civil society water and sanitation providers remain largely unmonitored.

In many countries, water sector reforms are being implemented so as to clarify and coordinate roles and responsibilities, and thereby improve service delivery. Water sector reforms often distinguish between responsibilities for water resources and for service delivery, between responsibilities for regulation and for provision, and between delegating responsibilities for provision to public utilities and contracting private operators. Water sector reform can also change the level of decentralization, public consultation and participation, and the commercialization of utilities. Internationally supported water sector reform tends to focus on creating a sound regulatory environment, decentralizing responsibilities to the lowest appropriate level (subsidiarity), increasing the commercial pressures on water and sanitation utilities, and increasing the level of civic engagement. Water sector reform is, however, highly dependent on government responsibilities and procedures outside of the sector.

While water sector reforms tend to focus on formal systems of water and sanitation provision, it is also important to look beyond the formal providers designated by governments, particularly in low-income settings. In a great many small urban centres, a large share of households do not receive services from these formal providers, and residents get their water and dispose of their waste through other means. In attempting to improve provision, it is important to build on or adapt to these alternatives. In any case, the notion that there is a single provider is very misleading. Water and sanitation systems involve a wide range of actors, of which the entity that delivers water or collects waste from households is only a small part. Indeed, from an environmental perspective, ecosystems

themselves are ‘providers’ of water and wastewater treatment.



GOVERNMENT RESPONSIBILITIES AND AUTHORITIES

Governmental responsibilities for water and sanitation provision are often divided across ministries and across levels of government. These responsibilities are allocated differently, depending on the country, and also change over time.

The ministries/authorities responsible for water and sanitation provision

Most countries have a national authority with principal responsibility for urban water supplies, including those in small urban centres. These authorities are not generally water providers, but manage, regulate or provide the policy framework for water providers, and have numerous additional responsibilities. In many cases the relevant national authority is the ministry of water, or a similarly named authority, with responsibilities extending to the management of water resources. In others, it is a ministry or department of public works, urban development, interior or construction, whose responsibilities centre on services or infrastructure provision. In some cases it is a ministry or department of health. And in some cases it is the ministry of local government.

These same authorities are often responsible for sanitation too. Even if the same authority is responsible, water and sanitation are often managed very differently, particularly in countries where waterborne sewerage systems only reach a small share of urban populations and do not exist at all in many or most small urban centres.

The choice of government agency to take responsibility for water and sanitation can affect both the priority they are given and the policies that guide provision. As with many institutional choices, context is more important and the choice is as much a reflection of local conditions

as an influence upon them. Shifting responsibilities alone rarely solves problems. Giving responsibility to a ministry of water does not necessarily mean that water service systems will be managed so as to better protect water resources. Giving responsibility to the ministry of health does not mean that water-related diseases will decline. Giving responsibility to the ministry of construction does not mean that laying water pipes will be timed to fit in with other construction works. But administrative boundaries between sectors or between different levels of government can create serious impediments to improving water and sanitation provision.

Even national statistics on the institutional arrangements for managing urban water and sanitation provision are scarce. For the Global Water Supply and Sanitation Assessment 2000, countries were asked to identify the authorities responsible for the management of water and sanitation in urban and rural areas.¹ The results were not published, partly because they are somewhat difficult to interpret, but they do show striking variations between regions, between water and sanitation, and between rural and urban areas.

The responsibilities for urban water and sanitation were most often with different authorities in Africa, where articulated sewerage systems are comparatively rare in most nations. 19 of the 44 African countries reporting indicated that responsibilities were divided, and sanitation involving low-cost, on-site technologies was often the responsibility of a different authority to that managing the sewerage system. There was less fragmentation of responsibilities for water and sanitation in Asia and the Americas, where only 10 out of 64 countries reported different authorities.²

Having different institutions responsible for urban and rural sanitation was also common. Health authorities were more likely to be responsible for rural than for urban sanitation. For Africa, Asia and the Americas combined, rural sanitation was the responsibility of health authorities in about 30 per cent of countries,

while for urban sanitation the corresponding figure was only about 4 per cent. Conversely, particularly in Africa and Asia, public works and other infrastructure-centred authorities were dominant in urban areas, and of marginal significance in rural areas.

From the perspective of integrated water resources management, there is an inherent preference for having the same national authority responsible for both water and sanitation in both rural and urban areas. At least in principle, this should provide a good basis for effective river basin authorities, and for a better balance between water and sanitation provision. Agencies with overlapping jurisdictions and competing political interests can also limit the scope for innovative measures to improve water and sanitation provision, especially when governments organize and administer water sector policy activities separately – irrigation under one department, domestic water supply and sanitation overseen by another, hydropower activities managed by a third, infrastructure supervised by a fourth, water quality controlled by a fifth, environmental policy under a sixth, and so forth. These fragmented bureaucracies often make decisions according to individual agency mandates that are independent of each other.

By contrast, some divisions of responsibilities may be justified in order to ensure that conflicts between water resource priorities and water and sanitation service priorities are addressed openly at the highest level of government, and do not come to reflect the bureaucratic interests of a single ministry or other authority. In any case, coordination problems also arise within agencies. Moreover, other reforms within and beyond the water sector, such as privatization and decentralization, have had a greater influence on the institutions managing water and sanitation.

The levels of government responsible for water and sanitation

Just as the responsibilities, authorities and administrative capabilities for water and sanita-

tion provision can be allocated differently across sectoral ministries, so can they be allocated differently up and down the levels of government. If responsibilities are centralized at the national level, local government may be bypassed altogether, with providers under the direct authority of a national ministry or utility. If responsibilities are decentralized to local government bodies, they may be allowed to choose how water and sanitation provision is to be organized, at least formally. In practice, both central and local government bodies typically have some responsibility and authority, but there is considerable variation in their roles.

Recent decades have seen internationally uneven decentralization, not just in the water sector but more generally. Over 75 countries have transferred state responsibilities to lower levels of government, and while the motivations have varied, improved service delivery has typically been one of the justifications.³

Decentralization can take many forms, often grouped into deconcentration, delegation and devolution.⁴ Deconcentration is the least ambitious, and involves the shifting of central government responsibilities and staff to local offices, without any transfer of authority to lower levels of government. Applied to water and sanitation, deconcentration is likely to increase the presence of the responsible authorities in small urban centres, without making them more accountable to local government. Decentralization through delegation transfers certain responsibilities for decision making and administration to local government (or other locally constituted bodies, such as water committees), but keeps the policy making in the hands of central government. This could involve, for example, the setting up of urban water boards with the participation of local government, but ultimately accountable to and financially dependent on a national ministry. Decentralization through devolution involves the transfer of decision making, financial allocation and management to local government bodies, and is associated with elected local governments with

the authority to raise their own revenues and make investment decisions.

While decentralization has been widespread, success has been mixed.⁵ Ideally, decentralization should enable public authorities to adapt to local conditions and respond to local demands. Bad relations between central and local governments or between government agencies and community groups can easily undermine efforts to develop effective water provision in small urban centres. Thus, for example, a recent review of unsuccessful small town water and sanitation projects in Nigeria undertaken for the World Bank found that the exclusion of local government authorities and poor relations between the central government and community groups impeded the projects and helped bring about their failures.⁶ However, the successful decentralization of water and sanitation responsibilities inevitably depends on the success of other aspects of government decentralization.

Decentralization poses obstacles as well as opportunities for water and sanitation provision. Unless the transfer of responsibilities to local government is accompanied by the transfer of the authority and capacity to meet those responsibilities, decentralization is unlikely to be successful. For water and sanitation, decentralization can reduce the scope for cross-subsidies and create capacity problems for smaller urban centres, particularly as regards piped water and sewerage networks. And just as the authorities in small urban centres often lack the capacity to run a conventional water and sanitation utility, they may also lack the capacity to manage a larger scale private utility operator.⁷

One possible response to the capacity problems of small urban centres is to look for alternative technologies to conventional water and sanitation systems, and alternative approaches to managing them. Some innovative efforts in this regard were described in Chapter 4. Alternative responses are to look for support from providers and/or authorities in larger urban settlements, to create larger water districts that

encompass a number of urban settlements, or to avoid decentralizing responsibilities for water and sanitation and simply deconcentrate government authorities that are directed nationally or regionally.

Strong local governments, accountable to their residents, can make an enormous difference to the quality of water and sanitation provision in small urban centres. To the extent that decentralization successfully supports improvements in local government, it also creates opportunities for improving water and sanitation provision. Effective decentralization cannot be achieved by the water sector alone, however. In short, decentralization is an important part of the context for improvements in water and sanitation provision, but is not always part of the solution.



WATER AND SANITATION PROVIDERS AND THE ROLE OF PLANS, MARKETS AND COMMUNITY ACTION

There is currently enormous variation in patterns of provision among and even within small urban centres. In many settlements the principal water and sanitation providers are public utilities, in others they are community organizations or cooperatives, in others they are profit-seeking enterprises, and in still others they are a combination of diverse suppliers. Equally importantly, there is a great deal of variation in the scale at which these providers operate, how they are organized, whether and how they are regulated, and how they relate to each other and to others in the sector.

Many disagreements over how water and sanitation ought to be provided relate to preferences for planning, market forces or community action, not only within the water sector but more broadly. For most of the 20th century, even in market economies, plans rather than market forces dominated formal urban water and sanitation systems, and public utilities were assumed

Table 6.1

Idealized governance models for locally provided water and sanitation

	Planning	Market	Community Action
Asset owner	Government	Private corporation	Users/residents
Asset manager	Government	Private corporation	Users/residents
Consumer role	Citizens	Customers	Community members
Organizational structure	Civil service	Customers	Association/network
Accountability mechanisms	Hierarchy	Contract	Community norms
Primary decision-makers	Administrators, experts, public officials	Individual households, experts, companies	Leaders and members of community organizations
Primary goals of decision-makers	Minimize risk Meet legal/policy requirements	Maximize profits Efficient performance	Serve community/leader interest Effective performance
Key incentives for good performance	Expert/managerial feedback in public policy process Voter/ratepayer/party opinion	Price signals (share movements or bond ratings) Customer opinions	Community norms and goals shared Community opinion/sanctions
Key sanctions for failure to maintain services	State authority backed by coercion Political process (e.g. via elections) Litigation	Financial loss Takeover Litigation	Livelihood needs Social pressure Litigation (in some cases)
Participation of customers	Collective, top-down	Individualistic	Collective, bottom-up
Associated business model	Public utility	Private company or utility	Community cooperative

Source: Bakker, K. (2003) *Good Governance in Restructuring Water Supply: A Handbook*. Federation of Canadian Municipalities, Ottawa, Canada, p.19; adapted from McGranahan, G., Jacobi, P., Songsore, J., Surjadi, C. and Kjellén, M. (2001) *The Citizens at Risk: From Urban Sanitation to Sustainable Cities*, Earthscan, London.

to be the most suitable providers. By the last decade of the century, however, the perceived failures of planned economies were driving a shift towards privatization and market mechanisms on the one hand, and community-based provision systems on the other. Much of the international debate over privatization in Asia, Africa and Latin America centred on large contracts in major cities. Private sector participation is also an issue for small urban centres, however.

Table 6.1 summarizes three visions of how water and sanitation ought, ideally, to be provided. Under the ideal planning model, governments represent the public interest, government plans and policies drive provision, and the provider is a public entity. Under the ideal market model, competing suppliers offer a range of services and technologies, and local residents pay for those that best meet their needs and budgets. Under the ideal communitarian model, residents get together and organize their way to obtain water and sanitary improvements. Each model is associated with a particular type of provider: planning with public utilities, markets with private companies or utilities, and community action with community-based organizations or cooperatives.

None of these models is ever fully achieved, even on its own terms. Public utilities regularly fail to pursue the public interest. Private water

and sanitation companies regularly fail to respond to their customers. Community organizations regularly fail to gain the support of local residents. Other characteristics of providers and the water and sanitation systems within which they operate can be far more important to the quality of water and sanitation provision.

In any case, most systems of water and sanitation in urban centres in low- and middle-income nations involve complex combinations of these idealized types. Individual providers often combine characteristics typically associated with public, private and community-based providers. Private, public and community-based providers often operate in the same settlement and handle the same water or waste on its way to or from local residents. Getting existing providers to perform better is often more important to the quality of water and sanitation provision than changing the balance between public, private and community-based providers.

The tendency for individual providers to combine the characteristics of private, public and community-based organizations may to some extent reflect the arbitrary nature of the classification, but it can also result from intentional efforts to create providers that combine their better features. In an effort to improve the efficiency of public utilities, they are sometimes

given at least partial fiscal autonomy and subjected to commercial pressures similar to those affecting private providers. In an effort to ensure that private operators of water and sanitation networks pursue the public interest, on the other hand, they can be made to operate under contract to public authorities. Community organizations may be set up by the government to provide water or sanitation, or supported by government and become responsive to government policy shifts and to changing local demands.

Similarly, particularly where incomes and coverage rates are low, the simultaneous presence of private, public and community-based providers is often a functional response to the deficiencies in the formal water and sanitation networks. Single water and sanitation providers are still the norm in large and affluent urban settlements, where everyone is connected to piped water and sewerage networks (though in most such settlements there are niche markets, such as for bottled water, or well water where piped quality is poor). In most high-income nations, this is also the norm in small urban centres – and it also seems that many small urban centres in some middle-income nations have close to all their inhabitants so served. A few decades ago, when public utilities were seen to be the only effective means for a government to deliver on commitments to provide universal water and sanitation, even small and less affluent settlements often only had one official water and sanitation provider. At least unofficially, however, private enterprises or community-based organizations have long provided water and sanitation in many areas lacking public provision. Increasingly, this provisioning is recognized and even encouraged. Sometimes different providers combine to create supply chains; as, for example, when a public utility provides water to kiosk operators, who then sell water to itinerant vendors. Sometimes the different providers serve different sets of consumers. And sometimes the different types of providers compete for the same customers.

Even if there is not a wide variety of types of provider, the success of water and sanitation systems often depends on the combined efforts of private, public and civil society organizations. If the provider is a large public utility, the system is more likely to reach low-income settlements if CBOs and NGOs apply constructive pressure, and the quality of the services will depend on private enterprises providing the utility with a range of goods and services. If the provider is a private utility, then the system is likely to be better if public authorities negotiate a good contract and create a sound regulatory environment. If the providers are community-based organizations, they may need support from public authorities and the reliable delivery of goods and services from private enterprises.

The quality of provision is also likely to depend on relations within the sectors of the providers. Competition among private providers is one of the most effective means of improving private efficiency. Alliances among civil society organizations are one of the most effective means of increasing the capacity of CBOs. And public utilities need both support and discipline from other public entities.

While local and national conditions, policies and histories determine the types of providers and water and sanitation systems present in small urban centres, international trends can also be very influential. As noted above, decentralization has spurred a shift in public sector responsibilities for water and sanitation provision from national to district or municipal authorities. Also importantly, and far more controversially, the international promotion of private sector participation has had an important influence on water and sanitation providers, even if it has not had the effects that many of its proponents anticipated.⁸

Privatization and smaller urban centres

Even when the World Bank was promoting private sector participation heavily in the 1990s, it did not recommend complete privatization, with the ownership of piped water and sanitation

systems passing to the private sector. Recognizing that private companies would not compete within the water market, since water networks were prone to monopolization, it was proposed instead that they should compete 'for the market', or more specifically for contracts or concessions that would give them the right to sell water under specified conditions. Recognizing that individual market demand would not drive sanitation provision, since sanitation is to a large extent a public good, contracting was also proposed for sanitation. In practice, many different contract types were considered as means for improving the efficiency and responsiveness of utilities. But the emphasis was on contracts that would attract the major international water companies with a track record in water and sanitation provision in urban centres.

Because of this focus on large companies and contracts, it is often claimed that private water and sanitation enterprises are only interested in supplying large cities, where there are substantial returns to scale and a large concentration of customers willing to pay for water. This is only true, however, for a small number of large and powerful private enterprises. The international water companies involved in the push for greater private sector involvement that began in the 1990s have been interested primarily in supplying large cities, and preferably those with a large middle class.⁹ Most of the contracts monitored by international organizations have been in large cities.¹⁰ These international water companies and their large contracts account for a very specific segment of the water and sanitation market. Other private enterprises serve very different segments and, in most poorly served settlements, and especially for small urban centres, they are far more important (although initially it was widely claimed that the large private providers would serve the poorer areas also).

Even before the push for private sector involvement began, large numbers of small and often informal enterprises were providing water to a significant share of urban dwellers in low-

and middle-income countries.¹¹ These enterprises serve small markets, including those in smaller urban centres, and often sell water by the container either at source or at people's homes. Moreover, private enterprises are involved in digging wells and selling pumps to households in many parts of the world, so that people can access their 'own' water. Similarly, many private enterprises are involved in constructing, emptying and, less often, operating pit latrines, *aqua privies* (a type of latrine set above or adjacent to a septic tank) and a variety of other private toilet systems unconnected to any sewers.

The recent drive towards greater private sector involvement started from the top levels of government. Indeed, for indebted countries the initial pressures were typically from external agencies.¹² The resulting shifts have as much in common with government efforts to increase public sector involvement in the 19th and early 20th centuries, as with any market-driven process of private sector involvement. The disproportionate number of concessions granted in major cities should not be taken to imply that this is where private enterprises are best able to compete.

In the United States, despite its long history of private sector advocacy in most sectors of the economy, the 19th and early 20th centuries saw a rapid increase in public water systems, with major cities the first to support public systems.¹³ By the middle of the 20th century, public systems were dominant in all sizes of city, but the private sector was still somewhat more active in smaller urban centres: only 12 per cent of cities over half a million in population had private systems, as compared to 17 per cent for smaller urban centres.¹⁴ The companies operating these systems were not large international water companies. Rather they consisted of a wide range of often very local companies.

Moreover, for many centuries urban residents without access to piped water supplies, or whose own water supplies were unsafe or insufficient, have paid vendors to provide water

Table 6.2

Comparing differently scaled private providers of water and sanitation

	FORMAL/LARGER ←	→ INFORMAL/SMALLER	
	Multinational companies	Local companies and enterprises	Micro-/informal providers
Typical market speciality	<ul style="list-style-type: none"> Major cities Large networked systems / bulk provision & treatment High technical standards 	<ul style="list-style-type: none"> Secondary cities or urban centres Medium-scale networks or transport systems Working in consortia 	<ul style="list-style-type: none"> Filling gaps in service supply in urban centres of any size Niche markets Markets with low entry/investment costs
Relative competency	<ul style="list-style-type: none"> Access to latest international technology Access to international finance Corporate management skills 	<ul style="list-style-type: none"> Local procurement Access to national finance Knowledge of local conditions 	<ul style="list-style-type: none"> Local knowledge Innovation with local resources Responsive to demands of poor
Potential disadvantages	<ul style="list-style-type: none"> Foreign control of water is politically sensitive Relative lack of international competition Need profits in global currencies; vulnerable to changes in exchange rates Vulnerable to political risks 	<ul style="list-style-type: none"> Local companies may be embroiled in local politics Lack of local competition May target high-income consumers 	<ul style="list-style-type: none"> Quality controls are difficult for informal enterprises Lack of scope for investment Difficulty achieving returns to scale and obtaining permission or capacity to create piped network
Potential advantages for urban poor	<ul style="list-style-type: none"> Under stable conditions, have capacity to guarantee high coverage Large networks provide good basis for cross-subsidies Failing to fulfil obligations in low-income areas can be bad for international reputation 	<ul style="list-style-type: none"> Urban centres where local companies are most competitive are often poor and underserved Ability to adapt to niche markets Ideally, combine advantages of multinationals and informal providers 	<ul style="list-style-type: none"> Can provide services where others will not Can manage small individual payments Tailored services responding to the specific physical and social characteristics of the neighbourhood

Source: Based on McGranahan, G. and Lloyd Owen, D. (2004) *Getting Local Water and Sanitation Companies to Improve Water and Sanitation Provision for the Urban Poor*, Thematic Paper for the Urban Forum in Barcelona, UN-HABITAT, Nairobi; and Plummer, J. (2002) *Focusing Partnerships: A Sourcebook for Municipal Capacity Building in Public-Private Partnerships*, Earthscan, London.

nearby or deliver door-to-door. Similarly, urban residents without access to sewers have had to rely on other solutions, ranging from bucket latrines collected regularly, to aqua privies or pit latrines emptied intermittently (or, unfortunately, not emptied at all). Government agencies or utilities can play a variety of roles in these water and sanitation systems. They may, for example, set up the water kiosks, or manage the waste collection or disposal. Most itinerant water vendors, kiosk operators, latrine constructors and waste removers are private, however. Indeed, they often have uneasy relations to the government agencies responsible for water and sanitation, and are part of what has come to be termed the 'informal sector'.

As indicated in Table 6.2, the different private enterprises providing water and sanitation services serve different markets, and these markets are affected by the size of an urban area. In low- and middle-income countries, with a few exceptions, the multinational companies are largely restricted to urban centres over half a million in population. Most of the exceptions represent cases in which the wealth of the city is comparatively high, including cities where the presence of a significant industry also makes

private provision economically viable. For example, the city of Riberão Preto in the prosperous state of São Paulo in Brazil has a population of 500,000, which largely consists of middle- and higher income groups and also an industrial base.¹⁵ Cancún in Mexico has a population of just 400,000 inhabitants, some of whom live in lower income areas, yet providing water to the lucrative tourist resort makes the city a potentially attractive opportunity for a private operator, as shown in Box 6.1. Private operators have taken contracts in smaller cities for other reasons, however. For instance, Queenstown is not one of South Africa's largest or most important cities, yet it was one of the first to award a concession contract for the private provision of water and sanitation services. Rather than wealth, this was explained as an opportunity for the private company to 'test the water' in South Africa, before committing investment to a much larger urban centre.¹⁶

Large concessions to private consortia involving foreign multinationals have been very controversial, have grabbed the headlines in many countries and have often led to public protests. The controversy is not surprising. Foreign-dominated companies have been competing to be given the right to operate piped water

Box 6.1 The challenges of private water supply provision in Cancún, Mexico

Chapter 3 noted the variations in the quality and extent of provision for water and sanitation in this city of around 400,000 inhabitants between the coastal hotel resort, the main city centre, established low-income neighbourhoods and more recent peripheral and peri-urban settlements. In 1993, a 30-year concession was awarded to the private operator Azurix for the operation of water and sewerage services in Cancún. Following the collapse of Azurix, its stake was purchased by French water multinational Suez in 2001, with financing from the Mexican Public Works Bank (Banobras). The concession contract covers the production and supply of drinking water and the collection and treatment of waste-water in the municipality of Benito Juárez, which contains Cancún, and the adjacent municipality of Isla Mujeres, characterized by recent low-income peri-urban settlements. In particular, the concession contract aims to extend the water network to peri-urban areas, improve both service quality and revenue collection, and ensure that the service is able to respond to the growth of the hotel industry along the coast adjacent to Cancún, which presently accounts for approximately two-thirds of the income of the concession. Although the operator is responsible for providing water supply and waste-water services in the city, the contract

excludes waste-water collection and treatment in the coastal resort, which are operated by the state using federal government subsidies.

The private operator, Aguas de Cancún, has attracted criticism for failing to improve the quality of the service, in particular in relation to the intermittent nature of water supply, despite tariff increases. The official tariff structure is based on a cross-subsidy system whereby high commercial tariffs compensate for lower domestic tariffs. Due to these factors, some large commercial consumers in the city have switched to cheaper and more reliable private water tankers. Moreover, this practice has been most widespread in the coastal resort, which is the only area of Cancún that receives a high quality and continuous service. Here, some of the larger hotels and businesses have installed their own desalination and water treatment plants, which, despite the high initial costs, are said to be more cost effective since there is no charge for the extraction of seawater. However, both of these activities compromise the profitability of the private contract and also raise concerns about the concessionaire's ability to expand and improve services in other parts of the city.

Sources: Hall, D. and Lobina, E. (2003) 'Water privatisation in Latin America, 2002', Public Services International Research Unit, Suez Press Release, 10 July 2002; Domínguez, M. and García, A. (2005) 'Obstáculos a las metas del milenio en Cancún: la problemática local del agua potable y el drenaje sanitario [Barriers to achieving the Millennium Development Goals for water and sanitation in Cancún, Mexico]', Department of Human Ecology, Instituto Politécnico Nacional, Mánida, Mexico; Barkin, D. (2004) 'The contradictions of urban water management in Mexico', Universidad Autónoma Metropolitana, Mexico City.

and sewerage networks – strategically important monopolies previously the responsibility of the public sector. The debate has been very polarized. Proponents claim that private sector operators are more efficient and more responsive to consumers. Opponents claim that private operators are less public-spirited and pursue profits at the cost of the poor. All that the more ardent proponents and opponents seem to agree on is that the choice of public versus private utility operators represents a major shift with ideological as well as practical implications.

Empirically, it is difficult to discern whether increasing private sector participation in utility operations and management has any effect at all on the overall quality and extent of water and sanitation provision. A review based on a survey of the literature and an empirical analysis based on household surveys in Argentina, Bolivia and Brazil concluded that connection rates increased at comparable rates, whether or not services were contracted out to

private companies, and that connection rates for the poorest households also increased at comparable rates, undermining the claims of both proponents and opponents of privatization.¹⁷ A review of African evidence found similarly ambiguous results.¹⁸ Given the public controversy, the ambiguous results and the relatively high failure rate of international water and sanitation contracts, international promotion of this form of private sector participation cannot be justified as a means to improve water and sanitation provision.

There are more obvious benefits from the smaller water and sanitation providers, who often help to provide services where and when the water and sanitation utilities – public or private – fail. Whether or not these providers should be given a bigger role, more consideration clearly needs to be given to local water and sanitation companies, including both those that operate water or sewerage networks independently and those that bid for government contracts. It is also

Table 6.3

Cumulative private sector water and waste-water contract awards over five-yearly periods

Period	National	Expatriate	Multinational	Exit	Total
1990–1994	3	0	12	0	15
1995–1999	11	4	22	(3)	39
2000–2004	49	16	49	(3)	114

Source: McGranahan, G. and Lloyd Owen, D. (2004) *Getting Local Water and Sanitation Companies to Improve Water and Sanitation Provision for the Urban Poor*, Thematic Paper for the Urban Forum in Barcelona, UN-HABITAT, Nairobi.

important to consider the multitude of small water and sanitation enterprises that deliver water or collect human waste door-to-door, or install household or collective water or sanitation systems. Often the services from these providers do not meet official standards, and the prices for itinerant water providers are often extremely high – particularly if the water is being carried in containers, which is a very costly means of transportation.¹⁹ At other times, however, standards and prices are comparable.²⁰ Moreover, even their high priced water and substandard services are usually better than the alternatives, which is why people are willing to pay for them.

The following subsections provide a brief review covering three types of local private provider: national companies that are competing for large contracts (serving over 10,000 people); independent water and sanitation network operators; and small and informal water and sanitation enterprises. Asian examples are used to illustrate the national water and sanitation contractors. Latin American examples are used to illustrate independent water and sanitation networks. African examples are used to illustrate the small and informal water and sanitation enterprises. There is a logic to this choice: national companies have been winning an increasing share of the large water and sanitation contracts in Asia; independent water networks are comparatively well documented in

Latin America; and networks are particularly patchy in African cities, leaving a great deal of room for small water and sanitation enterprises. Each type of provider is, however, found in urban centres on all three continents.

■ National water and sanitation contractors: An emphasis on Asia

In middle-income countries in Asia, as in much of the rest of the world, there were moves in the 1990s to open up public utilities to private operators, and most of the initial contracts were in major cities. The Asian economic crisis of the late 1990s led to reduced international private investment, but Southeast Asia and China have nevertheless had a comparatively high concentration of private sector participation.²¹ Moreover, in comparison with other regions, Asia has seen a relatively high share of contracts won by local firms.

A review of private sector participation between 1989 and 2004 identified 120 water and/or sanitation contracts in Asia involving water or waste-water services to at least 10,000 people, of which 114 were still in operation in 2004.²² The majority of these contracts were in China (90), with most of the remainder in Malaysia (11), Thailand (9) and the Philippines (5). Of the 114 still in operation, 49 were joint ventures with multinational companies, 49 were with national companies and the remaining 16

Table 6.4

Private sector water and waste-water contract awards by city size for Asian countries with contracts for both national and multinational companies

Population (million)	National	Expatriate	Multinational	Total
0–1	29	11	41	81
1–2	5	2	3	10
2–5	5	3	9	17
5–10	1	1	6	8
10+	2	0	6	8
Total	42	17	64	124

Source: McGranahan, G. and Lloyd Owen, D. (2005) *Getting Local Water and Sanitation Companies to Improve Water and Sanitation Provision for the Urban Poor*, IIED and UN-HABITAT, London and Nairobi.

Box 6.2 Provision of water and sanitation services by the local private sector in towns and villages in Uganda

Uganda is one of the poorest countries in sub-Saharan Africa and has some of the lowest human development indicators. 88 per cent of the population lives in rural settlements and small towns with populations of up to 15,000 inhabitants, and water supply coverage for 1998 was estimated at 42 per cent in rural areas and 60 per cent in urban areas, while 47 per cent of the population had latrines.

Following the widespread failure of the public sector to deliver water and sanitation services, in 1997, Uganda undertook water sector reforms that aimed to increase the involvement of the private sector in managing urban water services. Many smaller urban centres had expanded beyond the existing capacity of their water and sanitation infrastructure, leading to great deficiencies (especially in sanitation), reliance on informal providers, and a high incidence of water-related disease. In response, the government created a programme to prioritize improved provision in small towns in Uganda, with the support of external agencies. In 2001, decentralized local authorities awarded management contracts to the local private sector for nine small towns (with populations of between 5000 and 15,000 and governed by town councils), in which the World Bank had already supported the renovation of the water and sewerage infrastructure.

Research in the two towns of Lugazi and Lyantonde identified some positive outcomes of the transition to management contracts. These included a shift from traditional sources (such as springs and congested hand pumps) to piped water supply, and improvements in both continuity (hours of running water per day) and reliability (availability of water services at outlets). Although the contracts offered the management company financial incentives in order to expand coverage with the materials provided by the public sector, it remains unclear to what extent this resulted in an increase in new connections. However, a major drawback was that the management contracts lacked any specific pro-poor measures. Although tariffs had been fixed prior to the management contracts coming into effect, water pricing had previously been increased in order to reflect the costs of production, and, coupled with the higher level of service offered, was thus unlikely to be affordable to

lower income consumers. In addition, the management contracts saw a large increase in the proportion of metered connections and the implementation of a strict disconnection policy in the case of non-payment.

By January 2003, a total of 24 small towns had contracted private sector operators under management contracts, and Uganda aimed to award private sector management contracts to all small town water supplies by March 2005. A new project supported by the African Development Fund in 2005 aims to contribute to this goal through the construction of new water supply systems and basic sanitation facilities in a further seven towns (to also include solid waste management and storm water drainage improvement, as well as public health education).

In parallel, Uganda is also employing small-scale private contractors to implement water supply projects in villages with populations of up to approximately 1000 inhabitants. Between 1998 and 2001, hundreds of village projects were tendered by local government, leading to an impressive increase in coverage of approximately one million people according to Uganda's Ministry of Finance. However, research undertaken in 15 villages revealed that in some cases the speed of construction was being pursued at the expense of long-term sustainability. In particular, it was observed that some companies had little experience of construction projects, and some had even been formed in order to access the funding offered by the village water supply programme, despite lacking the required expertise. This in turn raised concerns about the quality of the infrastructure, as well as the lack of emphasis on community mobilization, participation in decision-making and hygiene and sanitation education, all of which are essential for sustainability. Although local governments retained 10 per cent of the company's fee for any repairs that were needed in the six months after construction, this was not always put into practice. Furthermore, some communities were unable to raise the 10 per cent upfront contribution to the projects, and were either unable to participate in the programme or had their projects transferred to other villages that were able to collect the necessary funds.

Sources: ADF (2004) *Uganda Small Towns Water Supply and Sanitation Project: Appraisal Report*, African Development Fund, Abidjan; Tumusiime, C. and Njiru, C. (2004) *Performance of Management Contracts in Small Towns Water Services*, 30th WEDC Conference, Vientiane, Lao; WaterAid Uganda (2002) *The Paradoxes of Funding and Infrastructure Development in Uganda*, WaterAid and Tearfund.

with companies owned or operated by expatriate Chinese in Singapore or Malaysia. Moreover, as illustrated in Table 6.3, the share of contracts with local and expatriate contracts has been increasing from 20 per cent in the first period (1990–1994) to well over half in the third period.

There are also indications that the contracts are shifting away from the major cities, and that local and expatriate companies often have a competitive advantage in the smaller

urban centres. Thus, as indicated in Table 6.4, about two thirds of the contracts are now in urban areas of less than one million in population, and about half of these are held by national or expatriate companies.

Numerous local companies also hold smaller contracts, not considered attractive to the major water companies. Such contracts have become more common and better documented with recent water sector reforms, but are still not sufficiently

well documented to estimate their prevalence or growth. Box 6.2 describes the small water contracts that emerged with water sector reform in Uganda. As described in the following section, many small companies also emerged independently of public sector provisioning.

■ Independent water and sanitation networks: An emphasis on Latin America

A review of independent water entrepreneurs in Latin America documented a wide range of private water providers, including many independent water networks, some of which are located in smaller urban centres.²³ In Colombia, for example, a number of small local firms or individuals took over the municipal assets of small urban centres after failed attempts to make the municipal water utilities financially independent.²⁴ In Paraguay, small water enterprises called *aguateros* have been well documented. While these *aguateros* initially concentrated in the city of Asunción (with a population of about half a million)²⁵, various efforts have since been made to extend their operations to smaller urban centres, alongside the adaptation of the traditional community water committee model for a private provider, as outlined in Box 6.3.

Most of the independent water networks were found to have sprung up opportunistically in response to demands not being met by failing public utilities, and to have emerged from:²⁶

- even smaller networks distributing water from a borehole among neighbours;
- real estate developers who originally installed the water and sanitation systems to increase the value of their property;
- providers to industrial parks, who find a private source more reliable or cheaper, particularly for high-quality water;
- mobile distributors who have made the transition to networked systems;
- user cooperatives, many of which have become quasi-official over the years;
- successful imitation of other networks in the vicinity.

These small-scale water providers do not always

have the support of the government, and they can come into conflict with larger private operators with formal contracts. Thus, for example, in the case of Cochabamba, Bolivia, one of the sources of controversy was that the concessionaire won the right to take over the smaller systems as well as the municipal network, although many of the smaller systems had been developed and operated independently of the government.²⁷

Independent water and sewerage networks are also evident in Asia, and to a lesser extent Africa. In a review of eight cities undertaken by the Asian Development Bank, piped water networks operating outside the utility system were documented in at least half.²⁸ While the cities reviewed were all major cities, such networks are also evident in smaller urban centres.

■ Small and informal sector water and sanitation providers: An emphasis on sub-Saharan Africa

Residents of small urban centres who do not have access to functioning piped water or sewerage networks often rely on the private sector to help meet their water and sanitation needs. In some cases, households pay for the digging or drilling of a well, for the construction of a latrine, or for devices (for example, water pumps, water tanks or latrine plates/slabs) or maintenance for their own water and sanitation systems. In others, the private service extends to selling or delivering water to the household, or to operating pay-toilets or emptying bucket latrines, pit latrines, aqua privies or septic tanks. For the purpose of this section, water and sanitation providers only include those who sell water, operate pay-toilets or collect and dispose of human wastes (namely, those that are involved in activities that ensure access to desired water and sanitation services).

The most often described small water enterprises are the water kiosks where vendors sell water by the container, and the itinerant water vendors who deliver containers of water to people's homes. Water kiosks may sell water from

Box 6.3 Independent water supply provision by *aguateros* and water supply administrative committees in smaller urban centres in Paraguay

Aguateros are private operators who construct water supply infrastructure with their own financial resources and in the absence of state support, and then provide water services to customers. Having originated in the unserved neighbourhoods of the capital, Asunción, there are now approximately 400 *aguateros* throughout Paraguay, who are estimated to serve 20 per cent of the national population. These settlements include El Remansito, half an hour outside Asunción, where MZ Ingeniería captures water from the River Paraguay, treats it using its own water purification plant, and then distributes water through its own network consisting of 400 connections. Each connection has a meter, and the average monthly household charge is US\$3. The *aguatero* does not yet provide sewerage, which would require an additional and separate network. MZ Ingeniería was initially an informal provider, but it has now acquired legal status and pays tax on its revenue. It has already invested approximately US\$70,000 in the system, and hopes to expand its coverage to 2500 connections. A major concern of all *aguateros* in Paraguay is a parliamentary bill that proposes establishing a uniform tariff for *aguateros*' services designed to allow them to recuperate investment within a period of ten years, but on the condition that the infrastructure would then pass to a water and sanitation management committee.

Under the World Bank Global Small Towns Study, and with additional funding from the Canadian International Development Agency (CIDA), the Paraguayan Rural Water Authority has sought to expand the model of water supply administrative committees (*juntas administradoras de agua potable*) in the country. Currently, there are approximately 1200 committees in Paraguay, half of which are registered, regularly assessed and regulated by the water authority.

The water authority is responsible for rural villages, small towns and peri-urban settlements of larger cities with populations

of up to 10,000 inhabitants. Under the committee model, the water authority builds the infrastructure with state funding and then the community – organized as a committee – takes over the full operation, management and maintenance of the system. However, state funding has become limited for the establishment of new committees in unserved small settlements. In view of this situation, and within the framework of the World Bank project, the water authority has initiated a new form of the water supply committee for rural communities using private operators. Under the new scheme, the private operator constructs a water supply system – which typically includes drilling a borehole, constructing a network and a water tank – and claims a subsidy worth US\$150 from the water authority for each new household connection. Once constructed, the operator is granted a ten-year concession for the water supply system, after which time the infrastructure and service reverts to the water supply administrative committee of the village. The average household tariff is US\$3 per month, depending on metered consumption.

In the village of Monday near Ciudad del Este in eastern Paraguay, the community accepted the new model because it was the only way to obtain a water supply system given the current limits to state funding. However, many families there are still unable to afford the connection fee of US\$150, on which the profitability of the system hinges. In 2003, 140 households had connected to the new system, although the private operator hopes that this will eventually rise to around 400 in order to have a good level of profit. In another town, Itagua in the peri-urban area of the capital city, Asunción, the committee that started in 1974 with 64 households now has 5400 users and is a business estimated to be worth around US\$500,000, showing that the committee can also be effective on a larger scale.

Source: CEPIS (2003) 'Modelos de provisión de servicios de agua y saneamiento en el Paraguay' [Models for the provision of water and sanitation services in Paraguay], *Agua*, no. 1, December, pp 8–10.

a shallow well, a borehole, or a piped water system. People may carry the water home themselves or pay for a vendor to deliver the water. In some cases small enterprises will even use pipes (for example, plastic hose pipes) to carry the water short distances to their consumers. Itinerant vendors often carry the water in bicycle-, animal- or hand-drawn carts – or less often in motorized carts. They may collect the water from kiosks, or from other local sources. Tankers sometimes operate over longer distances.

Not all such enterprises are private. Water tankers are often operated by public agencies or the water network operator, rather than as

private enterprises. Kiosks can be owned and in some cases operated by the utility. Perhaps more confusingly when it comes to assessing how widespread small private water enterprises really are, it can be very difficult to discern whether neighbourhood water sellers are private enterprises in the conventional sense. Many millions of people pay their neighbours for access to water or sanitation facilities, and there is a continuum between commercial relationships where the seller is maximizing profits, and collective arrangements where costs are simply being shared. Especially when relations are informal, it is hard to tell where along this continuum a

Country	Location	Estimated Coverage
Somalia	Ali Matan	10
Nigeria	Dankida	15
Senegal	Dakar	21
Tanzania	Newala	25
Uganda	Kasangati	25
Uganda	Kampala	30
Ghana	Kumasi	32
Burkina Faso	Bobo Dialouso	33
Côte d'Ivoire	Abidjan	35
Niger	Guidan Roundji	40
Nigeria	Ibi	40
Kenya	Ukunda	45
Burkina Faso	Ouagadougou	49
Côte d'Ivoire	Boundiali	50
Mauritania	Nouakchott	51
Tanzania	Dar es Salaam	56
Kenya	Nairobi	60
Mali	Bamako	63
Guinea	Conakry	66
Burkina Faso	Niangologo	68
Benin,	Cotonou	69
Mali	Kayes	69
Sudan	Khartoum	80
Kenya	Mandera	90
Senegal	Diourbel	90
Nigeria	Onitsha	95

Note: Locations in bold are the country's capital or major city.

Source: Kariuki, M. and Schwartz, J. (2005) *Small-Scale Private Service Providers of Water Supply and Electricity: A Review of Incidence, Structure, Pricing and Operating Characteristics*, World Bank Policy Research Working Paper 3727, World Bank, Washington DC.

Table 6.5
Coverage by small water enterprises in Africa, as reported in case studies

given relationship lies. Similar difficulties can arise in distinguishing larger informal enterprises. While formal organizations often have to register and operate as either profit-making non-profit organizations (for example, NGOs), among informal organizations there is rarely a clear dividing line. In any case, while the extent to which a provider is charging a fair price or taking excessive profits is often very important locally, this applies to all sorts of providers and not just to overtly profit-seeking enterprises.

Although largely ignored in the early efforts to increase private sector participation, there have been several recent efforts to document the role of small private water and sanitation providers, and to determine how their contributions could be enhanced. While much of this documentation has focused on their role in the peri-urban areas of major cities,²⁹ many of the lessons also apply to smaller urban centres. Table 6.5 summarizes water coverage levels from small private water providers reported in a selection of settlements in Africa. The coverage levels are roughly comparable in major cities and other settlements, but are high in almost all settle-

ments: in all but two of the settlements the reported coverage is over 20 per cent, and in half it is 50 per cent or more. This may reflect the locations, which were chosen not to be representative but to illustrate the role of small private water providers. It may also reflect a problem alluded to in the previous paragraph: that while private water vendors are most often described as water kiosks and/or itinerant vendors, most private water transfers take place between neighbours (when household surveys are used to identify the extent of water vending, households purchasing from neighbours will typically appear as reliant on vendors).

Relations between utilities, water authorities and the small and informal water providers are often problematic. The sale of water is sometimes banned, particularly in settlements where the public sector is providing water for free or at subsidized prices. Even where the sale of water is not banned, small and informal vendors find it difficult to meet standards designed to safeguard water quality, especially when these standards are designed on the assumption that water quality should be the same as from a well-run utility.

Local authorities responsible for water vending often face national legal restrictions if they wish to adapt water and sanitary standards to suit local water vending. In any case they, along with the national authorities, typically face a series of policy dilemmas with regard to the regulation of water pricing and water quality, even if they have the interests of their citizens at heart.

Dilemma 1: Keeping down the price of vended water is an important policy goal, but reducing the price at which public water supplies are sold to private vendors does not necessarily affect the resale price. Since vendors often sell to low-income residents who cannot afford connections, there would seem to be reason to provide them with water at a comparatively low price. Alternatively, if supplies are limited then even if there is a competitive market for water, vendors will sell at a high market price determined by

how much consumers are willing to pay for the scarce water, regardless of the purchase price. This might seem to suggest the need to control the price at which vendors sell water, but here too there is a dilemma.

Dilemma 2: Attempting to prohibit the (re)sale of water at high prices can, in many circumstances, lead to still higher water prices. There would seem to be good reason to try to prohibit the sale of water at unaffordable prices. On the other hand, if these prohibitions reduce the quantity of water made available on the market, then they can actually increase the market price. Even disregarding the possibility that price controls will reduce water supplies, it is extremely hard to set appropriate prices when a large share of the vendors' costs lie in the transportation of water. Moreover, overly strict controls can increase the incentive for vendors to sell illicitly, making both quality and quantity harder to control. This in turn relates to the third dilemma.

Dilemma 3: Controlling vendor water quality can increase prices without improving the quality. The third dilemma relates to controlling water quality. Inspecting vendors and their water supplies is an obvious way of trying to ensure that private water sales do not become a threat to public health. Again, however, there is a danger that this will reduce the quantity of water made available on the market, and increase the incentive for vendors to sell illicitly, giving consumers even less recourse if they have complaints about the vendors and their operations.

Many of the more promising means of overcoming these dilemmas involve active engagement with community organizations and strengthening non-governmental means of making vendors more accountable to their consumers. Some of the more successful innovations are described in Chapter 4. For this chapter, the critical point is that partly because of the problems underlying these dilemmas, small private water sellers have not traditionally been recognized as legitimate providers, and have been largely neglected in the policy arena. By not

recognizing them, local authorities try to avoid taking responsibility for their failures: if vendors sell water at exorbitant prices or at low quality, that is not the water authority's fault. Yet by not actively preventing them from operating, they hope to avoid taking responsibility for interfering with a valuable service. In practice, the outcome varies enormously from place to place, and different authorities and different staff within any given authority may respond very differently. But it is very common for small water vendors to be part of an informal sector that is not officially condoned but is tolerated nonetheless.

