

Governance of Water and Sanitation Services for the Peri-urban Poor

A framework for understanding and action in metropolitan regions



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Introduction

It is a well-documented fact that water supply and sanitation systems fall short of present and future requirements in many countries, leaving some of the world's poorest people without adequate access to these most basic services. The well-being and livelihoods of millions of households and home-based enterprises in urban, rural and peri-urban areas are, therefore seriously impaired by the considerable time and money spent collecting water, buying it from private vendors or fighting diseases arising from deficient water supplies and poor or non-existent sanitation. And yet, while national and international initiatives and commitments to improve access to water and sanitation in the developing world focus on urban and rural areas, many tend to neglect the peri-urban context.

BOX 1: Understanding the Peri-urban Interface

Growing recognition of the co-existence of both rural and urban features within and beyond city limits has led to the distinction of common features of the peri-urban interface. Several research studies shows that some of these features are:

- A mix of urban and rural land uses and economic activities;
- Heterogeneous and rapidly changing socio-economic groups, whose livelihoods often draw on both natural resource-based activities and urban opportunities;
- The presence and activity of multiple and/or fragmented public and private agencies, often overlapping and with contradictory remits; and
- Location outside of the core or formal water supply and sanitation network.

The importance of considering water and sanitation in the wider context of metropolitan regions arises from the fact that there are social, economic, environmental and institutional interactions between urban and rural areas which are captured in the concept of the 'peri-urban interface'. This defines the context where many of the changes in urban-rural flows take place, leading both to problems and to opportunities not only for peri-urban communities but also for the sustainable development of adjacent rural and urban systems.

For those involved directly or indirectly in the long-term planning and daily management

of metropolitan regions in developing countries, the peri-urban context poses a unique set of circumstances requiring diverse and flexible solutions. Therefore, in order to help ensure the achievement of a long-term goal of more reliable, affordable and sustainable access to water and sanitation services to the poor peri-urban population of metropolitan areas, a specific institutional approach that takes into account peri-urban realities is needed.

Note to the Reader

This brochure serves as a supplement to the document entitled *Governance of Water and Sanitation Services for the Peri-urban Poor: A Framework for Understanding and Action in Metropolitan Regions*. This document is one of the main outputs of a three-year project* which has gathered and synthesised knowledge from around the developing world not only on peri-urban water and sanitation but also on peri-urban areas of metropolitan regions and the people who live and work in them. This includes information collected specifically for the project in peri-urban localities of five metropolitan regions: Chennai (India), Dar es Salaam (Tanzania), Cairo (Egypt), Mexico City (Mexico) and Caracas (Venezuela). It also draws on a small number of experiences and innovative peri-urban interventions in different countries.

The content of the document is the result of consultation with a broad range of people in over twenty countries, ranging from urban professionals and practitioners to engineers, politicians, academics, staff from national and international non-governmental organisations (NGOs) and, perhaps most importantly, peri-urban poor women and men. The document offers a synthesis of scientific knowledge, institutional practices, people's aspirations and formal and informal norms and regulations that govern the supply and access to water and sanitation services by the peri-urban poor in metropolitan areas.

Designed as an introduction to the framework document, this brochure will show how:

- Recognition of the unique characteristics of the peri-urban interface can affect water supply and sanitation decisions by public, private and community actors; and
- improved governance through multi-stakeholder partnerships can lead to enhanced peri-urban water and sanitation services in metropolitan regions.

*For more information about the project please visit: www.ucl.ac.uk/dpu/pui/

1 Understanding the Issues: Water and Sanitation in the Peri-urban Interface

Why Be Concerned with the Peri-urban Interface?

Over time, the term 'peri-urban' has been the subject of different interpretations and meanings. Emerging from the current debate is growing recognition of the fact that rural and urban features tend to increasingly intersect within cities and beyond their limits. The limited understanding of an urban-rural dichotomy deeply ingrained in most planning systems is inadequate to deal with processes of environmental and developmental change in the peri-urban context.

