Environment&Urbanization Brief - 8

Water and sanitation; what will deliver the improvements required for urban areas?

SUMMARY: Around 800 million urban dwellers lack the sustainable access to safe drinking water that the Millennium Development Goals prioritize, and close to 1 billion lack adequate sanitation. This helps explain why infant and child mortality rates for poor urban populations can be as high as those for poor rural populations. Fifteen years of international agency support for privatization has not produced the hoped-for improvements. The increased focus on water stress as being the problem is often ill-conceived, as inadequacies in provision for water and sanitation have little to do with inadequate freshwater supplies and much to do with inadequate water management. New directions are desperately needed to stop water and sanitation deficits growing in the increasingly urbanized societies of Africa, Asia and Latin America.

There are new approaches based on partnerships between government and communities that work on a large scale yet require modest resources. This Brief gives examples of community-designed, constructed and managed toilet blocks that serve hundreds of thousands of low-income people in Indian cities, and water points and sanitation blocks that have greatly improved provision in many of the poorest settlements in urban Bangladesh. It also illustrates ways to improve provision that are not classified as "water and sanitation" projects, including:

- *housing credit programmes that help low-income households afford better provision for water and sanitation;*
- *programmes providing the inhabitants of informal settlements with legal tenure, which allows utilities to extend provision for piped water and sewer connections;*
- *"slum and squatter" upgrading, which includes improved provision for water and sanitation, although these are not classified as water and sanitation projects; and*
- *local democratic reforms that allow poorer groups more influence and get more local resources devoted to water and sanitation.*

In thinking of how to meet the Millennium Development Goals for water and sanitation, governments and international agencies need to think of the urban groups who lack adequate provision not as the "targets" of their programmes but as partners and as clients to whom they should be accountable.

I. THE LARGE UNDERESTIMATION IN THE SCALE OF NEED

AROUND HALF THE urban population of Africa and Asia lack adequate provision for water and sanitation. In Latin America and the Caribbean, around one-quarter lack adequate provision (Table 1). Official UN statistics, on the other hand, show that the vast majority of these urban dwellers have "improved" provision. But, as this UN source explains, there is a difference between "adequate" and "improved" provision. There are no data for most nations on the proportion of people with "adequate" provision or with "sustainable access to safe drinking water" as demanded by the Millennium Development Goals.

Table 1: The number of urban dwellers lacking provision for water and sanitation in 2000

Region	Indicative estimates for the number (and proportion) of urban dwellers without "adequate" provision for:	
	Water	Sanitation
Africa	100–150 million (ca. 35–50%)	150–180 million (ca. 50–60%)
Asia	500–700 million (ca. 35–50%)	600–800 million (ca. 45–60%)
Latin America and the Caribbean	80–120 million (ca. 20–30%)	100–150 million (ca. 25–40%)

SOURCE: UN–Habitat (2003), *Water and Sanitation in the World's Cities; Local Action for Global Goals*, Earthscan, London, 274 pages.
N.B. This report emphasizes that its figures are "indicative estimates" because most governments do not report on provision for water and sanitation using definitions for "adequate" provision.

This is a Brief of the October 2003 issue of the journal ***Environment&Urbanization***, which was on the theme of **Water and Sanitation**. It draws on the papers in this issue (which are listed on the back page, along with details of how to obtain the issue or obtain copies of individual papers electronically). This summary, produced with the support of the Royal Danish Ministry of Foreign Affairs (DANIDA) and the UK Government's Department for International Development (DFID), is to allow the journal's main findings to reach a wider audience.

Available data only allow assessments of "improved" provision, which for water means access to at least 20 litres per person per day from a household connection, public standpipe, borehole, protected dug well, protected spring or rainwater connection within one kilometre of the user's dwelling.[1] Clearly, this is not the same as "adequate" provision. In most cities, 90–100 per cent of the population are within one kilometre of a standpipe or a public well, but these can be shared between hundreds or even thousands of people.[2] The water available from these sources is often of poor quality or only available intermittently, yet it still meets the official UN criteria for "improved" provision. And 20 litres per person per day is not enough for good health, especially for food preparation, laundry and personal hygiene.