The authors of a recent synthesis of research on small water enterprises in Accra, Dar es Salaam, Khartoum and Nairobi argue that the failure of utilities and local authorities to engage with these water enterprises is a major obstacle to their improvement.³⁰ In all of these cities, however, the authors also found that the situation is changing, with sectoral reforms providing more opportunities for small as well as large private enterprises. These sectoral reforms should also be affecting smaller urban centres. Combined with decentralization, the scope for changing relations between water authorities and small water enterprises should be quite considerable in smaller urban centres. Similarly, there may often be scope for improving access to finance for small water and sanitation enterprises. To date, however, most of the evidence and policy debate relates to larger water enterprises and the large urban centres they usually serve.

Small private sanitation providers are even less well documented than small water enterprises, and defining sanitary providers as only those involved in the transport of human waste is quite restrictive. They should be defined as those involved in activities that ensure access to desired sanitation services, which should include construction, operation and maintenance of septic tanks, pit latrines and pour-flush latrines, as well as the provision of emptying services from such facilities. Moreover, people are less inclined to buy adequate sanitation from private providers than they are to buy adequate water.

There are at least two reasons why people find it particularly difficult to purchase adequate sanitary improvements on the market. First, as indicated in Chapter 4, the costs of extending a sewer system is much higher than that of a piped water system, particularly if the sewers are built to meet conventional utility standards. Second, and perhaps more importantly, the benefits of improved sanitation are more public than the benefits of improved water supplies, and people have a less immediate incentive to purchase a truly safe sanitary service. In a neighbourhood where sanitary conditions are very poor, a household that disposes of its own human waste safely still has to face sanitary hazards if other people's faecal material is polluting the water, being transmitted by flies, finding its way to public sites where children play, contaminating food, or being transported along one of the many other faecal–oral routes typically pervasive in low-income urban settings. Thus small private providers are less likely to fill a gap in sanitation provision than a gap in water provision, unless a neighbourhood-centred approach, rather than a household-centred approach is used.

Nevertheless, hundreds of millions of urban dwellers rely on private providers to empty their septic tanks, aqua privies, bucket latrines or in some cases their pit latrines. Moreover, local and national authorities are often ambivalent about private sanitary providers for some of the same reasons as noted for water above. It is difficult to justify public authority support of private bucket latrine collection since bucket latrines are considered insufficiently sanitary, and are generally expensive to operate. Much the same applies to the collection of waste from other sanitary facilities that do not conform to official standards.

The implications of increasing private sector provision for small urban centres

The implications of privatization for small urban centres depend on the form that privatization takes, and perhaps more importantly where the drive for it originates, and also what influence different groups have in deciding whether and

what form it will take. Private sector participation involving large contracts for large water companies has been on the decline in some parts of the world. In any case such companies are unlikely to be interested in new contracts for smaller and low-income urban centres, and small and low-income urban centres are unlikely to have the capacity to handle such contracts.³¹ This was the case in Queenstown, South Africa, where a concession contract was awarded without first building the capacity of the local government to manage and regulate it.³²

At least in principle, private companies should be able to achieve returns to scale by working in a number of smaller urban centres, rather than single large urban centres. A distinction is often made between market consolidation and aggregation. Market consolidation refers to the expansion of local operators to a number of urban centres, on the basis of separate agreements. In principle, this allows the private provider to achieve returns to scale, but does not allow for cross-subsidies between settlements. Aggregation refers to the grouping of different urban centres into a single contract. Aggregation at least potentially allows for cross-subsidies.

In low- and middle-income countries, it is likely that small private enterprises in small urban centres have been growing in importance since 1990, but at least initially this was less because private enterprises were promoted, and more because of the rolling back of public sector provision. Often, however, the outcome was not that the market replaced the state, but that a variety of arrangements emerged, involving in different combinations the state, civil society organizations (ranging from international NGOs to local cooperatives and CBOs) and profit-seeking enterprises. As a book on service provision in East Africa in the mid-1990s states on its cover:

'Privatize!' sounds the advice to African states crumbling under the burden of service provision. And privatize they do. However, what takes place on the ground in Kenya,

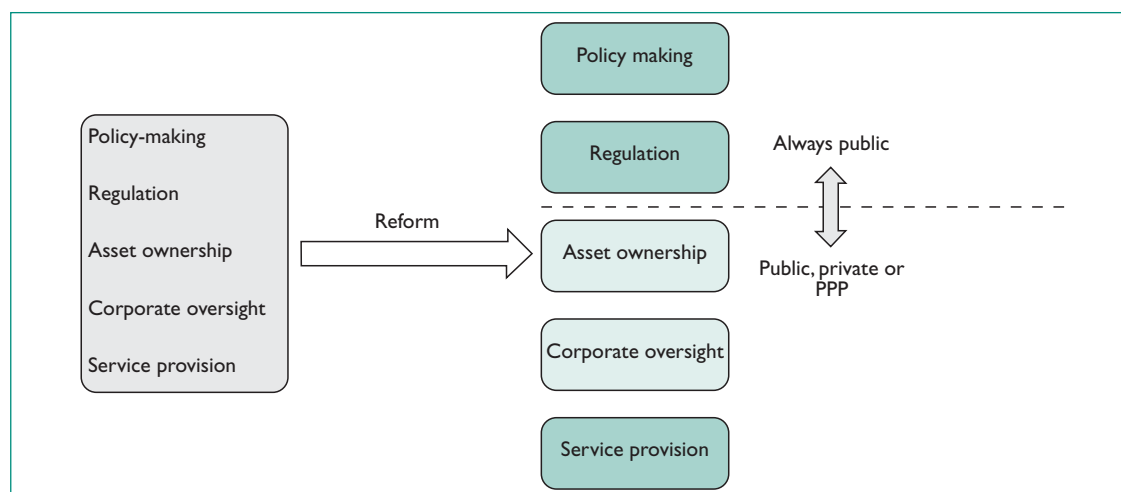


Figure 6.1

Separating functions within the water and sanitation sector

Note: PPP is public-private partnership

Source: World Bank (2004) *Operational Guidance for World Bank Group Staff: Public and Private Sector Roles in Water Supply and Sanitation Services*, Energy and Water Department and Infrastructure Economics and Finance Department, World Bank, Washington DC.

*Tanzania and Uganda has little to do with privatization as discussed in Western textbooks.*³³

More recently there has been growing interest among donors and national governments in private sector participation in small urban centres. More generally within the water sector, there has been a shift in attention from private sector participation towards water sector reform.

WATER SECTOR REFORM AND THE MULTIPLE MODELS OF WATER AND SANITATION MANAGEMENT IN SMALL URBAN CENTRES

As described above, when the World Bank and other international development agencies first promoted private sector participation, a disproportionate share of the attention was devoted to large contracts in large urban centres and the large companies that competed for them. More recently there has been a shift in emphasis towards water sector reform, wherein private sector participation is only one possible option. More attention has also been devoted to small urban centres. There is still a concern, however, that many water sector reforms respond to

problems as they are experienced in large urban centres and that, while they may recognize the need to take a different approach in rural areas, water sector reforms often do little to accommodate small urban centres.

As with private sector participation, the World Bank and other international development agencies have promoted water sector reform internationally, and partly as a result the reforms are often based on similar principles in different countries. According to operational guidelines for World Bank Group staff on public and private sector roles in water supply and sanitation services, the common challenges for sector reform are:³⁴

- achieving financial sustainability;
- strengthening sector policy and regulatory frameworks;
- improving the commercial and operational efficiency of the service providers;
- addressing the specific needs of the poor;
- reflecting externalities and environmental impacts.

The first three of these challenges are closely interlinked, and combine to form the core of the sector reforms being promoted internationally. The last two challenges may be equally or more important, but are less closely associated with the structural changes designed to create efficient and financially viable water and sanitation systems that respond to customer demands.

Model	Water association	(Ring-fenced) municipal water department	Water board	Small-scale private water company	Share corporation
Ownership	Town / Water Association	Town	Town / water board	Owner-manager, and/or shareholders	Various models
Corporate Oversight	Executive committee of Association	Town council water committee	Water Board	Owner-Manager	Board of directors
Operations	System manager and staff, or private operator	Municipal water department	System manager and staff, or private operator	Company staff	Managing director and utility staff
Who controls decision making?	End-users	Mayor / town council	Stakeholders represented on the Board	Owner-Manager, and/or shareholders	Board, Managing Director, and/or shareholders
Legal	Public	Public	Public	Commercial	Quasi-commercial
What sizes of towns?	Rural small towns and 'satellite' communities	All sizes of towns	All sizes of towns	Typically start in small towns, but expect to grow	Medium-sized and large towns

Source: Pilgrim, N., Roche, B., Revels, C., Kingdon, B. and Kalbermatten, J. (2004) *Town Water Supply and Sanitation*, World Bank–Netherlands Water Partnership, Washington DC.

Table 6.6

Summary of five management models for towns

However, the success of the first three makes it easier to achieve the goals for the last two.

The operational guidelines mentioned above recommend the separation of functions within the water sector as a basic step towards reducing political interference in the day-to-day operations of water and sanitation providers, and increasing the clarity and accountability of policy making, regulation, operational oversight and service provision (see Figure 6.1). Separating these functions is conducive to private sector participation, but can also provide the basis for more financially autonomous public providers that operate under company law, are set up as legally autonomous bodies, or at least keep separate accounts and retain a degree of independence in day-to-day operations.

This separation, clarification and coordination of functions is likely to be easier to achieve in large cities or in centralized institutions, and in affluent settings. It is clearly desirable for small urban centres to have efficient and financially viable water and sanitation systems that respond to the users' (the residents) demands. If, however, policy making is being undertaken in a distant capital city and there is no local regulatory presence or there is little local capacity for overseeing service provision, then such reform is unlikely to provide a sound basis for improving water and sanitation provision. Moreover, these reforms are based on expert judgement within the international water sector, and even in large cities there is as yet very little evidence as to whether they have correctly identified the priorities and will have the desired effects.

Models for managing formal water supply and sanitation systems in smaller urban centres

In response to the concern that small urban centres, and more specifically small towns, were being neglected, a number of projects have been initiated, networks set up, and reviews prepared. Reports examining small town water and sanitation in particular places or in relation to particular issues have been published by groups such as the World Bank's Water Supply and Sanitation Program, the multi-agency Water and Sanitation Program (WSP),³⁵ the programme on Water and Environmental Health at London and Loughborough (WELL),³⁶ the former USAID-funded Environmental Health Project (EHP),³⁷ and the Dutch International Water and Sanitation Centre (IRC).³⁸ There is little evidence that it is inherently more difficult to provide the residents of small urban centres with water and sanitation, or that any particular model of organizing water and sanitation provision is inherently better. There clearly are challenges and opportunities specific to smaller urban centres, but there are critical size differences among smaller urban centres – indeed this is part of the challenge when it comes to supporting water and sanitation systems in smaller urban centres.

Various models have been proposed for the management of formal water supply and sanitation systems in small urban centres. A recent review of the challenges of town water supply and sanitation identified five management models for towns, summarized in Table 6.6. It is assumed in every case described in the table that

the town government will have a regulatory function, and that the policy environment is being set by the national government.

A recent review of evolving water management models in the small urban centres of Vietnam examined a range of models, including:

- direct management by small town people's committee in small urban centres and commune people's committee in 'townlets';
- community management;
- cooperatives;
- provincial water supply companies (a form of state owned enterprise);
- other state-owned enterprises;
- private-water companies.

Settlement size was found to influence the choice of management model. Urban centres, with population sizes ranging between 4000 and 30,000, generally rely on provincial water supply companies, other state-owned enterprises or private water companies, while townlets, with populations as low as 2000, displayed more variation, with management models extending to people's committees, cooperatives and communities. Moreover, small townlets and towns often had multiple supply systems. The district town of Ben Luc, for example, had nine systems, while the small town of Le Loi had three including two community systems and one private system.

No particular management model was found to be outperforming the others. Indeed, it was noted that 'due to varying geography and demographics, and a rapidly evolving economic policy and regulatory environment, the use of a variety of management models is optimal'.³⁹ Systems in the smaller settlements performed slightly better, challenging the notion that greater size is always an advantage for water and sanitation provision.

Somewhat similar conclusions were drawn from a review of management models for small towns water supply in the Philippines:⁴⁰

- *Local government units* (LGUs) – this is when local authorities, such as municipalities or provincial governments, manage urban water systems directly (500 urban systems).
- *Water districts* – these were created as 'quasi public corporations', operating independently of LGUs, with support from the Local Water Utilities Administration, which have since become more fiscally and procedurally constrained 'government-owned and controlled corporations' (430 urban systems).
- *Rural water supply associations* – these are non-profit community-based associations, located in rural or small urban and peri-urban settlements, once supported and financed by a Rural Waterworks Development Corporation, but now amalgamated under the Local Water Utilities Administration (500 systems).
- *Water cooperatives* – these are similar to the rural water supply associations, except that the users contribute equity and have a financial stake in the success of the cooperative, and their support and oversight is provided by the Cooperative Development Authority (200 plus urban systems).
- *Private sector* – these are large private concessions, located in major urban areas, whose service coverage centres on affluent areas (four urban systems).

In the Philippines, the review examined 14 small town water supply systems and concluded that the community-based models (rural water supply associations and water cooperatives) were more successful, because they were more responsive to local conditions and demands. On the other hand, it also points out that statistics from the Local Water Utilities Administration indicate that a large share of the rural water supply associations failed. However, the successful community-based models documented were not fully autonomous providers, but received professional support from the larger water districts and

Box 6.4 Multi-sector partnerships in Moreno, Argentina

A significant part of the privatization debate has been whether or not private operators are able and willing to provide or extend services to low-income settlements. An international NGO based in Buenos Aires, the International Institute for Environment and Development–América Latina (IIED-AL), has sought to work with each of the three private companies that got concessions within different areas of Greater Buenos Aires to support this. Part of this work is an initiative to support a partnership between community organizations, municipal government and the private sector in Moreno, one of the outer municipalities within Buenos Aires Metropolitan Area. Moreno has a total population of 380,000 inhabitants and is one of the poorest municipalities in the metropolitan area; it is located 37km from the main city. In the 1990s, three concession contracts were awarded for water and sewerage services for different parts of the Buenos Aires Metropolitan Area. Moreno falls within the concession area awarded to Aguas del Gran Buenos Aires (AGBA).

Less than a fifth of Moreno's population are connected to the formal piped water system and only 11 per cent are connected to the official sewer system. Around 7 per cent of the municipality's population are served by autonomous local water and sanitation systems, and most of the rest rely on shallow wells (with poor quality water) and cess pits for sanitation. The concessionaire is responsible for provision to the entire area under its remit (which includes most of Moreno), including the expansion of the water and sewer network. But with no firm pro-poor measures in the contract, and with an exemption from working in areas where the inhabitants have no formal legal tenure of the land, it has not extended provision to any low-income settlement. It has also been difficult for any private concession to work successfully in Argentina since the economic crisis that began at the end of 2001 and the resulting increase in poverty and unemployment. In Moreno, more than half the population have income levels below the poverty line.

There was an obvious need to seek other ways to improve and extend provision for water and sanitation. With the active support of the municipal government in Moreno and support from

UNDP, IIED-AL developed a partnership-based management unit in Moreno. Partnership-based management is a participatory model that establishes a tri-sector alliance (government–civil society–private utility) in order to involve all key actors in the water and sanitation arena and combine the strengths of each to work together towards solutions. The aim was to build the capacity of all relevant actors in water and sanitation provision – that is, AGBA, local government agencies and community organizations – and to institutionalize the model by forming a local water authority with representatives of the different actors. A second aim was to change the levels of services set out in the concession contract to make them more appropriate for low-income settings, and develop and then replicate models of intervention in other similar areas.

The initiative is structured into four phases. The first stage focused on raising awareness among all actors about possible models of intervention – through regular meetings and workshops, working closely with the municipal Institute for Urban, Environmental and Regional Development (IDUAR), and also via a community newsletter. The second stage focused on collecting local data to produce a participatory water and sanitation map of the municipality that was as complete and accurate as possible. With strong local support, a much more comprehensive survey than expected was produced. The third stage was to form the partnership-based management unit as the means of establishing dialogue and discussion among the different actors participating in the project, eventually leading to the collaboration needed to expand and improve provision for water and sanitation. But it was difficult to get the regular participation of the private utility, AGBA, and eventually the company withdrew. In part, this was due to difficulties it faced as a result of the economic crisis; in part it was due to a process of internal restructuring. This initiative hopes to develop to a fourth stage to institutionalize the model into a local water authority that can form the basis of improvements for deficient water and sewerage services through which responsibility will be shared between the municipal government, civil society and the private sector.

Source: Hardoy, A., Hardoy, J., Pandiella, G. and Urquiza, G. (2005) 'Governance for water and sanitation services in low-income settlements: Experiences with partnership-based management in Moreno, Buenos Aires', *Environment and Urbanization*, vol 17, no 1, pp183–199.

financial support from the Local Water Utilities Administration. Again, it is important not to focus too narrowly on providers, but to consider provision within the broader water and sanitation systems to which they contribute.

The wide range of officially endorsed management models documented for Vietnam and the Philippines are probably exceptional, and reflect ongoing water reforms or a range of different local government levels, as is the case in the Philippines. A review of water supply

systems in small urban centres in Africa also found a great deal of variation, however, including different types of community management, municipal management and delegated management, as well as numerous combinations.⁴¹ A great many countries are going through water sector reform. Moreover, a great many more models would be needed to reflect the role of informal providers, non-government organizations and innumerable combinations thereof.

Models involving NGOs and multi-sector partnerships

Most of the models discussed in the previous section focus on the higher levels of management and assume that water and sanitation provision in any given small urban centre is organized in a coherent and consistent manner. The model defines the role of the government, and the sort of provision it either engages in or encourages. In practice, even small urban centres are likely to contain a wide range of different arrangements for water and sanitation provision, especially if the piped water and sewerage networks are not well developed. This includes not only the private providers described in an earlier section of this chapter, but also a wide range of non-governmental organizations, community organizations, and even other government agencies (see, for example, Box 6.4).

There are, for example, a range of different types of multi-sectoral partnership in the water and sanitation sector, some of which have been designed specifically to help extend provision in low-income urban areas. The intention is that these partnerships, which bring together government, private sector and civil society stakeholders, not only improve access to clean water and sanitation in unserved or inadequately served communities, but also help build capacity – including skills training in construction, maintenance, accounting and management – and raise awareness about water resource management and/or sustainable hygiene practices. Multi-sectoral partnerships can also have a consultative role in various aspects of regulatory reform, from helping to design tariff structures and coverage targets, increasing competition and quality control mechanisms and, especially, in terms of building sensitivity around the specific needs of the poor.⁴²

While the term ‘*partnership*’ may suggest a certain simplicity and harmony, collaboration can be a long and arduous process. Stakeholders each have a different set of interests, incentives, resources and values – and different levels of power. Although these differences are precisely

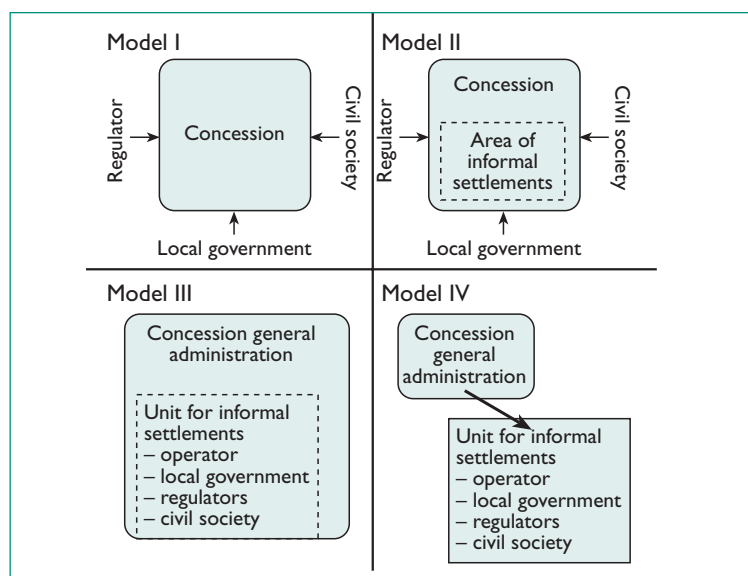


Figure 6.2

Different models of intervention for private utilities in informal settlements

Source: Hardoy, A. and Schusterman, R. (2000) 'New models for the privatization of water and sanitation for the urban poor', *Environment and Urbanization*, vol. 12, no. 2, pp63–75.

what can make multi-sectoral collaboration fruitful, such partnerships may require more *space* for innovation than other (bi-sector) partnerships. Research by Building Partnerships for Development in Water and Sanitation (BPD) explores some of the *systemic* barriers to successful partnerships, stemming from a mix of technical barriers, such as legal and regulatory frameworks that unwittingly prevent the establishment of such partnerships; socio-political barriers like hierarchical perceptions of leadership that prevent participation; lack of capacity within civil society to engage meaningfully; financial barriers, including weak contractual incentives and insufficient funding; and/or ineffective, highly restrictive procurement policies.⁴³

Many important partnerships improving provision in low-income areas have also been created among CBOs, and between CBOs and local NGOs.⁴⁴ As described in previous chapters, these partnerships are not always formed around water and sanitation. The National Slum Dwellers Federation in India emerged out of the struggles of slum dwellers to stop demolitions and evictions, but came to have an important role in improving provision for water and sanitation in existing slums and through projects that provided new houses for slum and pavement dwellers with good provision for water and sanitation. Both the partnership among the groups in different settlements, and the Federation's partnership with an

NGO, the Society for the Promotion of Area Resource Centres (SPARC), and cooperatives of women slum and pavement dwellers (Mahila Milan) have improved and extended provision for water and sanitation to many low-income households (see Chapter 4) and provided models for many other groups.⁴⁵ By contrast, the Pakistan NGO Orangi Pilot Project, whose work in sanitation in small urban centres was described in Chapter 4 and whose work in mapping was described in Chapter 5, was set up specifically to address sanitation issues – and later broadened its programme to include other aspects, including support for improving water supply, schools, health care, building quality and a number of small-scale economic activities. Partnerships between different stakeholders are also important for other programmes described in Chapter 4 that focused on upgrading and/or new house development but in which provision for water and sanitation were important – for instance the

support of CODI to community organizations and networks in Thailand and of the local development programme Programa de Desarrollo Local (PRODEL) in Nicaragua for community–municipal partnerships.

There are also different models of how private utility operators can work in informal settlements, as illustrated in Figure 6.2, and different ways they can work with both non-governmental organizations and community-based organizations.⁴⁶ Models III and IV offer more scope for civil society groups and local governments both to influence decisions and to act – although discussions with a range of specialists about the most appropriate model showed some favouring Model III and others favouring Model IV.⁴⁷ However, for many deprived settlements, the less formal relations with the utilities and the local government are often just as important as those set out in government plans.

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FINANCE FOR WATER AND SANITATION IN SMALL URBAN CENTRES¹



INTRODUCTION

The need to increase funding for water and sanitation provision in small urban centres is obvious, given the scale of the deficiencies described in earlier chapters and the short time left to meet the water and sanitation MDG targets by 2015. So is the need to increase the effectiveness of funding targeting and use to improve water and sanitation services, particularly for lower income groups. Meeting these two challenges should go hand in hand. As funds are used more effectively, this should make it easier to attract additional finance, whether in the form of loans, grants or simply payments for services delivered. Alternatively, as more funds are made available, more cost-effective delivery systems should become affordable, with piped systems, for example, replacing the manual or motorized transport of water containers. Unfortunately, obstacles also tend to go hand in hand: small urban centres with inadequately financed water and sanitation systems find it difficult either to attract more finance or to improve the cost-effectiveness of their water and sanitation systems.

Compared to other public services, water and sewerage networks are very capital intensive. A large share of their finance needs to be invested in infrastructure that, provided it is maintained, will yield benefits for decades or

more. Indeed, many Londoners rely on sewers constructed more than a century ago. In the long run, piped water and drainage networks are usually the least expensive means per person served to deliver and dispose of adequate quantities of water for urban populations. But it is usually difficult, and often impossible, to get prospective users to cover the investment costs up front. Consumers and local taxpayers are far more likely to be able and willing to pay for water and drainage networks as part of the service cost – in much the same way as with other goods and services. If water and sanitation infrastructure are costed on the basis of the initial investment plus maintenance plus the cost of supplying the water, with a view to getting the capital costs back over ten years, the weekly or monthly costs per household for good quality systems are actually relatively low; the kinds of innovations described in Chapter 4 such as ‘component sharing’ and simplified sewers can further reduce these.² Thus, some form of borrowing, or its economic equivalent, is usually necessary in order to finance these networks. In principle this might seem to be a simple financial transaction. In practice, however, financing investment in the water and sanitation systems of small urban centres is often highly constrained and fraught with problems, particularly where average incomes are low. Moreover, financing problems may not only delay investment, but may

also result in inappropriate and costly investments that make it all the harder to develop a sound basis for future investments.

In some small urban centres in low-income countries, this need to finance investment (which arises due to the timing of the costs and benefits, and can be met with loans) is complicated by the need to finance subsidies (which arise because certain people or groups are unable to afford adequate water and sanitation services, and is better met with grants). Regardless of the financial instruments available, not all small urban centres are able to afford the sort of water and sanitation systems that would enable them to meet the MDGs without some form of subsidy. As described later in this chapter, there is considerable debate over when and how subsidies should be applied. The failure to finance subsidies can have numerous repercussions, however. In many countries, for example, utilities have been directed to provide water below cost, but have not been provided with the resources that would allow them to do so without accumulating debts. Service delivery suffers as a result. Moreover, if such conditions exist or are anticipated by potential lenders, the financing of investments is also compromised.

There are many advantages of focusing on supporting local action that draw as much as possible on local resources – in part because this shows that improvements are possible without much donor funding, and in part because this often produces cheaper, more pro-poor and more sustainable solutions. For national governments seeking to fund water and sanitation improvements through loans from development banks, the use of local resources also has the advantage of minimizing the need for loans – and thus reducing debt burdens. In many small urban centres, the key to improved provision lies in better local governance and more supportive frameworks from higher levels of governance, not in finding new sources of external funding (see Chapter 4).

But there are many nations where there is little possibility of financing needed subsidies or investments from local sources, and little possibility of getting sufficient funding from higher levels of government. In addition, in many small urban centres, especially those growing rapidly and soon to become large urban centres, there is a need for especially large investments in the infrastructure of provision – often a need to draw water from extra-local sources, well-functioning water treatment plants, a water mains trunk network, a network of drains and, where needed, sewer mains for waste-water and storm run-off and often sewage and waste-water treatment plants. Also, some external subsidies or loans used to match local resources and capacities can be used to improve the quality of provision – for instance shifting from communal standpipes to group standpipes (which means fewer households per standpipe and shorter distances to and from water) or to yard standpipes.

In this chapter, as in other chapters, the emphasis is on the need to build local capacities in each small urban centre (and large village) that allow local choices as to what is done, in which poorer groups have influence and where the water and sanitation service providers are accountable to them. This has implications for the financing of investments, and especially of subsidies. In order to emphasize local processes, we have reversed the normal order with which different funding sources are discussed – so instead of a focus on international finance, it begins with a discussion of local finance, then municipal and national finance, then the role of loan finance, the role of water subsidies – and finally, the role of donor finance. Before looking at these different sources, however, an international review is provided of the level of water and sanitation sector finance currently obtained from different sources, and of the supply-side constraints in financing water and sanitation infrastructure.



THE SUPPLY SIDE OF WATER AND SANITATION SECTOR FINANCING³

Finance for water and sanitation investments comes from a variety of sources, many of which are not well documented. Finance for subsidies are even less well documented, and are not considered explicitly in this section, although a significant share of the investment finance relies on subsidies.

Table 7.1 provides estimates of financing of investment in water and sanitation in low- and middle-income countries, as reported to the Joint Ministerial Committee of the Boards of Governors of the World Bank. Of the six major sources identified, three are domestic and three are foreign. The domestic sources of funds include national budgets, internal cash generation and self-provisioning. Foreign sources of funds include international finance institutions (IFIs), bilateral donors and the private sector, with or without government guarantees.

Over the years covered, domestic sources have accounted for about two thirds of estimated investment finance, with the remaining third from foreign sources. National budgets alone constitute almost half of the finance. Foreign private sources have been the least significant during the period under review. This finding is particularly significant in that private sources of financing are reported to have peaked in the 1990s, and have decreased since then.

The different sources of finance for investment in water supply and sanitation systems

■ National budgets

National budgets may be used to meet short-term as well as long-term needs. The main source of such funds is taxes and they normally come from central and local government budgets. No reliable official data exist for funds from these sources because, in many countries, water and

Source of financing	Annual investment (US\$ billions)	Percentage
Domestic sources		
National budgets	6.6	43
Internal cash generation	1.0	7
Self-provisioning	2.5	17
Sub-total	10.1	67
Foreign sources		
International finance institutions	2.2	15
Bilateral donors	2.0	13
Private investors	0.7	5
Sub-total	4.9	33
Total major sources	15.0	100

Source: World Bank (2003) *Water Supply and Sanitation and the Millennium Development Goals*, Addendum 3 to the Progress Report and Critical Next Steps in Scaling Up: Education for all, Health, HIV/AIDS, Water and Sanitation DC2003-0004/Add.3, Development Committee (Joint Ministerial Committee of the Boards of Governors of the Bank and the Fund on the Transfer of Real Resources to Developing Countries), World Bank, Washington DC.

sanitation investments are often financed through budget line items that are not identified with a specific sector (for example, under 'social infrastructure' or 'general services'). Furthermore, in most low- and middle-income countries, there is the problem of separating budgeted and executed investments.

Based on partial surveys and extrapolations, WHO and UNICEF, in their *Global Water Supply and Sanitation Assessment Report* (2000), estimated that total national investments amount to US\$9.2 billion per year. This amount is likely to overestimate substantially the funds financed by the national budgets. Correcting for double-counting, the estimate in Table 7.1 shows that budget-financed investments have amount to roughly US\$6.6 billion annually.

■ Internal cash generation

This includes cash generation to utilities and service providers from tariffs and user charges from utilities, households and communities. In the absence of recent sector studies, it is impossible to estimate these amounts. A recent World Bank review⁴ found that tariff policies often fail to recover investment costs; this is consistent with findings from other studies. Extrapolating from figures available for major countries in each region, it was estimated that internal cash generation from operations might be in the order of US\$1.0 billion and would be lower if costs associated with necessary maintenance were actually incurred.

Table 7.1
Estimated annual water supply and sanitation investments in low- and middle-income countries by source of financing, 1990–2001 (2001 prices)

■ Self-provisioning

This refers to investments made by small-scale and community providers and by households for non-utility provided services. Out of these different sources household self-provisioning is the most significant but exceedingly difficult to estimate. However, some estimates of consumer coping costs show that these investments can be higher than public sector investments in informal settlements and in poorly functioning systems.⁵ One of the few places where detailed estimates have been made is in Karachi, where the Orangi Pilot Project Research and Training Institute has mapped the quality and extent of provision for water and sanitation for the whole city and estimates that household and community investments total the equivalent of US\$5.6 million (see Chapter 5). Notionally the total financing for self-provisioning was estimated to be US\$2.5 billion annually.

■ International finance institutions

Over the 1990–2001 period, the average annual commitments from IFIs were estimated to have been about US\$1,100 million from the World Bank, US\$600 million from the Inter-American Development Bank (IADB), US\$250 million from the Asian Development Bank and possibly another US\$250 million from the African Development Bank and the European Bank for Reconstruction and Development (in non-EU accession countries). The trend for IFI commitments has been downward. For example, on average, the World Bank committed US\$1.5 billion annually in the fiscal years 1990–1998, but only half as much (US\$0.8 billion) in the fiscal years in the 1999–2002 period. Similarly, the IADB committed US\$0.64 billion annually in the 1991–1995 period, but only US\$0.4 billion during 1996–2001. On average, total IFI financial assistance was estimated to be US\$2.2 billion annually. This excludes investments from the Islamic Development Bank.

■ Bilateral donors

This encompasses a range of programmes of different concessions, including export credits. Partial estimates indicate that the consolidated investment estimates may be in the order of US\$2.0 billion annually.

■ Private sector (with or without government guarantee)

In most low- and middle-income countries, the local private sector is not a significant player as a source of funds for the water and sanitation sector. This discussion is therefore limited to the foreign private sector. Private sources of financing include private banks that bring in loans as well as private investors who bring in their equity and technical know-how. The World Bank's Private Participation in Infrastructure (PPI) database reports the annual investments, net of cancellations, of US\$35 billion over the 1990–2001 period to be equivalent to annual investments of US\$2.9 billion. However, the PPI database books as annual investment the estimated total commitments during the entire private operator contract at the time of signing and includes internally generated funds. This practice overstates the annual private investments. A more conservative annual amount is estimated to be of the order of US\$0.7 billion, given that many of the reported PPI investment commitments will disburse over contract periods that range from 10–25 years.

Since the period covered in Table 7.1 there are higher volumes of financial flows from at least some sources. Private investment in 2004, for example, was reported to have amounted to US\$2 billion, although since most of this was concentrated in the three countries of China, Chile and Mexico, it does not necessarily represent a general trend.⁶ There are also indications of increased volumes of donor and IFI financial flows. For example, during the past four years, the World Bank has more than tripled its financial support to the sector from US\$600 million in fiscal year 2001 to US\$1.8 billion in fiscal year 2005.⁷ Other donors have reversed the downward trends in their financial support.

Supply-side constraints in financing water and sanitation infrastructure

Despite indications that water and sanitation financing from some sources is increasing, there are still severe constraints, limiting the scope for financing improved water and sanitation provision. It can be difficult to find the means to finance the investments that are needed to bridge the gap in time between when the costs are incurred and when the benefits of the resulting services are received. It can also be difficult to find the means to finance a sufficiently high and regular flow of payments to cover the service costs, particularly if the investments need to be repaid with interest. In principle, investment finance requires loans or their economic equivalent, while payments for services typically involve user fees or subsidies. As noted at the start of this section, these two financing challenges are often interrelated.

A key factor that can be used to attract investment financing is the availability of a reliable supply of long-term funds in the form of revenues sufficient to cover such recurrent costs as debt repayments, operation and maintenance. If, for example, the long-term flow of funds for financing water and sanitation are meant to come from user charges, but there is doubt that these charges will be sufficient to cover costs, then lenders are less likely to provide investment finance, or will charge higher rates to compensate for the risk that the loan will not be repaid (or will ask for some other form of guarantee that the payments will be made if the planned financial flows do not materialize). Even if the transfers are entirely within the public sector, the possibility that, for example, future payments for operations and maintenance will not be forthcoming is a good reason for not approving the investments required.

The main sources of long-term financial flows are internal cash generation from tariffs and government budgets, as well as the finance used for self-provisioning. In principle, it should be possible to rely only on tariffs for long-term financial flows. However, in many countries,

water and sanitation tariff levels fall well below operating costs. Moreover, even if tariffs can cover costs, the importance of water is such that it is rarely considered acceptable simply to cut off of the water supplies to users who cannot pay their bills. This means that, on the basis of tariffs alone, lenders cannot be assured that water and sanitation authorities are in a position to pay back loans. Hence it can be necessary to broaden the sources of long-term funds beyond tariffs to embrace multiple sources, such as government taxes and transfers, and rentals from municipal assets. Unfortunately, there are also factors and constraints that can affect the reliability of such funds. The constraints depend on the nature of the borrower or service provider – whether it is a national or local government, a public or private entity, a community-based organization or an NGO, or households or users as a group. The constraints also depend on the level of income of the country, the type of settlement and the individual users.

Small urban centres in low-income countries, with high rates of poverty, are among the most constrained in terms of securing long-term financial flows to pay for water and sanitation services. Moreover, they often lack the political influence to access national public funds, and do not have the capacity to use debt instruments to finance their investment needs on their own.

Borrowing through central government and/or public financial intermediaries (namely, regional/municipal development funds) can provide small urban centres with needed investment finance at somewhat attractive rates, but credit allocations are often politically driven and inefficiently allocated. Moreover, under this public finance model, local governments borrow on their own account through loans or bond issues but their borrowings are counted against general government debt, inevitably constraining central government borrowing capacity.

There has been progress in developing new instruments for financing infrastructure investments in urban centres. These are currently

Box 7.1 World Bank/IFC Municipal Fund

In 2003, the World Bank and the International Finance Corporation (IFC) entered the municipal finance market for the first time, without a sovereign guarantee, to support a water project in Mexico by issuing a US\$3 million partial credit guarantee. This type of financial instrument was made possible through the Municipal Fund – a joint venture set up between the International Bank for Reconstruction and Development (IBRD), IFC and the Multilateral Investment Guarantee Agency (MIGA) to expand the group's work with municipalities and other sub-sovereign governments. The fund provided a peso-denominated guarantee to a private Mexican trust, which issued bonds of US\$8.8 million equivalent in the local capital market. Bond proceeds are being used to provide a loan to the city of Tlalnepantla and its municipal water company for design and construction of a waste-water treatment plant. The financing model established the first municipal bond offering in Mexico that was not reliant on sovereign support and promoted secured financing for municipalities through their own revenues rather than a federal guarantee, further developing a new local asset class for the country's capital markets.

Municipal Fund typical transactions:

- A partial credit guarantee for a bond issue by a municipal water company to finance a treatment plant. The guarantee could enhance the rating to the level required to allow institutional investors to invest.
- A loan to a state or provincial electricity distribution company to finance a time-slice of their medium-term capital expenditure programme.
- A loan to a municipality to finance sanitation-related capital expenditure to be managed/implemented by a private management contractor, lessor, or concessionaire.
- Subordinated debt or equity in a financial intermediary that has substantial municipal exposure or a guarantee for a loan made by a financial intermediary to a sub-sovereign credit.
- A loan to a corporatized municipal water company to finance a portion of its capital expenditure programme devoted to unaccounted for water (UfW) reduction.
- A partial credit guarantee for a bond issue by a municipality for financing priority environmental or social infrastructure.

relevant primarily to well-off or large urban centres, although this may change as they develop.

Building an open, diversified and competitive sub-national credit market involves a variety of risks depending on each country's unique fiscal framework for decentralization and legal and regulatory framework for municipal borrowing. In order to reduce the risks involved with small urban centres accessing capital markets (whether domestic or foreign), national governments can work to improve the legal and regulatory framework for borrowing by: first, improving information systems, accounting and budgeting procedures and/or legislation; second, introducing bankruptcy legislation; third, allowing municipalities greater control of own-source revenues/taxes; fourth, improving the predictability of intergovernmental transfers so that small urban centres can plan strategically for investments while also creating assurances that transfers match clearly specified objectives; and fifth, by making a clear separation of fiscal and financial systems.⁸

Many low- and middle-income nations across Africa, Asia and Latin America have

attempted to provide the enabling environment required for municipal development/finance, and the development of domestic capital markets has been spurred by the emergence of institutional investors including mutual investment funds, insurance companies and pension funds. A recent book detailing the experiences of 18 countries in developing markets for sub-national borrowing offers lessons about fostering responsible credit market access within a framework of fiscal and financial discipline and suggests recommendations to guide ongoing efforts.⁹ Bringing municipalities to the market is a complex development challenge, especially for secondary and smaller cities.¹⁰

Despite these constraints, there have been the beginnings of a shift in the ways development banks are supporting municipal investments and finding ways of supporting these cities without the use of sovereign guarantees. The Municipal Fund, described in Box 7.1, is an innovation for the World Bank Group in meeting the needs of cities by providing a broader range of lending/financial services. However, most of the municipal agencies targeted in the Municipal Fund are municipalities that are already sufficiently creditworthy to tap

into private sources of finance and the majority of small urban centres remain beyond the reach of this new World Bank/IFC (International Finance Corporation) initiative.



FINANCING LOCAL ACTION FOR WATER AND SANITATION IMPROVEMENTS

While the supply side of investment finance for small urban centres needs to be improved, many of the most critical financial challenges and opportunities lie within and around the low-income communities themselves. Three key principles that underpin many of the innovations that have improved and extended provision for water and sanitation in low-income urban areas are: keep down unit costs, recover costs wherever possible, and work with low-income households in determining and developing responses. If the best local solution involves the active engagement of low-income groups in installing the improvements, two additional principles apply: credit for households can help to cover investment costs but it needs to be used carefully to avoid imposing financial burdens on low-income groups, and seek to develop a partnership between local community organizations and local government or water or sanitation utilities. There are strong links between these different principles. For instance, credit becomes more feasible for low-income households if unit costs are kept down. Better quality provision for water and sanitation becomes possible if local governments or water and sanitation utilities can provide the ‘externals’ into which community-managed provision can fit, as was evident in descriptions of condominium water and sanitation systems in small urban centres in Brazil and Pakistan (see Chapter 4).

Unit costs can be reduced in two ways:

- by households and community organizations taking on a proportion of the work and with careful management of any external contractors;
- by lowering the standards for what is provided to households or going for communal provision rather than household provision.

Credit can be provided:

- to allow households to afford capital investments for their own home or to cover their contribution to community schemes;
- to fund communal provision with cost recovery through charging for the service.

Cost recovery from low-income groups depends in part on whether they consider they are getting good value – so keeping down unit costs is important. But setting up the system to collect the payments that low-income households can afford is often problematic for formal systems. This helps explain why so many systems depend on community organizations to collect the payments from each household (or the repayments on loans taken), and why it is so important for community organizations to develop the capacity to handle significant quantities of money without losing the trust of their members. Evidence that low-income households value water highly has led external funding agencies to overestimate the extent to which low-income households will actually pay water bills – and few low-income households are going to repay loans or pay water bills if they can get away with not doing so (and they may even get support from politicians for avoiding such payments).

In addition, for any particular neighbourhood or centre needing a water supply system, what is possible depends on whether there are water mains on which to draw, or a good local source of fresh water that is easily and cheaply tapped. For sanitation, what is possible depends on whether there is a sewer or drainage mains into which to feed or the local context allows for good provision with on-site sanitation systems (for example, enough room within house plots, suitable ground and water table conditions, or a good cheap emptying service available).

Most of the innovations discussed in Chapter 4 provide some combination of these principles. For instance:

- For the Orangi Pilot Project-supported work, funding was drawn primarily from local inhabitants who pay for and manage the lane/street and community-level infrastructure. The scale and scope of what was possible was much increased when government agencies were paying for and managing the 'external' systems of water mains, sewers and drains into which these feed. Full recovery of other costs from low-income households was only possible because all efforts were made to keep down unit costs – the lane and neighbourhood investments typically costing about a fifth of what conventional contractors would charge – and OPP provided the framework to allow neighbours to cooperate and pool funding and the technical support. There were also some instances of loan finance being used – for instance to cover the costs of laying a water mains when local utilities would not do so.¹¹
- In the Baan Mankong programme in Thailand, unit costs were kept down by community organizations managing the improvements. This was supported by infrastructure subsidies and low-interest loans available to households for building or improving their homes. Community savings schemes were important for raising some of the funding needed and for developing each community's capacity to manage finance collectively.
- In the PRODEL programme, loans were available to low-income households to enlarge and improve their homes (and to support micro enterprises), with grants to local governments to improve infrastructure.
- In the programme in Hue, Vietnam, credit to households allowed the funding of improved provision for water and sanita-

tion, with local authorities also contributing to the costs.

- For the programme in San Roque, costs per household were kept down by shared taps and meters and by community organizations undertaking the 'internals'.

In many locations, providing or improving provision for water and sanitation to individual households is too expensive – as in the examples from Tirupur and for many households in San Roque. The community toilets in Tirupur (and elsewhere in India) are, in effect, reducing unit costs for the capital investments to what local agencies can afford by not trying to provide sanitation to individual homes. They also rely on local inhabitants to pay to cover maintenance. It is obviously much cheaper per person served to provide community sanitation; in Tirupur, the capital costs per toilet is Rs55,000, which is around US\$1,100. This means US\$22 is expended per person if there are 50 persons per toilet. In San Roque, the low-income households get cheaper water if they lay the pipes and install and manage the community taps; the unit costs are reduced by the community managing the investments and contributing to the work. Credit drawn from savings schemes helps residents pay for their contribution to the capital costs.

WaterAid has supported community provision for water and sanitation in Bangladesh's two largest cities, with cost recovery for the water provision, by channelled funding through local NGOs. The inhabitants of low-income settlements are provided with a range of communal or public facilities including water points and sanitation blocks. Management committees collect fees that repay construction and installation costs and that cover maintenance – although to date, cost recovery is applied for water but not yet for sanitation. The capital costs are repaid to the NGOs that use these monies to finance further investment.¹²

The improvements in Windhoek described in Chapter 4 were made more affordable by low-

income households by reducing standards (smaller plot sizes, allowing communal provision).

Combining government, community and household contributions: Water and sanitation in Poorwarama, Sri Lanka¹³

Another example of the use of a combination of government funding, household payments and community contributions in the form of free labour for construction and for maintenance and management comes from the community of Poorwarama in Sri Lanka. Again, it reinforces the point about how much more can be done if the resources and capacities of households, community organizations, local NGOs and government agencies are pooled.

Poorwarama developed as a relocation settlement when 109 families were moved there because of a road-widening project. Some years earlier, they had formed their own community development council to try to avoid being moved from their previous location or to negotiate a relocation site that was in an acceptable location (the first relocation site suggested was far from Colombo). A local NGO, Sevanatha, supported them and helped them identify a suitable site. Each household received a 50 square metre plot and Rs15,000 (around US\$167)¹⁴ for building temporary houses until permanent houses could be built.