The peri-urban interface refers not only to the fringe of the city, but to a context where both rural and urban features tend to coexist in environmental, socio-economic and institutional terms **BOX 2**. The context of the peri-urban interface is one which, on the one hand, frequently features a mixed population of disproportionately poor households and producers and, on the other, contains important environmental services and natural resources consumed in towns and cities. As shown in **BOX 3**, many localities in the peri-urban interface of metropolitan areas can be described as in transition from being predominantly rural to acquiring urban features. This process is commonly accompanied by substantial pressures on natural resources due to their increased marketability and greater volumes of pollution generated by higher concentrations of population and enterprises.

Because the peri-urban interface commonly features key sources of water provision for entire metropolitan areas, these areas are generally under the

jurisdiction of sectoral public agencies which are often highly centralised and responsible for overseeing the protection and administration of watershed systems. At the same time, even when they live in jurisdictions which are the main source of water or are net exporters of water to other metropolitan localities, peri-urban dwellers often face significant deficits in water supply and sanitation.

Options sought to cover water supply deficits rarely rely exclusively on the extension of formal infrastructural networks, but rather on more decentralised forms of service provision. Failure on the side of the public and private sectors to support such forms of water supply and sanitation provision often means that peri-urban dwellers, in particular the poor, are left to their own devices to access these essential services. Furthermore, as their needs and practices often remain 'invisible' to the public sector, policy changes aimed at improving the efficiency of formal water and sanitation systems frequently do little to ensure access to better services and often even constitute an obstacle.

Box 3: The Peri-urban Interface in the Metropolitan Context

The problem of institutional fragmentation is particularly relevant in the peri-urban context of metropolitan regions, where administrative units are subject to the policy decisions of several public agencies. Weak links and limited municipal power in infrastructural sectors frequently result in uncertainty as to which institution administers which specific area or activity. This has significant policy implications in the case of water supply and sanitation.

BOX 2: Isolating Common Features of the Peri-urban Interface (PUI)

Environmental

As a heterogeneous mosaic of 'natural' ecosystems, 'productive' or 'agro-ecosystems' and 'urban' ecosystems, the PUI is affected by material and energy flows demanded by urban and rural areas. Each type of subsystem conditions another. As far as water supply is concerned, the PUI is often the location of watersheds, whose management is essential to ensure the provision of water to nearby urban and rural areas.

Socio-economic

The uneven process of urbanisation taking place in the PUI is generally accompanied (or produced) by land speculation, shifting economic activities of higher productivity and the emergence of informal and often illegal activities. As a result, the social composition of peri-urban systems is highly heterogeneous and subject to quick changes. Farmers, settlers, entrepreneurs and urban middle class commuters may all coexist in the PUI but with different and often competing interests, practices and perceptions.

Institutional

The PUI features the convergence of sectoral and overlapping institutions with different spatial and physical remits. Thus, institutional arrangements and jurisdictions are often too small, large, urban or rural in their orientation to effectively address sustainability and poverty concerns. Private sector as well as non-governmental and community based organisations intervene in the management of peri-urban areas, but often without clear articulation or leadership from government structures.

Who Are the Peri-urban 'Water-poor'?

Definitions and statistical information based on narrow, urban-rural distinctions, make it difficult to determine how many people living in the peri-urban interface lack water and sanitation services. While many peri-urban inhabitants could be described as being 'water poor', meaning they lack access to sufficient water and adequate sanitation facilities to meet their needs, the absence of reliable and detailed data makes it impossible to present valid numbers on the provision of water and sanitation services in the peri-urban context.

The water-poor in peri-urban areas are not necessarily restricted to low-income households, as there might be members of other income groups lacking access to adequate water supply and sanitation. However, although there are frequent instances of neighbourly solidarity and collective efforts, low-income peri-urban dwellers and home-workers generally lack the means to improve their access to these services in a way that is affordable for them.