Improved provision for sanitation means access to a latrine of any kind.[3] But in many urban settings, dozens of households share each latrine, so access is difficult and maintenance is often inadequate. Many latrines are unsafe and lack provision for hand washing and anal cleaning. In many urban settings, they are difficult to empty. Children will not use most pit latrines because they are frightened of falling into the pits, and of what are usually dark, dirty and smelly places.[4] As World Health Organization staff stress, what the UN defines as "improved" provision does not greatly reduce the risk of faecal–oral diseases.[5]

The estimates in Table 1 used definitions for "adequate" provision that do greatly reduce the risk of infection from faecal–oral diseases. This includes regular high quality water supplies piped into the house or house yard, good quality toilets or latrines that are easily accessible and used by all family members, and safe and convenient disposal of wastewater. If the criteria for provision are changed from "improved" to "adequate", three to four times more urban dwellers are found to lack provision.[6] In addition, trends over time look much less impressive; the increase in the numbers reached with "adequate" provision during the 1990s is much less than the number reached with "improved" provision. Estimating the "scale of need" in urban areas and the funding required to address this depends on which of these definitions is used. The task of halving the number of people lacking provision for water and sanitation between 1990 and 2015 (as called for by the Millennium Development Goals) is far larger and more complex if it is based on the number lacking "adequate" provision rather than on the number lacking "improved" provision.

A children-centred view of provision for water and sanitation helps explain why higher standards of provision are needed.[7] A million or more infants and children die each year from diseases directly related to inadequate provision, and hundreds of millions are debilitated by illness, pain and discomfort. Their nutritional status is often compromised by water-related diseases (especially diarrhoea and intestinal worms), and this has impacts not only on physical development but also on social and mental development. Under-five mortality rates in the urban areas of many of the poorest nations are still between 150 and 200 per 1,000 live births, which implies much higher under-five mortality rates among low-income urban dwellers. In many nations, high mortality rates and disease burdens among children in low-income areas are hidden by aggregate statistics. For instance, in Nairobi, Kenya's capital, under-five mortality rates are around half the national average (61.5 per 1,000 live births), implying that urban conditions are much better for children – but they are 151 per 1,000 live births in the informal or illegal settlements where around half of Nairobi's population live.[8]

An urban bias in infant and child mortality statistics is to be expected. Most middle- and upper-income groups live in urban areas and have the resources and political power to bias investment to where they live. Urban areas also present economies of scale and proximity for good quality provision of services that lower mortality rates. But in many low-income nations, infant and child mortality rates in urban areas are not much lower than those in rural areas, and may be higher in the poorest urban populations than in the poorest rural populations. It may be cheaper to reduce health risks in urban areas – but these same health risks are much greater when people and their wastes are concentrated in large, high-density settlements with no provision for water, sanitation and drainage.

Official statistics can greatly overstate provision for water and sanitation, as illustrated by reports from low-income households in Pune and Mumbai.[9] Official statistics for Mumbai claim that 100 per cent of its population are served with piped water. Yet, interviews with low-income women highlight the challenges they cope with, including high prices, long lines by water points, irregular supplies, dirty water and the need to wait until dark to defecate in public spaces.

Discussions of water and sanitation often neglect drainage, and there can be serious inadequacies in provision for storm and surface drainage in urban areas and heavy impacts from flooding on urban populations, especially for low-income households.[10]

II. IS THE PROBLEM THE LACK OF AID FOR WATER AND SANITATION?

ONE OBVIOUS REASON for these inadequacies in provision is the lack of donor funding for improvements. Many donor agencies have long avoided working in urban areas, or have restricted funding to urban projects, in the belief that urban populations are already better served. They fail to see the extent of poverty and lack of provision among poor urban populations and the speed with which urban poverty is growing in most nations. Improving provision in urban areas does need substantial funding, especially for the big "trunk infrastructure" for water, sanitation and drainage, into which community or neighbour-

1. Piped systems are considered acceptable if they operate at 50 per cent of capacity, and hand pumps if they operate for 70 per cent of the time; see WHO and UNICEF (2000), *Global Water Supply and Sanitation Assessment, 2000 Report*, World Health Organization, UNICEF and Water Supply and Sanitation Collaborative Council, 80 pages.