There were no services on the lot and the inhabitants had to use the communal taps and toilets at the nearest railway station. Negotiations with the authorities led to four communal water taps and six communal toilets. The community organized a community action planning workshop for formulating a settlement improvement plan, advised by Sevanatha and to which representatives from the other institutions came. Among the main priorities for improvement were obtaining individual water connections, improvement of toilets, improved waste-water drainage and a better municipal waste collection system. The director of the government's Urban Settlement Improvement Project, who was invited to the workshop,

agreed to contribute funding to the waste collection system if the community agreed to cover the other costs.

To improve the water supply, the Water Board prepared a total estimate of Rs650,000 (US\$7222) for main water line and Rs8,000 (US\$89) per household connection. The community realized that a large part of this budget was for unskilled labour and they agreed to provide free labour for the excavation works to reduce the cost and contribute Rs4000 (US\$45) per household. So in effect, contributing community labour halved the money they had to contribute. Now, all the families have individual water connections with meters and they pay a monthly water bill to the government. Small operation and maintenance works are also managed by the community members themselves.

The problems of inadequate waste-water drainage were further exacerbated by the improved provision for water – and this also added to the problem of mosquitoes. The National Housing Development Authority and Colombo Municipal Council prepared a design and cost estimates, working with the community. The cost was Rs1,050,000 (US\$11,666) and part of this was allocated to the upgrading project; the community contributed Rs500 (or US\$6) per household. Sevanatha provided training assistance to the community leaders on community contract construction systems. The community managed the construction work, hiring the local labour from the settlement. Now all families have connected their waste-water outlets from the kitchen and bath to the main drain. The community managed the operation and maintenance work without much involvement from the municipality.

The water table for this site is high so it proved difficult to construct individual soak pits. The inhabitants were looking for a solution and Sevanatha organized a field visit to the settlement of Gajabapura, Bosevana where the community had implemented a shallow sewer system. The visitors were very impressed with the method and learned the construction methodology. The

National Housing Development Authority and Colombo Municipal Council developed the design and cost estimates, consulting the community. The community managed the construction work, hiring local labour, and was also responsible for constructing the individual toilets and carrying out the operation and maintenance works.

Key lessons:

- Community development councils cannot participate in development or effectively lobby with government agencies unless they are well organized. For this purpose, they require information, management tools, technical support and training for administrative matters. In this case, Sevanatha provided the support, introducing them to the project, informing them about available resources and helping them in negotiating with government agencies.
- The negotiation process becomes effective once it is backed with alternatives, cost estimates and implementation procedures and the development process by technical skills within the community.
- Government agencies are not good at translating a commitment to participatory planning into practice. To make it a reality there is a need to change procedures of planning and implementation in government agencies and to change the manner in which funding is approved, allocated and utilized.
- There is no lack of technical and financial resources in government agencies. The need is to equip and train the community development councils so that they are able to tap these resources.
- Only those members of the community who have money and time can participate in the process of development since it is an intensive and time-consuming affair. For this reason many people who would be useful in the process cannot participate in it since they have to earn a living. Therefore, funds for maintaining activities are necessary.



THE ROLE OF LOAN FINANCE IN LOW-INCOME NEIGHBOURHOODS

Loans for water and sanitation provision are typically associated with large investments in water and sanitation networks and waste-water treatment plants, but loans to households, community groups and NGOs can be just as critical. For many of the innovations described in this book, an important part of the costs were borne by low-income households through cash payments, through 'sweat equity' (that is, labour contributed free) and through management (with the time spent on this going unpaid). The availability of credit was important in many instances. Grants might seem more appropriate than loans for low-income households, especially the poorest households, since they have the least capacity to repay loans. Indeed, used well, grants can be effective. But experience has shown that if loan packages are designed and managed in ways that match people's needs and repayment capacities, they allow limited funding to go much further as the funds from repayments can be used to support new investments. In addition, when combined with community-driven initiatives that strive to keep down unit costs, the potential impact of a small loan becomes much greater. Collective loans can also have particular importance – for instance to allow savings groups formed by urban poor households to purchase land together on which new housing can be developed. This section will explore the use of loan finance for water and sanitation improvements through upgrading/incremental development and for acquiring or building a new home – which is the means by which access to better quality water and sanitation is achieved by many low-income households. The next section will discuss the use of subsidies.

Lending for water and sanitation improvement within incremental development

Successful loan programmes obviously depend on sufficient capital available to make the loans and good levels of cost recovery for loans that are made. If full cost recovery has to be achieved, obviously, the better the cost recovery, the lower the interest rate that needs to be charged. Interest rates can also be kept down by keeping management costs down.

Many loan programmes for low-income households develop out of community-managed savings schemes. The savings scheme usually has importance in three aspects: first, to develop the individual or household capacity to make regular payments (which will be needed to service loans, once loans are taken); second, to build some capital for each saver; and third, to develop the community's capacity to manage finance collectively – which lays the ground for the collective capacity to manage the improvements (since most improvements in urban settings require collective/community/public investments).

Community-managed savings schemes also have entry requirements that low-income groups can manage (unlike many loan schemes provided by NGOs or private enterprises). Many of the examples of the use of loan finance to support incremental improvements in housing for low-income groups come from the federations formed by the urban poor or homeless because community savings schemes are the foundation of these federations.

One example is the loans provided by a fund that was set up and managed by the Namibian Shack Dwellers Federation. The policy change in Namibia that allowed low-income households to get land with access to basic services was noted earlier. Many households wanted to upgrade facilities in their homes and neighbourhoods. Groups that save with the Namibian Shack Dwellers Federation can get loans from the Twanhangana Fund. The additional cost for an individual water and sewer connection (which will include a water meter to be read by the community) is estimated to be N\$1,200 per

household (US\$133).¹⁵

The experience of the Namibian Shack Dwellers Federation is that successful community self-help initiatives require four elements, one of which is access to a loan fund. First, the community themselves need to organize themselves and strengthen their own social capital; for the Federation, this is through savings groups. The savings process builds trust between members, improves communication skills and helps to develop systems of accountability between members and leaders. Second, self-help urban development communities require skills and knowledge – and this is acquired by a regular programme of community exchanges as savings groups who want to improve conditions visit other savings groups that have done so. These offer multiple opportunities for learning. Third, organized communities may need technical assistance to augment community learning and investment. The Namibian Housing Action Group as a support NGO to the Federation is able to assist, either directly or through consultants. Alternatively, Walvis Bay municipality and the City of Windhoek also offer technical services for self-help groups. Finally, self-help groups that are made up of those with low incomes require a source of loan finance in order to provide the necessary capital for improvements. In the case of the Federation, this is provided by the Twanhangana Fund.

There are comparable examples of community funds that support urban poor groups to form savings schemes and undertake investments to build or improve housing and basic services in many other nations, including Kenya, South Africa, Zimbabwe, Cambodia and India.¹⁶ These are also managed by urban poor federations and supported by NGOs and in some cases state agencies. Community funds offer loans to groups due to their interest in supporting land and service acquisition. Such loans differ from the use of micro-finance for enterprise development in that they need to trigger a development process – not simply to increase the access of the poor to financial markets. Water investments

Box 7.2 Revolving funds for sanitation in Kitale

A sanitation revolving fund has been initiated by ITDG (now Practical Action) in two settlements in Kitale (Tuwani and Shimo la Tewa). The first phase included 23 loans to plot owners, some of whom rent rooms within their plots. Many plot owners wished to take loans and the successful applicants were selected on the basis of those willing to accept the loan in the form of materials, and their capacity to contribute towards the cost. The loans are to be repaid over 2–3 years. The amounts loaned are between KSh27,000 and KSh60,000 (US\$342–759) and the interest rate charged is 12 per cent a year (if the repayment period is two to three years) or 11 per cent for one year repayment. A one month grace period on repayments is offered. To assist in securing repayments, an affidavit has been signed by each recipient.

The Catholic Diocese of Kitale has agreed to manage the sanitation revolving fund on behalf of ITDG. The Diocese already has some expertise in micro-finance. A board of trustees oversees the loans and includes three members from the Diocese along with community members.

Source: Stephens, L., Practical Action, personal communication.

have to be undertaken collectively and therefore only group borrowing options can assist those who need to undertake water investments.

Many urban NGOs have a long experience in supporting loan finance for water and sanitation and other improvements. For example, the Fundación Vivienda y Comunidad in Argentina raised US\$600,000 from one Northern NGO in 1987 for a fund that offered money under three distinct funding ‘windows’: no subsidy, part loan and part subsidy, and full subsidy. These loan funds supported income generation, improvements in services such as education, and neighbourhood improvements such as water supplies.¹⁷ The use of loan finance appears to have grown in popularity with the realization by NGOs focusing on infrastructure improvements that, in an era of cost recovery, soft loan funds offer the best possibility to secure development assistance to expand access to services. During the 1990s, NGOs such as WaterAid began to undertake increasing numbers of programmes to improve access to water services that combined community management with soft loans to repay water infrastructure investments and ongoing supply and maintenance costs.¹⁸

Box 7.2 describes how the Intermediate Technology Development Group (ITDG) Kenya established a revolving fund for sanitation in Kitale to facilitate access to better sanitation and to improve living conditions. This has

benefited more than 230 families (1400 poor women, men and children) – although it is mainly landlords that draw on this and the impact on tenants and on rent levels is not known.

Loan finance for water and sanitation improvements often helps the urban poor groups who use the loan finance to establish new relationships with local authorities. Even where the local authority is not directly offering financial support, they may be interested in working with a community- or federation-managed loan fund once they realize the potential of the fund to help improve local services. As illustrated by initiatives in Namibia and Pakistan, the local authority or other authority has an important role in defining acceptable standards and in enabling the community to link up to the piped networks.

Loan finance is often an important component of externally funded upgrading programmes – as illustrated by the example of PRODEL in Chapter 4. PRODEL is one of five institutions set up in different Central American nations with funding from Sida that have provided loans to low-income families to improve or expand their homes or build new ones. With US\$50 million external funding, some 400,000 people have been reached. The external funding was complemented by each family’s own resources and in some instances government housing subsidies direct to low-income households. The intermediary institutions set up by Sida also provided technical, social and legal assistance to help families get land tenure, infrastructure and build or improve their homes. Loan finance is used for housing improvements and enterprise development, rather than for infrastructure improvements, although communities may be expected to participate.¹⁹

Loan finance is also an important part of the national secure housing programme in Thailand described in Chapter 4. Here, loans are available to households through the community organizations or networks of which they are members, to finance housing construction or improvement. The community organizations are

the ones who plan and manage this and they can also draw on infrastructure subsidies to support upgrading, re-blocking (namely, the rearrangement of plots on a site) or developing a new site.

It is increasingly common for finance to support low-income households to be a blend of loan and subsidy. For the secure housing programme in Thailand, subsidies help fund infrastructure improvements while loans fund land acquisition and house improvement. For PRODEL in Nicaragua, grants fund municipal–community improvements in infrastructure while loans fund households' own construction or improvement programmes.

The lessons from loan schemes include:

- Low-income groups can benefit from loan finance and repay loans, if loan conditions are tailored to their needs and capacities to pay.
- Good levels of cost recovery are achievable and important, as the funding recovered goes to support more low-income households.
- Although one key goal is very high loan repayment rates, financial support to upgrading and new house development needs different ways to determine costs and interest rates than conventional micro-finance measures.
- Loans can be blended with subsidies.
- If low-income households are to be reached, alternative forms of collateral for loans are required. Conventional housing finance agencies usually require official land tenure documents before loans are made available and often proof that the house structure is legal – which obviously disqualifies very large sections of the urban population from getting loans. Many loan programmes have got around this by requiring more appropriate guarantees – for instance PRODEL in Nicaragua accepted valuable objects and municipal certificates that showed secure tenure as collateral.

Thus, loan finance can contribute to upgrading, including helping to speed up the incremental process by which housing and neighbourhoods are upgraded, supporting better quality housing and solving problems of lack of tenure and inadequate or no infrastructure and services.

Loan and grant finance for new housing with provision for water and sanitation

In regard to finance that helps low-income households acquire a new house or flat, very rarely can low-income groups afford to purchase a complete housing unit in urban areas, even with supportive finance systems. In most instances, the best they can afford is a land site with infrastructure and then manage the construction process incrementally. Often even the cheapest legal land site with infrastructure is too expensive so they either occupy land illegally (where there is generally very inadequate provision for water and none for sanitation) or purchase an illegal subdivision (where there may be some provision for water and sanitation but rarely to a good standard). Both with illegally occupied land and with illegal subdivisions, there are problems getting connected to the formal water and sanitation networks – and these have to be negotiated. Housing is also constructed or improved and extended incrementally, which generally means many years before a good quality house is built – and also many years involved in negotiating tenure of the land and provision for infrastructure and services. In many instances, the inhabitants do not get tenure or infrastructure.

Some nations have set up subsidy schemes to help low-income households afford new housing with good provision for water and sanitation. One example is the housing subsidy programme in South Africa. When the African National Congress was elected as South Africa's first democratic government in 1994, it recognized that housing was a priority for those living in the townships and informal settlements and promised to build one million houses within five years as part of its reconstruction and develop-

ment programme. The government introduced a capital subsidy programme for low-income households of up to 15,000 rand (US\$2430) for the purchase of land, infrastructure development and housing.²⁰ However, this was seen as a mechanism for making housing built by commercial contractors affordable to low-income households – and it was the housing developer that was funded by the subsidy. Many of the housing schemes developed by contractors funded by the housing subsidy proved to be poorly designed and built, often in locations far from income-earning opportunities and very small (often no more than a small core house).²¹ However, some housing subsidies have gone direct to low-income households and several thousand members of the South African Homeless People's Federation have built good quality houses with connections to conventional piped water and sewer systems funded by this government subsidy programme. These have demonstrated how community-managed house construction and development can produce good quality four-room houses for the same cost that contractors charge for tiny core houses. This example from South Africa is significant because it illustrates that the problem of reaching the urban poor with significant improvements is not only 'political will' (which is certainly present in South Africa) and resources (the government has provided very substantial funding for the housing subsidy programme), but how politicians and bureaucrats and the political and administrative structures in which they are located perceive poor people and their roles and rights within developing solutions.²²



WATER SUBSIDIES AND SMALL URBAN CENTRES

The importance of cost recovery

During the 1990s, for the international agencies involved in water and sanitation in urban areas, much more emphasis was given on cost recovery and financial management. As described in Chapter 6, many international agencies also

promoted and helped fund increasing involvement by the private sector. This arose from their frustration at the limited progress made by government agencies with improving and extending supplies during the 1970s and 1980s. Improving and extending piped systems were often hampered by the underpricing of water (which generally meant heavy subsidies to those who were connected), poor maintenance and many illegal connections.

Underpriced piped water provides a subsidy for those who receive it – so it is generally higher-income residents who benefit, since they are the ones who are connected to the piped network while lower-income groups were excluded.²³ In addition, the loss of revenue from these subsidies (including informal subsidies through permitting illegal connections and losses from leaks) inhibit water utilities extending the services. As political pressure often prevent government water agencies increasing water prices, some service providers have sought to increase their income by charging high connection fees, but this also further prevents access by low-income residents.²⁴

One justification for the privatization of water services was the hope that privately managed services would have less political pressure in the determination of water fees.²⁵ They could raise prices and, with higher revenues, greater efficiency and a desire to tap new customers' willingness to pay for better services, network expansion would be possible. Although unit prices may rise, the hope was that increasing numbers of residents would be able to secure access to piped water services at prices considerably lower than the informal services that were their only alternative.²⁶ Even where privatization was not considered, water companies have been encouraged to move towards cost recovery with greater independence from the state and more transparent accounting (as in, for instance, Nyeri in Kenya). In the expansion of piped water networks, particular emphasis has been placed on reaching lower cost consumers.

However, the level of interest from the private sector in water and sanitation has been

disappointing, as has the performance of many privatized utilities, especially in regard to extending access to poorer groups.²⁷ Private sector companies have become less interested in water and sanitation as they have realized that whatever the theoretical models suggest, in practice the poor cannot afford to pay enough to make serving them profitable. They have also been reluctant to work outside major cities.²⁸ For instance, in setting up a management lease contract in Nepal, the government required companies who submitted bids to have experience in two operations of a size similar to Kathmandu (around 1.1 million urban residents, 70 per cent of which are connected to the water network), one of which must be in a low- or middle-income country. Only seven companies globally were thought to qualify and in this particular case only two companies were serious about continuing their participation in the bidding process.²⁹

Small urban centres are less likely to be attractive to the private sector than large cities, where there is greater potential for economies of scale and there are greater numbers and generally higher proportions of high-income residents. In Gweru, the fifth largest urban centre in Zimbabwe (with around 137,000 inhabitants in 2002), BiWater (a UK company) withdrew from a privatization project arguing that, given consumers' capacity to pay, the returns were not sufficient to generate a commercial return.³⁰ In Côte d'Ivoire, as explained in Box 7.3, the fact that one service provider is responsible for the capital city and smaller urban centres is important in ensuring the profitability of this private sector venture, and it also allows internal cross-subsidies between larger and smaller urban centres. Profits generated in Abidjan support improved water provision in hundreds of smaller urban centres.

Ironically, just as the international agencies saw private sector involvement as the way to eliminate subsidies, so private sector companies recognized that they cannot supply the poor without some form of subsidy. The chief execu-

tive of SAUR international, J. F. Talbot, argues that subsidies are a requirement: 'water pays for water is no longer realistic in developing countries: even Europe and US subsidize services... Service users can't pay for the level of investments required, nor for social projects'.³¹ This is not an issue confined to low- and middle-income nations; problems related to service affordability is also recognized to be relevant for OECD countries:

*water and sanitation prices are increasing in some OECD countries and are likely to continue to do so. As a result, about half of OECD countries show evidence that affordability of water charges for low-income households is a significant issue or might become one if appropriate measures are not taken.*³²

There is an emerging consensus on subsidies, summed up by two quotes. The first is part of the response of the Asian Development Bank to the World Panel on Financing of Water Infrastructure and it argues that subsidies may be needed, albeit within a framework of cost recovery:

*Cost recovery is key to sustaining investments in water that expand access. Costs, however, must relate to the efficient provision of services. Inefficiencies cannot be passed onto consumers. If the extreme poor need to be subsidized, they should be.*³³

The second, from the OECD, reflects the changing perception of pricing strategies over the last decade:

*There does seem to be a general movement away from the pricing of water services solely to generate revenue, and towards the use of tariffs to achieve a wider range of economic, environmental, and social objectives. Awareness also seems to be growing about which elements of water price structures (connection charges, volumetric and fixed charges, etc.) can best achieve particular policy objectives.*³⁴

Box 7.3 Cross-subsidies for water between urban centres in Côte d'Ivoire

The national government is responsible for setting the general policy with the delegation of specific tasks to various organizations. Water services are managed by a private company (SODECI) that has the managerial and financial strength to implement the government's pro-poor aims.

SODECI applies three mechanisms to help reach the poor: subsidized household connections, a rising block tariff and licensed water resellers in informal settlements. The subsidy for the household connections comes from a surtax on water bills administered by a public sector fund. This internal cross-subsidy avoids dependence on external funding sources, and can in principle be maintained in the long term. The rising block tariff is another type of cross-subsidy, from large to small consumers. Since the tariff is fixed across the country, it also boosts the finances, and hence the services, in smaller urban centres, from Abidjan's stronger economic base. The licensing of resellers in informal settlements enables SODECI to exert an indirect influence on the cost and quality of informal services in such places, in which its own contract forbids it to work directly. The city of Abidjan, with 3.3 million residents, accounts for 48 per cent of SODECI's customers and 65 per cent of its turnover. The profits generated in the capital city have been the basis of the company's financial viability.

SODECI's strategy of subsidized connections covers the low-income areas in all the urban centres in which it operates. It charges a connection fee of only US\$40, which is well below the actual cost of US\$150; the difference is financed by the public sector Water Development Fund (FDE), which draws the funding from a surtax paid by customers – so this is a cross-subsidy between current and new customers. The success of SODECI's subsidized connections policy comes from the reliable, internally generated funding source. FDE devotes approximately 30 per cent of its annual budget to network construction and extension in small urban centres and peri-urban areas. This financial mechanism enables SODECI to implement a dynamic policy of service development in small urban centres, using money raised by FDE from the large cities, especially Abidjan. It now supplies over 600 small towns.

The rate of coverage has regularly increased for ten years. In Abidjan SODECI now serves 2.7 million people through household connections and another 0.3 million people through water resellers, leaving only 0.3 million people who obtain their water by other means such as public tap stands or dug wells. One side effect is the decline of public taps that had long been the main supply for low-income groups in Abidjan. Subsidized household connections have largely superseded them and now less than 300 public tap stands are still in use, accounting for less than 0.5 per cent of the city's consumption.

The average water consumption per head of population connected has decreased slightly over the past ten years because poorer families, who consume less water, have become connected. The subsidies for household connections have thus fulfilled their role to bring an affordable service to a larger part of the population. Most families in Abidjan fit these criteria and hence it is not surprising that subsidized connections represent more than 90 per cent of total connections since 1987. Thus the strategy is not targeted at 'the poorest of the poor'. A more targeted strategy would require stricter access criteria according to family incomes or the people's physical location. Another limitation is that the subsidized connections are available only to families who can show legal land tenure (as owner-occupiers or legal renters). So it is not available to the inhabitants of informal settlements, who are some of the poorest people in the country and should logically constitute one of the main targets of the subsidized connections strategy.

Nevertheless, the cross-subsidy principle is a powerful tool to promote household connections for low- and middle-income families and to support improved provision in small urban centres. SODECI's contract specifies the same tariff in all the cities and smaller urban centres whatever their size but its unit operating costs are higher in the small urban centres. SODECI's business in Abidjan (with a profit of US\$6 million per year) supports its business in the small urban centres (where it loses US\$5 million per year).

Source: WSP-Africa (2002) *Urban Water Supply Innovations in Côte d'Ivoire: How Cross-Subsidies Help the Poor*, Water and Sanitation Program, www.wsp.org/

In 2000, the World Water Council concluded with what might be considered to be accepted wisdom, which is that water should be provided through full cost pricing but it can be complemented by targeted subsidies. However, whilst the principle is clear, it can be hard to achieve in practice.

■ Subsidy systems

Relatively little attention has been paid by international development agencies to water subsidies in the last decade³⁵ because of the

assumption that more efficient utilities could provide non-subsidized services profitably. This was reinforced by ability/willingness-to-pay studies and by documentation on the high level of payments made by poor households to informal water vendors. In a recent study of low-income settlements in four sub-Saharan urban centres, the poor were paying an average of 10 per cent of their income to informal water vendors.³⁶ This appears to suggest that piped water supplies can be extended to low-income consumers who can afford to purchase adequate supplies.

Recent studies in Malaysia, the Philippines and South Africa show that subsidies are still being widely used. In Malaysia water provision is divided into 21 areas (consistent with provincial government) and only four of the 21 do not provide a water subsidy (in three areas there are particularly low costs associated with water provision).³⁷ 'These subsidies usually apply only for the first block of consumption (around 10–20 m³). These subsidies range between 7 per cent (in Perlis) to as high as 49 per cent (in Johor) (measured by the average price charged for the first and second block against average cost).'³⁸

World Bank technical reports written primarily by those promoting private sector involvement and some work by the Water and Sanitation Program have shown an interest in the current and potential use of subsidies – but noting that these need to be better targeted and where possible internal to the company (for example, through cross-subsidies). They also highlight the inadequacies of most current subsidy systems – for instance, it has been suggested that in India the government annually spends US\$1.1 billion subsidizing the water sector but many poor households do not benefit.³⁹ This is the criticism that has long been made against subsidized prices in piped water networks – that the benefits are for the (often relatively) small group able to connect to the system.

The most common way to provide subsidies for water for households connected to piped systems is through a rising block tariff, on the assumption that consumers who use less water are less well off (in practice, households that cannot afford individual connections may share, and have comparatively high levels of water use). For subsidies to those who are unconnected, the most common subsidy is through subsidized or free public or communal provision. One commonly applied rule of thumb for what households can afford to pay for water and sanitation services is up to 5 per cent of their income. WHO guidelines suggest that households should not have to pay more than 3.5 per cent of their

income to secure adequate supplies of water and 1.5 per cent for sanitation services.⁴⁰ In high-income countries, on average, water costs are less than 2 per cent of disposable household income – for a service that delivers water of drinking quality to each home. For instance, 1.3 per cent of average incomes in Germany and Netherlands and 1.2 per cent of average incomes in France go to water bills.⁴¹ Those who earn the minimum salary in France and Germany pay 3.4–5.2 per cent of their income;⁴² while the lowest income decile in the UK and Mexico, pay around 4 per cent.⁴³

The delivery of subsidies

In the absence of targeted subsidies at the household level (that is, water subsidies through income supplements paid to specific groups in need), subsidies will be delivered through differential tariffs (that is, cheaper tariffs for those most in need, which might include free services to those using public supplies). Table 7.2 outlines the choices that the water services provider has to make in developing a set of prices that provide subsidized water. Choices involve the source of the subsidy finance, the system by which households acquire the subsidy, and whether connection and/or ongoing water services (consumption) are subsidized.

■ Subsidize connection or services?

Subsidies can help fund access to the piped network or fund supplies through the piped network. The value in subsidizing connection costs is that these one-off payments may be the main reason that low-income households cannot afford to connect. For instance, in Kathmandu, around 40 per cent of households are not connected to the piped water system and the costs of connection for households in squatter settlements are US\$147–200.⁴⁴ In Buenos Aires, high connection charges inhibited the expansion of piped water services after privatization, which finally led to the introduction of a universal service charge for all customers in place of a service connection charge.⁴⁵

Table 7.2

Classification of Subsidy Options for Water Services

Categories	Options	Criteria for choosing alternative
How the subsidy is funded	General taxes – a transfer from central or local government to the provider Cross-subsidies – from some consumers to others	Cost of public funds (e.g. does the state have to borrow this money?) Maintenance against competing priorities (will it only last a short time?) Transparency (is the source of the funding clear – good governance?)
How eligibility is determined	Category-based (e.g. pensioner) Area-based (e.g. low income, high density) Means tested (i.e. household assessment) Self-determined or negotiated as informal (e.g. allowed non-payment) Community managed (special arrangements)	Equity issues and social objectives (e.g. good reach) Institutional capacities and costs in respect of targeting (e.g. is means testing affordable?) Incentive and secondary economic effects (e.g. do household subsidies encourage overuse?) Administrative costs Stigma issues
Good or service subsidized	Consumption (free water, increasing block tariffs) Connection costs to access piped water	Relative costs of one against the other Responsiveness to price changes (i.e. do lower prices increase use?)

Source: Developed from Gomez-Lobo, A. and Contreras, D. (2000) *Subsidy Policies for the Utility Industries: A Comparison of the Chilean and Colombian Water Subsidy Schemes*, Department of Economics, University of Chile.

There are a number of ways in which subsidized connection costs can be managed by the service provider. In some cases, some or all of the costs may be absorbed into the charges for water. In others, those who connect are allowed to spread the payment of the connection costs over time through a loan with a low or zero interest rate. Alternatively, households in low-income areas may be charged below the cost or exempted from these charges (see, for example, Box 7.3 on the Côte d'Ivoire). Another way to reduce connection charges is to provide a reduced service or a cheaper technology – which is not a subsidy but can make connection more affordable. If additional maintenance is required for this, then it will have financial implications. A study in Costa Rica suggested that a further advantage to subsidizing connections rather than use is that demand for access is less price-responsive than demand for use, and hence subsidies in this area have less distortion than would otherwise be the case.⁴⁶

One scheme developed in a squatter settlement in Pasig (the Philippines) may be from a large city (Pasig is within Metro Manila) but it is interesting for the way it permitted the extension of a cheaper better quality service to low-income households. First, it provided cheaper piped water through 'mother meters' shared by groups of households, which also meant lower connection charges. Second, the private utility sought funding from the local government to install the pipes in the community. Third, a way around water provision to squatter settlements was found through an agreement signed with a regis-

tered, legal resident's association. Repayment rates have been high, water prices have come down a lot (including prices for those who cannot afford to connect) and water services are much better than before.⁴⁷

■ Sources of finance

In terms of finance, the choice is between cross-subsidies (namely, money raised from one activity of the water provider being used to reduce the price paid for another activity) or through funding from the government to the service provider. As described in some detail later in this chapter, in the case of Mbombela municipality (South Africa), both systems can be used – and are used in other municipalities in South Africa. In this case, the finance offered by central government is insufficient to cover the costs of subsidized provision and hence providers are forced to use income from higher income customers to cover the additional costs incurred.

Cross-subsidies can be within an urban centre between different residential users or between residential and commercial users or between urban centres. The capacity to use cross-subsidies within any of these obviously depends on the number and the proportion of households within any area that need subsidies. Small urban centres are generally at a disadvantage on this, as most have fewer and lower proportions of middle- and high-income households. The example of the system in Côte d'Ivoire (described in Box 7.3), with profits from Abidjan financing services and connections in smaller urban centres, is considered by the Water and

Sanitation Program in Africa to offer important lessons for other nations. In particular, they highlight the funding for the subsidized connection programme that uses funds raised from connected customers through the Water Development Fund. Although similar subsidized connection policies exist in other African cities such as Dakar and Cotonou, the number of subsidized connections tends to be small (mainly benefiting the middle class) because they generally use the funds of external support agencies, which are limited.⁴⁸

Cross-subsidy within urban centres between residential and commercial or industrial customers are common, and studies in Manila and urban centres in Malaysia show the importance of non-residential customers for water revenues. In 21 water supply areas in Malaysia, the domestic rate is less than half the commercial rate in 13 cases, and more than half but less than two thirds in six cases.⁴⁹ Studies in various cities have shown that industrial and commercial users pay higher prices⁵⁰ but this may encourage such users to draw on alternative supplies.⁵¹

Rising block tariffs – so low water users pay less per litre – are often considered a useful approach.⁵² Higher consumption users pay prices that are above the average costs at the upper levels of their consumption to enable low-consumption users to pay prices that are below average costs. This is the reverse of most pricing strategies in which discounts are given for higher levels of consumption. These can also provide an incentive to curb non-essential water consumption, thereby encouraging water conservation. However rising block tariffs may conflict directly with the need to raise revenue.

Rising block tariffs are very popular. In a survey of 32 water utilities in Asia, 20 used such tariffs.⁵³ It is estimated that 38 per cent of the population of urban India live in urban centres that use this pricing system.⁵⁴ The effectiveness of rising block tariffs in guaranteeing adequate services for all while minimizing the need for subsidies depends on setting the size and price of the first block and on the degree of connection sharing. Political pressures may increase the size

of the initial block;⁵⁵ one Asian Development Bank study of 17 water utilities found that only two had a first block of 4–5 cubic metres or less a month (equivalent to 133–166 litres per household per day) and most had initial blocks of 15 cubic metres or more a month (equivalent to 500 litres per household per day). A study of three Asian cities (Dhaka, Colombo and Kathmandu) found that all had the first block above their lifeline estimate of six cubic metres per household per month (200 litres per household per day) and in Bangalore it was three times this volume. In all the urban centres studied, large sections of non-poor households were receiving subsidized water because the size of the subsidized block was too large.⁵⁶

The application of rising block tariffs is limited by the fact that it requires household connections and the metering of consumption. Public taps can be a more effective way of reaching low-income households – and these are likely to have more application in most small urban centres, because providing piped water connections to individual households is too expensive. In some urban centres, water from public taps is not charged – but the benefits for poorer households depend on the numbers and distribution of public taps and the quality and regularity of water supplies to them.

■ Subsidies for whom?

If it is decided to focus subsidies only on the most needy, they may be allocated by:

- distinct ‘needy’ category (for example, groups such as pensioners and students where there is a strong correlation with poverty and where there is a clear way to identify the group without means testing);
- area (depending on spatial concentrations of poverty);
- means testing households.

The first and the third of these options can have high administrative costs and considerable institutional capacity is needed to operate them, especially if there is means testing. The first is

Box 7.4 Assessing coverage and targeting: Chile and Colombia

A study compared the Chilean (means tested) and the Colombian (area-based) subsidy systems in regard to errors of inclusion and exclusion. In the case of Chile, a major concern is that only half (or less than half) of those entitled to receive the subsidy in the poorest groups appear to receive the subsidy. At the same time, some households in higher income groups manage to secure the subsidy (for example, 7 per cent in the 5th and 6th income deciles). The high rate of targeting failure reflects the smallness of the group entitled to subsidies (perhaps 5–10 per cent of residents) and the reliance on a voluntary request for the subsidy. The errors of exclusion (namely, the numbers entitled to benefit but do not receive it) are over 50 per cent even under the most optimistic assumptions.

In Colombia, vulnerable households are targeted using neighbourhood and dwelling characteristics. In each municipality, dwellings are placed in one of six categories using a basic stratification unit that is an area with homogeneous characteristics as defined by the National Planning Department. All dwellings in the area are first allocated a category, although particular dwellings with different characteristics may then be placed in different categories.

The poor correlation between residency and income means that there are high errors of inclusion associated with this area-based subsidy system. This also reflects the relatively generous system in which the first three groups within a six-fold residential classification are entitled to receive a subsidy. In the highest income decile, fewer than 40 per cent of households live in socio-economic areas 5 and 6 in which they pay a surcharge to subsidize the consumption of poorer households. There are also considerable errors of exclusion; if the subsidies are targeted at those living in the poorest area (socio-economic segment 1) then over 80 per cent of the target group are excluded (assuming this is deciles 1–3). Even if the next socio-economic area is also included, about one third of the target group remains outside the scheme.

Assessing the efficiency of both programmes suggests that the Colombian programme has the better overall performance and this appears to be due to better targeting properties (while there are higher errors of inclusion, fewer targeted households are excluded).

Source: Gomez-Lobo, A. and Contreras, D. (2000) *Subsidy Policies for the Utility Industries: A Comparison of the Chilean and Colombian Water Subsidy Schemes*, Department of Economics, University of Chile.

not often used for utility subsidies because it is considered to be insufficiently discriminating.⁵⁷ Where the institutional capacity to administer such schemes is in place, then it may be possible. However, further problems include the design of acceptable and suitable eligibility criteria. While the World Water Commission was broadly enthusiastic about the means tested targeted system used in Santiago (Chile), Box 7.4 raises some more fundamental questions about the success of this strategy. Concerned about access to water, the government introduced a targeted, means tested, government-administered ‘water stamps’ programme, whereby poor people received ‘stamps’ to cover part of their water bill.⁵⁸ This had the advantage that the utility did not have to administer the programme but had a clear incentive to serve the poor, who were now revenue-generating customers. However, in practice the scheme, which uses a general system for identifying means tested beneficiaries, fails to include many who need to benefit.

■ Community-managed (cross) subsidies

Where community organizations are responsible for the management of water and sanitation

systems, they may receive subsidized services from the official water provider – or they may themselves manage cross-subsidies. Communities that offer preferential terms to some of their members may be able to avoid some of the difficulties faced by formal agencies in regard to coverage and targeting because the local managers have more information on the situation of each family and their need for subsidies. However, if cross-subsidies are operating within low-income settlements, this is essentially the not-quite-so-poor subsidizing the very poor. Moreover, the capacity of communities to address these issues differs significantly, as shown by a survey of WaterAid’s work with community management in 150 low-income settlements in Dhaka and Chittagong. While this programme certainly brought improved provision for most of the population, not all very poor households benefited. Destitute families are dependent on water caretakers or programme committees to allow them to take a couple of pots for drinking and cooking at no charge.⁵⁹ In some settlements, monthly payments are required for using the facilities and this is affordable for working

families (at 30–35 Bangladesh taka (around US\$0.45) per month); if families cannot make such a regular commitment, they buy water by container, which implies a cost of four times that when making regular monthly payments. Generally, only the better-off families making regular payments are on the community management committees suggesting that there is a general problem with representation and that the rules of the scheme may not address the needs of the poorest groups.⁶⁰

■ Minimizing the need for subsidies

A further approach seeks to avoid the use of subsidies through strategies such as community involvement (reducing costs) and more flexible payment systems. Various strategies have been tried including the possibility to pay more frequently than monthly, pre-paid meters and micro-credit for connection and improvement costs.

In regard to more flexible payment systems, for households whose livelihood is dependent on the informal sector, it can be difficult to meet fixed monthly bills. Payment systems that better suit low-income households' capacity to pay can help reduce the need for subsidies. As noted above, community management can allow this – but making sure these serve the poorest groups is not easy. Water meters enable official service providers to provide subsidies based on the quantity of water used and also the possibility of flexible payment systems. They can also be linked to systems of pre-payment as well as the regular distribution of a fixed free or subsidized amount of water.⁶¹ However, pre-payment meters may merely force the poor to cut their own consumption.⁶² A cholera outbreak in Kwa-Zulu Natal may have been linked to the difficulties associated with a pre-paid meter system as residents (unable to access piped water) used untreated sources.⁶³ A further compounding factor here was the scale of breakdowns in the metered system;⁶⁴ and problems with faulty meters have also been noted in a similar scheme in a low-income settlement in Swakopmund, Namibia. This is also a reported problem in

Kabokweni (Mbombela) (see the case study below). It is also notable that meters are not the only strategy that can be used to offer more flexible payments. In other cases, such as Cartagena (Colombia), suppliers are considering shifting to a weekly billing system to improve payment levels.⁶⁵ Small-scale private operators may also have a greater ability to offer flexible payment systems suited to the needs of the poor, including daily payments.⁶⁶

The inability of the poor to pay even a reduced connection charge is a very real issue for the concessionaire in Cartagena.⁶⁷ Where cross-subsidies between use and connection are not viable, micro-credit can help individuals and communities and can be used for the initial connection or for subsequent improvements. In El Alto in Bolivia (the large municipality that has developed just next to La Paz), the offer of loan funds was to install bathrooms with a typical cost of US\$500 and lending at 14 per cent a year for 5 years.⁶⁸ A further strategy is used in Windhoek (Namibia) where households have been working together to lower the costs of connection.⁶⁹ In this case, communities are able to purchase land with standpipes and block toilets, and then upgrade services over a number of years when it is affordable. While a connection charge is still made, this is reduced because households have installed the infrastructure in the residential neighbourhood themselves.

■ Informal subsidies

There are numerous ways in which 'informal' subsidies can be granted. These include the use of illegal connections, failures in billing, irregular checking of meters to prevent tampering, and willingness not to disconnect in case of non-payment. With respect to illegal tapping, there are some indications that it is extensive. The Ghana Water Company estimates that approximately 50 per cent of water produced is unaccounted for due to leakage or illegal connections.⁷⁰ A second route for informal subsidies is that of non-payment. In the South African city of Stutterheim, only 28 per cent of low-income households pay their bills.⁷¹



THE FREE WATER POLICY OF THE SOUTH AFRICAN GOVERNMENT AND ITS APPLICATION IN MBOMBELA⁷²

South Africa has one of the most ambitious national programmes to improve provision for water and sanitation. Since 1994, with the overthrow of the apartheid government, and South Africa's first democratically elected government, various initiatives have sought to improve provision for water and sanitation in all settlements. This has been supported by a recognition that everyone has a right to 'basic water'. Here, this programme is outlined and its application described in some detail in Mbombela, a municipality with around 500,000 inhabitants, which includes the urban centre of Nespruit with around 240,000 inhabitants.

During the apartheid era, much of the black and mixed-race populations (who make up four fifths of South Africa's population) were moved to townships or artificially created homelands where provision for water and sanitation was much worse than in the urban areas where only whites could live. The legacy of this era is still apparent in water service provision. Under apartheid, there was a three-tier system of standards in provision. The best standards were for urban centres with exclusively white populations that had a high pressure piped water system and sewers; households were charged for water and sanitation but these had heavy state subsidies. The next level was townships; usually located several kilometres away from the city or town, they had a planned layout with taps to individual residences and simple waterborne sanitation. A flat rate was paid for all municipal services in a combined bill. The lowest service level was found in the trust areas (the former homeland areas) where water was supplied to communal standpipes (which were often distant from homes) free of charge, and the use of rivers

and streams was widespread. In 1994, some 14 million out of 42 million South Africans were without access to clean basic water.⁷³

The 1997 Water Services Act states that every South African has a 'right of access to basic water supply and basic sanitation' and 'reasonable measures' must be taken to realize these rights. Cost recovery is to be pursued but access cannot be denied on non-payment grounds if inability to pay is proved.⁷⁴ Local government is responsible for setting tariff rates in line with the 1997 Act and the 2000 Municipal Systems Act that requires that there is equitable treatment of users, that payment is in proportion to use, that charges to low-income households reflect only operating and maintenance costs, and that special tariffs apply for low levels of use by low-income households. By 2000 there was a growing realization within the Department of Water Affairs and Forestry (DWAF) that the pursuit of an orthodox cost-recovery model, which required customers to meet the cost of delivery, was having a negative impact on the health and well-being of low-income communities who could not afford enough water to meet health and hygiene requirements (there had been a major cholera outbreak in a low-income settlement, which was directly blamed on new cost-recovery policies for water). In February 2001, the government announced a policy to 'ensure that poor households are given a basic supply of water free of charge'. The level agreed was 6000 litres per household per month – or 200 litres per household per day (assuming eight persons per household).

Investment in better services took place after 1994 and funds for 'basic water' were included in the formal central government transfers to local government. Transfers to local governments were generally sufficient but they were often not used well, which meant too little funding to tackle infrastructure backlogs.⁷⁵ Responsibility for the provision of water services rests with local government, with dual regulation by the DWAF and the local government ministry, which has complicated oversight and support.

There are three different levels where subsidies can be applied: for bulk infrastructure, for household-level infrastructure and for provision of water. Municipalities receive subsidies for all three aspects: operating subsidies for the bulk transfer regional schemes, the Municipal Infrastructure Grant for community-level infrastructure and support for 'free basic water' for which the requirement of 6000 litres per household per month is considered to be a guideline only.⁷⁶ DWAF argues it has to be 'realistic' in its approach to free basic water and recognizes that different municipalities have different financial structures and abilities to recover costs from the non-poor. However, the 1997 Act does state that local governments are not allowed to deny the poor access to basic services on the grounds of inability to pay.

The funding of free basic water for the poor from national government transfers has to be complemented by local government funds levies and taxes, and cross-subsidization between high users and low users at the local level. National government grants are partly dependent on the numbers of low-income households⁷⁷ requiring basic services. It is accepted that national government funds may not be sufficient by themselves for local authorities to finance free water. The capacity of local government to find its own funding depends considerably on the ratio between wealthy and poor customers and on the extent to which user charges are effectively levied on non-poor users. At present, it is up to local authorities to decide if they want to target the subsidy or not. However, the simplest strategy where there is a large proportion of metered connections is to set rising block tariffs with the first block being free – as is evident in Table 7.3.

Provision for water and sanitation in Mbombela municipality

Mbombela municipality makes an interesting study because provision for water services are divided between the municipal government and a largely foreign-owned private company, the

Greater Nelspruit Utility Company (GNUC) whose parent company is BiWater. This company has a 30-year concession arrangement with Mbombela. The concession includes the urban centre of Nelspruit, which is the municipal capital and principal urban centre and it served an area with 52,562 households in 2004.

Nelspruit's boundaries were expanded in 1994 so they encompassed the previously 'white' town, formal township areas (for example Ka Nyamazane and Matsulu), which had yard taps and waterborne sanitation, and denser settlements in the trust areas (former homelands), where water provision was minimal or non-existent. According to the 1996 census 40 per cent of households in the Nelspruit Transitional Local Council area had incomes below the poverty line of 6000 rand (US\$975) a year and 60 per cent lived on incomes of 12,000 rand or less. Boundary changes followed the December 2000 local government elections and Nelspruit Transitional Local Council became Mbombela, incorporating a greatly increased area for which the municipality took responsibility for water provision. Thus half this newly defined municipality is supplied by GNUC.

In Mbombela municipality, according to official statistics, 64 per cent of the total population is served by free basic water; the figure is 40 per cent of the poor population.⁷⁸ This policy requires the measurement or control of the amount of water supplied to households. Other communities still benefit from 'informal' free supplies through different service level options.⁷⁹

Comparisons between the concession area and the non-concession area (and neighbouring municipalities)

In Nelspruit, the GNUC envisaged an annual 18 per cent return on its investment over the 30-year concession. All the financial risk lay with the concessionaire, and the municipality stated in the negotiation stages that it would not bail out GNUC with state funds nor sanction tariff increases. Can the concessionaire abandon the contract if the financial situation proves unten-

able (as of March 2005, GNUC debt was 40 million rand – roughly US\$6.5 million)? If it could be proved that an unforeseen external situation had arisen that had altered the business environment so as to jeopardize operations, the GNUC could back out of their obligations.⁸⁰ The introduction of the free basic water policy after the contract was agreed could be used to do so. This may explain recent municipal leniency in permitting tariff increases when the free basic water policy was introduced and subsequently.

Free basic water was not the first attempt to ensure that the needs of the poor were met. In 1999, the council introduced a voucher system for those with an income of less than 800 rand, or US\$130, a month. Vouchers were bought from the company and distributed to consumers. However, it was estimated that just 17 per cent of those eligible applied for the subsidies. Following a publicity campaign this increased to 51 per cent. Looking back, the deputy town manager of Mbombela municipality assessed the system to be cumbersome and unmanageable and that means testing was a huge administrative burden.