Health Risks and Livelihoods in the Peri-urban Interface

Although there is little specific research on the health risks and impacts experienced by peri-urban dwellers, early studies show the water-poor's extreme susceptibility to health risks. The peri-urban interface generates a particularly high risk of exposure to vector-borne diseases such as malaria as a result of certain productive activities occurring in peri-urban areas. The peri-urban context combines rural and urban characteristics and thus attracts vectors that would usually appear in either rural or urban areas. Out of the types of diseases recorded in the localities of the five case studies examined as part of this project, many arise through contact with faecal matter either

through the consumption of contaminated water or through person-to-person contact.

In addition, many income activities in the PUI are water intensive, such as agriculture and horticulture, animal husbandry and tanning, brick-making and building. For those involved in these activities, lack of water not only constrains personal consumption and hygiene but can also pose a serious threat to livelihoods. Even where a household's main income-generating activity is not dependent on the availability of water, livelihoods can be compromised due to the time spent on collecting water that must be taken away from other tasks, such as household duties and income generation. This is particularly stressful for women, and where children are involved, their school education can seriously be at risk. This problem appears to aggravate in peri-urban areas as they are populated by a high percentage of households of nuclear families and female single heads.

Land, Housing and Water and Sanitation Services

Many peri-urban settlements, especially poorer ones, develop outside existing 'formal' regulations and beyond where governments feel compelled to provide services. As illustrated in **BOX 4**, particular policies designed to control metropolitan expansion can reinforce unequal access to services. Despite the lack of services, governments' reluctance to make improvements and other deficiencies, settlement in the peri-urban interface remains a popular option for individuals, groups, entrepreneurs and even government agencies because land can be acquired with ease and informal providers are readily available to fill gaps in service provision. In many cases, however, resorting to informal options may come at the expense of much higher unit costs than conventional systems, inadequate



Box 4: The Zero Growth Pact and Expansion in Mexico DF

In the rural district of Milpa Alta, in the Metropolitan Zone of Mexico Valley, urban expansion is threatening crucial environmental city resources. In an attempt to control the process of metropolitan expansion over Milpa Alta, the District Federal Government has implemented several mechanisms.

One of these is the Zero Growth Pact, which serves as an agreement between the authorities and parajes-dwellers to stop new settlements. It establishes that only the population registered through the 1997 census can access public water. In return, those peri-urban dwellers included in the Pact have to police the area and denounce any new settlers, who are not allowed to receive any public water supply.

This situation is problematic for several reasons. In some cases, economically-troubled long-term settlers who would usually divide the land for cultivation are selling property to individuals or real estate speculators. Other times, politicians seeking clientelistic relations intervene to ensure the supply of free water to those who are outside the Zero Growth Pact. Consequently, informal settlements continue to be established in this area and dwellers access water through different, and often illegal, mechanisms.

clandestine connections or unprotected, polluted water sources.

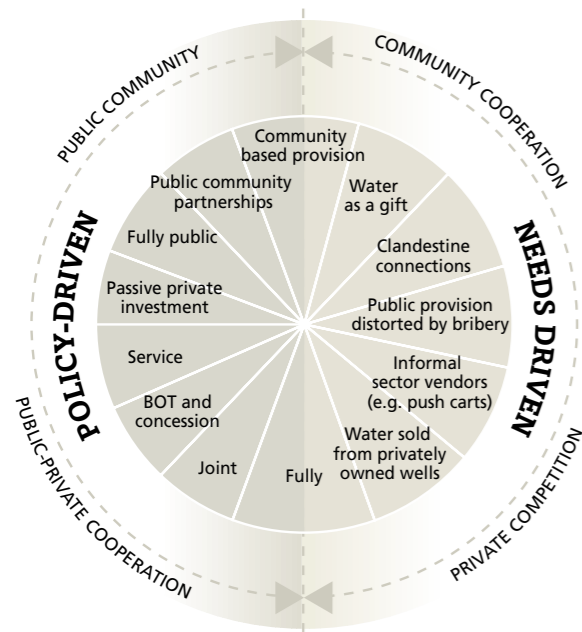
The informal status of settlements often delays low-income groups' access to services as authorities may be reluctant to provide connections where land tenure is in doubt. In such cases, an NGO or CBO can act as a guarantor to the municipal water authority until informal communities establish themselves as reliable clients (Box 5).