2. See the paper by Meera Bapat and Indu Agarwal listed on the back page.

3. Those with access to a private or shared toilet with connection to a public sewer or a septic tank, or access to a private or shared pour-flush latrine, simple pit latrine or ventilated improved pit latrine are classified as having "improved" provision; see reference 1, WHO and UNICEF (2000).

4. See the paper by Sheridan Bartlett listed on the back page.

5. Prüss, Annette, David Kay, Lorna Fewtrell and Jamie Bartram (2002), "Estimating the burden of disease from water, sanitation and hygiene at a global level", *Environmental Health Perspectives* Vol 110, No 5, pages 537–542.

6. These are indicative estimates based on reviews of more than 200 studies of individual cities and smaller urban centres; see UN–Habitat (2003), *Water and Sanitation in the World's Cities; Local Action for Global Goals*, Earthscan, London, 274 pages.

7. See the paper by Sheridan Bartlett listed on the back page.

8. APHRC (2002), *Population and Health Dynamics in Nairobi's Informal Settlements*, African Population and Health Research Centre, Nairobi, 256 pages.

9. See the paper by Meera Bapat and Indu Agarwal listed on the back page.

10. See the paper by Jonathan Parkinson listed on the back page. This also discusses the ways in which these inadequacies can be addressed, including the necessary integration of structural and non-structural strategies for flood control and the mitigation of environmental health problems.

hood improvements are integrated. There is not much point in extending piped supplies to unserved communities if bulk water supplies are insufficient to cope with the new customers.

However, it is often possible to greatly improve provision for low-income households without large donor funding. In India, a programme of more than 400 community-designed, built and managed toilet blocks in various cities now serves hundreds of thousands of people. These toilet blocks work much better than the conventional municipal-designed, contractor-built ones, but actually cost less, are maintained by community organizations and most include special toilets for children at the front. This programme was implemented by the Indian NGO SPARC working with two groups of community organizations, *Mahila Milan* (cooperatives formed by women "slum" and pavement dwellers) and the National Slum Dwellers Federation (and its member federations). The challenges for this programme were more institutional and political than financial. Their contracts meant less work for private sector contractors and no bribes for government employees; and World Bank procurement procedures had to be changed.[11]

Similarly, a large programme of community-managed water points and sanitation blocks in Bangladesh's two largest cities, Dhaka and Chittagong, required no large external funding. It was implemented in 150 "slums" by an international NGO (WaterAid) working with seven local NGOs. By 2001, 355 water points, tubewells or sanitation blocks had been constructed.[12]

These two programmes are unusual:

- in their focus on community management and on public toilets (which most international agencies are reluctant to support);
- in being able to reach hundreds of thousands of people despite being implemented by NGOs; and
- in their drive to reduce the gap between the cost of achieving adequate provision and what can be afforded by low-income groups – a gap that is always present in any effort to improve provision for very low-income groups.

Both programmes provided large numbers of low-income people with good quality facilities, kept unit costs as low as possible, and charged users a fee so that maintenance costs could be covered and, in the case of Bangladesh, most of the capital costs recovered. Yet, the cities and communities where these large-scale programmes were implemented (Dhaka, Chittagong, Mumbai, Pune and others) have some of the lowest-income urban populations. In Dhaka, for instance, many households earn less than US$ 5 a month.