Residents in the rural trust areas such as Daantji and Msogwaba were not billed for water services because without meters (or yard tanks) it is difficult to recover costs. Non-billing is in effect an informal subsidy. Today, the level of service is still that of communal standpipes, although distances to standpipes had been reduced as a result of GNUC's investment programme. Cost recovery is still not being pursued in the trust areas.⁸¹

Mbombela was one of the first municipalities to implement the government recommendation of 6000 litres of free water per household per month regardless of income – and also to provide an extra benefit of an additional 6000 litres for sanitation. Mbombela took the decision to make free basic water universal when the policy was initiated in January 2002. GNUC foresaw a loss in its revenue (estimated to be 7.39 million rand, or US\$1.2 million) and feared

the introduction would derail its cost-recovery efforts in the townships. The company successfully argued for tariff increases to compensate for the introduction of free basic water. A 10 per cent increase occurred in January 2002 and a further 10 per cent in July 2002. Annual increases also occur to coincide with each new financial year.

Payment levels have been considerably lower than GNUC expected in the townships – for instance cost recovery in the townships was 38 per cent in July 2001 and this fell to 27 per cent by December 2001.⁸² This led to credit control measures: after warnings, water was cut off, but restored if payment (or part payment) was made. Persistent non-payment led to the removal of pipework. Around 6000 newly installed meters were removed from the townships.⁸³ These rather punitive measures resulted in a backlash and people resorted to illegal connections/reconnections. Disconnections during the cholera epidemic of 2000 did not enhance GNUC's reputation. The result was even lower payment of bills; a campaign against GNUC was organized by PAC (Pan Africanist Congress),⁸⁴ and this led to even more illegal connections.

Payment levels fell following the introduction of the free basic water policy and stricter credit controls. Cost recovery from Nelspruit has remained high (over 90 per cent) but recovery in Ka Nyamazane (one of the township areas) is 21 per cent of the amount billed, while in Matsulu (another township) it is 10 per cent. In addition, there is a low level of billing in much of the concession area; there are few metered connections in the informal settlements around the townships and in the trust areas, but even in formalized township areas billing is not 100 per cent. Only 31 per cent of households are billed in the GNUC concession area. Despite the tariff increases, revenue losses (due to non-payment in the townships and the free basic water policy) continued and were not offset by savings in administrative costs or by central government subsidies from the Equitable Share (the name by which one of the central government transfers to

Table 7.3
Subsidy approaches to free basic water in different locations in South Africa

Municipality	Tariff structure	Subsidy approach and income source
Durban (Metro)	Rising block tariff, no charge for water in block I (6000 litres to all)	Internal cross-subsidies and service level options
Tshwane (Metro)	Rising block tariff	Targeted internal cross-subsidies through indigents policy (in old Pretoria area)
East London	Rising block tariff in East London and a flat charge/1000 litres in King William's Town	Targeted internal cross-subsidies through indigents policy
Hermanus	Rising block tariff, very low block I	Targeted internal cross-subsidies through policy for 'indigents'
Polokwane	Urban areas rising block tariff, low block I	Targeted internal cross-subsidies through indigents policy and Equitable Share
George	Flat rate and declining basic availability charge with service level	Targeted internal cross-subsidies through indigents policy and Equitable Share
Volksrust	Fixed monthly charge	Targeted rebate to the poor (9000 litres free) funded from Equitable Share
Litchenburg	Rising block tariff, zero block I to all	Internal cross-subsidies (Equitable Share used for bad debts)
Douglas	Two block regressive tariff	Targeted rebates to the poor (10,000 litres free) through indigents policy from Equitable Share
Nkomazi	Fixed charge	No free basic water at present, cross-subsidies to areas in old Transitional Local Council boundaries with low payment rates
Ngqushwa	Flat charge/1000 litres or fixed monthly charge	No targeted subsidies at present but high non-payment rate, Equitable Share used for general expenses

Source: DWAF (2002) *Free Basic Water Tap into Life: Information Kit for Free Basic Water Implementation in South Africa*, Department of Water Affairs and Forestry, Pretoria

municipalities is known). GNUC receives around half the Equitable Share grant, though GNUC's general manager suspects that more than half the municipality's poor households are outside their concession area. For 2004–2005, GNUC received 3.5 million rand (US\$570,000) from Mbombela as its portion of the Equitable Share and this is programmed to rise slightly in the medium term. However, this funding cannot cover both the cost of free basic water as well as the losses due to high levels of non-payment and low billing. Additional income to cover the costs comes from businesses, higher income residential customers and the company itself (through the deficit). But local politicians did not support the latest round of increases as higher income consumers are now complaining. Meanwhile the scale of company losses means that GNUC secured additional support from the council through reduced electricity payments and reduced rent for the use of municipal offices. However, rather than generating an 18 per cent return on investment, as predicted, GNUC has accumulated substantial debts, standing at 40 million rand (US\$6.5 million) in 2005 compared to 17 million rand (US\$2.75 million) in January 2002.

The company is not allowed to cut off water supplies completely in the case of default; they have tried to restrict the flow of water to non-paying households to 200 litres a month with

the use of tricklers. However, the GNUC customer services manager reported that credit control measures in the townships had been abandoned and that the use of restrictors was a waste of money and time because they had to employ contractors to check that they had not been removed and the contractors were colluding with the residents.

Prior to 1994, residents were billed at a flat rate for all municipal services at a heavily subsidized rate. This system appears to remain popular. However, the national government's commitment to cost recovery from high-volume users required a change in the system of provision and payment. It appears that individual debts began to accumulate when cost recovery began to be introduced, the voucher system was ended and full cost billing introduced prior to free water. Some households also had debts that had accumulated prior to 1994. Residents emphasize that they do not mind paying but the cost had to be reasonable. However, the free basic water policy introduced a very difficult situation. The general manager of the utility company argues that the free basic water policy is the worst thing that has happened for the water industry because they were forced to increase tariffs and the people the policy was meant to help 'actually saw their bills increase'. There is a real sense of confusion among residents who argue that they would pay 'fair' bills but consider their recent

	Monthly volume of water consumed				
	6kl	12kl	18kl	30kl	40kl
1999	7.56	18.48	29.4	51.24	72
2003 (Low pressure)	0	17.64	35.28	70.56	103
2003 (High pressure)	0	20.4	40.8	81.6	117
2005	0	20	46.4	101.2	147
% Change 1999–2005	-100	+8	+58	+98	+106

Note: 1 rand = US\$0.163 (March 2006)

Table 7.4
Comparison of
GNUC costs over its
first six years of
operations

charges to be too high. The conclusion is that the poor actually pay more for the average consumption of 12,000 litres a month (see Table 7.4, the cost as risen from 18.48 to 20 rand) and repayment has fallen resulting in increasing losses by the company.

At the same time, it should be recognized that the poorest families are not in the concession area. Work by TRAC Mpumalanga (a local NGO) indicates that poor/unemployed households in Mbombela have, in the post-apartheid era, relocated away from the townships towards the trust areas where the cost of living is lower and where they are able to acquire larger plots giving them the opportunity for some subsistence farming. Service provision is more basic⁸⁵ (communal standpipes) but no real cost recovery is pursued. Conversely those in employment, especially in the formal sector, have moved into the township areas to benefit from better service levels and access to transport links to Nelspruit.

There is an ongoing discussion about the extent to which non-payment reflects affordability or is strategic behaviour based on a long-established 'culture' of non-payment. According to GNUC figures, in Matsulu, which is 30 km away from Nelspruit (the main employment centre), the rate of cost recovery is 8 per cent whereas in Ka Nyamazane, which is 15 km away, it is 20 per cent. There is visible evidence of lower incomes in Matsulu: smaller houses, lower levels of maintenance, fewer satellite dishes. High levels of past debt are a further factor deterring people from paying their bills. They feel they can never catch up.

During the course of this research, four main reasons were identified as leading to non-

payment: socio-economic, ideological, political and grievances. Many of the households interviewed identified several factors that explain their reluctance to pay the water bills. Socio-economic reasons include a lack of experience in managing variable service bills and other debt (for example, loans taken for furniture). The second group reflects those who argue that non-payment is because of the private provider but non-payment rates are as high in the non-concession area. The political reasons relate directly to promises made by African National Congress (ANC) candidates during the December 2000 election that water would be free and water service staff feel that the politicians are not really behind the policy of cost recovery for services. The fact that Nelspruit was seen as a pilot case for possible wider adoption of private provision also attracted extensive opposition. The final category refers to those who are frustrated with the poor quality of service, either because of the quality of water or because of lack of provision for some days. Many households also believe that the meters are incorrectly set and that they are being cheated. The shift to a flat rate of 20 rand (US\$3.20) for water use from 6000–12,000 litres per month reflects a review that demonstrated the confusion experienced by customers.

There is presently a discussion about providing free basic water only for those below a certain income level. The utility knows that it needs more detailed household-level information for a cost-recovery strategy. Household surveys are required because 'location is not a function of poverty' and there is evidence of some wealthy households in the townships – for instance those with large two-storey houses and luxury cars. To act against those who are not paying, the company must be seen to be acting legitimately, that is, it must identify those who can afford to pay but who will not pay.

A further innovation is pre-paid meters that are to be piloted in one ward of Ka Nyamazane township and in one small trust area. Pre-paid meters may have many benefits for service

Table 7.5
Residential tariff structure, 1 July 2005, approved by Mbombela municipality

Volume of water per month	White River Normal	White River Restrictions	Kabokweni	Hazyview	GNUC Low Pressure	GNUC High Pressure
0–6 m ³	Free	Free	Free	Free	Free	Free
6–30 m ³	6.44	6.01	3.64	4.38	3.15	3.64
30–100 m ³	5.18	11.00	3.78	2.64	3.46	3.78
100+ m ³	4.87	22.00	4.74	2.62	3.65	4.01
Basic charges per month	30.86	30.86	N/A	59.93		10.03 (empty stands only)

Source: Interview responses at Mbombela municipality, 2005.
Note: tariffs given in rand.

providers; users have to pay up front thus preventing people running into debt and avoiding many of the difficult credit control confrontations associated with regular meters.⁸⁶ They are not always to the benefit of users who may self impose consumption restrictions and the government recommends pre-paid metres only as a last resort.⁸⁷

The area of Mbombela outside the GNUC concession receives water services from the Mbombela municipality. In this area there are two former white towns: White River and Hazyview. As in Nelspruit, both have a high level of water service, with their own supply sources. Water meters are in place and payment levels are high. Progressive block tariffs are not in operation so the opportunity to generate excess income for cross-subsidization is not pursued. The black township of Kabokweni receives a high quality of supply seven days a week⁸⁸ and most residents have taps on their stands or internal taps. Supply is metered and 2000 meters have been installed by the council, although only a small proportion are working. Cost-recovery levels are very low; households receive a combined municipal bill (excluding electricity) and hence non-payment means that residents are not paying for any municipal service, bar electricity. One municipal official noted that they had stopped sending bills because the cost of sending these was higher than the amount they got from it.

Mbombela municipality uses a range of pricing strategies. In White River and Hazyview, the unit costs charged for water decline as the quantity consumed rises. In the area of White River, there are restrictions due to a shortage of water and here, as with Kabokweni and the area

served by the utility company, the reverse is true and there are increasingly block tariffs to provide an incentive to conserve supplies (see Table 7.5).

Outside Mbombela, rural municipalities are responsible for water supply in a large former homeland trust area. Water is provided to communal standpipes and is not metered. Water is available regularly but not necessarily daily, and as a result water must be stored. No cost recovery is pursued.

When free basic water was introduced in Mbombela, the tariffs for White River, Hazyview and Kabokweni were increased on average by 7 per cent to fund this provision – but because of the small size of the settlements and because progressive block tariffs are not in operation, this was not sufficient. The municipality cannot rely on payment for water services to fund the cost of free basic water. Part of the cost is covered by national funding with the rest being covered from other locally raised sources of revenue, including revenue generated from distributing electricity to the white towns. The other main source of finance for basic free services and the shortfall caused by non-payment is the municipal Bad Debt Fund.

To reduce the cost of the free basic water programme, a decision was made to try to target beneficiary households through a formal 'indigent register'. But Mbombela's indigent register is out of date and most of the households that earn less than 800 rand (US\$130) a month are not on this register. Pensioners are in theory automatically included on the register. With this approach, only registered 'indigents' will be entitled to 6000 litres of free water each month. With the exception of pensioners, all households

will be required to reapply for indigent status each year and will be visited each year. This cannot work in the trust areas without a mechanism to measure consumption⁸⁹ and collect revenue from those above the poverty threshold. In the townships, this change will have particular implications for households whose incomes are just above the 800 rand per month threshold.

The infrastructure backlog facing Mbombela is daunting: in 2005, 32 per cent⁹⁰ of households (39,490) did not have access to a basic level of service (namely, a communal standpipe within 200 metres of their dwelling) and 63 per cent were without access to basic level sanitation (that is, a VIP latrine). The situation is being exacerbated by an influx into the area⁹¹ of people from other parts of South Africa and illegal immigrants from Mozambique and Zimbabwe. Figures on the scale of the influx are not readily available; municipal officials themselves do not have accurate figures. Anecdotal evidence suggests that it is on a huge scale. New settlements are springing up on the fringes of townships (referred to locally as 'squatter camps') and in the trust areas. A municipal town planner complained that settlers go into areas 'where we cannot develop infrastructure economically or practically'.⁹² One councillor suggested that Mbombela 'should be stricter... if people build where they are not supposed to, we won't provide services'. Many of the settlers are thought to be behind the proliferation of illegal connections. In an attempt to reduce the problems caused by poorly constructed illegal connections, Mbombela is starting to erect standpipes in some trust areas within 100 metres of each household, reducing the incentive to make illegal connections. As the Municipal Infrastructure Grant is only available for standpipes within 200 m, the shortfall in funding has to be met by Mbombela who are using the value-added tax they claim back from water and sanitation. The initiative is at an early stage and the scale of the backlog, influx of new settlers and lack of funds could halt this promising initiative.

A final perspective is provided by the water supply situation in neighbouring rural municipalities. In the Nkomagi local municipal area, access to supply from large regional schemes is often interrupted for weeks at a time, particularly in high consumption periods such as during hot, dry weather. This is caused both by weak technical management and also due to consumption that is unconstrained by any charging system. These system failures impact disproportionately on the poor who do not have facilities for domestic water storage.

In conclusion, this detailed case study has been included to highlight the difficulties of combining a strong social policy for water (free basic water) with effectively funded (public and private) water and sanitation providers. It also demonstrates that effective cost-recovery systems for non-poor high consumers are essential to enable provision of services to the poor.



STRATEGIES FOR SUSTAINABLE FINANCING

Key issues facing the water and sanitation sector

It is apparent from the review of the various risks facing the sector that the following are the major issues facing the water and sanitation sector:

- Low levels of consumer affordability of basic levels of water and sanitation services.
- Inadequacy and unreliability of revenues to cover operational costs and debt servicing (which includes capital expenditure, interest payments and benefits to equity holders).
- Political and foreign exchange risks associated with external sources of short-term funds needed for upfront infrastructure development.
- Inadequately developed domestic capital markets to serve as alternatives to external sources of short-term funds.

- Low creditworthiness of local governments and their water and sanitation utilities, thereby constraining their access to potential sources of private funds.
- Inefficiency of local governments and their utilities.

Strategies for improving financing

To address these issues, a number of strategies are being introduced by international and bilateral development agencies. Among them are the following:

- Shifting from reliance on external sources of funds to domestic sources of funds for financing both short-term and long-term needs.
- Shifting from sovereign lending to sub-sovereign lending.
- Enhancing creditworthiness of local governments and utilities.
- Improving operational performance of local governments and utilities.
- Improving affordability of low-income communities.
- Introducing sector reforms and legislation to provide an enabling environment for improved financing.
- Using strategic partnerships to improve the volume and effectiveness of financial flows.

■ Shifting from reliance on external to domestic sources of funds

Recent declines in private sector investment in water and sanitation services in low- and middle-income countries are due in part to currency shocks that have affected the viability of private sector participation in large concessions. The persistence of such political and foreign exchange shocks have led to the realization that, in the long run, it is necessary to shift from reliance on external financing to dependence on domestic financing of such sectors as water supply and sanitation, whose revenues are denominated in local currencies. To this end, there is now a concerted effort to strengthen

domestic capital markets and improve the access of local governments and their water utilities to domestic funds, with external funds playing only a transitional and catalytic role to promote access to such local funds at a reasonable cost. In developing domestic capital markets, local long-term savings like pensions and insurance funds should be tapped. The potential of tapping into the growing micro-finance market should also be explored. The local loans should have low and fixed interest rates and be long-term in nature; and official development assistance and external grants should be designed to help reduce interest rates and initial tariff levels.

■ Shifting from sovereign lending to sub-sovereign lending

One of the reasons for introducing the various instruments for improving affordability and enhancing creditworthiness and operational performance of utilities is to support the shift from sovereign lending to sub-sovereign lending. This has also entailed a shift from sovereign guarantees to sub-sovereign guarantees provided by bilateral and multilateral agencies. A number of new instruments are being developed by bilateral and multilateral agencies to support this shift. One of them is the Municipal Fund, a joint initiative of the World Bank and the IFC designed specifically to invest in projects at the state and municipal level without sovereign guarantees. There are ongoing efforts to expand this fund. Another instrument is the use of on-lending performance-based intergovernmental transfers that make use of competition. Colombia, Ecuador and Ethiopia are examples of the application of this approach. Another strategy to enhance the shift is through capacity-building approaches that make use of learning on the job rather than in classroom settings, coupled with continued professional support for small urban areas.

■ Enhancing creditworthiness of local governments and utilities

There are different complementary measures for enhancing the creditworthiness of local govern-

ments and their utilities and helping them to gain access to local markets. Among them are:

- Using guarantees and output-based aid;
- Improving performance of utilities and local governments;
- Improving user affordability.

This section discusses the use of guarantees and output-based aid.⁹³ Output-based aid or OBA is defined as performance-based subsidies that are provided when full cost recovery through direct user fees is not justified due to externalities, affordability constraints or not practicable due to the high cost of levying such charges. They are one of two streams of cash flow to utility operators, the other stream being user fees.

Typically, in OBA, service provision is contracted to a third party, usually a private provider or an NGO. Payments of public funding are tied to the actual delivery of services to a targeted group. Thus it can be designed to be pro-poor and used for service expansion or connections of service to specific groups, or for quantities of water used by the target groups. OBA helps to mitigate political risks. Hence it makes it possible for water supply and sanitation projects and transactions to be financed in the market place. However, its reliance on government payments undermines its creditworthiness since there is a perception that government payments are unreliable. To address this constraint, guarantees need to be provided to enhance the quality of OBA payments. There are private as well as development agency sources for such guarantees. One of these is a multi-donor trust fund administered by the World Bank. Known as the Global Partnership on Output-Based Aid (GPOBA), its purpose is to fund, demonstrate and document OBA approaches to support sustainable delivery of basic services to those least able to afford them without access to such services. Two principal options are available for providing guarantees. They are: partial risk guarantee and partial credit guarantee. A third is policy-based guaran-

tees. Partial risk guarantees are used to mitigate government payment risks for individual projects; partial credit guarantees are used to enable governments to mobilize funding for a subsidy pool that could be used to provide OBA payments to multiple projects like the Lake Victoria Region Water and Sanitation Initiative (LVWATSAN) and the Mekong Region Water and Sanitation Initiative (MEKWATSAN) administered by UN-HABITAT through its Water and Sanitation Trust Fund.

OBAs have several advantages. They can be used to:

- extend and improve market terms for borrowing by public entities;
- improve service affordability;
- enhance creditworthiness of utilities, thereby helping them to gain access to private funds at costs available to entities with a higher credit rating;
- address foreign exchange risks.

A number of working papers on OBA are available on the GPOBA website (www.gpoba.org).

■ Improving operational performance of local governments and utilities

In addition to the use of enhanced OBA, another way of improving access to domestic and external capital markets is through improvements in the performance of local governments and local utilities. Several complementary approaches have been used for this purpose. One of them is a joint initiative of the United States Agency for International Development (USAID) and the government of India launched in 1994 and known as the Indo-USAID Financial Institutions Reform and Expansion (FIRE-D) project.⁹⁴ It exemplifies what can be achieved through such initiatives.

The FIRE-D project uses a market-based approach to support the development of an infrastructure finance system and improve the delivery of urban environmental infrastructure services, especially water supply and sanitation services. The core approach is to provide techni-

cal assistance aimed at improving technical and financial managerial efficiency of local governments and water and sanitation companies so that they can operate on a cost-recovery basis. The project works with all three tiers of government in India (central, state and municipal) to create a supportive environment for cities to undertake vital reforms. So far, it has achieved significant results.

The chief characteristics of the approach are as follows:

- Placing more emphasis on the role of non-profit community organizations as well as the private sector in complementing public efforts to extend water and sanitation services to the poor.
- Helping to develop a structure for local governments to gain access to domestic capital markets through municipal bonds and the adoption of a locally developed municipal credit rating system. The first of these bonds was the Ahmedabad Municipal Corporation bond which was issued in 1998. Since then, 30 other Indian cities have obtained credit ratings, and seven of these have been able to issue bonds for infrastructure. Ahmedabad used the bond proceeds and a loan guaranteed by USAID to build the Raska water supply system that serves 60 per cent of the city population.
- Introducing urban management reforms, particularly in financial management and accounting practices. Through the help of this project, a technical guide on municipal accounting was prepared to spur reforms.
- Developing state-level policy frameworks for water and sanitation services, and a national policy framework for improving solid waste management.
- Sharing lessons learned through the establishment of a training network, organization of study tours, formation of city managers' associations, and the establishment of a website.

Achievements at the national level under the project include the preparation of a policy framework, creation of legal and fiscal incentives for local governments and utilities, and preparation of guidance on improved resource mobilization. Market-based financing options that have been introduced under the project include: municipal bonds, tax-exempt bonds, pooled financing development facility, and guidelines for financing options. The project has also helped to produce a model municipal law with sections on municipal organization, how to conduct business, and a structure for community participation in local government decision making, among others.

At the state level, the project has helped in the preparation of guidelines and a manual to improve municipal financial management through double entry, accrual-based accounting in Tamil Nadu. A Pooled Financing Development Facility developed under the project was first used in Tamil Nadu for water supply projects in 14 small and medium-sized cities. The Development Credit Authority of USAID issued a partial guarantee of the principal.

At the local level too, the project has achieved significant results, especially, in capacity development for project formulation, access to financial markets, enhanced creditworthiness, and in the promulgation of tools for financing and development of commercially viable water supply and sanitation projects. It has also introduced incentives to help local service providers develop a track record of debt servicing, starting with small loans, which would facilitate their access to private funds.

It should be possible to replicate this experience in other parts of the world, especially in small urban areas in middle-income countries.

■ Improving affordability

Various strategies are available for improving affordability. They include the following:

- Provision of an initial credit or grant to reduce the amount that needs to be borrowed for initial capital works, and hence the level of cost-recovering tariffs.

- Linking the supply of small urban centre services to larger nearby cities. Where this is feasible, the marginal cost of extending service to the small urban centre is usually lower than the cost of a stand-alone exclusive service to the small urban centre.
- Pooling together of a number of small urban areas either for an integrated service from a single provider or for a pooled financing system for different providers. This arrangement allows economies of scale to be captured, thereby reducing the cost of projects and/or the cost of borrowing.
- Use of a demand-driven approach. One of the major factors affecting affordability of services is the use of a supply-driven approach to the choice of technologies and service levels. Then based on the cost of the resulting services, tariffs are set in order to recover recurrent costs. This is the reverse of what should be done. The appropriate approach is to use a demand-driven approach so that service levels and technologies are chosen on the basis of what users want and are willing to pay for. Where, for technical reasons, cost-recovering tariffs for the lowest cost options would exceed the affordability of users, subsidies should be considered. In low-income and certain middle-income countries, governments are not in a position to provide long-term subsidies to cover part or all of the funds needed for meeting operational costs. In such countries, grants may be needed in the first instance not only for the capital costs, but also for operational costs. Such subsidies should be targeted and output-based.
- Output-based subsidy financed by national government funds (the example of Chile, which used a metering-based approach; and the example of Colombia, which used a geographic poverty mapping approach that is administratively and financially easier to implement).
- Use of lifeline tariffs financed by government (the example of South Africa).
- Use of guarantees of government payments towards output-based subsidies, based on guarantee instruments developed by development agencies like the IFC and the World Bank.

■ Use of partnerships

It is now realized that strategic partnerships are an essential instrument for increasing the volumes and effectiveness of financial flows. This is exemplified by the trilateral partnerships UN-HABITAT has been establishing with regional development banks, donors, governments and NGOs. The basic framework for the UN-HABITAT approach is the creation of a Water and Sanitation Trust Fund under which it has established a Water for African Cities programme and a Water for Asian Cities programme. Through this trust fund, UN-HABITAT has been able to leverage funds in partnership with the African and Asian Development Banks, the World Bank, bilateral donors, WaterAid and other NGOs.

Under its Water for Asian Cities programme, for example, UN-HABITAT is co-financing a major water supply and sanitation sector initiative for 12 small urban centres in the northern and central regions of Lao PDR, proposed to be implemented at a total cost of US\$24.9 million. The project is designed to improve the accessibility, quality, reliability and sustainability of water supply services in these 12 centres. UN-HABITAT's contribution of US\$500,000 is targeted mainly for capacity building, participation, awareness and community actions in the field of water supply development and urban environmental improvement. Different kinds of partnership arrangements have also been made for implementing a fast-track project in the urban centre of Xieng Nguen of Lao

Subsidies that have proved successful have taken different forms. They include:

- Subsidies for transition to cost-recovering tariffs financed with government funds and credit from the world Bank (for instance in Guinea).

PDR, where UN-HABITAT is providing US\$250,000 together with technical assistance; both the community and the utility, as the local service provider, are contributing a similar amount to implement this fast-track project.

UN-HABITAT is also supporting another water supply and sanitation sector project proposed for the provincial capitals of Dong Ha, Ha Tinh, Quang Ngai, Tam Ky, Thanh Hoa and the district town of Lang Co in Thua Thien Hue Province in the central region of Vietnam. The project, being implementing at a total cost of US\$96 million through part assistance of the Asian Development Bank, will be supported by UN-HABITAT for capacity building.

In another major initiative, UN-HABITAT in collaboration with the Asian Development Bank is planning a water supply and sanitation investment project in selected secondary urban centres along with the economic corridors in Greater Mekong sub-region. The project, with an envisaged budget of US\$50 million, would be building on a rapid-appraisal recently conducted by UN-HABITAT for 14 secondary urban centres in Cambodia, Lao PDR, Vietnam and Yunnan Province of China and will be financed through donors' grant money in the Water and Sanitation Trust Fund and loans from the Asian Development Bank.

A similar approach is being followed under the Lake Victoria Project, which was outlined in Chapter 4. This initially covers six small urban centres along Lake Victoria in Kenya, Tanzania and Uganda. In this case, the key areas of intervention include: first, facilitating and supporting the formation of associations of small-scale service providers; second, providing access to finance and supporting development of entrepreneurship skills; third, regulating prices and monitoring quality of water supplied to consumers; and, fourth, establishing linkages with utilities (through franchising and so forth) to ensure vertical integration and synergy.

This approach has been found to have a high value in return on every dollar invested by UN-HABITAT, including through:

- leveraging more funds for investment;
- confidence building and the creation of a platform for ownership at the community and municipality level;
- capturing economies of scale in human and financial resources through pooling of funds for multiple projects;
- creating positive spill-overs and inter-linkages between donor partners and among participating communities.

This is a replicable and scalable approach worth emulating by other entities.



DONOR CONTRIBUTIONS TO IMPROVING PROVISION FOR WATER SUPPLY AND SANITATION IN SMALL URBAN CENTRES

Aid flows to water and sanitation

All international donor agencies have clear goals in terms of the development outcomes to which their funding should contribute. However, they suffer from difficulties in ensuring that what they fund (and can fund) actually contributes to these outcomes. In many instances, it is not a lack of funding that prevents the desired outcomes from being achieved but a lack of interest by recipient governments and a lack of capacity among local organizations. As this section discusses, the source of the problem also lies in the difficulties faced by international funders in being able to support the local organizations in small urban centres that can help improve and extend provision for water and sanitation. There is a large physical and institutional gap between donor agencies' decision-making processes and the tens of thousands of small urban centres with deficiencies in provision for water and sanitation. There are also the complications that arise from donors' funding initiatives in the territories of other sovereign states and from having two different lines of accountability – upwards to the governments

Table 7.6

Aid to water supply and sanitation by donor

	Annual average commitment and share in total sector-allocable aid, 1996–2001					
	US\$ million		Percentage of donor total		Percentage of all donors	
	1996–1998	1999–2001	1996–1998	1999–2001	1996–1998	1999–2001
Australia	23	40	3	6	1	1
Austria	34	46	17	18	1	2
Belgium	12	13	4	4	0	0
Canada	23	22	4	4	1	1
Denmark	103	73	15	13	3	2
Finland	18	12	11	8	1	0
France	259	148	13	13	7	5
Germany	435	318	19	11	13	11
Ireland	6	7	7	7	0	0
Italy	35	29	14	9	1	1
Japan	1442	999	14	14	41	33
Luxembourg	2	8	4	13	0	0
Netherlands	103	75	8	7	3	2
New Zealand	1	1	2	2	0	0
Norway	16	32	4	5	0	1
Portugal	0	5	1	3	0	0
Spain	23	60	4	8	1	2
Sweden	43	35	6	6	1	1
Switzerland	25	25	7	6	1	1
United Kingdom ^a	116	165	8	7	3	5
United States	186	252	6	4	5	8
Total DAC countries	2906	2368	11	9	83	78
African Development Fund	56	64	10	9	2	2
Asian Development Fund	150	88	11	8	4	3
European Commission	–	216	–	5	–	5
International Development Association	323	331	6	6	9	11
Inter American Development Fund for Special Operations	46	32	9	9	1	1
Total multilateral	575	730	7	6	17	22
Total	3482	3098	10	8	100	100

Note: ^a A DFID study shows that since 1999 actual expenditure for water supply is about double the levels reflected here. Approximately half of the UK water expenditure takes place within multisector projects.

Source: OECD-DAC (2003) 'Supporting the development of water and sanitation services in developing countries', in *2002 Development Co-operation Report*, OECD, Paris p.183.

that fund them and downwards to the people in low- and middle-income nations on whose needs their entire operation is justified. As well as discussing the scale and nature of funding for water and sanitation and, within this, the funding for small urban centres, this section also explores these larger issues and how they influence current, and any possible future, support for water and sanitation in small urban centres.

Most official development assistance for water and sanitation comes from the bilateral aid agencies of governments in high-income countries – whether they spend this directly in their bilateral aid programmes (nearly three quarters of the total) or channel it through multilateral organizations and development banks.⁹⁵ In addition, there are the non-concessional loans to water and sanitation that are not 'aid' because they have little or no grant

element, most of which comes from the World Bank or the regional development banks.⁹⁶ Aid flows to water and sanitation are illustrated in Table 7.6.

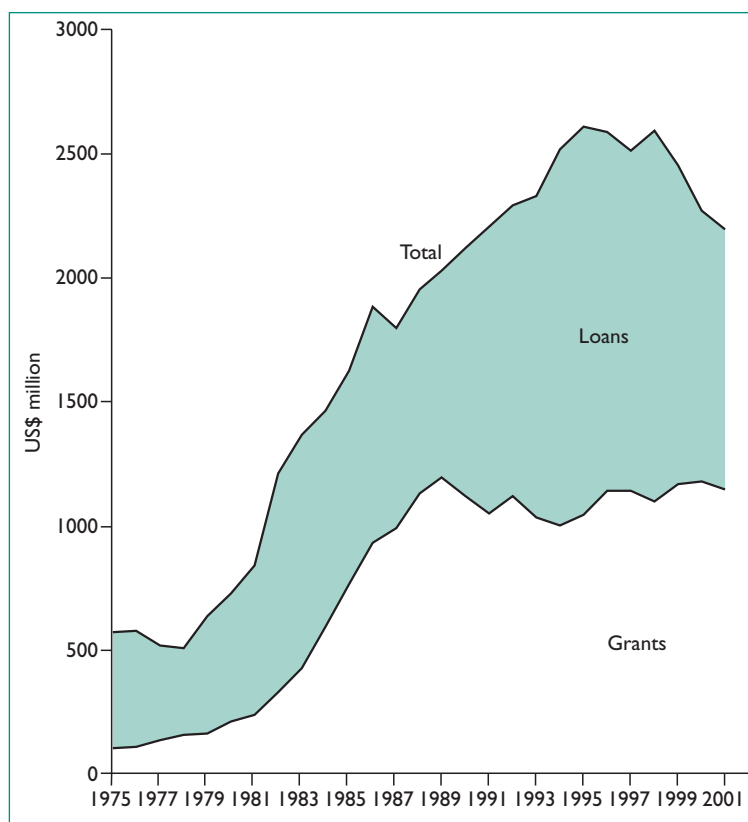
Total official development assistance (ODA) flows to the water sector⁹⁷ averaged between US\$2.5 billion and US\$3 billion a year for the 1999–2003 period. Japan was the largest ODA donor in the sector accounting for about one third of total aid to water. Activities funded by the World Bank's soft loans affiliate, the International Development Association (IDA), and the aid programmes of Germany, the United States, France, the United Kingdom and the European Commission add up to a further 45 per cent. Austria, Denmark, France, Germany, Japan and Luxembourg allocate above the Development Assistance Committee (DAC) average of 9 per cent of their ODA to the water sector.

In 2003, total ODA reached US\$68.5 billion, the highest level ever, both in nominal and real terms.⁹⁸ But the proportion allocated to water and sanitation dropped from 7 per cent in 1999 to under 5 per cent in 2003.⁹⁹ Official statistics show that donors are committing less to water and sanitation compared to commitments throughout the 1990s. They also give less to water and sanitation in relation to other sectors.¹⁰⁰ As a percentage of the commitments to social infrastructure and services (which also include health, education, governance and civil society, and population programmes), water and sanitation commitments dropped from 22 per cent in 1999 to 14 per cent in 2003.¹⁰¹

For sub-Saharan Africa, average funding to water and sanitation dropped from US\$603 million in 1999 (5 per cent of total ODA) to US\$583 million in 2003 (3 per cent of total ODA), while total ODA flows to the region, including flows to the social sector increased each year over this five-year period. In Latin America and the Caribbean, the proportion of total ODA to water and sanitation relative to total ODA fell from 8 per cent in 1999 to 5 per cent in 2003. In Asia, the percentage of commitments to water and sanitation relative to total ODA was more stable, although with a noticeable decline in the past few years.¹⁰²

When reviewing longer term trends, Figure 7.1 shows that funding for water and sanitation from bilateral agencies did increase significantly from the late 1970s to 1995 but after that, it levelled off and then declined.

'Trends in official development assistance indicate that support for water supply and sanitation infrastructure is very modest, both in relation to support provided to other infrastructure sectors and in terms of what is needed to meet the Millennium Development Goals.'¹⁰³ Estimates for the global funding needed to achieve the MDGs in water and sanitation by 2015 range from US\$51 billion to US\$102 billion for water supply and US\$24 billion to US\$42 billion for sanitation (depending on the technologies adopted and country-specific preferences and



conditions). Taking an average, this would amount to a total of US\$6.7 billion per year from 2001 to 2015.¹⁰⁴ According to the *Camdessus Report* prepared for the World Panel on Financing Water Infrastructure, US\$13 billion per year for water supply and US\$17 billion per year for sanitation are needed in order to meet the MDG Target 7 by 2015.¹⁰⁵ These estimates sharply contrast with the present annual commitments of US\$2–3 billion through official ODA, and US\$1–1.5 billion in the form of non-concessional lending (mainly by the World Bank) to water and sanitation.

It may be that water and sanitation are receiving more support from donors after 2003 (the last year for which statistics were available). Certain agencies have made specific commitments to increase funding. For instance, in February 2005, the Netherlands Minister for Development Cooperation announced her aim to provide sustainable access to safe drinking water and sanitation services to 50 million people.¹⁰⁶ Speaking at a conference to mark the World Water Day in March 2005, the UK Secretary of State for International Development announced

Figure 7.1

Trends in bilateral grants and loans for water supply and sanitation from DAC countries, 1975–2001: five-year moving averages, constant 2002 prices

Source: OECD-DAC (2003) 'Supporting the development of water and sanitation in developing countries', in OECD, 2002 *Development Co-operation Report*, OECD, Paris.

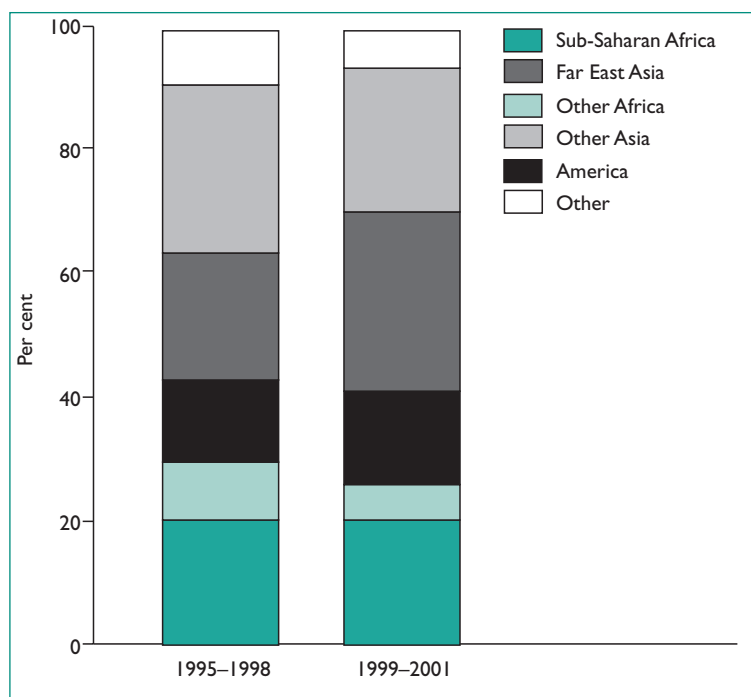


Figure 7.2

Geographic breakdown of aid for water supply and sanitation commitments, 1996-2001

Source: OECD-DAC, 2003, op. cit., pp184-185

the funding from the Department for International Development (DFID) in water and sanitation will increase from UK£47.5 million (US\$82.5 million) in 2005 to UK£95 million (US\$165 million) in 2007-2008.¹⁰⁷ The French aid programme has committed itself to doubling aid commitments to water and sanitation by 2009, most of which will go to Africa.¹⁰⁸ However, there is usually a timelag of several years between commitments being made and their disbursements, so even if donors decided in 2006 to greatly increase their commitments to water and sanitation, much of the funding would not be disbursed until 2010-2014.¹⁰⁹

■ The allocation of aid for water and sanitation between nations

As shown in Figure 7.2, about half of the total ODA for water supply and sanitation goes to Asia, with a focus on Far East Asia in recent years. The share of Africa has decreased slightly and that of the Americas increased a little.¹¹⁰ Aid for water and sanitation is concentrated in certain countries, with the ten largest recipients receiving 53 per cent of the total in 2000-2001.¹¹¹ China, India, Vietnam, Peru, Morocco and Egypt were among the top ten,¹¹² while many countries where a large proportion of

the population lack access to safe water and sanitation receive very little aid to address this. In 2000-2001, 12 per cent of total aid to water and sanitation went to countries where less than 60 per cent of population has access to an improved water source, which includes most of the least developed countries.¹¹³

■ Aid directed at small urban centres

Many development agencies have long assumed that urban populations are privileged over rural populations in terms of needs being met (including water supply and sanitation); some do not invest in urban water and sanitation because they think that this is too expensive.¹¹⁴ Most agencies do not see addressing urban poverty as a priority in nations in Africa and Asia.¹¹⁵ More detailed documentation on the deficiencies in provision in urban areas have questioned the validity of the assumption that urban populations were relatively well served for water and sanitation.¹¹⁶ In addition, it is also clear that both governments and international agencies consistently underestimate the scale and depth of urban poverty, in part because of income-based poverty lines that fail to recognize the higher costs of most necessities in urban areas, and also because poverty definitions give little attention to deprivations other than income (including inadequacies in provision for water and sanitation).¹¹⁷

There is a growing recognition within certain bilateral donors of the need to address urban development issues, both within individual agencies (for instance, changes in the late 1990s in Sida¹¹⁸ as it developed an urban strategy and an urban division) and collectively (as in the support many bilateral agencies provide to the Cities Alliance).¹¹⁹ The World Bank has also long had an urban policy, dating from the early 1970s.¹²⁰ In 2004, the World Bank had 12 per cent of its active project portfolio dedicated to the urban development theme, of which 10 per cent was implemented in the water and sanitation sector.¹²¹ The Inter-American Development Bank has also long had an urban policy, perhaps

not surprisingly given that most of the region's population live in urban areas.

It is difficult to evaluate the extent to which donor support to water and sanitation in urban areas goes to small urban centres. There is evidence of some increase in the attention to small urban centres by some agencies. For example, the World Bank recognizes that 'by 2020, 50 per cent of the developing world's population will be urban centres, most will live in small and medium-sized towns, and many will be low-income households', and that 'these markets account for the bulk of the un-served urban population and are therefore the primary targets of the Millennium Challenge'.¹²² The World Bank Water Supply and Sanitation Sector Board also considers the water supply and sanitation issue particularly acute in small and medium-sized urban centres: 'the rapid pace of urbanization, together with challenges and opportunities for local governments resulting from decentralisation, make town water supply and sanitation fundamental to economic growth and achievement of the Millennium Development Goals.'¹²³

But in practice, too little aid is allocated to addressing water and sanitation needs in urban areas and the division of aid between large and small urban centres remains unknown; indeed, there is not much reliable data on the division of aid between rural and urban areas.¹²⁴ The OECD aid project database does not differentiate between urban and rural areas, and most international agencies do not have major urban programmes, which helps explain why so few publish figures on the proportion of their funding that goes to urban development. Of those bilateral agencies that do publish figures about urban programmes, the proportion of their funding going to urban projects is usually between 2 and 12 per cent;¹²⁵ urban projects or programmes generally get a higher priority than this from the multilateral development banks.¹²⁶ Donor funding flows to urban water and sanitation is often spread across different sectors and reported under different sectoral headings, including health, education, housing and environ-

ment. For agencies that support urban projects, most statistics on the scale of their support for water and sanitation will not include funding to urban projects such as slum and squatter upgrading or serviced site schemes that have important components for water and sanitation. Similarly, the strong support given by the World Bank and many bilateral donors to local government reforms over the past two decades does not figure under the water and sanitation sector, yet this should contribute to improving and extending water and sanitation provision at local level.¹²⁷

Agencies rarely report on the priority given to small urban centres in their support to water and sanitation. One way around this is to review all their project commitments and see what proportion go to small urban centres, as defined in this book. But reports on individual water and sanitation projects often do not give any information on the project location, other than allocating them to 'rural' or 'urban'. In addition, for reasons that are not clear, some international agencies choose to classify support to 'small towns' as rural.¹²⁸

An analysis of the database entries of each of the DAC members shows that roughly US\$360 million of the US\$3 billion in ODA allocated to water supply and sanitation in 2003 (13 per cent) was allocated to small urban centres or related activities.¹²⁹ This could be considered inappropriately low when such a high proportion of households without access to adequate water and sanitation provision live (or will live) in small urban centres of low- and middle-income countries (see Chapter 3). Small urban centres tend to be overlooked in aid assistance as they typically fall in between two categories: the larger urban centres that are more likely to receive loans for investments, and rural areas that are more likely to benefit from grant-based support. The OECD DAC notes that a handful of large projects undertaken in urban areas dominate the water sector ODA and that many are financed through loans rather than grants. More than half of total ODA in the water sector

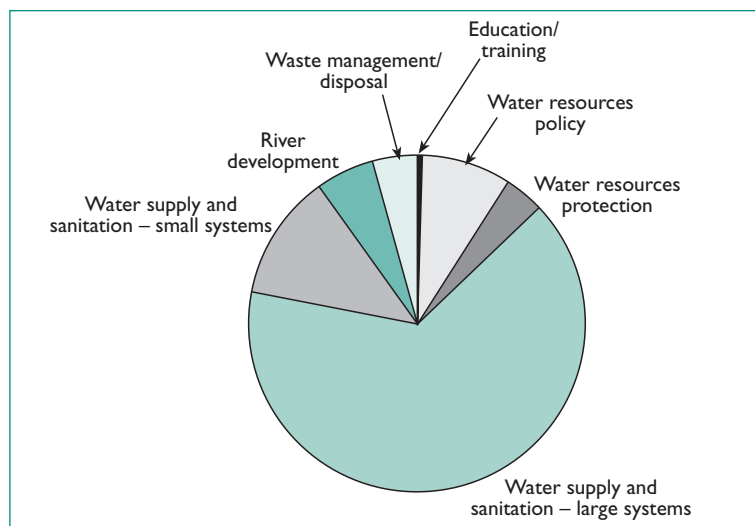


Figure 7.3

Water supply and sanitation aid by sub-sector, 1997-2001

Source: OECD DAC, 2003, op. cit., p.184

took the form of loans in 2003.¹³⁰ Opportunities for attracting finance for small urban centres directly from the national government may also be limited, particularly if the small urban centre is not classified as urban or as a municipality in its own right (as a municipality may be responsible for several small urban centres).¹³¹ There is a need for more external funding specifically targeted at small urban centres and at the national or regional support frameworks they need. The World Bank recognizes in its Ghana Small Towns Water Supply and Sanitation Project that 'as in other countries in the sub-region, small towns have not received focused and adequate attention in the context of water supply and sanitation, and have rather been treated within the overall rural sector'.¹³²

The nature of donors' support in water and sanitation

Aid flows to the water sector focus mainly on larger scale infrastructure systems (see Figure 7.3).¹³³ Between 1997 and 2001, more than half of the total ODA for water and sanitation was for 'large water supply and sanitation systems'.¹³⁴ Reviewing recent World Bank projects under the sector 'water, sanitation and flood protection',¹³⁵ most urban projects place significant emphasis on infrastructure, either through supporting infrastructure planning at municipal level, or through the upgrading of existing water or sewerage networks. Among the water sector

ODA allocated to small urban centres or related activities in 2004, 'large water supply and sanitation systems' accounted for 77 per cent of total flows, with 13 per cent to small-scale systems.¹³⁶ The five latest World Bank projects between 2002 and 2005 specifically dedicated to water supply and sanitation provision in small urban centres put a high focus on infrastructure improvement through technical and managerial assistance to local governments and local water agencies.