A common governmental response to informality of land settlement is to regularise what exists so that it meets the conditions imposed by law or to change laws so that there is more compliance in what has been done in the past. The expenses of tenure regularisation are usually so substantial that they are better diverted to the tasks of improving poor water supply and sanitation. In exchange for greater acknowledgement of informal land claims, informal land developers may let governments suggest site layouts that will allow more efficient installation of services someday. In other cases, households with sufficient income may be helped to create schemes – for water especially –

that are economically viable and perform satisfactorily because they are integrated with the urban ones. Technical assistance and the mobilisation of a community may be all that is needed, aside from creating lines of cooperation between urban and rural governments. Community management, better layouts, financing arrangements for incremental improvements leading toward integration in formal networks and billing that is not based upon land registration are all possible.

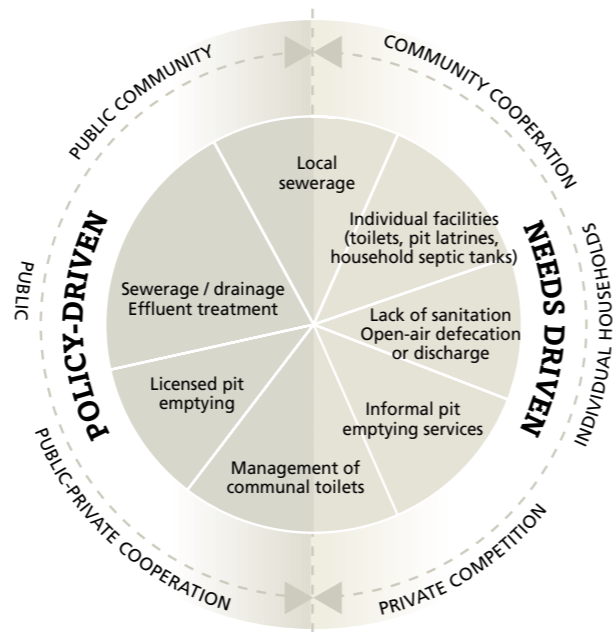
Water and Sanitation in the Peri-urban Context: A Technical or Governance Crisis?

When looking at the specific ways in which the poor gain access to water supply and sanitation, it is possible to identify a diversity of practices and arrangements. Some of these are formal, 'policy-driven' mechanisms supported by institutional arrangements of the state. Others operate on the basis of solidarity, reciprocity or need. These can be characterised as being 'needs-driven' and correspond to the wide spectrum of arrangements by which the poor



BOX 5: The Water Supply Wheel

The 'water supply wheel' outlines policy and needs-driven practices characteristic of water provision in the peri-urban interface. The left and right sides of the wheel correspond to what are usually, referred to as 'formal' and 'informal' practices. As the wheel demonstrates, the lines between these are frequently blurred.



BOX 6: The Sanitation Wheel

The 'sanitation wheel' shows the public, private and community aspects of sanitation and common means of intervention where these sectors overlap.



Box 8: Building Responsible Citizenship in Caracas

Access to water has always been considered a right in Venezuela. In poor areas, the norm has been that this service is not charged.

The 1999 Constitution and the new Organic Drinking Water and Sanitation Service Act established clear guidelines on the right to water access and participation as a means to improve this access. This process has been very successful since it is based on a joint responsibility principle whereby state hydrological company projects are supported by committed community participation and vice versa.

Implied in this relationship is the idea that the creation of citizenship carries certain rights and duties. However, payment for service is within these obligations. Thus, the state water company seeks to develop consumers responsible for the payment of the social rate and, in some cases, collective payments since community water meters connected to the mains are being tested in new projects.