In one sense, such programmes seem unfair. Why should low-income groups settle for community toilets and public standpipes while middle- and upper-income groups have piped water and sewer connections to their homes, often provided at less than their real cost? But this is often all that is possible in the real world, given the unwillingness of governments and international agencies to allocate large sums to low-income urban areas. Nor has the rush of new capital investment from private water companies materialized, despite the hopes and support for private sector provision from many international agencies.[13]

Neither the Indian nor the Bangladeshi programmes have been problem-free, but they show how locally driven solutions can deliver significant improvements for large numbers without large-scale external funding. The Indian example, in particular, demonstrates unusual levels of community control in design, construction and management. The Bangladeshi example shows how much the gap can be narrowed between costs and the capacity of low-income households to pay. In both cases, the new facilities, being community managed, can make special allowances for individuals or households who cannot afford to pay the official price.

These programmes also demonstrate that implementation on a large scale requires cooperation with government agencies and/or the organizations responsible for building and managing trunk infrastructure – even if this is only to permit these community initiatives. SPARC in India and WaterAid and its partner NGOs in Bangladesh could have built a few community water points or one or two public sanitation schemes; this is generally what NGOs do. It is often easier not to work with local government. Instead, they chose to manage programmes on a much larger scale – a far more complex task that called for a change in the attitude of local authorities towards this kind of provision, and a change in the relationship between these authorities and the organizations formed by "slum" residents and pavement dwellers. There are other cases of community-based initiatives to improve provision for low-income groups that required little external funding. For instance, in Orangi, Karachi's largest informal settlement, community-managed public water tanks improved water availability for large sections of the population. The extent of the improvements was modest in this case – community water tanks that helped ensure more regular supplies – but again, this showed how partnerships between community organizations and local government, along with better use of local resources, made improved provision possible.[14]

Given the lack of progress in improving provision in urban areas for most low-income and many middle-income nations over the last 30 years, whether through conventional private or public sector provision, these examples have wide relevance. Their importance lies not so much in what they did as in the space negotiated for community-driven innovation. Community provision cannot deliver the trunk infrastructure. Community facilities often need water mains to draw from. And community toilets in high-density urban settings are easier to manage and cheaper to build if they can connect to sewer systems. But if governments are willing to ensure that the trunk infrastructure is in place, there are many local possibilities for improved provision – whether through community-designed and managed public facilities (as

11. See the paper by Sundar Burra, Sheela Patel and Tom Kerr listed on the back page.

12. See the paper by Suzanne Hanchett, Shireen Akhter and Mohidul Hoque Khan with Stephen Mezulianik and Vicky Blagbrough listed on the back page.

13. As described in the paper by Jessica Budds and Gordon McGranahan listed on the back page.

14. See the paper by Noman Ahmed and Muhammad Sohail listed on the back page.

in the toilet blocks in the Indian cities), the NGO–community organization partnerships (as in Dhaka and Chittagong) or other models (including the community-financed local sewers that connect to individual houses, as in the Orangi Pilot Project model in Karachi and other cities in Pakistan).[15]