Much donor funding for urban water and sanitation over the last 15 years has been to support greater private sector involvement in the building or management of the water utilities. In some countries, national governments have been reducing investment in water supply and sanitation in the hope that private sector investments will fill the gap, although recent evidence suggests that this expectation may not be realized.¹³⁷

One important trend in donor finance that has implications for water and sanitation and for virtually all other aspects of development is the increasing total commitment to governance and civil society.¹³⁸ Overall, average ODA commitments between 1999 and 2003 to governance and civil society interventions were US\$1.4 billion a year. Sub-Saharan Africa received, on average, US\$606 million per year between 1999 and 2003, followed by US\$564 million in south and central Asia, US\$319 million in far east Asia, and US\$269 million in Latin America and the Caribbean. The general trend is for rapid increases in annual commitments: over these five years, commitments to south and central Asia increased five-fold while for far east Asia they increased by over two and half times; for sub-Saharan Africa, commitments nearly doubled; in Latin America and the Caribbean, commitments rose from 1999 to 2002 and then fell in 2003. It is difficult to get a sense of whether this increasing commitment to governance and civil society is likely to help improve provision for water and sanitation. Around 40 per cent of all funding during 2002 and 2003 went to demobilization,

post-conflict peace-building and land-mine clearance. Commitments to strengthening civil society received 31 per cent of all commitments in this category in 2002 and 18 per cent in 2003. However, it is difficult to draw any conclusions from this data, except to note that this reflects a recognition by donors that peace and better governance are central to development. It is possible to look at the data and point to the lack of support for certain key aspects of governance that have particular importance for water and sanitation in small urban centres – for instance, the low priority to funding public sector financial management. But demobilization and peace-building are obviously also preconditions for better provision for water and sanitation.

In discussing financial constraints, a distinction should be made between an absolute lack of resources for expanding water and sanitation coverage and the availability of resources but a need to apply them to addressing Target 10 of the MDGs.¹³⁹ The UN Millennium Project Task Force on Water Supply and Sanitation note that ‘in some countries with higher levels of income, sufficient financial resources exist to provide universal coverage, but their concentration among wealthier households leaves a substantial proportion of the population un-served.’¹⁴⁰ In many low- and middle-income countries, reallocating existing resources, by reducing subsidies to the better-off sectors and communities in order to prioritize service expansion to the poor, is all that is needed to achieve Target 10.¹⁴¹

OECD DAC documents and statistics do not provide much detail on how donors support water and sanitation provision (and, within this, support provision in small urban centres). To consider this in more detail, profiles are presented below of one of the largest bilateral funders, the largest multilateral funder, and one of the largest international NGO funders for water and sanitation: the French government’s bilateral programme, the World Bank and WaterAid.

The contribution of French development cooperation in improving water supply and sanitation provision in small urban centres

Water and sanitation receive a high priority within French official development cooperation, and France is the fourth largest bilateral donor in water and sanitation¹⁴² As for many donors, the priority to water (all components included)¹⁴³ declined after the 1990s¹⁴⁴ but support for drinking water supply and sanitation has increased from €121.7 million (US\$147.5 million) in 2003 (15 per cent of total bilateral aid), to €200 million (US\$240 million) in 2005 (16.5 per cent), of which approximately 60 per cent is allocated to Africa. In addition, France’s aid commitments to the water sector through multilateral institutions averages €100 million (US\$120 million).¹⁴⁵ 46 per cent of French bilateral aid in the water sector currently goes to drinking water supply, and 16 per cent to sanitation.¹⁴⁶

France has committed to doubling its aid to the water sector by 2009¹⁴⁷ with the objective of allowing access to water and sanitation for 9 million people in Africa by 2015. This increase will be allocated to unserved populations in Africa as a priority, including those living in small urban centres and in urban peripheries. It will also include more funding for basic sanitation provision and doubled aid funding for NGOs involved in the water sector.¹⁴⁸ French decentralized cooperation, which has been growing in importance since 1992, is also likely to enhance its contribution in the water and sanitation sector with the 27 January 2005 law on ‘international cooperation on the part of local authorities and water agencies in the field of water supply and sanitation’, which allows for an increase in the direct cooperation between the French local authorities and water agencies and their parallel recipient partners.

French aid retains project support as the central instrument of its aid delivery. The French Development Agency (AFD) is the principal implementer of French aid,¹⁴⁹ with most of its budget allocated to operational cooperation in

the form of projects. Concern for water and sanitation provision in smaller urban centres began to grow in AFD from the early 1990s, and the number of projects to support access to water facilities in small urban centres has increased steadily since then. The AFD division for infrastructure and urban development currently runs several projects targeted at improving water and sanitation provision for small urban centres and urban peripheries in Mali, Burkina Faso, Chad and Haiti, with an estimated average cost of €7–10 million (US\$8.5–12 million) per project. In Mali for instance, two AFD projects are underway that aim to extend access to the national water supply network for about 40 small urban centres, and there are plans to extend access to 20 additional localities.

AFD projects include funding for infrastructure to extend or put in place water supply services (collective, autonomous or decentralized systems, as appropriate) and for management systems. AFD operates within a country's sector-wide approach elaborated at national level, and for which the French embassy may have provided assistance. It also seeks to insert its projects within each country's decentralization reforms, and often provides municipal capacity building along with operational funding. Water is provided to the unserved areas through the national water provision operator. A 'chief operator' in charge of implementation is designated in each locality. According to the set of different actors and their relations on the ground, these can be local private operators, local government institutions, local politicians or traditional chiefs, user's associations or representative neighbourhood committees. The AFD also seeks to work in partnership with decentralized government organizations where possible. For example, in Mali, the government has initiated important decentralization reforms that give municipalities increasing responsibility in water supply management; by contrast, in Haiti, the municipal authorities of Port-au-Prince have a very minor role in peripheral areas and the AFD deals

directly with the official water provider (Camep) and the user committees set up at the neighbourhood level for managing the water counters and collecting the payments. AFD's intervention in small urban centres focuses more on setting up water supply facilities than on adequate provision for sanitation. This is in part due to a lack of demand from the national government and a shortage of operators on the ground for sanitation. Sanitation projects also generally prove to be more expensive.

The World Bank's activities in water supply and sanitation for small urban centres

The World Bank's loan portfolio for water and sanitation amounts to over US\$6 billion,¹⁵⁰ which makes it the largest external financier in water supply and sanitation. In mid-2004, it had 12 per cent of its active project portfolio dedicated to urban development, of which 10 per cent of projects were implemented in the water and sanitation sector. The World Bank committed a total of US\$14.2 billion under the sector 'water, sanitation and flood protection' between 28 February 2002 and 4 November 2005 (a total of 230 projects).¹⁵¹ The Water Supply and Sanitation Program is the main World Bank-administered form of assistance to water supply and sanitation. Its strategy focuses on supporting client countries in four main areas: improving operator performance, increasing rural access to sustainable water supply and sanitation, better managing of the water resources base, and the extension of water supply and sanitation services to the urban poor.¹⁵² The World Bank is also recognized as a lead agency in terms of knowledge and learning in the sector. It is engaged with national and local governments on water- and sanitation-related policies and programmes through policy advice and capacity building.

The World Bank documents recognize that the 'rapid pace of urbanization, together with challenges and opportunities for local governments resulting from decentralization, make town water supply and sanitation fundamental to economic growth and the achievement of the

Millennium Development Goals'.¹⁵³ It is also aware that the problem of water and sanitation provision in small urban centres requires specific attention, noting that such urban centres in the 2000–50,000 population range:

*face special challenges in the provision of their water supply and sanitation services. The demand for differentiated technologies – piped water supply in the core, alternative technologies in the fringe areas – and the often rapid, unpredictable water demand and spatial growth requires planning, design, and management skills that exceed ‘rural’ community-based management approaches. But, unlike larger towns or cities, these smaller towns often lack the financial and human resources to independently plan, finance, manage, and operate their water supply and sanitation systems.*¹⁵⁴

In many countries, small urban centres ‘have not received focused and adequate attention in the context of water supply and sanitation, and have rather been treated within the overall rural sector’.¹⁵⁵ The World Bank Water and Sanitation Program has launched Small Towns and Multi-Village Initiatives to study what is being done in these municipalities across the world and develop a programmatic approach to spreading the successes, in collaboration with the World Bank Rural Water Supply and Sanitation Thematic Group.¹⁵⁶ A Small Towns and Multi-Village Network was also set up to link sector professionals and national policy-makers and develop plans of action in the field.

A review of project descriptions for the 230 latest World Bank projects in the water supply and sanitation domain¹⁵⁷ suggests that provision for water supply and sanitation in small urban centres is usually addressed as a sub-component of an urban or rural water and sanitation project. Only five are exclusively dedicated to water and sanitation in small urban centres, although this may in part be related to what the Bank chooses to consider as ‘small towns’ and many of their

other water and sanitation programmes may be what this report considers to be small urban centres. These five projects are:

- The Small Towns Infrastructure and Capacity Building Project, Kyrgyz Republic (total budget US\$15.5 million) aims ‘to improve the availability, quality and efficiency of local infrastructure services for the population of participating small towns’. The National Community Development and Investment Agency is the main implementing agency.
- The Chongqing Small Cities Infrastructure Improvement Project, China (US\$280.7 million) aims to ‘support emerging small cities to improve the efficiency and effectiveness of infrastructure service delivery, to accommodate the rapid urban growth’. Chongqing Municipality is the implementing institution in charge.
- The Cambodia Provincial and Peri-Urban Water and Sanitation Project (US\$23.27 million) aims to build partnerships with the private sector and user groups in financing, operating and maintaining constructed facilities, after designing specific instruments that ensure inclusion of low-income communities residing in the service areas. The main implementing agencies are the Department of Potable Water Supply, Ministry of Industry Mines and Energy for provinces outside Phnom Penh and the Phnom Penh Water Supply Authority for Phnom Penh.
- The Small Towns Water Supply and Sanitation Project Ghana (US\$31 million) aims to ‘significantly increase access to piped water system in Ghana’s urban centres, with an emphasis on improving access, affordability and service reliability to the urban poor’. The Ghana Water Corporation Limited is the implementing institution in charge, which also receives the main allocations of the project for training and technical assistance.

- The Water and Sanitation Sector Support Project in Colombia (US\$70 million) aims to ‘support water sector reform by facilitating private sector participation in the management, and operation of water utilities, providing the environment and the financial support to ensure their viability’. The Colombian Ministry of Economic Development is the main implementing agency.

In its strategy for small urban centre water supply and sanitation, the World Bank promotes greater private sector involvement in the building or management of water utilities, for instance through the contracting of small-scale providers,¹⁵⁸ and public–private partnerships in order to ‘make the private sector participation work for the poor’. It notes that a ‘business planning approach that integrates the role of both utility managers (service provision) and town administrators (regulatory oversight) is a fundamental part of any town Water Supply and Sanitation’.¹⁵⁹ All the latest World Bank projects in town water supply and sanitation¹⁶⁰ involve support to private sector participation, with a view to bridging the finance gap in water supply and sanitation provision for small urban centres. The World Bank is also shifting away from financing subsidies for water supply and sanitation facilities towards a strategy of funding the promotion of water supply and sanitation and the leveraging of household and community resources.¹⁶¹

*A key challenge for Town Water Supply and Sanitation is to allocate limited government resources amongst a large number of dispersed towns. For every large town (50,000 to 200,000 people) there are 10 smaller ones (2000 to 50,000 people). The goal should therefore be to establish town utilities with a minimum investment, and to ensure that reforms are put in place so that the utilities can meet carefully defined cost-recovery objectives.*¹⁶²

The World Bank’s support for water and sanitation in smaller urban centres also takes place within a strong commitment to supporting decentralization and usually with measures to involve municipal governments. Most of the World Bank projects in water and sanitation¹⁶³ place significant emphasis on the infrastructure aspects, either through supporting infrastructure planning at municipal level, or through the upgrading of existing water or sewerage networks. The five latest World Bank projects specifically dedicated to water supply and sanitation provision in smaller urban centres¹⁶⁴ all put a high focus on infrastructure improvement through technical and managerial assistance to local governments and local water agencies. However, as the World Bank funded e-conference *Report on Town Water and Sanitation* stressed, water and sanitation utilities in small towns tend to be often over-designed, in terms of technical, operational and financial capacity while longer term investments in capacity building, governance, business and development skills, which are necessary to ensure the effectiveness and sustainability of improved water and sanitation provision, tend to be overlooked and often fail to attract traditional forms of donor finance.¹⁶⁵

The World Bank official documents also acknowledge that ‘understanding the unique and differentiated service demands of poor households ... requires the participation of users in the design, management, and regulation of services’, and that ‘the involvement of customers in determining appropriate levels and providers of service is essential’. Community participation is also recognized to be the best guarantee for good performance and sustainability: ‘When community members have committed their own time, effort, and resources to establishing improved water and sanitation systems, they are more committed to maintaining and sustaining their investments’.¹⁶⁶ However, the official documents are not explicit about the means by which the unserved and inadequately served are or might be involved in supervising local agencies.

The support given by the World Bank to decentralization and local government reforms during the past two decades are not within the water and sanitation sector, yet this should contribute to improve local governments' effectiveness and accountability, which are necessary conditions to improving and extending water and sanitation provision at local level. There are also a number of World Bank projects focussing on support to municipal local government for community-based planning that may include support to initiatives that can deliver significant improvements in water supply and sanitation for small urban centres. For example, the Local Development Programme implemented in Chad provides different grant facilities to co-finance sub-projects proposed by communities or decentralized authorities (in rural areas or small urban centres), including initiatives in water supply and sanitation. The Community Infrastructure Project in Pakistan supports investments in community development activities, basic services (including water and sanitation) and small-scale productive infrastructure, and proposes to strengthen capacity at both local government and community levels, to plan and deliver such services and infrastructure. The Honduras Barrio Ciudad Project (with a cost of US\$16.5 million) and the Third Urban Poverty Project in Indonesia (with a cost of US\$186.1 million) propose similar approaches. However, these projects remain a small part of the World Bank's activities, as there is still a general preference for sector-specific projects that favour private sector participation.

WaterAid

WaterAid is an international NGO 'dedicated exclusively to the provision of safe domestic water, sanitation and hygiene education to the world's poorest people' and it 'works by helping local organizations set up low cost, sustainable projects, using appropriate technology that can be managed by the community itself'. Most of its work is done in partnership with local organizations through in-country programmes – and it is also more proactive than many international

NGOs in seeking to influence the policies of governments and international agencies. In 2004–2005, its total income was UK£21.3 million (around US\$38.7 million).¹⁶⁷

In 2004–2005, it had programmes in 15 nations with its largest programmes being in Bangladesh, Tanzania, Ghana, Ethiopia, India, Nigeria and Uganda. It estimates that the work it funded in this year helped 610,000 people gain access to safe water supplies and 540,000 to gain access to sanitation – with more than this reached by its partners using WaterAid methodologies and funding from other sources.

WaterAid is unusual among international NGOs in having had an explicit urban strategy for many years¹⁶⁸ – and most of its country programmes have strong urban components.¹⁶⁹ It is aiming to allocate around 30 per cent of its funding to urban projects in the future. It is not possible to estimate what proportion of this work is in small urban centres but there are many examples of work in such centres. For instance, in India, it supports 123 projects in ten states, covering 1154 villages and 136 'slums' and this includes work in Tiruchirapalli in Tamil Nadu (which had around 847,000 inhabitants in 2001) to establish new bore wells with hand pumps, communal latrine blocks and 250 individual latrines connected to drains.¹⁷⁰ In Pakistan, it has long supported the work of Orangi Pilot Project, whose work in small urban centres in Pakistan is described in Chapter 4 and whose work on mapping is described in Chapter 5. In Ghana, its work includes supporting its partner, New Energy, to rehabilitate open wells and build latrines in Tamale (Ghana's third largest urban centre with around 202,000 inhabitants in 2000). In Nigeria, it is working with Partners for Water and Sanitation to develop a programme of water and sanitation provision for poor communities in small urban centres in Benue state. It is also a member of the Water and Sanitation for the Urban Poor group made up of international NGOs and private companies, set up to find solutions for the provision of water and sanitation services in peri-urban districts and mid-size towns.



THE CONSTRAINTS ON DONOR FUNDING TO IMPROVE PROVISION FOR WATER SUPPLY AND SANITATION IN SMALL URBAN CENTRES

One of the difficulties facing all international donors is the fact that success depends on improved outcomes in hundreds or thousands of local contexts that are far from their offices. Most donor agencies have improving and extending provision for water and sanitation among their priorities, even if many are reluctant to fund improved provision in urban areas (including small urban centres). Donors seem well suited to funding for water and sanitation since this needs capital investment (which is what the donors were set up to provide) that should bring significant health and time-saving benefits to poorer groups over a long period. If implemented successfully, such funding directly contributes to the achievement of two of the MDG targets: Target 10 (to halve the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015) and Target 11 (to achieve significant improvements in the lives of at least 100 million slum dwellers by 2020).¹⁷¹ In addition, better access to water supply and sanitation facilities in low- and middle-income countries also contributes to the attainment of other MDGs, as it helps reverse the spread of many diseases (MDG 6), contributes to reduced child mortality (MDG 4), and encourages children to attend school (MDG 2).¹⁷² Improving provision for water supply and sanitation in each locality also fits with international commitments to support good governance as it strengthens local capacities to improve, manage and maintain infrastructure and services. It can also help strengthen local government's revenue base and there may be potential for drawing in private sector expertise and capital and/or working in partnership with low-income groups and their grassroots organizations. Urban areas that are

well served with water supply and sanitation are also more likely to attract external investments. So there is a compelling case for donor involvement in water and sanitation.

But improving provision for water and sanitation has received strong support in the past from donor agencies without producing the hoped for results. It is now 30 years since the first UN Conference on Human Settlements in Vancouver in 1976, at which 132 governments committed themselves to providing 'safe water supply and hygienic waste disposal' as a priority. After the UN Water Conference in 1977, the United Nations designated the 1980s as the International Drinking Water Supply and Sanitation Decade. The failure to improve provision in small urban centres (and in rural areas and cities) is not only in water and sanitation but also in many other aspects, including provision for health care, schools, emergency services, the rule of law and safety nets. What this highlights is the difficulties that donor agencies face in knowing how to support what might be termed 'pro-poor' development in each locality.

Improving and extending provision for water and sanitation in small urban centres depends on more competent, more effective and more pro-poor local water and sanitation providing organizations in each urban centre. As Chapters 4, 6 and 8 make clear, the most appropriate form and mix of these organizations also varies greatly from place to place – for instance in terms of the relative roles of community organizations and cooperatives, small and large private enterprises, local and international NGOs and local and national governments. Almost all the other MDGs also depend on more competent, effective pro-poor local organizations in each locality. Most of the underlying causes of poverty may be in national or international factors but most of the deprivations that arise from poverty are rooted in local contexts, local power structures and local institutions' performance,¹⁷³ and these cannot be addressed without local changes.¹⁷⁴ One of the most critical roles for development assistance is to help ensure there is the organizational and financial framework that

supports the development of more effective, pro-poor local organizations – for water and sanitation and for other needs. This is not easily done. In most localities, it requires a change in the relationship between those with unmet needs and the local organizations, particularly the local authorities (city and municipal), in order to make local water and sanitation service providers more effective in meeting local needs and more accountable to those with unmet needs.¹⁷⁵ Local government reforms are important for this, as recognized by international donors, as they support decentralization. But as Chapter 4 described, this also requires more scope for grassroots organizations and their support NGOs to be able to act and to influence the state, as well as other stakeholders involved. Official water and sanitation providers are unlikely to serve low-income groups unless these groups can influence local governments and exert more influence on service providers. But international donors were not set up to engage in this kind of pro-poor local change¹⁷⁶ and have limited possibilities of doing so, if national recipient governments do not have this as a priority or lack the capacity to support this. Chapter 4 highlighted the importance of local initiatives in which the individuals and households that have inadequate provision (who usually have little or no influence) take a central role – and how these can bring much improved water and sanitation in small urban centres and contribute to building more effective governance systems, from the bottom up.¹⁷⁷ This section is interested in how international donors can support this and other forms of local development that bring better provision for water and sanitation.

Perhaps the difficulties that any international funder faces in successfully funding pro-poor initiatives and organizations in many different locations (including small urban centres) need more acknowledgement. Most international donors do not actually implement projects – in the sense that it is not their staff that dig the wells, install the pipes and build the water treatment plants. They fund other organizations to do so – whether this is through

government agencies, private sector enterprises or NGOs and community organizations. So their success depends on them finding good implementers and managers. As will be discussed in more detail below, most international donors are under strong pressures to keep down staff costs – so if they are funding a programme to support water and sanitation provision in a range of small urban centres, they may have no staff members on the ground supervising the work. In the end, it is donor agencies' difficulties in finding effective local implementers and managers that explains the large deficiencies in provision for water and sanitation. This section explores the types of institutional and political constraints on increased aid assistance support for water supply and sanitation provision in small urban centres. These are related to donor agencies' own structures (and the political system in which they are embedded), to their relationship with recipient governments, and to the incapacity or unwillingness of recipient governments to address water and sanitation needs.

Institutional constraints linked to the structure of donor agencies

Official bilateral and multilateral agencies' structure and mode of providing grants, soft loans or non-concessional loans, were initially set up to provide recipient (national) governments with large capital sums and professional advice. In part, this is the legacy of the 1950s conception of development assistance, which centred on capital to help national governments invest in productive activities and infrastructure supported by 'expert' foreign technical assistance.¹⁷⁸ Although the understanding of how international agencies should support development has evolved much since then, most of these agencies' basic structures remain little changed.

Official bilateral aid agencies are government departments that are unlike all other departments in that they work for the benefit of people that are not citizens of their country. In addition, 'the people for whose benefit aid

agencies work are not the same as those from whom their revenues are obtained'.¹⁷⁹ So unlike other government departments, there are no direct lines of accountability to their 'clients' through conventional political processes; the poor, whose needs bilateral agencies try to meet, have no politician in the host nation that is elected to represent their needs and no rights as citizens to question the validity of what donor agencies provide.¹⁸⁰ There is no 'feedback loop'¹⁸¹ between the original suppliers of funds, for example, from taxes (or voluntary contributions) in donor countries, and their intended beneficiaries. One of the key checks on any government agency in regard to ensuring good performance in any social policy – the right of citizens and civil society organizations to complain through local and national political systems – is not there in development assistance.¹⁸² Aid agencies' are thus accountable not to their clients but to their own governance structure, as established by procedures, and they usually view taxpayers as the principal stakeholder.¹⁸³ All bilateral agencies have to respond to their parliament and government for the delivery of their set development assistance goals. For instance, Sida states in its policy document that because 'it is the people of Sweden that finance Sweden's development cooperation through the taxes they pay, both Sida and the partner countries/organisations are responsible for reporting on the ways in which the funds have been used'.¹⁸⁴ Bilateral agencies must also be seen to address what the politicians and civil servants who oversee them consider as 'good practice'. Multilateral agencies are responsible to their own governing bodies, which are representatives of national governments. Such agencies inevitably place most emphasis in regard to accountability to reporting to the representatives of governments that are their main funders.

Each bilateral aid agency is also under strong pressure from various domestic constituencies.¹⁸⁵ This obviously includes a wide range of commercial businesses (contractors,

suppliers and consultants) and non-profit organizations (mostly the international NGOs based in that nation) that receive or want to receive this agency's funding. Environmental groups and human rights groups are also active and often powerful influences. Bilateral agencies are also sensitive to pressure from the media. In most donor countries, 'the aid agency is continuously subjected to strong outside pressures trying to influence what should be done, how it should be done and where it should be done'.¹⁸⁶ All bilateral agencies have above them an elected government to which they are responsible, which takes decisions about the allocation of funds for which they have responsibility and sets parameters and conditions on the use of such funds. One of the major challenges for donor agency staff is 'to manage ministerial expectations concerning the agency's capacity to deliver real world change' while building up and maintaining interested constituencies back home in order to help preserve donor budgets.¹⁸⁷ For example, all donor agencies need to maintain favourable links with the lobby groups that have the capacity to influence its budget allocation, and the private sector enterprises and voluntary organizations on which they rely to implement their initiatives.

All official bilateral agencies face difficulties in limiting the influence of domestic vested interests and of their government's foreign policy. Even in those countries where governments have put a high emphasis on ethical imperatives and international humanitarianism and have set careful checks to keep their aid policy formulation at a distance from foreign policy and commercial influences; 'if aid is not openly and directly serving policy interests, it should at least not work against them'.¹⁸⁸ Most multilateral agencies may be less subject to political pressure from donor governments, and often protected by their mandates; yet, inevitably, they are influenced by the policies and priorities of the governments that are their main funders and by those enterprises or civil society organizations that are funded to implement their initiatives.

Public opinion in donor countries also exerts an influence over decisions in development assistance. The setting of development targets by donor agencies that evolved into the MDGs was in large part driven by a worry that popular support for development assistance would drop off, without more evidence of development assistance's effectiveness. Popular sentiments in favour of 'helping the poor' have helped support the increased priority to humanitarian assistance in the field of development.¹⁸⁹ The media have an important role in shaping opinions among both the public and decision-makers, who tend to increasingly favour support to address humanitarian emergencies.¹⁹⁰ This may explain in part the increasing share of development assistance allocated to humanitarian purposes. Another consequence is that aid agencies tend to favour large and visible contributions to development problems that are covered by the international media. Investments that reduce a population's vulnerability to humanitarian crises tend to receive less attention in terms of aid support as they are also less visible to public opinion and political constituencies at home.

The people whose needs justify the whole development industry are those with the least power to influence development.¹⁹¹ Unless they have influential champions that represent their needs and priorities, these needs and priorities do not get addressed. They are also dependent on these champions accurately reflecting their needs and priorities, which is often not the case. One way in which the needs and priorities of those living in small urban centres might get more attention is through international NGOs. Much of the bilateral agency funding to civil society is through international NGOs, mostly those with offices in the donor nation.¹⁹² So whether or not bilateral funding for civil society supports provision for water and sanitation in small urban centres depends on whether these international NGOs press for such funding – and most have not done so, because they still think that 'urban populations' are much better served than rural populations or because they think that the bilat-

eral agency thinks this, or because rural water interventions are easier to manage. There are some exceptions to this – for instance international NGOs with strong commitments to water and sanitation that help advance the priority of water and sanitation (for instance WaterAid in the UK), or international NGOs that provide support for locally driven water and sanitation initiatives (examples of which were given in Chapter 4). But these remain the exceptions.

Engaging with local actors

The distance between the decision-making and management processes of donor agencies and their intended beneficiaries in hundreds or thousands of small urban centres and large villages makes important local actors largely invisible to external 'experts' and international agencies. It also creates serious constraints for most donors to engage with and support local poverty-reducing processes, including supporting the local organizations capable of bringing significant improvements in provision for water supply and sanitation.

The distance between decision making and implementation in the aid delivery process necessarily creates the need for procedures. These procedures allow aid agencies to work and engage with other development actors, while at the same time keeping their accountability to politicians and taxpayers back home. Over the years, the desire to improve the quality of aid has led to the extension of project preparation, monitoring and evaluation procedures and reporting requirements.¹⁹³ These can impose forms of conditionality that local organizations find difficult to meet and that also ill-match local circumstances.¹⁹⁴ Many procedures exclude the local organizations who have the potential to bring significant improvement at local level but lack the influence, the Western language skills or the familiarity with accepted procedures to be selected as 'beneficiary representatives' and participate in the decision making or implementation of donor-funded activities. Procedures also bring further constraints on the donors' side: for

example on donor agency staff that work within procedures that seem little related to conditions on the ground and that inhibit their connection to the local groups whose performance determines the success of the initiative.¹⁹⁵

Chapter 5 made clear the importance of improving local information systems to serve improved provision for water and sanitation. Local knowledge is also recognized as not only helpful but necessary in the search for solutions for water and sanitation at local level – as illustrated by many case studies in Chapter 4. Yet it is difficult for aid agencies to make full use of local knowledge and capacity – especially if those who have this knowledge and capacity do not speak the language of the donor agency. As donor agency staff are pressured to spend, to get results and to keep down staff costs, it is easier and more convenient to use consultants or contract out management to organizations in their own nation. In addition, as most bilateral agencies have had to contract out more as a way of managing workloads with limited staff, so this strengthens a specialized aid industry within their own nation that is also distant from local realities.¹⁹⁶ Many aid agencies' documents report an increasing use of consultants for technical and analytical work to the extent that 'the bias towards using foreign experts has become a systemic problem'.¹⁹⁷ Even though most low- and middle-income nations have competent and capable professionals, for donor agencies, these are still too distant or too inconvenient to use. Donors have even more difficulties working with grassroots organizations, despite the knowledge and capacity they can contribute. 'Development is still something that professionals and development institutions "do for them"'.¹⁹⁸ The poor are still perceived as 'targets' or 'beneficiaries'. The staff of aid agencies may find it difficult to see the poor as partners and active agents of their development, with knowledge, resources and rights to influence the way development is delivered to them, as they most often have no relations with them or their organizations.

Many aid agencies and development banks are placing an increasing emphasis on offices within each recipient nation in an effort to reduce the distance separating their work from local realities. The decentralization of responsibilities to in-country offices is also seen as a means to increase each agency's overall efficiency by shortening the lines of decision making between the different organizational levels and to support the donor–recipient government dialogue. UNICEF and UNDP were the first to focus on country offices. For UNICEF this is a legacy of its early development as a relief agency, for UNDP it originates in the agency being seen as a coordinator of technical assistance within each nation. Several bilateral agencies began to strengthen their in-country offices in the late 1970s (first among them the Nordic donors) and this trend increased in the 1990s.¹⁹⁹ Today decentralization reforms and the delegation of new means and responsibilities to in-country offices and/or national embassies has changed the balance of decision making away from head offices to offices or embassies in recipient nations.

This has strengthened the relationship between donors and recipient nation governments. Yet this does not necessarily decrease the distance between donor agencies and the local actors that require their support. Senior posts in in-country offices are typically staffed with expatriate programme officers who do not stay long. Short-term assignments to field offices and high staff turnover, added to a growing proportion of temporary contracts in most development agencies, represent obstacles for staff to engage with local actors and to absorb sufficient knowledge about the societies in which their projects are to be applied. There are also rarely effective mechanisms to ensure post-field knowledge transfers.²⁰⁰ Thus, in most aid agencies' in-country offices, donor staff spend most of their time in their offices in the capital city, under pressure to be 'strategic' and with little time to be able to assess the socio-political situation and connect with poor people.²⁰¹ In addition, donor

staff tend to be rewarded more for the financial management of funds than the actual performance of what is funded.²⁰² As a member of Sida staff recognized, 'development is about taking risks; yet, today [staff] incentive systems discourage risk-taking'.²⁰³

The search for greater efficiency and effectiveness

Since the 1980s, development assistance has sought greater aid effectiveness through different means. One has been by adopting a more explicit and multi-dimensional approach to reducing poverty, with the establishment of clear development goals (such as the adoption of the International Development Targets and later the UN MDGs).²⁰⁴ Another has been a focus on 'more efficient' management.²⁰⁵ The shift to 'management-by-results' is underpinned by using information to improve decision making and to steer country-led development processes toward well-defined goals.²⁰⁶ The need for aid agencies to demonstrate their effectiveness through quantitative and measurable indicators was mostly driven by growing worries among development assistance agencies of the fall in public support for aid in the 1980–1990s. The pressure to demonstrate results is often expressed with reference to the need to ensure people's support, although several studies have shown that public opinion seems to have little impact on bilateral aid policies apart from emergency aid.²⁰⁷ More tangible outcomes, such as the attainment of the MDGs, are seen as a way for aid agencies to justify aid spending to taxpayers and political leaders at home.²⁰⁸ During the High Level Forum on Aid Effectiveness in Paris in February–March 2005, the chair of the OECD Development Assistance Committee explained how 'results' and 'mutual accountability' naturally appear among the five principles of the Paris Declaration since 'we must demonstrate that we are using aid effectively. This will give the people the confidence that aid helps the poorest people in the world, and that more aid is a sound investment in all our futures'.²⁰⁹ The use of targets is also

necessary to 'measure' recipient governments' effectiveness at reducing poverty over time and thus validate donors' support.²¹⁰ 'The new partnership for development calls for countries to measure their achievement toward the Millennium Development Goals.'²¹¹ In recipient countries, the set of results indicators are meant to help build public demand for greater accountability. Across development agencies, it helps foster common approaches and better coordinated support. As expressed by the prime minister of The Netherlands, 'the MDG Targets offer a valuable framework for planning and monitoring Dutch efforts... A common international format would further improve transparency in reporting and allow mutual comparison among donors'.²¹²

The use of quantitative outcomes is also a way for development organizations to overcome the lack of clearly defined success criteria.²¹³ Most development ends to which donor agencies have committed themselves have been translated into numbered targets for them and their partners to reach. This is central to the MDGs. Danida, the Danish bilateral agency (the name stands for Danish International Development Assistance), highlights in its annual report that it operates 'with a lean professional staff and business-like procedures', in which 'concrete improvements' are associated to 'improved rationalizations' and 'the strengthening of target and performance management'.²¹⁴ The World Bank puts a high emphasis on result-oriented approaches both within the organization and for the programmes and projects implemented in recipient countries. Within all aid agencies, there is more emphasis on everyone reporting and assessing their performance against monitorable targets and efficiency criteria. This is also supported by the OECD Development Assistance Committee's good international practice criteria on the use of development assistance funds, with set standards and reporting requirements that are also based on tangible outcomes, and applicable to official development assistance and official aid.²¹⁵ Thus, 'government departments,

NGOs and private organisations active in the domains of development are increasingly required to operate as if they were businesses'.²¹⁶ Adherence to initial project timetables is an important part of this – even though imposed time-frames for the delivery of results can cause a loss of local ownership and threaten the strength and sustainability of the development process it seeks to initiate.²¹⁷

All donor agencies – from the multilateral development banks to official bilateral agencies to international NGOs – are under pressure to keep down their staff costs. For the World Bank and the regional development banks, keeping down staff costs relative to total loan amounts is a priority – as it is in any bank. But most official bilateral aid agencies and international NGOs also operate under pressure to minimize staff costs, driven by the assumption among senior civil servants and politicians (and the media) that an efficient development agency is one that is able to spend the lowest proportion of their total funding on their own staff and administration. The 2004 Sida Annual Report mentions that 'the savings requirement has had the effect that the recruitment of new staff to Sida was strictly restricted in 2004'.²¹⁸ The 'Efficiency Programme' to which the UK government's bilateral agency DFID has committed itself since April 2005 plans to cut DFID's staff costs by 3 per cent a year up to March 2008, with the loss of 170 UK-based staff and 124 staff appointed in-country.²¹⁹ One consequence of the drive to demonstrate low staff costs has been that many agencies hire external consultants to do work that was previously done in-house, because consultants do not appear as staff costs in their accounts.

But what happens to those aspects of development that actually require relatively little external funding and a need for this funding to be used carefully and strategically within a range of particular local contexts – for instance to improve provision for water and sanitation in a range of small urban centres? How would donor-agency staff be able to support pro-poor local processes in dozens or even hundreds of small

urban centres in a nation? If the country offices of donor agencies recognized that they need strong, permanent working relationships with representative organizations of the urban poor, it would be difficult to accommodate this within the pressure to minimize staff costs. How can this concept of efficiency be reconciled with 'good development' (for water and sanitation or other local needs) that minimizes the need for external funding – by keeping down unit costs and by using donor funding to leverage local resources? What happens if good development actually involves less funding but much more care in how it is used and much more attention paid to engaging with poor groups, including giving them more scope to influence what is done and ensuring more accountability to them in the ways funding is allocated and used?

■ Pressures to spend

All development agencies face considerable pressure to disburse the funds they have been allocated within their budgetary year or within the time-frame agreed at the outset. 'Projects often lead to a focus on disbursements and donors must use the resources agreed upon and planned for within the framework of the project, even though continuous monitoring perhaps shows that implementation capacity is too low, or that other activities should have higher priority.'²²⁰ This need to disburse all available funding is exacerbated by the fact that politicians tend to see success in terms of how much development assistance is allocated or how much debt relief is provided, and 'the whole culture in the aid industry is heavily biased towards measuring agencies and managers in terms of the amount of money they can dispose of'.²²¹ Managers both at headquarters and country offices are encouraged to spend their allocated resources; failure to do so may result in budget cuts in the future. In the UN and in the OECD DAC, donors who increase their total spend or total budgets in relation to their GDP are praised. Combine this with the 'efficiency' goals and this helps explain the preference among many bilateral agencies for

direct budget support or large contributions to programmes managed by multilateral organizations or international NGOs.

Changes in official donor support and the implications for water and sanitation

■ Poverty reduction strategy papers, budget support and aid harmonization

Over the last ten years, there have been major changes in the ways that official development assistance is provided, and these inevitably have importance in regard to the scale and nature of support available for water and sanitation in small urban centres – both now and in the future. From the late 1990s onwards, there was growing concern among development assistance agencies about the weak recipient country ‘ownership’ of development policies and the negative institutional impacts of both free-standing project assistance and policy-based conditionality.²²² This was in part translated into a shift in emphasis in donor agencies’ policy documents away from the use of conditionalities and towards a language of ‘partnership’ and the promotion of good governance – a new model by which recipient country governments become the ultimate ‘owner’ of development and budgetary support, the privileged modality for aid delivery. In 1999, James Wolfenson, then president of the World Bank, proposed the concept of ‘comprehensive development frameworks’ (CDFs), a new country-specific mechanism to map all the sectoral initiatives within a country onto a single coherent matrix in order to facilitate the coordination of different donors’ aid. All national (government, civil society and private sector) and international partners (multilateral and bilateral donors, international NGOs) involved in the development of a particular country must discuss and agree on a division of responsibility by referring to the national development policies so listed.²²³ Some of these concepts were then incorporated into a new approach to increase the effectiveness of development assistance for poverty reduction: poverty reduction strategy papers (PRSPs), which were to be prepared in all

low-income countries receiving concessional lending from the World Bank and the International Monetary Fund (IMF). Countries would also need at least an interim PRSP before they could access debt relief under the Enhanced Heavily Indebted Poor Countries (HIPC2) facility, and once they had a full PRSP in place and had implemented agreed poverty reduction actions they could obtain great support.

The World Bank exercises a strong influence on both the international development discourse and development policy and its implementation²²⁴ and most bilateral agencies agreed to coordinate their work with the PRSPs.²²⁵ The hope was that these would lead to more effective policies for attacking poverty that are better adapted to what donors term ‘local situations’ (but in reality mean national situations) and hence more effective aid. They should also provide the means for better coordination between donors.

Unlike previous approaches to aid conditionality, the PRSP philosophy emphasizes adherence to a process of comprehensive policy making, rather than the implementation of particular policies. The theory of the PRSP approach is based on five principles:

- 1 The principle of ‘national ownership’ states that priorities and policies for poverty reduction should be developed by governments based on consultation with constituents of the wider society.
- 2 These strategies should form the basis of a partnership for poverty reduction, embracing government, civil society, the private sector and international actors (principle of ‘partnership’).
- 3 The strategies should be based on a ‘long-term perspective’.
- 4 The strategies should be ‘comprehensive’ in tackling the multiple dimensions of poverty. According to the principle of ‘results-orientation’, national policies should be based on a detailed analysis of poverty in a country, and monitorable targets should be set to

measure their effectiveness at reducing poverty over time.

These principles come as 'a response to a profound crisis of confidence confronting the World Bank, the IMF and the rest of the international donor community towards the end of the 1990s'.²²⁶ They were also seen as a 'new' instrument to overcome some of the problems that project-oriented development assistance had faced. For example, in a policy paper by The Netherlands government bilateral agency, sectoral budget support was seen as a way of overcoming the problems with project aid that frequently led to unsustainable 'islands of development'.²²⁷

General budget support is the aid counterpart of the PRSP initiative and the international movement towards improving aid harmonization. Its purpose is to support countries in implementing their PRSPs, and to do so in the framework of a medium- or long-term partnership. Through budget support, donors channel their funds directly into the financial management, accountability and procurement system of the recipient government. These features are intended to strengthen country ownership of policy and policy making, to strengthen processes of democratic accountability (by allowing more effective parliamentary scrutiny, for example), and to rebuild government administrative capacity to decide and implement policies for themselves, after a decade of structural adjustment policies. They are also meant to provide predictable, long-term financial support to recipient national governments in a harmonized and coordinated manner that will improve aid effectiveness.

There are now many low-income nations in which half of the aid is received in the form of unearmarked contributions to the national budget,²²⁸ and by June 2005, 45 countries were implementing PRSPs. Many donors have increased the proportion of their funding to direct budget support and most bilateral aid agencies are now undertaking structural reforms with the aim of increasing their capacity to provide such

kinds of support and respond to their new commitment in this direction: procedures are being revised to allow for more flexibility in the adoption of harmonized instruments such as programme support, delegated cooperation, adoption of country systems and joint programming and reporting. In many donors' official documents, budget support is described as the most effective form of development aid. The Dutch Ministry for Development Cooperation holds that the PRSPs provide 'the best framework' for coherent government policy.²²⁹ Sida suggests that its partner countries 'always have the main responsibility for their own strategies for poverty reduction and special analyses of projects'.²³⁰ Within DFID, budget support is perceived as the ultimate instrument of partnership, recommended as the most appropriate means to deliver aid in countries with high levels of poverty that demonstrate their commitment to poverty reduction.²³¹ The UK, The Netherlands, Sweden, Ireland, Norway and Denmark are among the donors who have committed the most significant proportions of their bilateral aid to budget support. DFID has allocated 47 per cent of its 2004/2005 budget to country/regional programmes, with the main emphasis put on budget support for health and education.²³² More than half of the Danish bilateral assistance to the programme countries is concentrated in major long-term sector programmes, and is generally on the increase (53.8 per cent in 2001 and 56 per cent in 2003).²³³ The European Union is also increasingly focusing its development cooperation on budgetary aid.

Aid delivery in the form of harmonized budget support is popular with recipient governments. It also presents several advantages on the development agencies' side. This is the 'one cheque a year' model of development cooperation²³⁴ that allows aid agencies to reduce their administrative and staff costs by transferring the management and implementation responsibilities to recipient governments. For any bilateral agency, disbursing large sums in a few sectors in a few countries means they can also

better concentrate their aid in a way that is more visible to the eyes of politicians and the public opinion in their own country. Overall, it is easier both administratively and financially for donors to disburse their aid budgets into recipient government treasuries, than to provide a large number of small funding packages and technical support to a mosaic of field-based projects.²³⁵

Improved aid coordination and the harmonization of donors' aid has also come to be seen as a necessary reform to meet the MDGs. Donors agreed within the Paris Declaration²³⁶ to harmonize and align aid delivery, and to take 'far-reaching monitorable actions to reform the ways [aid is delivered and managed] as [they] look ahead to the UN five-year review of the Millennium Declaration and the Millennium Development Goals'.²³⁷ The Paris Declaration identifies five principles (ownership, harmonization, alignment, results and mutual accountability) and 12 indicators against which progress toward aid harmonization is to be measured. Its harmonization and alignment agenda implies a greater share of budgetary aid delivered in support of programmes owned and managed by recipient country governments. For example, by 2010, 85 per cent of aid flows should be aligned on recipient government priorities and reported in recipient national budgets.²³⁸ Aid coordination and the harmonization of donors' procedures are high on the international development assistance agenda and figure among the priorities of most bilateral donor agencies. Since 2003, the OECD DAC has established a special task force on harmonizing donor procedures to encourage its member countries' aid agencies in their effort towards improving aid harmonization and alignment. Some countries have regrouped themselves to form donor groups such as the Nordic Plus Group (Norway, Finland, Sweden, Denmark, Iceland, The Netherlands, Ireland and the UK), which committed itself in 2003 to 'bring the harmonisation agenda a step further' by producing an action plan for increasing harmonization.

