The peri-urban water poor: citizens or consumers?

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ABSTRACT Using the results of a comparative three-year research project in five metropolitan areas, this article reviews a range of practices in accessing water and sanitation by peri-urban poor residents and producers. It starts from the observation that neither centralized supply policies nor the market through, for example, large-scale profit-making enterprises are able to meet their needs. Although they are consumers insofar as they have no option but to pay market prices for water (and often for sanitation), the peri-urban poor are, in practice, sometimes regarded as citizens with basic entitlements such as the right to water. This article outlines a conceptual distinction between "policy-driven" and "needs-driven" practices in the access to peri-urban water and sanitation services. The case studies show that this access is mainly needs-driven and informal rather than the result of formal policies. The key to structural improvements in water and sanitation lies in the recognition of these practices and their articulation to the formal system under new governance regimes.

KEYWORDS environmental sustainability / governance / infrastructure / peri-urban interface / poverty / water and sanitation

I. INTRODUCTION

There now seems to be widespread agreement that in low- and middle-income countries the state alone will be unable to meet the internationally agreed targets for reducing the number of people in cities with no access to clean water and adequate sanitation.(1) This is partly a legacy of decades of supply-led engineering approaches with high operating costs and under-utilized investment, unrealistically high standards of per capita service to formal areas of cities and a general disregard for the needs of unregulated or "illegal" urban and peri-urban settlements.(2) Recent attempts to involve private investors in water supply have not yielded the desired results of expanding network coverage to low-income urban and peri-urban settlements, which are regarded as much less profitable than wealthier and more central areas of cities.(3) The recent collapse of large contracts between governments and multinational utility companies in cities such as Buenos Aires, Dar es Salaam and Cochabamba has compounded doubts about the capacity of the market to fill the gap in these most basic of services.

At the core of the discussion of whether the state can fulfil its obligation of meeting the needs of the urban poor, as embodied in efforts

Vol 18(2): 333–351. DOI: 10.1177/0956247806069608 www.sagepublications.com

such as the United Nations' Millennium Development Goals, are the notions of water as a right and as an economic good. Rights-based approaches to development argue that water is a human right and that jointly with sanitation it plays a significant role in the fight against poverty. Coupled with this is a long-held realization that denying access to basic sanitation and water in sufficient quantities (through, for example, high prices) to a concentrated population can have serious health consequences for all (and they should therefore be regarded as public goods). A somewhat opposing view is that there are economic and environmental costs implicit in the production of water for human consumption which, unless met through fiscal means, ought to be recouped by putting an economic price on it.

This article examines these two contrasting notions in a specific peri-urban context in metropolitan areas. With the help of evidence drawn from five cities, it shows that the water and sanitation needs of the peri-urban water poor are not being met either by conventional approaches such as the expansion of networked public utilities nor through formal large-scale private sector companies. Instead, much of their needs are met through a dizzying array of non-conventional and often officially unrecognized means such as informal operators, privately operated wells, gifts from neighbours, rainwater harvesting and clandestine connections. It argues that, similarly to the urban poor in informal settlements, conventional centralized approaches to service provision fail to acknowledge that the peri-urban poor are exposed fully to market forces but that they also deploy a broad range of individual and collective solutions of varying degrees of effectiveness, occasionally with external support. Although they are consumers insofar as they have no option but to pay market prices for water (and often for sanitation), the peri-urban poor are sometimes regarded as citizens with basic entitlements, as demonstrated in cases such as that of Caracas (Venezuela).

The next section briefly sketches the main features of the research project on which the article is based. Section III introduces the five metropolitan areas and the 10 localities studied as part of the research. Section IV outlines a conceptual framework for examining the governance of peri-urban water and sanitation, and introduces the set of practices and arrangements through which these services are supplied in the five case studies as well as in other low- and middle-income countries. Section V examines the notion of "water poverty" and provides evidence from the case studies. Section VI discusses the significance of the arguments embodied in the debate that to some extent opposes perceptions of water as a right and as an economic good in the specific context of the five case studies. A final section concludes.

II. A COMPARATIVE RESEARCH PROJECT

This article is based on the results of a three-year research project funded by the Department for International Development (DFID) of the British government on the governance of water and sanitation services in the peri-urban interface of five metropolitan regions: Cairo (Egypt), Caracas (Venezuela), Chennai (India), Dar es Salaam (Tanzania) and Mexico City.[4]

The five case studies illustrate a spectrum of different institutional

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Acknowledgement: The authors wish to acknowledge the valuable work of the five partner institutions who participated in the research project (see reference 4). Also the comments on an earlier version of this article from two anonymous referees and from participants at the N-AERUS Conference on "Urban Governance, Diversity and Social Action in Cities of the South", World Urban Forum, Barcelona, 15–16 September 2004, and the ESRC Seminar on "Housing, Public Services and Social Movements", Institute for the Study of the Americas, London, 10 December 2004.

1. Nickson, Andrew (2002), "The role of the non-state sector in urban water supply", presented at the World Development Report 2004/05 Workshop "Making Services Work for Poor People", Eynsham Hall, Oxford, 4–5 November; also UN–Habitat (2003), *Water and Sanitation in the World's Cities. Local Action for Global Goals*, Earthscan, London; and World Bank (2003), *World Development*

arrangements for the formal and informal delivery of water and sanitation services in different regions of the world. Each of the five teams initially prepared a characterization of their metropolitan region, including an institutional profile, social, economic and spatial trends, and an overview of peri-urban localities. This was complemented by an institutional map of the formal and informal metropolitan water and sanitation systems, with a peri-urban emphasis.

Each team profiled two peri-urban localities, selected using three criteria. First, the localities had to show evidence of the key peri-urban features as defined in the project.[5] Second, the choice should attempt to capture a diversity of formal and informal water and sanitation arrangements. Third, the selected peri-urban localities should be home to a significant number of low-income households, in order to gain a better understanding of the specific strategies and practices deployed by poor women and men.

At the next stage, the metropolitan-wide institutional analysis was complemented by a series of interviews with key agencies and actors involved in water and sanitation systems. It was further developed through a set of multi-stakeholder workshops that aimed to assess weaknesses and opportunities in the current system (including both formal mechanisms and informal practices) to improve access by the peri-urban poor, while looking at other dimensions such as environmental sustainability, effective management and efficiency of the system as a whole. The fieldwork in specific localities allowed local teams to engage with the specific reality of peri-urban women and men. This was done through the use of transect walks and a series of participatory exercises such as focus group meetings and workshops, as well as observation and interviews.