III. DISAPPOINTMENT WITH THE PRIVATE SECTOR

FOR MORE THAN a decade, the increased involvement of the private sector in water and sanitation has been vigorously promoted by many international agencies as the solution to improved provision. Yet this has achieved neither the scale nor the benefits anticipated.[16] The search for alternative solutions to public provision from 1990 onwards was understandable, given the very limited achievements during the 1980s of the United Nations International Drinking Water Supply and Sanitation Decade and the low priority given by virtually all international agencies to urban water and sanitation.[17] There was a recognition that new sources of capital and more attention to cost-recovery were needed and that the role of private investment flows in economic development had been underestimated. But even in 1990, it was never established how international profit-seeking enterprises were going to provide new capital to deliver (often expensive) trunk infrastructure and maintain this for households with very limited capacity to pay either capital or running costs. And many of those in greatest need of improved provision lived in settlements where land tenure was uncertain or illegal and where the costs for installing pipes was often high because of difficult terrain, complex and cramped plot layouts and large distances from existing water mains and trunk sewers or drains. The fact that many case studies showed the urban poor paying high prices for water (and sometimes for access to toilets) encouraged an assumption that "the poor could pay" for conventional public or private sector provision. But if low-income households have to pay a water vendor or a water kiosk very high prices for a few litres per day, it does not mean that they will pay the same amount per litre if connected to a piped water supply. The examples from India, Bangladesh and Pakistan mentioned above show that self-financing, or close to self-financing, schemes can serve low-income groups, but only when community-driven solutions drive down capital costs (including contractor profits) and help to moderate management costs, or when small-scale private water (and sometimes sanitation) providers operate in competitive markets.[18] No international water company could build and run the toilet blocks in Mumbai and Pune, delivering the quality of service and the low price achieved by community provision, and still make the kind of profit they require. Nor could they (or municipal authorities) install sewers at the unit cost achieved by community provision in Karachi, supported by Orangi Pilot Project. The barriers to high quality provision for water and sanitation in low-income settlements persist, whether utilities are publicly or privately operated.[19] It is worth noting that the World Bank's 2003 *World Development Report* no longer presents private sector provision as the key to improved water and sanitation provision in urban areas.[20]

IV. WATER STRESS OR WATER MISMANAGEMENT?

BETWEEN THE 1980s and the 1990s, there was a switch from a concern with improved water provision for human use to a concern with water scarcity. The voluminous literature on water stress generally assumes that water scarcity is at the root of problems with provision, and much of the literature legitimates its concern for water scarcity by making this claim. But the nations facing water stress are not the nations with the greatest inadequacies in provision for water.[21] Many large cities where provision is inadequate have little or no overall shortage of freshwater resources.[22] Why, then, in so many large cities do large sections of the population receive water for only a few hours a day?[23]

A growing number of case studies show the local circumstances that contribute to water shortages despite relatively plentiful local supplies. Guadalajara, Mexico's second largest city, faces a severe water shortage because the vast Lake Chapala on which it draws is drying up, with potentially dire economic and environmental consequences for the city and region.[24] But the problem is caused by inadequate water management "upstream" of Guadalajara, while inadequate wastewater management in Guadalajara produces serious problems for users "downstream". There are innovations in Mexico on multi-stakeholder water basin management that seek to address problems like these, but solutions are difficult when they involve so many state governments (the river that feeds Lake Chapala runs through five different states), the federal government and many farmers and industries. The problem is less one of freshwater supply than of difficulties in developing institutions that can manage its use and allocation in ways that are fair to the poor.

There are also growing concerns about water supplies for Beijing, China's capital.[25] Groundwater levels are dropping as water withdrawals exceed aquifer recharge rates, and most groundwater is contaminated. Around the city, agriculture has shifted towards higher value products, but agriculture is a major water user and contributor to water pollution. Here, as in Guadalajara, addressing water stress requires a regional perspective in which agriculture, as well as industry, the power sector and residential and commercial areas must improve the efficiency with which they use freshwater and reduce water pollution. However, in neither of these cities does a move to "integrated water resource management"

15. Orangi Pilot Project (1995), "NGO profile: Orangi Pilot Project", *Environment and Urbanization* Vol 7, No 2, October, pages 227–236.

16. As described in the paper by Jessica Budds and Gordon McGranahan listed on the back page; also Hardoy, Ana and Ricardo Schusterman (2000), "New models for the privatization of water and sanitation for the urban poor", *Environment and Urbanization* Vol 12, No 2, October, pages 63–75; and Loftus, Alexander J and David A McDonald (2001), "Of liquid dreams: a political ecology of water privatization in Buenos Aires", *Environment and Urbanization* Vol 13, No 2, October, pages 179–199.

17. UNCHS (Habitat) (1996), *An Urbanizing World: Global Report on Human Settlements, 1996*, Oxford University Press, Oxford and New York; also Satterthwaite, David (1997), "The scale and nature of international donor assistance to housing, basic services and other human settlements-related projects", WIDER, Helsinki, 38 pages.