Implications for improving water and sanitation in small urban centres

Improving the coordination of donor efforts within recipient nations and the alignment of aid behind the national priorities of recipient governments are both necessary parts of more effective development assistance. The need for recipient governments to struggle with the differing (and changing) agendas, timetables and rules, procedures and requirements of many different donors is lessened. This should help strengthen the capacity and effectiveness of recipient governments. PRSPs also put poverty reduction at the centre of the development discourse. Improved aid harmonization and alignment should also facilitate the predictability and coordination of funding flows.

But this also means that increasing support to water and sanitation provision now depends on whether this is a priority for recipient governments and whether they have the capacity to act effectively. The design and management of the policies, programmes and projects for improved water and sanitation provision are the responsibility of the recipient governments. Donors' capacity to support improved provision for water supply and sanitation at local level seems much reduced.

But according to the UN Millennium Project Task Force on Water Supply and Sanitation, one of the chief constraints to expanding water supply and sanitation coverage is an absence of political leadership and government commitment to allocating sufficient national resources to the sector and to undertaking the reforms necessary to improve performance and attract investment.²³⁹ 'For decision-makers in finance ministries, for example, investments in water supply and sanitation are perceived as having lower returns than funds spent in other sectors'.²⁴⁰ Another problem is that in many countries there is no specific ministry for water and sanitation. Whereas health care and education have their own ministries to fight for their share of funding, responsibility for water resource management, water supplies and sanitation tends

to be spread across many different parts of recipient governments and they lack influence; they may also have conflicting views on what are the most important water- and sanitation-related issues. Because there is no single part of the government to take the lead in water and sanitation, it often receives less emphasis in recipient countries' national programmes, and thus less support from within their PRSPs. Clearly, how well a sector is profiled within PRSPs influences how it gets prioritized.²⁴¹ Chapter 5 highlighted the poor quality and lack of detail in available statistics on provision for water and sanitation in most nations – which makes it difficult to highlight the scale and nature of the deficiencies in provision, especially in urban areas. Moreover, a recent study suggests that even where water supply and sanitation issues are addressed in PRSPs, this is rarely translated into sufficient funds being allocated to the sector in practice.²⁴² In addition, many PRSPs are also 'anti-urban' as they make assumptions regarding 'urban bias' in development outcomes that are unproven or questionable.²⁴³

Improvements in water and sanitation provision depend on the commitment and capacity of the recipient government. Donor funds are increasingly channelled to recipient countries' elected governments based on the assumption that they are representative of and accountable to their citizens' needs and priorities, including the poorest. This also accords with what politicians in high-income countries consider as 'good governance'; they see their counterparts in low- and middle-income nations as the rightful spokespeople and representatives of their citizens. The PRSPs are seen as the means by which democratic processes can operate, based on thorough consultation with all parts of civil society. For instance, DFID's 2005 Departmental Report states that 'in the preparation of [the PRSP], priorities for poverty reduction are identified, agreed and monitored through processes in which local decision-makers and populations are directly involved'.²⁴⁴ But again, the 'local' here is actually national. There is also some evidence

that direct budget support may have shifted the balance away from work with civil society organizations.²⁴⁵ Civil society organizations may have little say over the agenda when it comes to the elaboration of the PRSPs.²⁴⁶ Even if some civil society groups are included in discussions, the PRSP process is not set up to incorporate the views and priorities of grassroots groups and is not in a format that allows them to be effective.²⁴⁷ National poverty reduction strategies are mostly backed up by the technical staff in the administration who are put in charge of the elaboration of the policies.²⁴⁸ There is often no time to prepare positions or to consult with wider constituencies.²⁴⁹ The documents discussed at meetings are only made available at the last moment, and they are rarely translated into national language(s). Moreover, recipient governments often use the argument that civil society organizations lack a democratic mandate and merely represent their own interests.²⁵⁰

The poor in particular are very seldom given a part in the process. Their low status and lack of political patronage limits the possibilities of them making their needs and priorities heard. Indeed, exclusion from political and policy processes is an important aspect of poverty.²⁵¹ It is also difficult for poor groups to express their needs in terms of national policy change. Their main needs and priorities will generally be for immediate local changes – and changes in their relationships with local governments and other service providers and often with powerful local groups. These kinds of very context- and location-specific needs and priorities are not easily included in general discussions of national priorities. In effect, a large part of what is needed is very localized PRSPs in which low-income groups and their community organizations have major roles – and where the link between what is proposed and what is done in relation to their priorities is far more immediate. This is exacerbated by the fact that in most countries, there is no means to facilitate accountability through the dissemination of detailed information to the grassroots.²⁵² Moreover, there

are long histories of mistrust between the poor and other social groups in many contexts and ‘the kinds of changes needed to prioritize improved water and sanitation services to poor households often threaten status quo arrangements that confer substantial benefits on politically influential groups’.²⁵³ There are too many policies intended to fight poverty that do not take into consideration strategies involving and building partnership with local organizations and civil society groups, although these are much more able to bring significant improvements over a longer period of time.

‘Agencies have a strongly espoused theory of development as consensus, which leads to claims that PRSPs ... are means towards ensuring ownership of development by all stakeholders’.²⁵⁴ But poverty cannot be tackled without addressing the power relations and the cultural and social interests that sustain unequal access to economic opportunity and social resources.²⁵⁵ ‘If the poor lack voice and influence, rights and protection by the rule of law, then much-increased donor flows and even debt relief and fairer global markets are unlikely to bring them much benefit’.²⁵⁶ PRSPs and budgetary support do not strengthen ‘local’ ownership, they strengthen national ownership. They reinforce the position of those in power at national level and this may be at the expense of most other social groups. ‘Donors who operate at the country level become an integral part of the existing and complex patterns of patronage that already exist in that society and political economy’, and may be ‘contributing to the reproduction and reinforcement of the prevailing patterns of patronage that they are trying to eliminate through their good governance agendas’.²⁵⁷ There is still too little recognition among the donor community that pro-poor development has to involve political change that produces tangible results in each locality that benefit low-income groups; bilateral and multilateral donors still primarily view the target group as recipients of public services rather than active participants in local development and interna-

tional aid.²⁵⁸ The donor community has committed itself to increase aid effectiveness in the Paris Declaration, yet this declaration has no indicator of progress concerning the participation of civil society in the decision making of what gets to be funded and how.

Donors recognize the importance of decentralizing power and resources to lower level structures, and ensuring that policy and practice are tailored to fit local contexts. But if budget support provides national governments with increased influence and responsibility for development purposes, the extent to which this is shared through the different levels of government is usually not up to donors’ expectations and most local authorities lack the means and incentives to invest in and sustain improved water and sanitation provision at local level. Small urban centres’ opportunities for attracting finance from the national government may be particularly limited if they are not a municipality in their own right (as a municipality may be responsible for several small towns).²⁵⁹ They typically fall into a ‘middle ground’ between larger urban centres that are more likely to assume external loans for investments,²⁶⁰ and rural areas that are more likely to benefit from fully grant-based support. Local civil society groups may also find less donor funding to support them. National governments are inevitably loath to lose control over which cities and which sectors receive funding, and dislike or even prevent external agencies steering funding to citizen groups or NGOs outside their sphere of responsibility.²⁶¹ The enthusiasm among some donors for supporting civil society has led in some nations to increasing government control over what gets funded and who can receive such funding. For donors, the direct funding of local organizations and civil society groups may raise serious issues of sovereignty and political accountability, which would put them into conflict with the recipient country government especially when the latter is democratically elected.²⁶² One former staff member from DFID recalled how in the development of a PRSP in Bolivia from early 2000 to

mid-2001, donor support to grassroots organizations that directly represented the deprived groups was seen as an unacceptable interference in national political processes by the Bolivian authorities.²⁶³

Staff in donor agencies are aware of these constraints; yet, in the current context that emphasizes country-driven approaches, they have limited means to push for increased support to water supply and sanitation in recipient countries. During their negotiations with recipient governments for budget support, donors cannot tell recipient countries what their priorities should be, as this would go against the principle of 'national ownership'. They can provide advice and/or assistance to strengthen the PRSP formulation processes in ways that ensure appropriate emphasis is given to water and sanitation. They can help provide evidence of the links between improved water supply and substantial progress towards the attainment of the MDGs, as an advocacy tool in water-related policy discussions with partner governments – although this depends on donor staff in recipient-country offices with expertise in water and sanitation and, with the decline in project support, such expertise is increasingly rare.

Many donors allocate part of their water and sanitation budget to supporting international organizations that seek to provide such evidence and seek to encourage recipient governments to give water and sanitation appropriate priority and allocate appropriate long-term funding to the relevant authorities. Such organizations include the Global Water Partnership (GWP), the World Bank Water and Sanitation Program, or the Water Supply and Sanitation Collaborative Council (WSSCC). But none of this can guarantee a stronger commitment nor increased funding flows from recipient governments towards water and sanitation.²⁶⁴ And what will happen to those important aspects of development that neither donors nor recipient governments prioritize? Will water and sanitation in small urban centres be within these 'important' aspects that get marginalized?

The need to coordinate and harmonize donors' aid may become an obstacle to donor support for water and sanitation in countries in which a core donor group has not yet been organized. For instance, the Rwandan government adopted a new water and sanitation policy in 2004, but because there was no coordinated donor group (although the World Bank has recently taken the step to form one) donors were reluctant to channel large sums because no one would 'take the lead'. In Malawi, the new Malawi Economic Growth and Development Strategy gives water and sanitation a much higher priority but the government lacks the necessary funds to increase investment as there is not yet an agency among the government/donor group who has expressed willingness to take the lead for that matter.²⁶⁵

Most official donors recognize their lack of capacity to support local initiatives and so support this by funding intermediary institutions: NGOs based in their own nation or international NGOs (and occasionally NGOs in recipient nations) and multilateral organizations that implement or support projects at local level.²⁶⁶ But they usually fund a restricted list of intermediary institutions, as this makes management easier and keeps down transaction costs. Under pressure to reduce staff costs and to increase budget support, many donors' country offices have reduced their project-support functions. They lack the advisers and the technical knowledge to be able to assess needs and find solutions in regard to the water supply and sanitation provision or to engage with and learn how to support water and sanitation initiatives undertaken at local level by civil society groups and/or municipalities. The result is that only a very small proportion of the total funding provided by official donors supports local initiatives to improve provision for water and sanitation.

Some new approaches

Most donor agencies have sought to develop channels of support for local initiatives – in part, in recognition of the important role of civil society. There are many examples of decentral-

ized funds and other mechanisms that allow official donors to support local initiatives – and many examples of this were given in Chapter 4. However, Chapter 4 also noted how many of the community-driven initiatives to improve provision for water and sanitation received support not from the official donors but from international NGOs or private foundations. For official donors, the issue is what form of funding channels are possible that are effective, that do not present them with high staff costs and that do not generate too much opposition from recipient governments.

One of the most innovative examples of this is the Community-Led Infrastructure Finance Facility (CLIFF),²⁶⁷ operational in India since June 2002. This illustrates a means by which official donors can support local community-driven approaches. It is unusual in that it has placed around US\$10 million of official bilateral aid²⁶⁸ at the disposal of organizations assisting slum and pavement dwellers,²⁶⁹ who can draw on this funding to support a set of diverse projects in slum upgrading, community-managed resettlement, improved water and sanitation provision and other forms of infrastructure, which they themselves develop, carry out and manage in conjunction with municipalities and the private sector. It provides the organizations of the poor with loans, guarantees and technical assistance in a form that helps leverage funds from public and private resources and, where possible, to recoup the capital for reinvestment. It also helps solve cash-flow problems that are particularly difficult for civil society organizations engaged in large programmes – for instance as donors or governments only provide funding when projects are underway or are late with promised funding contributions. CLIFF funds serve to support a portfolio of 13 projects²⁷⁰ to date, in different sectors and implemented in different cities in India. This has included support for a very large programme of community-designed, implemented and managed toilet and washing facilities, first in Pune, then in Mumbai and now in many other urban centres,

including some small urban centres (as described in Chapter 4). Such models have helped develop a recognized partnership whereby communities design, build, manage and maintain toilets, and municipalities provide the capital costs of construction and help in providing suitable sites. Not only do such projects bring significant improvement to the poor in terms of water and sanitation, but they help build stronger relationships between the different actors involved in the provision of services at local level towards better forms of governance, more effective and more accountable to those in need.²⁷¹ This in turn has helped the civil society organizations engaged in these initiatives gain legitimacy in debates on national slum sanitation policy.²⁷² CLIFF is also a way for donors to coordinate their actions and make aid delivery more ‘transparent and collectively effective’ in recognition of the harmonization principle of the Paris Declaration.²⁷³ Their support is aligned along the priorities identified by the local organizations who themselves design the projects and apply for their funding. The UN Millennium Project Task Force on Improving the Lives of Slum Dwellers describes CLIFF as an ‘important innovation [that] demonstrates how official donor agencies can support community processes and leverage local resources’.²⁷⁴ But this is an isolated example. There is not much evidence of comparable mechanisms being developed elsewhere. The importance of official donors developing channels such as these to support local organizations and local partnerships for the achievement of the MDGs is not getting the attention it deserves. There is too little discussion in development assistance on how the official bilateral aid agencies and development banks can develop funding structures able to support the choices and priorities made by local organizations, formal and informal, in which poorer groups have influence.

Most official donors do have some facilities to provide financial support for local initiatives – what are in effect small grants funds. But most have a very limited capacity to identify and then

provide appropriate support to a large number of initiatives, especially those in locations far from major cities and main roads. Most provide one-off grants, with little capacity to support the local processes these help fund. One important issue is how these can be better used.

An important part of getting action on water and sanitation in small urban centres is generating innovations that then encourage and support innovation, experimentation and investment in other small urban centres. All low- and middle-income nations need support for this. As this book makes clear, the innovations needed are not so much around technologies as around innovations that reduce unit costs and rethink how responsibilities for installation, maintenance and cost recovery are shared between households, community organizations, local governments and local water and sanitation service providers. It is also important for innovations to be developed locally – not by external agencies promoting only the innovations that their experts consider appropriate. Donor funding should be not so much one-off grants for small projects as support for a process by which many local initiatives and innovations are supported, including those by community organizations, private enterprises, local NGOs and local governments. This should include support for

documenting and disseminating these experiences in-country – to other community organizations, private enterprises, local NGOs and local governments – and support for other groups from that country visiting these innovations and discussing them with those who were responsible for them. In effect, what this is doing is recognizing that most policy innovations for improving provision for basic needs are driven by local innovation and precedent that show more effective approaches. As each particular innovation is viewed, discussed and visited by the very people that could implement a comparable innovation in their own small urban centre, so the possibility for ‘up-scaling’ is achieved – but through a multiplication of local initiatives rather than an expansion of a single initiative. Because it is potential local implementers learning direct from local implementers, the likelihood of inappropriate attempts at replication is much reduced. However, the means by which official donors can do this will not conform to current ‘conventional wisdom’ in regard to efficiency – it will not spend huge sums of money (it should strive to support approaches that limit or even eliminate the need for donor funding), it will allow mistakes to be made (and to be learned from), and it may require considerable staff time (unless the work is contracted out).

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- 97 The OECD DAC defines aid to water supply and sanitation as including the following sub-categories: water resources policy and administrative management; water resources protection; water supply and sanitation (large systems); water supply and sanitation (small systems); river development; waste management and disposal; and education and training in water supply and sanitation. It should be noted that the OECD databases do not capture off-budget sheet commitments from donor agencies to the water sector, such as guarantee schemes, and do not account for aid to water supply and sanitation extended within multisector programmes or delivered through NGOs.
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- 99 Cardone, R. (2005) 'Analysis of donor flows to water supply and sanitation services', draft paper prepared for UN-HABITAT, *Getting Water and Sanitation in Small Towns*, Nairobi, pp1–3.
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- 124 Cardone, 2005, op. cit., p.1.
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- 250 See Piron, L.-H. with Evans, A. (2004) *Politics and the PRSP Approach: Synthesis Paper*, ODI Working Paper 237, March, Overseas Development Institute, London.
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- 264 Slaymaker et al, 2004, op. cit.
- 265 See DFID (2005) 'Update on DFID's work in water and sanitation since the Water Action Plan', August, <http://www.dfid.gov.uk/pubs/files/update-water-sanitation.pdf>
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- 268 CLIFF funds are provided by DFID (over UK£6.8 million) and SIDA (approximately UK£1.5 million). Homeless International UK coordinates CLIFF at the international level and contributes finance from its Guarantee Fund, which is totalling over UK£0.5 million at present. These funds flow through the World Bank and the Cities Alliance group, which administers CLIFF on behalf of the bilateral donors.
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INTEGRATED WATER RESOURCES MANAGEMENT AND THE PROVISION OF WATER SUPPLY AND SANITATION IN SMALL URBAN CENTRES¹



INTRODUCTION

All urban centres need a regular supply of good quality raw water for the provision of water supply and the means to dispose of waste-water. In recent years, there has been a growing recognition of the need to fit provision for water supply and sanitation within a framework that considers the needs and demands of all water-using sectors and ecological processes. Doing so is usually termed integrated water resources management (IWRM) and this is usually done within a water drainage basin unit.

However, to date, too little attention has been given to the linkages between IWRM and urban water and sanitation services. While many of the tools and mechanisms relevant to an IWRM approach have been discussed in relation to urban areas, such as urban water demand management, water treatment and sewage effluent standards – and also the broader changes that affect water governance, such as privatization and decentralization – only rarely have these been analysed within the specific context of IWRM. In addition, much of the literature in IWRM does not address domestic water and sanitation concerns in any detail. At the same time, much of the literature on urban water and sanitation makes little reference to IWRM – as if

where the water came from and where the waste-water goes were not its concerns. Where the wider water resources theme has been addressed, the discussion has tended to focus on the narrow context of the supply of water and discharge of sewage, to the neglect of issues such as institutional design, decision-making scale, governance and implementation practice.²

This chapter explores IWRM and its relation to improving provision for water and sanitation in small urban centres. It considers the linkages between water supply, waste-water and sewage disposal and the resources in the wider water drainage basin or catchment sub-unit. These linkages are two-directional: even small urban centres have the potential to affect the quality and/or quantity of water resources available to other users (including other urban centres), while other uses and practices in a drainage basin may affect the quality and/or quantity of water upon which a small urban centre depends for domestic water and sanitation provision. The chapter discusses some of the ways in which these issues are being resolved within an integrated water resources framework. It also describes some innovative experiences, considering their strengths and limitations, as well as their implications for service provision to lower income groups. It should also be emphasized that IWRM is always influenced by the political context in which it is

situated, and its tools and methods cannot do much good if this context favours more powerful interests and marginalizes the interests of other water users, especially low-income groups.

IWRM has become a familiar term in the water sector, and its broad principles are increasingly influencing water resources policy and legislation. Broadly speaking, IWRM responds to changes in one part of the water system that affect other parts, and which are not necessarily addressed by private property rights or government agencies.³ It helps bring together concerns for hydraulic infrastructure and for water resources management systems, which have traditionally been developed for each water-related sector independently, with no or little coordination between sectors.⁴ IWRM thus takes into account all aspects of water resources development, management and use, with a view to maximizing and reconciling the *economic*, *social* and *environmental* benefits of water use.⁵

In this way, IWRM promotes the integration of land and water management and the joint consideration and management of all waters and aquatic environments (surface water, groundwater and coastal environments). It considers different water uses and users in conjunction, rather than separating them into distinct sectors such as irrigation, urban water and sanitation, hydroelectric power and industrial water use. This in turn calls for a particular focus on upstream–downstream dynamics, as well as adopting more extensive physical, temporal and administrative boundaries than those used in more conventional water project management: river basin⁶ or smaller watershed/catchments (the area downstream of a certain point in a drainage basin that receives water from the same source). This requires longer term time-frames than political processes so that these better coincide with the operation of the hydrological cycle and other ecological processes rather than electoral terms, and wider governance structures to encompass a broader range of actors that include water users as well as non-users.⁷ IWRM therefore entails a shift from the

standard hydrological cycle, whereby physical water resources are continuously recycled through the environment, to what has been termed the ‘hydrosocial’ cycle⁸, which refers to the human aspects of water resources manipulation, through hydraulic infrastructure, water use for economic activities, modes of management and governance structures. This better enables water resources to be considered as a whole, including the linkages between each sector, in terms of both conflicts between different sectors over water and the opportunities for sharing and reusing water resources, and the necessary governance structures to achieve the objectives of IWRM.⁹

IWRM emerged in part as a response to the 1992 Dublin Principles¹⁰, which, in summarized form, state that:

- Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment... effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems.
- Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels.
- Women play a central part in the provision, management and safeguarding of water.
- Water has an economic value in all its competing uses and should be recognized as an economic good... Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources.

Therefore, the overall goal of IWRM is to strengthen water governance frameworks, and in so doing, improve the development, management and use of water. Substantial emphasis is also placed on public participation, especially from women and low-income groups.¹¹ In this regard,

it is important not to focus solely on water users, but also on other actors with an interest in drainage basin development. A more integrated water governance framework does not necessarily indicate the need for a centralized water resources ministry (as opposed to separate departments dealing with irrigation, urban water supply and hydropower, for instance), but an ability to plan, manage and use water in conjunction and in synergy where possible and minimize conflicts among competing uses and users.¹²

IWRM may be considered as a response to growing water scarcity or a water 'crisis' – but this should not be a unique driver for IWRM, since it is also applicable to places where water is not scarce. Indeed, the tendency to confuse physical (or 'first order') scarcity, arising from geoclimatic conditions, and produced (or 'second order') scarcity, arising through modes of water management that have little to do with natural conditions even in physically arid areas, is commonplace.¹³ Furthermore, the often assumed relationship between water scarcity and deficient provision is often tenuous.¹⁴

A range of different tools have been put forward to help achieve the objectives of IWRM. These include different mechanisms (for example, markets), institutions (for example, river basin committees) and regulations (for example, pollution standards).¹⁵ Within these, other aspects are also important, including the scale at which decision making is structured, governance frameworks and implementation practice. The focus here is not solely on whether IWRM is implemented and with what mechanisms, but whether the chosen mechanisms are implemented in ways that are effective and compatible with the objectives of IWRM. For instance, decision making at the lowest appropriate scale is preferable, and decentralization has often been implemented for this purpose, but this will only be effective when accompanied by adequate financial resources, strong local capacity and an appropriate wider governance framework. Similarly, the creation of a river basin committee will not necessarily lead to better basin management if it does not contain

trained staff, or fails to include participation from all types of social actor in the watershed, thus running the risk of becoming monopolized by the interests of more powerful groups.¹⁶

In particular, it is important not to lose sight of the three-dimensional goals of IWRM, that is, to foster *economic, social and environmental* benefits. This calls for decisions to be based on a consideration of the economic, social and environmental costs and benefits, rather than in accordance with private or sectoral interests or through mechanisms that focus on only one of these objectives, often economic benefits. This is not easily achieved, given the very large differences in the power of different water users.¹⁷

The extent of implementation of IWRM in Africa, Asia and Latin America is difficult to determine. Nevertheless, it forms a central part of the strategies of both the World Bank¹⁸ and some other external agencies, such as the Inter-American Development Bank (IADB).¹⁹ The World Summit on Sustainable Development held in Johannesburg in 2002 called for the implementation of IWRM and water efficiency plans.²⁰ In addition, many initiatives can be identified that adhere to at least some of the principles of IWRM, such as river basin committees, water markets and water reuse between different sectors. Some of these strategies are presented after the next section, which discusses issues surrounding IWRM and small urban centres.



IWRM AND SMALL URBAN CENTRES

Water supply and sanitation in small urban areas, as elsewhere, should be planned in an integrated and coordinated way. IWRM is a way of thinking about actions that affect water use that asks what others are doing or planning to do that could affect what is being done to provide water and sanitation services for the urban centre under consideration. It also questions how what is being done for water and sanitation could affect other measures within and outside the urban area. There are many different boundaries for thinking

about or applying the principles of IWRM. In regard to water and sanitation in small urban areas, using an IWRM approach calls for ensuring that if a certain quantity of water is brought into the urban area, adequate provision is made for the collection and safe disposal of the water after it has been used and turned into waste-water. Although this is obvious, initiatives to improve urban water supplies often have no provision for waste-water management, which produces problems such as overflowing pit latrines (which cannot cope with the much-increased volume of waste-water), building foundations damaged by waste-water and waste-water pools often contaminated with faecal matter.

Where this simple principle has not been followed, there have been some serious consequences. For example, in some small urban centres in Yemen, where there are some of the earliest sky scrapers built of sun-dried mud bricks (that can be up to 13 storeys high), the structural integrity of some buildings was undermined because when improved water supply was introduced, the then existing method of sullage disposal through soakaway pits was not changed. These pits could not handle the increased waste-water flows and some of the tall buildings had to be evacuated. When the residents saw the negative effect of the augmented water supply, they introduced piped systems of sullage collection and disposal.²¹

Another example of the consequences of lack of coordination between water supply and sanitation occurred in a number of large villages in Egypt located in the middle of irrigated farming areas. Chapter 2 noted that around a fifth of Egypt's population lives in large villages with urban characteristics. Here, augmented water supply led to the failure of the pit latrine systems they had in place for sullage disposal. These pits overflowed, causing environmental health hazards and aesthetic nuisance; in addition, the overflows from the pit latrines eventually reached the irrigation drainage canals, rendering the quality of the drainage canal water unsuitable for reuse.²²

Although potential conflicts between urban water needs and other needs are generally less in small urban centres than in major cities – both because of fewer people and enterprises and because average levels of consumption per person are lower – there are important governance issues in regard to the water needed and to the impact of waste-water on those living and working downstream. The taking of water for one group of users should not damage the interests of another group; the disposal of one centre's waste-water should not pollute other people's or community's water supply.

This also has to be done in a manner that reflects the interests and needs of poor communities. In South Africa, the National Water Act (1998) gives priority in the allocation of water to that required to provide basic domestic water supplies as well as to the water required to sustain the environment (on which the livelihoods of many low-income people depend). This too must be supported by ongoing management processes that translate the principles into practical action. These processes are best managed at a national or a river basin level where a small urban centre will be just one 'player' among many. There are no easy solutions. In this process, the challenge is to ensure a voice for the small urban centres and a voice for those who are ill-served or unserved with water and sanitation in what is often a complex technical discussion with many vested interests at work.²³

The tools of integrated water resource management such as the promotion of water conservation and demand management can also help to reduce the costs to small urban communities of meeting their water and sanitation needs.

Most small urban centres are located within agricultural areas; indeed a high proportion of them grew as markets and service centres for agriculture. This can mean a good potential synergy between waste-water management and providing farmers with nutrient-rich waste-waters. Most small urban centres also lack the industries whose waste-

Box 8.1 Inter-municipal initiative for IWRM in the Ayuquila river basin, Mexico

In the Ayuquila river basin in western Mexico, an innovative participatory multi-stakeholder programme aims to improve the management of urban and rural land and water resources, with a view to reconciling local economies and livelihoods with water resources and biodiversity protection.

The Ayuquila is one of the most important rivers in western Mexico. From source to mouth (at the Pacific Ocean), its course is 294 km long, and its basin covers an area of approximately 10,000 km² in the states of Jalisco and Colima. It also forms the northern limit of the Sierra de Manantlán Biosphere Reserve. The basin contains a number of municipalities with medium-sized urban centres and villages, some of which are prosperous, especially Autlán and El Grullo, while others are more deprived, such as Tuxcacuesco and Tolimán. Decentralization to the municipal level has been implemented, but largely without the necessary human and financial resources.

The water resources of the basin are used by a number of different sectors, including commercial (export) and subsistence agriculture, cattle ranching, fishing and aquaculture, industry and urban water supply and waste-water discharge. Irrigated agriculture is the largest water user, consuming up to 70 per cent of the river flow and up to 97 per cent during the dry season. The clearing of land for cattle ranching increases erosion and sediment in the river channel, affecting downstream water quality. The discharge of untreated sewage from the towns of Autlán and El Grullo, and industrial effluent from a sugar cane processing factory 15 km from Autlán, have resulted in the contamination of the river, while water diversions and storage for irrigation have reduced river flow, particularly in the dry season. Effluent from the sugar cane factory in particular had a negative impact on fish in the river, as the high content of organic material depleted oxygen levels, meaning that fish could not survive for 30 km downstream of the factory. This also affected local livelihoods that depended on fishing, and also the health of both local people

(gastrointestinal and skin disease) and livestock (death of unborn young). Low river flows exacerbated these effects because contaminants became more concentrated.

Three water management initiatives have been created in the river basin, at the regional, municipal and local levels. At the regional level, in 1998, the Ayuquila River Basin Commission was created. The commission includes staff of the National Water Commission, Jalisco and Colima State Governments and representatives of water user associations (agriculture, industry, ranching, fishing, urban water supply). However, the commission did not include the participation of other groups, such as civil society, municipalities, universities, other government agencies, the private sector and unorganized water users. Moreover, it only considered water 'users' but not 'producers', thus landowners in the upper basin were not included, despite the importance of upstream forest management. Via the federal government and state governments of Jalisco and Colima, the commission also created a River Basin Management Organization, comprising a team focusing on improving water planning, use and management. However, its future is uncertain due to the lack of secure federal funding. The commission and organization have played an important role in basin-wide management, including discussion between the two states of the construction of a fourth dam for irrigation, and the establishment of a minimum ecological flow.

While the commission focused on water use, an inter-municipal initiative created in 2001 also sought to address some of the needs of the social groups in the lower basin. This initiative includes ten municipalities (Autlán de Navarro, El Grullo, Unión de Tula, El Limón, Tonaya, Tuxcacuesco, Tolimán, Zapotitlán de Vadillo, Ejutla and Venustiano Carranza) and is supported by the Manantlán Biodiversity Foundation of Western Mexico, the Universities of Guadalajara and Bernes (Switzerland), the federal government and interna-

tional development assistance agencies. The principal aim is to strengthen municipal capacity for environmental management within a basin-wide framework, including solid waste management and water supply and sanitation. The priority is to improve waste-water and sewage disposal and treatment, and a waste-water quality study was undertaken to assist the planning of an appropriate waste-water treatment system for each municipality. At present, only Autlán de Navarro has a sewage treatment plant, and Unión de Tula is in the process of constructing one. El Grullo is in greatest need of a facility due to the size of its population, but it cannot afford a conventional plant and is considering other options.

At the local level, the effluent produced by the sugar cane factory was addressed by a multi-stakeholder group, comprising representatives of the factory, the National Water Commission, University of Guadalajara, Las Paredes communal landholding and associations of irrigators, sugar cane producers and rural farmers. As a result, the factory implemented various measures to control effluent and improve the efficiency of water use within the plant. For example, water used in different processes was discharged into irrigation channels either directly or via a sedimentation tank, instead of into the river, and saline groundwater extraction was substituted with irrigation water use, which it recycles back into the irrigation channels. These measures have reduced the amount of organic material discharged into the river, with positive consequences for fish stocks and the livelihoods of riparian communities.

In line with the mechanisms for enhanced participation introduced by the new 2004 Mexican Water Law, these initiatives represent a process that entails the participation of different institutions and social groups around a common, long-term goal, through the merging of scientific information, government management, educational activities and concrete actions to improve environmental management and social welfare in the river basin.

Sources: Martínez, L. M., Santana, E., García, S., Graf, S. and Rodríguez, A. (2005) unpublished report (in Spanish), University of Guadalajara, Manantlán Biodiversity Foundation of Western Mexico and Sierra de Manantlán Biosphere Reserve, November; Trinidad, A. (2005) 'Autlán, Mexico: Ecological management of the Ayuquila watershed', *Innovating Cities Across the World*, proceedings of the International Platform on Sustainable Urban Development, Geneva, 11–13 October, pp6–7; DERN-IMBECIO, DRBSM/CONANP and LaSUR-EPEL (2003) 'Global change, urbanization and natural resource management in Western Mexico', *ETFRN News*, European Tropical Forestry Research Network, the Netherlands; Cardenas, O. and Martínez, L. (no date) 'A GIS-based approach for participatory decision making in Mexico: A case study in the Sierra de Manantlán biosphere reserve', *GIS Development*, www.gisdevelopment.net, accessed 3 November 2005; University of Wisconsin-Madison (no date) 'Rio Ayuquila', Gaylord Nelson Institute for Environmental Studies, www.ies.wisc.edu, accessed 3 November 2005; and Ayuquila River Basin initiative website, www.ayuquila.com, accessed 3 November 2005.

waters can make waste-water flows unfit for reuse in agriculture. In addition, farmers often use waste-water flows because these are

cheaper – for instance this allows them to avoid the cost of pumping groundwater.²⁴ There are also a range of relatively simple waste-water

treatment options that are well suited to small urban centres, especially those where land costs are not too high as many of the simpler, cheaper systems such as waste stabilization ponds and constructed wetlands are relatively land intensive.²⁵ But maximizing the benefits from waste-water reuse in agriculture and minimizing the costs – for instance the health risks to the farmers as well as to those who consume the produce – needs good governance.²⁶

Box 8.1 illustrates the relevance of IWRM for small urban centres and also the difficulties it faces in addressing all needs and reconciling different interests. In the Ayuquila river basin in Mexico, water resources are used by commercial (export) and subsistence agriculture, cattle ranching, fishing and aquaculture, industry and urban areas. Different users influence the quality and quantity of water available for other users – for instance the clearing of land for cattle ranching is widely believed to increase erosion and sediment in the river channel, affecting downstream water quality. The discharge of untreated sewage from urban centres and a sugar cane processing factory contaminate the river. The factory effluent in particular affects fish populations and thus local livelihoods that depend on fishing. It also affects the health of both local people (gastrointestinal and skin disease) and livestock. Water diversions and storage for irrigation have reduced river flow, particularly in the dry season.

An inter-municipal initiative involving ten municipalities started in 2001, in part to address needs not being considered by the river basin commission. This initiative seeks to strengthen municipal capacity for environmental management within a basin-wide framework, including solid waste management and water supply and sanitation. The priority is to improve waste-water and sewage disposal and treatment, which has obvious implications for other water users downstream of each municipality. At present, only one urban centre has a sewage treatment plant with another being constructed. One of the

most populous urban centres is in greatest need of a facility due to the size of its population, but it cannot afford a conventional plant and is considering other options. Meanwhile, a multi-stakeholder group with representatives of the factory, the National Water Commission, the University of Guadalajara, Las Paredes communal landholding and associations of irrigators, sugar cane producers and rural farmers negotiated with the factory to implement various measures to control effluent and improve the efficiency of water use within the plant. These measures have reduced the amount of organic material discharged into the river, with positive consequences for fish stocks and the livelihoods of riparian communities.

This shows how an IWRM perspective implies the need to consider the synergies and conflicts between different water uses and sectors within a drainage basin or catchment. Considering urban water and sanitation within an IWRM framework entails focusing on the economic, social and environmental aspects of urban water supply within a wider water resources framework. The principal foci are raw water for urban water supply and the discharge of waste-water and sewage.²⁷ Yet, IWRM is also concerned with the linkages between urban water supply and water using activities beyond the urban area such as rural water supply and agriculture.²⁸ The urban component of IWRM has also been referred to as integrated urban water management (IUWM),²⁹ the principal components of which are:

- equitable access to water resources through participatory and transparent management, including support for effective water user associations, involvement of marginalized groups, and consideration of gender issues;
- improved policy, regulatory and institutional frameworks, such as water quality standards, and pollution control;
- inter-sectoral approach to decision making for water development, management and

- use;
- supply optimization, including assessments of surface and groundwater supplies, non-conventional supplies such as rainwater harvesting, water balances, waste-water recycling, water conservation where possible, and capitalizing on potential synergies with other sectors, including developing water supply schemes that provide people with water for domestic *and* productive uses;³⁰
- demand management, including water use efficiency technologies, cost-recovery policies and decentralized water management.

Urban centres also require water and discharge wastes for activities other than domestic water and sanitation provision (defined here to include workplaces, schools and hospitals), such as urban agriculture, formal and small-scale industry, recreation and culture, however, these will not be discussed here.

The first point to emphasize is that, in comparison with agriculture and industry, urban water and sanitation is generally a low-volume water use. In many countries, especially those where agriculture still employs a significant proportion of the workforce and generates a significant proportion of the GDP, agriculture is the largest water user, accounting for up to 80 per cent of all water use.³¹ In some countries, such as some North African nations, the growth in irrigated agriculture (often for the export market) has increased the share of water being used by agriculture. This illustrates why care should be exercised when dealing with assertions that physical water scarcity is a limitation to the provision of water and sanitation services to urban centres, in particular to low-income groups. Previous research has shown that there is often no direct relationship between physical hydrological conditions and the availability of water for urban provision.³² One of the key challenges for IWRM is how to expand and improve provision of water supply and sanitation

in the high proportion of small urban centres where services are so deficient. The first report on *Water and Sanitation in the World's Cities* explored IWRM and urban areas, and its application to low-income cities and neighbourhoods, focusing on a shift from supply-led to demand-centred strategies, including urban (water) demand management, a demand-responsive approach to improving and extending provision to low-income groups.³³ This section briefly considers the application of urban water demand management to small urban centres.

An urban centre's need for raw water resources for water supply, and its need to discharge waste-water and sewage, may conflict with other existing water users in the drainage basin, especially if they perceive themselves as being affected by new or expanded water use by urban users. The linkages between raw water for urban water supply and the discharge of waste-water and sewage from urban areas and the wider water resources in a drainage basin are often characterized by an upstream–downstream relationship. Activities upstream of the urban area may affect the quality and quantity of fresh water upon which the settlement draws for domestic provision. The urban area also has the potential to affect downstream users (including other urban centres) and the aquatic environment through the same activities and effects outlined above. The effects produced would depend on a number of factors, including the size of the urban centre, its levels of water consumption, its provision for waste-water and sewage treatment and its predominant economic activities. More specifically, four principal types of relationship can be identified:³⁴

- 1 Urban → upstream, whereby the demand for urban water flow causes changes to the upstream flow of water. This may arise from the construction of large-scale infrastructure, such as a dam, that reduces or otherwise alters (for example, seasonally) the flow of water downstream, especially when reservoirs are being filled (this is a

frequent source of conflict between hydro-electric companies and farmers). Indeed, the use of water for electricity production, principally for industrial and urban areas, forms an important linkage between these sectors.³⁵ In many cities, urban water demand has led to the exploitation of water sources that are increasingly further upstream, or further afield, including in other watersheds.³⁶

- 2 Upstream → urban, whereby the use of land and water upstream affects the quality and/or quantity of water available to downstream urban centres for water supply. This may occur, for instance, as a result of large-scale extractive uses (for example, irrigated agriculture, mining, water-intensive industries such as steel) that reduce the supply of surface water or groundwater to a downstream settlement. Upstream land-use practices that lead to soil erosion, especially deforestation, but also certain agricultural practices, are commonly thought to increase the proportion of sediment in raw water. In addition, water contamination often results from upstream activities, including contamination by fertilizers, pesticides and livestock wastes from agriculture and by industrial effluents. Both increased sediment and contamination increase the water purification process and its cost.
- 3 Urban → downstream, whereby urban areas affect the quality and/or quantity of water in downstream areas (including coastal areas), through changes in land use and cover, and use of water. The most important of these changes is the discharge of inadequately treated or untreated sewage, which can have a variety of effects for downstream populations and environments, including diarrhoeal disease among water users, shellfish contamination and the development of algae blooms that starve aquatic life of oxygen and sunlight. Again, these problems complicate water

purification for downstream settlements and may be felt disproportionately in coastal areas, especially where these lie downstream of a number of urban centres. Also, urban-based formal or informal industries may contaminate water flowing downstream, through insufficiently treated effluents or the unregulated use of particularly dangerous chemicals, as in the cases of leather tanning and gold panning. Another effect comes from the changes in land cover in urbanized areas, whereby the replacement of vegetated or bare land cover with concrete and asphalt can exacerbate flooding under certain circumstances.

- 4 Urban in situ, whereby urban areas affect the quality and/or quantity of water that also constitutes a source of their urban water supply. This can occur when urban activities lead to the contamination of lakes or reservoirs from which they also draw raw water. This is a growing problem for some cities, where areas from which water is sourced for urban supply are on the city periphery, with settlement and often new industry developing without adequate water and sanitation infrastructure. Similarly, groundwater resources may also become contaminated, especially through faecal matter where urban sanitation is inadequate (and especially where the water table is high) or where industries are disposing of wastes into wells. Groundwater contamination or overexploitation have also often required cities to look for additional sources of drinking water elsewhere.³⁷

However, the upstream–downstream effects are rarely simple cause–effect relationships. First, it is difficult to artificially separate ‘humans’ and ‘nature’ into distinct realms, not only due to the interrelatedness of social–nature interaction, but also the fact that nature has so long been modified by people that it is difficult to describe

any nature as purely 'natural'.³⁸ Second, the widespread tendency to identify simple and direct (linear) cause–effect relationships between social and natural phenomena is problematic on a number of levels. The accuracy of assumptions about, for instance, the relationships between deforestation and soil erosion, or between population increase and resource depletion, is increasingly being challenged, especially when other possible factors, in particular non-local influences, are ignored.³⁹ On one level, there is often little good scientific evidence in support of these relationships and this is often compounded by inadequate measurement techniques. Different studies often lead to inconclusive or even contradictory evidence. For example, a review of the linkages between forests and environmental benefits (maintenance of water flows during the dry season, the control of flooding, erosion and sedimentation, and maintenance of aquatic habitats) found that there was often little evidence to support claims of direct relationships, and many of the unclear and conflicting field results were attributed as much to the strong role of local conditions and other factors as the supposed relationship itself. Similarly, empirical studies on the relationship between forests and the maintenance of dry season flows found evidence to support the opposing theories that forests increased water flows by absorbing moisture and releasing it gradually in dryer periods, and also that forests reduced water flows by losing moisture through evapotranspiration.⁴⁰ On another level, many environmental processes have been observed not to follow regular or predictable behaviour, and many are also not yet well understood by science, making it difficult to support arguments that certain activities cause certain impacts.⁴¹ This is particularly true for the area of groundwater processes, many of which are still not well understood by hydrogeologists, which makes estimations difficult even in the unusual case that very good quality physical data is available. This area of research is also increasingly calling into question the validity of the scientific

methods used to measure environmental phenomena.

Furthermore, in some cases there may be a fine line between the same phenomenon causing a negative or a positive impact. For example, untreated (especially if concentrated) sewage may cause problems for farmers using water for irrigation, because of their exposure to disease-causing agents in the water and because their crops may become contaminated with faecal matter, thus posing health risks for consumers. In some countries, the direct reuse of sewage as agricultural fertilizer has been prohibited. However, if sewage is adequately treated, water containing sewage effluent may be beneficial to farmers because it contains more nutrients than non-effluent water, and reduces (and may eliminate) the need for artificial fertilizers. In one case, a group of farmers in Chile even launched a legal challenge to an urban water company that planned to relocate the discharge pipe of its sewage treatment plant *downstream* of an existing irrigation channel, meaning that they would no longer benefit from the effluent.⁴² Nevertheless, these examples illustrate the applicability of the broad objectives of IWRM between human settlements of all sizes within the same drainage unit (and, of course, between settlements) in order to minimize the possible negative effects both on their raw water supply, and on the supplies for downstream users. In the past, a non-integrated water management approach has placed more emphasis on finding technological solutions to these problems, such as constructing new infrastructure to exploit alternative (and sometimes more distant) water sources, despite the potential to cause water problems for other users and places.⁴³ With the shift towards a more integrated approach, non-infrastructure strategies are becoming more prevalent. These have taken different forms, including the sharing or recycling of water between different sectors, different allocation mechanisms including water rights and markets in water rights, the establishment of basin unit-wide organizations, as well as more innovative schemes such as increased

attention to the protection of water sources used for urban water supply, and payment by cities for the more effective management of upstream watersheds in order to secure reliable and good quality raw water.



IWRM STRATEGIES FOR SMALL URBAN CENTRES

This section focuses on six strategies used to reconcile urban water and sanitation provision and management with a wider integrated water resources management approach, and discusses their relevance to small urban centres. They are:

- 1 urban water demand management and inadequate water and sanitation provision;
- 2 inter-sectoral synergies and water-sharing practices;
- 3 water allocation mechanisms and water markets (when urban water supply depends on these);
- 4 drainage basin organizations and cooperation;
- 5 protection of urban water sources;
- 6 payment for watershed services.

Urban water demand management and inadequate water and sanitation provision

Water demand management (WDM) seeks to make water use more equitable, efficient and sustainable, with a particular focus on meeting demand by improving existing supplies, rather than developing new sources. In relation to the provision or improvement of water supply services in urban centres, it focuses on a more holistic set of measures to improve provision than supply-led provision. However, much of the literature focuses on WDM for relatively large and wealthy cities, such as in Australia and Singapore where the focus is to reduce water use and wastage in cities. Here, measures tend to focus on high specification infrastructure (namely, piped water with multi-tap connections), new water-saving technologies and

pricing incentives.⁴⁴ Water conservation measures can have the effect of greatly increasing water supplies where water usage is extravagant, but this is less applicable to the small urban centres that are the focus of this report, where the more pressing issue is the use of too little and/or poor quality water through inadequate provision of services.⁴⁵ Similarly, other WDM measures, such as reducing physical losses (leakage), increasing efficiency and improving revenue collection (often from charging higher income or institutional users prices that are not subsidized, but also from reducing the number of illegal connections) are also likely to be relevant to utilities in most cities in low- and middle-income nations but not to many small urban centres since they have fewer and a lower proportion of higher income and institutional users.⁴⁶ Limited technical and financial capacities also provide less means to increase water availability through more efficient use. Where much of the population rely on a range of alternative providers (such as a community-based scheme), there may be a limited capacity to involve these in a WDM programme. Thus, existing approaches to WDM in small urban centres in low- and middle-income nations are more likely to focus on addressing deficiencies in provision.