The establishment of Technical Water Fora ensures the participation of peri-urban communities in the decision making process. These fora have been essential means of raising awareness among the population on the costs associated with the production of water - treatment, transportation and distribution. This not only builds responsible water consumption but helps people to understand what is being charged and why.

gain access to water, often with little or no support from the state, its policies and resources.

The 'water supply wheel' BOX 5 and the 'sanitation wheel' BOX 6 show the roles of the public, private and community sectors in the provision of water and sanitation and the extent to which these roles are based on cooperative arrangements across the sectors and at different scales. Each sector is far from homogeneous: the public sector can contain highly centralised state agencies or decentralised ones; the private sector might involve companies ranging from those operating under the formal sector to informal vendors operating exclusively at the local level; the community sector might involve formal, state- or NGO-supported schemes or cooperatives established among residents.

The complexity of water supply and sanitation practices found on the ground is slowly leading to changes in debates among influential actors and commentators about the different roles that the state and other actors play or ought to play in the supply of basic infrastructure. For example, the World Bank's earlier broad support for privatisation of infrastructure, introduction of competition and a much reduced role for the state away from production and towards regulation, has subtly shifted towards a greater and explicit acceptance of the state not only as regulator but also as another producer of services, be this at the central or local government levels. It has also shifted towards a view that a range of formal and informal producers should not merely be tolerated, but should also be positively encouraged by giving them legal status, enabling them to develop partnerships with public and formal private providers, and by facilitating the mechanisms adopted by the poor to gain access to multiple independent providers while strengthening their regulation,

particularly in areas related to health and groundwater depletion.

Citizens or Consumers?

A fundamental question arises when considering this transition from competition to cooperation: Are the peri-urban poor citizens or consumers? In other words, what is their status at the constitutional level and within current policy frameworks regulating the provision of basic services? But also, what is their reality in terms of the practices by which they effectively access water and sanitation?

In the peri-urban context, the poor are both citizens and consumers. In all five case studies examined in this project, there are constitutional provisions in place that frame water as a human right that should be guaranteed to all people – rural, urban or peri-urban. However in recent years, this definition of 'right' has been subjected to fundamental changes prompted by the introduction of water tariffs. In some cases this process has been linked to the total or partial privatisation of basic services provision, while in other cases, water tariffs have been introduced as a means of improving the financial capacity and cost recovery of public agencies. A common aspect to all such reforms has been the reformulation of the universal right to water. In practice, such a right has been restricted to 'those in need'. This often means that reformed regulatory frameworks focus on creating special measures and mechanisms to provide water to the poor, while introducing full or partial economic costing practices for the large majority.

The right to water and sanitation is not, however, just a right to subsidised services, but a means to ensure that water and sanitation fulfill a social and environmental

collective function and that the most disadvantaged groups in society are effectively empowered to have a say in the decision-making process. In order for the peri-urban poor to have a voice in the provision of water and sanitation, policy-driven and market-based strategies must give way in favour of needs-driven ones. These approaches involve a multitude of actors in partnership, resulting in greater innovation, inclusion and delivery that is responsive to the realities the peri-urban poor face.

2 Taking Action

The Water and Sanitation Cycle

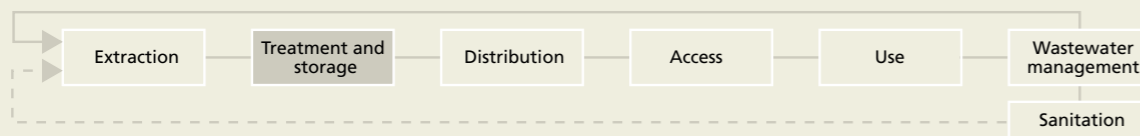
As with other infrastructure services, technical, financial and institutional conditions now make possible the ‘unbundling’ of the different segments of the water and sanitation production process. These could, given the right regulatory conditions, be given to specialised agents – whether in the public, private or community sectors – who might be best equipped to take them on.