The final stage involved an iterative process of drafting a set of observations and principles emanating from the available literature and from the information collected in the 10 localities and their metropolitan regions, in terms of what might constitute "good practice" in governance and management of water and sanitation services in peri-urban areas with a focus on poverty and environmental sustainability. These "guidelines" were drafted by the London team and circulated to each of the five partners for detailed comments before being discussed at three international workshops organized as part of the project, where a number of experts were also invited to present case studies in their respective region.[6] The three workshops took place in Chennai (India), Nairobi (Kenya) and Quito (Ecuador), with support from local and international organizations.[7] A final workshop held in Cape Town, South Africa, brought together the five partners, as well as a number of local experts and international support agencies.[8]

III. THE FIVE CASE STUDIES

Table 1 provides an overview of the main characteristics of the five metropolitan areas and their peri-urban localities. All five show a high degree of institutional complexity and consist of different administrative units. In some cases, there is no single political or administrative authority, resulting in overlapping agencies, as in Chennai and Cairo. There also tends to be institutional fragmentation and a lack of communication between different administrative units operating in the

Report 2004: Making Services Work for Poor People, Oxford University Press, Washington DC.

2. Nickson, Andrew (1997), "The public–private mix in urban water supply", *International Review of Administrative Sciences* Vol 63, pages 165–186.

3. Budds, Jessica and Gordon McGranahan (2003), "Are the debates on water privatization missing the point? Experiences from Africa, Asia and Latin America", *Environment & Urbanization* Vol 15, No 2, pages 87–113.

4. EngKar Project R8137. The research ended in February 2006 and was coordinated by the Development Planning Unit (DPU), University College London. The five project partners were the Latin American Faculty for Social Sciences (FLACSO) in Mexico City, the Centre for Development Studies (CENDES) in Caracas, the Citizens Alliance for Sustainable Living (SUSTAIN) in Chennai, the University College of Lands and Architectural Studies (UCLAS) in Dar es Salaam and the Urban Studies and Training Institute (UTI) in Cairo. For more information about the partners and the project, including downloadable outputs, visit the DPU's Peri-urban Interface Programme website: www.ucl.ac.uk/dpu/pui.

5. The notion of "peri-urban interface" makes reference not just to the fringe of the city but to a context where both rural and urban features tend to co-exist, in physical, environmental, social, economic and institutional terms. Environmentally, it is a heterogeneous mosaic of "agro-ecosystems" and "urban" ecosystems, affected by material and energy flows demanded by urban and rural systems. It tends to be socially and economically heterogeneous and subject to

TABLE 1
Overview of the five metropolitan areas/regions

	Population 2000 (millions)	Area (km^2)	Annual population growth rate (1990s)	Metropolitan administrative structure	Responsibility for formal metropolitan water and sanitation system	Peri-urban localities studied in the project (and population in thousands)
Chennai	7	1,177	2.2%	Chennai Metropolitan Area: Chennai city, 8 municipal towns, 27 town *panchayats*, 18 census towns and 1 cantonment area	Public agencies at state, metropolitan and local level	Valasaravakkam and surroundings (112) Kotivakkam and surroundings (54)
Dar es Salaam	2.5	1,350	4.8%	Metropolitan Dar es Salaam: three semi-autonomous municipalities under the Greater Dar es Salaam Council	Public–private partnership with a community component	Tungi (18) Stakishari (15)
Greater Cairo Region	17	3,400	2%	Greater Cairo Region (GCR): governorate of Cairo and parts of the governorates of Giza and Qualiobia	Two separate public agencies for water and sanitation at metropolitan level to be fully reformed	Abou El-Noumrus City (41) Abou-El-Geitt (93)
Mexico D.F.	8.6	1,480	1.8%	Federal District of Mexico City: 16 *delegaciones* (sub-districts) (NB: D.F. does not represent the whole metropolitan area of Mexico)	Increasingly decentralized metropolitan public system with private concessions	San Bartolomé Xicomulco (3) San Salvador Cuauhtenco (10)
Caracas	4.2	6,207	2.7%	Caracas Metropolitan Region: 17 municipalities belonging to 3 political-administrative entities (states)	Regional public agency to be devolved/ transferred by 2007	Bachaquero (4) Paso Real 2000 (4)

SOURCE: Unpublished fieldwork reports.

metropolitan area. In the case of Dar es Salaam, there is a weak link between the municipal council and its institutions at sub-ward and ward level. The Metropolitan District in Caracas, created in 1999, is an attempt to coordinate the actions of the five municipalities that comprise the Caracas Metropolitan Area, while seeking to promote a unified vision of the city.

These metropolitan areas are also characterized by varying degrees of

spatial differentiation. In Cairo, this has been the result of the strategies adopted by the economic elite preserving for itself a particular physical space. Examples of this include several five-star hotels in Giza City and other peripheral areas, and villas built legally or illegally over prime agricultural land stretching towards the western and southwestern parts of the Greater Cairo Region. Similarly, in the case of Caracas, large socioeconomic transformations linked to the process of globalization have produced spatial and lifestyle changes due to the expansion of the metropolis towards the periphery, thus reinforcing historically high levels of sociospatial inequality.

All five cases show a marked gap in access to water and sanitation between metropolitan averages and peri-urban localities, with the latter suffering significant deprivation (often masked by aggregate statistics) and reliance by peri-urban dwellers on alternative systems of water supply and sanitation other than piped water and flush toilets. Box 1 provides some views on this.

BOX 1
Water and sanitation in the peri-urban interface

In Dar es Salaam, the socioeconomic heterogeneity of the peri-urban interface often leads to conflict between different groups, as in Tungi where the interests of middle-class and low-income groups have clashed. Most borehole and deep-well proprietors and water vendors invest in lucrative water supply businesses.

Basic service infrastructure groans under the pressures of peri-urban population growth. In Caracas, ". . . *the pipe network is overburdened at present, and the most prevalent perception is that the current state of service is worse than before as a result of population growth in the area (due to sub-division of plots and new land occupations) and the expansion of the diameter of the mains serving the neighbouring community, Brisas del Cartanal, which took volume and water pressure away from Bachaquero*."