Nevertheless, demand management can be linked to a demand-responsive approach, which aims to tailor services to lower income groups' needs, priorities and capacities to pay. This is largely achieved through alternative technologies, pricing and management options, such as: free or subsidized standpipes, lower tariffs for low-volume consumers, subsidized connection costs, flexible payment options and community management. Some of these tools have been implemented in Zambia, as illustrated by Box 8.2. However, questions have arisen over the provision of free water in standpipes. On the one hand, service providers may regard these as a source of financial loss (in terms of equipment, frequent maintenance and unbilled water) and allegations are made that the free provision of water creates an incentive for wastage. On the

Box 8.2 The implementation of urban water demand management in Zambia

In Zambia, natural water scarcity and increasing demand for water suggest the need to improve the efficiency and sustainable use of existing water resources rather than focusing on developing new supplies to meet projected demand. To date, equitable access to water by all users, in particular poor urban men, women and children, has not been achieved, due to a combination of factors including lack of financial resources for infrastructure, competing demand from other sectors (for example, agriculture), and the contamination of water sources.

The institutional landscape for water in Zambia is complex. The Ministry of Energy and Water Development (through the Department of Water Affairs) is responsible for overall water resources management (planning, regulation and development), while the Ministry of Local Government and Housing is responsible for the delivery of water supply and sanitation services. The responsibilities and coordination of these two ministries had been unclear, thus creating operational overlaps and gaps. However, recent sectoral reforms in both the water resources and water supply sub-sectors have established clearer institutional structures from the national to the local levels.

Local authorities are obliged to provide water supply and sanitation services to the areas under their jurisdiction, and most have joined with other local authorities to establish commercial water utilities in Lusaka (population approximately one million) and other larger urban centres including Kafubu and Mulonga. The utilities are required to provide efficient and sustainable services, and are working to reduce high levels of leakage, unbilled water, illegal connections and customer wastage. Some water supply services are still managed by local authorities, which have generally not adopted WDM measures. In rural areas, services are managed at the village level with the participation

of user committees. A survey found that where community participation and management was strong, village water services were well maintained, water charges were collected effectively and water wastage was minimal, denoting effective WDM and a sense of community ownership leading to sustainable services.

Regulatory institutions comprise the Water Board for water resources, the Environmental Council of Zambia for water quality and pollution control, and the National Water Supply and Sanitation Council (NWASCO) for urban services. NWASCO has an important role in demand management because it requires water providers to reduce unaccounted for water, through ordering the repair of underground pipes, installing meters and introducing cost recovery through tariffs. In contrast, the Water Board has not yet adopted and implemented WDM through the policy that advocates integrated and sustainable water resources management and development.

Other sectors that use water in Zambia include industry (for example, sugar or cement), mining, agriculture and hydropower. To date, only a few private companies in the mining and agriculture sectors have implemented WDM measures by introducing water recycling and reuse. There is an urgent need for other industries and irrigators to adopt WDM, especially as they represent larger water users than urban utilities.

In addition, bilateral and multilateral institutions have been the main financers of water programmes and providers of technical assistance, while some academic institutions play a role in training personnel and designing awareness campaigns. NGOs and CBOs are also valuable partners in programme implementation in both the water supply and water resources initiatives, especially in education and public awareness, as in the case of WaterNet's Integrated Water Resource programme.

Therefore, the only actors comprehensively engaged in implementing WDM in Zambia are the commercial water utilities, overseen by the regulatory agencies. This is in part compounded by inadequate financial support and weak roles of other agencies in promoting WDM, despite its strong role in various national laws. The following measures were highlighted that could improve the implementation and effectiveness of WDM in Zambia:

- a clear understanding of the concept of WDM among water-related stakeholders, including the potential benefits (for example, financial) it may bring to different users;
- a clearer articulation of WDM in water legislation, especially for groundwater;
- adequate financial support for implementing WDM measures;
- training and capacity building for the implementation of WDM;
- promotion of linkages within and between water-using sectors, including collaboration in programme formulation and implementation, and strategy developments, largely led by the three regulatory agencies;
- development and provision of WDM tools, guidelines and programmes;
- improving provision among the village schemes, including the promotion of rooftop rainwater harvesting (as an alternative to unimproved sources), establishing women's committees, introducing new technological and management options, reducing water wastage (for example, by restricting times and volumes of water collected or using a water point attendant) and protecting water sources (for example, by prohibiting tree felling or cultivation around wells or securing the water point during restricted times).

Source: Nyambe, Imasiku (no date) *Institutional Implications, Issues and Necessities for Effective Water Demand Management in Zambia*, School of Mines, University of Zambia, Lusaka, Zambia.

other hand, they may be a key source of fairly safe and cheap water for a large share of an urban centre's population who may be unable to afford a higher level of service.⁴⁷ Experience suggests that improved provision must be carried out in conjunction with hygiene promotion and sanitation education activities to maximize the health benefits of improved provision. In this

way, water provision is improved with fewer resources than a conventional approach, while aiming for a service that will be sustained by the users, and also minimizing impacts, for instance from the inadequate disposal of human waste.⁴⁸

A similar demand-responsive approach can be applied to urban sanitation. This has largely focused on low-cost technologies, alongside

initiatives such as sanitation promotion and social marketing to stimulate demand. Unlike water, there is more potential for sanitation to be on site rather than networked, with water supply and sanitation decoupled,⁴⁹ although as Chapter 4 highlighted, condominal sewers are often more appropriate in small urban centres if there is the technical and managerial capacity to implement them. Chapter 4 also described how sanitation can be managed within smaller areas than is currently the case, such as by neighbourhood, which would provide a large enough scale to be financially viable but also small enough to be managed affordably under a community model or a utility–community partnership.

Inter-sectoral synergies and water-sharing practices

The implementation of water demand management between different sectors can be achieved by establishing synergies or resource-sharing practices. In this way, different sectors consider how they can coordinate their own water demands with those of other sectors, establishing dual use and recycling where possible. For example, there is great potential for farmers to irrigate with water that has already been used by domestic urban users or industry, so long as the effluent is adequately treated, because irrigation does not require water that has been purified to such high standards. Indeed, the additional nutrients from waste-water can be beneficial to farmers, as illustrated by the example of Chile given above. There are also possibilities for many industries that are large water users to draw on treated waste-water flows for some large water-using tasks – for instance for coolants. Similarly, when urban water supply is integrated into hydroelectric dam projects, the cost of drinking water treatment can be reduced when the extraction point is either in the dam reservoir or below the dam wall, because the sediment content will be much reduced. Given the small volume of water required for urban water supply, especially for smaller urban centres, this is unlikely to affect

the volumetric flow needed for hydropower generation.⁵⁰ It is important to remember, however, that synergies will not always be possible, depending on the nature, location and timing of water use among and between different sectors. Nevertheless, establishing synergies and water recycling between sectors is an area with good potential for more efficient, equitable and sustainable resource use within an IWRM framework.

Water allocation mechanisms and water markets

The allocation of water to different sectors and users, including setting aside water for ecological uses, is one of the most relevant mechanisms for IWRM. The way in which water is allocated can determine how much of the resource urban centres may extract, from which sources and under what conditions. It is also usual to have in place standards for the discharge of different types of both industrial and sewage effluents. The most widespread mechanism in most countries is government allocation, either by a central water resources agency, or by regional or local authorities.⁵¹ Government allocation is usually implemented through water abstraction permits or licences, according to a set of predefined sectoral uses such as irrigation, industry and water supply. The government determination of uses allows it to prioritize certain sectors (often potable water), favour particular users, such as a particularly important national industry or to foster social equity (among indigenous groups, for example), and to adjust water use according to the conditions of different regions. In this way, the government holds a privileged position by being able to plan and allocate water to different sectoral uses according to the country's economic and social development.

Following the definition of the Dublin Principles in 1992, the state role in water allocation came under increasing scrutiny. The principal criticisms levied include that the state has been inefficient in water allocation and management because it has followed political

priorities rather than economic logic. This is reflected, for example, in the preference for supply-led approaches adopted by many countries, often characterized by large-scale infrastructure works such as dams – and this is the type of approach that IWRM and WDM aim to overcome.

As a result, some countries have replaced state allocation with market-oriented mechanisms through water sector reforms. Two economic-based approaches have been put forward to replace the state-led approach: marginal cost pricing and water markets.⁵² Marginal cost pricing aims to increase the efficiency of water use by pricing water according to its true cost. This cost includes two aspects: the cost of the provision of the water (infrastructure, consumables, human resources and sometimes profit) and the opportunity cost of the water: that is, the cost that could be obtained by putting water to an alternative use. However, in practice this approach is impracticable, except, perhaps in the case of urban water supply. This is because the use of water by certain industries, and notably irrigated agriculture, is so voluminous that prices would be unrealistically high (even if they reflected real marginal costs) and would render these economic activities unviable. The application of cost-reflective pricing and full cost recovery to the urban water sector is an issue that has been much discussed, especially in relation to private sector participation (seeing as a private operator would have to cover all costs and generate excess revenue as profit). However, a broad consensus now exists that full cost recovery is not feasible for lower income groups, and such areas must be cross-subsidized by wealthier users, at least in the short term.

Water markets, however, introduce economic and market principles to water management but without drastic price increases, and have been implemented in a number of countries, including some of the western states of the United States for around a century, and more recently in Chile, Australia, Mexico and

South Africa. In addition, informal water markets operate in other countries, including Brazil, India and Sri Lanka. Water markets operate by allowing water entitlements (rights, permits or allocations) to be traded in order to achieve reallocation, based on the economic theory that water will be priced according to its scarcity value (the scarcer water becomes, the higher its price) and only users who really need water will purchase it from other users, thus leading to the allocation of water to the highest (economic) value uses.⁵³ One of the key motives behind the introduction of water markets is the rationalization of the irrigation sector, because it aims to make farmers use their existing water allocation more efficiently (through water-saving irrigation technologies, for example) in order to either extend irrigation or be able to sell any excess water to other users, or alternatively, pay for any additional water that they may require.

Water markets are relevant to urban water provision, including that to small urban centres, in two ways. First, reforms that centre on market-based approaches to water resources have been included in some sector reform packages that also include the privatization of the urban water sector. This was the case in Cochabamba (population approximately 500,000) in Bolivia, where a private water company was awarded a concession contract for the city's water and sewerage utility in 2000 and simultaneous exclusive rights to the region's (scarce) water resources. This exclusivity contract required all independent water providers, which had emerged because the existing utility failed to serve many areas, to come under the management of the private company, and the owners of all private wells (for small-scale peasant irrigation and drinking water) to pay fees for water extraction.⁵⁴ Second, water rights regimes can determine the allocation of water to urban uses, including those of small urban centres. Depending on the regulations and obligations of different water markets, they can also protect urban centres against negative impacts from upstream uses and prevent urban

settlements from causing downstream impacts. Box 8.3 describes the case of water rights and water markets in Chile in the context of IWRM and urban areas. Chile is a case that has attracted substantial attention due to the unusually liberal features of its water markets, and which has been widely recommended for replication in other countries, especially in Latin America.⁵⁵

Drainage basin organizations and cooperation

The establishment of drainage basin organizations comprising water users is another mechanism that has the potential to fulfil IWRM objectives, through the coordination of different users and uses. Some organizations were modelled on the Tennessee Valley Authority in the United States created in the 1940s, such as the Cauca Valley Corporation in Colombia.⁵⁶ As noted earlier, establishing a basin-wide organization does not necessarily imply putting in place a centralized management system. Indeed, the basin organization should work within existing political-administrative structures, rather than overriding them with a higher level of governance. In this regard, it is particularly important to involve municipalities, not only because they already play a major role in river basin development, but also because they represent decision making at the smallest traditional governance scale (as distinct from the regional and national levels). Therefore, the basin organization should assume only certain functions, in particular those that concern reconciling the economic, environmental and social aspects of water and natural resources management. In order to achieve this, it is also preferable to define the remit, role and responsibilities of the organization through legal statute.⁵⁷

Municipal governments have been important actors in many basin organization initiatives, including those in the Chicamocha basin in Colombia, where 74 municipal governments collaborated, and the Ayuquila river basin in Mexico, as illustrated in Box 8.1. The Ayuquila

River Basin Commission is an example of how stakeholder negotiation has worked towards mitigating the upstream–downstream impacts of water use, in terms of both quality and quantity. In particular, the commission shows how a basin-wide organization can work towards reconciling the economic, environmental and social dimensions of water management and basin development that are compatible with an IWRM approach. The commission includes representatives of a wide range of social actors, including different water users, the natural reserve, different levels of government, civil society and external agencies. It is also important to note, however, that some actors, including small-scale independent fishing enterprises, are not involved in the commission, and the inclusion of actors such as these remains a future challenge for the institution.

In some other cases, payment and/or market mechanisms have been introduced into existing collaborative institutions. These include the Cauca Valley, where larger farmers belonging to the Cauca Valley Corporation collect additional voluntary fees in order to invest in better watershed management, as discussed in more detail in the section below on markets in watershed services.⁵⁸ India has extensive experience with participatory watershed management, and in some watersheds tradable water rights have been introduced to support cooperation between different water users.⁵⁹ Indeed, it has been suggested that market initiatives may serve to strengthen existing non-market institutions. This may be the case where payment and/or trading schemes enhance existing initiatives, especially with larger and more complex undertakings, or provide funding mechanisms that have helped to sustain existing institutions.⁶⁰

■ Protection of urban water sources

In recent years, two types of initiative have emerged in which urban centres have assumed a greater role in the management of the upstream watersheds from which they draw water for urban water supply. The first is the protection of water sources, often through the establishment

Box 8.3 Markets in tradable water rights in Chile

In Chile, water rights have existed since colonial times but were converted into secure private property rights under the country's 1981 Water Code. The motives behind the adoption of this policy were jointly political and economic. Politically, the military government under General Pinochet (1973–1990) sought to replace the statist reforms instituted by his predecessor, President Allende (1970–1973), with radically neoliberal policies. An important part of this project was the economic revitalization of Chile through the opening of export markets, which relied upon natural resource sectors including agriculture, mining and forestry, all of which depended heavily on water. Under the 1981 law, water rights can be obtained in three ways: by formalizing 'historic' rights that were in use before 1981, by requesting new rights from the state, which are granted free of charge if the resource is available, or by purchasing rights from another rights-holder. Water rights are separate from land and are secure private property guaranteed by the state. This means that water rights can be privately traded between willing buyers and sellers, they can only be expropriated by the state with payment at the full market value, and they are legally protected against violations by other water users. Any violations, however, have to be resolved in the private civil courts. Until recently, water rights were not regulated, except through the civil legal system, but were administered by a government water authority, the National Water Directorate. However, in an amendment to the Water Code in 2005, the Water Directorate gained greater regulatory powers.

The water markets system was envisaged to increase the efficiency of water use and allow sectors that needed additional water to purchase water from sectors that could economize water. Although most transfers in Chile to date have been within the agriculture sector, much attention has been paid to transfers from the agriculture sector to the urban sector. In the case of the Maipo Valley in central Chile, the water company for Santiago has purchased a number of water rights from farmers. These purchases are often attributed to

the company wishing to acquire water rights for future urban/population expansion, and in this case, the transfer of water from one sector to another via a purchase transaction that avoids bureaucracy. However, the water company owns enough water rights to supply up to 80 million people, whereas the current population of Santiago is only five million. Water companies' interest in water rights can instead be attributed to economic investment in water rights themselves. Given that water rights are constantly rising in price, especially in the arid areas of central and northern Chile, they are becoming one of the core businesses of the water company, and allegedly even more profitable than urban water supply. However, it is worth noting that throughout Chile, many farmers have been reluctant to sell water rights, even if they do not use all their water. This is attributed to the need for extra water for dry periods and cultural barriers to selling water.

In relation to small urban centres, the situation with water rights can follow two scenarios. The majority of urban centres are served by regional water utilities, most of which have been privatized. Under the Water Code, only formal urban providers defined as 'utilities' need legal water rights in order to extract water for water supply. Non-utility providers, including the rural water supply committees and cooperatives that operate in many villages (usually formally and with state support) do not need legal rights (nor do households who use water for drinking and watering animals). While utilities are able to defend their water rights against violations by other users (in terms of both quality and quantity), the reverse is true for the rural water supply organizations, potentially placing them in a more vulnerable position if changes to the water system occur.

Water markets have often been praised for their compatibility with both IWRM and WDM. However, both of these assertions are challenged to some extent by the Chilean experience. In terms of efficiency, some evidence from Chile suggests that little water is being reallocated within the market. The number of water market transactions in most

basins of Chile, even in the arid north, is very low. While some have suggested that this indicates the initial optimal allocation of water rights, it has also been observed that while surface water markets were stagnant, requests for unallocated groundwater resources increased rapidly. Even the full allocation of groundwater rights in some areas has not led to the purchase of rights from existing owners, but rather the illegal use of wells, thus challenging the idea that water markets foster demand-led as opposed to supply-led development.

The potential for social inequality arising from water markets has been a concern in Chile. In general, less powerful water users have had less access to formalized or new water rights due to a lack of awareness of the requirements of the law and financial resources to submit the application. Such groups have often not contested water violations in the private courts. Some evidence suggests that commercial farmers have bought up the rights of peasant farmers, although many farmers do not contemplate selling, and much controversy has arisen over the purchase of water rights from indigenous groups by mining companies in northern Chile. In addition, all rights-holders in a hydrological basin or sub-basin are required to form a water users association, known as a vigilance committee. The role of the committee is to act as a local level regulator to ensure that rights-holders are using water in accordance with their water rights. However, voting rights are proportional to water rights holdings, and some committees are dominated by larger scale agricultural and industrial users (for example, mining), with smaller scale users, such as peasant farmers, having little voice or influence in decision making.

In terms of sustainable water use and environmental impacts, Chile's Water Code has been criticized for its inadequate environmental measures. The law is vague on pollution standards and the Water Directorate has been unable to curb groundwater overexploitation. Furthermore, attempts to retrospectively establish minimum ecological flows in rivers have failed due to conflicts with economic interests.

Sources: Bauer, C. (1997) 'Bringing water markets down to earth: The political economy of water rights in Chile, 1976–95', *World Development*, vol. 25, no. 5, pp639–656; Budds, J. (2004) 'Power, nature and neoliberalism: The political ecology of water in Chile', *Singapore Journal of Tropical Geography*, vol. 25, no. 3, pp322–342; Hearne, R. and Easter, K.W. (1997) 'The economic and financial gains from water markets in Chile', *Agricultural Economics*, vol. 15, no. 3, pp187–199; Romano, D. and Leporati, M. (2002) 'The distributive impact of the water market in Chile: A case study in Limari Province, 1981–1997', *Quarterly Journal of International Agriculture*, vol. 41, nos 1–2, pp41–58; Rosegrant, M. and Binswanger, H. (1994) 'Markets in tradable water rights: Potential for efficiency gains in developing-country water-resource allocation', *World Development*, vol. 22, no. 11, pp1613–1625; Rios, M. and Quiroz, J. (1995) *The Market for Water Rights in Chile: Major Issues*, World Bank Technical Paper no. 285, World Bank, Washington DC

of conservation areas, while the second is the creation of markets in 'watershed services' in some places, whereby downstream actors make payments to upstream users to undertake better watershed management in order to improve the quality and/or quantity of water flowing downstream.

Protecting water sources has become a particular issue in some larger cities, especially where settlement has expanded outwards and into areas from which water is sourced for urban supply.⁶¹ Such settlement often occurs in the absence of adequate water and sanitation infrastructure, as in the case of Cancún.⁶² Similarly, in the São Paulo Metropolitan Area, untreated sewage from informal settlements led to the eutrophication of one of the city's water supply reservoirs, compromising its use for drinking water. This problem was exacerbated by planning regulations that prohibited the installation of sanitation infrastructure in these settlements, precisely because they were located within the catchment of the reservoir.⁶³ Settlement in the absence of adequate sanitation is also a problem when groundwater resources are used for urban supply, because the aquifer may become contaminated with faecal matter, especially where the water table is high. Furthermore, many cases have been documented in which groundwater resources on which urban centres rely have been overexploited, although often other sectors, such as industry, have contributed to this.⁶⁴

In some urban centres, measures have been taken to protect the area in which the water source is located, in order to secure water supply, but most of the cases documented have been major cities, including remedial measures implemented in the case of São Paulo.⁶⁵ The principal measure taken to protect water sources is the establishment of protected areas. One example of this is the safeguarding of water supplies for Lima and Callao in Peru through the establishment of a natural reserve on a 28 kilometre stretch of the Rimac river; this has allowed various measures to reduce its pollution

through, for instance, river bank restoration and reforestation. It has also allowed other objectives including biodiversity preservation, recreation/tourism and environmental education.⁶⁶ Similarly, national forests have been created to protect the sources of rivers from which water supply is drawn for Caracas and for a range of smaller urban centres in Venezuela – although in the case of Caracas, despite these long-standing protection measures, water supply has been unable to keep pace with growing demand, which is attributed to poor management alongside physical supply issues.⁶⁷ This illustrates that measures to secure water supplies for urban services can be effective, but that good management systems are also essential.

The establishment of protected areas can be contentious, especially when preservation is likely to conflict with other uses of water for economic activities, such as agriculture or pastoralism.⁶⁸ Also, many areas earmarked for preservation may already be settled (sometimes by native peoples) and measures may be put forward to displace these groups. While some conservation measures may be implemented for urban areas without protected water sources, only limited measures may be possible in some cases, especially when urban areas are downstream of other urban areas or major water users. Here, alternative mechanisms have been implemented in some places, including collaborative watershed management and markets in watershed services.

Payment for watershed services

Watershed services can be defined as the 'natural' benefits that watersheds provide, in terms of quality, quantity and regularity of water flow. Markets in environmental services, which include watershed services as well as other ecological functions such as carbon sequestration, biodiversity preservation and landscape beauty, have arisen in some cases as a response to negative externalities from the use of resources by some users (providers) on other

Box 8.4 Payment for watershed protection in the Piracicaba, Capivari and Jundiá river basins, Brazil

In the Piracicaba, Capivari and Jundiá (PCJ) river basins in São Paulo State, a reduction in water quantity and quality had been experienced by water users. Urban water supply and sewage disposal (with only a very small proportion of sewage being treated), intensive agriculture and industry had all led to reductions in water quality, especially in dry periods with reduced river flows. The quantity of water had also been reduced by sedimentation of the river bed as a result of upstream soil erosion. This led users in the Piracicaba basin to start to draw water from the Corumbataí basin, which became unsustainable. The Piracicaba river basin is particularly important since it provides water for 55 per cent of the population within the São Paulo Metropolitan Area.

In 1989, an Inter-municipal Basin Committee was formed by 40 municipalities (out of 62 in the three basins) and some businesses in order to improve watershed management. This was achieved through the protection of the water-generating areas (along water courses), by implementing measures such as improved waste management, more efficient water consumption, water flow regulation (maintenance of dry season flows), water quality improvement, and erosion and sedimentation control.

In 1998, the members of the committee established a common trust fund to finance these measures, which became official in 1999. The municipal water and sanitation utility of Piracicaba (Semaé) contributes US\$0.0045 for every cubic metre of water that it supplies to domestic customers. These customers are served in eight urban centres with a total population of approximately 550,000 inhabitants, including Piracicaba with 360,000 inhabitants. Some industrial and irrigation users also contribute to the scheme, but not via charges collected by Semaé. Contributions are also received from the private sector partners and also state and federal institutions as part of national programmes for refor-

estation and natural resource management, such as Fundo Nacional de Meio Ambiente (FNMA), the national environment fund, and Fundo Estadual de Recursos Hídricos (FEHIDRO), the federal water resources fund. At present, the annual investment amounts to about US\$450,000, which is insufficient to finance substantial reforestation over a longer term period. This amount could be greatly increased if contributions could be secured from the remaining 22 municipalities within the basins, especially as they now benefit from improved basin management (the São Paulo Metropolitan Area in particular, as a large proportion of its raw water is sourced in the Piracicaba basin) and large-scale agricultural and industrial users, but they have been reluctant to acknowledge their downstream environmental impacts and pay towards a 'free' resource.

The members of the committee jointly decide the priority areas and amounts for investment, which are expressed in annual action plans prepared by each municipality. The principal destination for the funds is one-off payments to private landowners to reforest river bank areas and other water source areas in order to curb erosion. These payments are made in conjunction with a reforestation plan, approval of the relevant environmental authorities, (native) tree seedlings and technical assistance. However, there do not appear to be any obvious additional benefits to landowners from reforestation, apart from meeting the river bank protection standards set by the 1965 Environment Law. A key benefit, however, is that Semaé has been able to maintain supply without sourcing water from elsewhere, and is thus able to maintain low prices for users. Longer term goals include restoration of the Brazilian Atlantic Rainforest, which has undergone significant reduction over the last century, a liquid and solid waste management programme, environmental education and technological improvements.

Sources: Porras, I. (IIED, Edinburgh) based on Landell-Mills, N. (1999) 'Country profile for Brazil', unpublished document, IIED, Edinburgh; Semaé (2001) 'Conservação dos recursos hídricos por meio da recuperação e da conservação da cobertura florestal da Bacia do Rio Corumbataí [Conservation of water resources through the rehabilitation and conservation of forest cover of the Corumbataí River Basin]', www.semaepiracicaba.org.br; Razera, S. (2005) 'A luta pela Agência na Bacia do Piracicaba [The struggle for the Piracicaba River Basin Agency]', http://www.riob.org/relob/relob_bpiracicaba.htm; Esquierra, J. C. (2005) Piracicaba, Capivari and Jundiá Committee website, www.agua.org.br.

users or non-users (receivers). In this way, payments can act as an incentive for providers to engage in better environmental management for the benefit of receivers with an explicit interest in securing environmental services. For example, in Pimampiro in Ecuador, the municipal government pays smallholder farmers who have land near its drinking water source to adopt good agricultural practices so as not to pollute the water with fertilizer or pesticide, or to cause excessive turbidity through soil erosion.⁶⁹ In the Cauca Valley in Colombia, large-scale water users, principally sugar cane farmers and sugar cane refining industries, pay additional fees to

implement local watershed management plans that were outside the financial means of the Cauca Valley Corporation, in order to protect the water that is so vital to their economic activities. The improved management has the additional effect of improving the supply of drinking water to towns and cities in the 33 municipalities in the valley, which had suffered from shortages during the dry season.⁷⁰

The payments (in cash, in kind or via financial incentives such as tax reductions or subsidies) must balance the willingness of the receiver to pay for a certain level of environmental service, while also being sufficient to

compensate the provider for both the economic cost of alternative land or water uses and/or the effort expended on better environmental management. This may not necessarily be expressed solely in the level of payment, but also its stability and duration. Furthermore, the payment will also depend on the quantity and quality of the watershed service that providers are able to supply, which will depend on an array of factors, including climate, institutional and legislative framework, land size and secure land tenure. Indeed, it has been suggested that some of these conditions may already prevent lower income potential environmental service providers from participating in schemes.⁷¹ Nevertheless, the funds collected by some watershed organizations are impressive; for example, the Guabas River Association (Asoguabas) in the Cauca Valley collected over US\$600,000 in 1998.⁷²

To date, reviews have identified a number of different initiatives worldwide, including the case of Brazil, outlined in Box 8.4, where watershed protection allowed a water and sanitation utility serving eight urban centres to maintain supplies without sourcing water from elsewhere and thus maintain low prices for users.⁷³ However, many of these initiatives are at an early stage, and benefits and implications may have not yet been fully explored or documented.⁷⁴ A number of unanswered questions surround this type of scheme, including the observation that payment for watershed services contravenes the 'polluter pays' principle.⁷⁵ This could potentially lead to demands for payment in return for environmental services, although this has not yet been observed in practice.⁷⁶ However, the idea underlying payment for watershed services is to encourage *better* upstream environmental conservation

(such as leaving land forested rather than developing it for agriculture or logging), rather than paying other users to curb excessive use or serious pollution, which in many cases (at least in theory) are controlled by legislation or regulation. However, the measures are also often driven by private interests, as opposed to conservation per se, which is not in itself compatible with an IWRM approach.⁷⁷

A further issue is the assumed nature of the human–environment dynamics that underlie the rationale behind such schemes, and the contested nature of these, as mentioned earlier.⁷⁸ For example, the watershed associations in the Cauca Valley invest voluntary fees in forest and vegetation protection in the highland water sources with a view to increasing water flows in the dry season and stabilizing discharges in the wet season. This arose because deforestation in the upper parts of the valley was largely blamed for deteriorating water quality and quantity, although other contributing factors (including their own practices) may not have been considered.⁷⁹

The effectiveness of such schemes may also depend upon wider factors such as the types of land and water managers present in a basin and the scale at which the scheme is designed to operate. For instance, commercial farmers and industrial users may not easily be persuaded to change their practices for cities, nor larger urban centres for smaller ones, and payments offered may not be sufficient to encourage them. It is also likely to be more difficult to implement such schemes in larger basins where considerable distances exist between different environments and users. This suggests that such schemes may work better under more localized conditions.

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THE NEEDED PRO-POOR GOVERNANCE FRAMEWORK IN SMALL URBAN CENTRES



INTRODUCTION

Lessons from the past 40 years of development assistance have shown that good provision for water and sanitation is not only about infrastructure. It is also about local capacity to make appropriate choices in regard to the technology used and the institutional forms for building and managing it. This includes a local capacity to innovate when conventional methods do not work. It is also about finding local possibilities for all those who need water to get their needs met. In many settings, it is also about local possibilities for partnerships between government agencies, private enterprises, community organizations and, often, local NGOs – or at least an acceptance by government of the role of other service providers. Ironically, the less funding available (from households, communities, private enterprises and government), the more the need for ingenuity and for partnerships through which the resources and capacities of different stakeholders are combined. Only in relatively prosperous small urban centres can there be standard good quality solutions provided to every household by a single model and a single agency – whether government or private utility. In most small urban centres in Africa, Asia and Latin America, good quality solutions for low-income groups also depend on their more active engagement and, of course, on governments and water

service providers allowing for and supporting this.

Thus, a large part of ‘governance’ for water and sanitation is local governments providing the framework that encourages and supports such an active engagement and ‘smart partnerships’ that allow locally appropriate solutions to develop in each small urban centre. Chapters 4 to 7 highlighted how much can be done to address deficiencies in provision for water and sanitation in small urban centres (and large villages). Chapter 4 described the range of technologies available and had many examples of where they are working well. It highlighted one key issue for governance – the successful partnerships between groups of low-income households and water and sanitation providing agencies that lowered costs and allowed better quality provision to be afforded both by utilities and by households. Chapter 5 discussed the means by which the information needed for action at local and national level can be generated, with case studies showing where and how this had been done; again, case studies of partnerships between local governments and community organizations showed new ways to generate the data needed to support local action. Chapter 6 showed the range of institutional forms for improving and extending provision for water and sanitation – but with an interest not only in the role of different providers (government, international and national companies, small-scale private sector, NGO and

community organizations) but, as importantly, in their potential to work together in any small urban centre. The quality of local government has a key influence on realizing this potential. Chapter 7 discussed the different possibilities for financing improved and extended provision for water and sanitation in small urban centres, including the different sources from which funding can be drawn. Again, this included examples of partnerships through which different actors worked together: government–community–household; government–private company; and international NGO–local NGO–local government. Chapter 8 discussed the regional water governance framework within which provision for water and sanitation fits – integrated water resources management – which recognizes other water needs and water-related risks (for instance flooding and water scarcity) and seeks to provide a collaborative framework within which all water users’ needs are met, including ecological needs.

Thus, much of relevance to the topic of governance has been covered in earlier chapters. So this chapter discusses the bigger governance framework to support this – in effect not water and sanitation governance but the governance framework within which this has to happen. It includes a section on developing the capacity within each urban centre to address deficiencies in provision, including strategic planning, professional training and information generation – and how to increase the capacity of local governments to work with low-income groups and their community organizations and with small-scale service providers. Prior to these sections, some attention is given to governance frameworks and the tools and methods that support good governance.



GOVERNANCE¹

The interest among the official development assistance agencies in good governance is in part related to their dissatisfaction with the shortcomings of many (national) recipient

governments who are their official partners and through whom most development assistance is channelled. In part, it is related to the search for more effective development strategies after the disappointing results from some international agencies’ promotion of the market – itself a response to earlier critiques of the performance of government agencies.² During the 1990s, the interest in governance was also fuelled by a growing discussion of how poverty should be reconceptualized from an almost exclusive focus on ‘income’ or consumption to include a concern for improving provision for water and sanitation (and other services), civil and political rights and voice – and all of these relate strongly to governance.³ The reasons for this search for greater effectiveness are obvious from the deficiencies in provision for water and sanitation described in Chapter 3. If provision for water and sanitation in small urban centres is so inadequate, obviously new approaches are needed from governments and international agencies.

But the issue of good governance was also pushed onto the development agenda by pressures from citizens and citizen organizations. It is no coincidence that much of the innovation in good governance at national and local levels came from countries where democracy was strengthened.⁴

Governance as a concept recognizes that power also exists outside the formal authorities and institutions of government.⁵ At its root, good governance is the construction of new relationships between citizens and governments.⁶ The term ‘governance’ is used for one aspect of this citizen–government relationship. It encompasses the institutions and processes, both formal and informal, that provide for the interaction of the state with a range of other stakeholders affected by the activities of government. Thus, it includes not only government institutions but also the wider set of institutions and organizations that influence the processes of government. Arguably, this broader set of relationships has long existed, but a previous concept of government was that it should somehow stand back from the messy

business of negotiating acceptance of and agreement to its own processes and decisions. There is now recognition that this messy business is part of the process.⁷ Rather than government taking decisions in isolation, there is growing acceptance (indeed, expectation) of an engaged state negotiating its policies and practices with those who are a party to, or otherwise affected by, its decisions. This questions government strategies that simply involve negotiating with a few powerful but unrepresentative groups. Rather, the concept embraces a more systematic consideration of who should be included and how. Governments, and indeed state power, are an important, perhaps predominant, but not all-determining force. Not all relationships between state and citizens fall within the remit of governance according to this definition since it does not include relationships between individuals and the state that are concerned simply with those individual's concerns and that do not affect others on any significant scale.

But in discussing these broader governance issues, the focus for this report remains on how to ensure better provision for water and sanitation for those who are currently unserved or very inadequately served in small urban centres. Most of these have low incomes; a high proportion have very low incomes. The interests of these people arise at many different levels: they may have an interest in whether water utilities are regulated by national or municipal government, or whether the utility operators are public or private, as well as a more direct interest in whether a piped water network is extended to their neighbourhood and whether there is a regular supply of water or what sort of sanitation systems or services are made available. These interests can be expressed in a number of different ways: by paying money to a provider, by voting in an election or a referendum, by asserting rights through a legal system, by moral or religious suasion, by supporting or working with a community-based organization, or, of course, by digging their own wells and constructing their own latrines. Official utilities may respond (or

fail to respond) to their interests for many different reasons, depending on how water and sanitation provision is organized and regulated. While it is clear that some regimes are more favourable to those lacking adequate provision, it is difficult to generalize about specific practices and arrangements. While these are not all issues of government, narrowly defined, they are issues of governance, since governance extends beyond the institutions of government, and includes the important role governments have in regulating, facilitating and collaborating with other actors and institutions – as well as the important role other actors have in achieving public goals and holding governments to account. Better water and sanitation governance for the urban poor does not mean that the local government or other government agencies have to provide these services; in many instances, these are better outsourced to private enterprises or NGOs or community associations. But local governments have to take responsibility for ensuring this happens and to demand accountability from service providers. In most small urban centres, it also means working with small-scale vendors, civil society organizations and, perhaps most important, the low-income residents themselves. Moreover, many different government agencies and authorities contribute to the quality of water governance, and not just the agencies formally in charge of water and sanitation services.

It is clear from earlier chapters that the key governance issue for water and sanitation cannot be reduced to a discussion of 'public versus private'. What might be termed 'pro-poor' governance for water and sanitation is a serious challenge, whether the utilities are publicly or privately operated. Increasing private sector participation raises particular challenges, but water contracts can vary considerably in the extent to which the interests of the unserved or ill-served are taken into account. Most large private concessions have given little attention to this. But the same is true for a high proportion of public utilities. Perhaps what characterizes both of these

is the limited possibilities for the unserved or ill-served to influence what these private or public utilities do. Despite the varied contexts, more pro-poor water governance is usually facilitated by, if not dependent on, poor groups gaining more power and influence either through representative political structures or through more direct participation in water and sanitation provision – whether in planning, installing, managing and/or monitoring provision. Inevitably, it is influenced by the larger governance context – for instance whether poor groups can organize and, when needed, protest; also about whether they can get information about water management.⁸

Earlier chapters also made clear the important role of small-scale water and sanitation providers in many small urban centres and this raises a number of water governance issues, though for the most part these issues remain relatively unexplored and many of the options for working with small-scale enterprises to improve water and sanitation governance remain untried. While local governments that ignore the informal providers may be preferable to those that try to eliminate or regulate them, there are many ways in which the operations of informal provision for water and sanitation could be improved, and those utilities working closely with residents in the communities served by these small-scale providers could help small-scale enterprises to provide better services.

Principles of water governance

Effective water governance requires that:

- Approaches should be:
 - open and transparent;
 - inclusive and communicative;
 - coherent and integrative;
 - equitable and ethical.
- Performance and operation should be:
 - accountable;
 - efficient;
 - responsive and sustainable.⁹

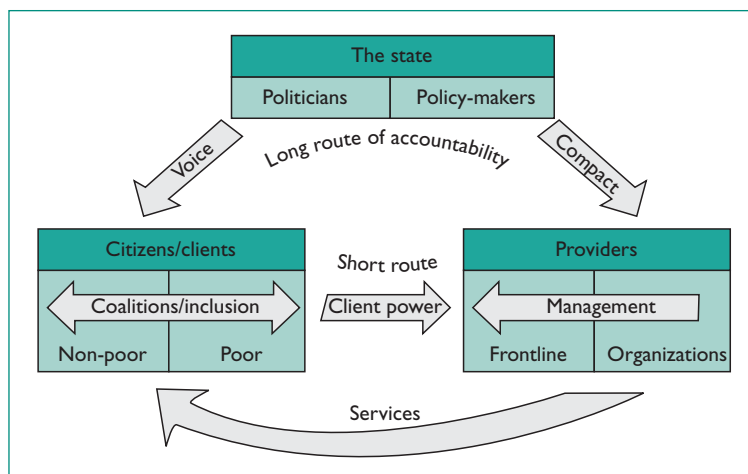
There is a growing consensus that in order to achieve this, water and sanitation providers and those who work with them need to be more accountable to lower income groups. The World Bank notes that service delivery to low-income groups can be improved ‘by putting poor people at the center of service provision: by enabling them to monitor and discipline service providers, by amplifying their voice in policymaking, and by strengthening the incentives for providers to serve the poor’.¹⁰ A simple framework that emphasizes the role of negotiation in ensuring that services such as water work better for low-income groups was developed for the *2004 World Development Report on Making Services Work for Poor People*. The framework is based on the notion that the demands for improvement need to come from the poor people themselves, and that the level of improvement will depend upon the influence that poor people can bring to bear on the service providers, either directly or via the government.

As displayed in Figure 9.1, the framework focuses on the relations between ‘clients/citizens’, ‘providers’ and ‘the state’. It distinguishes between two routes of accountability: the short route whereby those lacking good provision for water and sanitation exert an influence directly on the provider, and the long route whereby they influence politicians and policy-makers, who in turn influence the providers. By placing the influence of the poor themselves at the centre, the framework provides a useful corrective to the tendency for other stakeholders in the water sector to claim that their interests coincide with those of poor groups. Also, while it raises more questions than it answers (concerning, for example, how the poor can increase their political voice vis-à-vis the state or increase the client power vis-à-vis providers), the questions it raises are central to water and sanitation governance and how it can be made to serve the interests of low-income groups. This framework also fails to make explicit one of the most effective means by which low-income groups have influenced official policies that was described in some detail in

Chapter 4: by taking action themselves, developing solutions to their lack of provision for water and sanitation and then using these local solutions as precedents through which to develop partnerships with official providers to act on a larger scale.

While defining the principles of good governance or pro-poor governance in relation to water and sanitation (and other key services) is relatively easy, it is difficult for any national government agency or donor agency to know how to get ‘better’ or more pro-poor governance in hundreds or thousands of small urban centres. In part, this is because local contexts vary so much. What is possible in one small urban centre may be completely inappropriate in another – for instance because of differences in water availability, in the scale and distribution of the capacity to pay within the local population and in technical capacity. In part, this is because more pro-poor governance is opposed by powerful interests in most locations. In part, it is because pro-poor governance for water and sanitation depends on support from much more than the institutions concerned with water and sanitation.

Table 9.1 illustrates this by highlighting how very different local governance contexts influence the best means by which national governments and international agencies can promote better governance. It highlights how this varies, depending on the quality of local government (from democratic and accountable to undemocratic and unaccountable) and the resources available to local government (from relatively well-resourced local governments to poorly resourced local governments). Perhaps



the most important point to remember here is that support for community provision should be seen not as an alternative to promoting better local governance but a powerful way of supporting better local governance – again, as described in some detail in Chapter 4.

The means by which poor groups influence governance

While a greater capacity to influence water and sanitation providers is not always accompanied by a greater capacity to influence water policies, or vice versa, many of the more successful cases of low-income urban dwellers negotiating water and sanitation improvements have combined negotiation with local government and with providers. In terms of Figure 9.1, this effectively combines the long and short routes, and raises questions about how the long route is sometimes made far shorter than at other times.

The capacity of urban poor groups to influence water policies and water providers also depends, of course, on how responsive the

Figure 9.1

Key relationships of power and accountability

Source: World Bank (2003) World Development Report 2004: Making Services Work for Poor People, The World Bank and Oxford University Press, Washington DC.

Resources available to local government	The quality of local government/governance	
	From democratic and accountable local government structures to undemocratic, unaccountable and often clientelist local government
From relatively well resourced, local government institutions with the needed technical competence...	Local government can be the channel through which external funding for water and sanitation is channelled, whether or not it is the main provider or it oversees and supports private sector or community provision	Long-term support needed for governance reforms at all levels of government; also support needed for local private and community provision both to improve conditions and to build local pressure on government for better governance.
... to poorly resourced local governments lacking funding, a strong local revenue base and technical capacity	Need for a strong focus on capacity building for local government and support for its partnerships with civil society and local private sector service providers (including informal providers)	As above but with strong support for local private providers and community provision within a long-term goal of supporting more competent, accountable and transparent local government

Table 9.1

The different local contexts through which national governments and international agencies can pursue good governance

government and water providers are. Politicians often promise better water services. Democracy should help to increase the accountability of politicians, and help make governments more responsive to the water demands of their less well-off citizens. Ideally, democratization and decentralization ought to be a particularly effective means of getting governments to be more responsive to citizen demands for good provision for water and sanitation. Indeed, this combination may well have been a factor explaining why public water and sanitation services improved in many urban centres in Latin America even when their economies were not improving during the 1980s and 1990s.

Similarly, the capacity of urban poor groups to influence water providers directly depends on how responsive these providers are, and what they are responsive to. This depends in turn on the compact that they have with the state – whether this takes the form of a contract, an agreed regulatory regime, or simply the rule of law. Yet again, it is important not to exaggerate the distinction between a privately and publicly operated utility. Under many circumstances, the distinction between negotiating with large utilities as opposed to small enterprises is more significant, especially since large private utility operators are almost always working under contract. Many contracts with large water companies involve fees that are paid to the company for providing water, that are distinct from the fees paid by water users. Moreover, like a public utility, they are usually officially prohibited from accepting above-tariff payments for better services (with good reason). If the company's contract gives them a strong incentive to do so, they are likely to be very responsive to the demands of the urban poor. If the contract does not give such incentives, they will be less responsive. Market conditions matter, but are mediated by the state.

A small-scale water vendor that earns all their revenue from sales has different motivations for responding to demands. In this case, much will depend on the level of competition in

the market (rather than for the market, as is the case with competition for large concessions), and other factors that determine whether the water vendor needs to be concerned about losing sales.

The framework illustrated in Figure 9.1 has its limitations, and these limitations are highlighted by the issue of corruption. At least superficially, corruption is a means through which poor residents, and others, can influence both government officials and water (and to a far lesser degree sanitation) providers. While corruption undermines good governance, bad governance clearly breeds corruption. This is not only because the necessary controls on corrupt behaviour are lacking, but because when official policies do not have public support, corruption thrives. Again the principles by which corruption is defeated are obvious – and they are within the principles already listed for good governance – but the means by which international agencies can support these are less clear.