Outside the metropolitan core and in poorer areas of cities, different stages of the cycle are rarely covered by a single agency. In the case of the peri-urban interface, there is a variety of uncoordinated and indistinct actors involved in the different stages concerned with water supply and sanitation activities. Therefore, both from a technical and a governance perspective, it is necessary to examine the different stages of the water and sanitation cycle (BOX 7) and, in particular, the practices deployed at each stage in order to gauge the extent to which they improve access to these services by the peri-urban poor and aid the environmentally sustainable management of the natural resource base.

Extraction, Treatment and Storage

Despite decades of large-scale public investments in the extraction and treatment of water through centralised

Box 7: The Water and Sanitation Cycle



To understand the specificity of water supply and sanitation in the peri-urban interface, it is important to examine the diversity of actors involved at each stage in the provision of these services. Understanding their activities and relationships helps when addressing the challenges faced in improving access by the peri-urban poor and enhancing environmental sustainability.

Box 8: Water Extraction in Chennai

Peri-urban Chennai is the location of several water consuming activities. To serve these needs, groundwater is extracted before delivery by tankers to domestic, commercial, institutional and industrial consumers. Because of the highly dispersed nature of water extraction and delivery through tanker lorries it is difficult to quantify the water supplied and consumed by different activities. Despite the claims of public officials, recent studies show drinking water is not prioritised ahead of industrial uses.

Industrial uses of water, such as the private ‘packaged water’ industry, extract millions of litres of potable water per day, wasting, by conservative estimates, anywhere between 15-35 percent of the water they draw from the ground. Others, such as reverse osmosis plants, return water to aquifers with higher concentration of metals and minerals. These activities not only reduce water availability for the poor but have a deleterious effect on the quality of water and the long-term sustainability of this resource.

systems, all the case studies revealed that demand remains greater than supply, particularly in those areas of the city which have been perennially worst served, including rapidly expanding peri-urban areas (BOX 8). This poses the question of whether decentralised systems of extraction and treatment managed by lower-tier authorities are more desirable options for meeting the present and future needs of poor peri-urban communities and enhancing environmental sustainability. Decentralisation is feasible where there is good quality groundwater, but decentralised systems dependent on surface water are generally more problematic.

There are examples of community and private sector involvement in extracting water through private or

community tube wells and boreholes where governments lack the capacity to extract and treat adequate quantities of water. However, as these are mainly informal solutions, they lack proper regulation and may even have negative consequences resulting from over-extraction or reliance on over-estimates of aquifer volumes.

The development of alternatives to unsustainable water extraction does not mean finding a simple solution to a universal problem. Although centralised water extraction, treatment and storage generally involve high capital investment in large-scale infrastructure and may be at times inefficient to run, when undertaken by a publicly accountable and regulated agency it is likely to lead to more acceptable levels of water quality – at least at the point where it leaves the treatment plant – and less waste. More spatially decentralised forms of extraction and treatment require lower levels of capital investment and are, in practice, a viable option. They may also be a more desirable option for poor peri-urban communities in that,

Box 9: Factors Influencing Access and Consumption of Water

Adequate access to water supply is not solely dependent on the existence of a water source. Therefore, when assessing people’s level of access both to water supply and sanitation it is important to consider not only distance to a source and number of users sharing a facility, but also to involve a range of other aspects such as:

- **Regularity:** how frequently is the service available to people and when;
- **Sufficiency:** how much (water) is available per person;
- **Affordability:** how much is paid for service, in particular, relative to income;
- **Quality:** what is the quality of available services; and
- **Safety:** how safe and culturally acceptable is access to and use of facilities, especially for those who rely on outside facilities, such as public toilets.

Box 10: Community-managed Water Schemes in Dar es Salaam

In an attempt to address the chronic problem of potable water supply for low-income communities in Dar es Salaam, the government of Tanzania, with support from the World Bank, the African Development Bank and other financiers, has embarked on the programme to reform water supply in metropolitan Dar es Salaam. A fundamental part of this is the privatisation of parts of the Dar es Salaam Water and Sewerage Authority (DAWASA), including the management of the piped water supply in settlements occupied by high and middle-income earners.