In Cairo, service improvements are often delayed. This has created a decline in community participation due to ". . . *a lack of confidence in officials. Formerly, the communities contributed with money to the sanitation project, which is still under construction. The community in Abu El-Numrous claims they had contributed financially to the sanitation plant, and yet the project is on hold*."

SOURCE: Unpublished project reports.

IV. THE GOVERNANCE OF PERI-URBAN WATER AND SANITATION SERVICES

Despite slim evidence of its effectiveness, particularly in poorer urban neighbourhoods, over the last two decades low- and middle-income countries have experienced a push towards the increased involvement of the private sector in the delivery of services.(9)

In practice, there is a fault line between the idea of the state as guarantor of basic service delivery, which encompasses the notions of

rapid changes over time (small farmers, informal settlers, industrial entrepreneurs and urban middle-class commuters may all co-exist with different and often competing interests, practices and perceptions. In institutional terms, it is characterized by the convergence of sectoral and overlapping institutions with different spatial and physical remits. See Allen, A (2003), "Environmental planning and management of the peri-urban interface (PUI). Perspectives on an emerging field", *Environment & Urbanization* Vol 15, No 1, April, pages 135–147; also Dávila, J (2005), "Falling between stools? Policies, strategies and the peri-urban interface", in D McGregor, D Simon and D Thompson (editors), *The Peri-Urban Interface: Approaches to Sustainable Natural and Human Resource Use*, Earthscan, London, pages 44–56.

6. Allen, Adriana, Julio D Dávila and Pascale Hofmann (2006), *Governance of Water and Sanitation for the Peri-urban Poor: A Framework for Understanding and Action in Metropolitan Regions*, Development Planning Unit, University College London, 126 pages; also Allen, Adriana, Julio D Dávila, Pascale Hofmann and Chris Jasko (2006), "So close to the cty, so far from the pipes. The governance of water and sanitation and the peri-urban poor", Development Planning Unit, University College London, 12 pages. These can be downloaded for free from www.ucl.ac.uk/dpu/pui.

7. The workshop in Chennai was organized by Sustain, the project partners. In Nairobi, the workshop was jointly organized by DPU and UN–Habitat, while the one in Quito was jointly organized by DPU and the Centro Internacional de Gestión Urbana, CIGU. A full list of participants at the workshops and presentations may be

social equity and the basic right to resources, and market-based approaches that focus almost exclusively on cost recovery and the financial sustainability of service supply.

Service provision can involve a variety of different (public–private) organizational arrangements. For instance, governments might assume different responsibilities in the provision of these services. Direct provision or "production" of a service involves the physical act of constructing, maintaining and delivering, while indirect provision involves the role of ensuring that the service is available through decisions concerning policy and standards of service. In this case, governments may be responsible for coordinating, financing, enabling and regulating producers. Yet another arrangement might involve a long-term relationship between the state as provider of a service and a group of citizens.[10]

Reference is often made to a "regulator–provider–consumer triangle" as a means of explaining the basic roles and relations performed in the delivery of water and sanitation.[11] However, as shown below, there are significant differences in the way this triangle functions in the practices deployed by the peri-urban poor to access water and sanitation and the kinds of arrangements prescribed and supported at a policy level by influential bodies such as the World Bank.

To a large extent, ongoing debates about the most appropriate institutional arrangements to deal with water and sanitation have little to do with ecological processes or social practices. Water and sanitation services are subject to rival political projects rooted in different principles and value systems. Such rival positions are exemplified, for instance, in the debate on whether water and sanitation should be a human right and universal entitlement or a commodity provided through the market. Before discussing the question of whether poor peri-urban consumers should be regarded as consumers who ought to get "their money's worth" through a market transaction, or rather, be regarded as citizens entitled to a range of services, we will examine the evidence gathered in the research regarding their access to these services.

a. The spectrum of peri-urban service providers

The peri-urban poor gain access to water and sanitation services through a broad range of practices and arrangements. Some of these are formal, "policy-driven" mechanisms explicitly supported by the state, such as private tankers licensed to sell water. There is also a wide array of arrangements operating on the basis of solidarity, reciprocity or need, such as the provision of water as a gift among community members, as well as cases of water-pushcart vendors who might access water through different means and sell it to members of their own community. These mechanisms might be characterized as being "needs-driven", and are rarely supported by the state.

The "water supply wheel" in Figure 1 outlines a continuous spectrum of policy and needs-driven practices characteristic of water provision in the peri-urban interface. It provides a schematic and comprehensive (although not exhaustive) representation of the array of existing peri-urban practices. While policy-driven mechanisms can be clearly identified from the perspective of production and provision, the arrangements identified on the right of the wheel are best examined and understood

found on the project website, see reference 4. In addition, the proceedings of the Quito workshop were published as Dávila, Julio D and Mónica Rhon (editors) (2005), "La gobernabilidad en el suministro de agua y saneamiento en la interfaz periurbana de áreas metropolitanas", *Cuaderno de Debate* No 1, CIGU, Quito.

8. These included representatives from the Nairobi office of the Water and Sanitation Programme of the World Bank, the Swedish International Development Cooperation Agency (Sida), the International Development Research Centre of the Canadian Government, the Netherlands-based International Water and Sanitation Centre, the regional manager for Africa of the International Council for Local Environmental Initiatives (ICLEI), and Building Partnerships for Development. The workshop was jointly organized with the University of Cape Town.

9. See Cook, P and C Kirkpatrick (editors) (1988), *Privatization in Less-developed Countries*, Wheatsheaf, Brighton, UK; also Adam, C, W Cavendish and P Mistry (1992), *Adjusting Privatization: Case Studies from Developing Countries*, James Currey Ltd, London; World Bank (1994), *World Development Report 1994: Infrastructure for Development*, Oxford University Press, New York; and Batley, R (1996), "Public–private relationships and performance in service provision", *Urban Studies* Vol 33, Nos 4–5, pages 723–751; and Johnstone, Nick and Libby Wood (editors) (2001), *Private Firms and Public Water*, Edward Elgar, Chelthenham, UK.

10. Joshi, A and M Moore (2004), "Institutionalized co-production: Unorthodox public service delivery in challenging

environments", *The Journal of Development Studies* Vol 40, No 4, pages 31–49; also Ostrom, E (1996), "Crossing the great divide: co-production, synergy and development", *World Development* Vol 24, No 6, pages 1073–1087.