PARTICIPATION

Citizens 'participate' in government for obvious reasons: to try to get government agencies to meet their needs, support their priorities and protect their rights. So they participate to get governments to do something or change the way they do things. This participation in government can take many forms but most fall into two categories: a direct engagement with government bodies, and influencing government through voting for elected representatives. What this report highlights is the importance of supporting this direct engagement with government bodies within small urban centres. This direct engagement can both directly address water and sanitation (and other needs) and begin to address the processes that caused the inadequacies in provision.

One of the key requirements demanded of all water and sanitation service providers should be that the various stages of the planning and delivery of services are done in participatory ways and with a focus on meeting the needs of

low-income groups. This is best done by ensuring that the poor are allowed to be part of the decision-making processes. Many of the tools and methods for supporting greater participation by those ill-served or unserved by official service providers have been described in some detail already – for instance the community mapping focused on low-income areas and the urban centre-wide mapping and discussions of priorities. Participation is also needed in the management of service providers and in monitoring their performance. In many instances, the ‘participation’ is not only in allowing low-income groups or ill-served groups more voice in decisions but also in their involvement in designing, implementing and managing the solutions – for instance, the many partnerships developed between urban poor groups and local service providers described in Chapter 4. The importance of official providers working with groups of households (or with neighbourhood organizations) rather than with each household is one of the main themes of this report, and this should imply high levels of participation, unless service providers only see this as a means to reduce their costs and increase their revenues.

There is now an extensive literature on different tools and methods that support participation, although not much of this is on water and sanitation in urban areas¹¹ – or on participation within small urban centres. This includes methods by which citizen groups increased their engagement in budget analysis, reviews of budget expenditures and performance monitoring.¹² But in many small urban centres, the issue is not so much holding any official service provider to account but partnerships between local governments, service providers and resident groups to address deficiencies in provision.

There are obvious challenges for governments and any service providers in allowing for participation – and doing so is often seen as a cost and a constraint. Elected politicians often claim that they were elected to represent people’s views and may even oppose more partic-

ipatory models. For instance, in South Africa, there is a real tension between ‘participation and delivery’ and many people take the view that local government should get on with its job and provide services. The need for participation is also less where everyone or virtually everyone gets an adequate service; households and neighbourhood organizations in urban centres with 100 per cent coverage for piped water and sewers do not want to engage constantly with service providers, as long as they get a good service and there are provisions to ensure quality of services and prevent unfair pricing – and provisions available to those who feel unfairly treated. But for most small urban centres, much of the population do not have adequate provision so systems that allow their voices to influence plans and priorities are particularly important.

Sherry Arnstein noted how there is broad support for the idea of citizen participation but very often only for ‘consultation’:

Participation of the governed in their government is, in theory, the cornerstone of democracy – a revered idea that is vigorously applauded by virtually everyone... The applause is reduced to polite handclaps, however, when this principle is advocated by the have-nots. And when the have-nots define participation as redistribution of power, the consensus on the fundamental principle explodes into many shades of outright racial, ethnic, ideological and political opposition.¹³

Participatory governance

Participatory governance implies a need for more scope for participation within the relationships between citizens and government – so it goes beyond increasing the scope for participation in a specific neighbourhood or a single development. There are many participatory projects that involve citizens and local government in localized decision-making but which do little to change government processes. Hence, not all participa-

Box 9.1 Participatory budgeting

Participatory budgeting is one of the most significant innovations in democracy and local development. Initially developed in Brazil some 15 years ago (particularly in the city of Porto Alegre), it spread to over 100 Brazilian municipalities during the late 1990s and then to urban centres in Latin America and elsewhere after 2000.

The forms that participatory budgeting take are diverse, influenced by existing forms of government, by political motivation and by state–civil society relations.

Experience varies much between urban centres as to:

- where participation takes place (citizen participation at the neighbourhood or the urban centre-wide level) and the form of participation (for instance, from every citizen having a right to attend and vote in 'participatory budgeting assemblies', to participation by representatives of neighbourhood associations, trade unions or other civil society organizations);
- the proportion of the budget controlled by participatory budgeting (from a few per cent to all of the investment budget) and who takes the final decisions (from the municipal council to the participatory budgeting council);
- what body is in charge of the decision making (a new council, existing institutions or a mixture of the two), who manages it (for instance, the mayor's office, the finance or planning department, or shared between several departments), and who oversees the works that are funded (for instance, what role for civil society groups);
- the extent to which it has resulted in more funding and attention to the poorer neighbourhoods.

Some urban centres have made special provision within participatory budgeting for vulnerable groups or groups that have particular difficulties getting their priorities heard (for instance, committees for women or children and youth). Some have delegates elected for particular groups – for instance, the elderly, adolescents, indigenous groups and the disabled.

Participatory budgeting has also helped encourage or support innovative responses by civil society groups in the informal economy and social economy through, for instance, the use of social currencies, collective purchases and systems based on barter clubs and 'prosumers' (someone who is both a producer and a consumer of goods and services).

Source: Cabannes, Y. (2004) 'Participatory budgeting: A significant contribution to participatory democracy', *Environment and Urbanization*, vol. 16, no. 1, pp27–46.

tion, even participation involving government agencies and officials, is participatory governance if it is limited in scope, scale and space.

Participatory governance offers greater scope for action by organized civil society groups. Increasing numbers of international agencies recognize the importance of citizen movements and associated NGOs, and provide these with financial support. Some citizen movements have focused on a specific goal or policy and have dissipated once success has been achieved, for example, the pro-democracy movements in a number of countries. Some have,

themselves, sought to join government, with leaders standing for political office or accepting government appointments. However, others offer a grassroots challenge to existing government processes and have campaigned for greater involvement and inclusion. Such groups see participatory governance as a necessary complement to representative democracy, which often fails to represent the interests of less powerful groups, especially in situations of resource scarcity, where elections become a way of allocating limited state benefits rather than making political choices.

Local governments may see participatory governance as a way of increasing their legitimacy. As governments have lost legitimacy and found their scope and decision making being questioned, some have sought to regain citizen confidence and improve performance through offers of inclusive decision making to a range of other interested parties. Measures have been taken at national and local levels, and have included further information, formal consultation and increased accountability to citizens. There have been some notable attempts to reach out to groups that have been excluded previously – for instance governments institutionalizing multi-stakeholder decision-making councils. However, the extent to which the multi-stakeholders outside of government have real decision making influence varies greatly.

Participatory budgeting is one example of more participatory governance. Participatory budgeting is one of the most significant innovations in participatory governance – and one that is being applied in around 250 urban centres around the world.¹⁴ Most are in Brazil, but participatory budgeting initiatives are also flourishing in urban centres in many other Latin American nations (and in some European nations). Participatory budgeting means more scope for citizen groups and community-based representatives in setting priorities for local government expenditures; it also implies a local government budgeting system that is more transparent and available to public scrutiny (as shown

in Box 9.1). A review of participatory budgeting in 25 municipalities shows the many different motivations behind the initiation of such programmes. While these programmes have some common aspects in their approach, their strategies and outcomes are very much related to contextual factors such as the motivation of the mayor or leading group within the local council, the degree of autonomy that the council has over its own budget, and the nature and scope of the groups drawn into the budgeting programme.

Within participatory budgeting, there are different modes by which citizens participate. There are generally assemblies open to all citizens and then assemblies or meetings for each neighbourhood. Participatory budgeting discussions also involve delegates and leaders from existing civil society organizations such as social movements, neighbourhood associations and trade unions. This process is not outside representative democratic systems because the municipal council is still responsible for approving the budget – but more scope is given to civil society groups to influence it. In most Brazilian experiences, the council of the participatory budget, formed by elected delegates at public assemblies and forums, has a central role – including organizing the form that citizen participation can take, the themes to be discussed and the preparation of the participatory budget for submission to the municipal council. In many of the non-Brazilian experiences, participatory budgeting is built on already existing social or political frameworks such as neighbourhood associations or elected parish councils.¹⁵

However, effective participatory budgeting is not easily implemented. The comment of Martin Pumar, a former mayor of Villa El Salvador (one of the municipalities on the periphery of Lima) has particular relevance – as he introduced participatory budgeting during his term of office:

The municipal structure and bureaucracy were not yet capable of dealing with the changes. First of all the participatory budgeting of course

implies relinquishing power, also the everyday power of councillors, municipal workers. Personal favours, clientelistic relations are part and parcel of our municipal culture. So there was quite some resistance in the municipal apparatus. Yet even for those who understand and support the change it was not easy. All of a sudden urban development received tens of project proposals to be implemented, where the municipality had to develop all the technical plans to prepare the construction.¹⁶

When participatory budgeting was introduced, the municipal authorities had particular difficulties responding to the multiplicity of demands and priorities that this generated. A municipal councillor in Peru identified the constraints on making participatory budgeting effective for a municipality's development:

- Overcoming the confrontational attitude through which neighbourhood leaders address the authorities – both neighbourhood leaders as well as municipal officials have to learn to work together.
- Learning to govern in a less politicized way – and so not disqualify a proposal because it comes from another political party.
- Learning to move away from the culture of the leader and the follower – with mayors seen as people who will solve everything. Modern mayors have to learn to delegate decision making and responsibilities, while neighbourhood leaders and the population have to learn that they are co-governors who are entitled to come up with their own proposals and solutions, instead of expecting the authorities to solve everything for them, just because they have elected them to power.
- Municipal authorities and neighbourhood leaders having a vision that goes beyond short-term actions (for instance those that municipal authorities need to ensure re-election) and avoiding the investment budget being scattered among many differ-

ent small projects (to make sure that each neighbourhood gets something). There are a few examples where leaders of various communities pooled the budget and realized substantial investments that benefited various neighbourhoods such as levelling a major road and a pre-study for the construction of a water and sanitation system. But these examples are rare. It will take a long learning process to change people's mindset in such a way that we can really speak of co-governance: long-term planning taking a larger area into account then just your own neighbourhood. A neighbourhood leader is not trained to consider long-term and larger scales.

- The conventional understanding of 'neighbourhood improvement' in which modernity is associated with concrete – even if a park is planned.
- Participatory budgeting reaching the leaders but not all the population.

A review of community participation within municipalities around the world found that in general, public works agencies do not like working with community organizations.¹⁷ Many municipal authorities are staffed by administrators and technical professionals who find the concept of community participation irrelevant. This is perhaps especially so in public works departments. Municipal officials have an incomplete knowledge of the potentials and limitations of participatory approaches. Even if they are willing to try participatory approaches, they often lack the skills and resources needed to do so. They also do not appreciate the difficulties in developing effective partnerships with community organizations – or the extent to which their bureaucratic procedures and official norms, codes and regulations inhibit participation. If municipal authorities want to support the kinds of government–civil-society partnerships that have been described in earlier chapters, this will require a transfer of power and decision making from municipal agencies to community organizations. Many inter-

national agencies also fail to recognize that the very nature of the conventional municipality is in conflict with the concept of participation.¹⁸



TOOLS AND METHODS TO SUPPORT GOOD LOCAL GOVERNANCE¹⁹

The operational experience of the United Nations Human Settlements Programme (UN-HABITAT) confirms that 'it is neither money, nor technology, nor even expertise but good governance that means the difference between a well-managed and inclusive city and one that is poorly managed and exclusive'.²⁰ Water and sanitation services of adequate quantity and quality that can be accessed by all men, women, adolescents and children, whatever their income, are an important outcome of good urban governance.

A survey on governance in 165 countries reported that a 1 standard deviation increase in any one of six governance indicators causes a 2.5-fold increase in the income, a 4-fold decrease in infant mortality and a 15–25 per cent increase in literacy, thus establishing a clear relationship between governance and human development.²¹ The survey concluded that: 'The result of good governance is development that gives priority to the poor, advances the cause of women, sustains the environment, and creates needed opportunities for employment and other livelihood.'²²

UN-HABITAT's work in Madhya Pradesh has included the development of a pro-poor governance framework that will allow water and sanitation reform and investments to reach the lowest income groups through partnership building at all levels. The governing principles of this approach include:

- involving civil society and influence priorities and investments;
- paying specific attention to women, adolescent girls and boys, children and marginalized groups;

- introducing mechanisms to empower the most vulnerable to articulate their interests and hold government and providers to account;
- formulating and apply a regulatory framework that protects providers and consumers alike;
- services that are responsive, affordable and sustainable.

This framework allows both a quantitative and a qualitative assessment of water governance. The quantitative assessment maps the existing water governance regime by considering:

- service delivery functions (water supply, sanitation and hygiene education) and the management partners that deliver these services and roles at different levels;
- the inter-relationships between the institutions that provide water governance;
- the effectiveness of the water services provided.

As the different partners and their management roles are mapped, this allows the identification of which elements of governance are missing or where management roles and responsibilities are inadequate. The qualitative appraisal assesses whether the attributes of good governance such as transparency, accountability and participation are present. This also maps the extent to which these attributes are present within each stakeholder group.

Key features of the approach include the incorporation of environmental and health considerations into management and urban planning practice, building genuine partnerships linking local institutions with community groups, creating spaces for civil society voice and action, and adapting and using urban management tools for planning, monitoring, technology options, communication and information. Some of these tools are outlined below.

Community-based Environmental Management Information Systems

Community-based Environmental Management Information Systems (CEMIS) emphasize planning as a dialogue (consultation) at different levels with the family, the neighbourhood and the community, and with partners who include political leaders, governments, and NGOs, in order to share information and experiences.

The Urban Governance Index

This index provides a framework through which to assess the nature and quality of urban governance in any location and identify gaps and key areas for action.²³ At the *local level*, the index seeks to catalyse local action to improve the quality of urban governance. Local indicators are developed by local governments and their partners to respond directly to their unique contexts and needs. The index also permits the regional and global benchmarking of urban centres against key indicators, based on the quality of their urban governance. This in turn allows comparisons between urban centres – which may also catalyse specific action to improve the quality of local governance. This benchmarking also allows the index to demonstrate, at the global level, the importance of good urban governance in achieving broad development objectives, such as the MDGs and those in the Habitat Agenda.

The Global Urban Observatory

The observatory helps national and regional governments, local authorities and civil society organizations to develop and apply policy-oriented urban indicators, statistics and other urban information. The observatory was established by UN-Habitat in response to the call by the United Nations Commission on Human Settlements for a mechanism to monitor global progress in implementing the Habitat Agenda and to monitor and evaluate global urban conditions and trends.²⁴

Values-based Water Education

Values-based Water Education was developed by UN-HABITAT under its Water for African Cities Programme as a guided process of behaviour change through self-transformation in order to guide communities to an equitable and sensible use of water resources. Focusing mainly on schools, it goes beyond providing information on water, sanitation and hygiene to inspire and motivate learners to change their behaviour and adopt attitudes that promote wise and sustainable use of water. It seeks to integrate the values enshrined in the Millennium Declaration and basic human values by working at three levels – environmental, social and economic, in order to develop a new water use ethic.

Water demand management

WDM enables water utilities to become more efficient and financially viable service providers by reducing wastage and losses. It involves the implementation of policies or measures that serve to control or influence the amount of water used. This can be influenced by education and awareness, economics and enforcement of legislation on the customer side. Efficiencies include reduced losses, increased waste-water use and more effective demand.

Financial resource mapping

Financial resource mapping can be a useful tool to identify sources of finance for any intervention to improve provision for water and sanitation.²⁵ It can also provide the basis for developing partnerships between different funders. This mapping should cover both governmental and non-governmental sources (private, NGO, donor agencies) and, for each source, identify the criteria by which funding can be obtained. It should also review the current uptake of each funding source to ascertain the areas/sectors with financing gaps and/or potential for convergence. In India, financial resource mapping has proved particularly relevant, giving the large number of national and state government funds and

schemes that are available and from which funding may be drawn. A financial resource mapping exercise for the Water for Asian Cities Programme in Madhya Pradesh (India) identified a great range of funds/resources.²⁶ This also allowed the identification of resources on which a new intervention could draw – for instance the community structures in ‘notified slums’ that had been in operation for more than eight years, after being created by an earlier employment generation programme.



CAPACITY BUILDING FOR WATER AND SANITATION SERVICES DELIVERY IN SMALL URBAN CENTRES²⁷

Ensuring ‘safe and sufficient’ water and ‘basic’ sanitation in small urban centres requires management skills that exceed conventional ‘rural’ approaches. But a conventional ‘urban’ utility-managed approach may not be possible because it cannot produce sufficient revenues to support a full complement of professional staff, and the potential for full cost recovery. Unfortunately reform programmes in many countries have tended to focus either on larger urban centres or on rural solutions that are not appropriate for small urban centres or for most large villages. Most small urban centres also do not provide the business opportunities that attract private capital and professionals in many fields including managers and operators of water supply and sanitation systems. Most small urban centres lack competent professionals and have difficulty attracting or retaining them. There has also been a lack of attention to developing appropriate utility models for small urban centres. The main challenge is how to support the development of local organizations able to improve and extend provision – and in doing so, to find the technical and organizational solutions that fit best with local circumstances and possibilities. They should be expanded over time as actual, not

projected, demand and revenues increase. Small urban centres may have few possibilities of external support. Community participation and cooperation between stakeholders is important to cut costs and ensure that consumers get services they want and can afford. This calls for a dynamic planning/expansion process, where business planning is very important as a planning tool for matching management arrangements and investments to water sales and revenues.

Local governments in small urban centres are often the lowest formal level of government and they often have wide-ranging responsibilities for providing many basic services. With increasing decentralization, they have been charged with greater responsibilities yet are often widely varying in competence, experience and capacity. Their importance for more effective development and environmental management, including good provision for water and sanitation (and many other aspects of poverty reduction) is often forgotten.²⁸ Local governments can be key agents in development and better environmental management; they can also be key blocks to this. As Chapter 7 made evident, they are also among the most challenging institutions to reach with development assistance. Within the limited attention given to 'urban' by international agencies, large urban centres including cities receive much more attention because of their size and economic importance and often as the location for higher levels of government (regional, provincial, state); the local authorities that manage each small urban centre are scattered, often remote, and often with poor communications with higher levels of government.

Most small urban centres also concentrate a limited capacity to pay for water and sanitation services (from populations and enterprises), while their governments generally have less technical capacity and financial management skills to develop local solutions. In many nations, large numbers of small urban centres are still governed by rural governance structures with little capacity to address the water and sanita-

tion needs of their inhabitants and enterprises. As Chapter 2 described, these include small urban centres on city peripheries – for instance satellite towns, municipalities on the edge of metropolitan areas and as yet unincorporated urban areas that house large concentrations of low-income groups that still fall under the responsibility of a rural local authority. As a result, their structure, capacity and oversight by national authorities may not receive adequate attention or priority.

National policies of decentralization to local authorities have often not been backed up with adequate capacity development and resources to support small urban centre governments' new responsibilities. This includes the capacity and resources to meet new roles and responsibilities regarding provision of water and sanitation services. Local authorities have diverse roles in water management, particularly now that sustainable management of water resources is becoming a priority development issue. Not only are they expected to provide or facilitate water and sanitation services but also increasingly called upon to address protection of water resources to improve environmental sustainability and use participatory approaches to maximize stakeholder inputs to management decisions. Local authorities have roles in river basin water management agencies both as users and as representatives of the population within their jurisdiction and will be expected to endorse regulatory approaches that support sustainable management of water resources, including environmental and ecosystem protection – as discussed in more detail in the next section.

While the local authority has the responsibility to ensure that the population have access to basic services, as Chapter 6 described, there are many different modalities, including private sector participation and community provision. Certain key areas need to be addressed, to develop the capacity of small urban centre governments and their supporting partners to undertake and satisfactorily perform these tasks:

- capacity to deliver sustainable water and sanitation services;
- strategic planning for water and sanitation services;
- access to knowledge about how to implement and manage water and sanitation services;
- capacity within utilities and local authorities;
- supporting structures and systems for small urban centre water and sanitation services.

The need for capacity building

With large deficiencies in provision in small urban centres and much of the population with low incomes, water supply and sanitation service solutions are usually small scale. As Chapter 4 emphasized, there are a wide range of technologies from which to choose. Chapter 6 highlighted the different modes of management and cooperation between different service providers. Choosing and developing the technologies and management modes most appropriate to local circumstances requires technical and managerial skills in the local authority. A wide range of skills is needed for managing small-scale solutions and supporting (where appropriate) community-managed and small-scale private sector-managed options – and this rarely seems to be recognized in the staffing or structure of small urban centre local authorities. Inadequate or inappropriate human resource capacity in both the utility and local authorities has contributed to low prioritization and limited knowledge of the issues involved in service delivery to low-income households in sub-Saharan Africa.²⁹

Looking at small urban centres and rural areas, Katz and Sara³⁰ found that effective response to demand for water services should include procedures for an adequate information to households, provisions for capacity building at all levels, and a re-orientation of supply agencies to allow consumer demand to guide investment programmes. The study also found that the existence of a formal community organization to

manage the water system and provision of training in operations and maintenance are significant factors in ensuring water system sustainability. Competent, capable, representative community organizations able to engage with government and to help develop solutions are clearly a key part of capacity development in many instances.

The services that do exist are often of poor quality, because of a combination of poor planning and design, poor operation and inadequate maintenance. Local sanitation problems are often solved at the expense of the wider environment as untreated wastes pollute groundwater and surface waters.³¹ Past efforts sometimes characterized by ambitious master plans have often given only lip-service to capacity building, or only supported these as one-off interventions, focusing on the development stage with inadequate support to operation and maintenance. But there are many recognized good practices that are as yet inadequately absorbed into the practices of local government. The obvious conclusion is that the inadequate and short-term capacity-building interventions should be replaced by a long-term view of capacity development that takes place over a period of time and is anchored or institutionalized in competent local capacity-building institutions.

Compounding the multidisciplinary and managerial complexity of solutions is the lack of qualified staff in local authorities where there may be only a very small engineering or works department with limited or no planning and management experience and no dedicated structures to address water and sanitation. Poor schooling and other services make it difficult to attract well-qualified and experienced staff to small urban centres and there is limited access to in-service training.

The lack of local capacity is widely recognized (and has been recognized for many years), so why the lack of demand for specific action? Some of the reasons put forward include the poor quality of existing training and the greater attention given to length of service rather than competence when considering promotion.³²

Others may involve the difficulty that practitioners have in specifying the capacity building that is needed, the failure to identify the skills required in staff for an effective institution and a lack of vision of the role of the institution itself.

Even in cities the need for improved capacity may not be recognized. In a report on water in Asian cities that demonstrates a wide range of performance deficiencies, the only element of capacity that was found necessary to highlight was for stakeholders outside and not inside the utilities.³³ If we are to confront urban water and sanitation service deficiencies, there is a need to move beyond performance indicators to strategic action that identifies the causes and solutions to the problems.

Assessments have pointed out that large numbers of technical and scientific personnel lack sufficient knowledge about overall water management and use. While important scientific and technological advances have been made, the specific needs of low- and middle-income nations in monitoring and managing their water resources are not high on the research agenda. 'Many barriers to the effective management and supply of water lie in the institutional and managerial sphere and will not be solved by improved technologies alone. Research focused on effective institutional structures and management techniques is required.'³⁴

Retaining staff is problematic for small urban centres and for provincial organizations and will remain so. This stems not only from the attractions of moving to bigger and more central locations but often from the frustration of not being able to do the job due to lack of resources, lack of access to information and lack of recognition in small centres. There is also the loss of both young and experienced professionals in many African countries due to HIV-AIDS.³⁵ These issues are not easy to overcome, but clearly the issue of lack of capacity in small urban centres will not be overcome by small-scale interventions and a few training programmes. Attention to the underlying issues of access to knowledge and technical support in

the context of national development has to be fundamental to any strategy for change.

Strategic planning for water and sanitation services

Small urban centres need a flexible approach that allows adaptation to changing circumstances and new information. This flexibility is all the more important for urban centres that have rapidly growing populations and changing economies. This is the basis of the adaptive approach to strategic planning that is promoted by some experts and which recognizes the gradual broadening of the knowledge base³⁶ and a demand-based and incentive-driven strategy.³⁷ Whatever is considered the 'right' approach to addressing the water and sanitation problems of small urban centres, the capacity to make decisions and take action starts at the simplest level of awareness:

- Awareness of the importance of water and sanitation among decision-makers, which is vital to commitment and resource allocation and prioritization of the issue at the local authority level.
- Commitment to strategic planning to address water and sanitation services, which requires the capacity within the utility to understand the problems, potential solutions and manage a process to develop ownership and commitment to the solutions within the local authority and the communities to be served.
- The capacity to implement the plans and sustain support to the service delivery.

The lack of planning capacity may be one of the most significant obstacles to progress, particularly as planning for water and sanitation in small urban centres has the complexities mentioned earlier and needs to take an incremental approach.

Planning for water supply and sanitation services also requires specific training to encompass the stakeholder participation elements,

Box 9.2 Knowledge about what?

Utilities or local authorities are likely to need capacity in the following areas:

- appropriate technology choice;
- financial management and billing regimes;
- pro-poor management systems and billing systems;
- stakeholder involvement strategies including participatory methods;
- engineering management and design and operations;
- demand management;
- water resources management;
- spare parts systems and general operation and maintenance strategies;
- investment decisions;
- information management, awareness creation and political commitment;
- monitoring systems;
- conflict resolution;
- water and waste-water quality management.

option identification and strategy selection. The development of such capacity at local authority level may be challenging and raises larger questions in regard to the level of support from national level. Action that builds on a strategic approach does deliver results³⁸ but so far has not been enough to up-scale service delivery and address issues of sustainability.

The actual choice of strategy is a central element of the strategic planning process. Too often it is assumed that the local authority is responsible for service delivery and must therefore provide and manage the services itself – which results in strategies and plans that are far beyond the authority’s local competence and capacity. But in other circumstances, it is often assumed that the local authority is unable to carry out this function and the private sector should take on the task. In both cases, problems arise if the decision is not made from a sound understanding of the problems and the choices available and the capacity is not put in place to ensure the chosen strategy is effective. A wide range of implementation modalities are possible but an appropriate and participatory planning process is essential, which includes ensuring the appropriate people have the knowledge and capacity to make the strategic decisions.

Access to knowledge about how to implement and manage water and sanitation services

The strategies for the delivery of water and sanitation services in small urban centres have been well developed and tested. There is a considerable body of knowledge documented from many different development agencies that describes the strategies, technologies and methods for implementation and maintenance. However, as few small urban centres concentrate sufficient demand/capacity to pay to allow standard solutions, this makes strategies more methodologically complex than those involved with large-scale piped water supply and sewerage systems. The knowledge spans disciplines addressing institutional, management, financial, social and technical aspects, which do not fit easily into conventional engineering approaches to water and sanitation service delivery – see Box 9.2

One difficulty is that while there is a great deal of information available on water and sanitation service provision, much of it is not readily accessible. The information is not accessible to those that need it in small urban centres. Nor is it used in the curricula of education programmes of the varied professionals that need to be engaged in implementation. Engineering solutions, especially for piped systems, are well established in the curricula of engineers but community-based solutions, small-scale technology, social skills and tools, and the financial and management options are rarely to be found in educational curricula.

Efforts have been made to assemble the knowledge in various toolkits³⁹ and it would be useful to assess the impact and accessibility of these tools. The World Bank Rural Water Supply and Sanitation Toolkit⁴⁰ provides some guidance for addressing capacity building in small urban centres where conditions are similar to rural communities. However, the complexity of linking these responses to other types of water supply and sanitation systems, integrating solutions and providing for the long-term capacity-building

support is rarely addressed in the water and sanitation documentation. *Upgrading Urban Communities: A Resource for Practitioners*⁴¹ has many examples of how to do it and gives case studies that include some capacity building; there is also *A Practitioners Companion on Provision of Water and Sanitation Services to the Urban Poor*.⁴²

The inhabitants of small urban centres and their own community organizations have knowledge and capacity that is not adequately tapped. In many places, there is a long history of community organizations managing their water supplies with appropriate systems and with coping strategies to deal with difficulties including water shortages. The use of participatory approaches recognizes this potential for communities to contribute in various ways to the planning, design, implementation and management of water and sanitation services. However, to be successful this requires a local authority capacity to manage the process and the understanding, often lacking, that the local authority is serving the community and not the other way round. The capacity of the local authority to maximize the benefits of community knowledge and commitment, particularly taking into account gender differences is still weak.

The lack of access to information and experience has to be addressed with a variety of strategies. The knowledge is often there but is not being applied. There is a range of complementary solutions to this including for example:

- National technical support structures to provide assistance to local authorities.
- Strengthening of centres of knowledge such as training centres, universities and research institutions in the field of small urban centre water and sanitation services – including such centres in small urban centres (as described in Chapter 4 in Pakistan) and professional engagement and knowledge sharing about technologies that work in small urban centres (as described in Chapter 4 in relation to condominium water and sanitation solutions).
- Twinning local authorities to share knowledge and experience; where community organizations are successful water and sanitation service providers, these may also be twinned.
- Improved physical/electronic access to well-structured information.

Capacity within utilities and local authorities

Most water and sanitation solutions for small urban centres are small scale and involve greater stakeholder participation in technology selection, implementation, management, payment strategies, operation and maintenance. They are also demanding in terms of management support from the local authority requiring a mix of disciplinary skills and complexity of decision making.

Local authorities with responsibility for service provision need to make strategic decisions on how best to use their limited capacity and how to supplement this by training, expansion and devolution of responsibility to stakeholders or the private sector.

Capacity for decision making and for action is required at several levels. This includes not only implementing programmes that may emphasize community or stakeholder capacity but also developing political awareness and political will that is built from knowledge; also managerial capacity to design and manage the implementation and subsequent operation and maintenance and the technical competence of staff for installation, operation and maintenance. Attention is also needed to community relations and to the customers who require capacity to choose, to understand and to participate in the roles and responsibilities that may be attributed to them (see Box 9.3).

Communication routes between the utility and community organizations are very important and as earlier chapters have shown, representative grassroots organizations can make the work of any utility substantially easier. The Water Utility Partnership toolkit on water and sanitation service provision in urban areas addresses

capacity building with the following advice for utilities working with communities:

- Ensure the capacity in the utility to engage with the low-income community, to manage and implement diverse options.⁴³ Train staff in participatory techniques, engage staff with social skills, allocate resources and develop a work plan for dealing with services to low-income communities.
- Develop routes for communicating effectively with the community.
- Develop collaboration mechanisms with other agencies working in the community such as the local authority, NGOs, health and the private sector.
- Raise awareness within the community of the benefits of safe water, sanitation and good hygiene practices. Awareness will need to be built on a range of water issues such as service level, management and pricing; on sanitation issues such as technology, financing and maintenance; and on hygiene issues such as sanitation, hand washing and environmental sanitation. Awareness raising should not be limited to the community and its leaders but may also be targeted at the local authority, collaborating agencies, teachers and other civic groups.
- Develop capacity within the community to take on specific management responsibilities for water and sanitation services.

Absence of awareness and information available to low-income groups about the importance of sound sanitary practices or what users should reasonably expect from providers will influence their readiness to demand or accept improved services. However, international experience suggests that in urban areas the demand for sanitation exists. The message is that appropriate information and communication for sensitization are necessary for consumers, but must be accompanied by making the appropriate facilities and management systems available. For example, an urban local body in India had spent

2.4 million rupees (equivalent to over US\$50,000) in one year on an awareness programme that yielded little or nothing as it was not supported by access to basic infrastructure.⁴⁴

Clearly the capacity requirements for local authorities of small urban centres to effectively deliver water and sanitation services may be beyond their reach, and alternative strategies appropriate to national realities may be considered. Their capacity needs may be reduced by allowing, authorizing or contracting others to provide the necessary services. Experience of large-scale private sector involvement suggests that they are not appropriate solutions for small urban centres as they may not be adequately supervised by the local authority and the financial basis may not be large enough to attract their interest. However, there is enough experience with liberalization of service delivery to allow small-scale private sector involvement to suggest that this is both a successful and effective means to increase coverage and provide a basic form of service that can be improved over time.⁴⁵ Chapter 6 described the importance of small-scale providers such as tankers, hand carts, small-scale piped systems and septic tank and latrine-emptying services. The informal nature of small-scale private sector operators affects the level of service (when legal they can produce a service equal or better than the utility) but does provide an opportunity to address capacity building, regulation or certification.

Alternative systems to supplement the capacity of small urban centre local authorities derive from national- or state-level intervention and are discussed in the next section.

Supporting structures and systems for small urban centre water and sanitation services

Recognition of the challenges facing small urban centres has led to supporting action from national governments that can take a variety of forms from local government associations to national technical support agencies and distance learning programmes.

Box 9.3 Capacity building for small urban centres: Experiences with water and waste-water operators in Zimbabwe

The work of water and waste-water operators (WVO) is key to health, environmental sustainability, and economic development and indeed in contributing to meeting the MDGs. Yet in the past in Zimbabwe these cadres have been invisible in terms of defined career path, skills development and recognition of their trade. Prior to 1993, training for these operators was offered on an ad hoc basis by the City of Harare. Even then this training was not institutionalized within the local authority activities but driven by a motivated individual.

Recognizing the inherent weaknesses of this approach to training, local authorities through the engineer's forum approached the Institute of Water and Sanitation Development for support in training WVOs. The training was then formalized and offered with a three-year progressive system starting with Operators Part 1 and moving through to Part 3.

After several years of implementation, the Institute worked towards registration of the course with the Ministry of Higher Education following national standards and regulations. Currently in line with other trades offered at tertiary institutions, the WVO course offers a national certificate, and national diploma. There are plans to start a higher national diploma that will see these students moving from their specialization to general management of water resources. This will be particularly relevant for plant supervisors and managers.

Source: Noma Nesenzi, Institute of Water and Sanitation Development, Zimbabwe.

Useful lessons

The course has been a learning curve for the institute, the local authorities and even for the Ministry of Higher Education:

- **Adaptation of materials.** A lot of materials were initially received from the Canadian Association of Water and Wastewater and these were then adapted.
- **Career development.** The students value what they see as career development and as such are willing to pay for their own education. Due to economic difficulties, local authorities withdrew the tuition support they used to give to students but instead of a decrease in enrolment there has been a steady increase.
- **Skill level.** The registration of the course with the Ministry of Higher Education opened an opportunity for raising the entry qualification and thus directly improving management of treatment plants.
- **Inclusive course.** The course is open to the plant operators working with private sector, urban and rural local authorities and also to the region.
- **Self-instruction.** The design of self-learning with specific contact points and examinations makes the courses cheaper and affordable.
- **The future.** The Institute is considering the registration of WVOs as a trade so that these often invisible cadres have a voice that can be used in bargaining for improved working conditions and can be eligible for reimbursements of tuition, as with other registered trades.

■ Technician training

Low- and many middle-income nations may not have systems for capacity-building support or supervision to ensure small urban centres are able to provide basic services of an acceptable standard; many have no programme for training of basic water and waste-water technical staff. Almost invariably, simple water and waste-water treatment facilities in small urban centres are managed and staffed by junior personnel with few educational or professional qualifications. These are front line personnel directly responsible for the quality of services delivered or the performance of waste management systems, thus responsible for both public health and welfare as well as the protection of water resources from pollution.

Addressing the qualifications of this category of staff is one strategy to build on existing systems and structures. Using experience from the Canadian Water and Wastewater Association and South Africa, Zimbabwe established a formal training programme for water and waste-water operators (see Box 9.3) that is also available in a distance learning format and suitable for adoption by other countries in the region. It is important to recognize that delivery of basic services is not only about recruitment of engineers, who may be in short supply and difficult to attract to small communities, but also the many technical support staff responsible for the day-to-day operation and maintenance. Action and results are possible with greater attention to the qualification of staff in these positions.

Box 9.4 Optimizing service delivery in Ghana

Recognizing the performance problems with existing water and sanitation systems in small urban centres, Ghana requested support from the Canadian International Development Agency (CIDA) to improve water system management, operation and maintenance by implementing the District Capacity Building Project (DISCAP) in northern Ghana.

It soon became obvious that building capacity at the district level was a necessary but not sufficient condition to obtain properly functioning water supply systems and DISCAP decided to complement these activities with small urban centre initiatives directed to water boards, operators and the community itself. The purpose of this initiative was to progressively build on acquired awareness, skills, empowerment and dialogue in order to improve administrative, managerial, operational and financial systems performance in a sustainable way. These local activities were supplemented by regional initiatives to provide the necessary enabling environment. Issues tackled at regional level were outstanding government loans to small urban centre systems, required policy changes, by-laws and clearly defining roles and responsibilities at all levels.

Source: Susana Sandoz, www.discap.org

This process, which is called the Optimization Model, addresses primarily the software aspects of the system, empowering stakeholders to focus on what they can do themselves. One of the main strategies takes the form of topical two- or three-day workshops followed by two- or three-day visits to each urban centre to put the learning into practice. Training is delivered by local training institutions.

Clusters of small urban centres were selected around a larger urban centre where a better qualified operator existed who was selected to act as mentor. An advantage of this approach is experience sharing among clusters of urban centres, as well as the possibility of joint provision of services like preventive maintenance to all centres in a cluster by private sector providers.

After 18 months' implementation, real sustainable advances have been observed in stakeholders' attitude changes, increased dialogue and cooperation, a better gender balance and more effective staff. The systems are now reducing their water losses, are more financially stable, administrative procedures are in place and service to customers has substantially increased. Eight female system operators are working well and the role of women in decision-making roles has increased.

■ International/national technical support

Government may not be equipped to provide the type of support that local authorities need. Box 9.4 gives an example of a short-term international intervention in Ghana while Box 9.5 describes a new structure specifically designed to support small urban centres in Ecuador.

In other situations NGOs can fill a gap and have proved to be very effective in some cases, as examples in Chapters 4 to 7 show. However, in order to focus attention on sustainable water and sanitation service provision, benefits will be gained from a more structured relationship between the NGO and the local authority where complementary roles are better defined. NGOs themselves cannot be assumed to have adequate technical and managerial capacity for effective and sustainable water and sanitation service provision. In Ghana, after investment in a small urban centre upgrading programme that saw water and sanitation facilities in over 100 small urban centres improved, it was necessary to address failing operation and maintenance. The regional programme in Ghana described in Box

9.4 demonstrated some of the benefits from tackling capacity building and establishing support structures from local capacity-building institutions and regional mentors.

Local governments in small urban centres often lack adequate professional staff at the more senior levels to take on water and sanitation responsibilities. This was the case in Ecuador where, after decentralization, a survey of 214 municipalities showed that 89 per cent indicated the need for technical assistance, in particular in the commercial and administrative areas of water and sanitation provision.⁴⁶ This led to the development of the PRAGUAS technical assistance programme that promotes delegated management models and provides a range of benefits to local authorities (see Box 9.5). This approach of national government providing structured support to local authorities is one strategy to address the capacity gap at local level as well as to promote the policies and principles guiding national development. While the goals may vary according to national objectives, the concept of using a national programme or national institution to support the local

authority in service provision has been proved to have potential for filling a gap in capacity.

How to support small urban centres

The achievement of the MDG targets for water and sanitation by 2015, and continued progress thereafter until everyone is served with adequate water and sanitation services, requires concerted attention to capacity. The particular position of small urban centres as key governance and service centres both for their populations and for those in their region – and often as focal points for rapid growth but also for poverty and the unserved – merits special attention. This is particularly true as they frequently lack the human and financial capacity to address water and sanitation problems on their own without external assistance. More coordinated action is necessary in five key areas, drawing on the experience and knowledge already available.

■ Commitment to action

National and local commitment is required to address the lack of capacity to manage and sustain water and sanitation services in small urban centres. The problem is clear and will respond most effectively to action coordinated at national and local levels, using a strategic planning approach. Such an approach has to recognize the needs and the opportunities for more flexible approaches to water and sanitation service delivery for small urban centres. As Chapter 5 emphasized, national planning has to be linked to local planning – to allow solutions and actions appropriate to each locality within the framework of national support, assistance and monitoring. Capacity-building components should be more clearly articulated within projects and programmes, with outcomes, impacts and indicators specified. At the local authority level, taking a strategic approach will mean tackling the problem with multi-structured actions, including encouraging small-scale private sector involvement in service delivery, facilitating community-based initiatives and developing its own capacity.

Box 9.5 PRAGUAS technical assistance to municipalities in Ecuador

Signing up for technical assistance from PRAGUAS (Programa de Agua Potable y Saneamiento para Comunidades Rurales y Municipios Pequeños), the municipality gets:

- a services evaluation and assessment;
- an estimate of investments needed to improve water supply services over the next ten years;
- design of a new management model;
- technical assistance for optimizing system performance.

There are three stages to the programme:

- stage 1 – evaluation and assessment (2–4 months);
- stage 2 – management model implementation (6 months to 1 year);
- stage 3 – follow-up and second incentive payment (2 years plus).

The programme includes financial incentives to municipalities to introduce a delegated management model where service administration, operation and maintenance are delegated to a public or a private operator. 43 municipalities signed up with PRAGUAS for technical assistance.

Source: WSP (2005) *Lessons from Small Municipalities in Ecuador. Delegating Water and Sanitation Services to Autonomous Operators*, Water and Sanitation Program, World Bank, Washington DC

■ Building capacity of small urban centres

There are clearly many areas where training of local authority/utility staff is needed. However, this is unlikely to be either sustainable or successful if carried out without reference to larger strategic planning systems of both the small urban centre/local authority and the national government. Capacity building needs to be supported and sustained through local institutions whether they be universities, training institutions or private consultants. This requires improved anchoring of knowledge and information at resource centres within the country and as close to local action as possible.

Twinning or facilitating the linkages between local authorities is another strategy to facilitate peer-to-peer exchange of good practice where ‘those with something to learn’ are partnered with ‘those with something to share’. Training needs for local authority staff is not restricted to technical personnel and capacity building should also be targeted at the management level in charge of small urban centres. They are the ones to establish the enabling environment and the framework for action. The final choice of strategies and technical solutions to

problems will be made at this level and they should include pro-poor, gender aware and stakeholder participation strategies. The governance decisions create the enabling environment for the local authority staff, the private sector and the community to act.

■ **Developing or strengthening support structures for local authorities**

Addressing the lack of capacity at the level of small urban centres may take a combination of routes. The establishment of a functional technical support structure can give special advice to small urban centres on design, financing, management, and operation and maintenance, gaining advantages of scale and reducing the need for recruitment of expensive personnel at the local level. This may be achieved through government structures, utilities, franchise agreements with NGOs or the private sector. Given that in most small urban centres, it is not possible to develop the full technical competence and broad capacities, more centralized support structures can be both effective and acceptable and may vary from support with design and implementation to more targeted intervention supporting operation and maintenance weaknesses in the local authority.

Adoption of service standards and guidelines may also provide a basis against which formal training, education or professional qualifications can be delivered, and monitoring of small urban centre performance can be measured. The important role of water and waste-water technical staff for day-to-day operations demands greater attention of national authorities to ensure the standardized training, certification and employment, not only for small urban centres but for all water and waste-water plants. Given the pivotal role that these operatives play, this is one effective and achievable goal to be taken up at the national level. It will also address in part the recruitment problem of local authorities who often cannot identify a professional cadre of personnel below that of engineer with any formal training in water supply and sanitation.

■ **Improving access to knowledge**

The wealth of local and international experience in addressing water and sanitation service delivery for small urban centres needs to be better packaged and made more suitable for local adaptation. More attention should also be given to making it more accessible to different levels of personnel. Internationally prepared material has very limited attraction due to the lack of local relevance. However, when anchored in local capacity-building institutions, this international knowledge can be adapted to the appropriate social, cultural and environmental context. Local capacity builders as the repository of knowledge can learn and build up experience in a structured way over time, providing sustainability and relevance to local water and sanitation solutions and are the only long-term solution to present capacity constraints. The formation and strengthening of training networks, which might involve numerous disciplines and attract participation from public, private and civil society organizations, may be useful in providing a 'safe space' for colleagues to work together to build internal capacity.

■ **New models of support from external agencies**

As discussed in earlier chapters, if the water and sanitation MDGs are to be met by 2015, there is a need for innovative fast-track delivery mechanisms. Since most small urban centres have a combination of rural and urban characteristics, there is a need for development assistance agencies to design new approaches and delivery mechanisms to improve and extend service coverage. In many cases, external support to small urban centres is provided to groups of such centres or comes under rural water supply and sanitation programmes. Under such schemes, little attention is given to capacity building to support investments in physical infrastructure and this often means a rapid deterioration in services. Many small urban centres, especially those that are trading centres supporting their surrounding hinter-

lands, also have large influxes of non-residents, who also require services.

The time-frame for implementing water and sanitation projects in many development agencies is also too short to keep pace with the rapid unplanned growth in many small urban centres. Typical project cycles of five to ten years mean proposed schemes are outdated by the time they are implemented and inadequate in relation to demand. New delivery mechanisms such as the European Union Water Facility, the African Water Facility and programmes such as UN-HABITAT's Lake Victoria Water and Sanitation and Mekong initiatives strive to change the approach. They promote pro-poor approaches in programme design that maximize

the complementarity between investments in physical infrastructure and local capacity building to sustain the investments. There is evidence that if sufficient capital is injected into small urban centres to kick-start investments in water and sanitation and support for capacity building to improved revenue collection, operation and maintenance, there is a real possibility that the MDGs can be achieved in a shorter time-frame. Although this report highlights water and sanitation needs, it is every bit as important to consider the associated elements of solid waste management and drainage. Apart from having a comparable impact on the living environment, they also present opportunities for linking provision of services with income generation.

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