Also included is the DAWASA-led Community Water Supply and Sanitation Programme, with a goal of improving water supply in low-income settlements, including peri-urban areas. This programme aims to institutionalise and scale-up community managed water supply schemes developed in peri-urban areas by appointing NGOs to work with local communities to assist them in identifying water needs, designing and implementing projects and management training.

Distribution and Access

Private sector involvement may offer some alternatives for improving distribution, a stage at which difficulties are typically encountered due to the complications of extending formal, piped networks. Past experiences have shown that high costs frequently prevent water distribution by (large) private contractors to poor peri-urban neighbourhoods, and thus would only work if service to poor areas were cross-subsidised. Another option to provide water to the peri-urban poor is through a partnership between the community and the private/public sector where the private/public sector provides water in bulk to a neighbourhood with further dispersal managed by the community itself.

In terms of access, the issue of users’ willingness to pay for a service is important, as the culture of non-payment results in a notorious lack of revenue and chronic under-investment in water supply and sanitation. However, this needs to be contrasted with situations in which the peri-urban poor are spending a disproportionately high amount on informal and often unsafe forms of water supply (BOX 9). Money spent by the peri-urban poor on water supply could easily be diverted into more productive endeavours. A successful community supply model collaborating with local authorities takes this into account, addressing multiple benefits (BOX 10). It, minimises the burden on women and children by decreasing time spent collecting water and it has the potential to improve livelihoods of the peri-urban poor, as many depend on water for productive uses. Moreover, a transition from informal vendors to community-managed systems can lower water charges considerably while increasing municipal revenues for further improvements to the system.

Another problem frequently faced in poor urban and peri-urban settlements is the effect water losses have on network supplies. In the five case studies, for example, losses through a small range of causes such as leakages and evaporation are estimated to be in a range of between 35 and 55 percent of the water produced. A greater sense of ‘ownership’ of the formal network system by users is likely to lead to greater rates of detection and reporting of losses thus reducing maintenance and repair costs. In addition, a formally established collaboration between communities and local authorities provides a way of increasing municipal revenues that can be used to improve the system further.

Use and Wastewater Management

After water has been used and reused, wastewater must be disposed of. Because of potential health risks, this can

Box 11: The Role of Informal Wastewater Management in Greater Cairo

Peri-urban communities in both Cairo and Giza lack a public underground sewage system. Therefore, the majority of residents use domestic facilities to discharge wastewater. These septic tanks should be emptied regularly, but a lack of financial resources in local governments and the lack of equipment lead to delays, subsequent overflows and community-wide pollution and health problems.

In response to this problem, residents commonly use informal, private vacuum vehicles. Fees for these services vary depending on the location of the house and size of the trench, but are double the cost of public service. Despite the apparent efficiency, effectiveness and importance of private sector involvement in this case, the potential for cost-effective and mutually beneficial partnerships remains unexplored.

Box 12: Community-led Sanitation in Luanda, Angola

Facing increasing difficulties due to massive urban migration in recent years, Luanda's peri-urban areas, considered transitional rather than permanent, have often gone ignored during periods of infrastructure improvements. The Sambizanga project has alleviated strains on households, who were spending a quarter of their income on water, allowing them to redirect their earnings and benefit from water standpipes run as small enterprises by local committees. An important feature of this project is its emphasis on encouraging demand for improved sanitation through the use of community 'mobilisers'. This is particularly important for initiatives that focus on in-house sanitation, which is normally a household responsibility. However, initiatives that involve user involvement in the provision of public sewerage facilities, may also require action to mobilize community interest. Furthermore, the project's success has afforded communities greater opportunities to engage with local government using participatory techniques.

be a particularly precarious issue. The peri-urban localities of the five case studies have very limited or no underground sewer system to dispose of wastewater. A number of households have septic tanks but for the poorest open discharge is the most common practice. The affordability of extending sewer systems into the peri-urban interface must therefore be carefully considered against alternative approaches such as low-cost, community-based wastewater collection and treatment systems **BOX 11**. The success of these systems depends on partnerships between local authorities and communities, with NGOs taking on an intermediary role in most cases.