11. See reference 1, World Bank (2003). For a dissenting view, see Gutierrez, E, B Calaguas, J Green and V Roaf (2003), *New Rules, New Roles: Does Private Sector Participation Benefit the Poor?*, Synthesis Report, WaterAid and Tearfund, London; also Water Utility Partnership for Capacity Building Africa (2003), *Better Water and Sanitation for the Urban Poor. Good Practice from Sub-Saharan Africa*, European Communities and Water Utility Partnership, Nairobi.

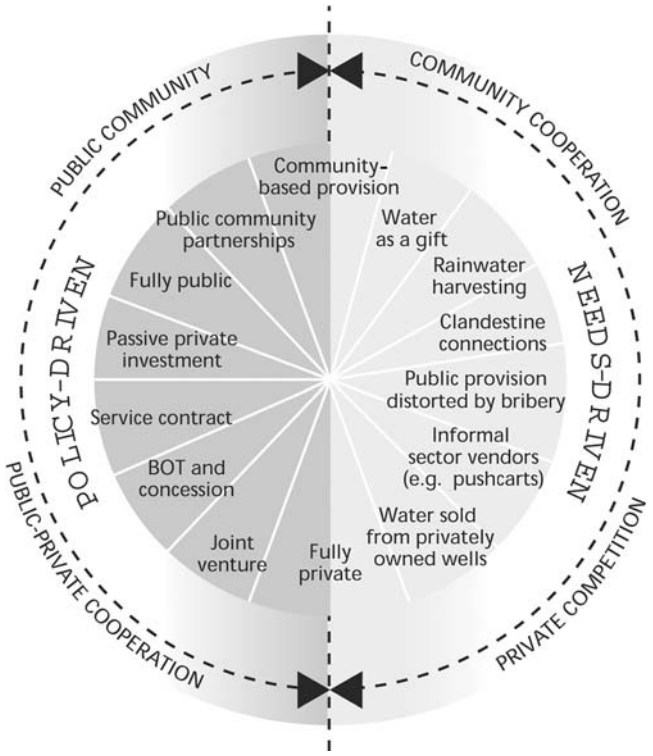

FIGURE 1
Policy-driven and needs-driven practices in the "water supply wheel"

SOURCE: Allen, A (2005), "Governance and service delivery in the peri-urban context: towards an analytical framework", unpublished paper prepared for the research project *Service Provision Governance in the Peri-urban Interface of Metropolitan Areas*, Development Planning Unit, University College London.

from the perspective of access and, in particular, from the viewpoint of highly localized strategies adopted by the peri-urban poor.

The water supply wheel also shows the role of the public, private and community sectors in the provision of water, and the extent to which these roles are based on cooperative arrangements across two or three of these sectors and at different scales. None of the three sectors can be regarded as homogeneous; for example, the public sector might be present in the form of either highly centralized state agencies or of decentralized local bodies. Similarly, at a community level there might be arrangements marked by some degree of formalization, such as community schemes actively supported by the public sector or by external NGOs, as well as more informal relations of cooperation on the basis of solidarity ties.

These strategies and practices are not static. For instance, in peri-urban Dar es Salaam community-based provision based on the development of piped network kiosks and taps run by the community with NGO

support originated as a needs-driven practice but, over time, became institutionalized and supported by the state.

Although less diverse, the "sanitation wheel" in Figure 2 shows a spectrum of arrangements. In the five case studies, the most common peri-urban practices tended to be needs-driven. The peri-urban poor rarely have access to formal facilities operated by the public or formal private sector, such as waterborne sewerage or licensed pit-emptying services. A large number still lacks any form of hygienic disposal for human excreta, or rely on septic tanks, individual or shared pit latrines and/or public toilet facilities, which often involve an admission charge.

Sanitation is seen as less of a priority than access to drinking water, although perceptions between women and men differ. This is confirmed by other studies, which found that women often have a better appreciation of the health implications of lack of sanitation than men, who prioritize other services and facilities when making investment decisions.[12] In some cases, lack of investment on individual facilities is due to the reluctance of landlords to spend money on sanitation, or the

12. Water and Sanitation Programme (2004), "The case for marketing sanitation", Field Note, Sanitation and Hygiene Series, WSP, Nairobi.

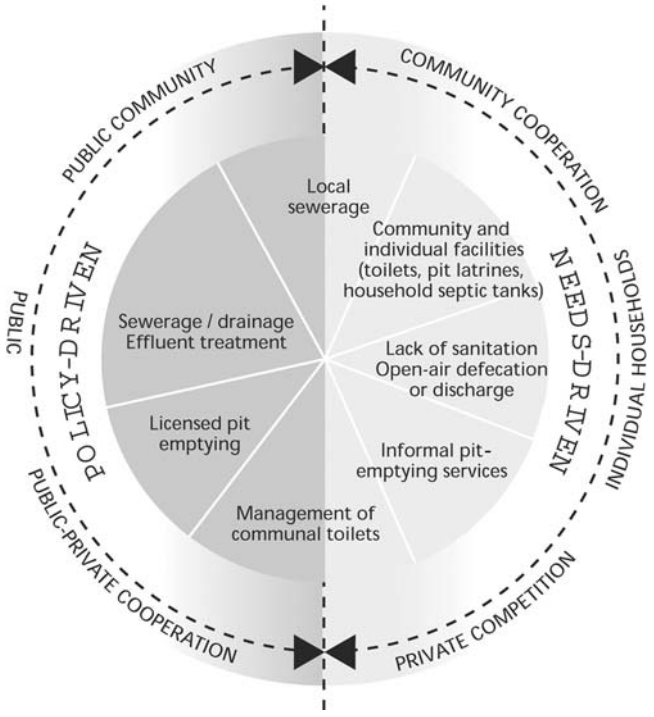

FIGURE 2
Policy-driven and needs-driven practices in the "sanitation wheel"

SOURCE: Tayler, K (2005), "Notes for sections on sanitation and wastewater disposal", prepared for the research project *Service Provision Governance in the Peri-urban Interface of Metropolitan Areas*, Development Planning Unit, University College London.

fear of informal settlers of losing their investment due to the land and housing tenure insecurity.