18. Solo, Tova Maria (1999), "Small-scale entrepreneurs in the urban water and sanitation market", *Environment and Urbanization* Vol 11, No 1, April, pages 117–131.

19. See the paper by Jessica Budds and Gordon McGranahan listed on the back page.

20. The World Bank (2003), *World Development Report 2004: Making Services Work for Poor People*, Oxford University Press, 288 pages.

21. McGranahan, Gordon (2002), "Demand-side water strategies and the urban poor", PIE Series No 4, IIED, London, 67 pages; also see reference 6, UN–Habitat (2003).

22. See reference 6, UN–Habitat (2003); also Connolly, Priscilla (1999), "Mexico City: our common future?", *Environment and Urbanization* Vol 11, No 1, April, pages 53–78; and Anton, Danilo J (1993), *Thirsty Cities: Urban Environments and Water Supply in Latin America*, IDRC, Ottawa, 197 pages.

23. See reference 6, UN Habitat (2003).

24. This draws on the case study by Etienne von Bertrab listed on the back page.

25. This draws on the case study by J Wolf, M S van Wijk, X Cheng, Y Hu, C A van Diepen, A W Jongbloed, H van Keulen, C H Lu and R Roetter listed on the back page.

26. See the paper by Jonathan Baker and Hege Wallevik listed on the back page; also *Environment and Urbanization* Vol 15, No 1, April, which was on rural-urban transformations.

necessarily mean better water and sanitation for poor city dwellers or adequate water supplies for poor farmers.

V. RURAL–URBAN PERSPECTIVES IN WATER USE AND WASTEWATER MANAGEMENT

BOTH URBAN AND rural specialists often overlook the multiple interconnections between rural and urban households and enterprises.[26] Urban specialists often miss the importance of agriculture around the city to food supplies, while rural specialists miss the opportunities provided to farmers by city-based demand for higher value agricultural products (including fruit, vegetables and meat and dairy products).[27] Most discussions of water also miss rural–urban connections, as secure city water supplies often depend on better watershed management "upstream", while wastewater flowing out of cities is usually important for farming "downstream". For instance, in the city of Hubli–Dharwad (in India), untreated wastewater flows via sewers and wastewater drains into natural water courses that flow into the hinterlands – and different cropping systems draw on these wastewater flows (vegetables, vegetables mixed with field crops and agroforestry).[28] Better management is needed to reduce the environmental and public health risks faced by farmers and food consumers, without threatening the farmers' livelihoods and food production. In Kumasi (Ghana's second largest city), there are also positive aspects to the use of urban wastewater streams for agricultural production and farmers' livelihoods, but here too there are health risks to farmers and consumers, and local measures are needed to address these.[29]

VI. THE MILLENNIUM DEVELOPMENT GOALS

WHATEVER ONE MAY think of the validity or utility of the Millennium Development Goals (MDGs) that are currently influencing the policies and priorities of most governments and international agencies, they include goals that have huge importance for low-income urban dwellers: universal primary education, much-reduced infant, child and maternal mortality, halving the number of people without safe drinking water, adequate incomes and food intakes by 2015 compared to 1990, and halting and then reversing the spread of AIDs, malaria and other major diseases. If these objectives are achieved in urban as well as rural areas, it would mean significant benefits for low-income urban populations. The MDGs also include the need to significantly improve the lives of at least 100 million "slum" dwellers by 2020 (which includes increasing the proportion of people with "improved" sanitation and access to secure tenure).