If dealt with properly, wastewater can provide a valuable resource. The reuse of water alters the water cycle and creates alternative water sources, thereby conserving limited resources and minimising environmental pollution. Sewage irrigation is particularly convenient for peri-urban agriculture because these activities are closest to the point of discharge and sewage farms are traditionally located in the city fringes. In the peri-urban interface, most reuse

activities are informal and therefore lack appropriate health and safety measures. Depending on the type of crops grown on plots, prior treatment of the wastewater is required to minimise any health impacts. At the same time it is vital to sustain the level of nutrients in the water to keep up the fertilising effect. As a result, it is crucial for community water and sanitation projects to integrate hygiene education and training.

Despite its potential uses, wastewater cannot be incorporated into daily routine without restrictions. The reuse of wastewater provides a chance to subsidise wastewater treatment. However, the problem is that the disposal and treatment of wastewater and the demand for its use are not linked to overall government plans. In all cases it is important to protect public health and minimise environmental risks at all times and therefore avoid uncontrolled use of wastewater, as is still widely applied in many places.

Sanitation

A point recognized by several of the initiatives taken into account in this document is the need for increased emphasis on sanitation and hygiene promotion. As is the case with other steps in the water cycle, many peri-urban households, seeing little or no government action, take matters of sanitation into their own hands, developing on-plot or in-house facilities. These and other local-level solutions create adverse health risks for those living and working in adjacent areas.

In addressing the issue of peri-urban sanitation with a focus on poor households and environmental sustainability, planners face a number of basic choices:

- 1 Whether sanitation facilities should serve individual households, groups of households or the community at large.
- 2 Whether or not to use water to transport excreta.
- 3 Whether excreta and wastewater should be disposed of on or off the plot.

It is sometimes assumed that communal facilities provide the only affordable option for providing sanitation facilities for low-income people. In fact, their experience worldwide suggests that public facilities that can be open to everyone are often problematic. Cleaning and maintenance are often the main problems with publicly managed facilities. Many, perhaps most, have been abandoned and those that remain are often in a completely unhygienic state. As already noted, one response to these problems is to assign the management of community facilities to either the private sector or civil society groups. Most such initiatives require that users pay to use facilities. This suggests that communal facilities are

often relatively expensive for users. A better option is to provide toilet facilities that are shared by specified families, each of whom is provided with a key. Examples of this approach include systems provided with support from Lutheran World Services in Kolkata, India and WaterAid's partner organisations in Addis Ababa, Ethiopia.

Shared facilities may be the only option where either space is very limited or people are too poor to pay for on-plot facilities. In all other cases, the aim should be to provide on-plot facilities for individual families. Research has shown that on-plot sanitation is possible on plots with areas as small as 14 square metres. It is arguable that the potential public health benefits justify some subsidy if it means that people can afford on-plot facilities. The Sambizanga Project in Luanda **BOX 12** is an example of an initiative to provide household level facilities, in this case dry-pit latrines.

Conclusion

With what appears to be a variety of potential water supply and sanitation solutions emerging, questions remain over who can initiate and support improvements of these sorts for peri-urban locations. This is the most challenging obstacle; it arises from the fragmented responsibility and perception of needs held by public bodies and from the limited capacity of public, private and community agents to act alone in response to the needs of peri-urban dwellers.

This brochure has introduced an argument in favour of needs-rooted, as opposed to policy-rooted, strategies and practices in water supply and sanitation for peri-urban areas. The keys for upgrading conditions are founded in heightened awareness of the unique context of the peri-urban interface and recognition of the benefits of needs-rooted practices and their articulation to the formal system under new governance regimes **BOX 16**. Responsibility for translating these factors into actions lies in the hands of stakeholders from across all sectors, whose combined efforts can achieve goals that reflect the water and sanitation needs and rights of peri-urban dwellers.