Informal peri-urban practices are at best overlooked and at worst resisted by the regulations, policies and practices that guide and support the formal system. Peri-urban areas generally lie outside the coverage of formal systems, which are, in most cases, limited to a relatively small metropolitan core, as in Chennai. Cairo provides an example of the lack of consideration of the role played by the informal private sector. Although informal water vendors are usually perceived negatively, they can be effective in servicing peri-urban dwellers who lack alternative means of water supply, while their role might be enhanced by means of institutional support to access good quality and plentiful water supplies, but also by ensuring there is adequate competition (by, for example, preventing the creation of cartels that might increase prices beyond the access of the poor).[13]

13. Water Engineering and Development Centre (WEDC) (2002), *Public Private Partnerships and the Poor*, available at http://wedc.lboro.ac.uk.

There is a high degree of fragmentation of agents involved in the different stages of peri-urban water supply and sanitation. The highest diversity is found in the water distribution and access stages. To a large extent, water extraction continues to be the responsibility of the public sector, although there are cases where extraction is performed by the private sector (e.g. individual private well owners or illegal aquifer extraction). But it is at the distribution stage that the highest diversity of actors operate, either within the formal system and thus under the regulation and supervision of the state, or in the interstices left by such a system.

b. Peri-urban water and sanitation practices

Table 2 outlines the practices found in the five case study cities in terms of access to water supplies by peri-urban poor households. Supply through peri-urban piped network connections is unsatisfactory (e.g. under 5 per cent in Dar es Salaam's localities) and so are the few formal alternatives to the piped system, leaving the peri-urban poor to rely partially or mainly on needs-driven forms of supply. Only a few of those practices, shown in the third column of the table, such as the community kiosks in Dar es Salaam or the horizontal condominiums in Caracas, are acknowledged and supported by formal institutional arrangements, with the majority arising from poor people's efforts to gain access to what the formal system is unable to supply.

In some cases, such as Mexico City and Chennai, the physical inaccessibility of peri-urban localities significantly limits the provision of water supply not only through extensions to the piped network but also through alternative forms of supply. In other cases, such as Cairo, the formal system actively obstructs informal supply efforts, with the government trying to eradicate informal water vendors without realizing fully the consequences this might have on limiting access by the peri-urban poor. In Dar es Salaam, informally supplied water fails to meet minimum standards of quality, with negative impacts on users' health. However, what needs to be considered is the potential of the informal private system to provide a reliable and fairly flexible source to the peri-urban poor when it comes to the frequency of supply, pricing and modes of payment. The formal (private) system, on the other hand, is highly regulated and thus less flexible in adapting to poor people's needs and capacities.

TABLE 2
Access to peri-urban water supply in the five case studies

Provider	Policy-driven water supply practices	Needs-driven water supply practices
Public (state) sector	• Piped network (household connections and public standpipes) • Wells and bore wells (not Mexico City) • Provision by tankers (not GCR)	• Public provision distorted by bribery practices (Chennai and Mexico) • Water kiosks (Dar es Salaam) • Negotiation with communities through "technical water for a" (Caracas)
Private sector	• Buying from licensed tankers (not in GCR) • Buying packaged water (cans, bottles, sachets)	• Buying from informal tankers • Private vendors drawing from own site piped connections/own boreholes or wells sold directly by bucket or through push carts and bicycle vendors (Dar es Salaam) • Sales from private boreholes or wells (GCR)
Community		• Rainwater harvesting (not Caracas or GCR) • Water theft • Gifts or paid provision from neighbours • Clandestine connections • Own individual wells and boreholes (not Mexico or Caracas) • Piped network (community organization agreement with local authority (Mexico)or public water company (Caracas) • Piped network kiosks and taps run by the community with NGO support (Dar es Salaam) • Boreholes and kiosks run by the community (Dar es Salaam) • Horizontal condominiums (Caracas)

SOURCE: Unpublished project reports.

There are examples in Egypt and Pakistan where the community – with support from engineers in Egypt and NGOs/CBOs in Pakistan – has extended the existing water distribution system. However, this is not common practice in peri-urban areas and does not constitute a viable solution, particularly in cases where there are attempts at controlling urban expansion, as in Mexico City.[14]

Small decentralized reticulated distribution systems are a reality in peri-urban and suburban localities where the main water distribution system has yet to reach. For example, there are 90 community-operated systems each covering between 50 and 300 households in peri-urban Cochabamba (Bolivia), drawing water either from underground or surface

14. With a view to halting population growth in the ecologically sensitive sub-district of Milpa Alta, the government of the Federal District of Mexico has implemented a number of measures. The territory was divided into urban and non-urban areas (*parajes*), and a decision was taken that rural dwellers were not entitled to individual connections to

water sources.[15] Water is stored in overhead storage tanks and is delivered to yard or in-house connections. An attempt to systematize and scale up this system is found in the work of Aguatuya, the result of a partnership between a private consortium, the city's municipal water company, a non-profit foundation and water committees with community representation.[16]

V. WHO ARE THE PERI-URBAN "WATER POOR"?

Many peri-urban inhabitants could be described as being "water poor", as they lack access to sufficient water and adequate sanitation facilities to meet their needs. However, the absence of reliable and detailed data makes it difficult to present valid numbers for "adequate" provision, as the peri-urban interface is not a geographically fixed area and, at best, statistics only distinguish between urban and rural areas.

A salient feature of the water poor in the peri-urban context is the fact that they are almost invariably forced to spend a significant proportion of their income in water. The research confirmed that the water poor in peri-urban areas are not necessarily restricted to low-income households, as often members of other income groups also lack access to adequate water and sanitation services. However, low-income peri-urban dwellers and home workers tend to be more vulnerable than higher-income ones, as they often lack the financial and political means to improve their access to water and sanitation services in a manner that is not only affordable to them but also secure in the long term.

Generally, the type of use and amount of water actually consumed is rarely determined by people's needs but depends instead on levels of service available. In peri-urban areas, this is linked not only to the distance to a water source, which is an indicator in rural areas, but also to the number of people sharing the same facility (the variable to consider in urban areas), as both have an impact on the time spent, and consequently the amount collected. However, adequate access to water supply does not merely depend on these two variables, but relates also to a number of attributes of the service such as regularity, sufficiency, affordability, quality and safety.[17]

Field interviews with peri-urban dwellers provide some hints to advance a definition of the peri-urban water poor, where important features include informal/illegal access to water, access to poor-quality water and insufficient access to water (Box 2).