The MDGs are unusual in that they include some specifically urban components. But this does not mean that governments and international agencies will address them.[30] Much of the literature on the MDGs focuses exclusively on rural areas. The goal on slum dwellers is often not even mentioned. Many assume that virtually all hunger, income poverty and inadequate provision for water and sanitation is in rural areas, despite the evidence to the contrary.[31]

With regard to water and sanitation, the MDGs are relatively clear: to halve the proportion of people without sustainable access to safe drinking water and access to improved sanitation between 1990 and 2015. As mentioned earlier, the definitions brought to bear will have a huge influence on the attention given to urban deficiencies. If the MDGs act on the definitions used by WHO/UNICEF for "improved" provision, urban areas will get little attention. If the definitions used by UN–Habitat for "adequate" provision are the standard, then urban areas will demand far more attention. But if more attention is given to urban areas, then note needs to be taken of the kinds of community–municipal partnerships that were discussed earlier in this Brief.

VII. THINKING OUTSIDE THE "WATER AND SANITATION" BOX

PROVISION FOR WATER and sanitation can be improved in many ways, although some are not classified under "water and sanitation". For instance, housing credit programmes can allow low-income households to afford better quality homes that have adequate provision for water and sanitation.[32] Programmes providing those who live in informal settlements with legal tenure may allow local utilities to extend provision for piped water and sewer connections.[33] "Slum and squatter" upgrading usually includes improved provision for water and sanitation, although these projects are not classified under water and sanitation. Local democratic reforms that allow poorer groups more voice and influence may get more local resources devoted to improved water and sanitation or support for the community-driven innovations described earlier. **To meet the Millennium Development Goals for water and sanitation, governments and international agencies need to think of the urban groups that lack adequate provision not as the "targets" of their programmes but as their partners; and also as their clients, to whom they should be accountable**. The benefits of such partnerships in terms of "sustainability" and cost-effectiveness are evident in the examples given earlier. They can even help politicians get re-elected, as many local politicians in Mumbai have realized.

27. See the paper by J Wolf, M S van Wijk, X Cheng, Y Hu, C A van Diepen, A W Jongbloed, H van Keulen, C H Lu and R Roetter listed on the back page; also van den Berg, L M, M S van Wijk and Pham Van Hoi (2003), "The transformation of agriculture and rural life downstream of Hanoi", *Environment and Urbanization* Vol 15, No 1, April, pages 35–52.

28. See the paper by Andrew Bradford, Robert Brook and C S Hunshal listed on the back page.

29. See the paper by Bernard Keraita, Pay Drechsel and Philip Amoah listed on the back page.

30. See the paper by David Satterthwaite listed on the back page.

31. See IIED (2003), *The Millennium Development Goals and Local Processes; Hitting the Targets or Missing the Point?*, International Institute for Environment and Development, London, 156 pages. This is available in print at no charge (e-mail humans@iied.org) and can be downloaded from IIED's website (www.iied.org).

32. See the papers by Bruce Ferguson and Jesus Navarrete and by Mohini Malhotra listed on the back page. The first of these gives examples of government programmes that have successfully increased the supply and reduced the cost of land for housing and, in so doing, effectively avoided the increase in "slums". It also discusses how microfinance programmes can help to fund upgrading programmes that also generally include better provision for water and sanitation. The paper by Mohini Malhotra describes the growing trend for microfinance institutions to provide loans for home improvements – which often include such improvements as connection charges to piped water and sewer systems or better provision within the home through better internal plumbing and/or toilets.

33. See the paper by Lula da Silva, Luiz Inácio Cassiana Rosa de Castro, Sueli de Fátima Machado, Alveci Oliveira de Orato Santos, Luiz Tarcísio Teixeira Ferreira, Paulo Teixeira, Marta Suplicy and Olívio Dutra listed on the back page. This gives details of an ambitious programme in São Paulo, Brazil, for land tenure legalization on public land. This is relevant to water and sanitation because it is difficult for conventional utilities to provide high quality provision in settlements where the land is occupied illegally (and they are often not permitted to do so). The paper includes extracts from a speech by President Lula on his recollections of living in areas of São Paulo that were often flooded, and of cockroaches and rats competing for dry space as the floodwaters rose. The speech was made at a ceremony where legal title was being given to many low-income communities.

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