Informal and/or illegal access to water is often linked to insecure tenure of land and housing rights, and this is particularly crucial in the peri-urban context where customary, quasi-customary and statutory systems coexist or overlap with each other.[18] In Dar es Salaam customary and quasi-customary systems are facilitating access to unplanned and unsurveyed land for housing. The process is leading to over-densification in low-income housing settlements and faecal contamination of groundwater sources. These adverse effects are associated with the lack of a regulatory framework for informal housing land development coupled with the absence of coordination between land use and the development of water and sanitation systems.

Another aspect that characterizes water poverty in the peri-urban interface refers to the water-related health risks and impacts experienced

reticulated water and sanitation systems. Using a 1997 census of population in the *parajes* as a basis, a Zero Growth Pact embodies an agreement between the local authorities and the *paraje* dwellers recorded in the census to stop new settlements. According to the pact only the registered population is entitled to access water provided through public tankers and communal taps; in exchange, registered peri-urban dwellers are expected to police the area and denounce any new settlers.

15. See reference 6, Allen, Dávila and Hofmann (2006); also Bustamante, R, J Butterworth and N Faysse (2004), "Is there a future for locally managed domestic water supply systems in peri-urban Cochabamba, Bolivia? Analysis of performance and some possible scenarios", Working Paper for NEGOWAT project workshop, São Paulo, 16–21 August 2004.

16. See www.aguatuya.com.

17. See Hofmann, P (2004), "Access to water supply and sanitation services of low-income households in the peri-urban interface of developing countries", Paper prepared for the research project *Service Provision Governance in the Peri-urban Interface of Metropolitan Areas*, Development Planning Unit, University College London. Available from www.ucl.ac.uk/dpu/pui/research/current/governance/outputs.html.

18. Durand-Lasserve, A (2004), "Land for housing the poor in African cities. Are neo-customary processes an effective alternative to formal systems?", in Hamdi, N (editor), *Urban Futures. Economic Growth and Poverty Reduction*, ITDG Publishing, Rugby, UK, pages 160–174.

BOX 2
The peri-urban "water poor"

The testimonies that follow, from peri-urban dwellers in the five case studies, help to understand their perceptions and experiences of water poverty.

The insecurity associated with practices such as "illegal" connections is a recurrent factor highlighted by most interviewees, as illustrated by a peri-urban resident in Caracas: ". . . *here is where the water problem is most visible, on Terrace 11. We have the connection to the pipe furthest away, on the main highway . . . we connected an illegal tap, but it doesn't meet our needs. Water doesn't reach my house at leas . . . We have no responsibility, some people waste a lot of water, there are broken pipes and they aren't repaired*."

While in some areas, like Cairo, the poor quality of water is a central concern, in other places the main problem affecting peri-urban communities is related to its irregular and inadequate supply. A woman in Caracas explains how this affects her life: "*When they give me water every fourth day, I don't do any other chores, I just get water . . . The next day I do all my chores, because water takes a lot of your time, fetching water, filling bottles, checking that there are no leaks*."

Peri-urban poor residents develop different coping strategies to deal with irregular and insufficient water supply. A woman from Milpa Alta (Mexico) explains: "*They give us water every third day at the tap, by hour. They give us three or four hours a day and we organize by number on a list of families. There are 17 families in this area, around 80 people including children. We get half an hour of water each . . . When your turn comes, you grab the hose and connect it to the barrel*."

Street taps are the only means of water supply in some of Chennai's peri-urban areas. The number of street taps varies from one tap serving 258 persons in Valasaravakkam to one tap for 41 people in Manapakkam.

The water and sanitation services deficiency suffered by peri-urban poor residents causes various diseases including diarrhoea, intestinal worms, typhoid, cholera and dysentery. In Tungi, the peri-urban locality in Dar es Salaam, the number of cases of diarrhoea almost tripled between 2001 and 2003. In 2002 alone, 299 cases of diarrhoea were reported, the consequences of which led to 13 deaths.

SOURCE: Unpublished project reports.

by peri-urban dwellers and producers. Although there is little specific research in this area, it could be argued that in comparison to the urban or the rural poor, the peri-urban poor may live in the "worst of both worlds", as they are often exposed to a combination of rural and urban health hazards associated with water consumption and waterborne pathogens.[19] Household and surface drainage systems are generally combined, and this increases the risk of exposure to waterborne and water-washed diseases. When competition for limited water resources is high, it is common for peri-urban farmers to re-use untreated wastewater for irrigation, thereby posing potentially serious health hazards for

19. Birley, M H and K Lock (1998), "Health and peri-urban natural resource production", *Environment & Urbanization* Vol 10, No 1, April, page 89–106.

agricultural workers and consumers of food produced using wastewater. The health and livelihoods of the peri-urban poor bear the brunt of these risks because they often inhabit low-lying and marginal lands, which are more susceptible to flooding by contaminated water and other wastewater forms of pollution. This is confirmed by the types of diseases recorded in the localities of the five case studies examined, many of which arise through human contact with faecal matter, either through the consumption of contaminated water or through person-to-person contact.[20]

20. See reference 17.

Looking at the link between livelihoods and water needs, another distinctive feature that characterizes the water needs of the peri-urban poor is that their livelihoods tend to be more diversified than in the rural and urban context, as poor households are more likely to depend on both natural and non-natural resource-based productive activities. Many income activities in the peri-urban interface are water intensive, such as agriculture and horticulture (e.g. Mexico and Chennai), animal husbandry and tanning, and brick making. In peri-urban Dar es Salaam, water is extensively used in food vending, poultry and cattle keeping, concrete block making and "tie and dye" textile production. For those involved in these activities, lack of water not only constrains personal consumption and hygiene but also poses 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 collecting water (up to two hours per day in some cases reported in Chennai) that must be taken away from other tasks. This is particularly stressful for women and, where children are involved, their school education can be at risk. This problem appears to be significant in peri-urban areas as they are populated by a high percentage of households comprising nuclear families and female single heads. This means that they can only rely on a very limited number of family members to fulfil daily tasks and to diversify household income. For example, nuclear families account for more than 60 per cent of the total in Caracas, and between 50 and 59 per cent of Chennai's peri-urban population. This phenomenon is a result of the migration patterns that characterize demographic influx to and from the peri-urban interface.

VI. CITIZENS OR CONSUMERS?

The magnitude and impending consequences of the "water and sanitation" crisis have led human rights activists and development theorists to stress that water and sanitation play a vital role in the fight against poverty. As such, the right to water and sanitation is seen as indivisible from other human rights such as the right to health, work, shelter and, more fundamentally, the right to participate in the decision-making process. In this context, water is regarded as a public good and a basic human right best administered by the public sector in direct dialogue and cooperation with civil society. The definition of water as a human right means that "*. . . fresh water is a legal entitlement rather than a commodity or service provided on a charitable basis.*"[21]

21. World Health Organization (2003), *The Right to Water*, WHO, Geneva, page 9. See www.who.int/water_sanitation_health/rightowater/en/.

The inability or incapacity of governments in low- and middle-income countries to guarantee their citizens' supposed right to water has given rise to increasing scepticism among many who claim that business and the market can resolve the world's water crisis. This claim is well

represented by the work of Swedish analyst Fredrik Segerfeldt, who argues that given that the majority of poor households in low- and middle-income countries have no connection to water mains, in practice the urban and peri-urban poor are already exposed to market forces, although on very unfair terms, as they pay on average up to 12 times more to obtain water than those legally connected to water mains.[22] And yet there is empirical evidence showing that small-scale providers (NGOs and private sector) can provide water of good quality, at low cost and in sufficient volumes to urban (and peri-urban) dwellers.[23]

In the context of this broader debate, a central question is: are the peri-urban poor citizens or consumers? In other words, what is their status both in a broader legal framework and in policy environments that regulate the provision of basic services? Similarly, what is their reality in terms of the practices through which they effectively access water and sanitation?

The answer to the first question is that in the peri-urban context, the poor are both citizens and consumers. In all five case studies examined, there are constitutional provisions in place that define water as a human right to be guaranteed to all people – rural and urban. While in most cases peri-urban dwellers would arbitrarily be classified as either rural or urban, in cases like India there is explicit recognition of and provisions for the inhabitants of peri-urban areas or "transitional" areas.

In recent years, the definition of "right" has been subject to major changes prompted by the introduction of water tariffs. In some cases, this process has been linked to the total or partial privatization of basic service provision, while in other cases water tariffs have been introduced as a means of improving the financial capacity and cost recovery of public agencies, as in the case of Caracas. A common aspect to all such reforms has been the reformulation of the universal right to water. At the policy level, this right is often restricted to "those in need". This means that reformed regulatory frameworks focus on creating special measures and mechanisms to provide water for the poor, while introducing full or partial economic costing practices for the large majority. In this context, it is relevant to examine how "those in need" are defined and, in particular, how these definitions affect the peri-urban poor. In some cases, "need" is defined by applying conventional poverty measures, while in other cases significant differences are established between the rural and urban poor, usually allocating more subsidies to the former.

India's 2002 National Water Policy asserts that:

> ". . . adequate safe drinking water facilities should be provided to the entire population both in rural and in urban areas. Irrigation and multipurpose projects should invariably include a drinking water component wherever there is no alternative source of drinking water. Drinking water needs of human beings should be the first charge on any available water."[24]

Although the policy does not clearly lay down whether drinking water is a right or a good, the message is clear. Neither current policy reforms nor established practices contemplate treating water and sanitation services as goods, which would depend upon market mechanism for access and delivery. Prime responsibility for providing these services has conventionally been with publicly funded local government institutions. This responsibility has been strengthened through enactments under the 73rd

22. Segerfeldt, F (2005), *Water for Sale: How Business and The Market Can Resolve the World's Water Crisis*, Cato Institute, Washington DC.

23. See, for example, Solo, T M (2003), *Independent Water Entrepreneurs in Latin America. The Other Private Sector in Water Services*, The World Bank, Washington DC.

24. See http://wrmin.nic.in/policy/nwp2002.pdf.

and 74th amendments to the national Constitution, which deal respectively with urban and rural local government structures and reconfirm the status of the poor as citizens, giving these institutions the responsibility for providing basic services. In practice, there are two incentives for peri-urban dwellers to remain under the jurisdiction of rural local bodies. First, funds from the central government Ministry of Rural Development are considerably larger than those available through programmes administered by the Ministry of Urban Development, with the former including grants to *gram panchayats* (self-governing local authorities), and various programmes funding water supply, roads, education and health. Second, in rural jurisdictions water is supplied for free, and charges for other services such as electricity are lower than in municipal areas.

In Tanzania, according to the Water Utilization Act (1974) – amended in 1991 and 1997 – and Water Policy (2002), water is regarded as a "social good". However, owing to the high cost of potable water supply, peri-urban communities are forced to pay for water, although at a subsidized rate; this payment covers only maintenance and running costs. In this respect, the state pays for capital investment in community water supply systems, while private water vendors charge commercial rates (usually leading to small profits). Therefore, from policy and statutory provisions, water remains a social good only in so far as public (state)-provided systems are concerned. However, only a few communities in the peri-urban interface have access to potable water supplied by the state as a social service, largely because of the limited resource capacity of the state to provide potable water to the sprawling peri-urban settlements.

Similarly, in the case of Mexico, access to water is a universal right guaranteed by the national Constitution. Article 27 establishes the sovereignty of the state over all water resources within the national territory, and treats water as a common good. Moreover, Mexico has signed international treaties agreeing to guarantee access to water as a human right. However, there are differences in the status of different water users. In theory, all inhabitants have rights to water for domestic consumption. Agricultural producers have water rights registered in the Public Registry of Water Rights, while industrial users are under a different regime.

The Egyptian government treats access to water and sanitation as a right of all its citizens, and potable water and sanitation are heavily subsidized. However, this does not specify the type and quality of service guaranteed by the state. In recent years, several foreign donor agencies have pushed the government to introduce gradual increases in water and sanitation tariffs as part of the changes recommended to improve the performance of the water and sanitation service sector. However, the large majority has resisted this measure, as water and sanitation are sensitive issues, largely perceived by Egyptian citizens as public goods.

An important consideration refers to what is defined and guaranteed as a "right". While in some cases this refers exclusively to the provision of safe water, in other cases, such as in Venezuela, the definition of rights is far more encompassing. Here, recent reforms sought the revitalization and reform of public systems that focus on enhancing poor people's entitlements and rights to water rather than emphasizing profits. This experience shows that the peri-urban poor can be simultaneously responsible consumers and empowered citizens, as rights and responsibilities go hand in hand (Box 3).

It is worth highlighting that the right to sanitation as an entitlement

BOX 3
Building responsible citizenship in metropolitan Caracas

Access to water has always been considered a right in Venezuela, and in poor areas the norm has been that this service is not charged for. The 1999 national Constitution and the 2001 Drinking Water and Sanitation Service Act establish clear guidelines on the right to water access and participation to improve access. This process is based on a joint responsibility principle between Hidrocapital, the state water company, and the communities. The principle of "Community that participates – community that achieves results" implies the exercise of rights and duties whereby citizenship is created. Individual and collective payment for service is within these obligations, as Hidrocapital seeks to develop consumers responsible for the payment of a "social rate" (US$ 1 a month) in poor areas and, in some cases, collective payments through the use of community water meters.

The establishment of Technical Water Fora (TWF) ensures the participation of peri-urban communities in the decision-making process. These fora foster collaboration between citizens and technical personnel in the water and sanitation sector and have become a key mechanism for community mobilization and improved service provision. The fora have helped raise awareness about the costs associated with the production of water – treatment, transportation and distribution. This not only creates a sense of responsibility about water consumption but also helps people understand what is being charged and why.

Despite being a government initiative, the TWF are fairly autonomous. Communities are not only users and consumers of a service, but also part of the service that can help to build it up. They participate in the service construction process from the initial diagnosis and project design stages to regular monitoring.

By 2005, this participatory strategy had helped meet the water targets of the Millenium Development Goals planned for 2015. It has also contributed to the strengthening of community fabric, social citizenship and a new network of relationships between the community and the state in the creation of a new water culture.

A key aspect is the participation of women in this process, who represent more than 75 per cent of the members and heads of the TWF. Their participation in these organizations has contributed to the emergence of female leadership within popular groups. The active participation of women in the TWF represents a change from a well-established patron–client form of politics. It also reinforces the need to develop a gender focus in polices aimed at improving and making the water and sanitation system more democratic.

SOURCE: Unpublished project reports; also Lacabana, M and C Cariola (2005), "Construyendo la participación popular y una nueva cultura del agua en Venezuela", *Cuadernos del CENDES* No 59, pages 111–133.

provided for at the constitutional level is generally less explicit. Many argue that this is implicit in the right to water, as access to basic sanitation is a prerequisite for clean water. However, there are few cases in Africa, Asia and Latin America where such provisions are in place. In

practice, access to sanitation by peri-urban dwellers in the five case studies examined is highly deficient, running from the lack of any facilities to inadequate collective facilities provided by the government.

These cases demonstrate that, although access to water is in theory recognized as a right to be enjoyed by all, in practice the needs of the peri-urban water poor still fall short of these entitlements. The issue of the status of their localities is theoretically an important one, particularly in India, where rural status enshrines the principle of water as a free public good. And yet most of the cases documented here show that the majority are consumers of these services and pay a commercial price for them. In some cases, such as Dar es Salaam and Cairo, many of the peri-urban poor are also producers of these services, as exemplified by privately owned wells, local small-scale distributors of water, and providers of latrine-emptying services.

VII. CONCLUDING REMARKS

The five case studies reported in this article provide a complex picture of the range of means of delivery of basic water and sanitation services to peri-urban dwellers. The evidence shows that the options available to cover the deficit in basic services rarely rely exclusively on the extension of formal infrastructural networks but on more decentralized, more flexible forms of service provision. Failure by the public and private sectors to support such forms of water and sanitation provision often means that peri-urban dwellers, in particular the poor, are left to their own devices in accessing these essential services. As their needs and practices often remain "invisible" to the public sector, policy changes aimed at improving the efficiency of formal water and sanitation provision frequently do little to ensure better access by the peri-urban poor, and often even represent an obstacle.

This paper has argued that there is a significant contrast between policy-driven and needs-driven practices in accessing water and sanitation services. The five cases show that access to water and sanitation by poor peri-urban dwellers is mainly needs-driven and informal rather than the result of formal policies. The key to structural improvements in water and sanitation lies in the recognition of these practices and their articulation to the formal system under new governance regimes.

An approach to water and sanitation services that strengthens collective action can have multiple benefits. For one thing it can minimize the burden on women and children by decreasing time spent on collecting water. At the same time, it has the potential to improve livelihoods of the peri-urban poor, as many of them greatly depend on water for productive uses. Moreover, the transition from informal vendors to purchasing water from community-managed systems can lower considerably the money spent on water. This has happened in the case of Dar es Salaam, where the monthly charges for potable water from peri-urban community-managed systems can vary, depending on its quality, but are cheaper overall than the monthly fee for the public network system. Similarly, the case of Caracas shows that having a "right" to water does not necessarily mean that the service is provided free but rather, that mechanisms to guarantee that such right is effectively exercised are put in place.

The right to water and sanitation is, in fact, not just a right to

subsidized services but a means to ensure that water and sanitation fulfil 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 2001, the Brazilian government enacted a groundbreaking federal law entitled "City Statute", which explicitly recognizes the right to the city as a collective right and establishes a new legal premise and political framework based on urban land use and development control. Within this framework, municipalities are entrusted with the responsibility of formulating territorial and land use policies that seek a balance between individual property rights and collective social and environmental rights. Insofar as the City Statute guarantees the "right to a place", not only for urban dwellers but also peri-urban communities, it constitutes a useful example of the type of innovation required to improve the rights and entitlements of the peri-urban poor who, more often than not, remain invisible to the eyes of urban and rural local authorities. Another important aspect of the City Statute is that it provides municipalities with legal instruments and authority to regularize land tenure. This is also a relevant provision to improve access to water and sanitation in the peri-urban context, as insecure access to these services is in most cases associated with varying degrees of land and housing informality.

Interventions designed to engage with problems of scale and diversity over the long term frequently require first and foremost a new political and organizational culture on the part of water and sanitation authorities, local politicians and users. As the case of Caracas shows, this new culture can be developed so that people's priorities and energies are incorporated through active collaboration with the water authority. This not only provides communities with greater control over the design and management of their own services but it also reduces their dependence on corrupt patronage politics, strengthening their identity and a belief that water is not merely a right but also involves a set of responsibilities on the part of users.

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